

*DRAFT*  
PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District One

**State Road 544 (Lucerne Park Road) from Martin Luther King  
Boulevard to State Road 17**

**Project Development & Environment Study**

Polk County, Florida

Financial Management Number: 440273-1-22-01

ETDM Number: 5873

January 2025

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26, 2022, and executed by Federal Highway Administration and FDOT.

Appendix A  
ICE Tech Memos

# CERTIFICATION

AGENCY: Florida Department of Transportation District One  
801 North Broadway Avenue  
Bartow, Florida 33831-1249

I hereby certify that I am a registered professional engineer in the State of Florida and that I have supervised the preparation of, and approved the analysis, findings, opinions, conclusions and technical advice hereby reported for:

REPORT: SR 544/SR 17 Intersection Control Evaluation (ICE) - Stage 1

PROJECT: SR 544 Project Development and Environment (PD&E) Study

LOCATION: SR 544 from Martin Luther King Boulevard to SR 17  
Polk County, Florida

FPID No.: 440273-1-22-01

I acknowledge that the procedures and references used to develop the information contained in this memorandum are standard to the professional practice of transportation engineering as applied through professional judgement and experience.

Engineer in Responsible Charge: Anastasiya A. Senyushkina

Professional Registration No.: 82191

Date: 8/11/2021

Digitally signed by  
Anastasiya A Senyushkina  
Anastasiya A Senyushkina  
Date: 2021.08.11  
10:49:12-04'00'

A blue square logo with a white stylized 'S' or 'G' shape inside, positioned to the left of the digital signature text.



# AIM Engineering & Surveying, Inc.

## MEMORANDUM

Tampa Office  
3802 Corporex Park Drive, Suite 225  
Tampa, Florida 33619  
(T) 813-627-4144 / (F) 813-664-1899  
www.aimengr.com

**Date:** August 11, 2021

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**To:** David C. Turley, P.E. – FDOT District One DEMO Project Manager  
Richard (OJ) Oujevolk, P.E. – FDOT District One DEMO Engineering Manager

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**From:** Greg Root/Anastasiya Senyushkina, P.E.

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**Subject:** SR 544/SR 17 Intersection (Polk County) — Stage 1+ Intersection Control Evaluation

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### INTRODUCTION/PROJECT BACKGROUND

The purpose of this memorandum is to document the Intersection Control Evaluation (ICE) analysis that was conducted for the SR 544/SR 17 intersection. This ICE analysis was conducted to support the SR 544 Project Development & Environment (PD&E) Study from Martin Luther King Boulevard to SR 17 in Polk County. This memorandum documents the results of the Stage 1 CAP-X and SPICE analyses that were conducted for the intersection, as well as the results of the more detailed traffic operations analyses conducted using the SYNCHRO and SIDRA software.

A Project Traffic Analysis Report (PTAR) was previously prepared in support of the SR 544 PD&E study and this PTAR was approved by FDOT District One on January 22, 2021. The opening year and design year utilized for this PD&E study are 2025 and 2045, respectively. The 2025 and 2045 Average Annual Daily Traffic (AADT) volumes documented in the approved PTAR are provided in **Appendix A**. The 2045 a.m. and p.m. peak hour volumes documented in this same report are also provided in **Appendix A**.

### EXISTING INTERSECTION CHARACTERISTICS

The SR 544/SR 17 intersection is a four-legged signalized intersection. SR 17 is the eastern terminus of SR 544 and the eastern leg of this intersection is designated as CR 544 (Scenic Highway). SR 17 is a north-south roadway that traverses most of Polk County extending from US 27 south of Frostproof to US 17-92 in Haines City. SR 17 intersects SR 544 on a skew angle. Verano Drive is located on the east side of SR 17 and intersects CR 544 as a stop control T-intersection approximately 40 feet to the east of the westbound CR 544 stop bar. There is a U.S. Post Office located in the northeast quadrant of the intersection. Access into and out of the post office is provided via a full median opening on CR 544. This full median opening is located approximately 330 feet to the east of the westbound CR 544 stop bar. Vehicles can also exit the post office and travel north or south on Verano Drive. Vehicles are not allowed to enter the post office parking lot via Verano Drive. The CR 544/Verano Drive intersection was intended to allow vehicles to exit the post office and turn right onto CR 544 and to allow vehicles traveling eastbound on CR 544 to turn right and travel northbound on Verano Drive to access the residential land uses north of the post office; however, left-turn movements from Verano Drive onto

eastbound CR 544 are not currently prohibited. The Lamb of God Lutheran Church is located in the northwest quadrant of the intersection and several single family homes are located in the southwest quadrant of the intersection. The southeast quadrant of the intersection is currently vacant. The posted speed limit on SR 544, CR 544 and SR 17 in the vicinity of the intersection is 45 mph. An aerial image depicting the SR 17 intersection is provided in **Figure 1**.

This intersection has experienced 45 crashes over the six-year period from 2014 through 2019, resulting in 18 injuries and no fatalities. Rear-end crashes were the most frequently occurring crash type. There were 19 rear-end crashes (approximately 42.2% of the total crashes) reported during this six-year period. There were also 17 left-turn/angle crashes (approximately 37.8% of the total crashes) and four sideswipe crashes (approximately 8.9% of the total crashes). None of the crashes involved bicyclists or pedestrians. The proposed SR 544 typical section in this area is a four-lane divided roadway that consists of two 11-foot inside travel lanes, two 12-foot outside travel lanes, a 22-foot raised median and a 10-foot shared use path on both sides of the road. The design speed and target speed for this typical section is 45 mph.

## **INTERSECTION CONTROL EVALUATION**

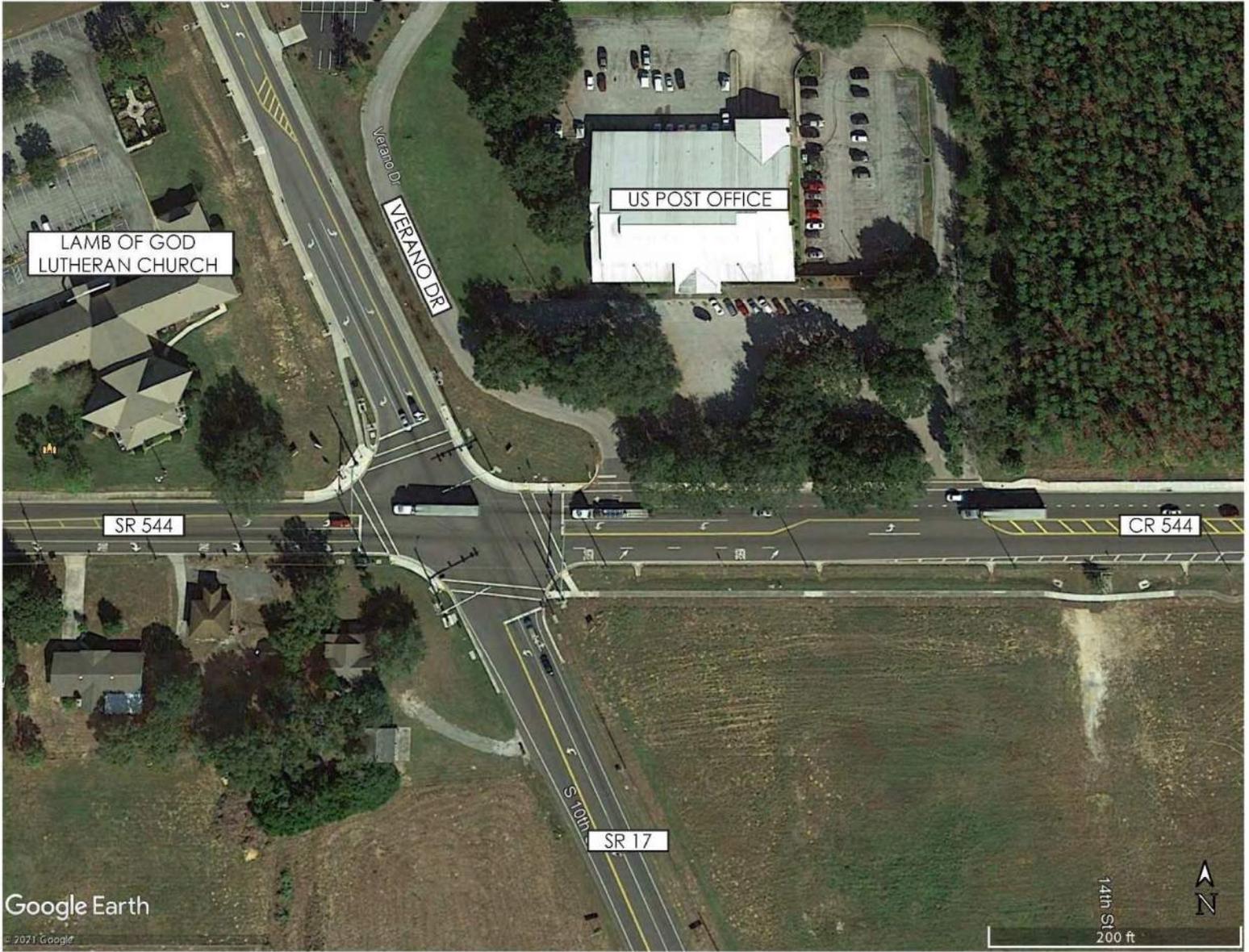
The FDOT ICE process was developed to consistently consider multiple context-sensitive intersection control strategies when determining the best improvement for a given location. This process promotes thoughtful consideration of alternative intersection types and supports objective evaluations of various intersection control strategies. For PD&E studies, the Stage 1 ICE can serve as the initial screening of potential alternative intersection control strategies with an emphasis on capacity (CAP-X) and safety (SPICE). The Stage 1 ICE analyses were supplemented with more refined capacity analyses conducted using the SYNCHRO and SIDRA software to provide more detailed operational analysis results. The following sections discuss the results of these Stage 1 ICE analyses.

Five alternative intersection control strategies were initially analyzed for this intersection and these included the following:

- Conventional traffic signal
- Unsignalized Restricted Crossing U-Turn (RCUT) intersection
- Signalized Restricted Crossing U-Turn (RCUT) intersection
- Median U-Turn (MUT) intersection
- Roundabout

The results of the design year (2045) a.m. and p.m. peak hour CAP-X analyses are summarized in **Table 1**. Only the conventional signalized intersection is projected to have v/c ratios less than 1.00 during both peak hours; however, the roundabout alternative is projected to have v/c ratios equal to 1.00 and 1.01 in the a.m. and p.m. peak hours, respectively. The other three alternatives are projected to operate overcapacity (i.e., have v/c ratios greater than 1.00) during both peak hours. The unsignalized RCUT intersection is projected to be significantly overcapacity in the design year with v/c ratios equal to 4.56 and 3.61 in the a.m. and p.m. peak hours, respectively. The signalized RCUT intersection and the MUT intersection are both projected to have v/c ratios that range between 1.07 and 1.11. The results of the SPICE analysis are also summarized in **Table 1**. The MUT intersection is projected to have the lowest number of total crashes (154), as well as the lowest number of fatal and injury crashes (31). The conventional signalized intersection is projected to have the second lowest number of total crashes (181), as well as fatal and injury crashes (44). The signalized RCUT intersection is projected to have the largest number of total crashes (294), as well as fatal and injury crashes (86).

Figure 1: Existing SR 544/SR 17 Intersection



Intersection Type	2045 V/C Ratios		Life-Cycle Crashes	
	AM Peak Hour	PM Peak Hour	Total	Fatal & Injury
Traffic Signal	0.84	0.81	181	44
Unsignalized RCUT	<b>4.56</b>	<b>3.61</b>	n/a	n/a
Signalized RCUT	<b>1.07</b>	<b>1.11</b>	294	86
Median U-Turn	<b>1.10</b>	<b>1.11</b>	154	31
Roundabout (2x2)	1.00	<b>1.01</b>	290	53
<b>Red font denotes a v/c ratio &gt; 1.00</b>				
Lowest number of crashes of all alternatives analyzed				
n/a = Not available (No safety performance function)				

The CAP-X and SPICE analysis summary sheets for the SR 17 intersection are provided in **Appendix B**.

The unsignalized RCUT intersection is not recommended for any additional evaluation due to the severe overcapacity conditions that are projected to occur in the design year. The signalized RCUT intersection is also not recommended for any additional evaluation due to the large number of fatal and injury crashes projected to occur over the 20-year time period (2025 – 2045). The implementation of a MUT intersection would result in northbound u-turn volumes equal to 498 vehicles in the a.m. peak hour and 459 vehicles in the p.m. peak hour. The southbound u-turn volumes would be equal to 462 vehicles in the a.m. peak hour and 474 vehicles in the p.m. peak hour. This would result in over 900 vehicles making u-turn movements on SR 17 during both peak hours. Additional traffic signals would be required on SR 17 north and south of the SR 544 intersection to provide adequate capacity for these u-turn movements. Based on the magnitude of the u-turn volumes and the opposing through volumes, it might be necessary to widen SR 17 and provide two through lanes in advance of the u-turn lanes. Bulb-outs would also need to be provided on SR 17 at these additional signalized intersections to ensure that the u-turning vehicles would be able to stay on the roadway pavement while making these movements. This would result in the need for additional right-of-way. Based on these considerations, a MUT intersection is not recommended for any additional evaluation.

Detailed peak hour traffic analyses were subsequently conducted for a conventional signalized intersection and a roundabout using the SYNCHRO and SIDRA software, respectively. The results of these detailed analyses are summarized in **Table 2**. The average overall intersection delays for the signalized intersection are projected to be equal to 55.7 seconds per vehicle in the a.m. peak hour and 49.6 seconds per vehicle in the p.m. peak hour. The northbound and eastbound left-turn movements are both projected to operate slightly overcapacity in the a.m. peak hour, with v/c ratios equal to 1.03 and 1.05, respectively. The average overall intersection delays for the roundabout are projected to be equal to 53.2 seconds per vehicle in the a.m. peak hour and 46.9 seconds per vehicle in the p.m. peak hour. The westbound movements are projected to operate slightly overcapacity in the a.m. peak hour with a v/c ratio equal to 1.04. No movements are projected to operate over capacity in the p.m. peak hour with either alternative. The SYNCHRO and SIDRA intersection analysis summary sheets for the SR 17 intersection are provided in **Appendix C**.

**Table 2: Design Year (2045) Peak Hour Operational Analysis Summary - SR 544/SR 17 Intersection**

AM Peak Hour							
Intersection	Movement	Signalized Intersection			Roundabout		
		V/C	Avg. Delay	LOS	V/C	Avg. Delay	LOS
SR 17	NB LT	1.03	106.7	F	0.94	57.7	F
	NB TH	0.48	36.7	D	0.94	59.0	F
	NB RT	0.48	36.7	D	0.94	57.4	F
	NB Approach	n/a	68.4	E	n/a	58.2	F
	SB LT	0.25	27.7	C	0.87	47.7	E
	SB TH	0.90	74.4	E	0.87	47.9	E
	SB RT	0.25	0.4	A	0.87	43.5	E
	SB Approach	n/a	36.2	D	n/a	45.8	E
	WB LT	0.31	21.5	C	1.04	93.8	F
	WB TH	0.98	75.4	E	1.04	91.2	F
	WB RT	0.31	34.7	C	1.04	94.4	F
	WB Approach	n/a	61.9	E	n/a	92.1	F
	EB LT	1.05	112.0	F	0.84	29.2	D
	EB TH	0.68	37.6	D	0.84	30.5	D
	EB RT	0.48	17.8	B	0.84	32.5	D
	EB Approach	n/a	54.6	D	n/a	30.7	D
ALL		0.90	55.7	E	n/a	53.2	F
PM Peak Hour							
Intersection	Movement	Signalized Intersection			Roundabout		
		V/C	Avg. Delay	LOS	V/C	Avg. Delay	LOS
SR 17	NB LT	0.88	75.1	E	0.87	46.3	E
	NB TH	0.41	31.6	C	0.87	47.0	E
	NB RT	0.41	31.6	C	0.87	47.2	E
	NB Approach	n/a	50.7	D	n/a	46.8	E
	SB LT	0.31	24.3	C	0.90	46.4	E
	SB TH	0.87	61.1	E	0.90	46.7	E
	SB RT	0.29	0.5	A	0.90	43.0	E
	SB Approach	n/a	29.6	C	n/a	45.0	E
	WB LT	0.72	49.0	D	0.73	30.0	D
	WB TH	0.97	76.4	E	0.73	28.4	D
	WB RT	0.21	34.4	C	0.73	32.0	D
	WB Approach	n/a	66.5	E	n/a	29.1	D
	EB LT	0.92	79.8	E	0.99	54.9	F
	EB TH	0.94	62.2	E	0.99	56.2	F
	EB RT	0.57	22.2	C	0.99	58.6	F
	EB Approach	n/a	54.1	D	n/a	56.7	F
ALL		0.89	49.6	D	n/a	46.9	E

The roundabout and signalized intersection alternatives are illustrated in **Appendix D**. The roundabout is shifted to the west of the existing intersection to avoid any right-of-way impacts to the post office. This westward shift results in right-of-way impacts to the Lamb of God Lutheran Church in the northwest quadrant, as well as two residential relocations in the southwest quadrant. Two-lane approaches are needed on all four legs of the roundabout to accommodate the design year peak hour volumes. This results in the need to widen SR 17 and CR 544 (an off-system roadway). The implementation of a roundabout at this intersection could also create problems for vehicles that exit the post office via Verano Drive and travel south on SR 17. The signalized intersection alternative retains the existing geometry on the east leg of the intersection to avoid any right-of-way impacts to the post office and requires less right-of-way in the southwest and northwest quadrants as compared to the roundabout. The signalized intersection concept graphic also shows that the lengths of the westbound left-turn lane at the SR 544/SR 17 intersection and the eastbound left-turn lane at the post office entrance can be increased with this alternative.

### **RECOMMENDED INTERSECTION CONTROL STRATEGY**

As stated above, the roundabout alternative has larger right-of-way impacts than the signalized intersection and would result in several residential relocations. Since the signalized intersection is projected to have a lower number of injury and fatal crashes, will require a smaller amount of additional right-of-way, and will not require any widening on the east leg of the intersection (i.e., CR 544), it is the recommended intersection control strategy for the SR 17 intersection.

## **Appendix A**

### Existing and Future Year Traffic Volumes

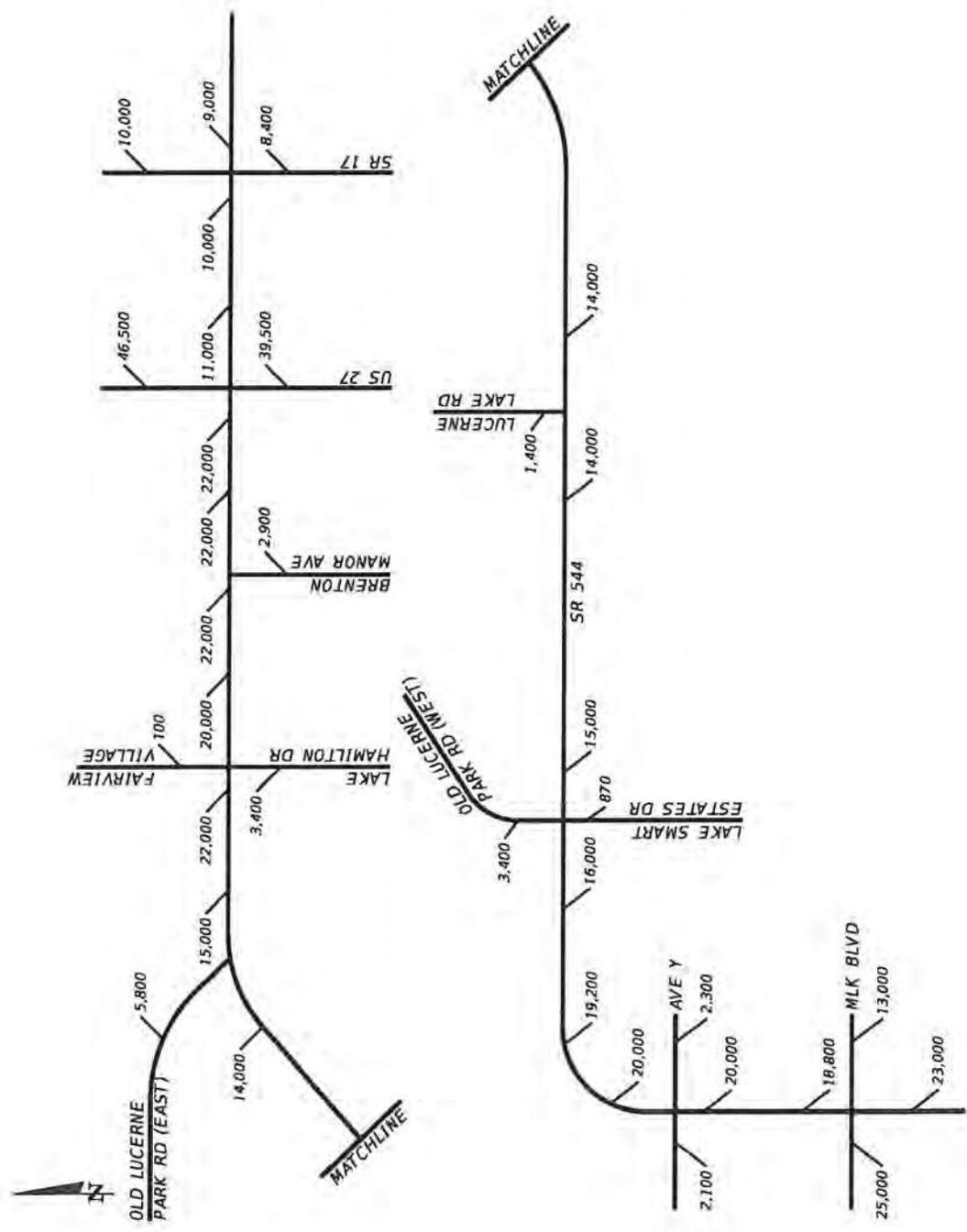


Figure 2-2: Existing (2019) AADT Volumes

**Table 2-2: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Mainline)**

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
South of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	21,686	0.96	0.95	19,778	1.0319	20,409	20,000	23,000	21,500	23,000 <sup>(8)</sup>
North of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	17,212	0.96	0.95	15,697	1.0319	16,198	16,000	18,800	17,400	18,800 <sup>(9)</sup>
South of Avenue Y <sup>(7)</sup>	2/16/2016	19,748	0.96	0.97	18,389	1.0988	20,206	20,000	n/a	n/a	20,000
North of Avenue Y <sup>(7)</sup>	2/16/2016	19,936	0.96	0.97	18,564	1.0988	20,399	20,000	n/a	n/a	20,000
South of Lake Conine Drive									19,200		19,200
West of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	16,214	1.01	0.94	15,394	1.0577	16,282	16,000	n/a	n/a	16,000
East of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	15,212	1.01	0.94	14,442	1.0543	15,226	15,000	n/a	n/a	15,000
West of Lucerne Lake Road	10/1/2019	14,506	1.03	0.94	14,045	1.0000	14,045	14,000	14,000	14,000	14,000
East of Lucerne Lake Road	10/1/2019	14,608	1.03	0.94	14,143	1.0000	14,143	14,000	n/a	n/a	14,000
West of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	18,070	1.01	0.94	17,156	1.0706	18,367	18,000	14,000	16,000	14,000 <sup>(10)</sup>
East of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	14,682	1.01	0.94	13,939	1.0706	14,923	15,000	n/a	n/a	15,000
West of Lake Hamilton Drive/Fairview Village	10/1/2019	22,630	1.03	0.94	21,910	1.0000	21,910	22,000	n/a	n/a	22,000
East of Lake Hamilton Drive/Fairview Village	10/1/2019	20,472	1.03	0.94	19,821	1.0000	19,821	20,000	n/a	n/a	20,000
West of Brenton Manor Avenue	10/1/2019	23,035	1.03	0.94	22,302	1.0000	22,302	22,000	n/a	n/a	22,000
East of Brenton Manor Avenue	10/1/2019	23,127	1.03	0.94	22,392	1.0000	22,392	22,000	n/a	n/a	22,000
West of Hide-A-Way Lane (Hidden Cove Entr)									21,000		21,000
West of US 27	10/1/2019	22,701	1.03	0.94	21,979	1.0000	21,979	22,000	n/a	n/a	22,000
East of US 27	10/1/2019	10,954	1.03	0.94	10,606	1.0000	10,606	11,000	11,000	11,000	11,000
West of SR 17	10/1/2019	10,500	1.03	0.94	10,166	1.0000	10,166	10,000	n/a	n/a	10,000
East of SR 17	10/1/2019	9,534	1.03	0.94	9,231	1.0000	9,231	9,200	8,800	9,000	9,000

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 21,000 vpd for the last five years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 16,000 vpd for the last five years.

<sup>(10)</sup> FDOT count station value was used because the 2018 AADT volume at this permanent count station was equal to 13,600 vpd.

**Table 2-3: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Cross Streets)**

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
M. L. King Boulevard West of SR 544 <sup>(7)</sup>	4/17/2018	26,560	0.96	0.95	24,223	1.0319	24,995	25,000	25,000	25,000	25,000
M. L. King Boulevard East of SR 544 <sup>(7)</sup>	4/17/2018	13,582	0.96	0.95	12,387	1.0319	12,782	13,000	13,500	13,250	13,000
Avenue Y West of SR 544 <sup>(7)</sup>	2/16/2016	1,960	0.96	1.00	1,882	1.0988	2,068	2,100	n/a		2,100
Avenue Y East of SR 544 <sup>(7)</sup>	2/16/2016	2,174	0.96	1.00	2,087	1.0988	2,293	2,300	n/a		2,300
Old Lucerne Park Road (west end) North of SR 544 <sup>(7)</sup>	1/9/2018	3,206	1.01	0.98	3,173	1.0560	3,351	3,400	n/a		3,400
Lake Smart Estates Drive South of SR 544 <sup>(7)</sup>	1/9/2018	862	1.01	1.00	871	1.0000	871	870	n/a		870
Lucerne Lake Road North of SR 544	10/1/2019	1,730	1.03	0.81	1,443	1.0000	1,443	1,400	n/a		1,400
Old Lucerne Park Road (east end) North of SR 544 <sup>(7)</sup>	1/9/2018	5,454	1.01	0.98	5,398	1.0706	5,779	5,800	n/a		5,800
Fairview Village North of SR 544	10/1/2019	96	1.03	1.00	99	1.0000	99	100	n/a		100
Lake Hamilton Drive South of SR 544	10/1/2019	3,344	1.03	1.00	3,444	1.0000	3,444	3,400	n/a		3,400
Brenton Manor Avenue South of SR 544	10/1/2019	2,916	1.03	0.98	2,943	1.0000	2,943	2,900	n/a		2,900
US 27 North of SR 544	10/1/2019	45,009	1.04	0.94	44,001	1.0000	44,001	44,000	46,500	45,250	46,500 <sup>(8)</sup>
US 27 South of SR 544	10/1/2019	34,554	1.04	0.94	33,780	1.0000	33,780	34,000	39,500	36,750	39,500 <sup>(8)</sup>
SR 17 North of SR 544	10/1/2019	10,764	1.03	0.95	10,533	1.0000	10,533	11,000	9,700	10,350	10,000
SR 17 South of SR 544	10/1/2019	8,680	1.03	0.95	8,493	1.0000	8,493	8,500	8,300	8,400	8,400

Note: Red font denotes assumed values used for this study.

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 44,000 vpd for the last four years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 34,000 vpd for four of the last five years.

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2020 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0021 - SR 544 SOUTHWEST OF CIRCLE 4 DRIVE, HAINES CITY

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR			
2020	10800	C	E	5300	W	5500	9.00	53.40	13.20
2019	11000	C	E	5400	W	5600	9.00	56.00	13.30
2018	10900	C	E	5400	W	5500	9.00	54.50	12.80
2017	9100	C	E	4400	W	4700	9.00	54.50	12.90
2016	8900	F	E	4300	W	4600	9.00	53.30	12.90
2015	8500	C	E	4100	W	4400	9.00	55.70	12.90
2014	8500	S	E	4200	W	4300	9.00	55.60	13.00
2013	8300	F	E	4100	W	4200	9.00	55.90	13.00
2012	8300	C	E	4100	W	4200	9.00	55.80	13.00
2011	8400	S	E	4300	W	4100	9.00	55.70	9.10
2010	8400	F	E	4300	W	4100	9.55	56.07	9.10
2009	8400	C	E	4300	W	4100	9.36	56.35	9.10
2008	8000	C	E	4000	W	4000	9.78	55.29	10.70
2007	8100	C	E	4200	W	3900	9.66	55.30	10.20
2006	9300	C	E	4700	W	4600	9.62	55.83	9.60
2005	8400	C	E	4200	W	4200	9.30	54.80	7.40

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2020 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 4786 - C.R. 544 / LAKE MARION ROAD, EAST OF S.R. 17

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	8800 S	E 4300	W 4500	9.00	53.40	11.20
2019	8800 F	E 4300	W 4500	9.00	56.00	11.20
2018	8400 C	E 4100	W 4300	9.00	54.50	11.20
2017	7600 T	E 3900	W 3700	9.00	54.50	6.20
2016	7200 S	E 3700	W 3500	9.00	53.30	13.60
2015	6800 F	E 3500	W 3300	9.00	55.70	13.60
2014	6600 C	E 3400	W 3200	9.00	55.60	13.60
2013	2100 S	0	0	9.00	55.90	7.40
2012	2100 F	0	0	9.00	55.80	6.20
2011	2100 C	E 0	W 0	9.00	55.70	9.60

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2020 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 5049 - SR17/10TH ST, N OF SR544/LK MARION RD, HAINES CITY

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	10400	C				
2020	10400	C				
2019	9700	C	S	5300	9.00	9.10
2019	9700	C	S	4900	9.00	6.50
2018	9400	C	S	4700	9.00	7.60
2017	9100	C	S	4600	9.00	6.70
2016	7500	C	S	3900	9.00	5.90
2015	8700	T				
2015	8700	T				
2014	8600	S	S	4400	9.00	4.50
2014	8600	S	S	4400	9.00	7.00
2013	8400	F	S	4300	9.00	7.00
2012	8400	C	S	4300	9.00	7.00
2011	10400	S	S	5200	9.00	5.20
2010	10400	F	S	5200	9.55	5.20
2009	10600	C	S	5300	9.36	5.20
2009	10600	C	S	5300	9.36	5.20
2008	9200	C	S	4600	9.78	5.90
2007	11700	C	S	5800	9.66	6.60
2006	12600	C	S	6300	9.62	7.60
2005	11800	C	S	5900	9.30	6.30
2005	11800	C	S	5900	9.30	6.30

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2020 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0046 - SR17/10TH ST, S OF SR544/LK MARION RD, HAINES CITY

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2020	8200 C	N 4100	S 4100	9.00	53.40	10.80
2019	8300 C	N 4100	S 4200	9.00	56.00	9.40
2018	8200 C	N 3900	S 4300	9.00	54.50	9.30
2017	6600 C	N 3200	S 3400	9.00	54.50	12.00
2016	5200 F	N 2600	S 2600	9.00	53.30	12.00
2015	5000 C	N 2500	S 2500	9.00	55.70	12.00
2014	6000 S	N 2800	S 3200	9.00	55.60	10.90
2013	5900 F	N 2800	S 3100	9.00	55.90	10.90
2012	5900 C	N 2800	S 3100	9.00	55.80	10.90
2011	5900 S	N 2800	S 3100	9.00	55.70	10.40
2010	5900 F	N 2800	S 3100	9.55	56.07	10.40
2009	5900 C	N 2800	S 3100	9.36	56.35	10.40
2008	6400 C	N 3100	S 3300	9.78	55.29	12.60
2007	11000 C	N 5500	S 5500	9.66	55.30	7.30
2006	8800 C	N 4300	S 4500	9.62	55.83	9.70
2005	8200 C	N 4000	S 4200	9.30	54.80	9.20

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

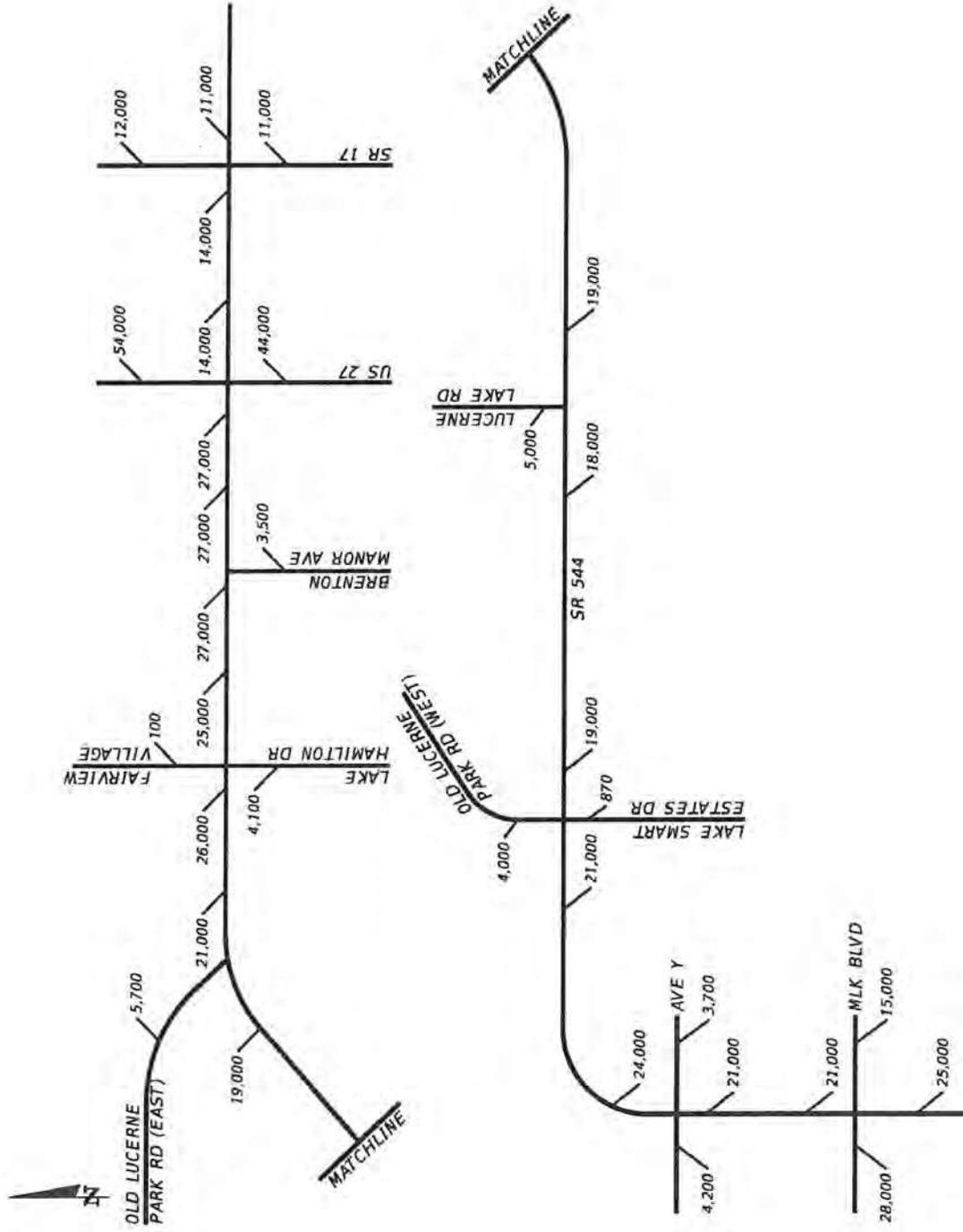


Figure 3-11: Opening Year (2025) AADT Volumes –Build Alternative No. 2



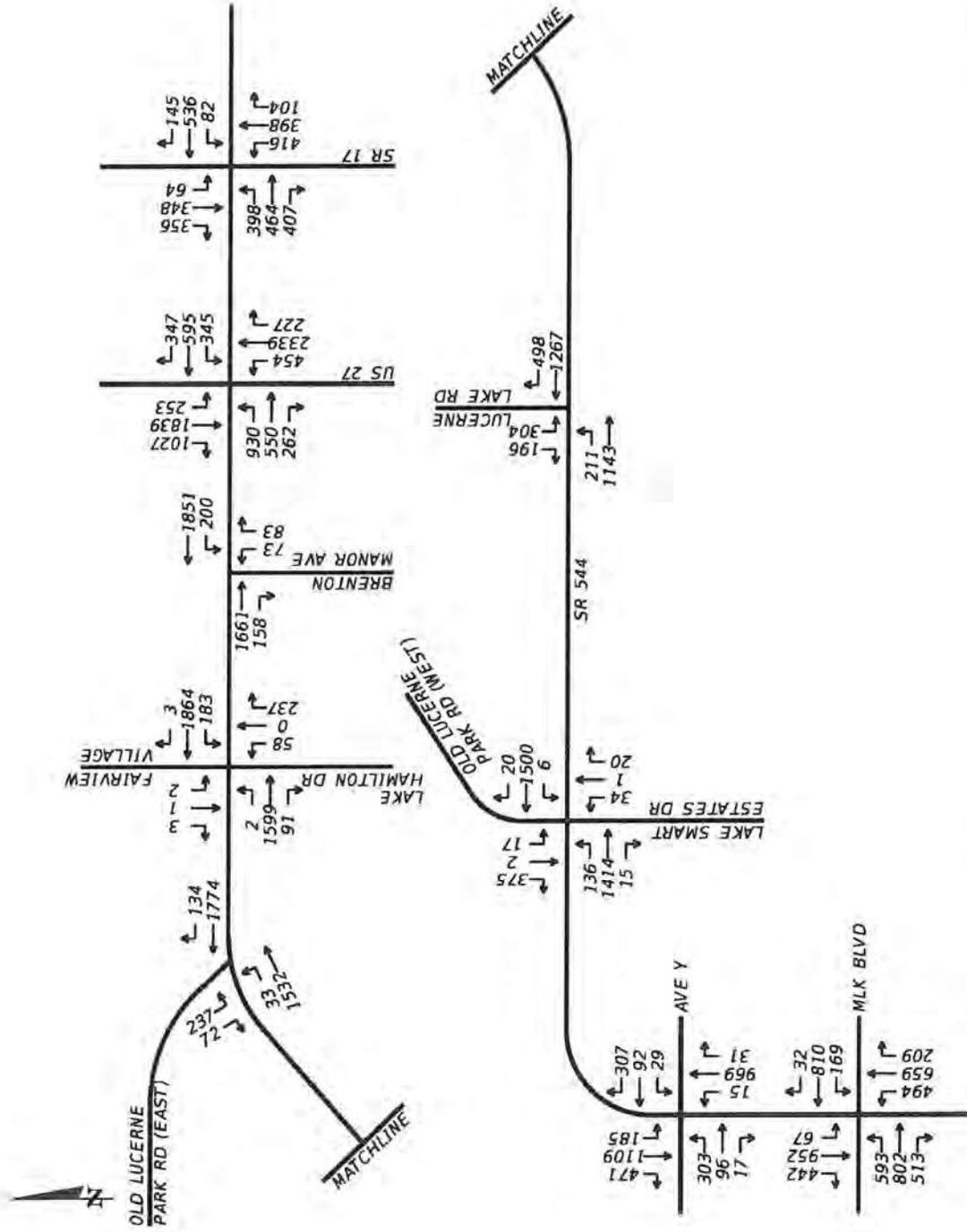
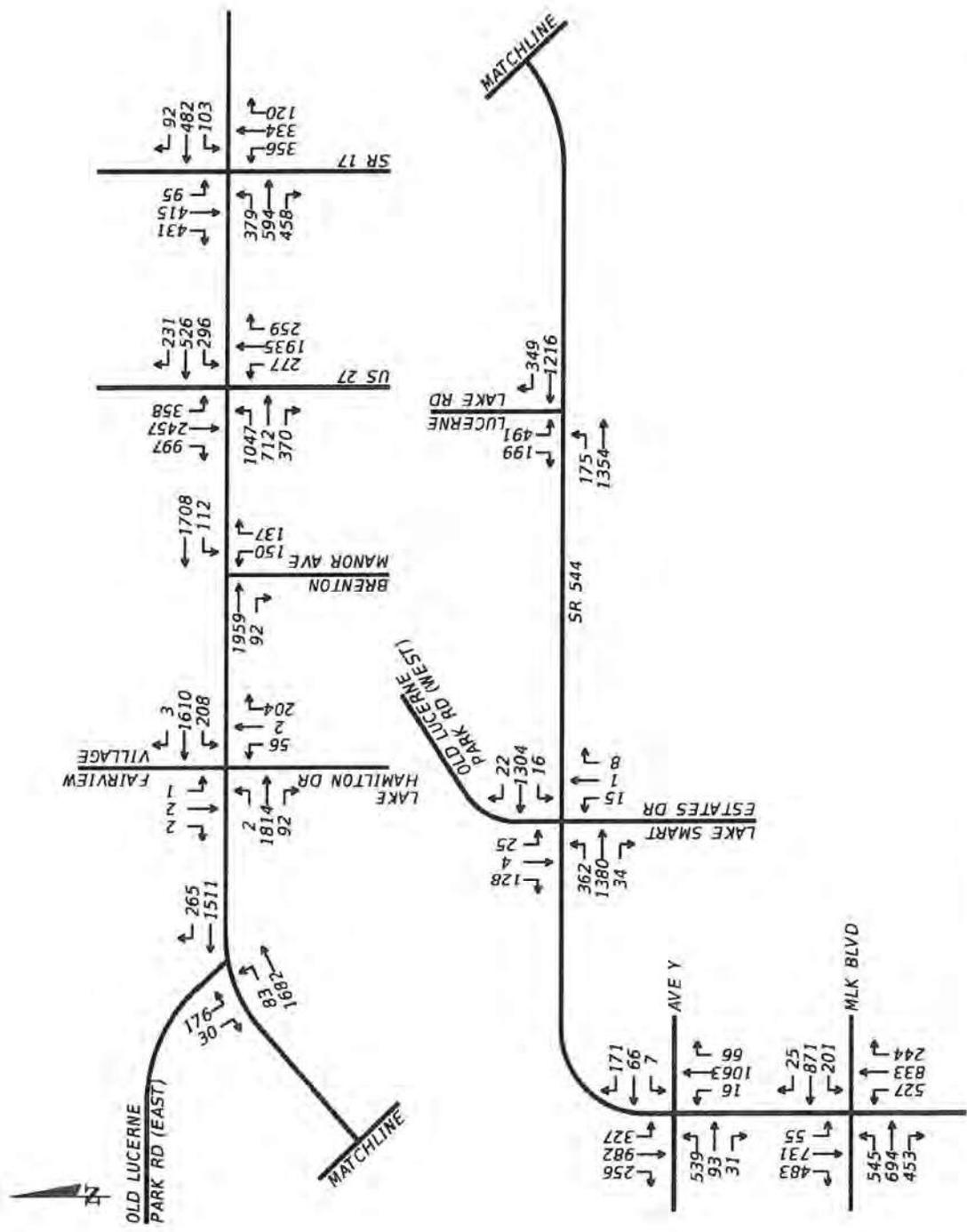


Figure 3-21: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2



**Figure 3-22: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2**

SR 544/SR 17 INTERSECTION  
DESIGN YEAR (2045) PEAK HOUR APPROACH TRUCK PERCENTAGES

AM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
398	8.0%	464	8.0%	407	5.0%	1269	89.31	7.0%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
82	5.0%	536	8.0%	145	8.0%	763	58.58	7.7%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
416	8.0%	398	5.0%	104	8.0%	918	61.5	6.7%
SB LT		SB TH		SB RT		SB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
64	8.0%	348	8.0%	356	8.0%	768	61.44	8.0%
PM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
379	3.0%	594	5.0%	458	4.0%	1431	59.39	4.2%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
103	4.0%	482	5.0%	92	3.0%	677	30.98	4.6%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
356	5.0%	334	4.0%	120	5.0%	810	37.16	4.6%
SB LT		SB TH		SB RT		SB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
95	5.0%	415	3.0%	431	5.0%	941	38.75	4.1%

## **Appendix B**

CAP-X and SPICE Analysis Summary Sheets

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/SR 17
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	398	464	407	7.00%	0.00%
Westbound	0	82	536	145	8.00%	0.00%
Southbound	0	64	348	356	8.00%	0.00%
Northbound	0	416	398	104	7.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3R-Suburban Residential</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.84	1	4.8	Fair	Fair	Good
2 X 2	1.00	2	5.6	Fair	Good	Good
Signalized Restricted Crossing U-Turn N-S	1.07	3	6.3	Good	Good	Fair
Median U-Turn N-S	1.10	4	6.3	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn N-S	4.56	5	4.4	Fair	Fair	Fair
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/SR 17
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	398	464	407	7.00%	0.00%
Westbound	0	82	536	145	8.00%	0.00%
Southbound	0	64	348	356	8.00%	0.00%
Northbound	0	416	398	104	7.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3R-Suburban Residential</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	<u>FULL</u>	/	2	2	0	/	1	1	1	/	2	1	1	/	1	1	1
Signalized Restricted Crossing U-Turn	<u>N-S</u>	1	2	2	0	1	1	1	1	/	/	/	2	/	/	/	2
Unsignalized Restricted Crossing U-Turn	<u>N-S</u>	1	1	2	0	1	1	1	1	/	/	/	1	/	/	/	1
Median U-Turn	<u>N-S</u>	1	/	2	0	1	/	1	1	/	/	1	1	/	/	1	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1426	<a href="#">0.84</a>	0.84	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	<a href="#">N-S</a>	1664	<a href="#">0.92</a>	1644	<a href="#">0.91</a>	1199	<a href="#">0.67</a>	1931	<a href="#">1.07</a>			1.07	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<a href="#">N-S</a>	829	<a href="#">1.03</a>	982	<a href="#">1.69</a>	1156	<a href="#">4.56</a>	465	<a href="#">2.31</a>			4.56	Fair	Fair	Fair
Median U-Turn	<a href="#">N-S</a>	1497	<a href="#">0.83</a>	1110	<a href="#">0.62</a>					1988	<a href="#">1.10</a>	1.10	Good	Good	Fair



# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/SR 17
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn	Left	Thru	Right	Heavy Vehicles	Volume Growth
Eastbound	0	379	594	458	4.00%	0.00%
Westbound	0	103	482	92	5.00%	0.00%
Southbound	0	95	415	431	4.00%	0.00%
Northbound	0	356	334	120	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3R-Suburban Residential</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	1800	
		3-phase signal		<b>Suggested = 1750</b>	1750	
		4-phase signal		<b>Suggested = 1700</b>	1700	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.81	1	4.8	Fair	Fair	Good
2 X 2	1.01	2	5.6	Fair	Good	Good
Signalized Restricted Crossing U-Turn N-S	1.11	3	6.3	Good	Good	Fair
Median U-Turn N-S	1.11	3	6.3	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn N-S	3.61	5	4.4	Fair	Fair	Fair
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/SR 17
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	379	594	458	4.00%	0.00%
Westbound	0	103	482	92	5.00%	0.00%
Southbound	0	95	415	431	4.00%	0.00%
Northbound	0	356	334	120	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3R-Suburban Residential</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	<u>FULL</u>	/	2	2	0	/	1	1	1	/	2	1	1	/	1	1	1
Signalized Restricted Crossing U-Turn	<u>N-S</u>	1	2	2	0	1	1	1	1	/	/	/	2	/	/	/	2
Unsignalized Restricted Crossing U-Turn	<u>N-S</u>	1	1	2	0	1	1	1	1	/	/	/	1	/	/	/	1
Median U-Turn	<u>N-S</u>	1	/	2	0	1	/	1	1	/	/	1	1	/	/	1	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1371	<a href="#">0.81</a>	0.81	Fair	Fair	Good
Signalized Restricted Crossing U-Turn	<a href="#">N-S</a>	1747	<a href="#">0.97</a>	1691	<a href="#">0.94</a>	1294	<a href="#">0.72</a>	1998	<a href="#">1.11</a>			1.11	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<a href="#">N-S</a>	979	<a href="#">1.08</a>	851	<a href="#">1.59</a>	1117	<a href="#">3.61</a>	540	<a href="#">2.77</a>			3.61	Fair	Fair	Fair
Median U-Turn	<a href="#">N-S</a>	1582	<a href="#">0.88</a>	1042	<a href="#">0.58</a>					1991	<a href="#">1.11</a>	1.11	Good	Good	Fair



**Federal Highway Administration (FHWA)**  
**Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

<b>Project Name:</b>	SR 544 PD&E Study from MLK Blvd to SR 17	<b>Intersection Type</b>	At-Grade Intersections
<b>Intersection:</b>	SR 544/SR 17	<b>Opening Year</b>	2025
<b>Agency:</b>	FDOT District One	<b>Design Year</b>	2045
<b>Project Reference:</b>	FPID No.: 440273-1-22-01	<b>Facility Type</b>	On Urban and Suburban Arterial
<b>City:</b>	Polk County	<b>Number of Legs</b>	4-leg
<b>State:</b>	Florida	<b>1-Way/2-Way</b>	2-way Intersecting 2-way
<b>Date:</b>	8/11/2021	<b># of Major Street Lanes (both directions)</b>	5 or fewer
<b>Analyst:</b>	AIM Engineering & Surveying, Inc.	<b>Major Street Approach Speed</b>	Less than 55 mph

**Crash Prediction Summary**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Rank	AADT Within Prediction Range?	Source of Prediction
Traffic Signal	Total	5.82	11.55	180.98	2	Yes	Calibrated SPF w/ EB
	Fatal & Injury	1.40	2.82	43.79			
2-lane Roundabout	Total	9.52	18.19	289.60	3	No	Uncalibrated SPF
	Fatal & Injury	1.68	3.44	53.30			
Median U-Turn (MUT)	Total	4.95	9.82	153.83	1	N/A	CMF
	Fatal & Injury	0.98	1.97	30.65			
Signalized RCUT	Total	8.61	19.88	293.78	4	No	Uncalibrated SPF
	Fatal & Injury	2.42	5.99	86.22			
Unsignalized RCUT	Total	No SPF	No SPF	No SPF	--	No	Uncalibrated SPF
	Fatal & Injury	No SPF	No SPF	No SPF			

## **Appendix C**

SYNCHRO and SIDRA Analysis Summary Sheets

Lanes, Volumes, Timings  
24: SR 17 & SR 544/CR 544

06/10/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	398	464	407	82	536	145	416	398	104	64	348	356
Future Volume (vph)	398	464	407	82	536	145	416	398	104	64	348	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		1000	175		725	350		0	300		235
Storage Lanes	2		1	1		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frt			0.850			0.850		0.969				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3242	1759	1538	1719	1759	1495	3242	3312	0	1671	1759	1495
Flt Permitted	0.950			0.336			0.950			0.456		
Satd. Flow (perm)	3242	1759	1538	608	1759	1495	3242	3312	0	802	1759	1495
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2869			932			1226			1438	
Travel Time (s)		43.5			14.1			18.6			21.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	8%	8%	5%	5%	8%	8%	8%	5%	8%	8%	8%	8%
Adj. Flow (vph)	419	488	428	86	564	153	438	419	109	67	366	375
Shared Lane Traffic (%)												
Lane Group Flow (vph)	419	488	428	86	564	153	438	528	0	67	366	375
Enter Blocked Intersection	No	No	No	No	No	No						
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex						
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	

Lanes, Volumes, Timings  
24: SR 17 & SR 544/CR 544

06/10/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8		8				6		Free
Detector Phase	7	4	5	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0	11.0	11.0	24.0	24.0	11.0	24.0		11.0	24.0	
Total Split (s)	22.0	59.0	23.0	12.0	49.0	49.0	23.0	47.0		12.0	36.0	
Total Split (%)	16.9%	45.4%	17.7%	9.2%	37.7%	37.7%	17.7%	36.2%		9.2%	27.7%	
Maximum Green (s)	16.0	53.0	17.0	6.0	43.0	43.0	17.0	41.0		6.0	30.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	
Act Effct Green (s)	16.0	52.6	75.6	48.6	42.6	42.6	17.0	43.4		36.0	30.0	129.6
Actuated g/C Ratio	0.12	0.41	0.58	0.38	0.33	0.33	0.13	0.33		0.28	0.23	1.00
v/c Ratio	1.05	0.68	0.48	0.31	0.98	0.31	1.03	0.48		0.25	0.90	0.25
Control Delay	112.0	37.6	17.8	21.5	75.4	34.7	106.7	36.7		27.7	74.4	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	112.0	37.6	17.8	21.5	75.4	34.7	106.7	36.7		27.7	74.4	0.4
LOS	F	D	B	C	E	C	F	D		C	E	A
Approach Delay		54.6			61.9			68.4			36.2	
Approach LOS		D			E			E			D	
90th %ile Green (s)	16.0	53.0	17.0	6.0	43.0	43.0	17.0	41.0		6.0	30.0	
90th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	MaxR		Max	MaxR	
70th %ile Green (s)	16.0	53.0	17.0	6.0	43.0	43.0	17.0	41.0		6.0	30.0	
70th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	MaxR		Max	MaxR	
50th %ile Green (s)	16.0	53.0	17.0	6.0	43.0	43.0	17.0	41.0		6.0	30.0	
50th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	MaxR		Max	MaxR	
30th %ile Green (s)	16.0	53.0	17.0	6.0	43.0	43.0	17.0	41.0		6.0	30.0	
30th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	MaxR		Max	MaxR	
10th %ile Green (s)	16.0	51.0	17.0	6.0	41.0	41.0	17.0	53.0		0.0	30.0	
10th %ile Term Code	Max	Hold	Max	Max	Gap	Gap	Max	Hold		Skip	MaxR	
Stops (vph)	346	376	228	51	471	107	364	391		45	311	0
Fuel Used(gal)	39	39	32	1	17	3	17	13		2	12	3
CO Emissions (g/hr)	2754	2706	2212	104	1211	226	1179	881		106	866	234
NOx Emissions (g/hr)	536	527	430	20	236	44	229	171		21	168	46
VOC Emissions (g/hr)	638	627	513	24	281	52	273	204		25	201	54
Dilemma Vehicles (#)	0	14	0	0	19	0	0	19		0	13	0
Queue Length 50th (ft)	~197	333	198	37	467	96	~204	190		34	302	0
Queue Length 95th (ft)	#303	461	283	67	#704	156	#311	246		66	#483	0
Internal Link Dist (ft)		2789			852			1146			1358	
Turn Bay Length (ft)	150		1000	175		725	350			300		235
Base Capacity (vph)	400	719	897	279	583	496	424	1109		263	406	1495
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0

Lanes, Volumes, Timings  
 24: SR 17 & SR 544/CR 544

06/10/2021

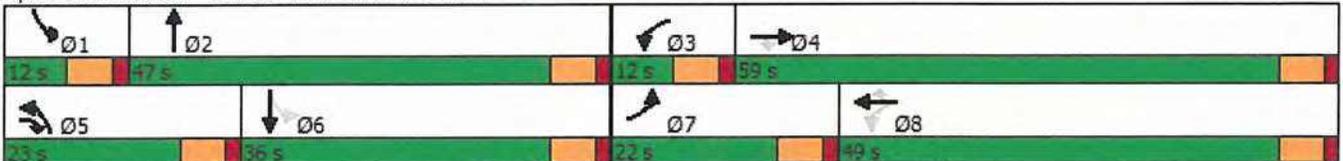


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	1.05	0.68	0.48	0.31	0.97	0.31	1.03	0.48		0.25	0.90	0.25

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 129.6  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 55.7  
 Intersection LOS: E  
 Intersection Capacity Utilization 89.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 130  
 70th %ile Actuated Cycle: 130  
 50th %ile Actuated Cycle: 130  
 30th %ile Actuated Cycle: 130  
 10th %ile Actuated Cycle: 128  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: SR 17 & SR 544/CR 544



Lanes, Volumes, Timings  
24: SR 17 & SR 544/CR 544

06/09/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	379	594	458	103	482	92	356	334	120	95	415	431
Future Volume (vph)	379	594	458	103	482	92	356	334	120	95	415	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		1000	175		725	350		0	300		235
Storage Lanes	2		1	1		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.97	0.95	0.95	1.00	1.00	1.00
Frnt			0.850			0.850		0.960				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3400	1810	1553	1736	1810	1568	3335	3324	0	1719	1845	1538
Flt Permitted	0.950			0.119			0.950			0.483		
Satd. Flow (perm)	3400	1810	1553	217	1810	1568	3335	3324	0	874	1845	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2869			932			1226			1438	
Travel Time (s)		43.5			14.1			18.6			21.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	5%	4%	4%	5%	3%	5%	4%	5%	5%	3%	5%
Adj. Flow (vph)	391	612	472	106	497	95	367	344	124	98	428	444
Shared Lane Traffic (%)												
Lane Group Flow (vph)	391	612	472	106	497	95	367	468	0	98	428	444
Enter Blocked Intersection	No	No	No	No	No	No						
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex						
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	pm+pt	NA	Perm	Prot	NA		pm+pt	NA	Free
Protected Phases	7	4	5	3	8		5	2		1	6	

Lanes, Volumes, Timings  
24: SR 17 & SR 544/CR 544

06/09/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4	8		8				6		Free
Detector Phase	7	4	5	3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0	11.0	11.0	24.0	24.0	11.0	24.0		11.0	24.0	
Total Split (s)	21.0	49.0	21.0	12.0	40.0	40.0	21.0	47.0		12.0	38.0	
Total Split (%)	17.5%	40.8%	17.5%	10.0%	33.3%	33.3%	17.5%	39.2%		10.0%	31.7%	
Maximum Green (s)	15.0	43.0	15.0	6.0	34.0	34.0	15.0	41.0		6.0	32.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes							
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Max		None	Max							
Act Effct Green (s)	15.0	43.0	63.9	40.0	34.0	34.0	14.9	41.0		38.1	32.1	120.0
Actuated g/C Ratio	0.12	0.36	0.53	0.33	0.28	0.28	0.12	0.34		0.32	0.27	1.00
v/c Ratio	0.92	0.94	0.57	0.72	0.97	0.21	0.88	0.41		0.31	0.87	0.29
Control Delay	79.8	62.2	22.2	49.0	76.4	34.4	75.1	31.6		24.3	61.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	79.8	62.2	22.2	49.0	76.4	34.4	75.1	31.6		24.3	61.1	0.5
LOS	E	E	C	D	E	C	E	C		C	E	A
Approach Delay		54.1			66.5			50.7			29.6	
Approach LOS		D			E			D			C	
90th %ile Green (s)	15.0	43.0	15.0	6.0	34.0	34.0	15.0	41.0		6.0	32.0	
90th %ile Term Code	Max	MaxR		Max	MaxR							
70th %ile Green (s)	15.0	43.0	15.0	6.0	34.0	34.0	15.0	41.0		6.0	32.0	
70th %ile Term Code	Max	MaxR		Max	MaxR							
50th %ile Green (s)	15.0	43.0	15.0	6.0	34.0	34.0	15.0	41.0		6.0	32.0	
50th %ile Term Code	Max	MaxR		Max	MaxR							
30th %ile Green (s)	15.0	43.0	15.0	6.0	34.0	34.0	15.0	41.0		6.0	32.0	
30th %ile Term Code	Max	MaxR		Max	MaxR							
10th %ile Green (s)	15.0	42.8	14.7	6.0	33.8	33.8	14.7	41.0		6.0	32.3	
10th %ile Term Code	Max	Hold	Gap	Max	Gap	Gap	Gap	MaxR		Max	Hold	
Stops (vph)	343	520	302	65	423	69	327	339		68	371	0
Fuel Used(gal)	35	53	36	2	16	2	12	11		2	14	4
CO Emissions (g/hr)	2455	3691	2539	172	1095	144	863	752		154	954	284
NOx Emissions (g/hr)	478	718	494	33	213	28	168	146		30	186	55
VOC Emissions (g/hr)	569	855	588	40	254	33	200	174		36	221	66
Dilemma Vehicles (#)	0	23	0	0	18	0	0	19		0	16	0
Queue Length 50th (ft)	156	456	236	46	381	56	146	145		44	317	0
Queue Length 95th (ft)	#248	#689	341	#117	#599	103	#230	194		79	#495	0
Internal Link Dist (ft)		2789			852			1146			1358	
Turn Bay Length (ft)	150		1000	175		725	350			300		235
Base Capacity (vph)	425	648	828	148	512	444	416	1135		319	493	1538
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0

Lanes, Volumes, Timings  
 24: SR 17 & SR 544/CR 544

06/09/2021

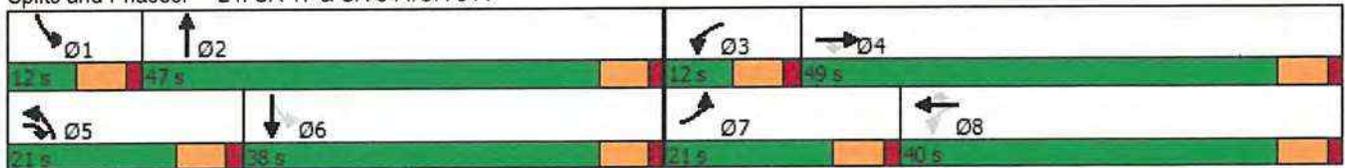


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.92	0.94	0.57	0.72	0.97	0.21	0.88	0.41		0.31	0.87	0.29

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 120  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 49.6  
 Intersection Capacity Utilization 89.0%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 120  
 70th %ile Actuated Cycle: 120  
 50th %ile Actuated Cycle: 120  
 30th %ile Actuated Cycle: 120  
 10th %ile Actuated Cycle: 119.8  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 24: SR 17 & SR 544/CR 544



# SITE LAYOUT

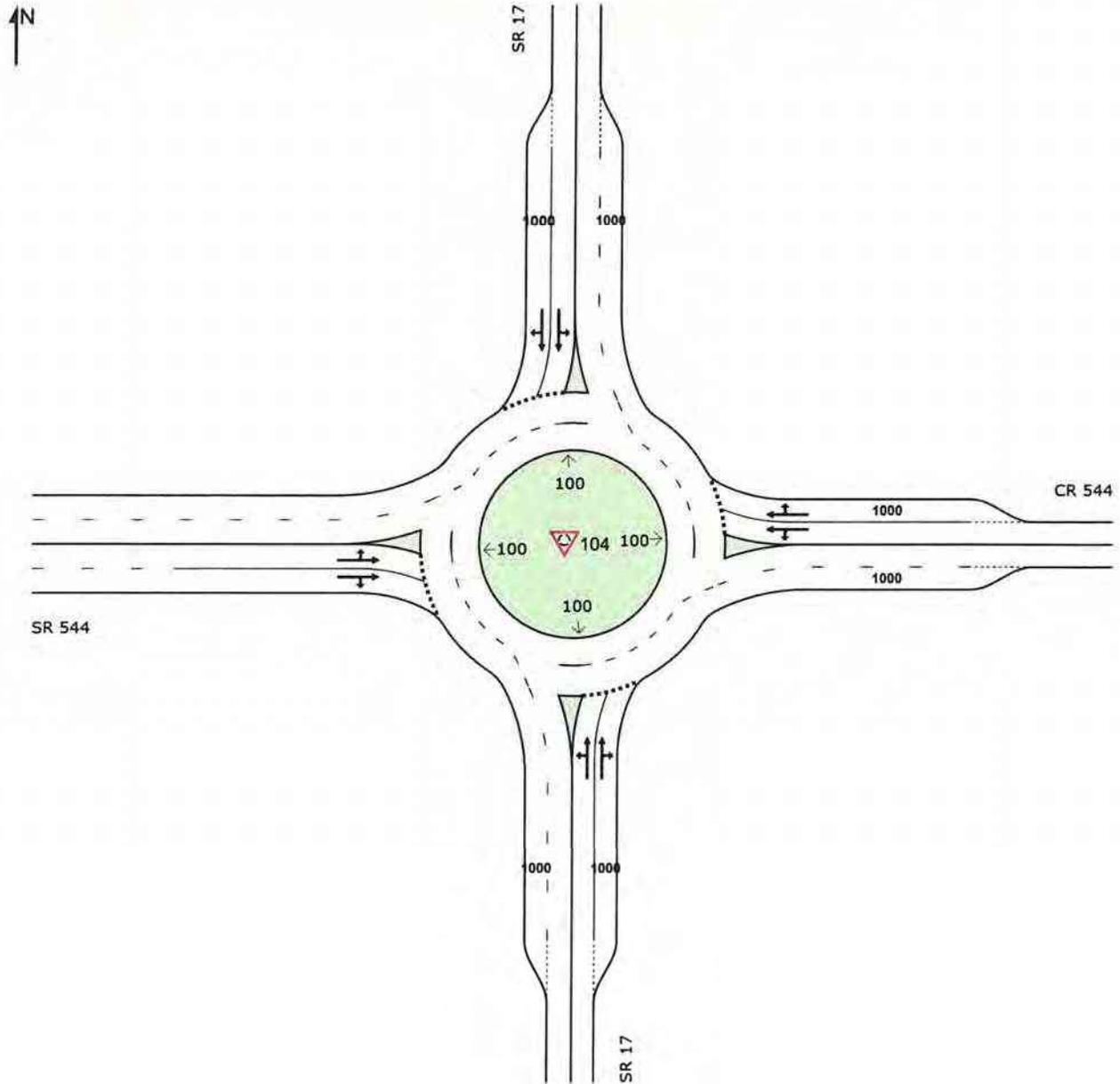
Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total Veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
South: SR 17														
3	L2	416	8.0	438	8.0	0.943	57.7	LOS F	12.9	343.5	0.93	1.72	3.62	18.8
8	T1	398	5.0	419	5.0	0.943	59.0	LOS F	14.1	368.7	0.93	1.74	3.67	20.2
18	R2	104	8.0	109	8.0	0.943	57.4	LOS F	14.1	368.7	0.93	1.74	3.67	19.8
Approach		918	6.7	966	6.7	0.943	58.2	LOS F	14.1	368.7	0.93	1.73	3.65	19.5
East: CR 544														
1	L2	82	5.0	86	5.0	1.043	93.8	LOS F	16.7	441.4	1.00	2.10	5.05	14.8
6	T1	536	8.0	564	8.0	1.043	91.2	LOS F	18.3	487.5	1.00	2.15	5.19	15.0
16	R2	145	8.0	153	8.0	1.043	94.4	LOS F	18.3	487.5	1.00	2.20	5.34	15.1
Approach		763	7.7	803	7.7	1.043	92.1	LOS F	18.3	487.5	1.00	2.15	5.20	15.0
North: SR 17														
7	L2	64	8.0	67	8.0	0.872	47.7	LOS E	8.3	221.6	0.90	1.45	2.81	21.1
4	T1	348	8.0	366	8.0	0.872	47.9	LOS E	8.8	234.8	0.90	1.45	2.81	21.2
14	R2	356	8.0	375	8.0	0.872	43.5	LOS E	8.8	234.8	0.89	1.46	2.83	21.4
Approach		768	8.0	808	8.0	0.872	45.8	LOS E	8.8	234.8	0.90	1.46	2.82	21.3
West: SR 544														
5	L2	398	8.0	419	8.0	0.844	29.2	LOS D	13.7	364.6	0.90	1.47	2.45	24.8
2	T1	464	8.0	488	8.0	0.844	30.5	LOS D	14.6	383.0	0.91	1.47	2.44	25.5
12	R2	407	5.0	428	5.0	0.844	32.5	LOS D	14.6	383.0	0.91	1.47	2.44	25.5
Approach		1269	7.0	1336	7.0	0.844	30.7	LOS D	14.6	383.0	0.91	1.47	2.44	25.3
All Vehicles		3718	7.3	3914	7.3	1.043	53.2	LOS F	18.3	487.5	0.93	1.67	3.39	20.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# LANE SUMMARY

Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV ] %						[ Veh	Dist ] ft				
South: SR 17													
Lane 1	448	7.9	475	0.943	100	57.7	LOS F	12.9	343.5	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	518	5.6	549	0.943	100	58.7	LOS F	14.1	368.7	Short	1000	0.0	NA
Approach	966	6.7		0.943		58.2	LOS F	14.1	368.7				
East: CR 544													
Lane 1	374	7.3	358	1.043	100	94.0	LOS F	16.7	441.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	430	8.0	412	1.043	100	90.4	LOS F	18.3	487.5	Short	1000	0.0	NA
Approach	803	7.7		1.043		92.1	LOS F	18.3	487.5				
North: SR 17													
Lane 1	378	8.0	433	0.872	100	47.7	LOS E	8.3	221.6	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	431	8.0	494	0.872	100	44.2	LOS E	8.8	234.8	Short	1000	0.0	NA
Approach	808	8.0		0.872		45.8	LOS E	8.8	234.8				
West: SR 544													
Lane 1	632	8.0	749	0.844	100	29.2	LOS D	13.7	364.6	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	704	6.2	834	0.844	100	32.1	LOS D	14.6	383.0	Full	1600	0.0	0.0
Approach	1336	7.0		0.844		30.7	LOS D	14.6	383.0				
Intersection	3914	7.3		1.043		53.2	LOS F	18.3	487.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: SR 17										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From S To Exit:	W	N	E							
Lane 1	438	10	-	448	7.9	475	0.943	100	NA	NA
Lane 2	-	409	109	518	5.6	549	0.943	100	0.0	1
Approach	438	419	109	966	6.7		0.943			
East: CR 544										
Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.	

From E To Exit	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	86	287	-	374	7.3	358	1.043	100	NA	NA
Lane 2	-	277	153	430	8.0	412	1.043	100	0.0	1
Approach	86	564	153	803	7.7		1.043			
<b>North: SR 17</b>										
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	E	S	W							
Lane 1	67	310	-	378	8.0	433	0.872	100	NA	NA
Lane 2	-	56	375	431	8.0	494	0.872	100	0.0	1
Approach	67	366	375	808	8.0		0.872			
<b>West: SR 544</b>										
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E	S							
Lane 1	419	213	-	632	8.0	749	0.844	100	NA	NA
Lane 2	-	275	428	704	6.2	834	0.844	100	NA	NA
Approach	419	488	428	1336	7.0		0.844			
<b>Total %HV Deg. Satn (v/c)</b>										
Intersection	3914	7.3		1.043						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

<b>Merge Analysis</b>												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
<b>South Exit: SR 17 Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	393	422	3.00	2.00	484	1420	0.341	2.5	5.5
Merge Lane	1	-	100.0	Merge Lane is not Opposed			393	1800	0.218	0.0	0.0	
<b>East Exit: CR 544 Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	281	303	3.00	2.00	385	1519	0.253	2.4	4.4
Merge Lane	1	-	100.0	Merge Lane is not Opposed			281	1800	0.156	0.0	0.0	
<b>North Exit: SR 17 Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	429	463	3.00	2.00	555	1388	0.400	2.6	6.3
Merge Lane	1	-	100.0	Merge Lane is not Opposed			429	1800	0.238	0.0	0.0	
<b>West Exit: SR 544 Merge Type: Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

# SITE LAYOUT

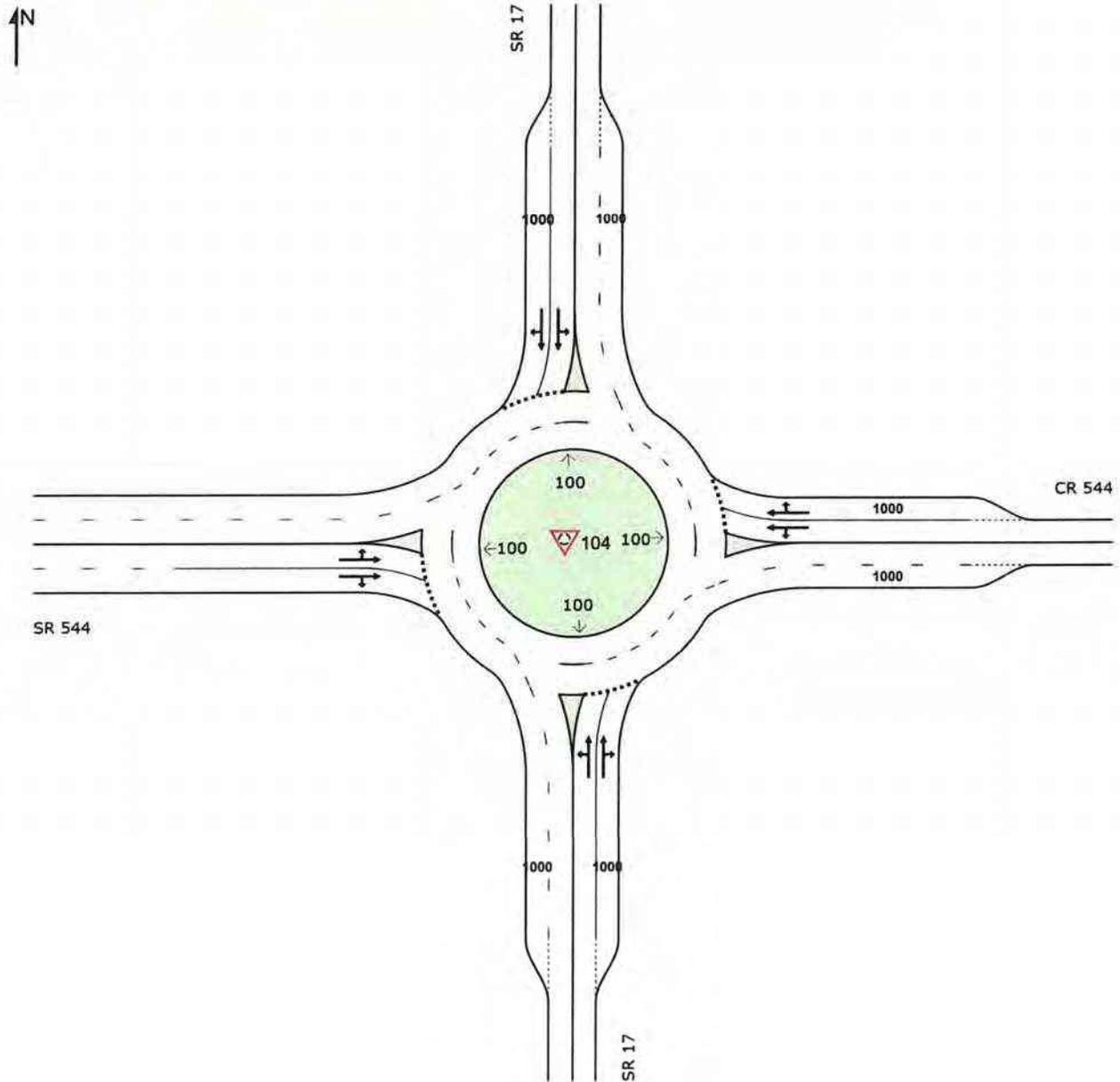
Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

 Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV ] %	[ Total veh/h	HV ] %				[ Veh. veh	Dist ] ft				
South: SR 17														
3	L2	356	5.0	367	5.0	0.869	46.3	LOS E	8.5	221.4	0.92	1.44	2.76	20.7
8	T1	334	4.0	344	4.0	0.869	47.0	LOS E	9.1	234.5	0.91	1.45	2.77	22.3
18	R2	120	5.0	124	5.0	0.869	47.2	LOS E	9.1	234.5	0.91	1.45	2.78	21.9
Approach		810	4.6	835	4.6	0.869	46.8	LOS E	9.1	234.5	0.91	1.44	2.77	21.5
East: CR 544														
1	L2	103	4.0	106	4.0	0.725	30.0	LOS D	4.9	127.3	0.86	1.15	1.87	25.0
6	T1	482	5.0	497	5.0	0.725	28.4	LOS D	5.1	132.5	0.85	1.14	1.86	25.7
16	R2	92	3.0	95	3.0	0.725	32.0	LOS D	5.1	132.5	0.84	1.13	1.85	25.6
Approach		677	4.6	698	4.6	0.725	29.1	LOS D	5.1	132.5	0.85	1.14	1.86	25.6
North: SR 17														
7	L2	95	5.0	98	5.0	0.896	46.4	LOS E	10.9	280.9	0.92	1.53	3.00	21.4
4	T1	415	3.0	428	3.0	0.896	46.7	LOS E	11.5	297.7	0.92	1.53	3.00	21.5
14	R2	431	5.0	444	5.0	0.896	43.0	LOS E	11.5	297.7	0.91	1.55	3.05	21.5
Approach		941	4.1	970	4.1	0.896	45.0	LOS E	11.5	297.7	0.92	1.54	3.02	21.5
West: SR 544														
5	L2	379	3.0	391	3.0	0.989	54.9	LOS F	26.3	677.4	1.00	2.10	4.24	19.6
2	T1	594	5.0	612	5.0	0.989	56.2	LOS F	28.0	724.4	1.00	2.13	4.28	19.8
12	R2	458	4.0	472	4.0	0.989	58.6	LOS F	28.0	724.4	1.00	2.15	4.33	19.8
Approach		1431	4.2	1475	4.2	0.989	56.7	LOS F	28.0	724.4	1.00	2.13	4.29	19.8
All Vehicles		3859	4.3	3978	4.3	0.989	46.9	LOS E	28.0	724.4	0.93	1.67	3.23	21.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\PM Pk Hr\SR 544\_SR 17\_2045 PM Pk Hr\_Build Alt 2.sip9

# LANE SUMMARY

Site: 104 [SR 544/SR 17 Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	[ Total	HV ]						[ Veh	Dist ]				
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: SR 17													
Lane 1	389	4.9	447	0.869	100	46.3	LOS E	8.5	221.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	446	4.3	513	0.869	100	47.1	LOS E	9.1	234.5	Short	1000	0.0	NA
Approach	835	4.6		0.869		46.8	LOS E	9.1	234.5				
East: CR 544													
Lane 1	326	4.7	449	0.725	100	30.0	LOS D	4.9	127.3	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	372	4.5	513	0.725	100	28.3	LOS D	5.1	132.5	Short	1000	0.0	NA
Approach	698	4.6		0.725		29.1	LOS D	5.1	132.5				
North: SR 17													
Lane 1	459	3.4	512	0.896	100	46.3	LOS E	10.9	280.9	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	511	4.7	571	0.896	100	43.8	LOS E	11.5	297.7	Short	1000	0.0	NA
Approach	970	4.1		0.896		45.0	LOS E	11.5	297.7				
West: SR 544													
Lane 1	704	3.9	712	0.989	100	54.9	LOS F	26.3	677.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	772	4.4	780	0.989	100	58.2	LOS F	28.0	724.4	Full	1600	0.0	0.0
Approach	1475	4.2		0.989		56.7	LOS F	28.0	724.4				
Intersection	3978	4.3		0.989		46.9	LOS E	28.0	724.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: SR 17										
Mov.	L2	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From S	W	N	E			veh/h	Satn	Util.	SL	Lane
To Exit:							v/c	%	%	No.
Lane 1	367	22	-	389	4.9	447	0.869	100	NA	NA
Lane 2	-	322	124	446	4.3	513	0.869	100	0.0	1
Approach	367	344	124	835	4.6		0.869			
East: CR 544										
Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.	

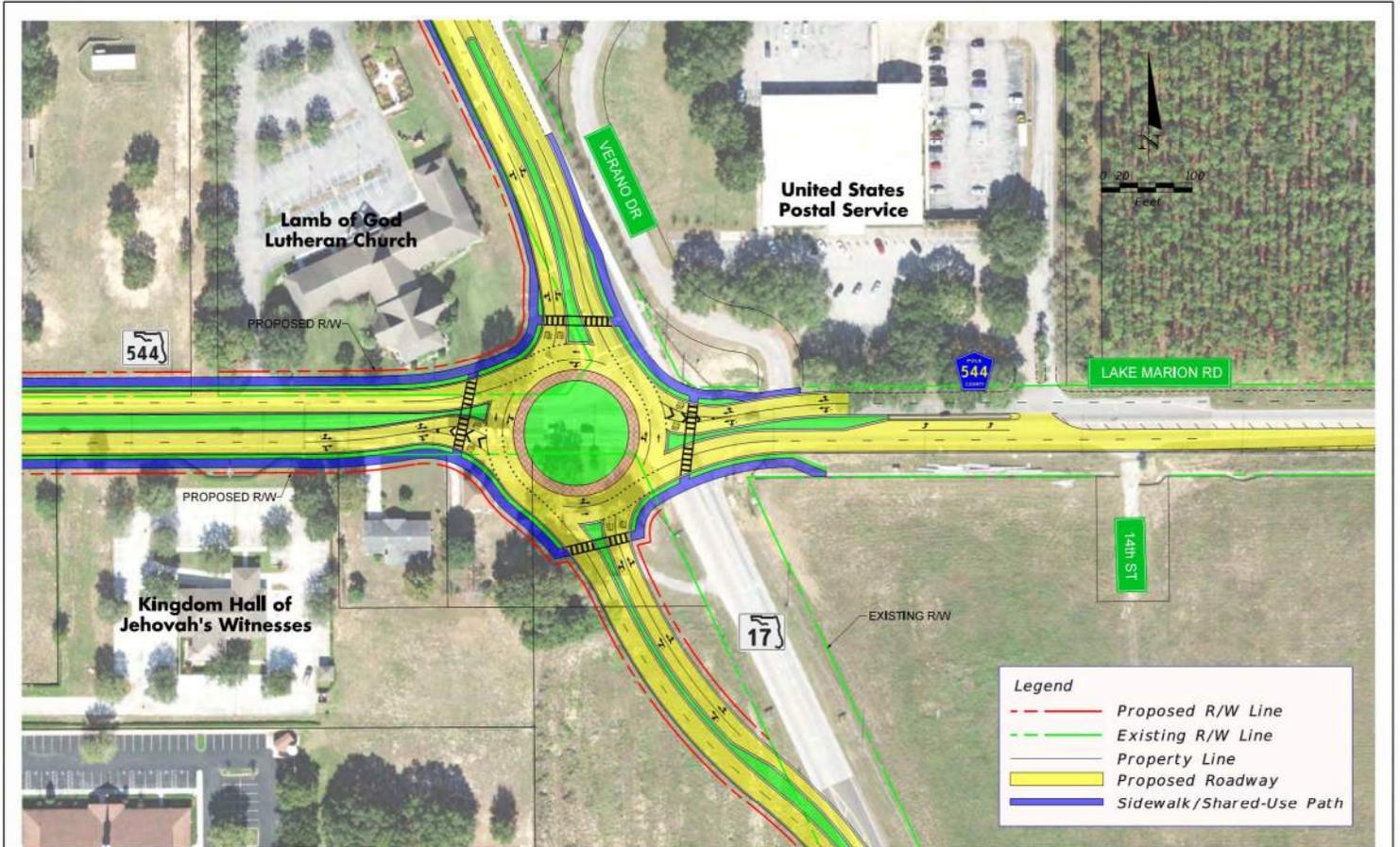
From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL %	Ov. %	Lane No.
Lane 1	106	220	-	326	4.7	449	0.725	100	NA	NA	
Lane 2	-	277	95	372	4.5	513	0.725	100	0.0	1	
Approach	106	497	95	698	4.6		0.725				
<b>North: SR 17</b>											
Mov. From N To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	E	S	W								
Lane 1	98	361	-	459	3.4	512	0.896	100	NA	NA	
Lane 2	-	67	444	511	4.7	571	0.896	100	0.0	1	
Approach	98	428	444	970	4.1		0.896				
<b>West: SR 544</b>											
Mov. From W To Exit:	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. %	Ov. Lane No.
	N	E	S								
Lane 1	391	313	-	704	3.9	712	0.989	100	NA	NA	
Lane 2	-	299	472	772	4.4	780	0.989	100	NA	NA	
Approach	391	612	472	1475	4.2		0.989				
<b>Total %HV Deg. Satn (v/c)</b>											
Intersection	3978	4.3		0.989							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

<b>Merge Analysis</b>												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
<b>South Exit: SR 17</b>												
<b>Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	467	482	3.00	2.00	539	1373	0.393	2.6	6.3
Merge Lane	1	-	100.0	Merge Lane is not Opposed				467	1800	0.259	0.0	0.0
<b>East Exit: CR 544</b>												
<b>Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	411	432	3.00	2.00	423	1413	0.299	2.5	5.1
Merge Lane	1	-	100.0	Merge Lane is not Opposed				411	1800	0.228	0.0	0.0
<b>North Exit: SR 17</b>												
<b>Merge Type: Priority</b>												
Exit Short Lane	2	1000	0.0	413	425	3.00	2.00	417	1418	0.294	2.5	5.1
Merge Lane	1	-	100.0	Merge Lane is not Opposed				413	1800	0.229	0.0	0.0
<b>West Exit: SR 544</b>												
<b>Merge Type: Not Applied</b>												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

## **Appendix D**

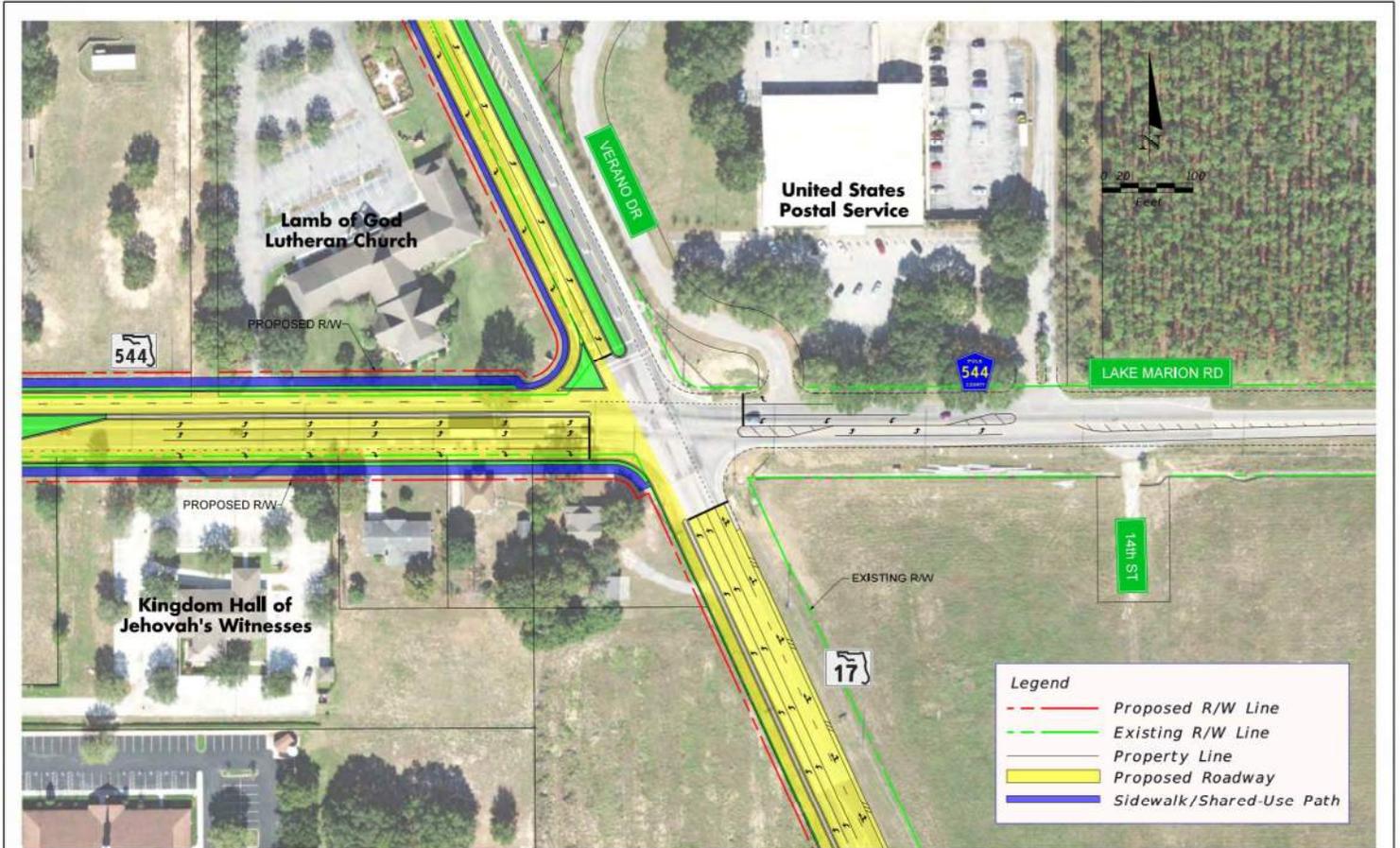
Roundabout and Signalized Intersection Preliminary Geometric Concepts



Source: Aerial FDOT, Polk County 2020

DATE		REVISIONS		ENGINEER OF RECORD		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 300 Dorado, Florida 32765		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
						544	POLK	4403273-1-22-01	1

**SR 544 PD&E STUDY  
SR 17 INTERSECTION  
ROUNDBOUT ALTERNATIVE**



Source: Aerial FDOT, Polk County 2020

REVISIONS		ENGINEER OF RECORD		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SR 544 PD&E STUDY SR 17 INTERSECTION SIGNALIZED ALTERNATIVE	SHEET NO. 2
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				544	POLK	4403273-1-22-01		

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8/17/2021 11:41:53 AM Signalized Alt 2

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# Florida Department of Transportation

## Intersection Control Evaluation (ICE) Form

### Stage 1: Screening

To fulfill the requirements of Stage 1 (Screening) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms are to be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval. **Selections must be made in the "Intersection Type" and "Project Funding Source" cells below for the appropriate Stage 1 and Stage 2 forms to fully populate.**

Project Name	SR 544 PD&E Study (Brenton Manor Avenue Intersection)		FDOT Project #	440273-1-22-01	
Submitted By	G. Root/A. Senyushkina	Agency/Company	AIM Engineering & Surveying	Date	1/23/2024
Email	<a href="mailto:g.root@aimengr.com">g.root@aimengr.com</a>	FDOT District	District 1	County	Polk
Project Locality (City/Town/Village)	Winter Haven				
Intersection Type	At-Grade Intersection	FDOT Context Classification	C3C - Suburban Commercial		
Project Funding Source	Federal	Project Type	Corridor Improvement Project		
Project Purpose <i>(What is the catalyst for this project and why is it being undertaken?)</i>	The purpose of this project is to widen SR 544 (currently a two-lane divided roadway) to a four-lane divided roadway. The need for additional capacity on SR 544 is due to the additional traffic volumes projected to travel on this roadway as a result of the future growth in residential and non-residential land uses projected by the Polk Transportation Planning Organization. This project will also enhance mobility options for pedestrians and bicyclists by providing facilities where they do not currently exist.				
Project Setting Description <i>(Describe the area surrounding the intersection)</i>	South State Bank is in the southeast quadrant of the intersection. A car wash/oil change business and a small restaurant are in the southwest quadrant. The land on the north side of SR 544 is currently undeveloped. A commercial vehicle parking facility is located on the east side of Brenton Manor Avenue south of the bank.				
Multimodal Context <i>(Describe the pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development patterns)</i>	There is an existing sidewalk on the south side of SR 544 both west and east of Brenton Manor Avenue. There is also a designated bicycle lane on the south side of SR 544. There is no fixed route transit service on this portion of SR 544. Pedestrian and bicyclist activity in this area is low. The potential for increased levels of bike/ped activity to occur in this area is possible since the proposed roadway improvements include 10-foot shared use paths on both sides of SR 544.				

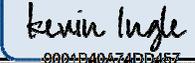
Major Street Information										
Route #:	SR 544	Route Name(s)	Lucerne Park Road				Milepost	9.661		
Existing Control Type	Signal		Existing AADT	27,000		Design Year AADT	43,000			
Design Vehicle	Florida Interstate Semitrailer (WB-62FL)		Control Vehicle	Florida Interstate Semitrailer (WB-62FL)						
Primary Functional Classification	Urban Minor Arterial				Design Speed (mph)	45				
Secondary Functional Classification (if app.)					Target Speed (mph) [if app.]	45				
Approach #1	Direction	Eastbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Neither side of the approach		Left-Turn		Weekday AM Peak		Weekday PM Peak		
	Crosswalk on Approach?	Yes		Left-Through		Left		Left		
	On-Street Bike Facilities?	No		Through	2	Through	1,661	Through	1,959	
	Multi-Use Path?	Yes		Left-Through-Right		Right	158	Right	92	
	Scheduled Bus Service?	No		Through-Right		Daily Truck %		6.0%		
	Bus Stop on Approach?	No		Right-Turn	1					
Approach #2	Direction	Westbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Neither side of the approach		Left-Turn	1	Weekday AM Peak		Weekday PM Peak		
	Crosswalk on Approach?	Yes		Left-Through		Left	200	Left	112	
	On-Street Bike Facilities?	No		Through	2	Through	1,851	Through	1,708	
	Multi-Use Path?	Yes		Left-Through-Right		Right		Right		
	Scheduled Bus Service?	No		Through-Right		Daily Truck %		6.0%		
	Bus Stop on Approach?	No		Right-Turn						

Minor Street Information										
Route #:	n/a	Route Name(s)	Brenton Manor Avenue				Milepost (if app.)	n/a		
Existing Control Type	Signal		Existing AADT	3,500		Design Year AADT	5,400			
Design Vehicle	Florida Interstate Semitrailer (WB-62FL)		Control Vehicle	Florida Interstate Semitrailer (WB-62FL)						
Primary Functional Classification			Urban Local			Design Speed (mph)	30			
Secondary Functional Classification (if app.)						Target Speed (mph) [if app.]				
Approach #1	Direction	Southbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Neither side of the approach		Left-Turn						
	Crosswalk on Approach?	No		Left-Through		Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?	No		Through		Left		Left		
	Multi-Use Path?	No		Left-Through-Right		Through		Through		
	Scheduled Bus Service?	No		Through-Right		Right		Right		
	Bus Stop on Approach?	No		Right-Turn		Daily Truck %				
Approach #2	Direction	Northbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Both sides of the approach		Left-Turn	1					
	Crosswalk on Approach?	Yes		Left-Through		Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?	No		Through		Left	73	Left	150	
	Multi-Use Path?	No		Left-Through-Right		Through		Through		
	Scheduled Bus Service?	No		Through-Right		Right	83	Right	137	
	Bus Stop on Approach?	No		Right-Turn	1	Daily Truck %		4.0%		
Approach #3	Direction			Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:			Left-Turn						
	Crosswalk on Approach?			Left-Through		Weekday AM Peak		Weekday PM Peak		
	On-Street Bike Facilities?			Through		Left		Left		
	Multi-Use Path?			Left-Through-Right		Through		Through		
	Scheduled Bus Service?			Through-Right		Right		Right		
	Bus Stop on Approach?			Right-Turn		Daily Truck %				

Crash History (Existing Intersections Only)
Append the most recent five-years of crash data for the intersection from the CAR System. If the crash data evidences any issues relating to safety performance, discuss briefly here:
There were three crashes reported at or within 300 feet of this intersection during the six-year period from 2014 through 2019. These crashes resulted in one injury and no fatalities. Two of these crashes were angle crashes and the other was a rear-end crash. There were no crashes involving bicyclists or pedestrians. None of the crashes occurred on wet pavement and none occurred at night.

Control Strategy Evaluation								
Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.								
Control Strategy	CAP-X Outputs				SPICE Outputs		Strategy to be Advanced?	Justification
	V/C Ratio		Ped Accom.	Bike Accom.	Crash Prediction Rank	SSI Rank		
	Weekday AM Peak	Weekday PM Peak						
Two-Way Stop-Controlled							No	A traffic signal is warranted. Not applicable.
All-Way Stop-Controlled							No	A traffic signal is warranted. Not applicable.
Signalized Control	0.67	0.75	5.08	n/a	4	3	No	MUTCD signal warrants are met per FDA signal warrant analysis. Does not provide positive speed control. Highest number of fatal/injury crashes.
Roundabout (1-lane)							No	Inconsistent with the proposed four-laning of SR 544. A one-lane (NB) x two-lane (EB/WB) roundabout is over capacity in the 2045 pm pk hr.
Roundabout (2-lane)	0.88	0.90	4.68	4.58	1	1	Yes	Provides positive speed control. Lowest number of fatal & injury crashes. Highest SSI scores. Safer for pedestrians.
Median U-Turn							No	The existing intersection is a T-intersection.
RCUT (Signalized)	0.65	0.66	2.96	n/a	2	2	No	Does not provide positive speed control. Higher number of fatal & injury crashes compared to the roundabout.
RCUT (Unsignalized)							No	A traffic signal is warranted. Not applicable.
Jughandle							No	Requires significant additional R/W.
Displaced Left-Turn							No	The existing intersection is a T-intersection.
Continuous Green Tee	0.67	0.74	2.65	4.33	3	4	No	Does not provide positive speed control. Higher number of fatal/injury crashes compared to the roundabout.
Quadrant Roadway							No	Higher number of fatal/injury crashes compared to the roundabout.
Thru-Cut (Signalized)							No	The existing intersection is a T-intersection.
Thru-Cut (Unsignalized)							No	The existing intersection is a T-intersection.
Bowtie							No	The existing intersection is a T-intersection and the cross street is the south leg.

Partial Displaced Left-Turn							No	The projected WB left-turn volumes are not high enough to warrant/justify this type of control strategy for the existing T-intersection.
--------------------------------	--	--	--	--	--	--	----	--

Resolution				
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer				
Project Determination		Identified Control Strategy Approved		
Comments	A roundabout would help to facilitate lower vehicle speeds east and west of this intersection and help to promote the desired target speed of 45 mph. This control strategy is projected to have the lowest number of fatal & injury crashes and the highest SSI scores of all the alternatives that were analyzed. A two-lane x two-lane roundabout is projected to provide LOS E operations through the year 2044.			
DTOE Name	Mark Mathes	Signature	DocuSigned by:  05/23/2024 Date	1:30 PM EDT
DDE Name	Kevin Ingle	Signature	DocuSigned by:  05/24/2024 Date	9:51 AM EDT

# CERTIFICATION

AGENCY: Florida Department of Transportation District One  
801 North Broadway Avenue  
Bartow, Florida 33831-1249

I hereby certify that I am a registered professional engineer in the State of Florida and that I have supervised the preparation of, and approved the analysis, findings, opinions, conclusions and technical advice hereby reported for:

REPORT: SR 544/US 27 Stage 1+ Intersection Control Evaluation (ICE)  
Technical Memorandum

PROJECT: SR 544 Project Development and Environment (PD&E) Study

LOCATION: SR 544 from Martin Luther King Boulevard to SR 17  
Polk County, Florida

ROADWAY ID: 16140000

MILEPOST No: 9.873

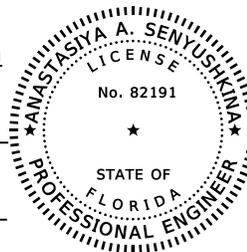
FPID No.: 440273-1-22-01

I acknowledge that the procedures and references used to develop the information contained in this memorandum are standard to the professional practice of transportation engineering as applied through professional judgement and experience.

Engineer in Responsible Charge: Anastasiya A. Senyushkina

Professional Registration No.: 82191

Date: 7/26/2023



Anastasiya A Senyushkina  
2023.07.28 12:20:56-04'00'



# AIM Engineering & Surveying, Inc.

## MEMORANDUM

Tampa Office  
201 E. Kennedy Boulevard, Suite 1800  
Tampa, Florida 33602  
813-627-4144  
www.aimengr.com

**Date:** July 26, 2023

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**To:** David C. Turley, P.E. - FDOT District One DEMO Project Manager

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**From:** Greg Root/Anastasiya Senyushkina, P.E.

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**Subject:** SR 544/US 27 Intersection (Polk County) - Stage 1+ Intersection Control Evaluation

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### INTRODUCTION/PROJECT BACKGROUND

This memorandum documents the Intersection Control Evaluation (ICE) conducted for the US 27 and Brenton Manor Avenue intersections. This analysis was conducted in support of the SR 544 Project Development & Environment (PD&E) Study from Martin Luther King Boulevard to SR 17 in Polk County. The length of this study corridor is approximately 8.1 miles. The design year (2045) traffic projections indicate the SR 544 AADT volumes are expected to range between 26,000 vehicles per day (vpd) and 43,000 vpd, while the US 27 AADT volumes are expected to range between 61,000 vpd and 77,000 vpd. The results of the Stage 1 CAP-X and SPICE analyses, as well as the more detailed traffic operations analyses conducted using the SYNCHRO/SimTraffic and SIDRA software are included in this memorandum.

### EXISTING ROADWAY/INTERSECTION CHARACTERISTICS

SR 544 is a two-lane divided roadway with 12-foot travel lanes on the west side of US 27. There is a two-way center left-turn lane between Hidden Cove Avenue and Brenton Manor Avenue and a raised median between Brenton Manor Avenue and US 27. Paved shoulders exist on both sides of the road. In addition, there is curb and gutter and a six-foot sidewalk on the south side of the road. The paved shoulder on the south side transitions to a designated bicycle lane at the Center State Bank entrance/exit. There is also a short, designated bicycle lane on the north side of SR 544 just west of US 27.

On the east side of US 27, SR 544 is a two-lane undivided roadway with 12-foot travel lanes and paved shoulders. In the vicinity of the intersection, the shoulder on the north side of the road transitions to a designated bicycle lane with curb and gutter. The proposed SR 544 typical section in this area is a four-lane divided roadway that consists of two 11-foot inside travel lanes, two 12-foot outside travel lanes, a 22-foot raised median and 10-foot shared use paths on both sides of the road. The design speed and target speed for this typical section is 45 mph. The context classifications for the portions of SR 544 west and east of US 27 are C3C (Suburban Commercial) and C3R (Suburban Residential), respectively. The context classification for US 27 in the vicinity of the SR 544 intersection is C3C.

### EXISTING INTERSECTION CHARACTERISTICS

The US 27 intersection is a four-legged signalized intersection. US 27 is a Strategic Intermodal System (SIS) Highway that traverses all of Polk County. This roadway has connections with I-4, US 17-92 and SR 60 and serves as a major regional roadway for both passenger vehicles and freight transportation. A Race Trac gas

station/convenience store is located in the southwest quadrant of the intersection and HC Pharmacy and Gas is located in the northwest quadrant of the intersection. A large golf cart sales business (i.e., Bargain Carts) is also located on the west side of US 27 just north of HC Pharmacy and Gas. There is a clearance store (Perfume Paris) located in the northeast quadrant of the intersection and a Rugs Outlet store located in the southeast quadrant of the intersection. An aerial image depicting the US 27 intersection is provided in **Figure 1**, which is included in **Appendix A**.

The Brenton Manor Avenue intersection is an unsignalized T-intersection and is located on the south side of SR 544. Brenton Manor Avenue provides access to Ridge Technical College and Brenton Manor, a small single family residential community on the northwest side of Middle Lake Hamilton. This roadway also provides access to South State Bank located in the southeast quadrant of the intersection, as well as a car wash/oil change business and a small restaurant in the southwest quadrant. In addition to the existing land uses identified above, there is also a large commercial vehicle parking facility (Century Commercial Vehicle Parking) that is currently going through the permitting process. The existing westbound directional median opening that provides access to the bank will be closed.

An aerial image depicting the Brenton Manor Avenue intersection is provided in **Figure 2**, which is included in **Appendix A**. The distance between Brenton Manor Avenue and US 27 is approximately 1,120 feet. The posted speed limits on SR 544 are 50 mph (west of US 27) and 55 mph (east of US 27). In the immediate vicinity of the US 27 intersection, the posted speed limit decreases to 45 mph. The posted speed limits on US 27 and Brenton Manor Avenue are 60 mph and 25 mph, respectively.

Crash data was provided by District One for the years 2014 through 2019. The data sources were the FDOT's Crash Analysis Reporting System (CARS) and Signal Four Analytics. The crash data is included in **Appendix A**. The US 27 intersection has experienced 204 crashes over this six-year period, resulting in 142 injuries and two fatalities. The most prevalent crash types are rear-end crashes (109), left-turn/angle crashes (36), and sideswipe crashes (26). Two of the crashes involved bicyclists and one crash involved a pedestrian. The pedestrian crash was one of the two fatalities. The other fatality involved a left-turn crash. The Brenton Manor Avenue intersection has experienced three crashes over this six-year period, resulting in one injury and no fatalities. Two crashes were angle crashes and the other was a rear-end crash. No bicyclists or pedestrians were involved in these crashes.

## **INTERSECTION CONTROL EVALUATION – CAP-X AND SPICE ANALYSIS**

The PD&E study goals are to determine the location and conceptual design of the improvements that satisfy the purpose and need for the project, while also minimizing the impacts to the natural and social environment and satisfying the requirements of the National Environmental Policy Act (NEPA). Ten alternative intersection control strategies were initially analyzed for the US 27 intersection, and these included the following:

1. Conventional traffic signal
2. Partial Displaced Left-Turn (PDLT) intersection (US 27 only)
3. Partial Displaced Left-Turn (PDLT) intersection (SR 544 only)
4. Fully Displaced Left-Turn (FDLT) intersection (i.e., both roadways)
5. Diamond Interchange
6. Single Point Urban Interchange (SPUI)
- 7.-10. Northeast Quadrant Roadway (NEQR), Southeast Quadrant Roadway (SEQR), Southwest Quadrant Roadway (SWQR), and Northwest Quadrant Roadway (NWQR)

The CAP-X and SPICE analyses were conducted using the opening year (2025) and design year (2045) traffic volumes documented in the FDOT approved Project Traffic Analysis Report (PTAR). The Average Annual Daily Traffic (AADT) volumes and peak hour volumes are provided in **Appendix A**. The results of the 2045 CAP-X and SPICE analyses conducted for the US 27 intersection are summarized in **Table 1**. The US 27 intersection CAP-X and SPICE analysis summary sheets are provided in **Appendix B**.

**Table 1: Stage 1 ICE Analysis Summary - US 27 Intersection**

Intersection Type	2045 V/C Ratios		Life-Cycle Crashes		SSI Scores	
	AM Peak Hour	PM Peak Hour	Total	Fatal & Injury	Opening Year	Design Year
Traffic Signal	<b>1.06</b>	<b>1.10</b>	595	177	5	0
Fully Displaced Left-Turn	0.71	0.69	523	155	0	0
Partial Displaced Left-Turn (US 27)	0.84	0.87	559*	166*	n/a	n/a
Partial Displaced Left-Turn (SR 544)	0.74	0.80	559*	166*	n/a	n/a
Diamond Interchange (US 27)	0.94	<b>1.13</b>	404	161	46	17
Single Point Urban Interchange (SR 544)	0.66	0.58	456	114	77	57
NW Quadrant Roadway	0.83	0.91	719**	270**	6	0
NE Quadrant Roadway	0.98	0.99	***	***	***	***
SE Quadrant Roadway	0.89	<b>1.06</b>	***	***	***	***
SW Quadrant Roadway	0.95	<b>1.16</b>	***	***	***	***

\* Estimated values using the average of the traffic signal and the fully displaced left-turn alternatives.

\*\* The sum of the crashes estimated for the three intersections that comprise this intersection control strategy.

\*\*\*SPICE analysis not conducted for this alternative due to the high v/c ratios.

Lowest number of crashes of all alternatives analyzed

n/a = No Safety Performance Function (SPF) available

The diamond interchange and three of the four quadrant roadway alternatives were not advanced for any additional evaluation due to the high volume-to-capacity (v/c) ratios for these alternatives. The NWQR alternative eliminates the need for eastbound SR 544 to northbound US 27 vehicles and southbound US 27 to westbound SR 544 vehicles to travel through the main SR 544/US 27 intersection. Since these are the two highest turning movement volumes at this intersection, the NWQR provides the most direct route for these two movements, including trucks traveling to/from the Wal-Mart distribution center.

A preliminary signal warrant analysis was conducted for the Brenton Manor Avenue intersection using the October 2019 traffic count data provided by FDOT. The 2019 data is the "existing conditions" traffic data for the PD&E study. The results of this analysis indicated that a traffic signal was warranted. Warrant 1B (interruption of continuous traffic) and Warrant 2 (four-hour minimum vehicular volume) were satisfied. The signal warrant analysis is provided in **Appendix C**. Six alternative control strategies were initially analyzed for the Brenton Manor Avenue intersection and the results of the 2045 CAP-X and SPICE analysis are summarized in **Table 2**.

**Table 2: Stage 1 ICE Analysis Summary - Brenton Manor Avenue Intersection**

Intersection Type	2045 V/C Ratios		Life-Cycle Crashes		SSI Scores	
	AM Peak Hour	PM Peak Hour	Total	Fatal & Injury	Opening Year	Design Year
Two-Way Stop Control	<b>205.41</b>	<b>173.56</b>	90	30	62	43
All-Way Stop Control	<b>2.82</b>	<b>2.86</b>	77	21	91	85
Traffic Signal	0.67	0.75	217	74	78	64
Green-T Signalized Intersection	0.67	0.74	209	63	78	64
Roundabout (2EW x 1NS)	0.88	<b>1.22</b>	265	53	82	72
Roundabout (2 x 2)	0.88	0.90	265	53	82	72

Lowest number of crashes of all alternatives analyzed

n/a = No Safety Performance Function (SPF) available

The following alternatives were not analyzed:

- Unsignalized and signalized RCUT intersections - The diverted northbound left-turn vehicles from Brenton Manor Avenue would be required to turn right and then u-turn at the US 27 intersection.
- Two-way stop control and all-way stop control – These alternatives have very high v/c ratios.
- Green-T signalized intersection – This alternative does not provide positive speed control or help to promote the desired 45 mph target speed.

The 2045 CAP-X and SPICE analysis summary sheets for the Brenton Manor Avenue intersection are provided in **Appendix D**.

### INTERSECTION CONTROL EVALUATION – SYNCHRO/SIMTRAFFIC ANALYSIS (US 27)

Detailed peak hour traffic analyses were subsequently conducted at the US 27 intersection for the two PDLT alternatives, the full DLT alternative, the NWQR alternative and the SPUI alternative. The results of the design year peak hour SYNCHRO analyses conducted for the PDLT and FDLT intersections are summarized in **Table 3**. The SYNCHRO intersection analysis summary sheets for these alternatives are also provided in **Appendix E**. The average delays for the total northbound, southbound, westbound and eastbound vehicles represent the weighted average delays for all of the vehicles that flow through the main intersection and, in many cases, through one or more of the crossover intersections. The weighted average delay calculations for these alternatives are also provided in **Appendix E**.

Peak Hour	PDLT (North/South)		PDLT (East/West)		FDLT	
	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS
AM Peak	63.9	E	44.7	D	21.9	C
PM Peak	67.5	E	57.3	E	21.5	C

*Note: The average delay values are the overall average delays and include the crossover intersections.*

The FDLT intersection operates significantly better than the two PDLT intersections; however:

- The FDLT intersection has much larger right-of-way impacts than the PDLT intersections.
- The FDLT intersection also results in right-in/right-out only access for all existing/future land uses located in all four quadrants of the intersection. For example, all southbound US 27 vehicles (north of SR 544) that want to access the Race Trac gas station/convenience store would need to travel westbound on SR 544 and make a u-turn at the first available median opening.

**Based on the right-of-way and access impacts to the commercial land uses in the northwest and southwest quadrants of the intersection (and the large amount of truck traffic traveling through this intersection), the DLT alternatives were eliminated from any further consideration.**

The NWQR alternative does not allow “direct” left-turn movements to be made at the US 27 intersection and requires three existing left-turn movements to travel through two additional intersections. The northern end of the quadrant roadway was assumed to intersect US 27 just south of the Stay Plus Inn hotel, creating a new T-intersection at this location. The southern end of the quadrant roadway would intersect SR 544 at the existing Brenton Manor Avenue, creating a four legged intersection. The NWQR alternative is illustrated in **Appendix F**. The results of the NWQR design year peak hour SimTraffic analyses are summarized in **Table 4**. The SYNCHRO and SimTraffic analysis summary sheets for this alternative are provided in **Appendix G**. The overall average delays estimated for this alternative result in LOS E operations during both peak hours. One individual movement is projected to operate at LOS F in the a.m. peak hour and two individual movements are projected to operate at LOS F in the p.m. peak hour.

Peak Hour	SR 544/US 27		US 27/NWQR		SR 544/NWQR <sup>(1)</sup>		All Three Intersections	
	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS
AM Peak	39.1	D	30.2	C	33.3	C	74.1	E
PM Peak	33.9	C	36.6	D	41.2	D	78.6	E

<sup>(1)</sup> The southern leg of this intersection is Brenton Manor Avenue.

The NWQR alternative will minimize the additional right-of-way required at the existing SR 544/US 27 intersection and maintain the existing driveway access points. A frontage road would be required to provide access to and from the Stay Plus Inn hotel on the west side of US 27. This access modification would result in additional travel distance for both the northbound vehicles entering this hotel and the vehicles exiting this hotel that desire to travel southbound on US 27.

The SPUI alternative is illustrated in **Appendix H**. The SPUI is shifted to the east of the existing intersection to minimize the right-of-way impacts to the existing land uses on the west side. This eastward shift results in three business relocations. The SPUI alternative would eliminate the northbound US 27 directional median opening south of SR 544 providing direct access to multiple land uses on the west side of US 27. The SPUI would also impact the existing northbound access into the Stay Plus Inn hotel. A frontage road would be required to provide access to and from this hotel. As discussed earlier, this frontage road would also be provided with the NWQR alternative.

The detailed traffic operations analyses conducted for this alternative are summarized in **Table 5**. The SPUI is projected to operate at LOS E overall in the a.m. peak hour and LOS D overall in the p.m. peak hour. None of the individual movements are projected to operate with a v/c ratio greater than 1.00. The SYNCHRO intersection analysis summary sheets for the SPUI alternative are also provided in **Appendix G**.

Peak Hour	SPUI (North/South)	
	Avg. Delay	LOS
AM Peak	57.0	E
PM Peak	49.8	D

## **INTERSECTION CONTROL EVALUATION – SYNCHRO AND SIDRA ANALYSIS (BRENTON MANOR AVENUE)**

Detailed peak hour traffic analyses were subsequently conducted for a conventional signalized T-intersection and a two-lane by two-lane three-legged roundabout using the SYNCHRO and SIDRA software, respectively. The results of these detailed analyses are summarized in **Table 6**. The overall average delay values for these two alternatives are very similar. Although the v/c ratios for the northbound roundabout approach are projected to be much lower than 1.00, the average p.m. peak hour delay is projected to result in LOS F operations. Since the maximum average delay for LOS E is 49.9 seconds/vehicle, the transition from LOS E to LOS F is expected to occur between 2044 and 2045. The SYNCHRO and SIDRA analysis summary sheets for these alternatives are provided in **Appendix I**.

As discussed earlier, the NWQR alternative would result in a four-legged intersection at Brenton Manor Avenue. Detailed peak hour traffic analyses were also conducted for a four-legged signalized intersection and a four-legged roundabout. These detailed analysis results are also summarized in **Table 6**. The signalized intersection is projected to have significantly lower overall average vehicle delays compared to the roundabout. The SYNCHRO and SIDRA intersection analysis summary sheets for these two alternatives are also provided in **Appendix I**.

Peak Hour	T-Intersection				Four-Legged intersection			
	Signalized Intersection		Roundabout		Signalized Intersection		Roundabout	
	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS
AM Peak	19.7	B	22.6	C	32.8	C	104.9	F
PM Peak	22.0	C	21.9	C	42.1	D	109.3	F

## RECOMMENDED INTERSECTION CONTROL STRATEGY

**Table 7** provides a comparison of the crashes estimated to occur with the NWQR alternative and the SPUI alternative. The NWQR alternative includes a four-legged signalized intersection at Brenton Manor Avenue. The SPUI alternative also includes a three-legged roundabout at the Brenton Manor Avenue intersection. The current SPICE software overestimates the number of crashes that are expected to occur at an intersection of two, two-way roadways where left-turn movements are prohibited on all intersection approaches because there are no FHWA-approved Crash Modification Factors (CMF's) for this type of intersection control strategy. Consequently, adjustment factors developed by Kittleson & Associates were used for the SR 544/US 27 intersection.

Alternative	Intersection	Total Crashes	Fatal & Injury Crashes
NWQR	SR 544/US 27	<b>319</b>	<b>118</b>
	US 27/NWQR	160	70
	SR 544/Brenton Manor Ave/NWQR	240	82
	<b>All Three Intersections</b>	<b>719</b>	<b>270</b>
SPUI + Roundabout	SR 544/US 27	456	114
	SR 544/Brenton Manor Avenue	265	53
	<b>Both Intersections</b>	<b>721</b>	<b>167</b>
<b>Total crashes for a conventional signalized intersection x Adjusted MUT Type A CMF (521 x 0.6116 = 319)</b>			
<b>Fatal &amp; injury crashes for a conventional signalized intersection x Adjusted MUT Type A CMF (157 x 0.7511 = 118)</b>			

The PD&E study recommends a SPUI for the US 27 intersection and a roundabout for the Brenton Manor Avenue intersection. This recommendation is based on the following:

- The SPUI + roundabout alternative is expected to result in 103 fewer fatal and injury crashes as compared to the NWQR alternative.
- The SPUI + roundabout alternative is also projected to have lower vehicle delays than the NWQR and would not cause any delay for the through vehicles on US 27.
- The implementation of a SPUI at the SR 544/US 27 intersection would enhance the functionality of this SIS corridor and help to promote the efficient movement of freight within this portion of Polk County.

It is also recommended that a Stage 2 ICE analysis be conducted for these two intersections using updated information when the final design phase of the project is initiated.

## **Appendix A**

Existing Geometry, Historic Crash Data and  
Existing/Future Year Traffic Volumes

Figure 1: Existing SR 544/US 27 Intersection



Figure 2: Existing SR 544/Brenton Manor Avenue Intersection



HSMV_RepAgency_Re	Reporting_Form_Type	Crash_Date	Crash_Tim	City	County	Crash_Street	Intersecting_Street	Offset_Dist	Offset_Dir	Crash_Type	Vehicles	Non_Motorist	Fatalities	Injuries	Alcohol_Re	Distraction	Drug_Relat	Estimated_	
82267094	FHPC14OFFFHP	Short	6/20/2014	1:30 PM	Winter Hav	Polk	STATE ROAD 544	UH HWY 27 (STATE ROAD 25)	300 West	Rear End	2	0	0	0	N	N	N	\$600	
82267118	FHPC14OFFFHP	Short	10/10/2014	4:45 PM	Winter Hav	Polk	STATE ROAD 544	US HWY 27 (STATE ROAD 25)	75 East	Unknown	2	0	0	0	N	N	N	\$6,000	
82780701	2015-0251	Polk Co SO	Long	6/6/2015	5:06 PM	Unincorporated	Polk	U.S. HIGHWAY 27	0	Off Road	1	0	0	0	N	N	N	\$1,000	
82781890	2016-0189	Polk Co SO	Long	4/28/2015	7:38 AM	Unincorporated	Polk	US HWY 27	3 South	Rear End	2	0	0	1	N	N	N	\$1,000	
83197029	FHPC14OFFFHP	Short	5/30/2014	5:53 AM	Winter Hav	Polk	SR-25 NB / SR-544	SR-544	200 North	Sideswipe	2	0	0	0	N	N	N	\$1,300	
83292016	FHPC14OFFFHP	Long	1/30/2014	7:00 PM	Unincorporated	Polk	SR25 (US27)	SR547 LUCERNE PARK RD	0	Other	1	1	0	1	N	N	N	\$50	
83307088	FHPC14OFFFHP	Short	5/11/2014	9:04 PM	Haines City	Polk	CR 544	HIGHWAY 27	3 West	Rear End	2	0	0	0	N	N	N	\$1,000	
83469370	2015-0265	Polk Co SO	Long	6/16/2015	2:12 PM	Unincorporated	Polk	U.S. HIGHWAY 27	100 North	Rear End	2	0	0	1	N	N	N	\$900	
83697777	FHPC14OFFFHP	Short	9/12/2014	5:20 PM	Haines City	Polk	CR544	SR25NB	0	Rear End	2	0	0	0	N	Y	N	\$1,500	
83700911	FHPC15OFFFHP	Long	1/2/2015	10:13 AM	Winter Hav	Polk	SR 25	SR 544	300 North	Other	2	0	0	0	N	N	N	\$2,000	
83711630	FHPC14OFFFHP	Short	1/22/2014	9:39 AM	Unincorporated	Polk	SR 544 (LUCERNE PARK ROAD)	U.S. HWY 27 (SR 25)	100 West	Left Turn	2	0	0	0	N	N	N	\$1,500	
83742405	FHPC15OFFFHP	Short	6/29/2015	2:10 PM	Winter Hav	Polk	U.S. 27 (SR25 NB)	SR544	40 South	Other	2	0	0	0	N	Y	N	\$850	
83747311	FHPC14OFFFHP	Long	5/12/2014	10:43 AM	Winter Hav	Polk	SR 544	US HIGHWAY 27	75 West	Rear End	2	0	0	0	N	N	N	\$1,700	
83749913	FHPC14OFFFHP	Long	2/5/2014	12:40 PM	Unincorporated	Polk	SR 25 (US HWY 27)	SR 544 (LUCERNE PARK RD)	0	Left Turn	2	0	0	0	N	N	N	\$5,000	
83759128	FHPC14OFFFHP	Long	7/16/2014	12:00 PM	Winter Hav	Polk	STATE ROAD 544 (LUCERN PARI	U.S. HIGHWAY 27 (STATE ROAD	0	Rear End	2	0	0	2	N	N	N	\$1,500	
83790294	FHPC15OFFFHP	Long	4/5/2015	6:45 AM	Haines City	Polk	SR 25	SR 544	50 South	Rear End	2	0	0	1	N	N	N	\$2,000	
83790302	FHPC15OFFFHP	Long	5/28/2015	8:30 PM	Haines City	Polk	SR 25	SR 544	0	Other	2	0	0	0	N	N	N	\$1,000	
83811536	FHPC14OFFFHP	Long	5/15/2014	4:58 PM	Haines City	Polk	US HIGHWAY 27 (SR 25)	COUNTY ROAD 544	150 South	Rear End	2	0	0	1	N	N	N	\$4,000	
83826158	FHPC14OFFFHP	Long	7/3/2014	5:50 PM	Unincorporated	Polk	US-27	LUCERNPARK RD	0	Rear End	3	0	0	1	N	N	N	\$5,500	
83839211	FHPC17OFFFHP	Short	6/19/2017	3:00 PM	Unincorporated	Polk	US-27	SR-544 (LUCERNE PARK ROAD)	200 North	Rear End	2	0	0	0	N	N	N	\$1,000	
84035419	2014-0086	Polk Co SO	Long	2/26/2014	12:14 PM	Unincorporated	Polk	HWY 544 E	50 East	Other	2	0	0	1	N	Y	N	\$7,000	
84110713	2014-0035	Winter Hav	Long	1/17/2014	2:00 PM	Winter Hav	Polk	SR 544	100 West	Rear End	2	0	0	0	N	N	N	\$600	
84110957	2014-0164	Winter Hav	Short	3/11/2014	7:17 PM	Winter Hav	Polk	SR 544	0	Rear End	2	0	0	0	N	N	N	\$1,000	
84111098	2014-0221	Winter Hav	Long	4/4/2014	3:52 PM	Winter Hav	Polk	SR 544	200 West	Head On	2	0	0	1	N	Y	N	\$2,500	
84111264	2014-0294	Winter Hav	Long	5/2/2014	4:01 PM	Winter Hav	Polk	HWY 544	40 West	Left Turn	2	0	0	0	N	N	N	\$10,000	
84293196	2014-0037	Polk Co SO	Long	1/27/2014	7:58 AM	Unincorporated	Polk	US HIGHWAY 27 (C.R. 25)	LUCERNE PARK ROAD (C.R. 544)	0	Rear End	3	0	0	2	N	N	N	\$2,000
84293832	2014-0021	Polk Co SO	Long	1/15/2014	4:50 PM	Unincorporated	Polk	S.R. 544 (LUCERNE PARK RD)	40 West	Angle	3	0	0	0	N	N	N	\$5,900	
84293843	2014-0101	Polk Co SO	Long	3/8/2014	4:11 PM	Unincorporated	Polk	US HWY 27	150 South	Rear End	2	0	0	0	N	N	N	\$5,300	
84484260	FHPC14OFFFHP	Long	11/28/2014	12:00 PM	Winter Hav	Polk	STATE ROAD 25 (US-27)	STATE ROAD 544 (SCENIC HWY)	25 North	Sideswipe	2	0	0	0	N	Y	N	\$3,500	
84498128	FHPC15OFFFHP	Long	1/25/2015	2:25 PM	Haines City	Polk	NOTHBOUND U.S HWY 27	STATE ROAD 544	250 South	Rear End	3	0	0	0	N	Y	N	\$5,000	
84543259	FHPC14OFFFHP	Long	11/28/2014	12:17 PM	Haines City	Polk	STATE ROAD 544	UNITED STATES HIGHWAY 27	100 East	Rear End	3	0	0	0	N	N	N	\$2,700	
84564601	FHPC15OFFFHP	Long	3/11/2015	4:19 PM	Winter Hav	Polk	US27	SR544	200 North	Bicycle	1	1	0	1	N	N	N	\$600	
84622378	2014-0153	Polk Co SO	Long	4/8/2014	3:00 PM	Unincorporated	Polk	US HWY 27 SOUTH	LUCERNE PARK ROAD	0	Sideswipe	3	0	0	0	N	N	N	\$6,000
84622494	2014-0253	Polk Co SO	Long	6/10/2014	11:32 PM	Unincorporated	Polk	STATE ROAD 25	HIGHWAY 544	0	Off Road	1	0	0	0	Y	N	N	\$3,000
84623195	2014-0201	Polk Co SO	Long	5/8/2014	10:35 AM	Unincorporated	Polk	US 27 (SR 25)	SR 544 (LUCERNE PARK RD)	0	Bicycle	1	1	0	1	N	N	N	\$3,500
84623414	2014-0314	Polk Co SO	Long	7/21/2014	9:55 AM	Unincorporated	Polk	S.R. 544 (LUCERNE PARK RD)	U.S. HWY 27	50 West	Unknown	3	0	0	1	N	N	N	\$4,500
84623739	2014-0377	Polk Co SO	Long	8/29/2014	7:30 PM	Unincorporated	Polk	HIGHWAY 27 N	HIGHWAY 544 E	15 South	Rear End	2	0	0	1	N	N	N	\$1,500
84624193	2014-0559	Polk Co SO	Long	12/30/2014	2:25 PM	Unincorporated	Polk	SR25/HWY 27	SR544	100 South	Rear End	2	0	0	0	N	N	N	\$4,000
84624489	2014-0395	Polk Co SO	Long	9/11/2014	8:01 AM	Unincorporated	Polk	SR 544	HWY 27	50 West	Rear End	2	0	0	0	N	N	N	\$200
84624711	2014-0540	Polk Co SO	Long	12/15/2014	10:30 PM	Unincorporated	Polk	US HWY 27	SCENIC HWY	0	Rear End	2	0	0	4	N	N	N	\$25,000
84624923	2014-0369	Polk Co SO	Long	8/25/2014	5:23 PM	Unincorporated	Polk	SR 25 (HWY 27)	SR 544E	100 North	Rear End	2	0	0	4	N	N	N	\$10,000
84625417	2014-0428	Polk Co SO	Long	10/2/2014	8:58 PM	Unincorporated	Polk	STATE ROAD 25	HIGHWAY 544 EAST	10 North	Rear End	2	0	0	2	N	N	N	\$0
84625446	2014-0400	Polk Co SO	Long	9/14/2014	10:45 AM	Unincorporated	Polk	US HWY 27	HWY 544	100 South	Other	1	0	0	0	N	N	N	\$3,000
84625617	2014-0416	Polk Co SO	Short	9/24/2014	3:45 PM	Unincorporated	Polk	US HWY 27	SR 544	10 South	Rear End	2	0	0	0	N	N	N	\$450
84625620	2014-0516	Polk Co SO	Long	11/30/2014	5:00 PM	Unincorporated	Polk	US HWY 27	CR 544	0	Angle	2	0	0	8	N	N	N	\$4,000
84625768	2014-0526	Polk Co SO	Long	12/7/2014	4:21 PM	Unincorporated	Polk	U.S. HIGHWAY 27	STATE ROAD 544	0	Rear End	3	0	0	1	N	N	N	\$8,500
84626062	2014-0491	Polk Co SO	Long	11/12/2014	8:40 PM	Unincorporated	Polk	U.S. 27	FL 544	0	Other	1	0	0	0	N	N	N	\$4,500
84626287	2015-0010	Polk Co SO	Long	1/7/2015	9:17 AM	Unincorporated	Polk	LUCERNE PARK RD	HWY 27 S	0 East	Rear End	2	0	0	2	N	N	N	\$1,000
84626288	2015-0085	Polk Co SO	Short	2/24/2015	9:00 AM	Unincorporated	Polk	LUCERNE PARK RD	HWY 27 S	0 West	Other	1	0	0	0	N	N	N	\$500
84894952	FHPC15OFFFHP	Short	5/4/2015	12:50 PM	Winter Hav	Polk	SR 544	SR 25	25 West	Sideswipe	2	0	0	0	N	N	N	\$2,300	
84997126	2015-0093	Winter Hav	Long	2/19/2015	12:08 PM	Winter Hav	Polk	LUCERNE PARK RD	HWY 27	0	Rear End	2	0	0	0	N	N	N	\$100
84997192	2015-0118	Winter Hav	Short	3/4/2015	7:26 PM	Winter Hav	Polk	SR 544	HWY 27	15 West	Rear End	2	0	0	0	N	N	N	\$1,000
84997398	2015-0205	Winter Hav	Short	4/10/2015	3:55 PM	Winter Hav	Polk	SR 544	US 27	0	Head On	2	0	0	0	N	N	N	\$0
85143656	FHPC18OFFFHP	Short	3/6/2018	3:10 PM	Winter Hav	Polk	SR-544 (LUCERNE PARK RD)	US-27	10 West	Other	2	0	0	0	N	Y	N	\$3,000	

85152829	FHPC15OFFFHP	Long	10/25/2015	8:35 AM	Winter Hav Polk	SR 25	SR 544	100 North	Rear End	2	0	0	0	N	N	N	\$2,000
85154665	FHPC16OFFFHP	Long	8/27/2016	1:20 PM	Haines City Polk	U.S. HIGHWAY 27 (STATE ROAD	STATE ROAD 544	10 South	Rear End	2	0	0	0	N	N	N	\$4,000
85154666	FHPC16OFFFHP	Long	8/27/2016	1:21 PM	Haines City Polk	U.S. HIGHWAY 27 (STATE ROAD	STATE ROAD 544	50 South	Rear End	2	0	0	0	2	N	N	\$3,500
85243957	FHPC16OFFFHP	Long	8/10/2016	3:18 AM	Winter Hav Polk	STATE ROAD 544 (LUCERNE PAR	UNITED STATES 27 (STATE ROAC	15 West	Other	2	0	0	0	1	N	N	\$2,500
85252574	FHPC16OFFFHP	Long	6/6/2016	7:32 AM	Haines City Polk	STATE ROAD 25 (US-27)	STATE ROAD 544 (LUCERNE PAR	50 North	Rear End	2	0	0	0	0	N	Y	\$2,500
85290632	FHPC16OFFFHP	Long	6/23/2016	7:49 AM	Winter Hav Polk	U.S. HIGHWAY 27(SR 25)	STATE ROAD 544(SR 544)	25 South	Rear End	2	0	0	0	2	N	N	\$10,000
85290633	FHPC16OFFFHP	Long	6/23/2016	8:48 AM	Winter Hav Polk	U.S. HIGHWAY 27(SR 25)	STATE ROAD 544(SR 544)	25 East	Rollover	2	0	0	0	4	N	N	\$26,500
85363547	FHPC17OFFFHP	Long	1/13/2017	10:11 AM	Winter Hav Polk	U.S. HIGHWAY 27 (STATE ROAD	STATE ROAD 544 (LUCERN PARK	5 South	Rear End	2	0	0	0	4	N	N	\$3,000
85371205	FHPC17OFFFHP	Long	8/9/2016	8:20 PM	Haines City Polk	US HIGHWAY 27 (SR 25)	LUCERNE PARK RD (SR 544)	50 South	Rear End	2	0	0	0	0	N	N	\$1,000
85387002	FHPC17OFFFHP	Short	1/13/2017	5:11 PM	Haines City Polk	UNITED STATES 27 (STATE ROAC	COUNTY ROAD 544	250 South	Rear End	2	0	0	0	0	N	N	\$3,000
85390353	FHPC16OFFFHP	Long	11/27/2016	3:37 PM	Haines City Polk	U.S. HIGHWAY 27(SR 25)	STATE ROAD 544(SR 544)	0	Left Turn	2	0	0	0	0	N	N	\$20,000
85541331	FHPC17OFFFHP	Long	10/2/2017	6:15 AM	Haines City Polk	STATE ROAD 25 (US-27)	COUNTY ROAD 544	0	Angle	3	0	0	0	1	N	Y	\$5,000
85573880	FHPC17OFFFHP	Short	12/2/2017	8:55 AM	Winter Hav Polk	SR544	US27	35 East	Left Turn	2	0	0	0	0	N	N	\$2,000
85579914	FHPC18OFFFHP	Long	2/9/2018	8:15 PM	Winter Hav Polk	STATE ROAD 25 (US-27)	LUCERN PARK ROAD	200 South	Rear End	3	0	0	0	2	N	Y	\$18,500
85591162	FHPC19OFFFHP	Long	10/16/2019	2:11 PM	Winter Hav Polk	EB SR-544	SR-25	0 West	Rear End	3	0	0	0	1	N	N	\$10,500
85601592	FHPC17OFFFHP	Long	10/2/2017	2:48 PM	Haines City Polk	SR 25 (US HWY 27)	SR 544 (LUCERNE PARKED RD)	0	Left Turn	2	0	0	0	0	N	N	\$10,500
85686827	2015-0032: Polk Co SO	Long	1/22/2015	9:40 AM	Unincorporated Polk	U.S. HIGHWAY 27	LUCERN PARK ROAD	50 North	Unknown	2	0	0	0	0	N	Y	\$6,300
85687855	2015-0117: Polk Co SO	Long	3/16/2015	8:20 AM	Unincorporated Polk	LUCERNE PARK RD	HWY 27	25 West	Rear End	2	0	0	0	0	N	N	\$400
85688089	2015-0186: Polk Co SO	Long	4/27/2015	4:15 AM	Unincorporated Polk	US HWY 27	LUCERNE PARK RD	0	Angle	2	0	0	0	1	N	N	\$6,500
86082367	2015-0298: Polk Co SO	Long	7/6/2015	4:25 PM	Unincorporated Polk	LUCERNE PARK RD	HWY 27	0	Rear End	2	0	0	0	1	N	N	\$0
86082430	2015-0337: Polk Co SO	Short	7/31/2015	10:45 AM	Haines City Polk	US HWY 27	LUCERNE PARK ROAD	5 South	Rear End	2	0	0	0	0	N	Y	\$600
86084562	2015-0477: Polk Co SO	Long	10/30/2015	2:45 PM	Unincorporated Polk	LUCERNE PARK RD	HWY 27	20 South	Rear End	2	0	0	0	0	N	N	\$425
86312001	2015-0477: Polk Co SO	Short	10/30/2015	1:43 PM	Unincorporated Polk	SR 25 (HWY 27)	SR 544 (LUCERNE PARK RD)	200 North	Rear End	2	0	0	0	1	N	Y	\$700
86312715	2016-0098: Polk Co SO	Long	3/3/2016	3:07 PM	Unincorporated Polk	US HWY 27	LUCERNE PARK RD	0	Pedestrian	1	1	1	0	0	N	N	\$5,000
86312743	2015-0570: Polk Co SO	Long	12/30/2015	3:45 AM	Unincorporated Polk	HWY 27	SR 544	0 North	Sideswipe	3	0	0	0	0	N	N	\$4,650
86313023	2015-0569: Polk Co SO	Long	12/30/2015	5:14 AM	Unincorporated Polk	SR 544E	SR 25 (HWY 27)	300 East	Sideswipe	2	0	0	0	0	N	N	\$2,000
86313353	2016-0085: Polk Co SO	Long	2/25/2016	12:45 PM	Unincorporated Polk	STATE ROAD 544 EAST	U.S. HWY. 27	100 East	Left Turn	2	0	0	0	0	N	N	\$1,600
86313567	2016-0054: Polk Co SO	Short	2/5/2016	5:21 PM	Unincorporated Polk	LUCERNE PARK RD	SR 25 (HWY 27)	0	Rear End	2	0	0	0	0	N	N	\$300
86313769	2016-0052: Polk Co SO	Short	2/4/2016	1:33 PM	Unincorporated Polk	US HWY 27	SR 544	0	Left Turn	2	0	0	0	0	N	N	\$2,000
86442401	2016-0284: Polk Co SO	Long	6/22/2016	8:30 AM	Unincorporated Polk	U.S HIGHWAY 27	SR-544	30 South	Rear End	2	0	0	0	0	N	N	\$2,500
86442475	2016-0140: Polk Co SO	Long	3/28/2016	9:00 AM	Unincorporated Polk	SR 25 (HWY 27)	SR 544 (LUCERNE PARK RD)	30 South	Sideswipe	2	0	0	0	0	N	N	\$4,000
86443561	2016-0240: Polk Co SO	Long	5/28/2016	8:30 AM	Unincorporated Polk	SR 544	HWY 27	10 East	Left Turn	2	0	0	0	0	N	N	\$17,000
86444166	2016-0389: Polk Co SO	Long	8/26/2016	6:50 PM	Haines City Polk	US 27	CR 544	0	Sideswipe	2	0	0	0	0	N	N	\$1,200
86444337	2016-0330: Polk Co SO	Long	7/23/2016	8:00 PM	Unincorporated Polk	SR 544 (LUCERNE PARK RD)	SR 25 (HWY 27)	0	Other	3	0	0	0	5	N	N	\$7,500
86444818	2016-0375: Polk Co SO	Long	8/19/2016	3:25 PM	Unincorporated Polk	SR 25 (HWY 27)	SR 544E	150 North	Unknown	2	0	0	0	0	N	Y	\$2,100
86446527	2017-0043: Polk Co SO	Long	1/26/2017	5:40 PM	Unincorporated Polk	HWY 27	LUCERNE PARK RD	50 North	Rear End	3	0	0	0	2	N	N	\$6,000
86937179	2017-0050: Polk Co SO	Long	2/1/2017	6:00 PM	Unincorporated Polk	LUCERN PARK ROAD	HWY 27	0	Rear End	2	0	0	0	0	N	N	\$3,500
86937303	2017-0118: Polk Co SO	Long	3/12/2017	11:42 AM	Unincorporated Polk	LUCERNE PARK RD	HWY 27	0	Right Turn	2	0	0	0	0	N	N	\$100
86937580	2017-0066: Polk Co SO	Long	2/5/2017	3:45 PM	Unincorporated Polk	SR 544 (LUCERNE PARK RD)	SR 25 (HWY 27)	100 West	Other	1	0	0	0	0	N	N	\$10,000
86939251	2017-0196: Polk Co SO	Long	4/27/2017	2:50 PM	Unincorporated Polk	US HWY 27	SR 544	0	Off Road	1	0	0	0	0	N	N	\$1,800
86939262	2017-0327: Polk Co SO	Long	7/19/2017	8:20 AM	Unincorporated Polk	US HWY 27	SR 544	0 North	Rear End	2	0	0	0	1	N	N	\$3,500
86939334	2017-0331: Polk Co SO	Short	7/21/2017	2:11 PM	Unincorporated Polk	US HWY 27	LUCERNE PARK ROAD	0 North	Rear End	2	0	0	0	0	N	N	\$100
86995121	2017-0366: Polk Co SO	Long	8/10/2017	3:47 PM	Unincorporated Polk	US HWY 27	LUCERNE PARK RD	0 South	Rear End	2	0	0	0	3	N	N	\$10,000
86995639	2017-0413: Polk Co SO	Long	9/13/2017	12:10 AM	Unincorporated Polk	HWY 27	SR 544	0	Angle	2	0	0	0	5	N	N	\$17,000
86996142	2017-0401: Polk Co SO	Long	9/2/2017	8:57 PM	Unincorporated Polk	LUCERNE PARK RD	HWY 27	0	Left Turn	2	0	0	0	2	N	Y	\$5,000
86996194	2017-0420: Polk Co SO	Long	9/17/2017	5:00 PM	Unincorporated Polk	US 27	LUCERNE PARK RD	0 South	Sideswipe	2	0	0	0	0	N	N	\$1,000
87157605	FHPC18OFFFHP	Long	7/5/2018	2:30 PM	Winter Hav Polk	CR544	US27 (SR25)	30 West	Rear End	2	0	0	0	0	N	N	\$2,200
87195984	FHPC18OFFFHP	Long	5/10/2018	10:45 AM	Haines City Polk	STATE ROAD 544	US-27	200 East	Off Road	1	0	0	0	0	N	Y	\$3,000
87195860	FHPC18OFFFHP	Long	4/2/2018	1:05 PM	Haines City Polk	SR-25 (US-27)	SR-544	300 North	Unknown	2	0	0	0	0	N	N	\$1,500
87216994	FHPC18OFFFHP	Long	11/8/2018	8:17 PM	Haines City Polk	U.S. HIGHWAY 27(SR 25)	STATE ROAD 544(SR 544)	0	Left Turn	2	0	0	1	3	N	N	\$20,000
87235550	FHPC18OFFFHP	Short	11/2/2018	6:56 PM	Haines City Polk	NB U.S. HIGHWAY 27	STATE ROAD 544	200 South	Rear End	2	0	0	0	0	N	N	\$3,000
87273100	FHPC18OFFFHP	Short	10/10/2018	6:16 AM	Haines City Polk	US 27	CR 544 (LUCERNE PARK ROAD)	10 South	Right Turn	2	0	0	0	0	N	Y	\$2,000
87273101	FHPC18OFFFHP	Long	10/10/2018	4:44 PM	Haines City Polk	SR544 (LUCERNE PARK RD)	US 27	100 West	Rear End	2	0	0	0	0	N	Y	\$3,000
87273127	FHPC19OFFFHP	Long	1/21/2019	8:08 PM	Haines City Polk	US 27	CR 544 (LUCERNE PARK RD)	25 East	Left Turn	2	0	0	0	0	N	N	\$2,000
87276913	FHPC19OFFFHP	Long	1/11/2019	11:29 AM	Unincorporated Polk	US 27	SR 544	200 North	Rollover	1	0	0	0	1	N	N	\$5,000

87289592	FHPC19OFFFHP	Short	1/21/2019	3:50 PM	Haines City Polk	US-27	STATE ROAD 544	40 South	Sideswipe	2	0	0	0	N	Y	N	\$1,000	
87289635	FHPC19OFFFHP	Long	7/26/2019	6:30 AM	Davenport Polk	US 27	STATE ROAD 544	100 North	Rear End	2	0	0	0	1	Y	Y	\$15,000	
87331732	2017-0437	Polk Co SO	Long	9/25/2017	4:55 PM	Unincorpar Polk	US HWY 27	LUCERNE PARK RD	0	Rear End	2	0	0	2	N	N	\$1,000	
87332050	2018-0049	Polk Co SO	Long	1/26/2018	3:30 PM	Unincorpar Polk	US HWY 27	LUCERNE PARK RD	0	Other	2	0	0	1	N	N	\$400	
87332501	2017-0468	Polk Co SO	Long	10/14/2017	11:19 AM	Unincorpar Polk	US HWY 27	SR 544	0	Rear End	2	0	0	0	N	N	\$4,500	
87332514	2018-0045	Polk Co SO	Long	1/24/2018	12:20 PM	Unincorpar Polk	SR 544	0	Other	2	0	0	0	1	N	N	\$1,200	
87665636	2018-0020	Polk Co SO	Long	1/8/2018	1:30 AM	Unincorpar Polk	HWY 27	LUCERNE PARK RD.	100 North	Rear End	2	0	0	1	N	N	\$1,000	
87665667	2018-0229	Polk Co SO	Long	5/11/2018	11:00 AM	Unincorpar Polk	US HWY 27	SR 544	0 South	Rear End	2	0	0	0	N	N	\$8,500	
87665832	2018-0059	Polk Co SO	Long	2/1/2018	2:00 PM	Unincorpar Polk	HWY 27	LUCERNE PARK ROAD	300 South	Unknown	2	0	0	0	N	N	\$3,000	
87667922	2018-0173	Polk Co SO	Long	4/4/2018	2:00 AM	Unincorpar Polk	US HWY 27	LUCERNE PARK ROAD.	0 South	Rear End	2	0	0	0	N	N	\$500	
87870391	2018-0335	Polk Co SO	Long	7/12/2018	3:45 PM	Unincorpar Polk	SR 544	US HWY 27	0	Other	2	0	0	0	N	N	\$200	
87870956	2018-0383	Polk Co SO	Long	8/12/2018	2:35 AM	Unincorpar Polk	US HWY 27	SR 544	0	Rear End	3	0	0	1	N	N	\$27,500	
87870991	2018-0571	Polk Co SO	Long	12/9/2018	11:15 PM	Haines City Polk	U.S HWY 27	S.R 544	0	Unknown	3	0	0	0	N	N	\$7,000	
88035284	FHPC19OFFFHP	Long	3/29/2019	1:24 PM	Haines City Polk	US 27 (SR25)	SR 544	40 South	Right Turn	2	0	0	0	0	N	N	\$1,750	
88099404	FHPC19OFFFHP	Short	10/3/2019	12:39 PM	Haines City Polk	SB US HIGHWAY 27	STATE ROAD 544	0 North	Rear End	2	0	0	0	0	N	N	\$1,000	
88107629	FHPC19OFFFHP	Long	10/31/2019	3:12 PM	Haines City Polk	LUCERNE PARK RD	STATE ROAD 25	0 West	Rear End	2	0	0	0	0	N	N	\$1,700	
88168933	FHPC19OFFFHP	Long	10/30/2019	12:27 PM	Haines City Polk	SR-544	SR-25 (US-27)	10 East	Rear End	2	0	0	0	0	N	N	\$1,100	
88750642	2018-0525	Polk Co SO	Long	11/9/2018	6:45 AM	Winter Hav Polk	HWY 27	SR 544	0	Rear End	4	0	0	2	N	N	\$1,500	
88751277	2018-0530	Polk Co SO	Long	11/12/2018	2:15 PM	Unincorpar Polk	HWY 27 (SB)	0 North	Unknown	2	0	0	0	0	N	Y	\$1,500	
88751497	2018-0528	Polk Co SO	Long	11/10/2018	11:30 PM	Unincorpar Polk	HWY 27	SR 544	0	Rear End	2	0	0	1	N	Y	\$15,000	
88751687	2018-0516	Polk Co SO	Long	11/2/2018	9:21 PM	Unincorpar Polk	HWY 27	LUCERNE PARK RD	0 North	Rear End	2	0	0	0	N	N	\$1,000	
88752001	2018-0584	Polk Co SO	Long	12/15/2018	4:20 PM	Unincorpar Polk	SR 544 E	0	Other	2	0	0	0	0	N	N	\$1,100	
88752742	2018-0606	Polk Co SO	Short	12/28/2018	6:50 PM	Haines City Polk	HWY 27	0 South	Other	2	0	0	0	0	N	N	\$1,000	
89008830	2019-0095	Polk Co SO	Long	2/22/2019	7:25 PM	Unincorpar Polk	HWY 27	LUCERNE PARK RD	0	Rear End	2	0	0	1	N	N	\$1,000	
89009872	2019-0127	Polk Co SO	Long	3/15/2019	7:10 AM	Unincorpar Polk	HWY 27	0 South	Sideswipe	3	0	0	0	0	N	N	\$2,000	
89009973	2019-0131	Polk Co SO	Long	3/17/2019	2:40 PM	Unincorpar Polk	SR25 (HWY 27) NB	5 South	Rear End	2	0	0	0	1	N	Y	\$11,000	
89010464	2019-0259	Polk Co SO	Long	6/1/2019	5:34 PM	Unincorpar Polk	US HWY 27	SR 544 (LUCERNE PARK RD)	30 North	Rollover	2	0	0	0	0	N	N	\$3,000
89011298	2019-0265	Polk Co SO	Long	6/5/2019	7:20 PM	Unincorpar Polk	SR 544 E	0	Rear End	2	0	0	0	0	N	N	\$200	
89011332	2019-0233	Polk Co SO	Long	5/17/2019	2:40 AM	Unincorpar Polk	STATE ROAD 544 (LUCERNE PAR	US HIGHWAY 27	0	Sideswipe	2	0	0	0	0	N	N	\$3,200
89011637	2019-0250	Polk Co SO	Long	5/28/2019	7:42 AM	Unincorpar Polk	US HWY 27	LUCERNE PARK RD	40 North	Rear End	2	0	0	1	N	N	\$700	
89011754	2019-0259	Polk Co SO	Long	6/1/2019	4:56 PM	Unincorpar Polk	LUCERNE PARK RD	US HIGHWAY 27	0	Right Turn	2	0	0	0	0	N	N	\$2,500
89012043	2019-0317	Polk Co SO	Long	7/7/2019	1:30 AM	Unincorpar Polk	S.R 544	0 East	Other	1	0	0	0	0	N	N	\$800	
89012972	2019-0347	Polk Co SO	Long	7/27/2019	4:08 PM	Unincorpar Polk	HWY 27 S	LUCERNE PARK RD	100 South	Rollover	1	0	0	1	N	N	\$500	
89013258	2019-0371	Polk Co SO	Long	8/7/2019	7:30 AM	Unincorpar Polk	LUCERNE PARK RD (SR 544)	10	Rear End	2	0	0	0	0	N	N	\$2	
89013323	2019-0442	Polk Co SO	Short	9/20/2019	9:32 AM	Unincorpar Polk	LUCERNE PARK RD	100	Unknown	2	0	0	0	0	Y	N	\$2,200	
89013372	2019-0388	Polk Co SO	Long	8/19/2019	7:32 AM	Haines City Polk	US HWY 27	0 South	Rear End	2	0	0	0	0	Y	N	\$1,300	
89119624	2019-0294	Winter Hav	Long	5/4/2019	8:30 PM	Winter Hav Polk	LUCERNE PARK RD	HWY 27	0	Rear End	2	0	0	1	N	N	\$10,200	
89370282	2019-0411	Polk Co SO	Long	9/3/2019	9:35 AM	Haines City Polk	LUCERNE PK RD	US HWY 27	0 East	Left Turn	2	0	0	0	0	N	N	\$1,200
89371288	2019-0495	Polk Co SO	Long	10/18/2019	9:40 PM	Unincorpar Polk	LUCERNE PARK RD	US HWY 27	0 West	Rear End	2	0	0	0	0	Y	N	\$12,000
89371289	2019-0518	Polk Co SO	Long	11/2/2019	10:39 PM	Unincorpar Polk	LUCERNE PARK RD.	0	Left Turn	2	0	0	0	5	N	N	\$24,000	
89371738	2019-0512	Polk Co SO	Long	10/30/2019	7:00 AM	Unincorpar Polk	SR25 (HWY 27)	LUCERNE PARK RD	200 North	Rear End	2	0	0	0	0	Y	N	\$500
89371876	2019-0513	Polk Co SO	Long	10/31/2019	10:13 AM	Unincorpar Polk	SR 25 (HWY 27)	LUCERNE PARK RD	20 North	Rear End	2	0	0	0	0	Y	N	\$3,000
89371896	2019-0526	Polk Co SO	Long	11/8/2019	10:27 AM	Unincorpar Polk	SR 25 (HWY 27)	LUCERNE PARK RD	20 East	Rear End	3	0	0	1	N	N	\$5,500	
89372488	2019-0565	Polk Co SO	Long	12/8/2019	3:36 AM	Unincorpar Polk	HWY 27	LUCERNE PARK ROAD	0	Rear End	2	0	0	5	N	Y	\$4,000	
89373065	2019-0599	Polk Co SO	Long	12/30/2019	11:28 PM	Unincorpar Polk	HIGHWAY 27 N	STATE ROAD 544	10 West	Rear End	2	0	0	0	0	N	N	\$15,000
89373090	2019-0588	Polk Co SO	Long	12/23/2019	6:46 AM	Haines City Polk	U.S HWY 27	0 North	Rear End	2	0	0	0	0	N	N	\$4,000	
89373181	2019-0598	Polk Co SO	Long	12/29/2019	6:01 PM	Unincorpar Polk	C.R 544 E	U.S HWY 27	200 West	Rear End	2	0	0	0	0	Y	N	\$5,000

Weather_C	Light_Cond	Street_Nur	Crash_Type_D	Crash_Typc	Crash_Sevc	Within_City	Manner_of_Cr	First_Harmful	First_HE_Locati	First_HE_Relat	First_HE_V	Type_of_Inter	Road_Sys_J	Type_of_SI	Road_Surf
Clear	Daylight		Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte State	Unpaved	Dry	
Clear	Daylight		Unknown	E	Property D:N		Angle	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: County	Unpaved	Dry	
Cloudy	Daylight		Off Road	S	Property D:N		Front to Front	Traffic Signal S Median	Non-Junction N			Four-Way Inte U.S.	Paved	Dry	
Clear	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection N			Four-Way Inte U.S.	Curb	Dry	
Cloudy	Daylight		Same Directio	N	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Paved	Wet	
Clear	Dark - Not Lighted		Single Vehicle S	N	Injury N		Unknown	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Curb	Dry	
Clear	Dark - Lighted		Rear End	E	Property D:Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: County	Curb	Dry	
Clear	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: U.S.	Unpaved	Dry	
Clear	Daylight		Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: County	Unpaved	Dry	
Fog, Smog,	Daylight		Other	S	Property D:N		Angle	Motor Vehicle On Roadway	Driveway/Alle N			Not at Interse: U.S.	Unpaved	Wet	
Clear	Daylight		Left Rear	S	Property D:N		Angle	Motor Vehicle On Roadway	Driveway/Alle N			Not at Interse: State	Unpaved	Dry	
Cloudy	Daylight		Backed Into	N	Property D:N		Other	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: U.S.	Curb	Wet	
Cloudy	Daylight		Rear End	W	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Paved	Dry	
Cloudy	Daylight		Left Entering	W	Property D:N		Angle	Motor Vehicle On Roadway	Intersection Y			Four-Way Inte U.S.	Paved	Dry	
Rain	Daylight		Rear End	E	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection N			Four-Way Inte State	Unpaved	Wet	
Cloudy	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Not at Interse: U.S.	Curb	Dry	
Cloudy	Dark - Lighted		Other	E	Property D:N		Angle	Motor Vehicle On Roadway	Intersection Y			Four-Way Inte U.S.	Unpaved	Dry	
Rain	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte U.S.	Paved	Wet	
Rain	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Wet	
Rain	Daylight		Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Not at Interse: U.S.	Unpaved	Wet	
Clear	Daylight		Other	E	Injury N		Other	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte U.S.	Unpaved	Dry	
Clear	Daylight		Rear End	E	Property D:Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Dry	
Clear	Daylight		Rear End	E	Property D:Y		Front to Rear	Motor Vehicle On Roadway	Y			State		Dry	
Clear	Daylight		Head On	EW	Injury Y		Front to Front	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Dry	
Rain	Daylight		Left Rear	N	Property D:N		Sideswipe, Op	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Wet	
Rain	Dawn		Rear End	S	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte U.S.	Unpaved	Wet	
Clear	Daylight		Right Angle	SE	Property D:N		Angle	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Dry	
Clear	Daylight		Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: U.S.	Unpaved	Dry	
Clear	Daylight		Same Directio	S	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Intersection-R:N			Not at Interse: State	Paved	Dry	
Clear	Daylight		Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Not at Interse: U.S.	Unpaved	Dry	
Clear	Daylight		Rear End	W	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Four-Way Inte State	Paved	Dry	
Clear	Daylight		Bicycle	S	Injury N		Angle	Pedalcycle On Roadway	Driveway/Alle Y			T-Intersection U.S.	Paved	Dry	
Rain	Daylight		Same Directio	S	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction N			Four-Way Inte U.S.	Unpaved	Wet	
Clear	Dark - Lighted		Off Road	S	Property D:N		Other	Other Post, Po On Roadway	Intersection N			Four-Way Inte State	Paved	Dry	
Clear	Daylight		Bicycle	N	Injury N		Angle	Pedalcycle On Roadway	Intersection N			Four-Way Inte U.S.	Unpaved	Dry	
Clear	Daylight		Unknown	N	Injury N		Angle	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Unpaved	Dry	
Clear	Unknown		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Other			Other State	Paved	Dry	
Rain	Daylight		Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: State	Paved	Wet	
Clear	Daylight		Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Four-Way Inte State	Unpaved	Dry	
Clear	Dark - Not Lighted		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection N			Four-Way Inte U.S.	Paved	Dry	
Clear	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Driveway/Alle N			Not at Interse: State	Paved	Dry	
Clear	Dark - Lighted		Rear End	S	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte State	Unpaved	Dry	
Clear	Daylight		Single Vehicle N	N	Property D:N		Other	Fire/Explosion On Roadway	Intersection N			Four-Way Inte U.S.	Unpaved	Dry	
Clear	Daylight		Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction N			Not at Interse: U.S.	Unpaved	Dry	
Clear	Daylight		Right Angle	SW	Injury N		Angle	Motor Vehicle On Roadway	Intersection N			Four-Way Inte U.S.	Unpaved	Dry	
Cloudy	Dusk		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte U.S.	Paved	Dry	
Clear	Dark - Lighted		Single Vehicle W	N	Property D:N		Other	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte U.S.	Paved	Dry	
Clear	Daylight		Rear End	E	Injury N		Front to Rear	Motor Vehicle On Roadway	Intersection Y			Four-Way Inte Local	Paved	Dry	
Clear	Daylight		Single Vehicle W	N	Property D:N		Other	Motor Vehicle On Roadway	Non-Junction N			Four-Way Inte Local	Paved	Dry	
Clear	Daylight		Same Directio	E	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Intersection-R:N			Four-Way Inte State	Paved	Dry	
Clear	Daylight		Rear End	E	Property D:Y		Front to Rear	Other Non-Fix On Roadway	Other			Other County	Curb	Dry	
Clear	Dusk		Rear End	E	Property D:Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction N					Dry	
Clear	Daylight		Head On	N	Property D:Y				N					Dry	
Clear	Daylight		Other	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N			Not at Interse: U.S.	Paved	Dry	

Cloudy	Daylight	Rear End	S	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Wet	
Cloudy	Daylight	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Four-Way Inte: U.S.	Curb	Dry	
Clear	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Curb	Dry
Cloudy	Dark - Not Lighted	Backed Into	E	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: State	Paved	Wet
Cloudy	Daylight	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Paved	Wet	
Clear	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Four-Way Inte: U.S.	Paved	Dry
Clear	Daylight	Rollover	S	Injury	N	Other	Overturn/Roll: On Roadway	Intersection	Y	Y-Intersection: U.S.	Paved	Dry
Cloudy	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Not at Interse: U.S.	Paved	Wet
Rain	Dusk	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Wet	
Cloudy	Daylight	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Wet	
Clear	Dusk	Left Entering	W	Property D:N	Angle	Motor Vehicle On Roadway	Intersection	Y	Four-Way Inte: U.S.	Paved	Dry	
Clear	Dark - Lighted	Right Angle	NW	Injury	N	Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: State	Paved	Dry
Clear	Daylight	Left Entering	S	Property D:N	Angle	Motor Vehicle On Roadway	Driveway/Alle:	Y	T-Intersection: County	Unpaved	Dry	
Clear	Dark - Lighted	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Paved	Dry
Cloudy	Daylight	Rear End	E	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Curb	Wet
Clear	Daylight	Left Entering	S	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection	Y	Four-Way Inte: U.S.	Paved	Dry	
Cloudy	Daylight	Unknown	N	Property D:N	Angle	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry	
Clear	Daylight	Rear End	E	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Not at Interse: U.S.	Unpaved	Dry	
Clear	Dark - Lighted	Right Angle	NW	Injury	N	Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: U.S.	Unpaved	Dry
Rain	Daylight	Rear End	E	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: County	Paved	Wet
Clear	Daylight	Rear End	S	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: Local	Unpaved	Dry	
Cloudy	Daylight	Rear End	E	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Four-Way Inte: State	Paved	Dry	
Clear	Daylight	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Not at Interse: State	Paved	Dry
Clear	Daylight	Pedestrian	S	Fatality	N	Other	Pedestrian On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry
Clear	Daylight	Same Direction	S	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry	
Clear	Dark - Not Lighted	Opposing Side	EW	Property D:N	Sideswipe, Op	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Paved	Dry	
Clear	Daylight	Left Entering	E	Property D:N	Sideswipe, Op	Motor Vehicle On Roadway	Driveway/Alle:	N	Not at Interse: State	Unpaved	Dry	
Clear	Dusk	Rear End	E	Property D:N	Other	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: Local	Unpaved	Dry	
Cloudy	Daylight	Left Entering	W	Property D:N	Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: U.S.	Unpaved	Dry	
Clear	Daylight	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry	
Cloudy	Daylight	Same Direction	S	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Intersection-R:N	N	Y-Intersection: State	Paved	Dry	
Clear	Daylight	Left Entering	E	Property D:N	Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: State	Paved	Dry	
Cloudy	Daylight	Same Direction	N	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: State	Unpaved	Dry	
Clear	Dark - Lighted	Other	S	Injury	N	Other	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: State	Paved	Dry
Clear	Daylight	Unknown	S	Property D:N	Angle	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Unpaved	Dry	
Clear	Daylight	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry
Clear	Daylight	Rear End	E	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: Interstate	Paved	Dry	
Clear	Daylight	Right/Through	S	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Intersection-R:Y	N	Four-Way Inte: County	Paved	Dry	
Clear	Daylight	Single Vehicle	E	Property D:N	Other	Fire/Explosion On Roadway	Intersection-R:N	N	Not at Interse: State	Curb	Dry	
Clear	Daylight	Off Road	E	Property D:N	Other	Curb On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry	
Clear	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry
Rain	Daylight	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Wet	
Clear	Daylight	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Y-Intersection: U.S.	Paved	Dry
Clear	Dark - Not Lighted	Right Angle	SW	Injury	N	Sideswipe, Op	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry
Clear	Dark - Lighted	Left Entering	W	Injury	N	Angle	Motor Vehicle On Roadway	Intersection-R:N	N	Four-Way Inte: U.S.	Paved	Wet
Clear	Daylight	Same Direction	S	Property D:N	Front to Front	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte: U.S.	Paved	Dry	
Clear	Daylight	Rear End	E	Property D:N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N	N	Four-Way Inte: County	Curb	Dry	
Clear	Daylight	Off Road	W	Property D:N	Unknown	Ditch Off Roadway	Non-Junction	N	Not at Interse: County	Curb	Dry	
Clear	Daylight	Unknown	N	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Intersection-R:N	N	Not at Interse: U.S.	Paved	Dry	
Clear	Dark - Lighted	Left Entering	W	Fatality	N	Angle	Motor Vehicle On Roadway	Intersection	Y	Four-Way Inte: U.S.	Paved	Dry
Rain	Dark - Lighted	Rear End	N	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Wet	
Clear	Dark - Lighted	Right/Left	E	Property D:N	Front to Front	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: U.S.	Curb	Dry	
Rain	Daylight	Rear End	E	Property D:N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: County	Curb	Wet	
Clear	Dark - Lighted	Left Entering	W	Property D:N	Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte: County	Paved	Dry	
Clear	Daylight	Rollover	W	Injury	N	Other	Overturn/Roll: On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry

Clear	Daylight	Same Direction	N	Property D:N	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Dry	
Cloudy	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Wet
Clear	Daylight	Rear End	E	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Curb	Dry
Clear	Daylight	Other	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Y-Intersection Local	Curb	Dry
Rain	Daylight	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte U.S.	Paved	Wet
Clear	Daylight	Other	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte State	Curb	Dry
Clear	Dark - Lighted	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Dry
Clear	Daylight	Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte U.S.	Unpaved	Dry
Clear	Daylight	Unknown	N	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: Local	Unpaved	Dry
Clear	Dark - Lighted	Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry
Cloudy	Daylight	Other	E	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte State	Curb	Dry
Clear	Dark - Lighted	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Dry
Clear	Dark - Lighted	Unknown	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Dry
Clear	Daylight	Right/Left	E	Property D:N		Angle	Motor Vehicle On Roadway	Intersection	Y	Four-Way Inte U.S.	Paved	Dry
Clear	Daylight	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Dry
Clear	Daylight	Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: Local	Paved	Dry
Clear	Daylight	Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Paved	Dry
Fog, Smog,	Dawn	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry
Clear	Daylight	Unknown	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Dry
Clear	Dark - Lighted	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte U.S.	Paved	Dry
Rain	Dark - Lighted	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte U.S.	Paved	Wet
Clear	Daylight	Other	E	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte State	Unpaved	Dry
Clear	Dawn	Other	S	Property D:N		Angle	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte U.S.	Unpaved	Dry
Clear	Dark - Lighted	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte Local	Paved	Dry
Clear	Daylight	Same Direction	N	Property D:N		Other	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Dry
Cloudy	Daylight	Rear End	N	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Y-Intersection State	Paved	Dry
Rain	Daylight	Rollover	S	Property D:N		Front to Rear	Overturn/Roll: On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Wet
Clear	Daylight	Rear End	W	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte State	Unpaved	Dry
Clear	Dark - Lighted	Same Direction	E	Property D:N		Sideswipe, Sar	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte State	Curb	Dry
Clear	Daylight	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Dry
Rain	Daylight	Right/Through	S	Property D:N		Angle	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte State	Paved	Wet
Clear	Dark - Not Lighted	Single Vehicle	E	Property D:N		Other	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Unpaved	Wet
Clear	Daylight	Rollover	S	Injury	N	Other	Overturn/Roll: On Roadway	Non-Junction	N	Not at Interse: Interstate	Paved	Dry
Clear	Daylight	Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: State	Paved	Dry
Clear	Daylight	Unknown	N	Property D:N		Angle	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte County	Unpaved	Dry
Clear	Daylight	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte U.S.	Unpaved	Dry
Clear	Dusk	Rear End	E	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte County	Curb	Dry
Rain	Daylight	Left Entering	E	Property D:N		Front to Front	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte Local	Unpaved	Wet
Rain	Dark - Not Lighted	Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Four-Way Inte County	Paved	Wet
Clear	Dark - Lighted	Left Entering	W	Injury	N	Front to Front	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte County	Paved	Dry
Clear	Daylight	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Not at Interse: State	Unpaved	Dry
Cloudy	Daylight	Rear End	S	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Not at Interse: State	Unpaved	Dry
Cloudy	Daylight	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Y-Intersection State	Paved	Dry
Clear	Dark - Lighted	Rear End	S	Injury	N	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Unpaved	Dry
Clear	Dark - Lighted	Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte State	Unpaved	Dry
Rain	Daylight	Rear End	N	Property D:N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse: U.S.	Paved	Wet
Clear	Dark - Lighted	Rear End	E	Property D:N		Front to Rear	Motor Vehicle On Roadway	Intersection-R:N		Not at Interse: County	Curb	Dry

Crash Number	Location Mile Post	Roadway Id	Crash Date	Crash Year	On Road	Intersecting Road	First Harmful Event	Manner Of Collision	Light Condition	Weather Condition	Surface Condition	Alcohol Drugs Involver	No. of Fatalities	No. of Injured
837844150	9.863	16140000	2/3/2015	2015	HAVENDALE BLVD	SR 25	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		
846234000	9.873	16140000	1/23/2017	2017	US 27	SR 544	Motor Vehicle In Transport	Other (See Narrative)	Daylight	Clear	Dry	No		1
846267250	9.873	16140000	1/19/2017	2017	US 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Front	Dark-Lighted	Clear	Dry	No		
853427170	9.873	16140000	6/23/2016	2016	US 27	SR 544	Motor Vehicle In Transport	Angle	Daylight	Clear	Dry	No		1
860825980	9.873	16140000	7/19/2015	2015	US 27	SR 544	Motor Vehicle In Transport	Front To Front	Daylight	Clear	Dry	No		
860827210	9.873	16140000	8/3/2015	2015	US 27	SR 544	Motor Vehicle In Transport	Front To Front	Dark-Lighted	Clear	Dry	No		
860841380	9.873	16140000	11/21/2015	2015	US 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dark-Not Lighted	Rain	Wet	No		
863137410	9.873	16140000	3/1/2016	2016	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		1
863137440	9.873	16140000	3/24/2016	2016	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Daylight	Rain	Wet	No		1
864424000	9.873	16140000	6/9/2016	2016	HWY 27	SR 544	Motor Vehicle In Transport	Angle	Daylight	Rain	Wet	No		2
864427260	9.873	16140000	5/3/2016	2016	SR 25	LUCERNE PARK RD	Motor Vehicle In Transport	Angle	Dark-Lighted	Clear	Wet	No		
864433890	9.873	16140000	5/19/2016	2016	CR 544	US 27	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		4
864437080	9.873	16140000	7/25/2016	2016	SR 25	SR 544	Motor Vehicle In Transport	Angle	Daylight	Clear	Dry	No		1
864439430	9.873	16140000	6/1/2017	2017	US 27	SCENIC HWY	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
864466220	9.892	16140000	2/9/2017	2017	SR 544	US 27	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		
864467180	9.873	16140000	12/15/2016	2016	US 27	SR 544	Motor Vehicle In Transport	Angle	Dark-Lighted	Clear	Dry	No		6
865061220	9.873	16140000	12/28/2018	2018	SR 25	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		
869380930	9.901	16140000	6/13/2017	2017	SR 544	US 27	Motor Vehicle In Transport	Other (See Narrative)	Daylight	Clear	Wet	No		
869383840	9.854	16140000	4/28/2017	2017	LUCERNE PARK RD	US 27	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
869384620	9.873	16140000	7/22/2017	2017	US 27	SR 544	Fire/Explosion	Other (See Narrative)	Daylight	Rain	Wet	No		
869389470	9.873	16140000	4/24/2017	2017	US 27	SR 544	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		2
869395750	9.873	16140000	6/9/2018	2018	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
869399070	9.873	16140000	6/25/2017	2017	SR 25	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		
873315800	9.873	16140000	11/25/2017	2017	US 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		1
873322160	9.873	16140000	3/7/2018	2018	SR 25	SR 544	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
873322210	9.873	16140000	10/8/2017	2017	LUCERNE PARK RD	US 27	Motor Vehicle In Transport	Front To Front	Daylight	Cloudy	Dry	No		2
873324920	9.881	16140000	12/8/2017	2017	SR 544	US 27	Motor Vehicle In Transport	Angle	Dark-Not Lighted	Clear	Dry	No		2
873325180	9.897	16140000	10/24/2017	2017	SR 544	US 27	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		
873329430	9.873	16140000	12/21/2017	2017	US 27	SR 544	Motor Vehicle In Transport	Sideswipe, Same Direction	Dark-Lighted	Clear	Dry	No		
873332120	9.873	16140000	11/27/2017	2017	HWY 27	SR 544	Motor Vehicle In Transport	Sideswipe, Same Direction	Dark-Not Lighted	Clear	Dry	No		
873334140	9.873	16140000	1/15/2018	2018	SR 25	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		1
876655720	9.873	16140000	12/29/2017	2017	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		1
876656220	9.873	16140000	12/23/2017	2017	US 27	SCENIC HWY	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		2
876657730	9.873	16140000	2/4/2018	2018	SR 25	SR 544	Motor Vehicle In Transport	Front To Rear	Daylight	Rain	Wet	No		1
876663850	9.873	16140000	7/17/2018	2018	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		
878698280	9.873	16140000	7/20/2018	2018	SR 25	LUCERNE PARK RD	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Rain	Wet	No		
878704590	9.873	16140000	7/5/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Front To Rear	Daylight	Cloudy	Dry	Alc		1
878704890	9.868	16140000	7/3/2018	2018	SR 544	SR 25	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
878706300	9.873	16140000	7/27/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dawn	Clear	Dry	No		3
878708770	9.873	16140000	8/12/2018	2018	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Daylight	Clear	Dry	No		1
878709670	9.873	16140000	10/11/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		2
878711320	9.873	16140000	8/29/2018	2018	US 27	SR 544	Motor Vehicle In Transport	Front To Rear	Daylight	Rain	Wet	No		
878713520	9.873	16140000	9/7/2018	2018	US 27	SR 544	Motor Vehicle In Transport	Sideswipe, Same Direction	Dark-Lighted	Clear	Dry	No		
878714730	9.873	16140000	9/25/2018	2018	HWY 27	LUCERNE PARK RD	Overturn/Rollover	Other (See Narrative)	Daylight	Clear	Dry	No		1
887511790	9.873	16140000	11/11/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		
887517440	9.873	16140000	12/1/2018	2018	HWY 27	LUCERNE PARK RD	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		
887520850	9.873	16140000	12/7/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Sideswipe, Same Direction	Daylight	Clear	Dry	No		
887526510	9.873	16140000	12/26/2018	2018	HWY 27	SR 544	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear	Dry	No		

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Crash_Date	Crash_Tim	County	Crash_Street	Intersecting_Street	Offset_Dist	Offset_Dir	Crash_Typ	Vehicles	Non_Motorist	Fatalities	Injuries	Alcohol_Rc	Distraction	Drug_Relat	Estimated_Weather_C	Light_Conc	Street_Nur	Crash_Type_D	Crash_Typ	Crash_Sew	Within_Cit	Manner_of_C
2/12/2015	2:40 PM	Polk	SR-544 (LUCERNE PARK RD)	BRENTON MANOR AVE	50	West	Rear End	2	0	0	0	N	N	N	\$4,000	Clear	Daylight	Rear End	E	Property D	N	Front to Rear
12/2/2017	8:41 AM	Polk	SR-544	BRENTON MANOR AVE	0		Unknown	2	0	0	0	N	N	N	\$1,000	Clear	Daylight	Unknown		Property D	N	Angle
8/29/2018	7:00 AM	Polk	LUCERNE PARK RD (SR 544)	BRENTON MANOR AVENUE	100	West	Unknown	2	0	0	1	N	Y	N	\$13,000	Clear	Daylight	Unknown	W	Injury	N	Angle

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2021 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 3106 - SR 544 W OF HIDDEN COVE, 0.5 MI W OF SR 25/US 27

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	25000 C	E 12500	W 12500	9.00	55.30	10.00
2020	19900 C	E 10000	W 9900	9.00	53.40	8.40
2019	21000 C	E 10500	W 10500	9.00	56.00	7.60
2018	21000 C	E 10500	W 10500	9.00	54.50	9.40
2017	19500 C	E 9800	W 9700	9.00	54.50	8.80
2016	16900 C	E 8400	W 8500	9.00	53.30	10.70
2015	16100 C	E 7900	W 8200	9.00	55.70	9.30
2014	15000 S	E 7500	W 7500	9.00	55.60	9.50
2013	14800 F	E 7400	W 7400	9.00	55.90	9.50
2012	14800 C	E 7400	W 7400	9.00	55.80	9.50
2011	15900 S	E 7900	W 8000	9.00	55.70	9.10
2010	16100 F	E 8000	W 8100	9.55	56.07	9.20
2009	16300 C	E 8100	W 8200	9.36	56.35	9.20
2008	14800 C	E 7300	W 7500	9.78	55.29	10.40
2007	16300 C	E 8200	W 8100	9.66	55.30	10.30
2006	16500 C	E 8300	W 8200	9.62	55.83	9.70

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2019 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0097 - SR 25/US 27, SOUTH OF SR 600/US 17/92 HAINES CITY

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	46500 C	N 23500	S 23000	9.00	52.00	9.90
2018	48000 C	N 24000	S 24000	9.00	51.90	10.60
2017	45000 C	N 22500	S 22500	9.00	52.00	10.50
2016	47500 C	N 24000	S 23500	9.00	52.10	10.30
2015	41500 C	N 21000	S 20500	9.00	52.00	11.60
2014	42000 S	N 21000	S 21000	9.00	52.10	8.90
2013	41000 F	N 20500	S 20500	9.00	52.50	8.90
2012	41000 C	N 20500	S 20500	9.00	52.10	8.90
2011	37000 F	N 19000	S 18000	9.00	52.30	11.30
2010	37000 C	N 19000	S 18000	9.09	54.24	11.30
2009	38500 C	N 19500	S 19000	8.99	53.28	10.80
2008	39000 C	N 19000	S 20000	9.32	52.85	11.20
2007	39000 C	N 19000	S 20000	9.77	54.93	13.60
2006	39500 F	N 20000	S 19500	9.70	54.49	15.10
2005	37500 C	N 19000	S 18500	8.70	52.30	15.10
2004	37000 C	N 19500	S 17500	8.30	51.20	15.10

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2019 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0098 - SR 25/US 27, NORTH OF HUGHES ROAD LAKE HAMILTON

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2019	39500 C	N 20000	S 19500	9.00	52.00	10.30
2018	38000 C	N 19500	S 18500	9.00	51.90	10.30
2017	34000 C	N 17500	S 16500	9.00	52.00	11.60
2016	38500 C	N 19500	S 19000	9.00	52.10	11.60
2015	35000 C	N 18000	S 17000	9.00	52.00	11.60
2014	32000 C	N 16500	S 15500	9.00	52.10	11.60
2013	29500 F	N 15000	S 14500	9.00	52.50	10.60
2012	29500 C	N 15000	S 14500	9.00	52.10	10.60
2011	29000 S	N 14500	S 14500	9.00	52.30	13.90
2010	29000 F	N 14500	S 14500	9.09	54.24	13.90
2009	29000 C	N 14500	S 14500	8.99	53.28	13.90
2008	30000 C	N 15500	S 14500	9.32	52.85	16.20
2007	31000 C	N 15500	S 15500	9.77	54.93	15.20
2006	30000 C	N 15000	S 15000	9.70	54.49	16.90
2005	30000 C	N 14500	S 15500	8.70	52.30	15.10
2004	31500 C	N 16000	S 15500	8.30	51.20	15.10

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

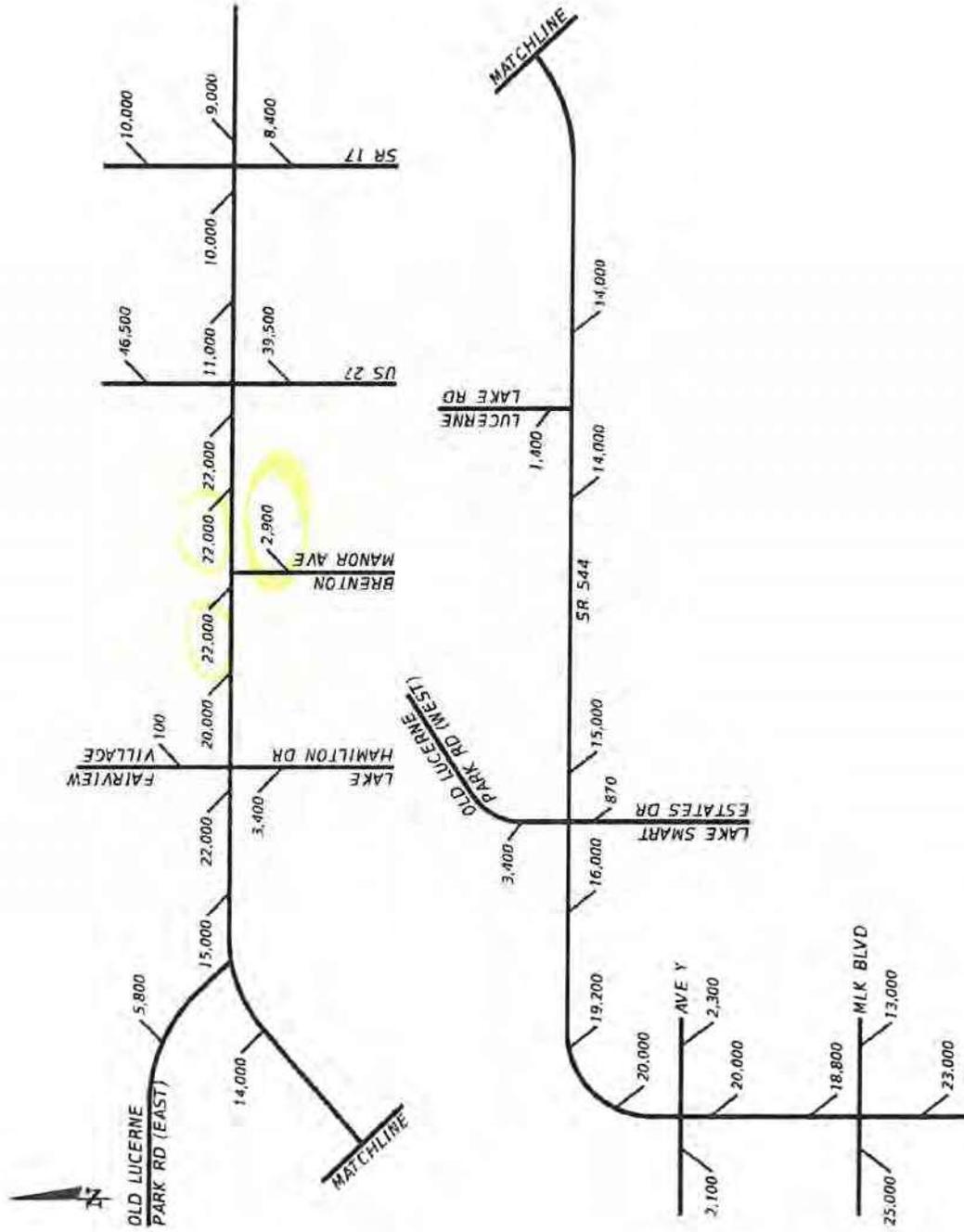


Figure 2-2: Existing (2019) AADT Volumes

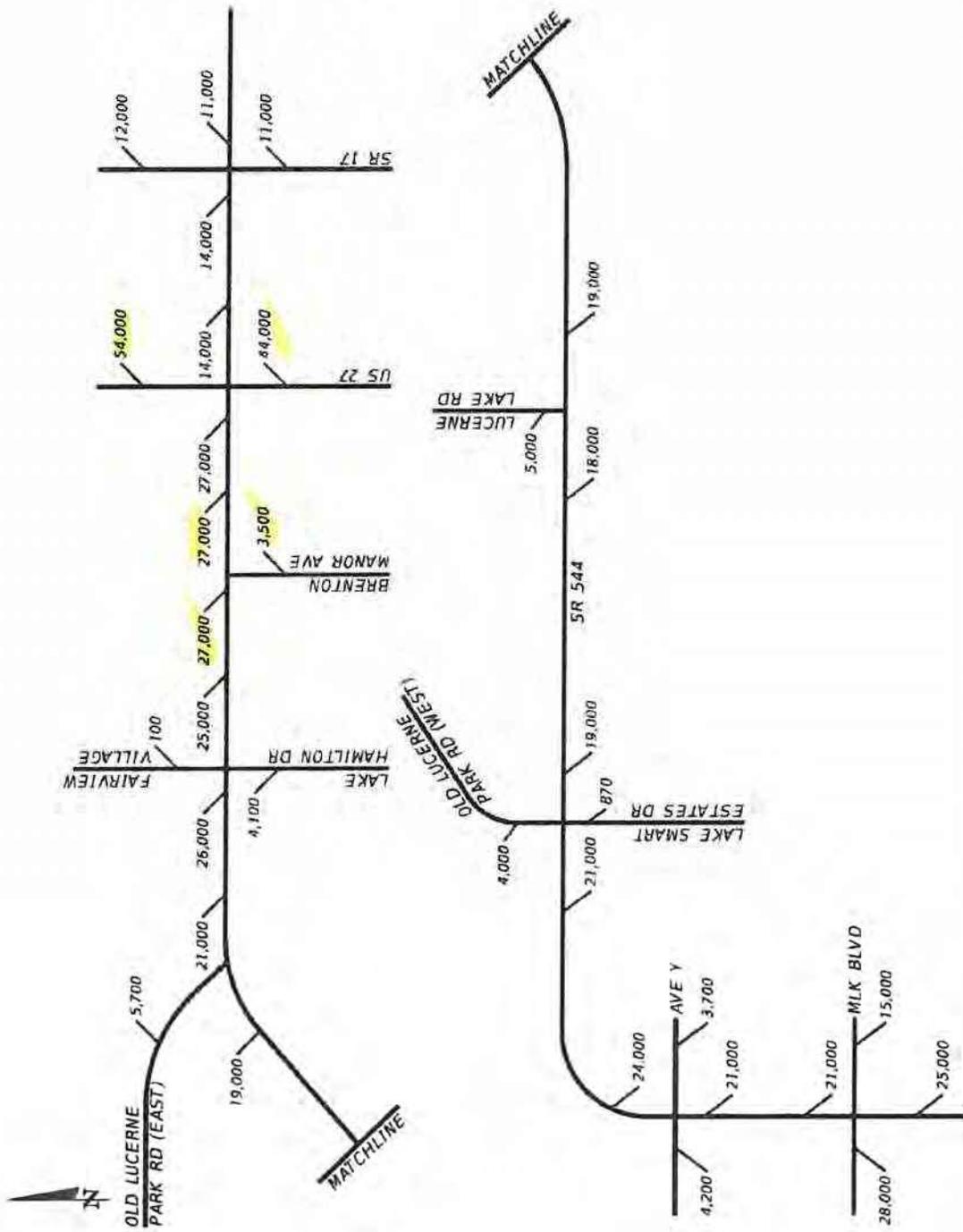


Figure 3-11: Opening Year (2025) AADT Volumes –Build Alternative No. 2

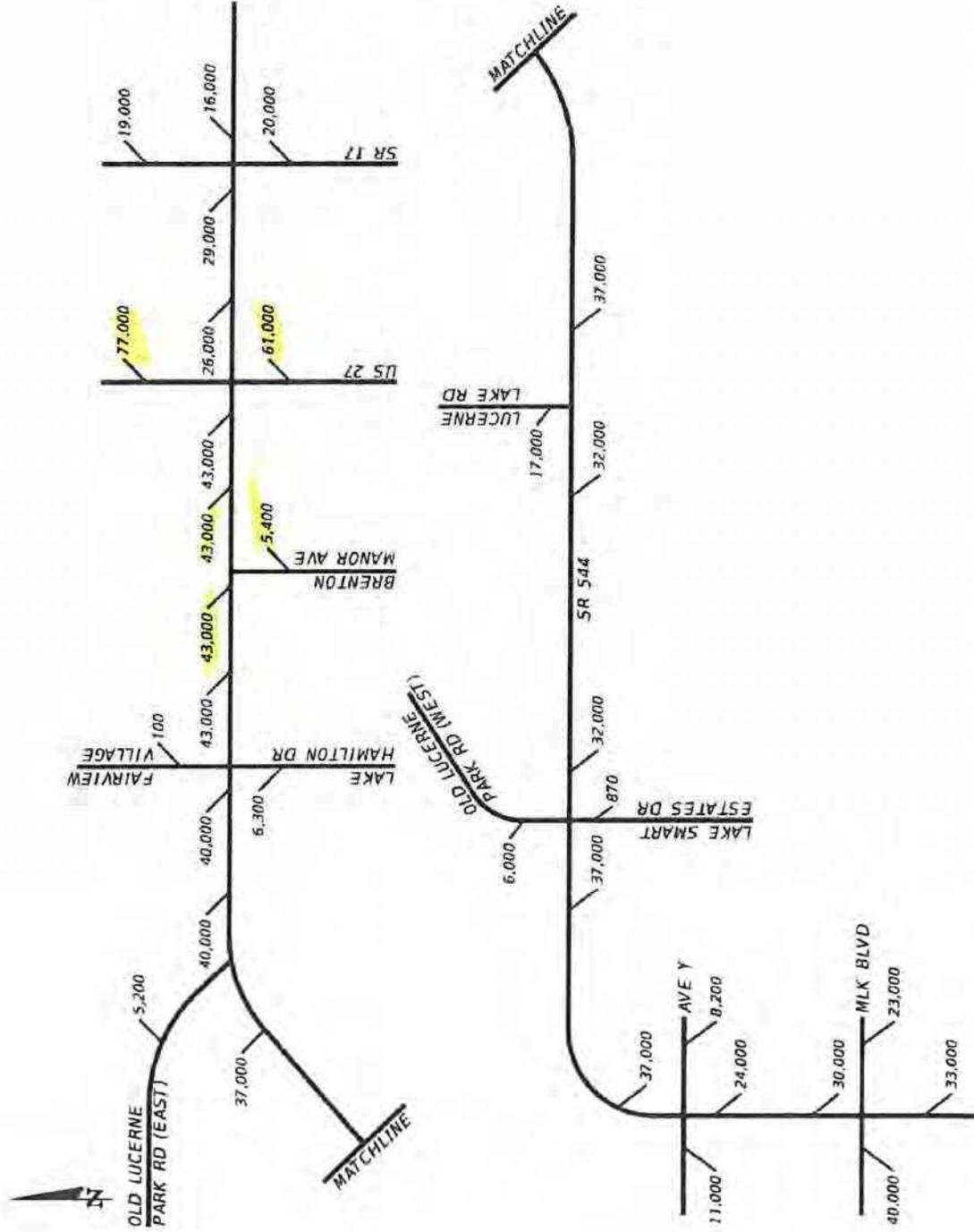


Figure 3-7: Design Year (2045) AADT Volumes – Build Alternative No. 2

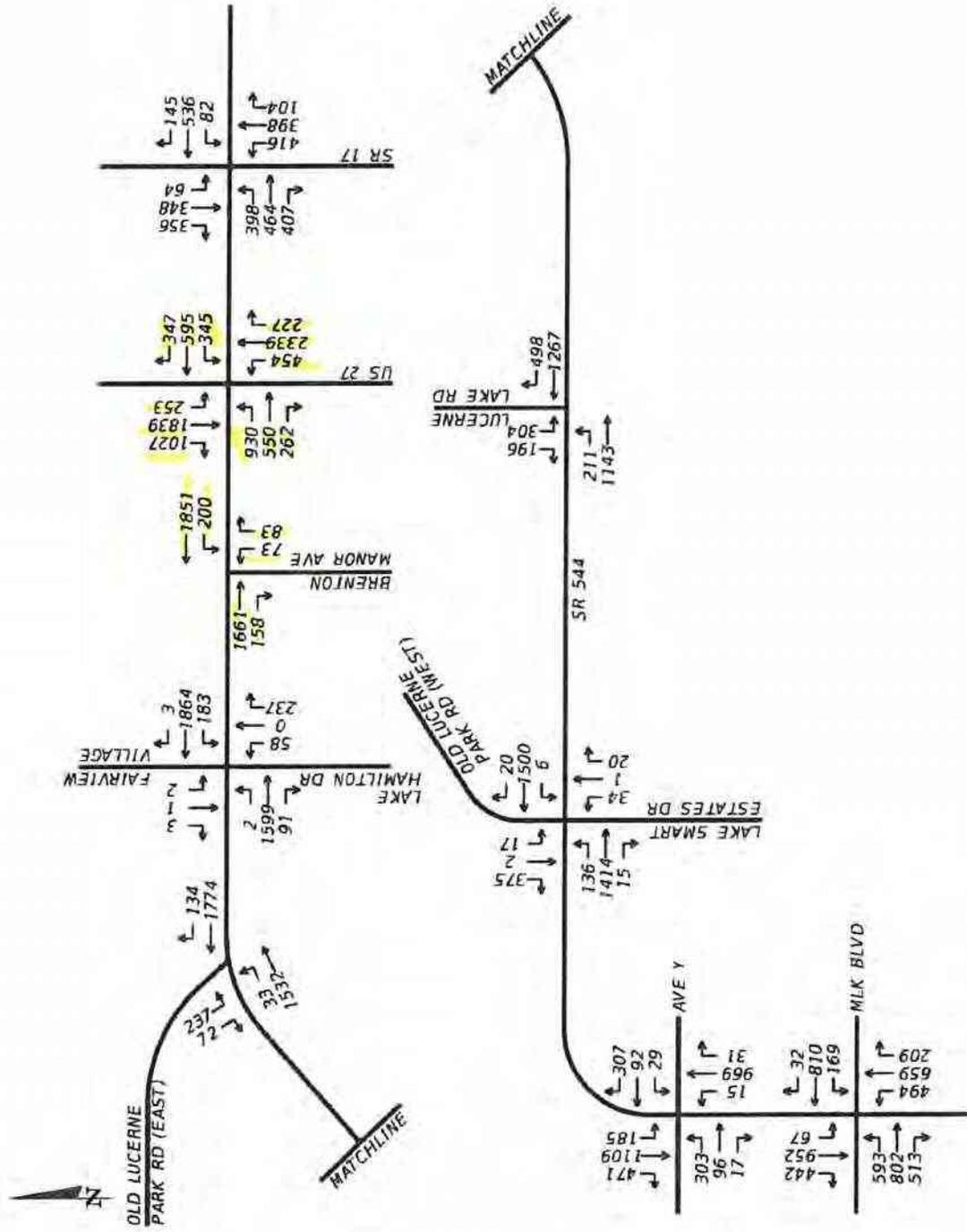


Figure 3-21: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2

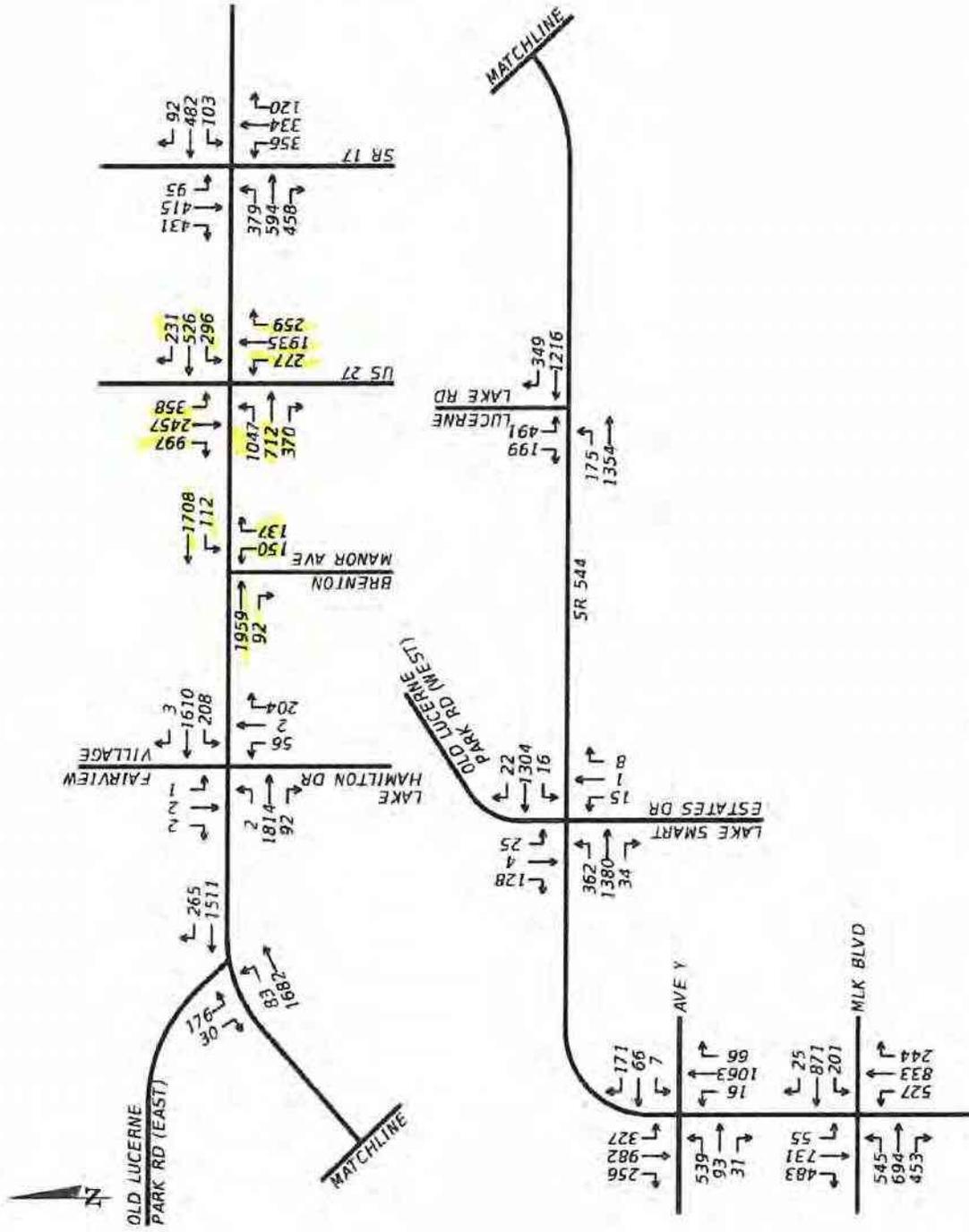


Figure 3-22: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2

**Table 3-8.** The average yearly growth rates range between 2.2% per year and 4.1% per year, with an average value equal to approximately 2.8% per year. Based on the results of this daily truck volume forecasting methodology, the following daily truck percentages (i.e., T-factors) were recommended (and approved by District One) for use in the SR 544 PD&E study:

Opening Year (2025)

- 7.4% from Martin Luther King Boulevard to US 27
- 12.9% from US 27 to SR 17

Design Year (2045)

- 6.0% from Martin Luther King Boulevard to US 27
- 10.8 % from US 27 to SR 17

Initially, it was assumed that the design year (2045) and opening year (2025) peak hour truck percentages would be approximately equal to one-half the 2045 and 2025 daily truck percentages. Consequently, the 2045 two-way peak hour volumes for the portion of SR 544 west of US 27 were multiplied by 3.0%, while the 2045 two-way peak hour volumes for the portion of SR 544 east of US 27 were multiplied by 5.4%. These preliminary 2045 peak hour truck volume estimates are provided in **Table 3-9**. Similarly, the 2025 two-way peak hour volumes for the portion of SR 544 west of US 27 were multiplied by 3.7%, while the 2025 two-way peak hour volumes for the portion of SR 544 east of US 27 were multiplied by 6.4%. These preliminary 2025 peak hour truck volume estimates are provided in **Table 3-10****Error! Reference source not found.** It should be noted that the two-way peak hour volumes were derived by multiplying the AADT volumes by a standard K-factor value equal to 9.0%.

The existing a.m. and p.m. peak hour truck volumes were obtained from the intersection turning movement counts provided by the District One Traffic Operations staff. The peak hour truck turning movement counts are provided in **Appendix M**. The a.m. and p.m. peak hours for the SR 544 study corridor were previously determined to be from 7:15 a.m. to 8:15 a.m. and 4:45 p.m. to 5:45 p.m., respectively. The differences between the design year peak hour truck volumes and the existing peak hour truck volumes were calculated along with the differences between the opening year peak hour truck volumes and the existing peak hour truck volumes. These differences are included in **Table 3-9** and **Table 3-10**. A comparison of the future year peak hour truck volumes with the 2019 peak hour truck volumes indicated that a reasonable amount of growth was estimated for the p.m. peak hour. However, many of the 2025 a.m. peak hour truck volumes were lower than the 2019 a.m. peak hour truck volumes. In addition, there were several 2045 a.m. peak hour truck volumes that were only slightly greater than the 2019 a.m. peak hour truck volumes.

A review of the existing a.m. and p.m. peak hour truck volumes indicates that, with one exception, the a.m. peak hour volumes are higher than the p.m. peak hour volumes. The ratio of the a.m. and p.m. peak hour truck volume was calculated for each location and then the overall average ratio for the study corridor was calculated. The average overall ratio was equal to 1.50. A revised estimate of the 2025 and 2045 a.m. peak hour truck volumes was obtained by multiplying the initial estimate of the 2025 and 2045 a.m. peak hour truck volumes by 1.50. The revised 2025 and 2045 a.m. peak hour truck volumes are also provided in **Table 3-9** and Table 3-10. The final recommended 2045 and 2025 peak hour truck volumes and percentages are provided in **Table 3-11** and **Table 3-12**, respectively. Based on these assumptions, the following SR 544 mainline peak hour truck percentages (i.e.,  $T_{PKHR}$ -factors) are recommended for use in the SR 544 PD&E study:

Opening Year (2025) – AM Peak Hour

- 5.6% from Martin Luther King Boulevard to US 27
- 9.6% from US 27 to SR 17

Opening Year (2025) – PM Peak Hour

- 3.7% from Martin Luther King Boulevard to US 27
- 6.4% from US 27 to SR 17

Design Year (2045) – AM Peak Hour

- 4.5% from Martin Luther King Boulevard to US 27
- 8.1 % from US 27 to SR 17

Design Year (2045) – PM Peak Hour

- 3.0% from Martin Luther King Boulevard to US 27
- 5.4 % from US 27 to SR 17

A similar approach was followed to obtain the design year (2045) and opening year (2025) truck volumes and percentages for US 27 and SR 17. The historic daily truck volumes on these two roadways were estimated by multiplying the historic Average Annual Daily Traffic (AADT) volumes by the historic daily truck percentages (i.e., the historic T-factors). The historic AADT volumes and T-factors associated with the four FDOT count stations listed below were obtained from the FDOT's Historical AADT Volume Reports for the years 2009 through 2019.

- Count Station No. 160097 – US 27 south of US 17/92 (i.e., north of SR 544)
- Count Station No. 160098 – US 27 north of Hughes Road (i.e., south of SR 544)
- Count Station No. 165049 – SR 17 north of SR 544/Lake Marion Road
- Count Station No. 160046 – SR 17 south of SR 544/Lake Marion Road

These reports are provided in **Appendix K** and the historic daily truck volume estimates are summarized in **Table 3-13**. It should be noted that only actual AADT volumes were used to obtain daily truck volume estimates (i.e., no first year or second year AADT volume estimates were used).

The design year (2045) daily truck volumes for the four FDOT count station locations were estimated by conducting growth trend analyses using the historic daily truck volumes and the FDOT's Traffic Trends software. The growth trend analyses are provided in **Appendix L**. A review of these analyses indicate the R<sup>2</sup> values associated with Count Station No. 160098 and Count Station No. 165049 are extremely low. A review of the daily truck volumes at these two locations indicates that these volumes did not experience any appreciable growth over the ten-year period. Consequently, the design year and opening year daily truck percentages for these two locations were assumed to be equal to the 2019 daily truck percentages obtained from the FDOT's 2019 AADT Volume Reports. For the other two locations, the design year (2045) daily truck volumes were divided by the design year (2045) AADT volumes that were previously estimated for Build Alternative No. 1, to obtain estimates of the 2045 daily truck percentages.

**Table 3-13: US 27 and SR 17 Historic Daily Truck Volumes and Percentages**

FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT	FDOT Count Station No.	Location	Year	AADT	T-Factor	Truck AADT
160097	US 27 South of US 17/92 (north of SR 544)	2009	38,500	10.80%	4,158	165049	SR 17 North of SR 544/Lake Marion Road	2009	10,600	5.20%	551
		2010	37,000	11.30%	4,181			2010		0	
		2011						2011		0	
		2012	41,000	8.90%	3,649			2012	8,400	7.00%	588
		2013						2013		0	
		2014						2014		0	
		2015	41,500	11.60%	4,814			2015		0	
		2016	47,500	10.30%	4,893			2016	7,500	5.90%	443
		2017	45,000	10.50%	4,725			2017	9,100	6.70%	610
		2018	48,000	10.60%	5,088			2018	9,400	7.60%	714
		2019	46,500	9.90%	4,604			2019	9,700	6.50%	631
160098	US 27 North of Hughes Road (south of SR 544)	2009	29,000	13.90%	4,031	160046	SR 17 South of SR 544/Lake Marion Road	2009	5,900	10.40%	614
		2010						2010		0	
		2011						2011		0	
		2012	29,500	10.60%	3,127			2012	5,900	10.90%	643
		2013						2013		0	
		2014	32,000	11.60%	3,712			2014		0	
		2015	35,000	11.60%	4,060			2015	5,000	12.00%	600
		2016	38,500	11.60%	4,466			2016		0	
		2017	34,000	11.60%	3,944			2017	6,600	12.00%	792
		2018	38,000	10.30%	3,914			2018	8,200	9.30%	763
		2019	39,500	10.30%	4,069			2019	8,300	9.40%	780

This resulted in the following 2045 daily truck percentages:

- US 27 south of US 17/92 (i.e., north of SR 544) – 9.9%
- US 27 north of Hughes Road (i.e., south of SR 544) – 10.3%
- SR 17 north of SR 544/Lake Marion Road – 6.5%
- SR 17 south of SR 544/Lake Marion Road – 7.0%

It should be noted that the estimated 2045 daily truck percentage for US 27 north of SR 544 is equal to the 2019 daily truck percentage. The opening year (2025) daily truck volume for SR 17 south of SR 544 was derived by interpolating between the existing (2019) and design year (2045) daily truck volumes. This resulted in a 2025 truck volume equal to approximately 900 trucks. The 2025 daily truck volume was subsequently divided by the 2025 AADT volume (i.e., 11,000 vehicles per day) to obtain a 2025 daily truck percentage equal to approximately 8.2%. The 2045 and 2025 daily truck volumes and percentages for Build Alternative No. 1 are provided in **Table 3-14**. The average yearly percentage increase in daily truck volumes over the 26-year period from 2019 to 2045 was subsequently calculated and these average yearly growth rates are also provided in **Table 3-14**. The average yearly growth rates range between 2.0% per year and 3.8% per year.

**Table 3-14: Design Year (2045) and Opening Year (2025) Daily Truck Volumes and Percentages for US 27 and SR 17**

Location	Build Alternative No. 1 (2045)			Existing (2019)			2019 - 2045 % Incr/Year	Build Alternative No. 1 (2025)		
	AADT	Truck AADT <sup>(1)</sup>	Daily Truck %	AADT	Truck AADT <sup>(1)</sup>	Daily Truck %		AADT	Truck AADT <sup>(1)</sup>	Daily Truck %
US 27 North of SR 544	77,000	7,600	9.9%	46,500	4,600	9.9%	2.5%	54,000	5,300	9.9%
US 27 South of SR 544	61,000	6,200	10.3%	39,500	4,100	10.3%	2.0%	44,000	4,500	10.3%
SR 17 North of SR 544	19,000	1,200	6.5%	10,000	600	6.5%	3.8%	12,000	800	6.5%
SR 17 South of SR 544	20,000	1,400	7.0%	8,400	800	9.4%	2.9%	11,000	900	8.2%

<sup>(1)</sup> Rounded to the nearest 100 vehicles

Initially, it was assumed that the design year (2045) and opening year (2025) peak hour truck percentages would be approximately equal to one-half the 2045 and 2025 daily truck percentages. The preliminary 2045 and 2025 peak hour truck volume estimates were compared to the existing a.m. and p.m. peak hour truck volumes obtained from the intersection turning movement counts provided by the District One Traffic Operations staff. The differences between the design year peak hour truck volumes and the existing peak hour truck volumes were calculated along with the differences between the opening year peak hour truck volumes and the existing peak hour truck volumes. These differences are included in **Table 3-15**.

A comparison of the 2025 and 2019 peak hour truck volumes indicated the 2025 truck volumes were lower than the 2019 a.m. peak hour truck volumes at two locations and were only marginally higher the 2019 a.m. peak hour truck volumes at the other two locations. In addition, a comparison of the 2045 and 2019 peak hour truck volumes indicated the 2045 truck volumes did not reflect reasonable growth over a 26-year period for both the SR 17 locations. As was the case with the SR 544 mainline, a review of the existing a.m. and p.m. peak hour truck volumes indicates the a.m. peak hour volumes are higher than the p.m. peak hour volumes for all four US 27 and SR 17 locations. Consequently, revised estimates of the 2025 and 2045 a.m. peak hour truck volumes

were obtained by multiplying the initial estimates of the 2025 and 2045 a.m. peak hour truck volumes by the individual ratios of the a.m. to p.m. peak hour truck volumes. Revised estimates of the 2025 a.m. peak hour truck volumes were calculated for all four locations, while revised estimates of the 2045 a.m. peak hour truck volumes were only calculated for the two SR 17 locations. The final estimates of the 2025 and 2045 peak hour truck volumes are also provided in **Table 3-15**.

**Table 3-15: Existing, Opening Year and Design Year Two-Way Peak Hour Truck Volumes for US 27 and SR 17**

Location	Build Alternative No. 1 (2045)			Existing AM PK Hr	Existing PM PK Hr	AM PK Hr	PM PK Hr	Existing AM/PM	Build Alternative No. 1 (2045)	
	AADT	Two-Way Pk Hr Volume	Two-Way AM/PM Pk Hr Truck Volume <sup>(1)</sup>	Two-Way Pk Hr Truck Volume	Two-Way Pk Hr Truck Volume	Truck Volume Difference	Truck Volume Difference	Pk Hr Truck Volume Ratio	Two-Way AM Pk Hr Truck Volume <sup>(2)</sup>	Two-Way PM Pk Hr Truck Volume <sup>(2)</sup>
US 27 North of SR 544	77,000	6,930	347	256	207	91	140	1.24	347	347
US 27 South of SR 544	61,000	5,490	285	199	173	86	112	1.15	285	285
SR 17 North of SR 544	19,000	1,710	56	56	22	0	34	2.55	144	56
SR 17 South of SR 544	20,000	1,800	63	37	25	26	38	1.48	93	63
Location	Build Alternative No. 1 (2025)			Existing AM PK Hr	Existing PM PK Hr	AM PK Hr	PM PK Hr	Existing AM/PM	Build Alternative No. 1 (2025)	
	AADT	Two-Way Pk Hr Volume	Two-Way AM/PM Pk Hr Truck Volume <sup>(1)</sup>	Two-Way Pk Hr Truck Volume	Two-Way Pk Hr Truck Volume	Truck Volume Difference	Truck Volume Difference	Pk Hr Truck Volume Ratio	Two-Way AM Pk Hr Truck Volume <sup>(2)</sup>	Two-Way PM Pk Hr Truck Volume <sup>(2)</sup>
US 27 North of SR 544	54,000	4,860	243	256	207	-13	36	1.24	301	243
US 27 South of SR 544	44,000	3,960	206	199	173	7	33	1.15	237	206
SR 17 North of SR 544	12,000	1,080	36	56	22	-20	14	2.55	91	36
SR 17 South of SR 544	11,000	990	41	37	25	4	16	1.48	60	41

<sup>(1)</sup> Initial estimate

<sup>(2)</sup> Final estimate

Based on these assumptions, the following peak hour truck percentages (i.e.,  $T_{PKHR}$ -factors) are recommended for use in the SR 544 PD&E study for US 27 and SR 17:

Opening Year (2025) – AM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 6.2%
- US 27 north of Hughes Road (i.e., south of SR 544) – 6.0%
- SR 17 north of SR 544/Lake Marion Road – 8.4%
- SR 17 south of SR 544/Lake Marion Road – 6.1%

Opening Year (2025) – PM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 3.3%
- SR 17 south of SR 544/Lake Marion Road – 4.1%

Design Year (2045) – AM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 8.4%
- SR 17 south of SR 544/Lake Marion Road – 5.2%

Design Year (2045) – PM Peak Hour

- US 27 south of US 17/92 (i.e., north of SR 544) – 5.0%
- US 27 north of Hughes Road (i.e., south of SR 544) – 5.2%
- SR 17 north of SR 544/Lake Marion Road – 3.3%
- SR 17 south of SR 544/Lake Marion Road – 3.5%

The final recommended 2045 and 2025 peak hour truck volumes and percentages for US 27 and SR 17 are also summarized in **Table 3-16**.

**Table 3-16: Final Design Year and Opening Year Peak Hour Truck Volumes and Percentages for US 27 and SR 17**

Location	Build Alternative No. 1 (2045)					
	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume	Two-Way PM Pk Hr Truck Percentage
US 27 North of SR 544	77,000	6,930	347	5.0%	347	5.0%
US 27 South of SR 544	61,000	5,490	285	5.2%	285	5.2%
SR 17 North of SR 544	19,000	1,710	144	8.4%	56	3.3%
SR 17 South of SR 544	20,000	1,800	93	5.2%	63	3.5%
Location	Build Alternative No. 1 (2025)					
	AADT	Two-Way Pk Hr Volume	Two-Way AM Pk Hr Truck Volume	Two-Way AM Pk Hr Truck Percentage	Two-Way PM Pk Hr Truck Volume	Two-Way PM Pk Hr Truck Percentage
US 27 North of SR 544	54,000	4,860	301	6.2%	243	5.0%
US 27 South of SR 544	44,000	3,960	237	6.0%	206	5.2%
SR 17 North of SR 544	12,000	1,080	91	8.4%	36	3.3%
SR 17 South of SR 544	11,000	990	60	6.1%	41	4.1%

The existing a.m. and p.m. peak hour truck percentages calculated from the intersection turning movement count data provided by the District One Traffic Operations staff were used to derive the future year peak hour truck percentages for the seven other cross streets (i.e., Martin Luther King Boulevard, Avenue Y, Old Lucerne Park Road (west and east ends), Lucerne Lake Road, Lake Hamilton Drive and Brenton Manor Avenue). **Table 3-17** summarizes the existing a.m. and p.m. peak hour truck percentages for these cross streets, as well as the recommended future peak hour truck percentages. These percentages were used for both the design year and opening year peak hour intersection analyses.

US 27 INTERSECTION  
DESIGN YEAR (2045) PEAK HOUR APPROACH TRUCK PERCENTAGES

AM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
930	0.05	550	0.05	262	0.05	1742	87.1	5.0%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
345	0.05	595	0.08	347	0.05	1287	82.2	6.4%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
454	0.05	2339	0.05	227	0.08	3020	157.81	5.2%
SB LT		SB TH		SB RT		SB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
253	0.08	1839	0.05	1027	0.05	3119	163.54	5.2%
PM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
1047	0.05	712	0.03	370	0.05	2129	92.21	4.3%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
296	0.05	526	0.05	231	0.05	1053	52.65	5.0%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
277	0.03	1935	0.05	259	0.05	2471	118.01	4.8%
SB LT		SB TH		SB RT		SB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
358	0.05	2457	0.05	997	0.03	3812	170.66	4.5%

BRENTON MANOR AVENUE INTERSECTION  
DESIGN YEAR (2045) PEAK HOUR APPROACH TRUCK PERCENTAGES

AM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
0	0.00	1661	0.05	158	0.05	1819	90.95	5.0%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
200	0.05	1851	0.05	0	0.00	2051	102.55	5.0%
PM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
0	0.00	1959	0.03	92	0.05	2051	63.37	3.1%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
112	0.05	1708	0.03	0	0.00	1820	56.84	3.1%

## **Appendix B**

CAP-X and SPICE Analysis Summary Sheets – US 27 Intersection

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	930	550	262	5.00%	0.00%
Westbound	0	345	595	347	6.00%	0.00%
Southbound	0	253	1839	1027	5.00%	0.00%
Northbound	0	454	2339	227	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Single Point E-W	0.66	1	4.8	Fair	Fair	Good
Displaced Left Turn	0.71	2	4.8	Fair	Fair	Good
Quadrant Roadway N-W	0.83	3	4.4	Fair	Fair	Fair
Partial Displaced Left Turn N-S	0.84	4	4.8	Fair	Fair	Good
Quadrant Roadway S-E	0.89	5	4.4	Fair	Fair	Fair
Diamond E-W	0.94	6	4.8	Fair	Fair	Good
Quadrant Roadway S-W	0.95	7	4.4	Fair	Fair	Fair
Quadrant Roadway N-E	0.98	8	4.4	Fair	Fair	Fair
Traffic Signal	1.06	9	4.8	Fair	Fair	Good
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	930	550	262	5.00%	0.00%
Westbound	0	345	595	347	6.00%	0.00%
Southbound	0	253	1839	1027	5.00%	0.00%
Northbound	0	454	2339	227	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	<b>FULL</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Quadrant Roadway	<b>S-W</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>N-E</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>S-E</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>N-W</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
Partial Displaced Left Turn	<b>N-S</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Displaced Left Turn	<b>FULL</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	<b>E-W</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Single Point	<b>E-W</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

Results for Non-roundabout Intersections															
TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1624	1.06	1.06	Fair	Fair	Good
Quadrant Roadway	<a href="#">S-W</a>			1412	0.81			1666	0.95	1317	0.73	0.95	Fair	Fair	Fair
	<a href="#">N-E</a>	1610	0.92			1378	0.79			1755	0.98	0.98	Fair	Fair	Fair
	<a href="#">S-E</a>			1484	0.85	1534	0.88			1596	0.89	0.89	Fair	Fair	Fair
	<a href="#">N-W</a>	1456	0.83					1230	0.70	1476	0.82	0.83	Fair	Fair	Fair
Partial Displaced Left Turn	<a href="#">N-S</a>	1284	0.71	1017	0.56					1477	0.84	0.84	Fair	Fair	Good
Displaced Left Turn	<a href="#">FULL</a>	1284	0.71	1017	0.56	615	0.34	897	0.50	1161	0.65	0.71	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 4 of 4

## Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				

## Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Diamond	<a href="#">E-W</a>					1611	<u>0.92</u>	1648	<u>0.94</u>					0.94	Fair	Fair	Good
Single Point	<a href="#">E-W</a>	1188	<u>0.66</u>			909	<u>0.53</u>					702	<u>0.39</u>	0.66	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	930	550	262	5.00%	0.00%
Westbound	0	345	595	347	6.00%	0.00%
Southbound	0	253	1839	1027	5.00%	0.00%
Northbound	0	454	2339	227	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	



# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	930	550	262	5.00%	0.00%
Westbound	0	345	595	347	6.00%	0.00%
Southbound	0	253	1839	1027	5.00%	0.00%
Northbound	0	454	2339	227	5.00%	0.00%
Adjustment Factor	0.80	0.95	/	0.85	/	/
Suggested	<b>0.80</b>	<b>0.95</b>	/	<b>0.85</b>	/	/
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

## Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Partial Displaced Left Turn	<u>E-W</u>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

## Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	<u>N-S</u>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Single Point	<u>N-S</u>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Partial Displaced Left Turn	<a href="#">E-W</a>					615	<u>0.34</u>	897	<u>0.50</u>	1301	<u>0.74</u>	0.74	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 4 of 4

## Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				

## Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Diamond	<a href="#">N-S</a>					1724	0.99	1460	0.83					0.99	Fair	Fair	Good
Single Point	<a href="#">N-S</a>	1577	0.88			1413	0.83					1089	0.61	0.88	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	1047	712	370	4.00%	0.00%
Westbound	0	296	526	231	5.00%	0.00%
Southbound	0	358	2457	997	5.00%	0.00%
Northbound	0	277	1935	259	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Single Point E-W	0.58	1	4.8	Fair	Fair	Good
Displaced Left Turn	0.69	2	4.8	Fair	Fair	Good
Partial Displaced Left Turn N-S	0.87	3	4.8	Fair	Fair	Good
Quadrant Roadway N-W	0.91	4	4.4	Fair	Fair	Fair
Quadrant Roadway N-E	0.99	5	4.4	Fair	Fair	Fair
Quadrant Roadway S-E	1.06	6	4.4	Fair	Fair	Fair
Traffic Signal	1.10	7	4.8	Fair	Fair	Good
Diamond E-W	1.13	8	4.8	Fair	Fair	Good
Quadrant Roadway S-W	1.16	9	4.4	Fair	Fair	Fair
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	1047	712	370	4.00%	0.00%
Westbound	0	296	526	231	5.00%	0.00%
Southbound	0	358	2457	997	5.00%	0.00%
Northbound	0	277	1935	259	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	<b>FULL</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Quadrant Roadway	<b>S-W</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>N-E</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>S-E</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
	<b>N-W</b>	/	0	0	0	/	0	0	0	/	0	0	0	/	0	0	0
Partial Displaced Left Turn	<b>N-S</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Displaced Left Turn	<b>FULL</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	<b>E-W</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1
Single Point	<b>E-W</b>	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

Results for Non-roundabout Intersections															
TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1679	<u>1.10</u>	1.10	Fair	Fair	Good
Quadrant Roadway	<a href="#">S-W</a>			1679	<u>0.96</u>			2024	<u>1.16</u>	1543	<u>0.86</u>	1.16	Fair	Fair	Fair
	<a href="#">N-E</a>	1597	<u>0.91</u>			1245	<u>0.71</u>			1775	<u>0.99</u>	0.99	Fair	Fair	Fair
	<a href="#">S-E</a>			1400	<u>0.80</u>	1737	<u>0.99</u>			1900	<u>1.06</u>	1.06	Fair	Fair	Fair
	<a href="#">N-W</a>	1586	<u>0.91</u>					1245	<u>0.71</u>	1417	<u>0.79</u>	0.91	Fair	Fair	Fair
Partial Displaced Left Turn	<a href="#">N-S</a>	1238	<u>0.69</u>	1117	<u>0.62</u>					1518	<u>0.87</u>	0.87	Fair	Fair	Good
Displaced Left Turn	<a href="#">FULL</a>	1238	<u>0.69</u>	1117	<u>0.62</u>	722	<u>0.40</u>	804	<u>0.45</u>	1242	<u>0.69</u>	0.69	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 4 of 4

## Results for Roundabouts

TYPE OF ROUNDABOUT	Zone 1 (North)			Zone 3 (East)			Zone 2 (South)			Zone 4 (West)			Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3	Lane 1	Lane 2	Lane 3				

## Results for Interchanges

TYPE OF INTERCHANGE	Sheet	Zone 1 (Rt Mrg)		Zone 2 (Lt Mrg)		Zone 3 (Ctr. 1)		Zone 4 (Ctr. 2)		Zone 5 (Lt Mrg)		Zone 6 (Rt Mrg)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Diamond	<a href="#">E-W</a>					1424	0.81	1983	1.13					1.13	Fair	Fair	Good
Single Point	<a href="#">E-W</a>	1037	0.58			950	0.56					878	0.49	0.58	Fair	Fair	Good

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	1047	712	370	4.00%	0.00%
Westbound	0	296	526	231	5.00%	0.00%
Southbound	0	358	2457	997	5.00%	0.00%
Northbound	0	277	1935	259	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	



# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/US 27
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	4
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	1047	712	370	4.00%	0.00%
Westbound	0	296	526	231	5.00%	0.00%
Southbound	0	358	2457	997	5.00%	0.00%
Northbound	0	277	1935	259	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

## Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Partial Displaced Left Turn	E-W	/	2	3	1	/	2	3	2	/	3	2	1	/	2	2	1

## Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Partial Displaced Left Turn	<a href="#">E-W</a>					722	<u>0.40</u>	804	<u>0.45</u>	1395	<u>0.80</u>	0.80	Fair	Fair	Good



**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

<b>Project Name:</b>	SR 544 PD&E Study from MLK Blvd to SR 17	<b>Intersection Type</b>	At-Grade Intersection
<b>Intersection:</b>	SR 544/US 27	<b>Opening Year</b>	2025
<b>Agency:</b>	FDOT District One	<b>Design Year</b>	2045
<b>Project Reference:</b>	FPID No.: 440273-1-22-01	<b>Facility Type</b>	On Urban and Suburban Arterial
<b>City:</b>	Polk County	<b>Number of Legs</b>	4-leg
<b>State:</b>	Florida	<b>1-Way/2-Way</b>	2-way Intersecting 2-way
<b>Date:</b>	3/23/2023	<b># of Major Street Lanes (both directions)</b>	6 or more
<b>Analyst:</b>	AIM Engineering & Surveying, Inc.	<b>Major Street Approach Speed</b>	55+ mph

**Crash Prediction Summary**

**SSI Score**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	21.82	34.98	594.68	2	No	Uncalibrated SPF	<u>5</u>	<u>0</u>	1
	Fatal & Injury	6.63	10.21	176.59						
Displaced Left Turn (DLT)	Total	19.20	30.78	523.32	1	N/A	CMF	<u>0</u>	<u>0</u>	2
	Fatal & Injury	5.83	8.98	155.40						

**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type:	Ramp Terminal Intersection
Intersection:	SR 544/US 27	Opening Year:	2025
Agency:	FDOT District One	Design Year:	2045
Project Reference:	FPID No.: 440273-1-22-01	Area Type:	Urban
City:	Polk County		
State:	Florida		
Date:	3/23/2023		
Analyst:	AIM Engineering & Surveying, Inc.		

**Crash Prediction Summary**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Rank	AADT Within range?	SSI Score		
							Open	Design	Rank
Signalized Diamond	Total	13.81	24.62	403.97	2	Yes	46	17	2
	Fatal & Injury	5.14	10.29	160.64					
Single-Point Diamond	Total	12.93	31.65	456.35	1	Yes	77	57	1
	Fatal & Injury	3.26	7.86	113.83					

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**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type	At-Grade Intersection
Intersection:	SR 544/US 27 (NWQR Alternative)	Opening Year	2025
Agency:	FDOT District One	Design Year	2045
Project Reference:	FPID No.: 440273-1-22-01	Facility Type	On Urban and Suburban Arterial
City:	Polk County	Number of Legs	4-leg
State:	Florida	1-Way/2-Way	2-way Intersecting 2-way
Date:	3/23/2023	# of Major Street Lanes (both directions)	6 or more
Analyst:	AIM Engineering & Surveying, Inc.	Major Street Approach Speed	55+ mph

**Crash Prediction Summary**

**SSI Score**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	17.04	32.86	520.61	1	No	Uncalibrated SPF	15	1	1
	Fatal & Injury	5.31	9.65	156.59						

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## SR 544/US 27 INTERSECTION (NWQR ALTERNATIVE) CRASH ADJUSTMENTS

The current SPICE software overestimates the number of crashes that are expected to occur at an intersection of two, two-way roadways where left-turn movements are prohibited on all intersection approaches because there are no FHWA-approved Crash Modification Factors (CMF's) for this type of intersection control strategy. The number of total crashes estimated to occur at the US 27/SR 544 signalized intersection (assuming left-turn movements can be made on all four approaches) was multiplied by a value equal to 0.6116 and used as an estimate of the number of total crashes that would be expected to occur at this intersection if no left-turn movements were allowed. Similarly, the number of fatal and injury crashes estimated to occur at the US 27/SR 544 signalized intersection (assuming left-turn movements can be made on all four approaches) was multiplied by a value equal to 0.7511 and used as an estimate of the number of fatal and injury crashes that would be expected to occur at this intersection if no left-turn movements were allowed. These factors represent adjusted Type A Median U-Turn (MUT) CMF's that were derived based on recent MUT safety research that was funded by FDOT and conducted by the Department of Civil, Environmental and Construction Engineering at the University of Central Florida. These specific values were derived by Kittleson & Associates and used previously in the ICE analysis conducted for the SR 31/SR 80 intersection in Lee County, Florida.

**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type	At-Grade Intersection
Intersection:	US 27/NWQR	Opening Year	2025
Agency:	FDOT District One	Design Year	2045
Project Reference:	FPID No.: 440273-1-22-01	Facility Type	On Urban and Suburban Arterial
City:	Polk County	Number of Legs	3-leg
State:	Florida	1-Way/2-Way	2-way Intersecting 2-way
Date:	3/23/2023	# of Major Street Lanes (both directions)	6 or more
Analyst:	AIM Engineering & Surveying, Inc.	Major Street Approach Speed	55+ mph

**Crash Prediction Summary**

**SSI Score**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	6.59	8.60	160.09	1	No	Uncalibrated SPF	22	5	1
	Fatal & Injury	2.76	3.86	69.69						

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**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

**Project Information**

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type	At-Grade Intersection
Intersection:	SR 544/Brenton Manor Ave (NWQR Alternative)	Opening Year	2025
Agency:	FDOT District One	Design Year	2045
Project Reference:	FPID No.: 440273-1-22-01	Facility Type	On Urban and Suburban Arterial
City:	Polk County	Number of Legs	4-leg
State:	Florida	1-Way/2-Way	2-way Intersecting 2-way
Date:	3/23/2023	# of Major Street Lanes (both directions)	5 or fewer
Analyst:	AIM Engineering & Surveying, Inc.	Major Street Approach Speed	Less than 55 mph

**Crash Prediction Summary**

**SSI Score**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	7.98	14.99	239.58	1	Yes	Calibrated SPF	70	46	1
	Fatal & Injury	2.69	5.22	82.40						

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## **Appendix C**

### Preliminary Traffic Signal Warrant Evaluation

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
TRAFFIC ENGINEERING  
October 2020

City: **Winter Haven**  
County: **16 - Polk**  
District: **One**

Engineer: **AIM Engineering**  
Date: **March 5, 2023**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
Minor Street: **Brenton Manor Avenue** Lanes: **1** Minor Approach Speed: **25**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph?  Yes  No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"  MAY  70%  100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.  Yes  No

Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).  Yes  No

Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.  Yes  No

**Condition A - Minimum Vehicular Volume**

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:  Yes  No  
100% Satisfied:  Yes  No  
80% Satisfied:  Yes  No  
70% Satisfied:  Yes  No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

<sup>a</sup> Basic Minimum hourly volume  
<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures  
<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7 am - 8 am	8 am - 9 am	12 pm - 1 pm	1 pm - 2 pm	2 pm - 3 pm	3 pm - 4 pm	4 pm - 5 pm	5 pm - 6 pm
Major	1,774	1,496	1,270	1,397	1,429	1,516	1,611	1,746
Minor	117	99	121	120	293	129	57	109

Existing Volumes

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

**Condition B - Interruption of Continuous Traffic**

Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.

Applicable:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
100% Satisfied:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
80% Satisfied:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
70% Satisfied:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

<sup>a</sup> Basic Minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Eight Highest Hours								
Street	7 am - 8 am	8 am - 9 am	12 pm - 1 pm	1 pm - 2 pm	2 pm - 3 pm	3 pm - 4 pm	4 pm - 5 pm	5 pm - 6 pm
Major	1,774	1,496	1,270	1,397	1,429	1,516	1,611	1,746
Minor	117	99	121	120	293	129	57	109

Existing Volumes

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
TRAFFIC ENGINEERING  
October 2020

City: **Winter Haven**  
County: **16 - Polk**  
District: **One**

Engineer: **AIM Engineering**  
Date: **March 5, 2023**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
Minor Street: **Brenton Manor Ave** Lanes: **1** Minor Approach Speed: **25**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph?  Yes  No
  2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 or 2 above is answered "Yes"  MAY  70%  100%

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

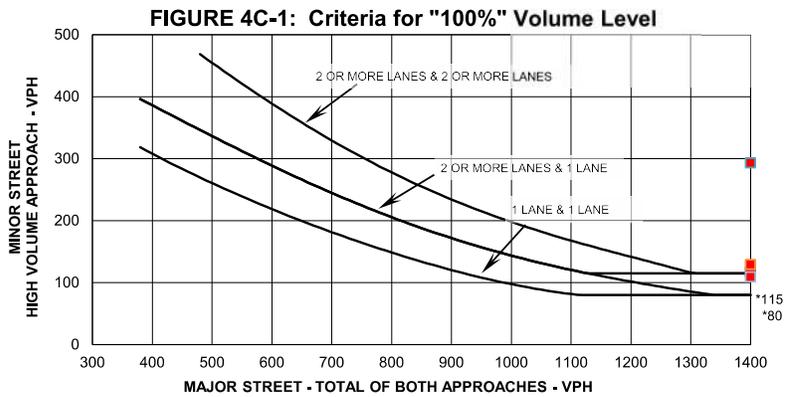
*If all four points lie above the appropriate line, then the warrant is satisfied.*

Applicable:  Yes  No  
Satisfied:  Yes  No

**100% Volume Level**

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 am - 8 am	1774	117
3 pm - 4 pm	1429	293
4 pm - 5 pm	1516	129
5 pm - 6 pm	1746	109

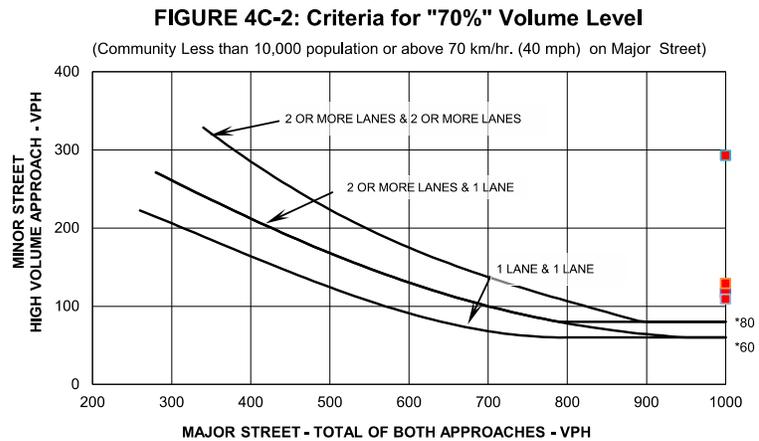
Plot four volume combinations on the applicable figure below.



\* Note: 115 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 80 mph applies as the lower threshold volume threshold for a minor street approach with one lane.

**70% Volume Level**

Four Highest Hours	Volumes	
	Major Street	Minor Street
7 am - 8 am	1774	117
3 pm - 4 pm	1429	293
4 pm - 5 pm	1516	129
5 pm - 6 pm	1746	109



\* Note: 80 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 60 ph. applies as the lower threshold volume threshold for a minor street approach with one lane.

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
TRAFFIC ENGINEERING  
October 2020

City: **Winter Haven**  
County: **Polk**  
District: **FDOT District One**

Engineer: **AIM Engineering & Surveying, Inc.**  
Date: **March 5, 2023**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
Minor Street: **Brenton Manor Avenue** Lanes: **1** Minor Approach Speed: **25**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph?  Yes  No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 or 2 above is answered "Yes"  MAY  70%  100%

**WARRANT 3 - PEAK HOUR**

If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied. Applicable:  Yes  No  
Satisfied:  Yes  No

Unusual condition justifying use of warrant:

-

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
AM Pk Hr	1774	117

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
AM Pk Hr	1242	82

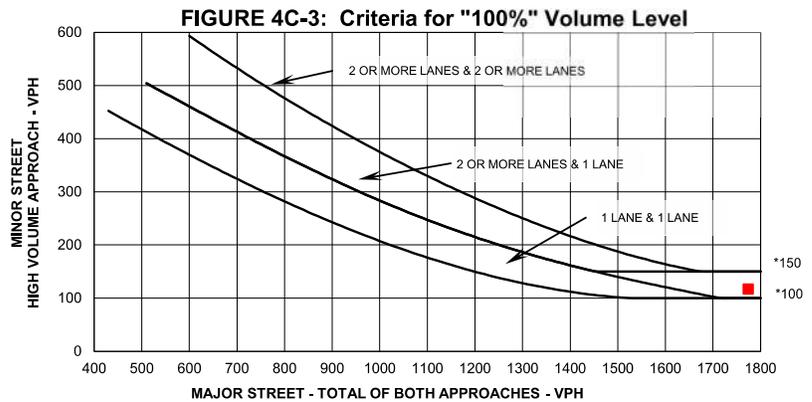
**Criteria**

1. Delay on Minor Approach (vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*	8.2	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

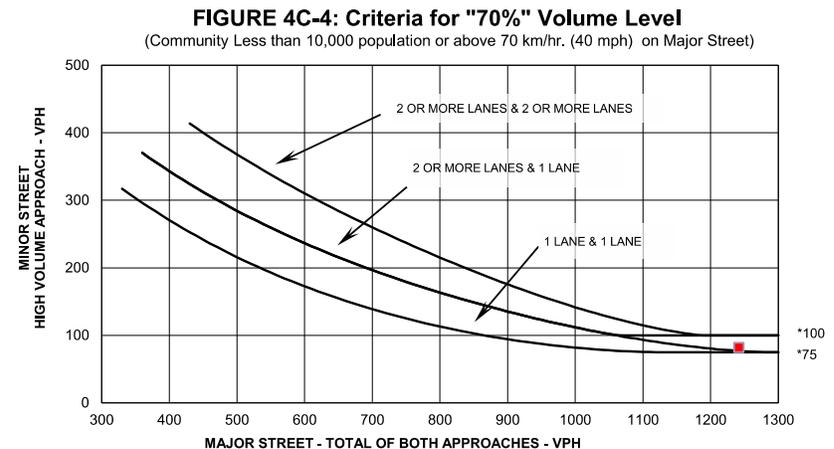
2. Volume on Minor Approach One-Direction (vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*	117	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

3. Total Intersection Entering Volume (vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1,891	
Fulfilled?:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 ph. applies as the lower threshold volume for a minor street approach with two or more lanes and 75 phi applies as the lower threshold volume threshold for a minor street approach with one lane.

## **Appendix D**

CAP-X and SPICE Analysis Summary Sheets – Brenton Manor Avenue  
Intersection

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Brenton Manor Avenue
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	S

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	0	1661	158	5.00%	0.00%
Westbound	0	200	1851	0	5.00%	0.00%
Southbound	0	0	0	0	0.00%	0.00%
Northbound	0	73	0	83	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.67	1	4.8	Fair	Fair	Good
Continuous Green T S	0.67	1	3.0	Poor	Poor	Good
1NS X 2EW	0.88	3	5.6	Fair	Good	Good
2 X 2	0.88	3	5.6	Fair	Good	Good
All-Way Stop Control	2.82	5	6.7	Good	Good	Good
Two-Way Stop Control E-W	205.41	6	3.7	Poor	Fair	Good
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Brenton Manor Avenue
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	0	1661	158	5.00%	0.00%
Westbound	0	200	1851	0	5.00%	0.00%
Southbound	0	0	0	0	0.00%	0.00%
Northbound	0	73	0	83	5.00%	0.00%
Adjustment Factor	0.80	0.95	/	0.85	/	/
Suggested	<b>0.80</b>	<b>0.95</b>	/	<b>0.85</b>	/	/
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone			<b>C3C-Suburban Commercial</b>			
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

## Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
Two-Way Stop Control	E-W	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
All-Way Stop Control	FULL	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
Continuous Green T	S	/	1	/	1	/	/	/	/	/	/	2	1	/	1	2	/

## Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>	/	/	/	/	/	/	/	/	1178	<u>0.67</u>	0.67	Fair	Fair	Good
Two-Way Stop Control	<a href="#">E-W</a>	/	/	/	/	/	/	/	/	--	<u>205.41</u>	205.41	Poor	Fair	Good
All-Way Stop Control	<a href="#">FULL</a>	/	/	/	/	/	/	/	/	4228	<u>2.82</u>	2.82	Good	Good	Good
Continuous Green T	<a href="#">S</a>	/	/	/	/	/	/	/	/	1174	<u>0.67</u>	0.67	Poor	Poor	Good



# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Brenton Manor Avenue
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	S

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	0	1959	92	3.00%	0.00%
Westbound	0	112	1708	0	3.00%	0.00%
Southbound	0	0	0	0	0.00%	0.00%
Northbound	0	150	0	137	5.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Continuous Green T S	0.74	1	3.0	Poor	Poor	Good
Traffic Signal	0.75	2	4.8	Fair	Fair	Good
2 X 2	0.90	3	5.6	Fair	Good	Good
1NS X 2EW	1.22	4	5.6	Fair	Good	Good
All-Way Stop Control	2.86	5	6.7	Good	Good	Good
Two-Way Stop Control E-W	173.56	6	3.7	Poor	Fair	Good
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# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Brenton Manor Avenue
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	North-South

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	0	1959	92	3.00%	0.00%
Westbound	0	112	1708	0	3.00%	0.00%
Southbound	0	0	0	0	0.00%	0.00%
Northbound	0	150	0	137	5.00%	0.00%
Adjustment Factor	0.80	0.95	/	0.85	/	/
Suggested	<b>0.80</b>	<b>0.95</b>	/	<b>0.85</b>	/	/
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

## Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
Two-Way Stop Control	E-W	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
All-Way Stop Control	FULL	/	1	0	1	/	0	0	0	/	0	2	1	/	1	2	0
Continuous Green T	S	/	1	/	1	/	/	/	/	/	/	2	1	/	1	2	/

## Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>	/	/	/	/	/	/	/	/	1305	<u>0.75</u>	0.75	Fair	Fair	Good
Two-Way Stop Control	<a href="#">E-W</a>	/	/	/	/	/	/	/	/	--	<u>173.56</u>	173.56	Poor	Fair	Good
All-Way Stop Control	<a href="#">FULL</a>	/	/	/	/	/	/	/	/	4289	<u>2.86</u>	2.86	Good	Good	Good
Continuous Green T	<a href="#">S</a>	/	/	/	/	/	/	/	/	1296	<u>0.74</u>	0.74	Poor	Poor	Good



**Florida Department of Transportation  
Safety Performance for Intersection Control Evaluation Tool**

**Results**

*Summary of crash prediction results for each alternative*

Project Information										
Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17				Intersection Type			At-Grade Intersection		
Intersection:	SR 544/US 27				Opening Year			2025		
Agency:	FDOT District One				Design Year			2045		
Project Reference:	FPID No.: 440273-1-22-01				Facility Type			On Urban and Suburban Arterial		
City:	Polk County				Number of Legs			3-leg		
State:	Florida				1-Way/2-Way			2-way Intersecting 2-way		
Date:	3/23/2023				# of Major Street Lanes (both directions)			5 or fewer		
Analyst:	AIM Engineering & Surveying, Inc.				Major Street Approach Speed			Less than 55 mph		
Crash Prediction Summary								SSI Score		
Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	Opening Year	Design Year	Rank
Traffic Signal	Total	7.32	13.54	217.41	5	Yes	Calibrated SPF	<a href="#">78</a>	<a href="#">64</a>	3
	Fatal & Injury	2.58	4.46	73.60						
Minor Road Stop	Total	2.94	5.71	89.72	2	Yes	Calibrated SPF	<a href="#">62</a>	<a href="#">43</a>	5
	Fatal & Injury	1.01	1.83	29.60						
All Way Stop	Total	2.96	4.34	76.76	1	No	Uncalibrated SPF	<a href="#">91</a>	<a href="#">85</a>	1
	Fatal & Injury	0.81	1.16	20.78						
2-lane Roundabout	Total	9.48	15.78	264.64	3	No	Uncalibrated SPF	<a href="#">82</a>	<a href="#">72</a>	2
	Fatal & Injury	1.78	3.25	52.50						
Continuous Green-T Intersection	Total	7.03	13.00	208.71	4	N/A	CMF	<a href="#">78</a>	<a href="#">64</a>	4
	Fatal & Injury	2.19	3.79	62.56						

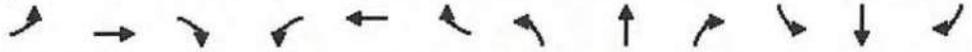
## **Appendix E**

SYNCHRO Analysis Summary Sheets for Partial Displaced and Fully Displaced  
Left-Turn Intersection Alternatives

Partial Displaced Left-Turn Intersection Alternative (North/South Only)

Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

03/17/2021

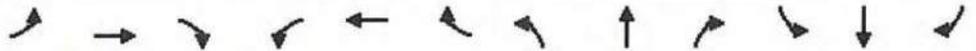


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑	↑↑		↑↑	↑↑			↑↑↑	↑		↑↑↑	↑↑
Traffic Volume (vph)	930	550	0	345	595	0	0	2339	227	0	1839	1027
Future Volume (vph)	930	550	0	345	595	0	0	2339	227	0	1839	1027
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		225	600		400	800		850	775		900
Storage Lanes	3		0	2		0	0		1	0		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.88
Frts									0.850			0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	4848	3438	0	3335	3343	0	0	4940	1495	0	4940	2707
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	4848	3438	0	3335	3343	0	0	4940	1495	0	4940	2707
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60			60	
Link Distance (ft)		196			248			416			380	
Travel Time (s)		3.0			3.8			4.7			4.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	8%	5%	5%	5%	8%	8%	5%	5%
Adj. Flow (vph)	979	579	0	363	626	0	0	2462	239	0	1936	1081
Shared Lane Traffic (%)												
Lane Group Flow (vph)	979	579	0	363	626	0	0	2462	239	0	1936	1081
Turn Type	Prot	NA		Prot	NA			NA	pm+ov		NA	Prot
Protected Phases	7	4		3	8			2	3		6	6
Permitted Phases									2			
Detector Phase	7	4		3	8			2	3		6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0	24.0		24.0	24.0
Total Split (s)	33.0	31.0		33.0	31.0			76.0	33.0		76.0	76.0
Total Split (%)	23.6%	22.1%		23.6%	22.1%			54.3%	23.6%		54.3%	54.3%
Yellow Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
All-Red Time (s)	1.5	1.5		1.5	1.5			1.5	1.5		1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Recall Mode	None	None		None	None			C-Max	None		C-Max	C-Max
Act Effct Green (s)	27.0	31.4		20.6	25.0			70.0	96.6		70.0	70.0
Actuated g/C Ratio	0.19	0.22		0.15	0.18			0.50	0.69		0.50	0.50
v/c Ratio	1.05	0.75		0.74	1.05			1.00	0.23		0.78	0.80
Control Delay	69.7	27.8		38.7	79.4			50.7	8.2		31.1	33.7
Queue Delay	20.3	2.6		0.9	15.8			17.5	0.4		6.3	79.9
Total Delay	90.1	30.3		39.6	95.3			68.2	8.6		37.4	113.6
LOS	F	C		D	F			E	A		D	F
Approach Delay		67.9			74.9			63.0			64.7	
Approach LOS		E			E			E			E	
Stops (vph)	832	484		138	525			2105	77		1467	836

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT (Partial DLT - North/South Only)

Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

03/17/2021

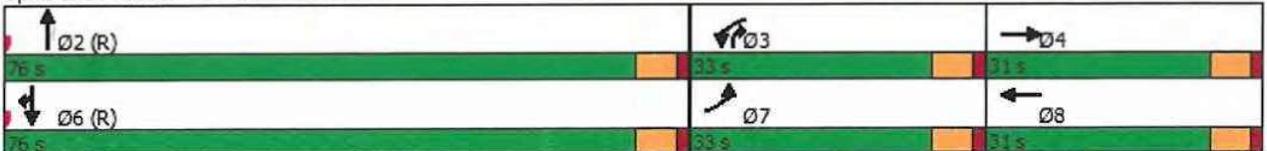


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Fuel Used(gal)	25	10		5	17			77	3		49	28
CO Emissions (g/hr)	1729	687		349	1196			5381	188		3440	1985
NOx Emissions (g/hr)	336	134		68	233			1047	37		669	386
VOC Emissions (g/hr)	401	159		81	277			1247	44		797	460
Dilemma Vehicles (#)	0	17		0	19			80	0		66	0
Queue Length 50th (ft)	~324	261		53	~326			799	74		518	455
Queue Length 95th (ft)	#403	#385		59	#453			#936	94		582	560
Internal Link Dist (ft)		116			168			336			300	
Turn Bay Length (ft)	500			600					850			900
Base Capacity (vph)	934	770		643	596			2470	1099		2470	1353
Starvation Cap Reductn	23	98		100	23			126	488		490	210
Spillback Cap Reductn	50	0		0	0			0	259		0	1263
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	1.11	0.86		0.67	1.09			1.05	0.39		0.98	12.01

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 120  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 65.9  
 Intersection LOS: E  
 Intersection Capacity Utilization 94.3%  
 ICU Level of Service F  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

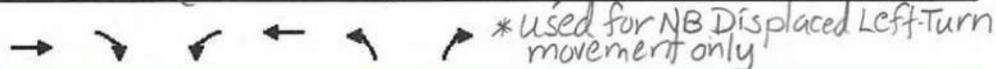
Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

54: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/19/2021



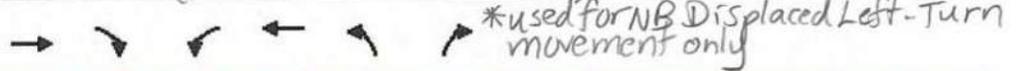
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	TTTT	T		TT	TTT	
Traffic Volume (vph)	1480	262	0	1622	454	0
Future Volume (vph)	1480	262	0	1622	454	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.81	1.00	1.00	0.95	0.97	1.00
Fr't		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	7329	1538	0	3343	3335	0
Flt Permitted					0.950	
Satd. Flow (perm)	7329	1538	0	3343	3335	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		203				
Link Speed (mph)	45			30	30	
Link Distance (ft)	191			196	312	
Travel Time (s)	2.9			4.5	7.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	0%	8%	5%	0%
Adj. Flow (vph)	1558	276	0	1707	478	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1558	276	0	1707	478	0
Turn Type	NA	Free		NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		Free				
Minimum Split (s)	24.0			24.1	24.0	
Total Split (s)	107.0			107.0	33.0	
Total Split (%)	76.4%			76.4%	23.6%	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	101.0	140.0		101.0	27.0	
Actuated g/C Ratio	0.72	1.00		0.72	0.19	
v/c Ratio	0.29	0.18		0.71	0.74	
Control Delay	7.1	0.3		22.0	13.8	
Queue Delay	2.1	0.0		48.6	0.0	
Total Delay	9.2	0.3		70.6	13.8	
LOS	A	A		E	B	
Approach Delay	7.8			70.6	13.8	
Approach LOS	A			E	B	
Stops (vph)	486	0		1161	129	
Fuel Used(gal)	17	2		16	4	
CO Emissions (g/hr)	1174	108		1130	277	
NOx Emissions (g/hr)	228	21		220	54	
VOC Emissions (g/hr)	272	25		262	64	
Dilemma Vehicles (#)	53	0		0	0	
Queue Length 50th (ft)	112	0		623	236	
Queue Length 95th (ft)	125	0		m654	297	

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT (Partial DLT-North/South Only)

Lanes, Volumes, Timings

54: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/19/2021

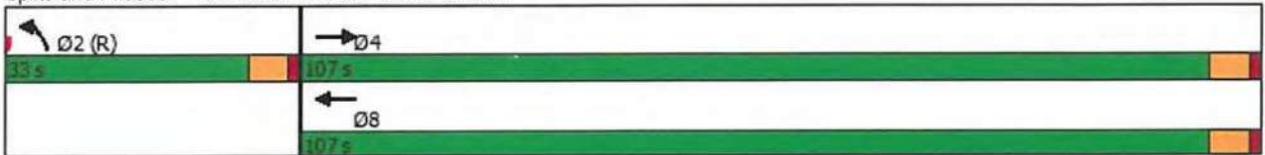


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	111			116	232	
Turn Bay Length (ft)						
Base Capacity (vph)	5287	1538		2411	643	
Starvation Cap Reductn	0	0		1101	0	
Spillback Cap Reductn	3515	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.88	0.18		1.30	0.74	

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle:	70
Control Type:	Pretimed
Maximum v/c Ratio:	0.74
Intersection Signal Delay:	35.2
Intersection LOS:	D
Intersection Capacity Utilization:	67.8%
ICU Level of Service:	C
Analysis Period (min)	15
m	Volume for 95th percentile queue is metered by upstream signal.

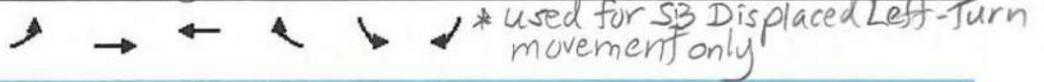
Splits and Phases: 54: US 27 NB Left Turn & SR 544



Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/19/2021



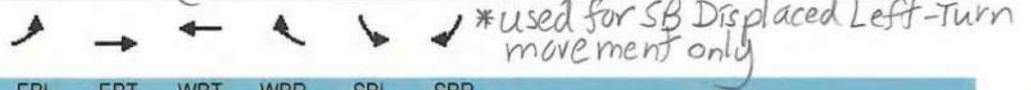
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑	↑	↑↑	
Traffic Volume (vph)	0	777	940	347	253	0
Future Volume (vph)	0	777	940	347	253	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.86	1.00	0.97	1.00
Fr't				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	3438	6052	1538	3242	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	3438	6052	1538	3242	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				358		
Link Speed (mph)		30	45		30	
Link Distance (ft)		248	114		336	
Travel Time (s)		5.6	1.7		7.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	8%	5%	8%	0%
Adj. Flow (vph)	0	818	989	365	266	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	818	989	365	266	0
Turn Type		NA	NA	Free	Prot	
Protected Phases		4	8		6	
Permitted Phases				Free		
Minimum Split (s)		24.0	24.0		24.0	
Total Split (s)		107.0	107.0		33.0	
Total Split (%)		76.4%	76.4%		23.6%	
Yellow Time (s)		4.5	4.5		4.5	
All-Red Time (s)		1.5	1.5		1.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)		101.0	101.0	140.0	27.0	
Actuated g/C Ratio		0.72	0.72	1.00	0.19	
v/c Ratio		0.33	0.23	0.24	0.43	
Control Delay		7.5	6.6	0.4	8.8	
Queue Delay		1.0	0.5	0.0	0.0	
Total Delay		8.5	7.1	0.4	8.8	
LOS		A	A	A	A	
Approach Delay		8.5	5.3		8.8	
Approach LOS		A	A		A	
Stops (vph)		192	292	0	72	
Fuel Used(gal)		4	13	3	2	
CO Emissions (g/hr)		263	903	209	145	
NOx Emissions (g/hr)		51	176	41	28	
VOC Emissions (g/hr)		61	209	48	34	
Dilemma Vehicles (#)		0	33	0	0	
Queue Length 50th (ft)		73	78	0	129	
Queue Length 95th (ft)		165	92	0	175	

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT (Partial DLT-North/South Only)

Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/19/2021

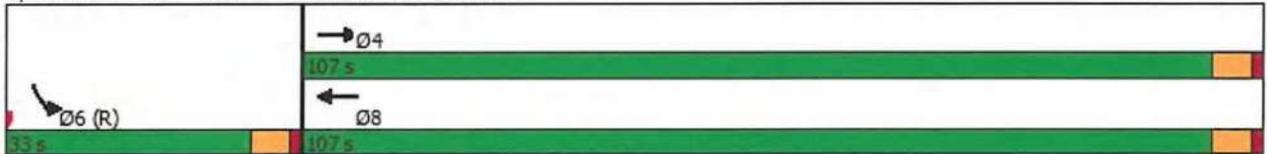


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		168	34		256	
Turn Bay Length (ft)						
Base Capacity (vph)		2480	4366	1538	625	
Starvation Cap Reductn		1316	0	0	0	
Spillback Cap Reductn		0	2749	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.70	0.61	0.24	0.43	

Intersection Summary

Area Type:	Other
Cycle Length:	140
Actuated Cycle Length:	140
Offset:	0 (0%), Referenced to phase 2: and 6: SBL, Start of Green
Natural Cycle:	50
Control Type:	Pretimed
Maximum v/c Ratio:	0.43
Intersection Signal Delay:	6.8
Intersection LOS:	A
Intersection Capacity Utilization	38.7%
ICU Level of Service	A
Analysis Period (min)	15

Splits and Phases: 56: SR 544 & US 27 SB Left Turn



Lanes, Volumes, Timings

47: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations			↖↖	↑↑↑	↑↑↑	
Traffic Volume (vph)	0	0	454	2566	2184	0
Future Volume (vph)	0	0	454	2566	2184	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3335	4940	4940	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3335	4940	4940	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	246			892	416	
Travel Time (s)	5.6			10.1	9.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	5%	5%	5%	0%
Adj. Flow (vph)	0	0	478	2701	2299	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	478	2701	2299	0
Turn Type			Prot	NA	NA	
Protected Phases			5	2	6	
Permitted Phases						
Detector Phase			5	2	6	
Switch Phase						
Minimum Initial (s)			5.0	5.0	5.0	
Minimum Split (s)			11.0	24.0	24.0	
Total Split (s)			31.0	140.0	109.0	
Total Split (%)			22.1%	100.0%	77.9%	
Yellow Time (s)			4.5	4.5	4.5	
All-Red Time (s)			1.5	1.5	1.5	
Lost Time Adjust (s)			0.0	0.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			None	C-Max	C-Max	
Act Effct Green (s)			25.0	140.0	103.0	
Actuated g/C Ratio			0.18	1.00	0.74	
v/c Ratio			0.80	0.55	0.63	
Control Delay			66.4	0.4	0.6	
Queue Delay			0.0	0.5	0.3	
Total Delay			66.4	0.9	0.9	
LOS			E	A	A	
Approach Delay				10.8	0.9	
Approach LOS				B	A	
Stops (vph)			424	0	6	
Fuel Used(gal)			18	15	7	
CO Emissions (g/hr)			1268	1051	516	
NOx Emissions (g/hr)			247	205	100	

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT (Partial DLT-North/South Only)

Lanes, Volumes, Timings

47: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection) 03/17/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)			294	244	120	
Dilemma Vehicles (#)			0	0	0	
Queue Length 50th (ft)			217	0	0	
Queue Length 95th (ft)			281	0	0	
Internal Link Dist (ft)	166			812	336	
Turn Bay Length (ft)						
Base Capacity (vph)			595	4940	3634	
Starvation Cap Reductn			0	0	650	
Spillback Cap Reductn			0	1537	0	
Storage Cap Reductn			0	0	0	
Reduced v/c Ratio			0.80	0.79	0.77	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 9 (6%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 6.6

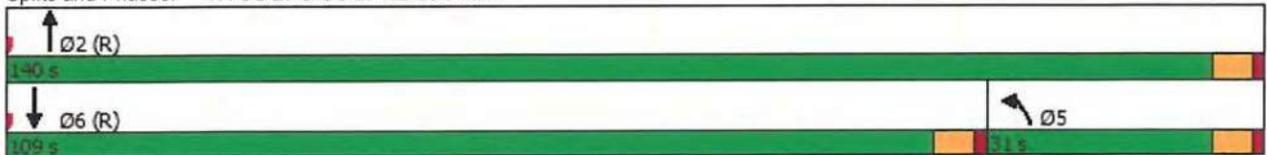
Intersection LOS: A

Intersection Capacity Utilization 65.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 47: US 27 & US 27 NB Left Turn



Lanes, Volumes, Timings

49: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑↑		↑↑↑	↑↑↑
Traffic Volume (vph)	0	0	3269	0	253	2866
Future Volume (vph)	0	0	3269	0	253	2866
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	0	0		0	2	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	1.00	0.97	0.91
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	4940	0	3242	4940
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	4940	0	3242	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			60
Link Distance (ft)	283		51			884
Travel Time (s)	6.4		1.2			10.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	5%	0%	8%	5%
Adj. Flow (vph)	0	0	3441	0	266	3017
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	3441	0	266	3017
Turn Type			NA		Prot	NA
Protected Phases			2		1	6
Permitted Phases						
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			5.0		5.0	5.0
Minimum Split (s)			24.0		11.0	24.0
Total Split (s)			109.0		31.0	140.0
Total Split (%)			77.9%		22.1%	100.0%
Yellow Time (s)			4.5		4.5	4.5
All-Red Time (s)			1.5		1.5	1.5
Lost Time Adjust (s)			0.0		0.0	0.0
Total Lost Time (s)			6.0		6.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			C-Max		None	C-Max
Act Effct Green (s)			111.2		16.8	140.0
Actuated g/C Ratio			0.79		0.12	1.00
v/c Ratio			0.88		0.69	0.61
Control Delay			2.0		68.2	0.6
Queue Delay			1.2		0.0	0.2
Total Delay			3.2		68.2	0.8
LOS			A		E	A
Approach Delay			3.2			6.3
Approach LOS			A			A
Stops (vph)			278		239	1

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT (Partial DLT-North/South Only)

Lanes, Volumes, Timings

49: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Fuel Used(gal)			14		10	17
CO Emissions (g/hr)			968		716	1171
NOx Emissions (g/hr)			188		139	228
VOC Emissions (g/hr)			224		166	271
Dilemma Vehicles (#)			0		0	0
Queue Length 50th (ft)			7		121	0
Queue Length 95th (ft)			m4		164	0
Internal Link Dist (ft)	203		1			804
Turn Bay Length (ft)					500	
Base Capacity (vph)			3925		578	4940
Starvation Cap Reductn			270		0	0
Spillback Cap Reductn			0		0	912
Storage Cap Reductn			0		0	0
Reduced v/c Ratio			0.94		0.46	0.75

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 4.7

Intersection LOS: A

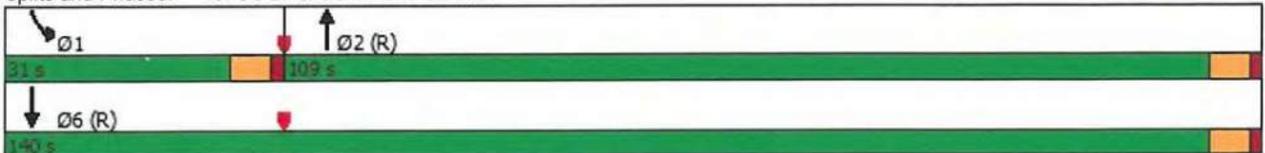
Intersection Capacity Utilization 80.4%

ICU Level of Service D

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 49: US 27 & US 27 SB Left Turn



Lanes, Volumes, Timings  
21: US 27 & SR 544 (Main Intersection)

03/17/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑↑	↑↑		↑↑	↑↑			↑↑↑	↑		↑↑↑	↑↑
Traffic Volume (vph)	1047	712	0	296	526	0	0	1935	259	0	2457	997
Future Volume (vph)	1047	712	0	296	526	0	0	1935	259	0	2457	997
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		225	600		400	800		850	775		900
Storage Lanes	3		0	2		0	0		1	0		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.94	0.95	1.00	0.97	0.95	1.00	1.00	0.91	1.00	1.00	0.91	0.88
Fr									0.850			0.850
Flt Protected	0.950			0.950								
Satd. Flow (prot)	4848	3505	0	3335	3438	0	0	4940	1538	0	4940	2760
Flt Permitted	0.950			0.950								
Satd. Flow (perm)	4848	3505	0	3335	3438	0	0	4940	1538	0	4940	2760
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60				60
Link Distance (ft)		196			248			416				380
Travel Time (s)		3.0			3.8			4.7				4.3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	5%	5%	5%	3%	5%	5%	5%	5%	3%
Adj. Flow (vph)	1079	734	0	305	542	0	0	1995	267	0	2533	1028
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1079	734	0	305	542	0	0	1995	267	0	2533	1028
Turn Type	Prot	NA		Prot	NA			NA	pm+ov		NA	Prot
Protected Phases	7	4		3	8			2	3		6	6
Permitted Phases									2			
Detector Phase	7	4		3	8			2	3		6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Minimum Split (s)	24.0	24.0		24.0	24.0			24.0	24.0		24.0	24.0
Total Split (s)	36.0	27.0		36.0	27.0			77.0	36.0		77.0	77.0
Total Split (%)	25.7%	19.3%		25.7%	19.3%			55.0%	25.7%		55.0%	55.0%
Yellow Time (s)	4.5	4.5		4.5	4.5			4.5	4.5		4.5	4.5
All-Red Time (s)	1.5	1.5		1.5	1.5			1.5	1.5		1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag				Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes				Yes			
Recall Mode	None	None		None	None			C-Max	None		C-Max	C-Max
Act Effct Green (s)	30.0	32.7		18.3	21.0			71.0	95.3		71.0	71.0
Actuated g/C Ratio	0.21	0.23		0.13	0.15			0.51	0.68		0.51	0.51
v/c Ratio	1.04	0.90		0.70	1.05			0.80	0.26		1.01	0.73
Control Delay	63.4	34.0		39.4	85.3			31.3	8.9		51.9	29.9
Queue Delay	20.8	8.3		0.2	18.3			1.2	0.3		34.9	81.9
Total Delay	84.1	42.3		39.6	103.5			32.5	9.2		86.8	111.8
LOS	F	D		D	F			C	A		F	F
Approach Delay		67.2			80.5			29.8			94.0	
Approach LOS		E			F			C			F	
Stops (vph)	925	619		108	464			1552	92		2202	764

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT (Partial DLT - North/South Only)

Lanes, Volumes, Timings

21: US 27 & SR 544 (Main Intersection)

03/17/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Fuel Used(gal)	26	14		4	16			52	3		81	26
CO Emissions (g/hr)	1841	946		293	1101			3625	224		5695	1800
NOx Emissions (g/hr)	358	184		57	214			705	44		1108	350
VOC Emissions (g/hr)	427	219		68	255			840	52		1320	417
Dilemma Vehicles (#)	0	24		0	16			69	0		84	0
Queue Length 50th (ft)	-93	343		46	~283			536	87		~853	407
Queue Length 95th (ft)	#439	#522		54	#404			600	110		#972	502
Internal Link Dist (ft)		116			168			336			300	
Turn Bay Length (ft)	500			600					850			900
Base Capacity (vph)	1038	819		714	515			2505	1175		2505	1399
Starvation Cap Reductn	51	68		86	44			286	457		405	319
Spillback Cap Reductn	0	8		0	0			17	306		0	1314
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	1.09	0.98		0.49	1.15			0.90	0.37		1.21	12.09

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.05

Intersection Signal Delay: 69.8

Intersection LOS: E

Intersection Capacity Utilization 96.9%

ICU Level of Service F

Analysis Period (min) 15

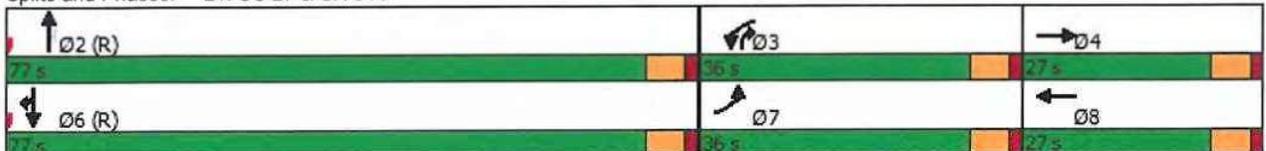
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

54: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/19/2021



\*used for NB Displaced Left-Turn movement only

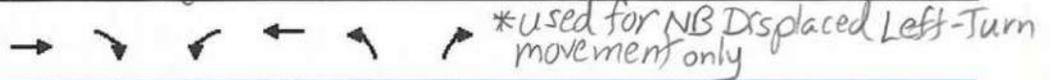
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑↑	↗		↑↑	↖↗	
Traffic Volume (vph)	1759	370	0	1523	277	0
Future Volume (vph)	1759	370	0	1523	277	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.81	1.00	1.00	0.95	0.97	1.00
Fr't		0.850				
Flt Protected					0.950	
Satd. Flow (prot)	7471	1538	0	3438	3400	0
Flt Permitted					0.950	
Satd. Flow (perm)	7471	1538	0	3438	3400	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		241				
Link Speed (mph)	45			30	30	
Link Distance (ft)	191			196	312	
Travel Time (s)	2.9			4.5	7.1	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	5%	0%	5%	3%	0%
Adj. Flow (vph)	1813	381	0	1570	286	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1813	381	0	1570	286	0
Turn Type	NA	Free		NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		Free				
Minimum Split (s)	24.0			24.1	24.0	
Total Split (s)	104.0			104.0	36.0	
Total Split (%)	74.3%			74.3%	25.7%	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)	98.0	140.0		98.0	30.0	
Actuated g/C Ratio	0.70	1.00		0.70	0.21	
v/c Ratio	0.35	0.25		0.65	0.39	
Control Delay	8.5	0.4		24.5	12.4	
Queue Delay	9.1	0.0		49.1	0.0	
Total Delay	17.6	0.4		73.6	12.4	
LOS	B	A		E	B	
Approach Delay	14.6			73.6	12.4	
Approach LOS	B			E	B	
Stops (vph)	652	0		1132	274	
Fuel Used(gal)	21	2		16	3	
CO Emissions (g/hr)	1496	153		1131	239	
NOx Emissions (g/hr)	291	30		220	46	
VOC Emissions (g/hr)	347	35		262	55	
Dilemma Vehicles (#)	63	0		0	0	
Queue Length 50th (ft)	147	0		596	139	
Queue Length 95th (ft)	163	0		m630	192	

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT (Partial DLT-North/South Only)

Lanes, Volumes, Timings

54: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/19/2021

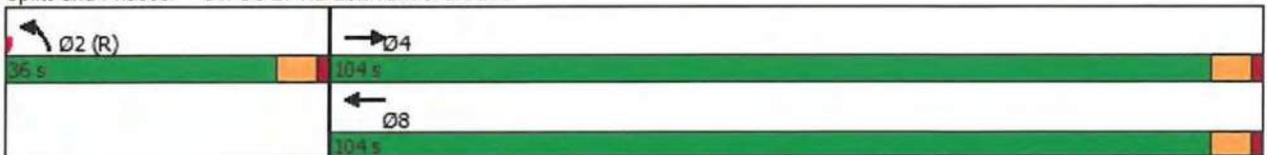


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Internal Link Dist (ft)	111			116	232	
Turn Bay Length (ft)						
Base Capacity (vph)	5229	1538		2406	728	
Starvation Cap Reductn	0	0		1200	0	
Spillback Cap Reductn	3395	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.99	0.25		1.30	0.39	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 37.3  
 Intersection Capacity Utilization 60.0%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

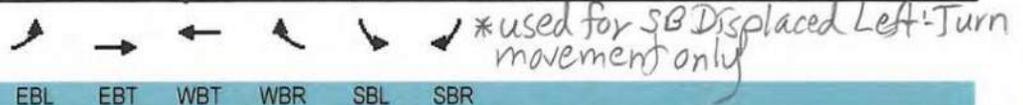
Splits and Phases: 54: US 27 NB Left Turn & SR 544



Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/19/2021



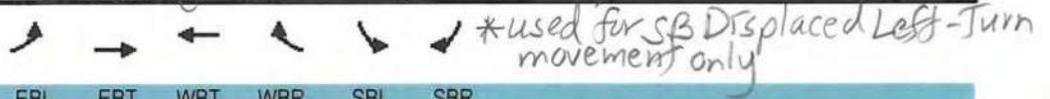
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑↑	↑	↓	↓
Traffic Volume (vph)	0	971	822	231	358	0
Future Volume (vph)	0	971	822	231	358	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.86	1.00	0.97	1.00
Fr't				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	3505	6225	1538	3335	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	3505	6225	1538	3335	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				238		
Link Speed (mph)		30	45		30	
Link Distance (ft)		248	114		336	
Travel Time (s)		5.6	1.7		7.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	3%	5%	5%	5%	0%
Adj. Flow (vph)	0	1001	847	238	369	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1001	847	238	369	0
Turn Type		NA	NA	Free	Prot	
Protected Phases		4	8		6	
Permitted Phases				Free		
Minimum Split (s)		24.0	24.0		24.0	
Total Split (s)		104.0	104.0		36.0	
Total Split (%)		74.3%	74.3%		25.7%	
Yellow Time (s)		4.5	4.5		4.5	
All-Red Time (s)		1.5	1.5		1.5	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Act Effct Green (s)		98.0	98.0	140.0	30.0	
Actuated g/C Ratio		0.70	0.70	1.00	0.21	
v/c Ratio		0.41	0.19	0.15	0.52	
Control Delay		10.6	7.4	0.2	4.7	
Queue Delay		1.8	0.2	0.0	0.0	
Total Delay		12.4	7.7	0.2	4.7	
LOS		B	A	A	A	
Approach Delay		12.4	6.0		4.7	
Approach LOS		B	A		A	
Stops (vph)		278	267	0	2	
Fuel Used(gal)		6	12	2	2	
CO Emissions (g/hr)		385	809	138	146	
NOx Emissions (g/hr)		75	157	27	28	
VOC Emissions (g/hr)		89	187	32	34	
Dilemma Vehicles (#)		0	30	0	0	
Queue Length 50th (ft)		101	71	0	0	
Queue Length 95th (ft)		m233	84	0	0	

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT (Partial DLT - North/South Only)

Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/19/2021

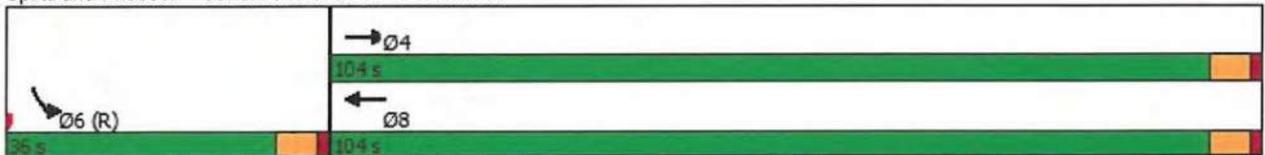


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Internal Link Dist (ft)		168	34		256	
Turn Bay Length (ft)						
Base Capacity (vph)		2453	4357	1538	714	
Starvation Cap Reductn		1228	0	0	0	
Spillback Cap Reductn		0	2562	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.82	0.47	0.15	0.52	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green  
 Natural Cycle: 50  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.52  
 Intersection Signal Delay: 8.4  
 Intersection Capacity Utilization 47.1%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 56: SR 544 & US 27 SB Left Turn



Lanes, Volumes, Timings

47: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations			↖↖	↑↑↑	↑↑↑	
Traffic Volume (vph)	0	0	277	2194	2753	0
Future Volume (vph)	0	0	277	2194	2753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3400	4940	4940	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3400	4940	4940	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	246			892	416	
Travel Time (s)	5.6			10.1	9.5	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	3%	5%	5%	2%
Adj. Flow (vph)	0	0	286	2262	2838	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	286	2262	2838	0
Turn Type			Prot	NA	NA	
Protected Phases			5	2	6	
Permitted Phases						
Detector Phase			5	2	6	
Switch Phase						
Minimum Initial (s)			5.0	5.0	5.0	
Minimum Split (s)			11.0	24.0	24.0	
Total Split (s)			27.0	140.0	113.0	
Total Split (%)			19.3%	100.0%	80.7%	
Yellow Time (s)			4.5	4.5	4.5	
All-Red Time (s)			1.5	1.5	1.5	
Lost Time Adjust (s)			0.0	0.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			None	C-Max	C-Max	
Act Effct Green (s)			21.0	140.0	107.0	
Actuated g/C Ratio			0.15	1.00	0.76	
v/c Ratio			0.56	0.46	0.75	
Control Delay			60.0	0.3	2.0	
Queue Delay			0.0	0.1	1.0	
Total Delay			60.0	0.4	3.0	
LOS			E	A	A	
Approach Delay				7.1	3.0	
Approach LOS				A	A	
Stops (vph)			253	0	127	
Fuel Used(gal)			11	13	11	
CO Emissions (g/hr)			739	895	751	
NOx Emissions (g/hr)			144	174	146	

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT (Partial DLT - North/South Only)

Lanes, Volumes, Timings

47: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/17/2021

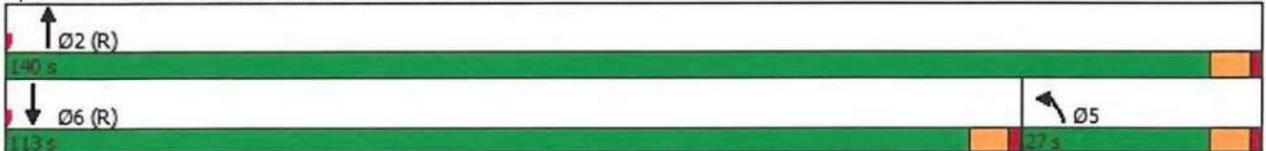


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)			171	207	174	
Dilemma Vehicles (#)			0	0	0	
Queue Length 50th (ft)			126	0	9	
Queue Length 95th (ft)			175	0	m5	
Internal Link Dist (ft)	166			812	336	
Turn Bay Length (ft)						
Base Capacity (vph)			510	4940	3775	
Starvation Cap Reductn			0	0	605	
Spillback Cap Reductn			0	1058	0	
Storage Cap Reductn			0	0	0	
Reduced v/c Ratio			0.56	0.58	0.90	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 3 (2%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 4.9  
 Intersection LOS: A  
 Intersection Capacity Utilization 71.1%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 47: US 27 & US 27 NB Left Turn



Lanes, Volumes, Timings

49: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑↑		↑↑	↑↑↑
Traffic Volume (vph)	0	0	2982	0	358	3454
Future Volume (vph)	0	0	2982	0	358	3454
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0		0	500	
Storage Lanes	0	0		0	2	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.91	1.00	0.97	0.91
Frt						
Flt Protected					0.950	
Satd. Flow (prot)	0	0	4940	0	3335	4940
Flt Permitted					0.950	
Satd. Flow (perm)	0	0	4940	0	3335	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		30			60
Link Distance (ft)	283		51			884
Travel Time (s)	6.4		1.2			10.0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	5%	5%	0%	5%	5%
Adj. Flow (vph)	0	0	3074	0	369	3561
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	3074	0	369	3561
Turn Type			NA		Prot	NA
Protected Phases			2		1	6
Permitted Phases						
Detector Phase			2		1	6
Switch Phase						
Minimum Initial (s)			5.0		5.0	5.0
Minimum Split (s)			24.0		11.0	24.0
Total Split (s)			113.0		27.0	140.0
Total Split (%)			80.7%		19.3%	100.0%
Yellow Time (s)			4.5		4.5	4.5
All-Red Time (s)			1.5		1.5	1.5
Lost Time Adjust (s)			0.0		0.0	0.0
Total Lost Time (s)			6.0		6.0	6.0
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			C-Max		None	C-Max
Act Effct Green (s)			108.7		19.3	140.0
Actuated g/C Ratio			0.78		0.14	1.00
v/c Ratio			0.80		0.80	0.72
Control Delay			2.4		72.2	0.9
Queue Delay			0.4		0.0	17.8
Total Delay			2.8		72.2	18.7
LOS			A		E	B
Approach Delay			2.8			23.8
Approach LOS			A			C
Stops (vph)			263		342	1

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT (Partial DLT - North South Only)

Lanes, Volumes, Timings

49: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/17/2021



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Fuel Used(gal)			13		15	20
CO Emissions (g/hr)			905		1040	1429
NOx Emissions (g/hr)			176		202	278
VOC Emissions (g/hr)			210		241	331
Dilemma Vehicles (#)			0		0	0
Queue Length 50th (ft)			6		168	0
Queue Length 95th (ft)			m9		224	0
Internal Link Dist (ft)	203		1			804
Turn Bay Length (ft)					500	
Base Capacity (vph)			3834		500	4940
Starvation Cap Reductn			273		0	0
Spillback Cap Reductn			0		0	1487
Storage Cap Reductn			0		0	0
Reduced v/c Ratio			0.86		0.74	1.03

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 10 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 14.6

Intersection LOS: B

Intersection Capacity Utilization 77.8%

ICU Level of Service D

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 49: US 27 & US 27 SB Left Turn



**WEIGHTED AVERAGE DELAY CALCULATIONS FOR SR 544/US 27 PDLT INTERSECTION (N/S)**

MOVEMENT	2045 AM PEAK HOUR				2045 PM PEAK HOUR			
	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	TOTAL DELAY	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	TOTAL DELAY
NB LT	454	13.8	66.4	36,410.8	277	12.4	60.0	20,054.8
NB TH	2,339	68.2	3.2	167,004.6	1,935	32.5	2.8	68,305.5
NB RT	227	8.6	0.0	1,952.2	259	9.2	0.0	2,382.8
ALL NB VEHICLES	3,020	68.0		205,367.6	2,471	36.7		90,743.1
SB LT	253	8.8	68.2	19,481.0	358	4.7	72.2	27,530.2
SB TH	1,839	37.4	0.9	70,433.7	2,457	86.8	3.0	220,638.6
SB RT	1,027	113.6	0.0	116,667.2	997	111.8	0.0	111,464.6
ALL SB VEHICLES	3,119	66.2		206,581.9	3,812	94.3		359,633.4
WB LT	345	39.6	0.9	13,972.5	296	39.6	3.0	12,609.6
WB TH	595	95.3	0.0	56,703.5	526	103.5	0.0	54,441.0
WB RT	347	0.0	0.0	0.0	231	0.0	0.0	0.0
ALL WB VEHICLES	1,287	54.9		70,676.0	1,053	63.7		67,050.6
EB LT	930	90.1	3.2	86,769.0	1,047	84.1	2.8	90,984.3
EB TH	550	30.3	0.0	16,665.0	712	42.3	0.0	30,117.6
EB RT	262	0.0	0.0	0.0	370	0.0	0.0	0.0
ALL EB VEHICLES	1,742	59.4		103,434.0	2,129	56.9		121,101.9
ALL VEHICLES	9,168	63.9		586,059.5	9,465	67.5		638,529.0

<sup>(1)</sup> Average delay (in seconds per vehicle) at the main intersection

<sup>(2)</sup> Average delay (in seconds per vehicle) at the displaced left-turn crossover intersection

Partial Displaced Left-Turn Intersection Alternative (East/West Only)

Lanes, Volumes, Timings

21: US 27 & SR 544 (Main Intersection)

07/06/2023

	↖		→		↘		↙		←		↖		↑		↘		↓		↙	
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations		↑↑	↑		↑↑	↑	↑↑	↑↑↑		↑↑	↑↑↑									
Traffic Volume (vph)	0	550	262	0	595	347	454	2339	0	253	1839	0								
Future Volume (vph)	0	550	262	0	595	347	454	2339	0	253	1839	0								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900								
Storage Length (ft)	500		225	600		400	800		850	775		900								
Storage Lanes	0		1	0		1	2		0	2		0								
Taper Length (ft)	25			25			25			25										
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00								
Frt			0.850				0.850													
Flt Protected							0.950			0.950										
Satd. Flow (prot)	0	3438	1538	0	3343	1538	3335	4940	0	3242	4940	0								
Flt Permitted							0.950			0.950										
Satd. Flow (perm)	0	3438	1538	0	3343	1538	3335	4940	0	3242	4940	0								
Right Turn on Red			Yes			Yes			Yes			Yes								Yes
Satd. Flow (RTOR)																				
Link Speed (mph)		45			45			60			60									
Link Distance (ft)		196			248			218			170									
Travel Time (s)		3.0			3.8			2.5			1.9									
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95								
Heavy Vehicles (%)	5%	5%	5%	5%	8%	5%	5%	5%	8%	8%	5%	5%								
Adj. Flow (vph)	0	579	276	0	626	365	478	2462	0	266	1936	0								
Shared Lane Traffic (%)																				
Lane Group Flow (vph)	0	579	276	0	626	365	478	2462	0	266	1936	0								
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No								No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right								Right
Median Width(ft)		0			0			24			24									
Link Offset(ft)		0			0			0			0									
Crosswalk Width(ft)		16			16			16			16									
Two way Left Turn Lane																				
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00								
Turning Speed (mph)	15		9	15		9	15		9	15		9								9
Number of Detectors		2	1		2	1	1	2		1	2									
Detector Template		Thru	Right		Thru	Right	Left	Thru		Left	Thru									
Leading Detector (ft)		100	20		100	20	20	100		20	100									
Trailing Detector (ft)		0	0		0	0	0	0		0	0									
Detector 1 Position(ft)		0	0		0	0	0	0		0	0									
Detector 1 Size(ft)		6	20		6	20	20	6		20	6									
Detector 1 Type		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex									
Detector 1 Channel																				
Detector 1 Extend (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0									
Detector 1 Queue (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0									
Detector 1 Delay (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0									
Detector 2 Position(ft)		94			94			94			94									
Detector 2 Size(ft)		6			6			6			6									
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex									
Detector 2 Channel																				
Detector 2 Extend (s)		0.0			0.0			0.0			0.0									
Turn Type		NA	pm+ov		NA	pm+ov	Prot	NA		Prot	NA									
Protected Phases		2	7		6	3	7	4		3	8									

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT for SR 544 3 EB Left Turn Lanes

Synchro 11 Report

(Partial DLT - East/West)

Lanes, Volumes, Timings

21: US 27 & SR 544 (Main Intersection)

07/06/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6						
Detector Phase		2	7		6	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)		24.0	11.0		24.0	11.0	11.0	24.0		11.0	24.0	
Total Split (s)		39.0	29.0		39.0	20.0	29.0	81.0		20.0	72.0	
Total Split (%)		27.9%	20.7%		27.9%	14.3%	20.7%	57.9%		14.3%	51.4%	
Maximum Green (s)		33.0	23.0		33.0	14.0	23.0	75.0		14.0	66.0	
Yellow Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)		1.5	1.5		1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag			Lead			Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode		C-Max	None		C-Max	None	None	None		None	None	
Act Effct Green (s)		33.3	61.8		33.3	53.1	22.4	74.9		13.7	66.2	
Actuated g/C Ratio		0.24	0.44		0.24	0.38	0.16	0.54		0.10	0.47	
v/c Ratio		0.71	0.41		0.79	0.63	0.90	0.93		0.84	0.83	
Control Delay		54.4	28.8		58.1	41.1	74.4	25.8		106.8	23.8	
Queue Delay		0.0	0.0		0.9	59.4	51.5	0.0		59.5	0.0	
Total Delay		54.4	28.8		58.9	100.5	125.9	25.8		166.2	23.8	
LOS		D	C		E	F	F	C		F	C	
Approach Delay		46.1			74.3			42.0			41.0	
Approach LOS		D			E			D			D	
90th %ile Green (s)		33.0	23.0		33.0	14.0	23.0	75.0		14.0	66.0	
90th %ile Term Code		Coord	Max		Coord	Max	Max	Max		Max	Max	
70th %ile Green (s)		33.0	23.0		33.0	14.0	23.0	75.0		14.0	66.0	
70th %ile Term Code		Coord	Max		Coord	Max	Max	Max		Max	Max	
50th %ile Green (s)		33.0	23.0		33.0	14.0	23.0	75.0		14.0	66.0	
50th %ile Term Code		Coord	Max		Coord	Max	Max	Max		Max	Hold	
30th %ile Green (s)		33.0	23.0		33.0	14.0	23.0	75.0		14.0	66.0	
30th %ile Term Code		Coord	Max		Coord	Max	Max	Max		Max	Hold	
10th %ile Green (s)		34.6	20.2		34.6	12.7	20.2	74.7		12.7	67.2	
10th %ile Term Code		Coord	Gap		Coord	Gap	Gap	Gap		Gap	Hold	
Stops (vph)		496	175		550	279	404	2051		232	1550	
Fuel Used(gal)		14	5		16	7	16	61		11	45	
CO Emissions (g/hr)		1009	332		1087	514	1150	4257		762	3158	
NOx Emissions (g/hr)		196	65		212	100	224	828		148	614	
VOC Emissions (g/hr)		234	77		252	119	266	987		177	732	
Dilemma Vehicles (#)		20	0		21	0	0	74		0	61	
Queue Length 50th (ft)		256	168		284	269	180	737		117	551	
Queue Length 95th (ft)		325	247		358	383	#302	816		#185	618	
Internal Link Dist (ft)		116			168			138			90	
Turn Bay Length (ft)			225			400	800			775		
Base Capacity (vph)		818	684		795	585	547	2646		324	2337	
Starvation Cap Reductn		0	0		40	112	181	0		137	0	
Spillback Cap Reductn		0	0		0	310	7	0		0	0	
Storage Cap Reductn		0	0		0	0	0	0		0	0	

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT for SR 544 3 EB Left Turn Lanes

(Partial DLT - East/West)

Lanes, Volumes, Timings

21: US 27 & SR 544

(Main Intersection)

07/06/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.71	0.40		0.83	1.33	1.31	0.93		1.42	0.83	

Intersection Summary

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 46.8

Intersection LOS: D

Intersection Capacity Utilization 83.9%

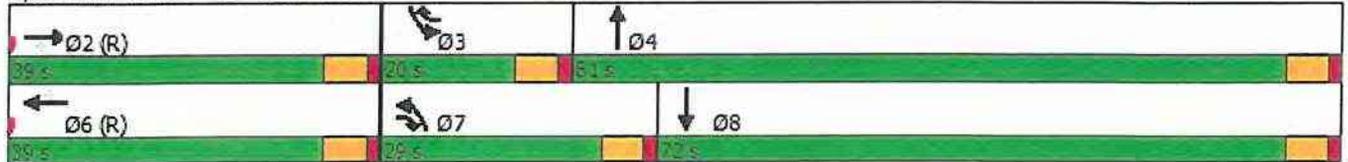
ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

07/06/2023

	↖	↗	↙	↑	↓	↘ * used for EB Displaced Left-Turn movement only
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↖↖	/		↑↑↑	↓↓↓	↘
Traffic Volume (vph)	930	0	0	2686	2092	1027
Future Volume (vph)	930	0	0	2686	2092	1027
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.94	1.00	1.00	0.91	0.81	1.00
Fr t						0.850
Flt Protected	0.950					
Satd. Flow (prot)	4848	0	0	4940	7329	1538
Flt Permitted	0.950					
Satd. Flow (perm)	4848	0	0	4940	7329	1538
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						562
Link Speed (mph)	30			30	60	
Link Distance (ft)	421			170	210	
Travel Time (s)	9.6			3.9	2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	5%	5%	5%
Adj. Flow (vph)	979	0	0	2827	2202	1081
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	0	0	2827	2202	1081
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1			2	2	1
Detector Template	Left			Thru	Thru	Right
Leading Detector (ft)	20			100	100	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	20			6	6	20
Detector 1 Type	CI+Ex			CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	Free
Protected Phases	2			4	8	
Permitted Phases						Free
Detector Phase	2			4	8	
Switch Phase						

(Partial DLT - East/West)

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn

(Phantom Intersection\*)

07/06/2023



\*used for EB Displaced Left-turn movement only

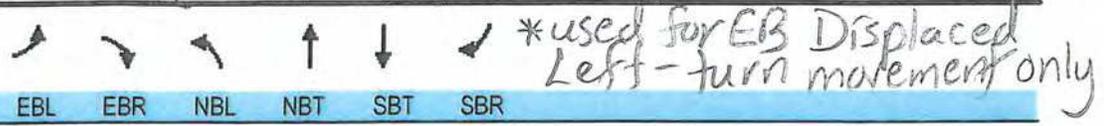
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	24.0			24.0	24.0	
Total Split (s)	42.0			98.0	98.0	
Total Split (%)	30.0%			70.0%	70.0%	
Maximum Green (s)	36.0			92.0	92.0	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	C-Max			Max	Max	
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	36.0			92.0	92.0	140.0
Actuated g/C Ratio	0.26			0.66	0.66	1.00
v/c Ratio	0.79			0.87	0.46	0.70
Control Delay	27.3			6.1	12.1	2.7
Queue Delay	0.0			3.3	0.4	0.0
Total Delay	27.3			9.4	12.5	2.7
LOS	C			A	B	A
Approach Delay	27.3			9.4	9.3	
Approach LOS	C			A	A	
90th %ile Green (s)	36.0			92.0	92.0	
90th %ile Term Code	Coord			MaxR	MaxR	
70th %ile Green (s)	36.0			92.0	92.0	
70th %ile Term Code	Coord			MaxR	MaxR	
50th %ile Green (s)	36.0			92.0	92.0	
50th %ile Term Code	Coord			MaxR	MaxR	
30th %ile Green (s)	36.0			92.0	92.0	
30th %ile Term Code	Coord			MaxR	MaxR	
10th %ile Green (s)	36.0			92.0	92.0	
10th %ile Term Code	Coord			MaxR	MaxR	
Stops (vph)	930			390	969	1
Fuel Used(gal)	15			9	42	8
CO Emissions (g/hr)	1046			634	2942	573
NOx Emissions (g/hr)	204			123	572	112
VOC Emissions (g/hr)	242			147	682	133
Dilemma Vehicles (#)	0			0	75	0
Queue Length 50th (ft)	337			123	226	0
Queue Length 95th (ft)	384			128	246	0
Internal Link Dist (ft)	341			90	130	
Turn Bay Length (ft)						
Base Capacity (vph)	1246			3246	4816	1538
Starvation Cap Reductn	0			329	0	0
Spillback Cap Reductn	0			0	1750	0
Storage Cap Reductn	0			0	0	0

(Partial DLT - East/West)

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

07/06/2023



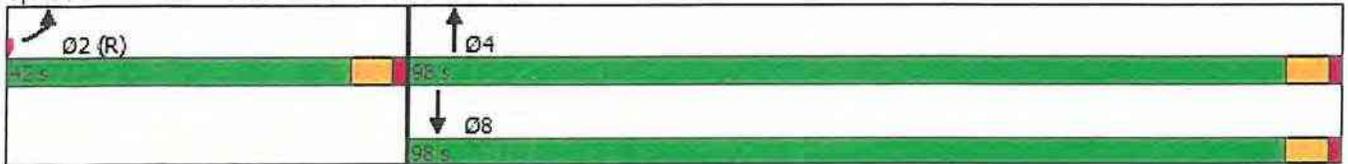
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Reduced v/c Ratio	0.79			0.97	0.72	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 4 (3%), Referenced to phase 2:EBL, Start of Green  
 Natural Cycle: 75  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.87  
 Intersection Signal Delay: 11.8  
 Intersection Capacity Utilization 79.6%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service D

Splits and Phases: 3: US 27 & SR 544 EB Left Turn



Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn

(Phantom Intersection\*)

07/06/2023



\*used for WB Drso placed Left-turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑↑		↑↑↑↑	↑		↑↑↑
Traffic Volume (vph)	345	0	2793	227	0	2101
Future Volume (vph)	345	0	2793	227	0	2101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	0.81	1.00	1.00	0.91
Frts				0.850		
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	7329	1495	0	4940
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	7329	1495	0	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				93		
Link Speed (mph)	30		60			30
Link Distance (ft)	303		198			218
Travel Time (s)	6.9		2.3			5.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	5%	8%	0%	5%
Adj. Flow (vph)	363	0	2940	239	0	2212
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	2940	239	0	2212
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1		2
Detector Template	Left		Thru	Right		Thru
Leading Detector (ft)	20		100	20		100
Trailing Detector (ft)	0		0	0		0
Detector 1 Position(ft)	0		0	0		0
Detector 1 Size(ft)	20		6	20		6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex		CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0		0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Free		NA
Protected Phases	6		4			8
Permitted Phases				Free		
Detector Phase	6		4			8
Switch Phase						

(Partial DLT - East/West)

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn

(Phantom Intersection\*)

07/06/2023



\*used for WB D is placed Left-Turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0		5.0			5.0
Minimum Split (s)	24.0		24.0			24.0
Total Split (s)	37.0		103.0			103.0
Total Split (%)	26.4%		73.6%			73.6%
Maximum Green (s)	31.0		97.0			97.0
Yellow Time (s)	4.5		4.5			4.5
All-Red Time (s)	1.5		1.5			1.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0			3.0
Recall Mode	C-Max		Max			Max
Walk Time (s)	7.0		7.0			7.0
Flash Dont Walk (s)	11.0		11.0			11.0
Pedestrian Calls (#/hr)	0		0			0
Act Effct Green (s)	31.0		97.0	140.0		97.0
Actuated g/C Ratio	0.22		0.69	1.00		0.69
v/c Ratio	0.49		0.58	0.16		0.65
Control Delay	28.1		11.6	0.2		4.5
Queue Delay	0.0		0.3	0.0		0.6
Total Delay	28.1		11.9	0.2		5.1
LOS	C		B	A		A
Approach Delay	28.1		11.0			5.1
Approach LOS	C		B			A
90th %ile Green (s)	31.0		97.0			97.0
90th %ile Term Code	Coord		MaxR			MaxR
70th %ile Green (s)	31.0		97.0			97.0
70th %ile Term Code	Coord		MaxR			MaxR
50th %ile Green (s)	31.0		97.0			97.0
50th %ile Term Code	Coord		MaxR			MaxR
30th %ile Green (s)	31.0		97.0			97.0
30th %ile Term Code	Coord		MaxR			MaxR
10th %ile Green (s)	31.0		97.0			97.0
10th %ile Term Code	Coord		MaxR			MaxR
Stops (vph)	339		1345	0		283
Fuel Used(gal)	5		56	2		7
CO Emissions (g/hr)	353		3916	113		492
NOx Emissions (g/hr)	69		762	22		96
VOC Emissions (g/hr)	82		908	26		114
Dilemma Vehicles (#)	0		100	0		0
Queue Length 50th (ft)	175		311	0		103
Queue Length 95th (ft)	234		332	0		110
Internal Link Dist (ft)	223		118			138
Turn Bay Length (ft)						
Base Capacity (vph)	738		5077	1495		3422
Starvation Cap Reductn	0		0	0		732
Spillback Cap Reductn	0		1186	0		0
Storage Cap Reductn	0		0	0		0

(Partial DLT - East/West)

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn

(Phantom Intersection\*)

07/06/2023



\*used for WB Displaced Left-turn movement only

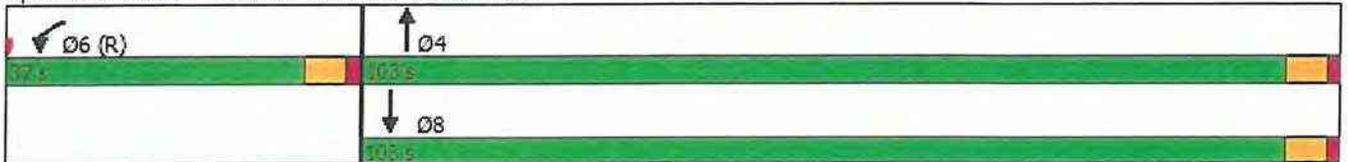
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Reduced v/c Ratio	0.49		0.76	0.16		0.82

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 6:WBL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 9.8  
 Intersection Capacity Utilization 60.4%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service B

Splits and Phases: 6: US 27 & SR 544 WB Left Turn



Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 07/06/2023



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations	↑↑	↑↑	↑↑			
Traffic Volume (vph)	930	812	1049	0	0	0
Future Volume (vph)	930	812	1049	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt						
Flt Protected	0.950					
Satd. Flow (prot)	3335	3438	3343	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3335	3438	3343	0	0	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (mph)		45	30		30	
Link Distance (ft)		486	221		222	
Travel Time (s)		7.4	5.0		5.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	8%	2%	2%	2%
Adj. Flow (vph)	979	855	1104	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	855	1104	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2			
Detector Template	Left	Thru	Thru			
Leading Detector (ft)	20	100	100			
Trailing Detector (ft)	0	0	0			
Detector 1 Position(ft)	0	0	0			
Detector 1 Size(ft)	20	6	6			
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0			
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Detector Phase	5	2	6			
Switch Phase						

(Partial DLT - East/West)

Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 07/06/2023



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Minimum Initial (s)	5.0	5.0	5.0			
Minimum Split (s)	11.0	24.0	24.0			
Total Split (s)	66.0	140.0	74.0			
Total Split (%)	47.1%	100.0%	52.9%			
Maximum Green (s)	60.0	134.0	68.0			
Yellow Time (s)	4.5	4.5	4.5			
All-Red Time (s)	1.5	1.5	1.5			
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0	6.0			
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0			
Recall Mode	None	C-Max	C-Max			
Walk Time (s)		7.0	7.0			
Flash Dont Walk (s)		11.0	11.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)	48.7	140.0	79.3			
Actuated g/C Ratio	0.35	1.00	0.57			
v/c Ratio	0.84	0.25	0.58			
Control Delay	49.3	0.2	2.4			
Queue Delay	0.0	0.0	0.7			
Total Delay	49.3	0.2	3.0			
LOS	D	A	A			
Approach Delay		26.4	3.0			
Approach LOS		C	A			
90th %ile Green (s)	56.8	134.0	71.2			
90th %ile Term Code	Gap	Coord	Coord			
70th %ile Green (s)	52.5	134.0	75.5			
70th %ile Term Code	Gap	Coord	Coord			
50th %ile Green (s)	48.8	134.0	79.2			
50th %ile Term Code	Gap	Coord	Coord			
30th %ile Green (s)	45.3	134.0	82.7			
30th %ile Term Code	Gap	Coord	Coord			
10th %ile Green (s)	40.1	134.0	87.9			
10th %ile Term Code	Gap	Coord	Coord			
Stops (vph)	832	0	315			
Fuel Used(gal)	23	3	7			
CO Emissions (g/hr)	1581	181	505			
NOx Emissions (g/hr)	308	35	98			
VOC Emissions (g/hr)	366	42	117			
Dilemma Vehicles (#)	0	0	0			
Queue Length 50th (ft)	422	0	1			
Queue Length 95th (ft)	463	0	215			
Internal Link Dist (ft)		406	141	142		
Turn Bay Length (ft)						
Base Capacity (vph)	1429	3438	1893			
Starvation Cap Reductn	0	0	416			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			

Build Alt. 2 2045 AM Peak SR 544 US 27 DLT for SR 544 3 EB Left Turn Lanes

(Partial DLT - East/West)

Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 07/06/2023



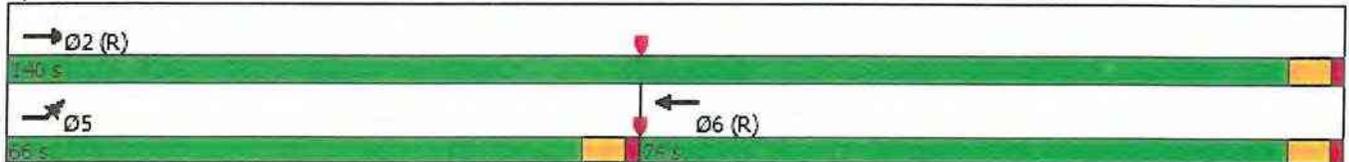
Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Reduced v/c Ratio	0.69	0.25	0.75			

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 25 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 17.6  
 Intersection Capacity Utilization 65.5%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service C

Splits and Phases: 1: SR 544 & SR 544 EB Left Turn



Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	✓	↑↑	↑↑		
Traffic Volume (vph)	803	0	345	942	0	0
Future Volume (vph)	803	0	345	942	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	1.00
Frt						
Flt Protected			0.950			
Satd. Flow (prot)	3438	0	3335	3343	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3438	0	3335	3343	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			45	30	
Link Distance (ft)	73			134	145	
Travel Time (s)	1.7			2.0	3.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	5%	8%	0%	8%
Adj. Flow (vph)	845	0	363	992	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	845	0	363	992	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2		1	2		
Detector Template	Thru		Left	Thru		
Leading Detector (ft)	100		20	100		
Trailing Detector (ft)	0		0	0		
Detector 1 Position(ft)	0		0	0		
Detector 1 Size(ft)	6		20	6		
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex		
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0		
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Prot	NA		
Protected Phases	2		1	6		
Permitted Phases						
Detector Phase	2		1	6		
Switch Phase						

(Partial DLT-East/West)

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	91.0		49.0	140.0		
Total Split (%)	65.0%		35.0%	100.0%		
Maximum Green (s)	85.0		43.0	134.0		
Yellow Time (s)	4.5 /		4.5 /	4.5 /		
All-Red Time (s)	1.5 /		1.5 /	1.5 /		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0		
Recall Mode	C-Max		None	C-Max		
Walk Time (s)	7.0			7.0		
Flash Dont Walk (s)	11.0			11.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	85.0		43.0	140.0		
Actuated g/C Ratio	0.61		0.31	1.00		
v/c Ratio	0.40		0.35	0.30		
Control Delay	0.7		38.9	0.2		
Queue Delay	1.3		0.0	0.0		
Total Delay	2.0		38.9	0.2		
LOS	A		D	A		
Approach Delay	2.0			10.6		
Approach LOS	A			B		
90th %ile Green (s)	85.0		43.0	134.0		
90th %ile Term Code	Coord		Hold	Coord		
70th %ile Green (s)	85.0		43.0	134.0		
70th %ile Term Code	Coord		Hold	Coord		
50th %ile Green (s)	85.0		43.0	134.0		
50th %ile Term Code	Coord		Hold	Coord		
30th %ile Green (s)	85.0		43.0	134.0		
30th %ile Term Code	Coord		Hold	Coord		
10th %ile Green (s)	85.0		43.0	134.0		
10th %ile Term Code	Coord		Hold	Coord		
Stops (vph)	64		263	0		
Fuel Used(gal)	3		9	7		
CO Emissions (g/hr)	223		597	486		
NOx Emissions (g/hr)	43		116	95		
VOC Emissions (g/hr)	52		138	113		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	0		132	0		
Queue Length 95th (ft)	0		178	0		
Internal Link Dist (ft)	1			54	65	
Turn Bay Length (ft)						
Base Capacity (vph)	2087		1024	3343		
Starvation Cap Reductn	969		0	0		
Spillback Cap Reductn	0		0	74		
Storage Cap Reductn	0		0	0		

(Partial DLT-East/West)

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.76		0.35	0.30		

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 10 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.40  
 Intersection Signal Delay: 7.3  
 Intersection Capacity Utilization 42.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 50: SR 544 WB Left Turn & SR 544



(Partial DLT - East/West)

Lanes, Volumes, Timings  
21: US 27 & SR 544 (Main Intersection)

07/10/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑	↑↑	↑↑↑		↑↑	↑↑↑	
Traffic Volume (vph)	0	712	370	0	526	231	277	1935	0	358	2457	0
Future Volume (vph)	0	712	370	0	526	231	277	1935	0	358	2457	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		225	600		400	800		850	775		900
Storage Lanes	0		1	0		1	2		0	2		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Flt Protected			0.850			0.850		0.950		0.950		
Satd. Flow (prot)	0	3505	1538	0	3438	1538	3400	4940	0	3335	4940	0
Flt Permitted							0.950			0.950		
Satd. Flow (perm)	0	3505	1538	0	3438	1538	3400	4940	0	3335	4940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60			60	
Link Distance (ft)		196			248			218			170	
Travel Time (s)		3.0			3.8			2.5			1.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	5%	5%	5%	3%	5%	0%	5%	5%	0%
Adj. Flow (vph)	0	734	381	0	542	238	286	1995	0	369	2533	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	734	381	0	542	238	286	1995	0	369	2533	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1		2	1	1	2		1	2	
Detector Template		Thru	Right		Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)		100	20		100	20	20	100		20	100	
Trailing Detector (ft)		0	0		0	0	0	0		0	0	
Detector 1 Position(ft)		0	0		0	0	0	0		0	0	
Detector 1 Size(ft)		6	20		6	20	20	6		20	6	
Detector 1 Type		CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	pm+ov		NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases		2	7		6	3	7	4		3	8	

Build Alt. 2 2045 PM Peak SR 544 US 27 DLT for SR 544 3 EB Left Turn Lanes

Synchro 11 Report

(Partial DLT - East/West)

Lanes, Volumes, Timings

21: US 27 & SR 544 (Main Intersection)

07/10/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6						
Detector Phase		2	7		6	3	7	4		3	8	
Switch Phase												
Minimum Initial (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)		24.0	11.0		24.0	11.0	11.0	24.0		11.0	24.0	
Total Split (s)		40.0	20.0		40.0	27.0	20.0	73.0		27.0	80.0	
Total Split (%)		28.6%	14.3%		28.6%	19.3%	14.3%	52.1%		19.3%	57.1%	
Maximum Green (s)		34.0	14.0		34.0	21.0	14.0	67.0		21.0	74.0	
Yellow Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)		1.5	1.5		1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)		6.0	6.0		6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag			Lead			Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?			Yes			Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode		C-Max	None		C-Max	None	None	None		None	None	
Act Effct Green (s)		34.0	53.8		34.0	62.7	13.8	65.3		22.7	74.2	
Actuated g/C Ratio		0.24	0.38		0.24	0.45	0.10	0.47		0.16	0.53	
v/c Ratio		0.86	0.64		0.65	0.35	0.85	0.87		0.68	0.97	
Control Delay		61.9	41.1		51.9	27.5	52.7	19.5		41.8	22.4	
Queue Delay		0.0	1.9		0.6	0.7	25.3	49.2		57.8	43.1	
Total Delay		61.9	43.0		52.5	28.2	78.0	68.8		99.6	65.5	
LOS		E	D		D	C	E	E		F	E	
Approach Delay		55.4			45.1			69.9			69.8	
Approach LOS		E			D			E			E	
Stops (vph)		658	299		465	149	242	1930		334	2184	
Fuel Used(gal)		20	8		13	4	9	53		11	62	
CO Emissions (g/hr)		1395	579		896	266	609	3711		757	4347	
NOx Emissions (g/hr)		271	113		174	52	118	722		147	846	
VOC Emissions (g/hr)		323	134		208	62	141	860		175	1008	
Dilemma Vehicles (#)		25	0		19	0	0	0		0	50	
Queue Length 50th (ft)		339	282		235	143	94	710		168	794	
Queue Length 95th (ft)		#427	400		299	213	m72	m587		224	#936	
Internal Link Dist (ft)		116			168			138			90	
Turn Bay Length (ft)			225			400	800			775		
Base Capacity (vph)		851	593		834	689	340	2364		541	2617	
Starvation Cap Reductn		0	0		78	209	58	1393		242	0	
Spillback Cap Reductn		0	97		0	0	0	309		0	596	
Storage Cap Reductn		0	0		0	0	0	0		0	0	
Reduced v/c Ratio		0.86	0.77		0.72	0.50	1.01	2.05		1.23	1.25	

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 1 (1%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97

Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

07/10/2023

Intersection Signal Delay: 64.9

Intersection LOS: E

Intersection Capacity Utilization 90.1%

ICU Level of Service E

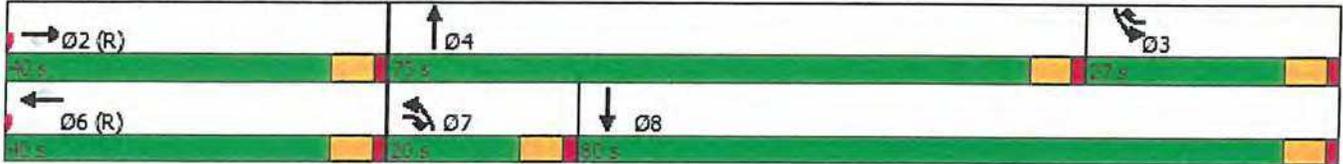
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

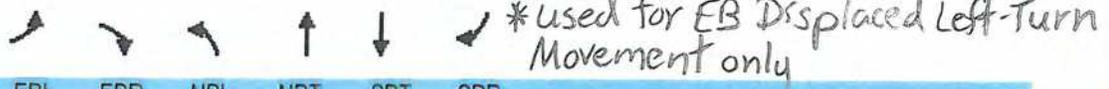
Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

07/10/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑↑↑			↑↑↑	↓↓↓↓	↙
Traffic Volume (vph)	1047	0	0	2166	2815	997
Future Volume (vph)	1047	0	0	2166	2815	997
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.94	1.00	1.00	0.91	0.81	1.00
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	4848	0	0	4940	7329	1568
Flt Permitted	0.950					
Satd. Flow (perm)	4848	0	0	4940	7329	1568
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						406
Link Speed (mph)	30			30	60	
Link Distance (ft)	421			170	210	
Travel Time (s)	9.6			3.9	2.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	0%	5%	5%	3%
Adj. Flow (vph)	1079	0	0	2233	2902	1028
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	0	0	2233	2902	1028
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	36			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1			2	2	1
Detector Template	Left			Thru	Thru	Right
Leading Detector (ft)	20			100	100	20
Trailing Detector (ft)	0			0	0	0
Detector 1 Position(ft)	0			0	0	0
Detector 1 Size(ft)	20			6	6	20
Detector 1 Type	CI+Ex			CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	0.0
Detector 1 Queue (s)	0.0			0.0	0.0	0.0
Detector 1 Delay (s)	0.0			0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	Free
Protected Phases	2			4	8	
Permitted Phases						Free
Detector Phase	2			4	8	
Switch Phase						

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

07/10/2023



\*used for EB Displaced Left-Turn movement only

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	24.0			24.0	24.0	
Total Split (s)	51.0			89.0	89.0	
Total Split (%)	36.4%			63.6%	63.6%	
Maximum Green (s)	45.0			83.0	83.0	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	C-Max			Max	Max	
Walk Time (s)	7.0			7.0	7.0	
Flash Dont Walk (s)	11.0			11.0	11.0	
Pedestrian Calls (#/hr)	0			0	0	
Act Effct Green (s)	45.0			83.0	83.0	140.0
Actuated g/C Ratio	0.32			0.59	0.59	1.00
v/c Ratio	0.69			0.76	0.67	0.66
Control Delay	18.6			10.4	20.2	2.2
Queue Delay	0.0			7.2	29.8	0.0
Total Delay	18.6			17.6	50.0	2.2
LOS	B			B	D	A
Approach Delay	18.6			17.6	37.5	
Approach LOS	B			B	D	
Stops (vph)	898			2010	1815	1
Fuel Used(gal)	14			19	73	8
CO Emissions (g/hr)	991			1297	5071	549
NOx Emissions (g/hr)	193			252	987	107
VOC Emissions (g/hr)	230			301	1175	127
Dilemma Vehicles (#)	0			0	101	0
Queue Length 50th (ft)	306			738	420	0
Queue Length 95th (ft)	358			591	448	0
Internal Link Dist (ft)	341			90	130	
Turn Bay Length (ft)						
Base Capacity (vph)	1558			2928	4345	1568
Starvation Cap Reductn	0			666	0	0
Spillback Cap Reductn	0			0	1607	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.69			0.99	1.06	0.66

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 0 (0%), Referenced to phase 2:EBL, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.76

(Partial DLT - East/West)

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection)

07/10/2023

Intersection Signal Delay: 28.5

Intersection LOS: C

Intersection Capacity Utilization 71.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: US 27 & SR 544 EB Left Turn



Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection\*)

07/10/2023



\*used for WB Displaced Left-Turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↘		↑↑↑↑	↗		↓↓↓
Traffic Volume (vph)	296	0	2212	259	0	2827
Future Volume (vph)	296	0	2212	259	0	2827
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	0.81	1.00	1.00	0.91
Frnt				0.850		
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	7329	1538	0	4940
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	7329	1538	0	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				134		
Link Speed (mph)	30		60			30
Link Distance (ft)	303		198			218
Travel Time (s)	6.9		2.3			5.0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	5%	5%	0%	5%
Adj. Flow (vph)	305	0	2280	267	0	2914
Shared Lane Traffic (%)						
Lane Group Flow (vph)	305	0	2280	267	0	2914
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	24		24			24
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Number of Detectors	1		2	1		2
Detector Template	Left		Thru	Right		Thru
Leading Detector (ft)	20		100	20		100
Trailing Detector (ft)	0		0	0		0
Detector 1 Position(ft)	0		0	0		0
Detector 1 Size(ft)	20		6	20		6
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex		CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		0.0
Detector 1 Queue (s)	0.0		0.0	0.0		0.0
Detector 1 Delay (s)	0.0		0.0	0.0		0.0
Detector 2 Position(ft)			94			94
Detector 2 Size(ft)			6			6
Detector 2 Type			CI+Ex			CI+Ex
Detector 2 Channel						
Detector 2 Extend (s)			0.0			0.0
Turn Type	Prot		NA	Free		NA
Protected Phases	2		4			8
Permitted Phases				Free		
Detector Phase	2		4			8
Switch Phase						

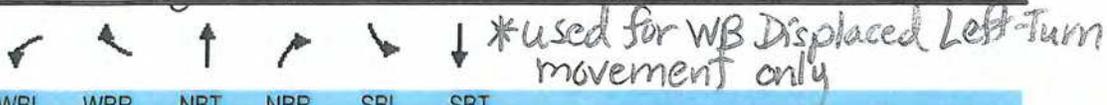
(Partial DLT - East/West)

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn

(Phantom Intersection\*)

07/10/2023



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	5.0		5.0			5.0
Minimum Split (s)	24.0		24.0			24.0
Total Split (s)	25.0		42.0			73.0
Total Split (%)	17.9%		30.0%			52.1%
Maximum Green (s)	19.0		36.0			67.0
Yellow Time (s)	4.5		4.5			4.5
All-Red Time (s)	1.5		1.5			1.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0			3.0
Recall Mode	Max		Max			Max
Walk Time (s)	7.0		7.0			7.0
Flash Dont Walk (s)	11.0		11.0			11.0
Pedestrian Calls (#/hr)	0		0			0
Act Effct Green (s)	19.0		36.0	140.0		67.0
Actuated g/C Ratio	0.14		0.26	1.00		0.48
v/c Ratio	0.67		1.21	0.17		1.23
Control Delay	46.5		143.9	0.2		125.6
Queue Delay	0.0		1.5	0.0		0.0
Total Delay	46.5		145.4	0.2		125.6
LOS	D		F	A		F
Approach Delay	46.5		130.2			125.6
Approach LOS	D		F			F
Stops (vph)	297		1849	0		2224
Fuel Used(gal)	5		121	2		89
CO Emissions (g/hr)	383		8477	129		6246
NOx Emissions (g/hr)	75		1649	25		1215
VOC Emissions (g/hr)	89		1965	30		1448
Dilemma Vehicles (#)	0		65	0		0
Queue Length 50th (ft)	153		~624	0		~1206
Queue Length 95th (ft)	203		#684	0		m#1255
Internal Link Dist (ft)	223		118			138
Turn Bay Length (ft)						
Base Capacity (vph)	452		1884	1538		2364
Starvation Cap Reductn	0		0	0		5
Spillback Cap Reductn	0		664	0		0
Storage Cap Reductn	0		0	0		0
Reduced v/c Ratio	0.67		1.87	0.17		1.24

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 5 (4%), Referenced to phase 6:, Start of Green  
 Natural Cycle: 150  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 1.23

(Partial DLT - East/West)

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection)

07/10/2023

Intersection Signal Delay: 123.4

Intersection LOS: F

Intersection Capacity Utilization 73.1%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

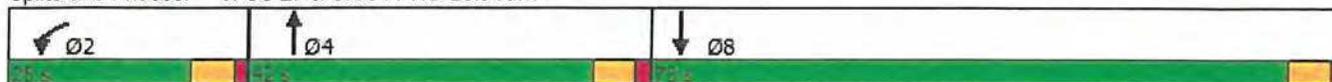
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: US 27 & SR 544 WB Left Turn



Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 07/10/2023



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations	↑↑	↑↑	↑↑			
Traffic Volume (vph)	1047	1082	803	0	0	0
Future Volume (vph)	1047	1082	803	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frnt						
Flt Protected	0.950					
Satd. Flow (prot)	3335	3505	3438	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3335	3505	3438	0	0	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (mph)		45	30		30	
Link Distance (ft)		486	221		222	
Travel Time (s)		7.4	5.0		5.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	0%	0%	0%
Adj. Flow (vph)	1079	1115	828	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	1115	828	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		24	24		0	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2			
Detector Template	Left	Thru	Thru			
Leading Detector (ft)	20	100	100			
Trailing Detector (ft)	0	0	0			
Detector 1 Position(ft)	0	0	0			
Detector 1 Size(ft)	20	6	6			
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex			
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0	0.0			
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		CI+Ex	CI+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Prot	NA	NA			
Protected Phases	5	2	6			
Permitted Phases						
Detector Phase	5	2	6			
Switch Phase						

Partial DLT (East/West)

Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn

*(EB Left-Turn Crossover Intersection)*

07/10/2023



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Minimum Initial (s)	5.0	5.0	5.0			
Minimum Split (s)	11.0	24.0	24.0			
Total Split (s)	77.0	140.0	63.0			
Total Split (%)	55.0%	100.0%	45.0%			
Maximum Green (s)	71.0	134.0	57.0			
Yellow Time (s)	4.5	4.5	4.5			
All-Red Time (s)	1.5	1.5	1.5			
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0	6.0			
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0			
Recall Mode	None	C-Max	C-Max			
Walk Time (s)		7.0	7.0			
Flash Dont Walk (s)		11.0	11.0			
Pedestrian Calls (#/hr)		0	0			
Act Effct Green (s)	71.0	140.0	57.0			
Actuated g/C Ratio	0.51	1.00	0.41			
v/c Ratio	0.64	0.32	0.59			
Control Delay	27.3	0.2	16.2			
Queue Delay	0.0	0.0	0.0			
Total Delay	27.3	0.2	16.2			
LOS	C	A	B			
Approach Delay		13.6	16.2			
Approach LOS		B	B			
Stops (vph)	740	0	734			
Fuel Used(gal)	18	3	11			
CO Emissions (g/hr)	1281	242	734			
NOx Emissions (g/hr)	249	47	143			
VOC Emissions (g/hr)	297	56	170			
Dilemma Vehicles (#)	0	0	0			
Queue Length 50th (ft)	360	0	277			
Queue Length 95th (ft)	432	0	492			
Internal Link Dist (ft)		406	141	142		
Turn Bay Length (ft)						
Base Capacity (vph)	1691	3505	1399			
Starvation Cap Reductn	0	0	0			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.64	0.32	0.59			

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 36 (26%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.64

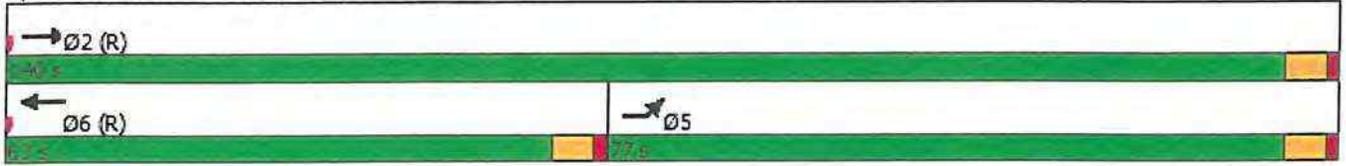
Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 07/10/2023

Intersection Signal Delay: 14.3  
Intersection Capacity Utilization 62.1%  
Analysis Period (min) 15

Intersection LOS: B  
ICU Level of Service B

Splits and Phases: 1: SR 544 & SR 544 EB Left Turn



Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 07/10/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑	↑↑		
Traffic Volume (vph)	1070	0	296	757	0	0
Future Volume (vph)	1070	0	296	757	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	3505	0	3335	3438	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3505	0	3335	3438	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			45	30	
Link Distance (ft)	73			134	145	
Travel Time (s)	1.7			2.0	3.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	5%	5%	0%	0%
Adj. Flow (vph)	1103	0	305	780	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1103	0	305	780	0	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2		1	2		
Detector Template	Thru		Left	Thru		
Leading Detector (ft)	100		20	100		
Trailing Detector (ft)	0		0	0		
Detector 1 Position(ft)	0		0	0		
Detector 1 Size(ft)	6		20	6		
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex		
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0		
Detector 1 Queue (s)	0.0		0.0	0.0		
Detector 1 Delay (s)	0.0		0.0	0.0		
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		Prot	NA		
Protected Phases	4		3	8		
Permitted Phases						
Detector Phase	4		3	8		
Switch Phase						

Partial DLT (East/West)

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 07/10/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	100.0		40.0	140.0		
Total Split (%)	71.4%		28.6%	100.0%		
Maximum Green (s)	94.0		34.0	134.0		
Yellow Time (s)	4.5		4.5	4.5		
All-Red Time (s)	1.5		1.5	1.5		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0		3.0	3.0		
Recall Mode	None		None	None		
Walk Time (s)	7.0			7.0		
Flash Dont Walk (s)	11.0			11.0		
Pedestrian Calls (#/hr)	0			0		
Act Effct Green (s)	109.9		18.1	140.0		
Actuated g/C Ratio	0.78		0.13	1.00		
v/c Ratio	0.40		0.71	0.23		
Control Delay	1.1		67.3	0.2		
Queue Delay	0.8		0.0	0.0		
Total Delay	1.9		67.3	0.2		
LOS	A		E	A		
Approach Delay	1.9			19.0		
Approach LOS	A			B		
Stops (vph)	101		278	0		
Fuel Used(gal)	4		10	6		
CO Emissions (g/hr)	309		677	390		
NOx Emissions (g/hr)	60		132	76		
VOC Emissions (g/hr)	72		157	90		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	1		139	0		
Queue Length 95th (ft)	150		184	0		
Internal Link Dist (ft)	1			54	65	
Turn Bay Length (ft)						
Base Capacity (vph)	2750		809	3438		
Starvation Cap Reductn	1235		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.73		0.38	0.23		

Intersection Summary

Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 140  
 Offset: 22 (16%), Referenced to phase 2: and 6:, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544

*(WB Left-Turn Crossover Intersection)*

07/10/2023

Intersection Signal Delay: 10.4

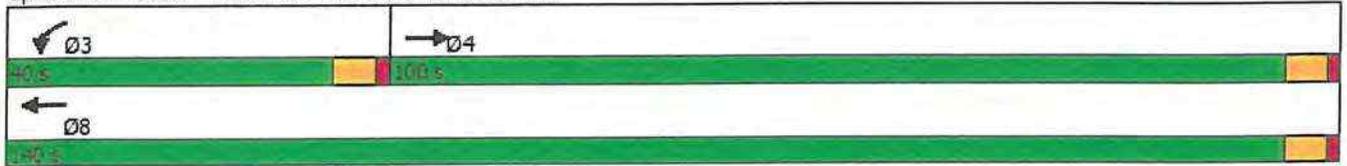
Intersection LOS: B

Intersection Capacity Utilization 48.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 50: SR 544 WB Left Turn & SR 544



**WEIGHTED AVERAGE DELAY CALCULATIONS FOR SR 544/US 27 PDLT INTERSECTION (E/W)**

MOVEMENT	2045 AM PEAK HOUR				2045 PM PEAK HOUR			
	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	TOTAL DELAY	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	TOTAL DELAY
NB LT	454	125.9	3.0	58,520.6	277	78.0	16.2	26,093.4
NB TH	2,339	25.8	0.0	60,346.2	1,935	68.8	0.0	133,128.0
NB RT	227	0.0	0.0	0.0	259	0.0	0.0	0.0
ALL NB VEHICLES	3,020	39.4		118,866.8	2,471	64.4		159,221.4
SB LT	253	166.2	2.0	42,554.6	358	99.6	1.9	36,337.0
SB TH	1,839	23.8	0.0	43,768.2	2,457	65.5	0.0	160,933.5
SB RT	1,027	0.0	0.0	0.0	997	0.0	0.0	0.0
ALL SB VEHICLES	3,119	27.7		86,322.8	3,812	51.7		197,270.5
WB LT	345	28.1	38.9	23,115.0	296	46.5	67.3	33,684.8
WB TH	595	58.9	3.0	36,830.5	526	52.5	16.2	36,136.2
WB RT	347	100.5	0.0	34,873.5	231	28.2	0.0	6,514.2
ALL WB VEHICLES	1,287	73.7		94,819.0	1,053	72.5		76,335.2
EB LT	930	27.3	49.3	71,238.0	1,047	18.6	27.3	48,057.3
EB TH	550	54.4	2.0	31,020.0	712	61.9	1.9	45,425.6
EB RT	262	28.8	0.0	7,545.6	370	43.0	0.0	15,910.0
ALL EB VEHICLES	1,742	63.0		109,803.6	2,129	51.4		109,392.9
ALL VEHICLES	9,168	44.7		409,812.2	9,465	57.3		542,220.0

<sup>(1)</sup> Average delay (in seconds per vehicle) at the main intersection

<sup>(2)</sup> Average delay (in seconds per vehicle) at the displaced left-turn crossover intersection

Fully Displaced Left-Turn Intersection Alternative (North/South and East/West)

Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

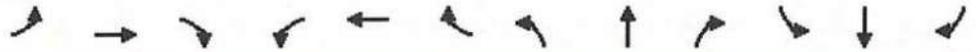
03/23/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑↑			↑↑↑	
Traffic Volume (vph)	0	550	0	0	595	0	0	2339	0	0	1839	0
Future Volume (vph)	0	550	0	0	595	0	0	2339	0	0	1839	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		225	600		400	800		850	775		900
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frts												
Flt Protected												
Satd. Flow (prot)	0	3438	0	0	3343	0	0	4940	0	0	4940	0
Flt Permitted												
Satd. Flow (perm)	0	3438	0	0	3343	0	0	4940	0	0	4940	0
Right Turn on Red												
			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60			60	
Link Distance (ft)		196			248			218			170	
Travel Time (s)		3.0			3.8			2.5			1.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	8%	5%	5%	5%	8%	8%	5%	5%
Adj. Flow (vph)	0	579	0	0	626	0	0	2462	0	0	1936	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	579	0	0	626	0	0	2462	0	0	1936	0
Turn Type												
		NA			NA			NA			NA	
Protected Phases												
		4			8			2			6	
Permitted Phases												
Detector Phase												
		4			8			2			6	
Switch Phase												
Minimum Initial (s)												
		5.0			5.0			5.0			5.0	
Minimum Split (s)												
		24.0			24.0			24.0			24.0	
Total Split (s)												
		33.0			33.0			57.0			57.0	
Total Split (%)												
		36.7%			36.7%			63.3%			63.3%	
Yellow Time (s)												
		4.5			4.5			4.5			4.5	
All-Red Time (s)												
		1.5			1.5			1.5			1.5	
Lost Time Adjust (s)												
		0.0			0.0			0.0			0.0	
Total Lost Time (s)												
		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
		None			None			C-Max			C-Max	
Act Effct Green (s)												
		22.3			22.3			55.7			55.7	
Actuated g/C Ratio												
		0.25			0.25			0.62			0.62	
v/c Ratio												
		0.68			0.76			0.80			0.63	
Control Delay												
		6.7			8.7			7.1			1.4	
Queue Delay												
		0.0			0.0			0.1			0.0	
Total Delay												
		6.7			8.7			7.2			1.4	
LOS												
		A			A			A			A	
Approach Delay												
		6.7			8.7			7.2			1.4	
Approach LOS												
		A			A			A			A	
Stops (vph)												
		28			37			1683			41	

Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

03/23/2021

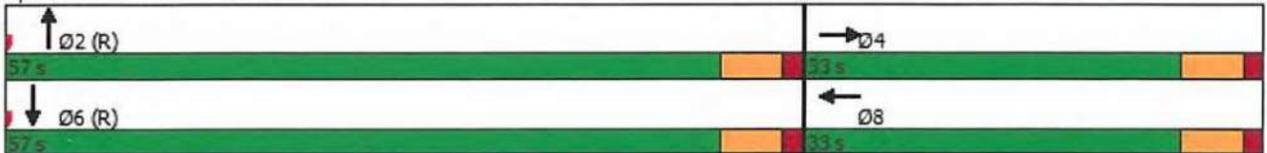


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Fuel Used(gal)		2			2			44			3	
CO Emissions (g/hr)		138			173			3066			243	
NOx Emissions (g/hr)		27			34			597			47	
VOC Emissions (g/hr)		32			40			711			56	
Dilemma Vehicles (#)		24			28			116			80	
Queue Length 50th (ft)		7			12			359			9	
Queue Length 95th (ft)		10			11			150			10	
Internal Link Dist (ft)		116			168			138			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1031			1002			3059			3059	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			87			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.56			0.62			0.83			0.63	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 5.3  
 Intersection LOS: A  
 Intersection Capacity Utilization 71.6%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

11: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/23/2021



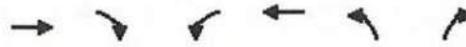
\*used for the NB Displaced Left Turn movement only

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	
Traffic Volume (vph)	550	262	0	595	454	0
Future Volume (vph)	550	262	0	595	454	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	0.850					
Fit Protected					0.950	
Satd. Flow (prot)	3438	1538	0	3343	3335	0
Fit Permitted					0.950	
Satd. Flow (perm)	3438	1538	0	3343	3335	0
Right Turn on Red						Yes
Satd. Flow (RTOR)	276					
Link Speed (mph)	45			30	30	
Link Distance (ft)	141			50	339	
Travel Time (s)	2.1			1.1	7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	0%	8%	5%	0%
Adj. Flow (vph)	579	276	0	626	478	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	579	276	0	626	478	0
Turn Type	NA	Perm	NA		Prot	
Protected Phases	4		8		2	
Permitted Phases	4					
Detector Phase	4	4	8		2	
Switch Phase						
Minimum Initial (s)	5.0		5.0		5.0	
Minimum Split (s)	24.0		24.0		24.0	
Total Split (s)	33.0		33.0		57.0	
Total Split (%)	36.7%	36.7%	36.7%		63.3%	
Yellow Time (s)	4.5		4.5		4.5	
All-Red Time (s)	1.5		1.5		1.5	
Lost Time Adjust (s)	0.0		0.0		0.0	
Total Lost Time (s)	6.0		6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	None		C-Max	
Act Effct Green (s)	22.6	22.6	22.6		55.4	
Actuated g/C Ratio	0.25	0.25	0.25		0.62	
v/c Ratio	0.67	0.47	0.75		0.23	
Control Delay	34.1	6.0	16.2		1.7	
Queue Delay	0.0		0.0		0.0	
Total Delay	34.1	6.0	16.2		1.8	
LOS	C	A	B		A	
Approach Delay	25.0		16.2		1.8	
Approach LOS	C		B		A	
Stops (vph)	473	28	102		5	
Fuel Used(gal)	11	1	4		3	
CO Emissions (g/hr)	768	90	256		191	
NOx Emissions (g/hr)	149	17	50		37	

Lanes, Volumes, Timings

11: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/23/2021



\*used for the NB Displaced Left-Turn movement only

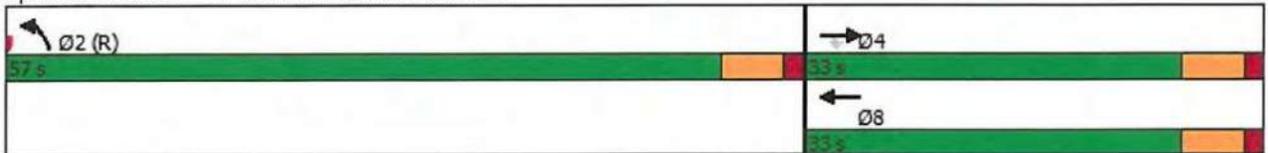
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
VOC Emissions (g/hr)	178	21		59	44	
Dilemma Vehicles (#)	26	0		0	0	
Queue Length 50th (ft)	155	0		31	0	
Queue Length 95th (ft)	198	55		43	0	
Internal Link Dist (ft)	61			1	259	
Turn Bay Length (ft)						
Base Capacity (vph)	1031	654		1002	2054	
Starvation Cap Reductn	0	4		0	0	
Spillback Cap Reductn	0	0		0	192	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.56	0.42		0.62	0.26	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 16.5  
 Intersection Capacity Utilization 39.4%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

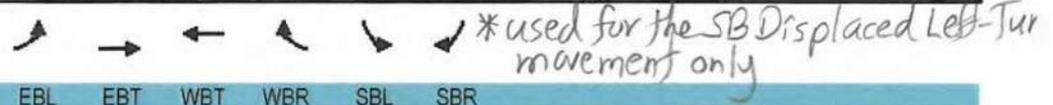
Splits and Phases: 11: US 27 NB Left Turn & SR 544



Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/23/2021



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↓	↓
Traffic Volume (vph)	0	550	595	347	253	0
Future Volume (vph)	0	550	595	347	253	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Fr't				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	3438	3343	1538	3242	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	3438	3343	1538	3242	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				365		
Link Speed (mph)		30	45		30	
Link Distance (ft)		248	114		344	
Travel Time (s)		5.6	1.7		7.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	8%	5%	8%	0%
Adj. Flow (vph)	0	579	626	365	266	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	579	626	365	266	0
Turn Type		NA	NA	Perm	Prot	
Protected Phases		4	8		6	
Permitted Phases				8		
Detector Phase		4	8	8	6	
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	
Minimum Split (s)		24.0	24.0	24.0	24.0	
Total Split (s)		33.0	33.0	33.0	57.0	
Total Split (%)		36.7%	36.7%	36.7%	63.3%	
Yellow Time (s)		4.5	4.5	4.5	4.5	
All-Red Time (s)		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		None	None	None	C-Max	
Act Effct Green (s)		23.5	23.5	23.5	54.5	
Actuated g/C Ratio		0.26	0.26	0.26	0.61	
v/c Ratio		0.65	0.72	0.54	0.14	
Control Delay		7.7	34.8	6.0	6.3	
Queue Delay		0.1	20.9	0.8	0.0	
Total Delay		7.8	55.7	6.8	6.3	
LOS		A	E	A	A	
Approach Delay		7.8	37.7		6.3	
Approach LOS		A	D		A	
Stops (vph)		42	518	36	107	
Fuel Used(gal)		2	11	1	2	
CO Emissions (g/hr)		151	796	91	152	
NOx Emissions (g/hr)		29	155	18	30	

Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the SB Displaced Left-Turn movement only

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
VOC Emissions (g/hr)		35	184	21	35	
Dilemma Vehicles (#)		0	30	0	0	
Queue Length 50th (ft)		8	167	0	79	
Queue Length 95th (ft)		22	217	62	121	
Internal Link Dist (ft)		168	34		264	
Turn Bay Length (ft)						
Base Capacity (vph)		1031	1002	716	1964	
Starvation Cap Reductn		0	381	135	0	
Spillback Cap Reductn		36	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.58	1.01	0.63	0.14	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 23.7  
 Intersection Capacity Utilization 33.7%  
 Analysis Period (min) 15

Intersection LOS: C  
 ICU Level of Service A

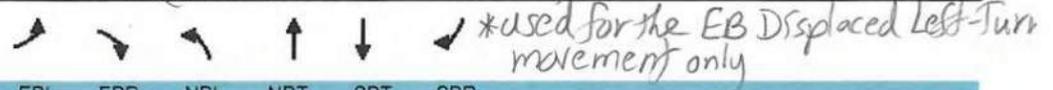
Splits and Phases: 56: SR 544 & US 27 SB Left Turn



Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

03/23/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑			↑↑↑	↑↑↑	↑
Traffic Volume (vph)	930	0	0	2339	1839	1027
Future Volume (vph)	930	0	0	2339	1839	1027
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frnt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	0	4940	4940	1538
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	0	4940	4940	1538
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						671
Link Speed (mph)	30			30	60	
Link Distance (ft)	421			170	210	
Travel Time (s)	9.6			3.9	2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	0%	5%	5%	5%
Adj. Flow (vph)	979	0	0	2462	1936	1081
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	0	0	2462	1936	1081
Turn Type	Prot			NA	NA	Free
Protected Phases	4			2	6	
Permitted Phases						Free
Detector Phase	4			2	6	
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	24.0			24.0	24.0	
Total Split (s)	33.0			57.0	57.0	
Total Split (%)	36.7%			63.3%	63.3%	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max	C-Max	
Act Effct Green (s)	27.0			51.0	51.0	90.0
Actuated g/C Ratio	0.30			0.57	0.57	1.00
v/c Ratio	0.98			0.88	0.69	0.70
Control Delay	33.8			6.7	15.3	2.2
Queue Delay	1.7			26.2	1.3	0.0
Total Delay	35.4			33.0	16.6	2.2
LOS	D			C	B	A
Approach Delay	35.4			33.0	11.4	
Approach LOS	D			C	B	
Stops (vph)	702			1442	1234	1
Fuel Used(gal)	15			14	37	3
CO Emissions (g/hr)	1044			998	2569	180
NOx Emissions (g/hr)	203			194	500	35

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the EB Displaced Left-Turn movement only

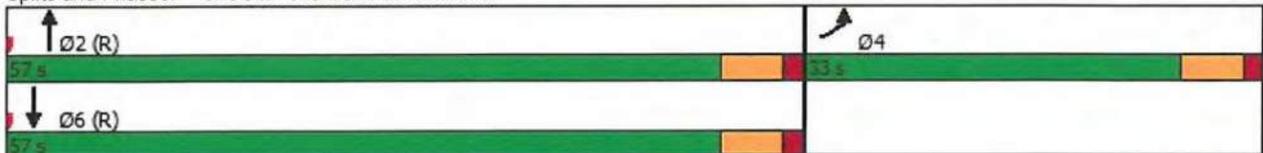
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)	242			231	595	42
Dilemma Vehicles (#)	0			0	102	0
Queue Length 50th (ft)	17			24	267	0
Queue Length 95th (ft)	m#376			46	320	0
Internal Link Dist (ft)	341			90	130	
Turn Bay Length (ft)						
Base Capacity (vph)	1000			2799	2799	1538
Starvation Cap Reductn	0			0	604	0
Spillback Cap Reductn	9			460	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.99			1.05	0.88	0.70

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 80  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 23.3  
 Intersection Capacity Utilization 81.7%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: US 27 & SR 544 EB Left Turn



Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection\*)

03/23/2021

\*used for the WB D is placed Left-Turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↶↶		↶↶↶	↶		↶↶↶
Traffic Volume (vph)	345	0	2339	227	0	1839
Future Volume (vph)	345	0	2339	227	0	1839
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Fr t				0.850		
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	4940	1495	0	4940
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	4940	1495	0	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				117		
Link Speed (mph)	30		60			30
Link Distance (ft)	303		198			218
Travel Time (s)	6.9		2.3			5.0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	5%	8%	0%	5%
Adj. Flow (vph)	363	0	2462	239	0	1936
Shared Lane Traffic (%)						
Lane Group Flow (vph)	363	0	2462	239	0	1936
Turn Type	Prot		NA	Free		NA
Protected Phases	8		2			6
Permitted Phases				Free		
Detector Phase	8		2			6
Switch Phase						
Minimum Initial (s)	5.0		5.0			5.0
Minimum Split (s)	24.0		24.0			24.0
Total Split (s)	33.0		57.0			57.0
Total Split (%)	36.7%		63.3%			63.3%
Yellow Time (s)	4.5		4.5			4.5
All-Red Time (s)	1.5		1.5			1.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max			C-Max
Act Effct Green (s)	15.1		62.9	90.0		62.9
Actuated g/C Ratio	0.17		0.70	1.00		0.70
v/c Ratio	0.65		0.71	0.16		0.56
Control Delay	11.9		9.9	0.2		2.0
Queue Delay	0.0		0.3	0.0		0.0
Total Delay	11.9		10.2	0.2		2.0
LOS	B		B	A		A
Approach Delay	11.9		9.3			2.0
Approach LOS	B		A			A
Stops (vph)	181		1319	0		105
Fuel Used(gal)	3		38	0		4
CO Emissions (g/hr)	212		2687	32		311
NOx Emissions (g/hr)	41		523	6		60

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection\*)

03/23/2021



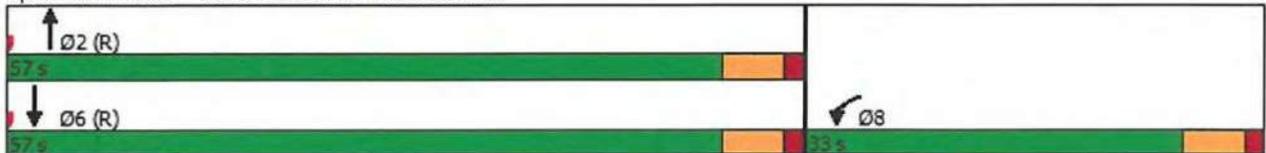
\*used for the WB Displaced Left-Turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
VOC Emissions (g/hr)	49		623	7		72
Dilemma Vehicles (#)	0		130	0		0
Queue Length 50th (ft)	112		264	0		24
Queue Length 95th (ft)	0		375	0		27
Internal Link Dist (ft)	223		118			138
Turn Bay Length (ft)						
Base Capacity (vph)	1000		3452	1495		3452
Starvation Cap Reductn	0		209	0		101
Spillback Cap Reductn	0		356	0		140
Storage Cap Reductn	0		0	0		0
Reduced v/c Ratio	0.36		0.80	0.16		0.58

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 6.7  
 Intersection LOS: A  
 Intersection Capacity Utilization 65.0%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 6: US 27 & SR 544 WB Left Turn



Lanes, Volumes, Timings

9: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/23/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations			↔↔	↑↑↑	↑↑↑	
Traffic Volume (vph)	0	0	454	2566	2184	0
Future Volume (vph)	0	0	454	2566	2184	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3335	4940	4940	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3335	4940	4940	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	380			788	104	
Travel Time (s)	8.6			9.0	2.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	5%	5%	5%	2%
Adj. Flow (vph)	0	0	478	2701	2299	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	478	2701	2299	0
Turn Type			Prot	NA	NA	
Protected Phases			5	2	6	
Permitted Phases						
Detector Phase			5	2	6	
Switch Phase						
Minimum Initial (s)			5.0	5.0	5.0	
Minimum Split (s)			11.0	24.0	24.0	
Total Split (s)			57.0	90.0	33.0	
Total Split (%)			63.3%	100.0%	36.7%	
Yellow Time (s)			4.5	4.5	4.5	
All-Red Time (s)			1.5	1.5	1.5	
Lost Time Adjust (s)			0.0	0.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			None	C-Max	C-Max	
Act Effct Green (s)			18.9	90.0	59.1	
Actuated g/C Ratio			0.21	1.00	0.66	
v/c Ratio			0.68	0.55	0.71	
Control Delay			37.6	0.4	5.6	
Queue Delay			0.0	0.1	0.0	
Total Delay			37.6	0.5	5.6	
LOS			D	A	A	
Approach Delay				6.1	5.6	
Approach LOS				A	A	
Stops (vph)			401	1	566	
Fuel Used(gal)			15	13	11	
CO Emissions (g/hr)			1025	932	752	
NOx Emissions (g/hr)			199	181	146	

Lanes, Volumes, Timings

9: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/23/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)			237	216	174	
Dilemma Vehicles (#)			0	0	0	
Queue Length 50th (ft)			129	0	106	
Queue Length 95th (ft)			168	0	117	
Internal Link Dist (ft)	300			708	24	
Turn Bay Length (ft)						
Base Capacity (vph)			1889	4940	3243	
Starvation Cap Reductn			0	0	14	
Spillback Cap Reductn			0	514	0	
Storage Cap Reductn			0	0	0	
Reduced v/c Ratio			0.25	0.61	0.71	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	31 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	55
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.71
Intersection Signal Delay:	5.9
Intersection LOS:	A
Intersection Capacity Utilization:	65.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 9: US 27 & US 27 NB Left Turn



Lanes, Volumes, Timings

7: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/23/2021



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↑↑		↙↘	↑↑↑		
Traffic Volume (vph)	3269	0	253	2866	0	0
Future Volume (vph)	3269	0	253	2866	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	4940	0	3242	4940	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	4940	0	3242	4940	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	55			829	291	
Travel Time (s)	1.3			9.4	6.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	8%	5%	0%	0%
Adj. Flow (vph)	3441	0	266	3017	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3441	0	266	3017	0	0
Turn Type	NA		Prot	NA		
Protected Phases	2		1	6		
Permitted Phases						
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	33.0		57.0	90.0		
Total Split (%)	36.7%		63.3%	100.0%		
Yellow Time (s)	4.5		4.5	4.5		
All-Red Time (s)	1.5		1.5	1.5		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max		
Act Effct Green (s)	65.1		12.9	90.0		
Actuated g/C Ratio	0.72		0.14	1.00		
v/c Ratio	0.96		0.57	0.61		
Control Delay	12.3		40.5	0.6		
Queue Delay	0.3		0.0	0.1		
Total Delay	12.6		40.5	0.6		
LOS	B		D	A		
Approach Delay	12.6			3.9		
Approach LOS	B			A		
Stops (vph)	1958		227	1		
Fuel Used(gal)	27		8	16		
CO Emissions (g/hr)	1892		592	1100		
NOx Emissions (g/hr)	368		115	214		

Lanes, Volumes, Timings

7: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/23/2021

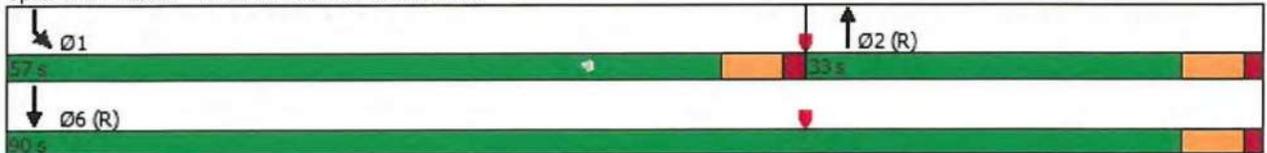


Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
VOC Emissions (g/hr)	439		137	255		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	244		73	0		
Queue Length 95th (ft)	m#838		107	0		
Internal Link Dist (ft)	1			749	211	
Turn Bay Length (ft)						
Base Capacity (vph)	3572		1837	4940		
Starvation Cap Reductn	16		0	0		
Spillback Cap Reductn	0		0	454		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.97		0.14	0.67		

Intersection Summary

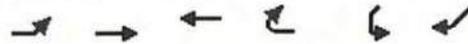
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 28 (31%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 70  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 8.4  
 Intersection Capacity Utilization 80.4%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: US 27 & US 27 SB Left Turn



Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection) 03/23/2021



Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations	↔↔	↑↑	↑↑			
Traffic Volume (vph)	930	812	1049	0	0	0
Future Volume (vph)	930	812	1049	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
<b>Frnt</b>						
Flt Protected	0.950					
Satd. Flow (prot)	3335	3438	3343	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3335	3438	3343	0	0	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (mph)		45	30		30	
Link Distance (ft)		486	221		222	
Travel Time (s)		7.4	5.0		5.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	8%	2%	2%	2%
Adj. Flow (vph)	979	855	1104	0	0	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	979	855	1104	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	7	4	8			
Permitted Phases						
Detector Phase	7	4	8			
<b>Switch Phase</b>						
Minimum Initial (s)	5.0	5.0	5.0			
Minimum Split (s)	11.0	24.0	24.0			
Total Split (s)	33.0	90.0	57.0			
Total Split (%)	36.7%	100.0%	63.3%			
Yellow Time (s)	4.5	4.5	4.5			
All-Red Time (s)	1.5	1.5	1.5			
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0	6.0			
Lead/Lag	Lead		Lag			
<b>Lead-Lag Optimize?</b>						
Recall Mode	None	None	None			
Act Effct Green (s)	31.4	90.0	46.6			
Actuated g/C Ratio	0.35	1.00	0.52			
v/c Ratio	0.84	0.25	0.64			
Control Delay	35.3	0.2	3.4			
Queue Delay	0.0	0.0	0.9			
Total Delay	35.3	0.2	4.3			
LOS	D	A	A			
Approach Delay		18.9	4.3			
Approach LOS		B	A			
Stops (vph)	788	0	277			
Fuel Used(gal)	19	3	5			
CO Emissions (g/hr)	1358	181	365			
NOx Emissions (g/hr)	264	35	71			

Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection)

03/23/2021

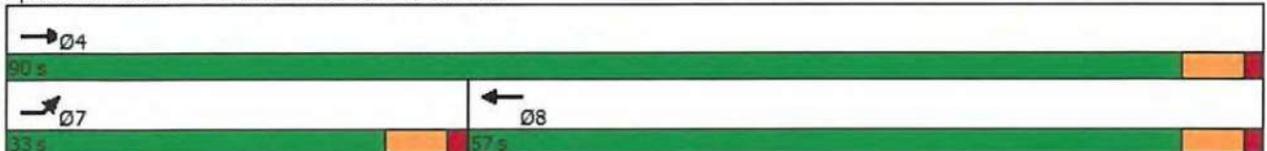


Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
VOC Emissions (g/hr)	315	42	85			
Dilemma Vehicles (#)	0	0	0			
Queue Length 50th (ft)	252	0	0			
Queue Length 95th (ft)	#392	0	51			
Internal Link Dist (ft)		406	141		142	
Turn Bay Length (ft)						
Base Capacity (vph)	1163	3438	1894			
Starvation Cap Reductn	0	0	470			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.84	0.25	0.78			

Intersection Summary

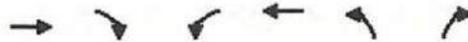
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 43 (48%), Referenced to phase 2: and 6:, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.84  
 Intersection Signal Delay: 13.4  
 Intersection LOS: B  
 Intersection Capacity Utilization 65.5%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: SR 544 & SR 544 EB Left Turn



Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 03/23/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↔	↑↑		
Traffic Volume (vph)	803	0	345	942	0	0
Future Volume (vph)	803	0	345	942	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	3438	0	3335	3343	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3438	0	3335	3343	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			45	30	
Link Distance (ft)	73			134	145	
Travel Time (s)	1.7			2.0	3.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	0%	5%	8%	0%	8%
Adj. Flow (vph)	845	0	363	992	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	845	0	363	992	0	0
Turn Type	NA		Prot	NA		
Protected Phases	4		3	8		
Permitted Phases						
Detector Phase	4		3	8		
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	57.0		33.0	90.0		
Total Split (%)	63.3%		36.7%	100.0%		
Yellow Time (s)	4.5		4.5	4.5		
All-Red Time (s)	1.5		1.5	1.5		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None		
Act Effct Green (s)	62.9		15.1	90.0		
Actuated g/C Ratio	0.70		0.17	1.00		
v/c Ratio	0.35		0.65	0.30		
Control Delay	0.7		40.3	0.2		
Queue Delay	0.7		0.0	0.1		
Total Delay	1.4		40.3	0.3		
LOS	A		D	A		
Approach Delay	1.4			11.0		
Approach LOS	A			B		
Stops (vph)	86		310	0		
Fuel Used(gal)	2		9	7		
CO Emissions (g/hr)	124		644	486		
NOx Emissions (g/hr)	24		125	95		

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 03/23/2021



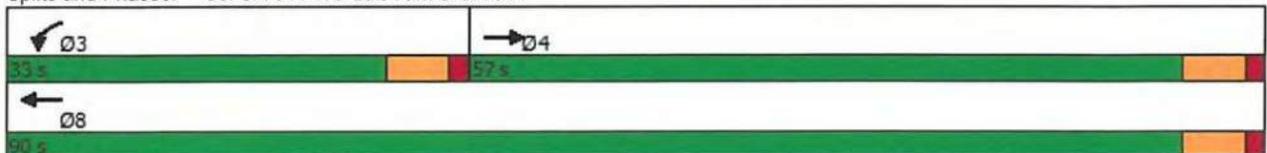
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
VOC Emissions (g/hr)	29		149	113		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	1		100	0		
Queue Length 95th (ft)	20		138	0		
Internal Link Dist (ft)	1			54	65	
Turn Bay Length (ft)						
Base Capacity (vph)	2402		1000	3343		
Starvation Cap Reductn	1111		0	0		
Spillback Cap Reductn	0		0	771		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.65		0.36	0.39		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 70 (78%), Referenced to phase 2: and 6:, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.65  
 Intersection Signal Delay: 7.3  
 Intersection Capacity Utilization 42.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 50: SR 544 WB Left Turn & SR 544



Lanes, Volumes, Timings  
 21: US 27 & SR 544 (Main Intersection)

03/23/2021

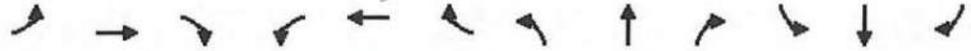


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑↑			↑↑↑	
Traffic Volume (vph)	0	712	0	0	526	0	0	1935	0	0	2457	0
Future Volume (vph)	0	712	0	0	526	0	0	1935	0	0	2457	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		225	600		400	800		850	775		900
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	3505	0	0	3438	0	0	4940	0	0	4940	0
Flt Permitted												
Satd. Flow (perm)	0	3505	0	0	3438	0	0	4940	0	0	4940	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)			45			45			60			60
Link Distance (ft)			196			248			218			170
Travel Time (s)			3.0			3.8			2.5			1.9
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	3%	0%	0%	5%	0%	0%	5%	0%	0%	5%	0%
Adj. Flow (vph)	0	734	0	0	542	0	0	1995	0	0	2533	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	734	0	0	542	0	0	1995	0	0	2533	0
Turn Type			NA			NA			NA			NA
Protected Phases			4			8			2			6
Permitted Phases												
Detector Phase			4			8			2			6
Switch Phase												
Minimum Initial (s)			5.0			5.0			5.0			5.0
Minimum Split (s)			24.0			24.0			24.0			24.0
Total Split (s)			36.0			36.0			54.0			54.0
Total Split (%)			40.0%			40.0%			60.0%			60.0%
Yellow Time (s)			4.5			4.5			4.5			4.5
All-Red Time (s)			1.5			1.5			1.5			1.5
Lost Time Adjust (s)			0.0			0.0			0.0			0.0
Total Lost Time (s)			6.0			6.0			6.0			6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None			None			C-Max			C-Max
Act Effct Green (s)			24.8			24.8			53.2			53.2
Actuated g/C Ratio			0.28			0.28			0.59			0.59
v/c Ratio			0.76			0.57			0.68			0.87
Control Delay			8.0			5.3			8.1			4.1
Queue Delay			0.0			0.0			0.1			0.0
Total Delay			8.0			5.3			8.2			4.1
LOS			A			A			A			A
Approach Delay			8.0			5.3			8.2			4.1
Approach LOS			A			A			A			A
Stops (vph)			44			27			1274			85

Lanes, Volumes, Timings

21: US 27 & SR 544 (Main Intersection)

03/23/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Fuel Used(gal)		3			2			34			7	
CO Emissions (g/hr)		199			122			2383			462	
NOx Emissions (g/hr)		39			24			464			90	
VOC Emissions (g/hr)		46			28			552			107	
Dilemma Vehicles (#)		34			24			97			143	
Queue Length 50th (ft)		16			8			263			12	
Queue Length 95th (ft)		12			10			367			m#24	
Internal Link Dist (ft)		116			168			138			90	
Turn Bay Length (ft)												
Base Capacity (vph)		1168			1146			2921			2921	
Starvation Cap Reductn		0			12			0			14	
Spillback Cap Reductn		0			0			102			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.63			0.48			0.71			0.87	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 6.1

Intersection LOS: A

Intersection Capacity Utilization 77.2%

ICU Level of Service D

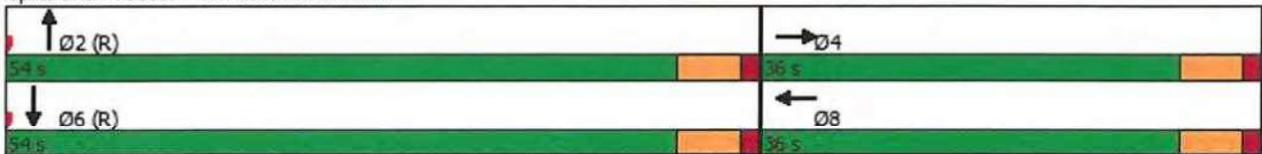
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

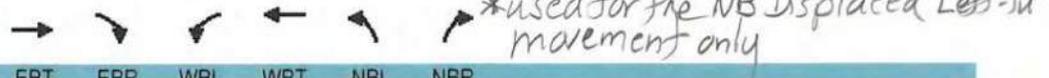
Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings

11: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/23/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	
Traffic Volume (vph)	712	370	0	526	277	0
Future Volume (vph)	712	370	0	526	277	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr t	0.850					
Flt Protected					0.950	
Satd. Flow (prot)	3505	1538	0	3438	3400	0
Flt Permitted					0.950	
Satd. Flow (perm)	3505	1538	0	3438	3400	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		381				
Link Speed (mph)	45			30	30	
Link Distance (ft)	141			50	339	
Travel Time (s)	2.1			1.1	7.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	5%	0%	5%	3%	0%
Adj. Flow (vph)	734	381	0	542	286	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	734	381	0	542	286	0
Turn Type	NA	Perm		NA	Prot	
Protected Phases	4			8	2	
Permitted Phases		4				
Detector Phase	4	4		8	2	
Switch Phase						
Minimum Initial (s)	5.0	5.0		5.0	5.0	
Minimum Split (s)	24.0	24.0		24.0	24.0	
Total Split (s)	36.0	36.0		36.0	54.0	
Total Split (%)	40.0%	40.0%		40.0%	60.0%	
Yellow Time (s)	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None		None	C-Max	
Act Effct Green (s)	26.1	26.1		26.1	51.9	
Actuated g/C Ratio	0.29	0.29		0.29	0.58	
v/c Ratio	0.72	0.53		0.54	0.15	
Control Delay	32.6	5.4		4.9	10.0	
Queue Delay	0.4	0.1		0.0	0.0	
Total Delay	33.0	5.4		4.9	10.0	
LOS	C	A		A	B	
Approach Delay	23.6			4.9	10.0	
Approach LOS	C			A	B	
Stops (vph)	611	36		27	207	
Fuel Used(gal)	14	2		2	3	
CO Emissions (g/hr)	979	120		118	228	
NOx Emissions (g/hr)	190	23		23	44	

Lanes, Volumes, Timings

11: US 27 NB Left Turn & SR 544 (Phantom Intersection\*)

03/23/2021



\*used for the NB Displaced Left-Turn intersection only

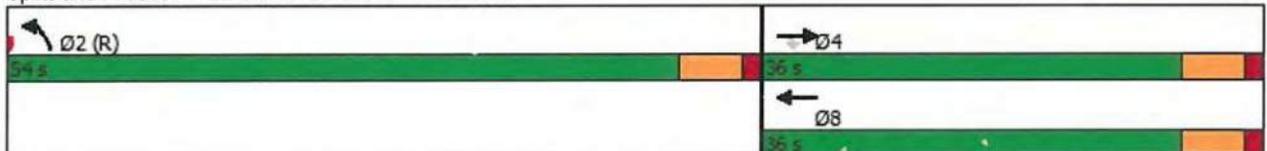
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
VOC Emissions (g/hr)	227	28		27	53	
Dilemma Vehicles (#)	34	0		0	0	
Queue Length 50th (ft)	193	0		6	90	
Queue Length 95th (ft)	244	60		14	134	
Internal Link Dist (ft)	61			1	259	
Turn Bay Length (ft)						
Base Capacity (vph)	1168	766		1146	1960	
Starvation Cap Reductn	122	18		12	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.70	0.51		0.48	0.15	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 16.4  
 Intersection Capacity Utilization 37.6%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 11: US 27 NB Left Turn & SR 544



Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the SB Displaced Left-Turn movement only

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↑	↓↓	
Traffic Volume (vph)	0	712	526	231	358	0
Future Volume (vph)	0	712	526	231	358	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Fr't				0.850		
Flt Protected					0.950	
Satd. Flow (prot)	0	3505	3438	1538	3335	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	3505	3438	1538	3335	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				238		
Link Speed (mph)		30	45		30	
Link Distance (ft)		248	114		344	
Travel Time (s)		5.6	1.7		7.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	3%	5%	5%	5%	0%
Adj. Flow (vph)	0	734	542	238	369	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	734	542	238	369	0
Turn Type		NA	NA	Perm	Prot	
Protected Phases		4	8		6	
Permitted Phases				8		
Detector Phase		4	8	8	6	
Switch Phase						
Minimum Initial (s)		5.0	5.0	5.0	5.0	
Minimum Split (s)		24.0	24.0	24.0	24.0	
Total Split (s)		36.0	36.0	36.0	54.0	
Total Split (%)		40.0%	40.0%	40.0%	60.0%	
Yellow Time (s)		4.5	4.5	4.5	4.5	
All-Red Time (s)		1.5	1.5	1.5	1.5	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.0	6.0	6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode		None	None	None	C-Max	
Act Effct Green (s)		25.4	25.4	25.4	52.6	
Actuated g/C Ratio		0.28	0.28	0.28	0.58	
v/c Ratio		0.74	0.56	0.39	0.19	
Control Delay		10.6	29.4	5.2	11.1	
Queue Delay		0.0	3.1	0.7	0.0	
Total Delay		10.7	32.5	5.9	11.1	
LOS		B	C	A	B	
Approach Delay		10.7	24.4		11.1	
Approach LOS		B	C		B	
Stops (vph)		76	427	25	261	
Fuel Used(gal)		3	9	1	4	
CO Emissions (g/hr)		233	636	58	281	
NOx Emissions (g/hr)		45	124	11	55	

Lanes, Volumes, Timings

56: SR 544 & US 27 SB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the SB Displaced Left-Turn movement only

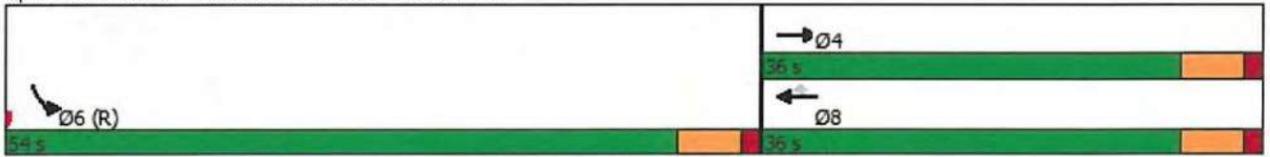
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
VOC Emissions (g/hr)		54	147	14	65	
Dilemma Vehicles (#)		0	23	0	0	
Queue Length 50th (ft)		18	137	0	116	
Queue Length 95th (ft)		34	175	49	164	
Internal Link Dist (ft)		168	34		264	
Turn Bay Length (ft)						
Base Capacity (vph)		1168	1146	671	1950	
Starvation Cap Reductn		0	484	202	0	
Spillback Cap Reductn		9	0	0	0	
Storage Cap Reductn		0	0	0	0	
Reduced v/c Ratio		0.63	0.82	0.51	0.19	

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2: and 6: SBL, Start of Green  
 Natural Cycle: 50  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 16.4  
 Intersection Capacity Utilization 39.9%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A

Splits and Phases: 56: SR 544 & US 27 SB Left Turn



Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

03/23/2021



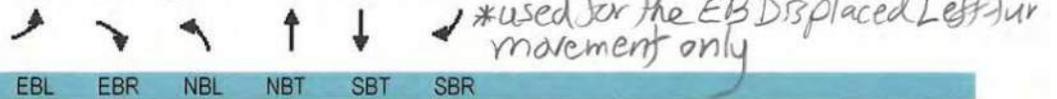
\*used for the EB Displaced Left-Turn movement only

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖↗			↑↑↑	↑↑↑	↖
Traffic Volume (vph)	1047	0	0	1935	2457	997
Future Volume (vph)	1047	0	0	1935	2457	997
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	0.91	0.91	1.00
Frnt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	0	4940	4940	1568
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	0	4940	4940	1568
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						487
Link Speed (mph)	30			30	60	
Link Distance (ft)	421			170	210	
Travel Time (s)	9.6			3.9	2.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	0%	5%	5%	3%
Adj. Flow (vph)	1079	0	0	1995	2533	1028
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	0	0	1995	2533	1028
Turn Type	Prot			NA	NA	Free
Protected Phases	4			2	6	
Permitted Phases						Free
Detector Phase	4			2	6	
Switch Phase						
Minimum Initial (s)	5.0			5.0	5.0	
Minimum Split (s)	24.0			24.0	24.0	
Total Split (s)	36.0			54.0	54.0	
Total Split (%)	40.0%			60.0%	60.0%	
Yellow Time (s)	4.5			4.5	4.5	
All-Red Time (s)	1.5			1.5	1.5	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max	C-Max	
Act Effct Green (s)	30.0			48.0	48.0	90.0
Actuated g/C Ratio	0.33			0.53	0.53	1.00
v/c Ratio	0.97			0.76	0.96	0.66
Control Delay	31.6			5.1	28.9	1.5
Queue Delay	18.4			1.0	43.4	0.0
Total Delay	50.0			6.1	72.3	1.5
LOS	D			A	E	A
Approach Delay	50.0			6.1	51.8	
Approach LOS	D			A	D	
Stops (vph)	983			1076	2096	1
Fuel Used(gal)	17			11	66	2
CO Emissions (g/hr)	1217			736	4599	165
NOx Emissions (g/hr)	237			143	895	32

Lanes, Volumes, Timings

3: US 27 & SR 544 EB Left Turn (Phantom Intersection\*)

03/23/2021

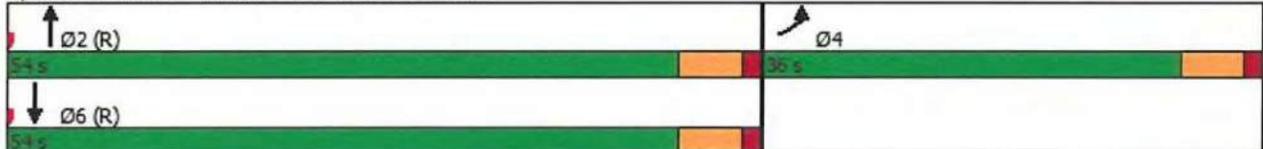


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)	282			171	1066	38
Dilemma Vehicles (#)	0			0	132	0
Queue Length 50th (ft)	347			19	476	0
Queue Length 95th (ft)	#421			21	#627	0
Internal Link Dist (ft)	341			90	130	
Turn Bay Length (ft)						
Base Capacity (vph)	1111			2634	2634	1568
Starvation Cap Reductn	0			0	440	0
Spillback Cap Reductn	76			358	12	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	1.04			0.88	1.15	0.66

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 37.8  
 Intersection LOS: D  
 Intersection Capacity Utilization 87.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: US 27 & SR 544 EB Left Turn



Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the WB Displaced Left-Turn movement only

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↙		↑↑↑	↗		↑↑↑
Traffic Volume (vph)	296	0	1935	259	0	2457
Future Volume (vph)	296	0	1935	259	0	2457
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frts				0.850		
Flt Protected	0.950					
Satd. Flow (prot)	3335	0	4940	1538	0	4940
Flt Permitted	0.950					
Satd. Flow (perm)	3335	0	4940	1538	0	4940
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)				161		
Link Speed (mph)	30		60			30
Link Distance (ft)	303		198			218
Travel Time (s)	6.9		2.3			5.0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	5%	5%	0%	5%
Adj. Flow (vph)	305	0	1995	267	0	2533
Shared Lane Traffic (%)						
Lane Group Flow (vph)	305	0	1995	267	0	2533
Turn Type	Prot		NA	Free		NA
Protected Phases	8		2			6
Permitted Phases				Free		
Detector Phase	8		2			6
Switch Phase						
Minimum Initial (s)	5.0		5.0			5.0
Minimum Split (s)	24.0		24.0			24.0
Total Split (s)	36.0		54.0			54.0
Total Split (%)	40.0%		60.0%			60.0%
Yellow Time (s)	4.5		4.5			4.5
All-Red Time (s)	1.5		1.5			1.5
Lost Time Adjust (s)	0.0		0.0			0.0
Total Lost Time (s)	6.0		6.0			6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		C-Max			C-Max
Act Effct Green (s)	13.6		64.4	90.0		64.4
Actuated g/C Ratio	0.15		0.72	1.00		0.72
v/c Ratio	0.61		0.56	0.17		0.72
Control Delay	15.8		7.1	0.2		4.1
Queue Delay	0.0		0.2	0.0		0.2
Total Delay	15.8		7.3	0.2		4.3
LOS	B		A	A		A
Approach Delay	15.8		6.5			4.3
Approach LOS	B		A			A
Stops (vph)	146		852	0		260
Fuel Used(gal)	3		25	1		8
CO Emissions (g/hr)	195		1777	36		535
NOx Emissions (g/hr)	38		346	7		104

Lanes, Volumes, Timings

6: US 27 & SR 544 WB Left Turn (Phantom Intersection\*)

03/23/2021



\*used for the WB Displaced Left-Turn movement only

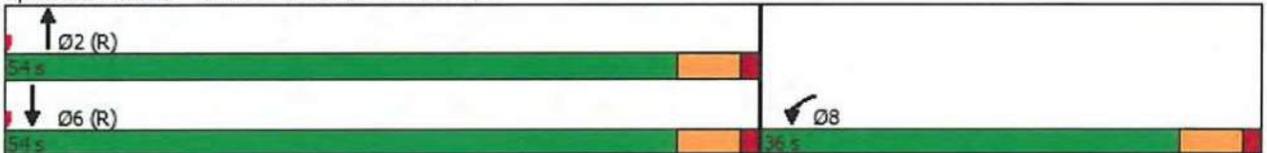
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
VOC Emissions (g/hr)	45		412	8		124
Dilemma Vehicles (#)	0		108	0		0
Queue Length 50th (ft)	98		167	0		52
Queue Length 95th (ft)	0		239	0		89
Internal Link Dist (ft)	223		118			138
Turn Bay Length (ft)						
Base Capacity (vph)	1111		3535	1538		3535
Starvation Cap Reductn	0		475	0		319
Spillback Cap Reductn	0		564	0		0
Storage Cap Reductn	0		0	0		0
Reduced v/c Ratio	0.27		0.67	0.17		0.79

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 65  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 6.0  
 Intersection Capacity Utilization 65.9%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service C

Splits and Phases: 6: US 27 & SR 544 WB Left Turn



Lanes, Volumes, Timings

9: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/23/2021



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations			↖↖	↑↑↑	↓↓↓	
Traffic Volume (vph)	0	0	277	2194	2753	0
Future Volume (vph)	0	0	277	2194	2753	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.97	0.91	0.91	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	0	0	3400	4940	4940	0
Flt Permitted			0.950			
Satd. Flow (perm)	0	0	3400	4940	4940	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	380			788	104	
Travel Time (s)	8.6			9.0	2.4	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	0%	3%	5%	5%	0%
Adj. Flow (vph)	0	0	286	2262	2838	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	286	2262	2838	0
Turn Type			Prot	NA	NA	
Protected Phases			5	2	6	
Permitted Phases						
Detector Phase			5	2	6	
Switch Phase						
Minimum Initial (s)			5.0	5.0	5.0	
Minimum Split (s)			11.0	24.0	24.0	
Total Split (s)			54.0	90.0	36.0	
Total Split (%)			60.0%	100.0%	40.0%	
Yellow Time (s)			4.5	4.5	4.5	
All-Red Time (s)			1.5	1.5	1.5	
Lost Time Adjust (s)			0.0	0.0	0.0	
Total Lost Time (s)			6.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode			None	C-Max	C-Max	
Act Effct Green (s)			13.1	90.0	64.9	
Actuated g/C Ratio			0.15	1.00	0.72	
v/c Ratio			0.58	0.46	0.80	
Control Delay			40.3	0.3	3.9	
Queue Delay			0.0	0.0	0.0	
Total Delay			40.3	0.3	3.9	
LOS			D	A	A	
Approach Delay				4.8	3.9	
Approach LOS				A	A	
Stops (vph)			248	0	554	
Fuel Used(gal)			9	11	12	
CO Emissions (g/hr)			641	792	821	
NOx Emissions (g/hr)			125	154	160	

Lanes, Volumes, Timings

9: US 27 & US 27 NB Left Turn (NB Left-Turn Crossover Intersection)

03/23/2021

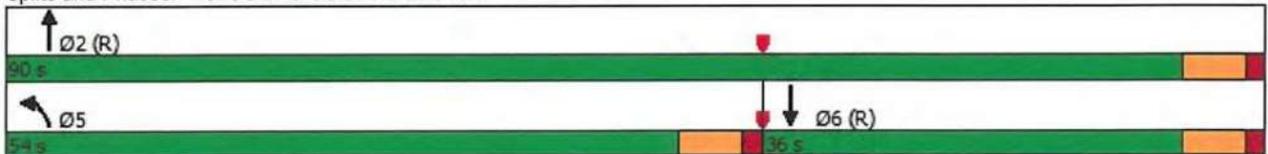


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
VOC Emissions (g/hr)			149	183	190	
Dilemma Vehicles (#)			0	0	0	
Queue Length 50th (ft)			79	0	69	
Queue Length 95th (ft)			113	0	75	
Internal Link Dist (ft)	300			708	24	
Turn Bay Length (ft)						
Base Capacity (vph)			1813	4940	3563	
Starvation Cap Reductn			0	0	11	
Spillback Cap Reductn			0	139	0	
Storage Cap Reductn			0	0	0	
Reduced v/c Ratio			0.16	0.47	0.80	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	25 (28%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.80
Intersection Signal Delay:	4.3
Intersection LOS:	A
Intersection Capacity Utilization	71.1%
ICU Level of Service	C
Analysis Period (min)	15

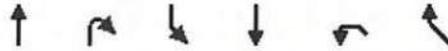
Splits and Phases: 9: US 27 & US 27 NB Left Turn



Lanes, Volumes, Timings

7: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/23/2021

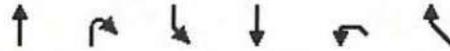


Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations	↑↑↑		↵	↑↑↑		
Traffic Volume (vph)	2982	0	358	3454	0	0
Future Volume (vph)	2982	0	358	3454	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.91	1.00	0.97	0.91	1.00	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	4940	0	3335	4940	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	4940	0	3335	4940	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			60	30	
Link Distance (ft)	55			829	291	
Travel Time (s)	1.3			9.4	6.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	0%	5%	5%	0%	0%
Adj. Flow (vph)	3074	0	369	3561	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	3074	0	369	3561	0	0
Turn Type	NA		Prot	NA		
Protected Phases	2		1	6		
Permitted Phases						
Detector Phase	2		1	6		
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	36.0		54.0	90.0		
Total Split (%)	40.0%		60.0%	100.0%		
Yellow Time (s)	4.5		4.5	4.5		
All-Red Time (s)	1.5		1.5	1.5		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max		None	C-Max		
Act Effct Green (s)	62.4		15.6	90.0		
Actuated g/C Ratio	0.69		0.17	1.00		
v/c Ratio	0.90		0.64	0.72		
Control Delay	12.3		39.3	0.9		
Queue Delay	0.1		0.0	1.1		
Total Delay	12.4		39.3	2.0		
LOS	B		D	A		
Approach Delay	12.4			5.5		
Approach LOS	B			A		
Stops (vph)	2313		320	2		
Fuel Used (gal)	28		12	19		
CO Emissions (g/hr)	1928		829	1344		
NOx Emissions (g/hr)	375		161	262		

Lanes, Volumes, Timings

7: US 27 & US 27 SB Left Turn (SB Left-Turn Crossover Intersection)

03/23/2021

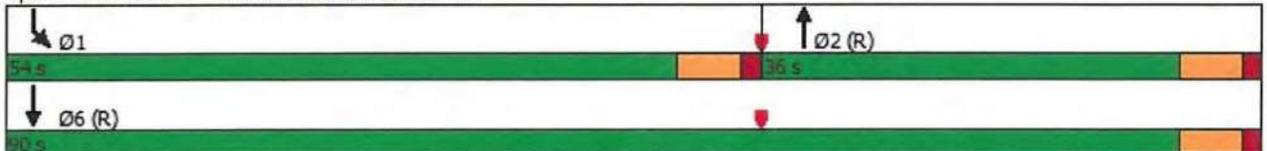


Lane Group	NBT	NBR	SBL	SBT	NWL	NWR
VOC Emissions (g/hr)	447		192	312		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	248		101	0		
Queue Length 95th (ft)	m#738		138	0		
Internal Link Dist (ft)	1			749	211	
Turn Bay Length (ft)						
Base Capacity (vph)	3422		1778	4940		
Starvation Cap Reductn	20		0	0		
Spillback Cap Reductn	0		0	1033		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.90		0.21	0.91		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 25 (28%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 8.5  
 Intersection Capacity Utilization 77.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: US 27 & US 27 SB Left Turn



Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection)

03/23/2021

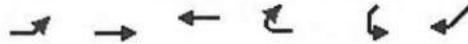


Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations	↑↑	↑↑	↑↑			
Traffic Volume (vph)	1047	1082	803	0	0	0
Future Volume (vph)	1047	1082	803	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
<b>Fr</b>						
Flt Protected	0.950					
Satd. Flow (prot)	3335	3505	3438	0	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3335	3505	3438	0	0	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						
Link Speed (mph)		45	30		30	
Link Distance (ft)		486	221		222	
Travel Time (s)		7.4	5.0		5.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	0%	0%	0%
Adj. Flow (vph)	1079	1115	828	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	1115	828	0	0	0
Turn Type	Prot	NA	NA			
Protected Phases	7	4	8			
Permitted Phases						
Detector Phase	7	4	8			
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0			
Minimum Split (s)	11.0	24.0	24.0			
Total Split (s)	36.0	90.0	54.0			
Total Split (%)	40.0%	100.0%	60.0%			
Yellow Time (s)	4.5	4.5	4.5			
All-Red Time (s)	1.5	1.5	1.5			
Lost Time Adjust (s)	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0	6.0			
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?						
Recall Mode	None	None	None			
Act Effct Green (s)	35.3	90.0	42.7			
Actuated g/C Ratio	0.39	1.00	0.47			
v/c Ratio	0.82	0.32	0.51			
Control Delay	30.5	0.2	3.0			
Queue Delay	0.0	0.0	0.5			
Total Delay	30.5	0.2	3.5			
LOS	C	A	A			
Approach Delay		15.1	3.5			
Approach LOS		B	A			
Stops (vph)	900	0	190			
Fuel Used(gal)	21	3	4			
CO Emissions (g/hr)	1468	242	266			
NOx Emissions (g/hr)	286	47	52			

Lanes, Volumes, Timings

1: SR 544 & SR 544 EB Left Turn (EB Left-Turn Crossover Intersection)

03/23/2021



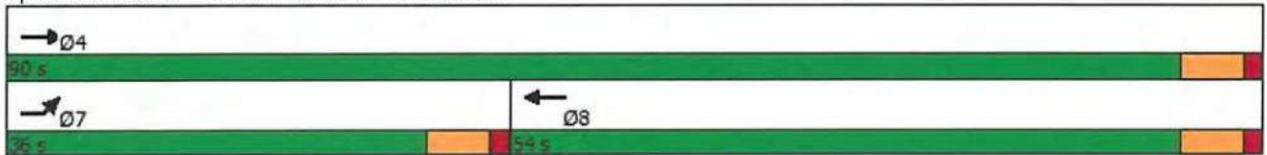
Lane Group	EBL	EBT	WBT	WBR	SWL	SWR
VOC Emissions (g/hr)	340	56	62			
Dilemma Vehicles (#)	0	0	0			
Queue Length 50th (ft)	274	0	0			
Queue Length 95th (ft)	336	0	215			
Internal Link Dist (ft)		406	141		142	
Turn Bay Length (ft)						
Base Capacity (vph)	1309	3505	1833			
Starvation Cap Reductn	0	0	518			
Spillback Cap Reductn	0	0	0			
Storage Cap Reductn	0	0	0			
Reduced v/c Ratio	0.82	0.32	0.63			

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 45 (50%), Referenced to phase 2: and 6:, Start of Green  
 Natural Cycle: 55  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 11.9  
 Intersection Capacity Utilization 62.1%  
 Analysis Period (min) 15

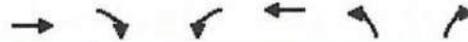
Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 1: SR 544 & SR 544 EB Left Turn



Lanes, Volumes, Timings

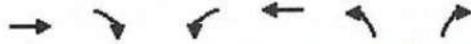
50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 03/23/2021



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑↑	↑↑		
Traffic Volume (vph)	1070	0	296	757	0	0
Future Volume (vph)	1070	0	296	757	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	1.00
<b>Fr</b>						
Flt Protected			0.950			
Satd. Flow (prot)	3505	0	3335	3438	0	0
Flt Permitted			0.950			
Satd. Flow (perm)	3505	0	3335	3438	0	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (mph)	30			45	30	
Link Distance (ft)	73			134	145	
Travel Time (s)	1.7			2.0	3.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	0%	5%	5%	0%	0%
Adj. Flow (vph)	1103	0	305	780	0	0
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	1103	0	305	780	0	0
Turn Type	NA		Prot	NA		
Protected Phases	4		3	8		
Permitted Phases						
Detector Phase	4		3	8		
<b>Switch Phase</b>						
Minimum Initial (s)	5.0		5.0	5.0		
Minimum Split (s)	24.0		11.0	24.0		
Total Split (s)	54.0		36.0	90.0		
Total Split (%)	60.0%		40.0%	100.0%		
Yellow Time (s)	4.5		4.5	4.5		
All-Red Time (s)	1.5		1.5	1.5		
Lost Time Adjust (s)	0.0		0.0	0.0		
Total Lost Time (s)	6.0		6.0	6.0		
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	None		None	None		
Act Effct Green (s)	64.4		13.6	90.0		
Actuated g/C Ratio	0.72		0.15	1.00		
v/c Ratio	0.44		0.61	0.23		
Control Delay	0.8		40.6	0.2		
Queue Delay	0.6		0.0	0.0		
Total Delay	1.4		40.6	0.2		
LOS	A		D	A		
Approach Delay	1.4			11.6		
Approach LOS	A			B		
Stops (vph)	99		267	0		
Fuel Used(gal)	2		8	6		
CO Emissions (g/hr)	160		555	390		
NOx Emissions (g/hr)	31		108	76		

Lanes, Volumes, Timings

50: SR 544 WB Left Turn & SR 544 (WB Left-Turn Crossover Intersection) 03/23/2021



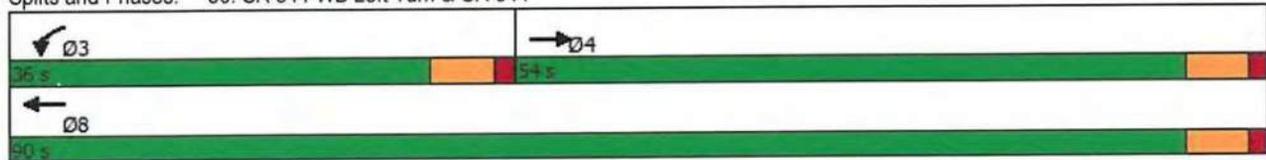
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
VOC Emissions (g/hr)	37		129	90		
Dilemma Vehicles (#)	0		0	0		
Queue Length 50th (ft)	0		84	0		
Queue Length 95th (ft)	33		120	0		
Internal Link Dist (ft)	1			54	65	
Turn Bay Length (ft)						
Base Capacity (vph)	2509		1111	3438		
Starvation Cap Reductn	914		0	0		
Spillback Cap Reductn	0		0	578		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.69		0.27	0.27		

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 55 (61%), Referenced to phase 2: and 6:, Start of Green  
 Natural Cycle: 40  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.61  
 Intersection Signal Delay: 6.4  
 Intersection Capacity Utilization 48.0%  
 Analysis Period (min) 15

Intersection LOS: A  
 ICU Level of Service A

Splits and Phases: 50: SR 544 WB Left Turn & SR 544



**WEIGHTED AVERAGE DELAY CALCULATIONS FOR SR 544/US 27 DLT INTERSECTION (N/S and E/W)**

MOVEMENT	2045 AM PEAK HOUR					2045 PM PEAK HOUR				
	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	AVG. DELAY (2)	TOTAL DELAY	VOLUME	AVG. DELAY (1)	AVG. DELAY (2)	AVG. DELAY (2)	TOTAL DELAY
NB LT	454	1.8	37.6	4.3	19,839.8	277	10.0	40.3	3.5	13,933.1
NB TH	2,339	7.2	12.6	0.0	46,312.2	1,935	8.2	12.4	0.0	39,861.0
NB RT	227	0.0	0.0	0.0	0.0	259	0.0	0.0	0.0	0.0
ALL NB VEHICLES	3,020	21.9			66,152.0	2,471	21.8			53,794.1
SB LT	253	6.3	40.5	1.4	12,194.6	358	11.1	39.3	1.4	18,043.2
SB TH	1,839	1.4	5.6	0.0	12,873.0	2,457	4.1	3.9	0.0	19,656.0
SB RT	1,027	0.0	0.0	0.0	0.0	997	0.0	0.0	0.0	0.0
ALL SB VEHICLES	3,119	8.0			25,067.6	3,812	9.9			37,699.2
WB LT	345	11.9	40.3	5.6	19,941.0	296	15.8	40.6	3.9	16,694.4
WB TH	595	8.7	4.3	0.0	7,735.0	526	5.3	3.5	0.0	4,628.8
WB RT	347	0.0	0.0	0.0	0.0	231	0.0	0.0	0.0	0.0
ALL WB VEHICLES	1,287	21.5			27,676.0	1,053	20.2			21,323.2
EB LT	930	35.4	35.3	12.6	77,469.0	1,047	50.0	30.5	12.4	84,283.5
EB TH	550	6.7	1.4	0.0	4,455.0	712	8.0	1.4	0.0	6,692.8
EB RT	262	0.0	0.0	0.0	0.0	370	0.0	0.0	0.0	0.0
ALL EB VEHICLES	1,742	47.0			81,924.0	2,129	42.7			90,976.3
ALL VEHICLES	9,168	21.9			200,819.6	9,465	21.5			203,792.8

<sup>(1)</sup> Average delay (in seconds per vehicle) at the main intersection

<sup>(2)</sup> Average delay (in seconds per vehicle) at the displaced left-turn crossover intersection

## **Appendix F**

Northwest Quadrant Roadway Alternative Preliminary Geometric Concept

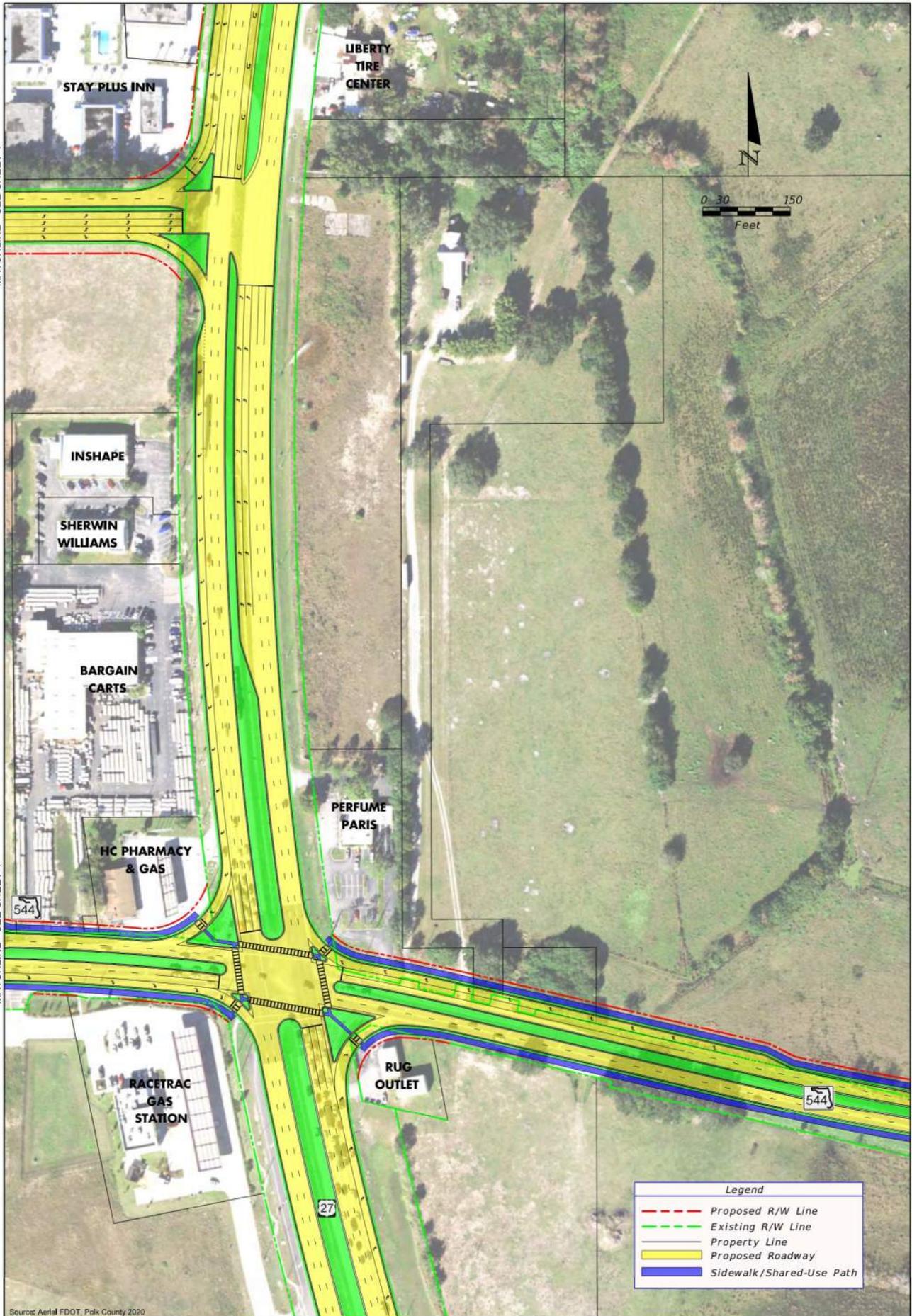


Legend	
	Proposed R/W Line
	Existing R/W Line
	Property Line
	Proposed Roadway
	Sidewalk/Shared-Use Path

DATE	ENGINEER OF RECORD	STATE OF FLORIDA		SR 544 PD&E STUDY	SHEET NO.
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovers Drive, Suite 200 Oviedo, Florida 32765	DEPARTMENT OF TRANSPORTATION			
	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	NW QUADRANT ALTERNATIVE	1

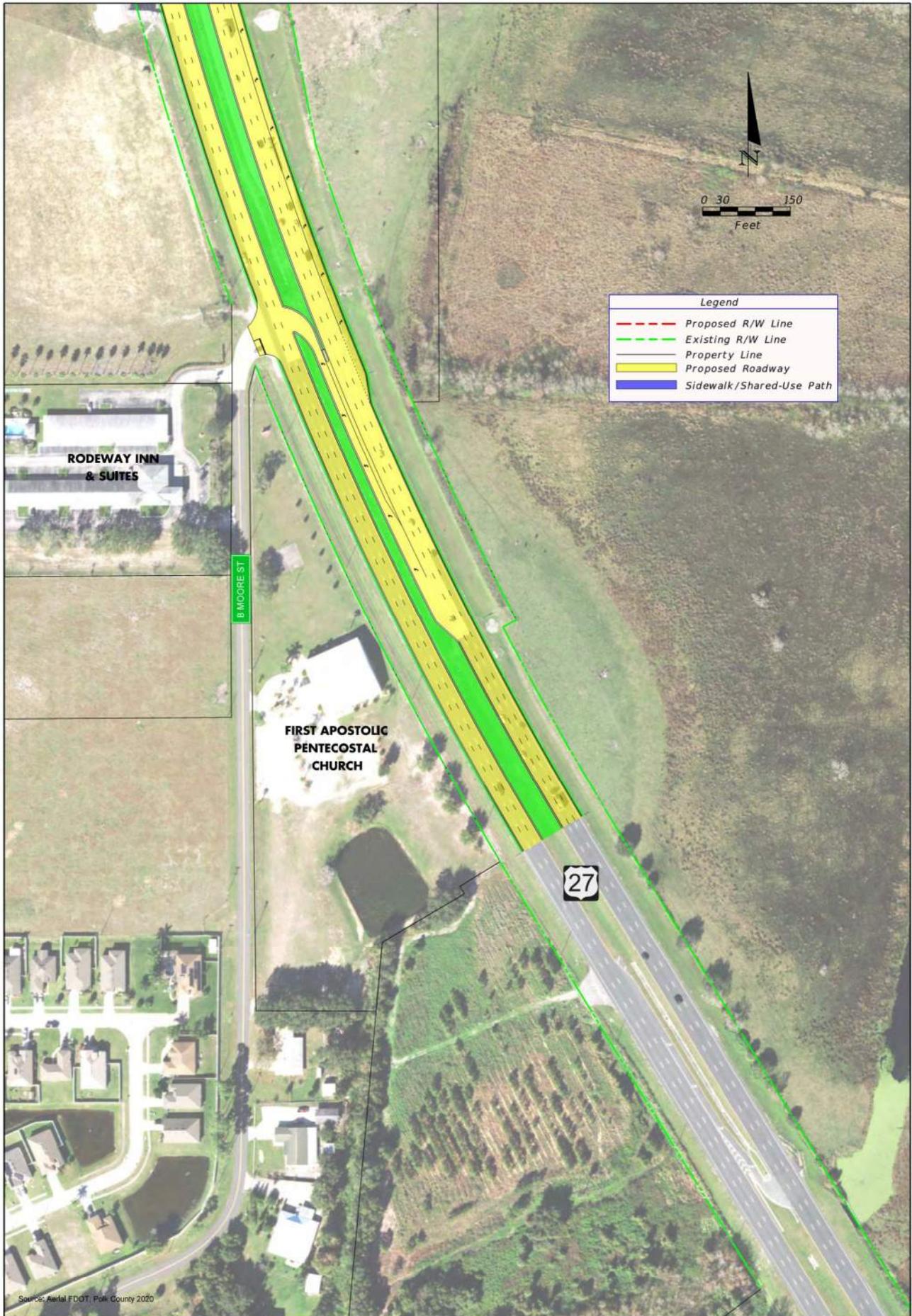
MATCHLINE - SEE SHEET 4

MATCHLINE - SEE SHEET 4



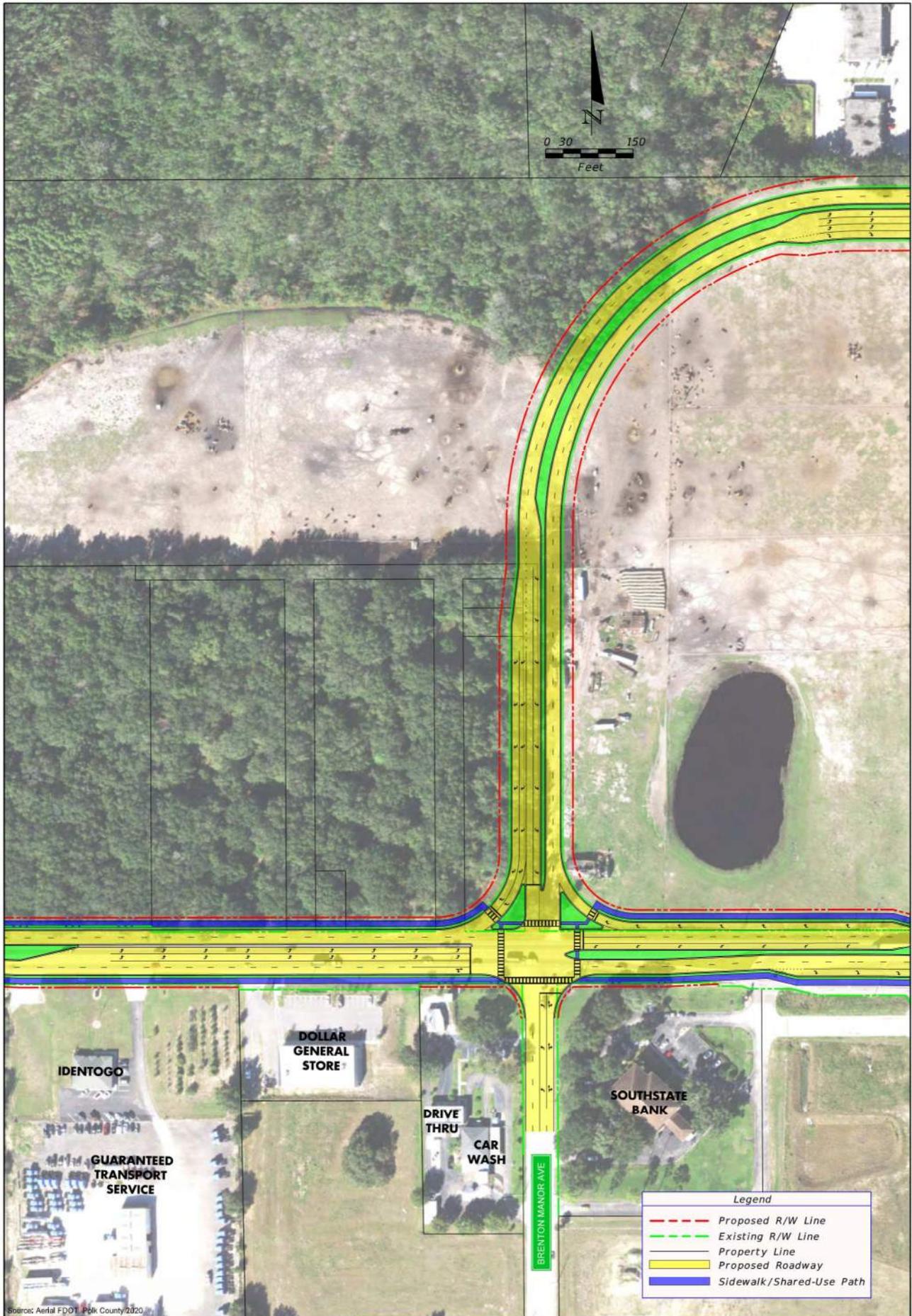
Source: Aerial FDOT, Polk County 2020

DATE	ENGINEER OF RECORD	STATE OF FLORIDA		SR 544 PD&E STUDY	SHEET NO.
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	DEPARTMENT OF TRANSPORTATION			
		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	2
				NW QUADRANT ALTERNATIVE	



Source: Aerial FDOT, Polk County 2020

DATE	ENGINEER OF RECORD	STATE OF FLORIDA		SR 544 PD&E STUDY	SHEET NO.
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	DEPARTMENT OF TRANSPORTATION			
		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	NW QUADRANT ALTERNATIVE
					3



Source: Aerial FDOT, Polk County 2020

DATE	ENGINEER OF RECORD Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID

SR 544 PD&E STUDY  
US 27 & SR 544  
NW QUADRANT ALTERNATIVE

SHEET NO.	4
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## **Appendix G**

Analysis Summary Sheets for Northwest Quadrant Roadway Alternative and  
SPUI Alternative

## **Appendix G1**

SYNCHRO/SIMTRAFFIC Analysis Summary Sheets for NWQR Alternative

2045 PEAK HOUR TRAFFIC OPERATIONS SUMMARY - NORTHWEST QUADRANT ROADWAY (NWQR) ALTERNATIVE

INTERSECTION	MOVEMENT	2045 AM PEAK HOUR (2nd SET OF MODEL RUNS)				2045 PM PEAK HOUR (2nd SET OF MODEL RUNS)			
		AVERAGE DELAY (sec/veh)		LEVEL OF SERVICE		AVERAGE DELAY (sec/veh)		LEVEL OF SERVICE	
		SYNCHRO	SIMTRAFFIC	SYNCHRO	SIMTRAFFIC	SYNCHRO	SIMTRAFFIC	SYNCHRO	SIMTRAFFIC
SR 544/US 27	EB TH	45.2	41.9	D	D	56.5	82.8	E	F
	EB RT	35.6	29.2	D	C	39.6	42.6	D	D
	WB TH	70.7	84.5	E	F	44.9	41.0	D	D
	WB RT	50.2	50.2	D	D	34.7	23.4	C	C
	NB TH	37.2	40.7	D	D	23.4	22.0	C	C
	NB RT	11.4	5.6	B	A	13.2	5.9	B	A
	SB TH	9.1	19.5	A	B	33.2	24.8	C	C
	SB RT	0.9	16.7	A	B	1.4	15.6	A	B
ALL	33.8	39.1	C	D	34.5	33.9	C	C	
US 27/NWQR	EB LT	33.8	36.6	C	D	68.2	72.5	E	E
	EB RT	10.3	23.7	B	C	28.5	40.1	C	D
	NB LT	47.8	65.0	D	F	63.9	78.3	E	E
	NB TH	13.9	24.6	B	C	15.4	14.1	B	B
	SB TH	38.5	35.7	D	D	43.0	42.6	D	D
	SB RT	11.6	18.3	B	B	6.7	24.1	A	C
	ALL	23.9	30.2	C	C	32.3	36.6	C	D
	EB LT	40.7	42.4	D	D	55.2	78.7	E	E
EB TH	26.1	27.3	C	C	30.0	35.4	C	D	
EB RT	26.1	25.0	C	C	30.0	32.8	C	C	
WB LT	18.2	69.4	B	E	20.9	33.0	C	C	
WB TH	35.2	48.4	D	D	37.8	33.4	D	C	
WB RT	19.5	32.0	B	C	17.0	16.0	B	B	
NB LT	35.2	39.5	D	D	34.3	43.8	C	D	
NB TH	44.2	54.2	D	D	56.0	93.6	E	F	
NB RT	44.2	29.0	D	C	56.0	66.7	E	E	
SB LT	52.3	44.8	D	D	52.4	47.5	D	D	
SB TH	61.6	47.4	E	D	50.0	46.9	D	D	
SB RT	33.1	19.6	C	B	22.2	18.6	C	B	
ALL	34.3	33.3	C	C	36.0	41.2	D	D	
SR 544/BRENTON MANOR AVE/NWQR	EB LT	40.7	42.4	D	D	55.2	78.7	E	E
	EB TH	26.1	27.3	C	C	30.0	35.4	C	D
	EB RT	26.1	25.0	C	C	30.0	32.8	C	C
	WB LT	18.2	69.4	B	E	20.9	33.0	C	C
	WB TH	35.2	48.4	D	D	37.8	33.4	D	C
	WB RT	19.5	32.0	B	C	17.0	16.0	B	B
	NB LT	35.2	39.5	D	D	34.3	43.8	C	D
	NB TH	44.2	54.2	D	D	56.0	93.6	E	F
NB RT	44.2	29.0	D	C	56.0	66.7	E	E	
SB LT	52.3	44.8	D	D	52.4	47.5	D	D	
SB TH	61.6	47.4	E	D	50.0	46.9	D	D	
SB RT	33.1	19.6	C	B	22.2	18.6	C	B	
ALL	34.3	33.3	C	C	36.0	41.2	D	D	

Lanes, Volumes, Timings  
21: US 27 & SR 544

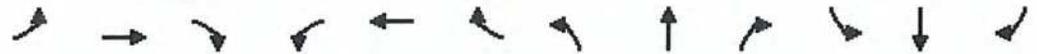
04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗		↑↑↑	↗		↑↑↑	↗
Traffic Volume (vph)	0	803	262	0	940	347	0	2793	227	0	2184	10
Future Volume (vph)	0	803	262	0	940	347	0	2793	227	0	2184	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		625	0		600	0		840	0		350
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	3438	1538	0	3343	1538	0	4940	1495	0	4940	1538
Flt Permitted												
Satd. Flow (perm)	0	3438	1538	0	3343	1538	0	4940	1495	0	4940	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			25			25			25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1091			1561			1309			1450	
Travel Time (s)		24.8			35.5			29.8			33.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	5%	0%	8%	5%	0%	5%	8%	0%	5%	5%
Adj. Flow (vph)	0	845	276	0	989	365	0	2940	239	0	2299	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	845	276	0	989	365	0	2940	239	0	2299	11
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1		2	1		2	1		2	1
Detector Template		Thru	Right									
Leading Detector (ft)		100	20		100	20		100	20		100	20
Trailing Detector (ft)		0	0		0	0		0	0		0	0
Detector 1 Position(ft)		0	0		0	0		0	0		0	0
Detector 1 Size(ft)		6	20		6	20		6	20		6	20
Detector 1 Type		Cl+Ex	Cl+Ex									
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm									
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings  
21: US 27 & SR 544

04/12/2023

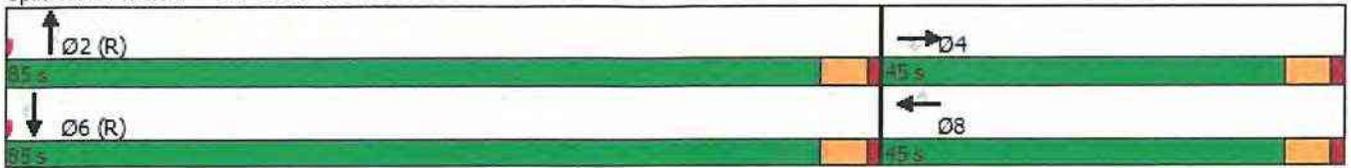


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase		4	4		8	8		2	2		6	6
Switch Phase												
Minimum Initial (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)		24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0
Total Split (s)		45.0	45.0		45.0	45.0		85.0	85.0		85.0	85.0
Total Split (%)		34.6%	34.6%		34.6%	34.6%		65.4%	65.4%		65.4%	65.4%
Maximum Green (s)		39.0	39.0		39.0	39.0		79.0	79.0		79.0	79.0
Yellow Time (s)		4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5
All-Red Time (s)		1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode		None	None		None	None		C-Max	C-Max		C-Max	C-Max
Act Effct Green (s)		39.0	39.0		39.0	39.0		79.0	79.0		79.0	79.0
Actuated g/C Ratio		0.30	0.30		0.30	0.30		0.61	0.61		0.61	0.61
v/c Ratio		0.82	0.58		0.99	0.76		0.98	0.26		0.77	0.01
Control Delay		45.2	35.6		70.7	50.2		37.2	11.4		9.1	0.9
Queue Delay		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Delay		45.2	35.6		70.7	50.2		37.2	11.4		9.1	0.9
LOS		D	D		E	D		D	B		A	A
Approach Delay		42.9			65.2			35.3			9.1	
Approach LOS		D			E			D			A	
Queue Length 50th (ft)		347	176		436	262		831	78		130	0
Queue Length 95th (ft)		430	272		#583	385		#1004	124		206	m0
Internal Link Dist (ft)		1011			1481			1229			1370	
Turn Bay Length (ft)			625			600			840			350
Base Capacity (vph)		1031	478		1002	478		3002	918		3002	944
Starvation Cap Reductn		0	0		0	0		0	0		0	0
Spillback Cap Reductn		0	0		0	0		0	0		0	0
Storage Cap Reductn		0	0		0	0		0	0		0	0
Reduced v/c Ratio		0.82	0.58		0.99	0.76		0.98	0.26		0.77	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 24 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 33.8  
 Intersection Capacity Utilization 89.9%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↑↑↑↑	↑	↑↑	↑↑↑↑	↑↑↑↑	↑↑
Traffic Volume (vph)	930	345	454	2686	1839	1280
Future Volume (vph)	930	345	454	2686	1839	1280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375	375	300			750
Storage Lanes	1	1	2			2
Taper Length (ft)	25		25			
Lane Util. Factor	0.94	1.00	0.97	0.91	0.91	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	4848	1538	3335	4940	4940	2707
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	4848	1538	3335	4940	4940	2707
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		312				
Link Speed (mph)	30			30	30	
Link Distance (ft)	2272			1450	1697	
Travel Time (s)	51.6			33.0	38.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	979	363	478	2827	1936	1347
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	363	478	2827	1936	1347
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	pt+ov
Protected Phases	4		5	2	6	6 4

Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4	5	2	6	6 4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	
Total Split (s)	37.0	37.0	29.0	93.0	64.0	
Total Split (%)	28.5%	28.5%	22.3%	71.5%	49.2%	
Maximum Green (s)	31.0	31.0	23.0	87.0	58.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	
Lead/Lag			Lag		Lead	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	31.0	31.0	23.0	87.0	58.0	95.0
Actuated g/C Ratio	0.24	0.24	0.18	0.67	0.45	0.73
v/c Ratio	0.85	0.60	0.81	0.86	0.88	0.68
Control Delay	33.8	10.3	47.8	13.9	38.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	10.3	47.8	13.9	38.5	11.6
LOS	C	B	D	B	D	B
Approach Delay	27.5			18.8	27.5	
Approach LOS	C			B	C	
Queue Length 50th (ft)	295	157	188	357	535	307
Queue Length 95th (ft)	350	187	m201	m372	605	384
Internal Link Dist (ft)	2192			1370	1617	
Turn Bay Length (ft)	375	375	300			750
Base Capacity (vph)	1156	604	590	3306	2204	1978
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.60	0.81	0.86	0.88	0.68

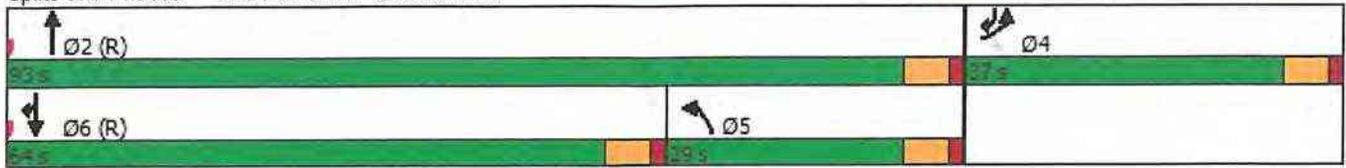
Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 23 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 23.9  
 Intersection Capacity Utilization 81.2%  
 Analysis Period (min) 15  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023

Splits and Phases: 2: US 27 & NW Quadrant Rd.



Lanes, Volumes, Timings  
 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	885	774	158	57	538	345	73	45	38	253	143	1338
Future Volume (vph)	885	774	158	57	538	345	73	45	38	253	143	1338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		0	350		350	350		0	500		400
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frts		0.975				0.850		0.931				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3352	0	1719	3438	1538	1719	1677	0	1703	1810	2682
Flt Permitted	0.950			0.282			0.661			0.500		
Satd. Flow (perm)	3335	3352	0	510	3438	1538	1196	1677	0	896	1810	2682
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		24				143		26				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		2642			1091			1065				2272
Travel Time (s)		60.0			24.8			24.2				51.6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%	5%	6%
Adj. Flow (vph)	932	815	166	60	566	363	77	47	40	266	151	1408
Shared Lane Traffic (%)												
Lane Group Flow (vph)	932	981	0	60	566	363	77	87	0	266	151	1408
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24				24
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94				94
Detector 2 Size(ft)		6			6			6				6
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				Cl+Ex
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				0.0
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	7	4		3	8	1	5	2		1	6	67

Lanes, Volumes, Timings  
 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	1	5	2		1	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0		17.0	24.0	24.0	17.0	17.0		24.0	24.0	
Total Split (s)	55.0	66.0		17.0	28.0	29.0	17.0	18.0		29.0	30.0	
Total Split (%)	42.3%	50.8%		13.1%	21.5%	22.3%	13.1%	13.8%		22.3%	23.1%	
Maximum Green (s)	49.0	60.0		11.0	22.0	23.0	11.0	12.0		23.0	24.0	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	C-Max		None	None	
Act Effct Green (s)	47.8	63.1		22.0	22.0	42.1	28.4	16.2		40.4	24.0	71.8
Actuated g/C Ratio	0.37	0.49		0.17	0.17	0.32	0.22	0.12		0.31	0.18	0.55
v/c Ratio	0.76	0.60		0.35	0.97	0.61	0.25	0.38		0.66	0.45	0.95
Control Delay	40.7	26.1		18.2	35.2	19.5	35.2	44.2		52.3	61.6	33.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	40.7	26.1		18.2	35.2	19.5	35.2	44.2		52.3	61.6	33.1
LOS	D	C		B	D	B	D	D		D	E	C
Approach Delay		33.2			28.4			40.0				38.2
Approach LOS		C			C			D				D
Queue Length 50th (ft)	347	308		17	168	159	46	49		207	125	532
Queue Length 95th (ft)	426	388		m18	m177	m162	86	106		m291	m181	#684
Internal Link Dist (ft)		2562			1011			985				2192
Turn Bay Length (ft)	575			350		350	350			500		400
Base Capacity (vph)	1257	1639		188	581	625	310	231		433	334	1506
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.60		0.32	0.97	0.58	0.25	0.38		0.61	0.45	0.93

Intersection Summary

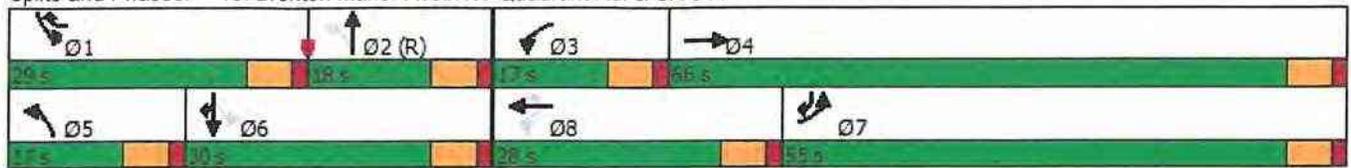
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 127 (98%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 115  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 34.3  
 Intersection Capacity Utilization 80.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023

Splits and Phases: 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544



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**Interval #1 Information Recording**


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Start Time 7:00  
 End Time 8:00  
 Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	9447	9571	9489	9330	9483	9368	9598
Vehs Exited	9394	9525	9413	9325	9475	9368	9546
Starting Vehs	502	562	497	497	539	530	545
Ending Vehs	555	608	573	502	547	530	597
Travel Distance (mi)	9436	9579	9503	9372	9484	9407	9614
Travel Time (hr)	524.5	565.6	537.3	528.6	542.6	521.5	564.3
Total Delay (hr)	195.5	230.8	205.5	200.9	212.0	192.9	228.7
Total Stops	12480	14295	13137	12572	13192	12345	13988
Fuel Used (gal)	352.6	367.7	358.3	352.9	359.9	351.6	368.5

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**Interval #1 Information Recording**


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Start Time 7:00  
 End Time 8:00  
 Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	9408	9540	9626	9482
Vehs Exited	9420	9537	9531	9454
Starting Vehs	537	539	482	524
Ending Vehs	525	542	577	554
Travel Distance (mi)	9479	9577	9564	9502
Travel Time (hr)	522.7	554.1	545.7	540.7
Total Delay (hr)	191.5	219.6	211.6	208.9
Total Stops	12176	13608	13021	13085
Fuel Used (gal)	353.8	365.5	361.9	359.3

## 2: US 27 & NW Quadrant Rd. Performance by movement

Movement	EBL	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	1.8	2.6	0.9
Total Del/Veh (s)	36.6	1.7	23.7	65.0	24.6	35.7	18.3	30.2

## 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.0	0.6	0.6	0.0	0.0	0.1	3.9	0.4	0.4	0.0	0.0	0.0
Total Del/Veh (s)	42.4	27.3	25.0	69.4	48.4	32.0	39.5	54.2	29.0	44.8	47.4	19.6

## 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544 Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	33.3

## 21: US 27 & SR 544 Performance by movement

Movement	EBT	EBR	WBT	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.5	1.4	0.0	0.0	0.2
Total Del/Veh (s)	41.9	29.2	84.5	50.2	40.7	5.6	19.5	16.7	39.1

## Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	74.1

Lanes, Volumes, Timings  
21: US 27 & SR 544

04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗		↑↑↑	↗		↑↑↑	↗
Traffic Volume (vph)	0	1070	370	0	822	231	0	2212	259	0	2753	10
Future Volume (vph)	0	1070	370	0	822	231	0	2212	259	0	2753	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		625	0		600	0		840	0		350
Storage Lanes	0		1	0		1	0		1	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91	1.00	1.00	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected												
Satd. Flow (prot)	0	3505	1538	0	3438	1538	0	4940	1538	0	4940	1568
Flt Permitted												
Satd. Flow (perm)	0	3505	1538	0	3438	1538	0	4940	1538	0	4940	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			25			25			25			25
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1091			1561			1309			1450	
Travel Time (s)		24.8			35.5			29.8			33.0	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	0%	3%	5%	0%	5%	5%	0%	5%	5%	0%	5%	3%
Adj. Flow (vph)	0	1103	381	0	847	238	0	2280	267	0	2838	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1103	381	0	847	238	0	2280	267	0	2838	10
Enter Blocked Intersection	No	No	No									
Lane Alignment	Left	Left	Right									
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	1		2	1		2	1		2	1
Detector Template		Thru	Right									
Leading Detector (ft)		100	20		100	20		100	20		100	20
Trailing Detector (ft)		0	0		0	0		0	0		0	0
Detector 1 Position(ft)		0	0		0	0		0	0		0	0
Detector 1 Size(ft)		6	20		6	20		6	20		6	20
Detector 1 Type		CI+Ex	CI+Ex									
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm									
Protected Phases		4			8			2			6	

Lanes, Volumes, Timings  
21: US 27 & SR 544

04/12/2023

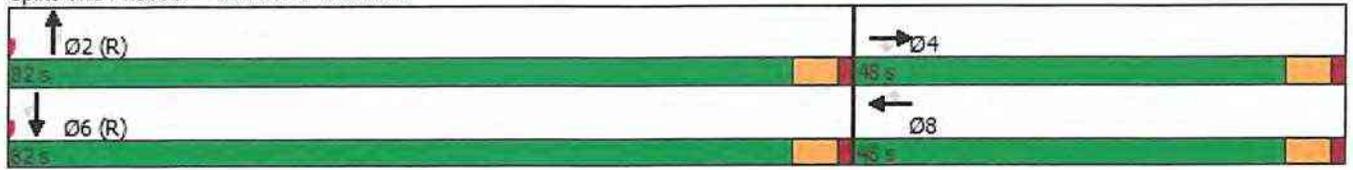


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			4			8			2			6
Detector Phase		4	4		8	8		2	2		6	6
Switch Phase												
Minimum Initial (s)		5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0
Minimum Split (s)		24.0	24.0		24.0	24.0		24.0	24.0		24.0	24.0
Total Split (s)		48.0	48.0		48.0	48.0		82.0	82.0		82.0	82.0
Total Split (%)		36.9%	36.9%		36.9%	36.9%		63.1%	63.1%		63.1%	63.1%
Maximum Green (s)		42.0	42.0		42.0	42.0		76.0	76.0		76.0	76.0
Yellow Time (s)		4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5
All-Red Time (s)		1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5
Lost Time Adjust (s)		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0
Recall Mode		None	None		None	None		C-Max	C-Max		C-Max	C-Max
Act Effct Green (s)		42.0	42.0		42.0	42.0		76.0	76.0		76.0	76.0
Actuated g/C Ratio		0.32	0.32		0.32	0.32		0.58	0.58		0.58	0.58
v/c Ratio		0.97	0.74		0.76	0.46		0.79	0.29		0.98	0.01
Control Delay		56.5	39.6		44.9	34.7		23.4	13.2		33.2	1.4
Queue Delay		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0
Total Delay		56.5	39.6		44.9	34.7		23.4	13.2		33.2	1.4
LOS		E	D		D	C		C	B		C	A
Approach Delay		52.2			42.7			22.3			33.1	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)		475	287		336	142		517	96		935	0
Queue Length 95th (ft)		#634	m395		416	224		581	149		m#969	m0
Internal Link Dist (ft)		1011			1481			1229			1370	
Turn Bay Length (ft)			625			600			840			350
Base Capacity (vph)		1132	513		1110	513		2888	909		2888	927
Starvation Cap Reductn		0	0		0	0		0	0		0	0
Spillback Cap Reductn		0	0		0	0		0	0		0	0
Storage Cap Reductn		0	0		0	0		0	0		0	0
Reduced v/c Ratio		0.97	0.74		0.76	0.46		0.79	0.29		0.98	0.01

Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 7 (5%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.98  
 Intersection Signal Delay: 34.5  
 Intersection Capacity Utilization 92.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1047	296	277	2166	2457	1355
Future Volume (vph)	1047	296	277	2166	2457	1355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	375	375	300			750
Storage Lanes	1	1	2			2
Taper Length (ft)	25		25			
Lane Util. Factor	0.94	1.00	0.97	0.91	0.91	0.88
Frt		0.850				0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	4848	1538	3400	4940	4940	2760
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	4848	1538	3400	4940	4940	2760
Right Turn on Red		Yes				No
Satd. Flow (RTOR)		187				
Link Speed (mph)	30			30	30	
Link Distance (ft)	2272			1450	1697	
Travel Time (s)	51.6			33.0	38.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	5%	3%	5%	5%	3%
Adj. Flow (vph)	1079	305	286	2233	2533	1397
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1079	305	286	2233	2533	1397
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			24	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9	15			9
Number of Detectors	1	1	1	2	2	1
Detector Template	Left	Right	Left	Thru	Thru	Right
Leading Detector (ft)	20	20	20	100	100	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	20	20	6	6	20
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)				94	94	
Detector 2 Size(ft)				6	6	
Detector 2 Type				CI+Ex	CI+Ex	
Detector 2 Channel						
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot	Perm	Prot	NA	NA	pt+ov
Protected Phases	4		5	2	6	6 4

Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Permitted Phases		4				
Detector Phase	4	4	5	2	6	6 4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	
Minimum Split (s)	24.0	24.0	11.0	24.0	24.0	
Total Split (s)	36.0	36.0	20.0	94.0	74.0	
Total Split (%)	27.7%	27.7%	15.4%	72.3%	56.9%	
Maximum Green (s)	30.0	30.0	14.0	88.0	68.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	C-Max	C-Max	
Act Effct Green (s)	30.0	30.0	13.6	88.0	68.4	104.4
Actuated g/C Ratio	0.23	0.23	0.10	0.68	0.53	0.80
v/c Ratio	0.97	0.61	0.80	0.67	0.97	0.63
Control Delay	68.2	28.5	63.9	15.4	43.0	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.2	28.5	63.9	15.4	43.0	6.7
LOS	E	C	E	B	D	A
Approach Delay	59.4			20.9	30.1	
Approach LOS	E			C	C	
Queue Length 50th (ft)	340	147	111	613	741	223
Queue Length 95th (ft)	m#403	m191	m153	681	#884	279
Internal Link Dist (ft)	2192			1370	1617	
Turn Bay Length (ft)	375	375	300			750
Base Capacity (vph)	1118	498	366	3344	2598	2216
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.61	0.78	0.67	0.97	0.63

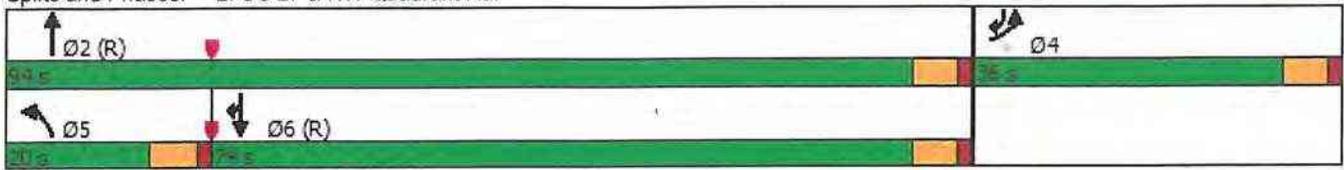
Intersection Summary

Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 80 (62%), Referenced to phase 2:NBT and 6:SBT, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 32.3  
 Intersection LOS: C  
 Intersection Capacity Utilization 90.3%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings  
2: US 27 & NW Quadrant Rd.

04/12/2023

Splits and Phases: 2: US 27 & NW Quadrant Rd.



Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	980	1012	92	33	493	296	150	67	70	358	79	1195
Future Volume (vph)	980	1012	92	33	493	296	150	67	70	358	79	1195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		0	350		350	350		0	500		400
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frts		0.987				0.850		0.923				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3454	0	1719	3505	1538	1752	1687	0	1752	1810	2760
Flt Permitted	0.950			0.240			0.704			0.318		
Satd. Flow (perm)	3335	3454	0	434	3505	1538	1299	1687	0	587	1810	2760
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		8				104		32				
Link Speed (mph)		30			30			30				30
Link Distance (ft)		2642			1091			1065			2272	
Travel Time (s)		60.0			24.8			24.2			51.6	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	5%	3%	5%	3%	5%	3%	3%	5%	3%
Adj. Flow (vph)	1010	1043	95	34	508	305	155	69	72	369	81	1232
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1010	1138	0	34	508	305	155	141	0	369	81	1232
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA	pt+ov
Protected Phases	7	4		3	8	1	5	2		1	6	67

Lanes, Volumes, Timings  
 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8	2			6		
Detector Phase	7	4		3	8	1	5	2		1	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0		11.0	24.0	24.0	21.0	17.0		24.0	24.0	
Total Split (s)	49.0	55.0		23.0	29.0	34.0	22.0	18.0		34.0	30.0	
Total Split (%)	37.7%	42.3%		17.7%	22.3%	26.2%	16.9%	13.8%		26.2%	23.1%	
Maximum Green (s)	43.0	49.0		17.0	23.0	28.0	16.0	12.0		28.0	24.0	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	Max	C-Max		None	None	
Act Effct Green (s)	43.0	62.1		22.0	22.0	47.5	32.5	15.5		45.4	24.0	67.0
Actuated g/C Ratio	0.33	0.48		0.17	0.17	0.37	0.25	0.12		0.35	0.18	0.52
v/c Ratio	0.92	0.69		0.23	0.86	0.49	0.40	0.62		0.85	0.24	0.87
Control Delay	55.2	30.0		20.9	37.8	17.0	34.3	56.0		52.4	50.0	22.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.2	30.0		20.9	37.8	17.0	34.3	56.0		52.4	50.0	22.2
LOS	E	C		C	D	B	C	E		D	D	C
Approach Delay		41.8			29.6			44.6			30.2	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	420	404		28	241	169	92	91		235	57	287
Queue Length 95th (ft)	#546	507		m32	#307	m249	149	#198		m#394	m92	386
Internal Link Dist (ft)		2562			1011			985			2192	
Turn Bay Length (ft)	575			350		350	350			500		400
Base Capacity (vph)	1108	1653		241	620	655	384	228		463	334	1426
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.91	0.69		0.14	0.82	0.47	0.40	0.62		0.80	0.24	0.86

Intersection Summary

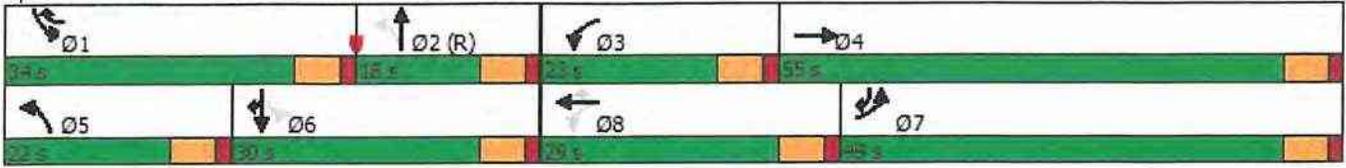
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 0 (0%), Referenced to phase 2:NBTL, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 36.0  
 Intersection Capacity Utilization 89.2%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Rd. & SR 544

04/12/2023

Splits and Phases: 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544



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**Interval #1 Information Recording**


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Start Time 4:30  
 End Time 5:30  
 Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	9683	9749	9641	9706	9618	9707	9726
Vehs Exited	9648	9749	9543	9633	9626	9647	9661
Starting Vehs	510	578	511	520	518	539	495
Ending Vehs	545	578	609	593	510	599	560
Travel Distance (mi)	9640	9793	9589	9613	9607	9694	9713
Travel Time (hr)	623.0	643.3	575.9	567.4	568.1	605.4	585.9
Total Delay (hr)	287.1	301.3	241.6	232.5	232.5	267.7	247.5
Total Stops	13549	16256	13795	13931	13469	14711	13814
Fuel Used (gal)	384.6	393.3	372.6	369.8	370.8	380.9	377.9

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**Interval #1 Information Recording**


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Start Time 4:30  
 End Time 5:30  
 Total Time (min) 60

Volumes adjusted by Growth Factors.

Run Number	8	9	10	Avg
Vehs Entered	9710	9716	9725	9697
Vehs Exited	9664	9618	9649	9644
Starting Vehs	509	517	556	524
Ending Vehs	555	615	632	575
Travel Distance (mi)	9645	9637	9692	9662
Travel Time (hr)	607.6	616.8	561.7	595.5
Total Delay (hr)	271.3	280.8	224.0	258.6
Total Stops	13754	14198	13717	14118
Fuel Used (gal)	380.4	383.4	371.4	378.5

## 2: US 27 & NW Quadrant Rd. Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	32.0	32.4	16.1
Total Del/Veh (s)	72.5	40.1	78.3	14.1	42.6	24.1	36.6

## 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544 Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	1.3	0.9	0.9	0.0	0.0	0.0	3.7	0.5	0.6	0.0	0.0	0.0
Total Del/Veh (s)	78.7	35.4	32.8	33.0	33.4	16.0	43.8	93.6	66.7	47.5	46.9	18.6

## 19: Brenton Manor Ave./NW Quadrant Rd. & SR 544 Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	41.2

## 21: US 27 & SR 544 Performance by movement

Movement	EBT	EBR	WBT	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	1.5	0.0	0.0	0.1
Total Del/Veh (s)	82.8	42.6	41.0	23.4	22.0	5.9	24.8	15.6	33.9

## Total Network Performance

Denied Del/Veh (s)	13.1
Total Del/Veh (s)	78.6

## **Appendix G2**

SYNCHRO Analysis Summary Sheets for Single Point Urban Interchange  
Alternative

Lanes, Volumes, Timings  
21: US 27 & SR 544

07/07/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	930	550	262	345	595	347	454	117	227	253	92	1027
Future Volume (vph)	930	550	262	345	595	347	454	117	227	253	92	1027
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		400	400		500	350		350	250		750
Storage Lanes	2		1	2		1	2		2	2		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	1.00	0.88	0.97	1.00	0.88
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3438	1538	3335	3343	1538	3335	1810	2632	3242	1810	2707
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3438	1538	3335	3343	1538	3335	1810	2632	3242	1810	2707
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60			60	
Link Distance (ft)		1091			1561			1309			1314	
Travel Time (s)		16.5			23.7			14.9			14.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	8%	5%	5%	5%	8%	8%	5%	5%
Adj. Flow (vph)	979	579	276	363	626	365	478	123	239	266	97	1081
Shared Lane Traffic (%)												
Lane Group Flow (vph)	979	579	276	363	626	365	478	123	239	266	97	1081
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	CI+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	4 5

Lanes, Volumes, Timings  
21: US 27 & SR 544

07/07/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6						
Detector Phase	5	2	3	1	6	7	3	8	81	7	4	45
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	13.5	26.5	24.0	35.0	26.5	24.0	24.0	24.0		24.0	24.0	
Total Split (s)	56.0	63.0	37.0	35.0	42.0	37.0	37.0	25.0		37.0	25.0	
Total Split (%)	35.0%	39.4%	23.1%	21.9%	26.3%	23.1%	23.1%	15.6%		23.1%	15.6%	
Maximum Green (s)	47.5	54.5	28.5	26.5	33.5	28.5	28.5	19.0		28.5	19.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.5		4.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.0		8.5	6.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	None	None	Min	None	None	None		None	Min	
Walk Time (s)		7.0			7.0						7.0	
Flash Dont Walk (s)		11.0			11.0						11.0	
Pedestrian Calls (#/hr)		0			0						0	
Act Effct Green (s)	47.6	32.6	58.8	47.0	32.1	56.5	26.2	20.8	70.3	24.4	19.0	69.1
Actuated g/C Ratio	0.30	0.21	0.38	0.30	0.21	0.36	0.17	0.13	0.45	0.16	0.12	0.44
v/c Ratio	0.97	0.81	0.48	0.36	0.91	0.66	0.86	0.51	0.20	0.53	0.44	0.90
Control Delay	74.5	68.2	22.8	45.7	79.6	29.0	79.0	72.9	14.5	64.5	71.9	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.5	68.2	22.8	45.7	79.6	29.0	79.0	72.9	14.5	64.5	71.9	38.8
LOS	E	E	C	D	E	C	E	E	B	E	E	D
Approach Delay		64.7			56.9			59.8				45.8
Approach LOS		E			E			E				D
90th %ile Green (s)	47.5	40.4	28.5	40.6	33.5	28.5	28.5	19.0		28.5	19.0	
90th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Max		Max	Max	
70th %ile Green (s)	47.5	36.4	28.5	44.6	33.5	28.5	28.5	19.0		28.5	19.0	
70th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Hold		Max	Max	
50th %ile Green (s)	47.5	33.6	28.5	47.4	33.5	25.5	28.5	22.0		25.5	19.0	
50th %ile Term Code	Max	Gap	Max	Hold	Max	Gap	Max	Hold		Gap	Max	
30th %ile Green (s)	47.5	29.4	25.2	51.4	33.3	22.2	25.2	22.0		22.2	19.0	
30th %ile Term Code	Max	Gap	Gap	Hold	Gap	Gap	Gap	Hold		Gap	Max	
10th %ile Green (s)	47.5	24.0	20.5	50.3	26.8	17.9	20.5	21.6		17.9	19.0	
10th %ile Term Code	Max	Gap	Gap	Hold	Gap	Gap	Gap	Hold		Gap	Max	
Queue Length 50th (ft)	528	306	136	155	338	195	250	121	43	133	96	388
Queue Length 95th (ft)	#676	358	172	217	#443	269	318	198	71	178	161	#556
Internal Link Dist (ft)		1011			1481			1229				1234
Turn Bay Length (ft)	500		400	400		500	350		350	250		750
Base Capacity (vph)	1014	1200	601	1002	716	595	609	240	1183	591	219	1196
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.48	0.46	0.36	0.87	0.61	0.78	0.51	0.20	0.45	0.44	0.90

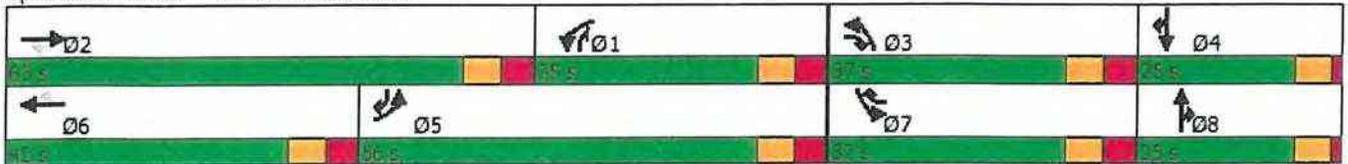
Intersection Summary

Lanes, Volumes, Timings  
 21: US 27 & SR 544

07/07/2023

Area Type: Other  
 Cycle Length: 160  
 Actuated Cycle Length: 156.4  
 Natural Cycle: 130  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 57.0  
 Intersection Capacity Utilization 82.4%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 160  
 70th %ile Actuated Cycle: 160  
 50th %ile Actuated Cycle: 160  
 30th %ile Actuated Cycle: 156.5  
 10th %ile Actuated Cycle: 145.3  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: US 27 & SR 544



Lanes, Volumes, Timings  
21: US 27 & SR 544

07/07/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1047	712	370	296	526	231	277	97	259	358	123	997
Future Volume (vph)	1047	712	370	296	526	231	277	97	259	358	123	997
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	500		400	400		500	350		350	250		750
Storage Lanes	2		1	2		1	2		2	2		2
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	1.00	0.88	0.97	1.00	0.88
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3505	1538	3335	3438	1538	3400	1810	2707	3335	1810	2760
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3505	1538	3335	3438	1538	3400	1810	2707	3335	1810	2760
Right Turn on Red			Yes			Yes			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			60			60	
Link Distance (ft)		1091			1561			1309			1314	
Travel Time (s)		16.5			23.7			14.9			14.9	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	5%	5%	5%	3%	5%	5%	5%	5%	3%
Adj. Flow (vph)	1079	734	381	305	542	238	286	100	267	369	127	1028
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1079	734	381	305	542	238	286	100	267	369	127	1028
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right									
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	CI+Ex											
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pt+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	4 5

Lanes, Volumes, Timings  
21: US 27 & SR 544

07/07/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			2			6						
Detector Phase	5	2	3	1	6	7	3	8	81	7	4	45
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	27.0	26.5	24.0	35.0	26.5	24.0	24.0	23.0		24.0	23.0	
Total Split (s)	60.0	63.0	29.0	35.0	38.0	29.0	29.0	23.0		29.0	23.0	
Total Split (%)	40.0%	42.0%	19.3%	23.3%	25.3%	19.3%	19.3%	15.3%		19.3%	15.3%	
Maximum Green (s)	51.5	54.5	20.5	26.5	29.5	20.5	20.5	17.0		20.5	17.0	
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.5		4.0	1.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	8.5	8.5	8.5	8.5	8.5	8.5	8.5	6.0		8.5	6.0	
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	Min	None	None	Min	None	None	None		None	None	
Walk Time (s)		7.0			7.0							
Flash Dont Walk (s)		11.0			11.0							
Pedestrian Calls (#/hr)		0			0							
Act Effct Green (s)	49.8	37.0	56.6	39.2	26.4	45.5	19.6	17.6	59.3	19.1	17.1	69.4
Actuated g/C Ratio	0.34	0.26	0.39	0.27	0.18	0.31	0.14	0.12	0.41	0.13	0.12	0.48
v/c Ratio	0.94	0.82	0.63	0.34	0.86	0.49	0.62	0.45	0.24	0.84	0.60	0.78
Control Delay	61.5	58.6	25.2	44.8	72.4	26.5	66.1	68.4	16.0	78.9	74.4	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	58.6	25.2	44.8	72.4	26.5	66.1	68.4	16.0	78.9	74.4	24.3
LOS	E	E	C	D	E	C	E	E	B	E	E	C
Approach Delay		54.2			54.6			46.0			41.7	
Approach LOS		D			D			D			D	
90th %ile Green (s)	51.5	46.0	20.5	35.0	29.5	20.5	20.5	17.0		20.5	17.0	
90th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Max		Max	Max	
70th %ile Green (s)	51.5	41.9	20.5	39.1	29.5	20.5	20.5	17.0		20.5	17.0	
70th %ile Term Code	Max	Gap	Max	Hold	Max	Max	Max	Hold		Max	Max	
50th %ile Green (s)	51.5	37.8	20.5	42.1	28.4	20.5	20.5	17.0		20.5	17.0	
50th %ile Term Code	Max	Gap	Max	Hold	Gap	Max	Max	Hold		Max	Max	
30th %ile Green (s)	51.5	33.4	20.5	43.1	25.0	19.1	20.5	18.4		19.1	17.0	
30th %ile Term Code	Max	Gap	Max	Hold	Gap	Gap	Max	Hold		Gap	Max	
10th %ile Green (s)	43.2	27.1	16.2	36.2	20.1	15.2	16.2	18.0		15.2	17.0	
10th %ile Term Code	Gap	Gap	Gap	Hold	Gap	Gap	Gap	Hold		Gap	Max	
Queue Length 50th (ft)	522	356	187	121	269	122	136	93	53	181	120	273
Queue Length 95th (ft)	#666	406	226	177	340	180	189	158	89	#255	194	376
Internal Link Dist (ft)		1011			1481			1229			1234	
Turn Bay Length (ft)	500		400	400		500	350		350	250		750
Base Capacity (vph)	1193	1326	612	904	704	499	484	220	1110	474	213	1361
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.55	0.62	0.34	0.77	0.48	0.59	0.45	0.24	0.78	0.60	0.76
Intersection Summary												

Lanes, Volumes, Timings  
 21: US 27 & SR 544

07/07/2023

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 144.5  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 49.8  
 Intersection Capacity Utilization 86.0%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 150  
 70th %ile Actuated Cycle: 150  
 50th %ile Actuated Cycle: 148.9  
 30th %ile Actuated Cycle: 145.5  
 10th %ile Actuated Cycle: 128  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 21: US 27 & SR 544



## **Appendix H**

Single Point Urban Interchange Alternative Preliminary Geometric Concept



ENGINEER OF RECORD Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		<b>SR 544 PD&amp;E STUDY</b> <b>US 27 &amp; SR 544</b> <b>SPUI ALTERNATIVE</b>	SHEET NO.  1
DATE		ROAD NO.	COUNTY		

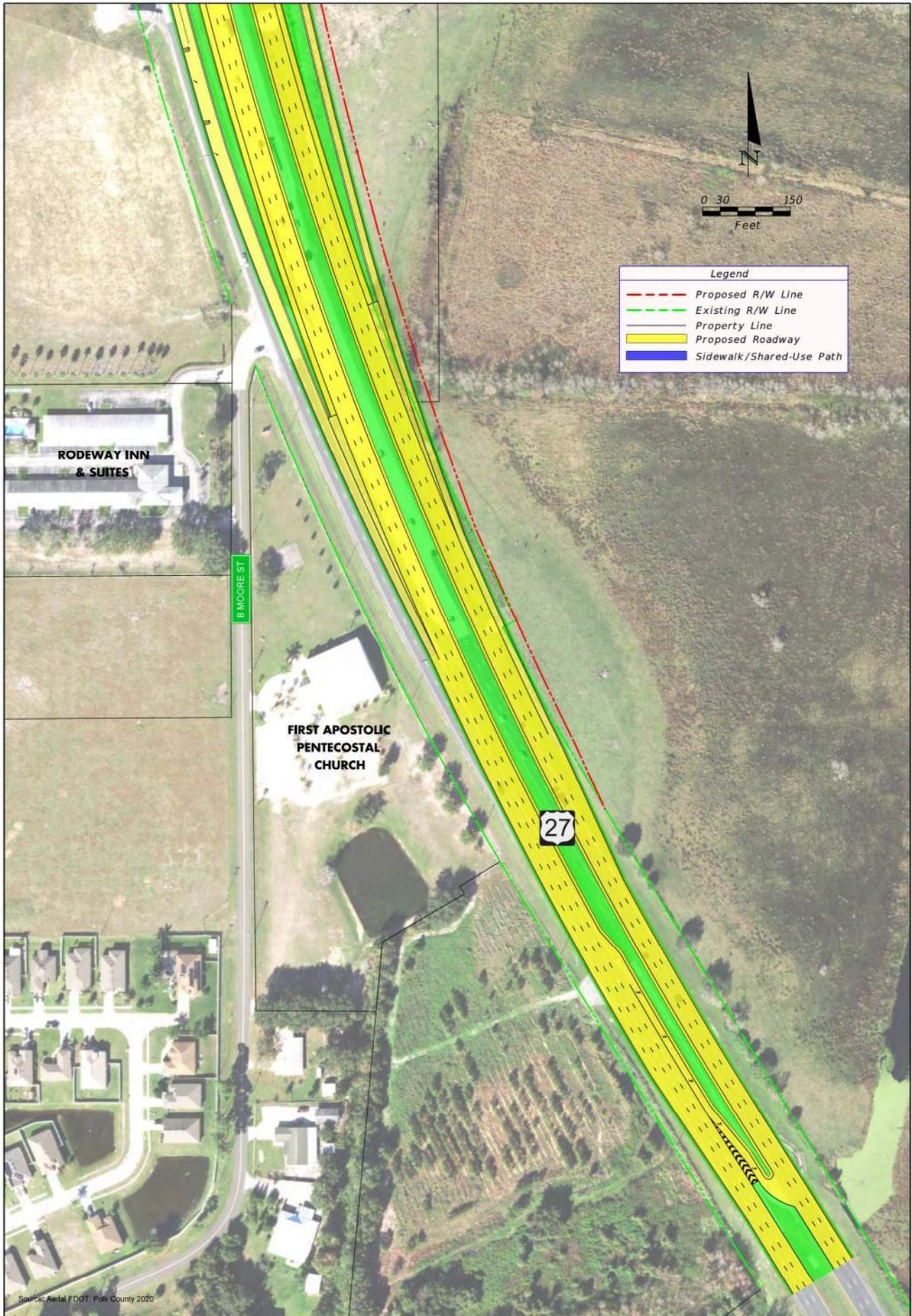


MATCHLINE - SEE SHEET 4

Source: Aerial FDOT, Polk County 2020

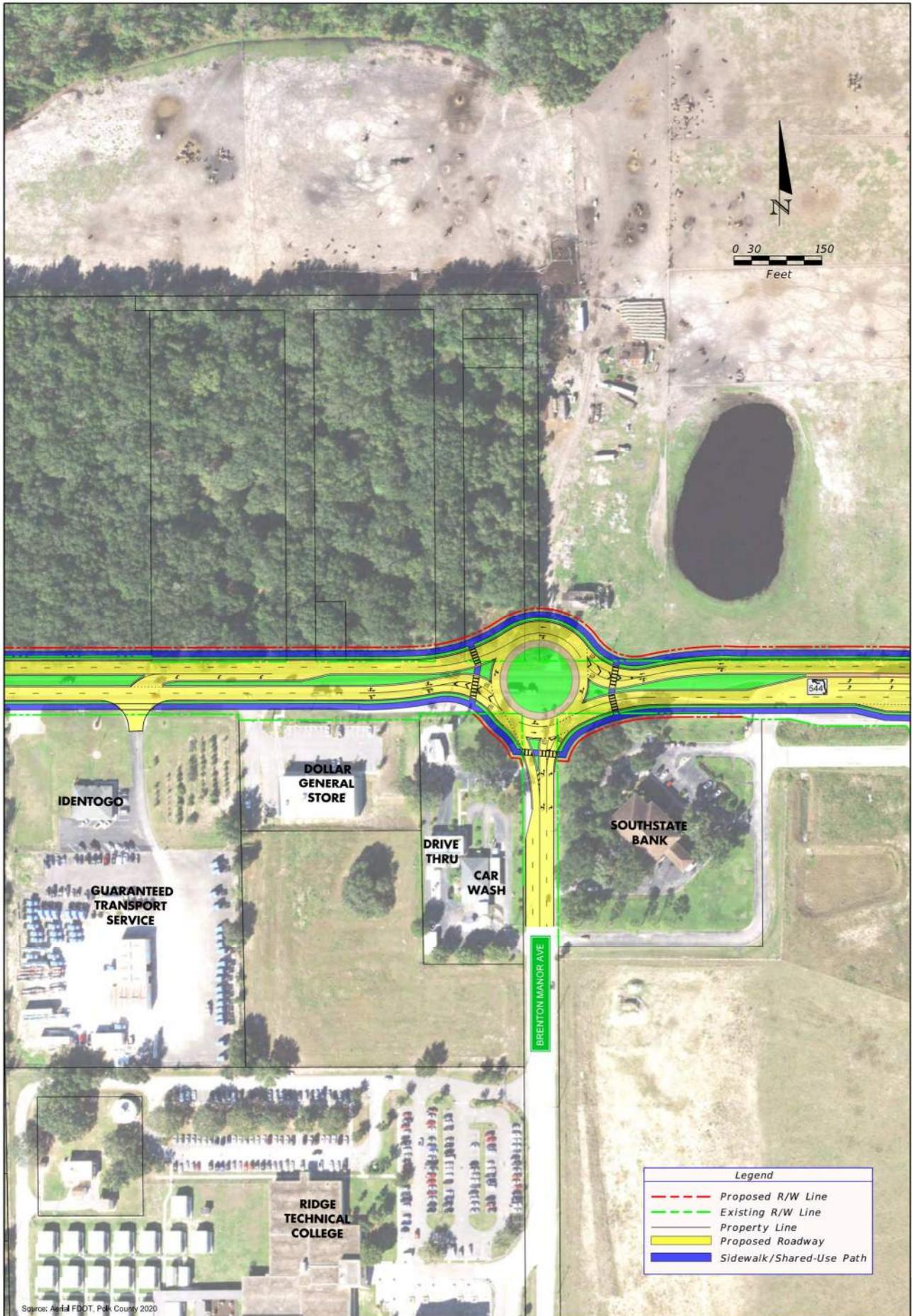
DATE	ENGINEER OF RECORD	STATE OF FLORIDA		SR 544 PD&E STUDY	SHEET NO.
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	DEPARTMENT OF TRANSPORTATION			
		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	2

**SR 544 PD&E STUDY**  
**US 27 & SR 544**  
**SPUI ALTERNATIVE**



Source: Aerial FDOT, Polk County 2020

DATE	ENGINEER OF RECORD			STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	SR 544 PD&E STUDY US 27 & SR 544 SPUI ALTERNATIVE	SHEET NO.  3
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765					



Legend	
	Proposed R/W Line
	Existing R/W Line
	Property Line
	Proposed Roadway
	Sidewalk/Shared-Use Path

Sources: Aerial: FDOT, Polk County 2020

DATE	ENGINEER OF RECORD	STATE OF FLORIDA		SR 544 PD&E STUDY	SHEET NO.
	Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	DEPARTMENT OF TRANSPORTATION			
		ROAD NO.	COUNTY	FINANCIAL PROJECT ID	4
				SPUI ALTERNATIVE	

**Appendix I**

SYNCHRO and SIDRA Analysis Summary

Sheets for Brenton Manor Avenue

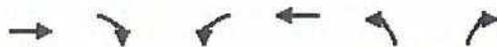
Lanes, Volumes, Timings  
 19: Brenton Manor Ave. & SR 544

07/06/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↙	↑↑	↖	↗
Traffic Volume (vph)	1661	158	200	1851	73	83
Future Volume (vph)	1661	158	200	1851	73	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		260	250		250	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.987					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3393	0	1719	3438	1719	1538
Flt Permitted			0.071		0.950	
Satd. Flow (perm)	3393	0	128	3438	1719	1538
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	17					87
Link Speed (mph)	30			30	30	
Link Distance (ft)	2534			1091	1065	
Travel Time (s)	57.6			24.8	24.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	1748	166	211	1948	77	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1914	0	211	1948	77	87
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2		1	2	1	1
Detector Template	Thru		Left	Thru	Left	Right
Leading Detector (ft)	100		20	100	20	20
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	6		20	6	20	20
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	

Lanes, Volumes, Timings  
19: Brenton Manor Ave. & SR 544

07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases			6			2
Detector Phase	2		1	6	3	2
Switch Phase						
Minimum Initial (s)	1.0		5.0	5.0	5.0	1.0
Minimum Split (s)	7.0		11.0	24.0	11.0	7.0
Total Split (s)	53.0		17.0	70.0	20.0	53.0
Total Split (%)	58.9%		18.9%	77.8%	22.2%	58.9%
Maximum Green (s)	47.0		11.0	64.0	14.0	47.0
Yellow Time (s)	4.5		4.5	4.5	4.5	4.5
All-Red Time (s)	1.5		1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead			Lag
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		None	None	None	Min
Act Effct Green (s)	50.4		66.0	67.2	9.1	50.4
Actuated g/C Ratio	0.60		0.78	0.79	0.11	0.60
v/c Ratio	0.94		0.76	0.71	0.42	0.09
Control Delay	29.8		35.9	7.9	42.3	2.7
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	29.8		35.9	7.9	42.3	2.7
LOS	C		D	A	D	A
Approach Delay	29.8			10.6	21.3	
Approach LOS	C			B	C	
90th %ile Green (s)	47.0		11.0	64.0	12.8	47.0
90th %ile Term Code	Max		Max	Max	Gap	Max
70th %ile Green (s)	47.0		11.0	64.0	10.6	47.0
70th %ile Term Code	Max		Max	Max	Gap	Max
50th %ile Green (s)	47.0		11.0	64.0	9.1	47.0
50th %ile Term Code	Max		Max	Hold	Gap	Max
30th %ile Green (s)	47.8		9.1	62.9	7.7	47.8
30th %ile Term Code	Dwell		Gap	Dwell	Gap	Dwell
10th %ile Green (s)	62.0		6.0	74.0	0.0	62.0
10th %ile Term Code	Dwell		Gap	Dwell	Skip	Dwell
Stops (vph)	1347		104	891	64	10
Fuel Used(gal)	54		4	24	2	1
CO Emissions (g/hr)	3803		261	1652	111	55
NOx Emissions (g/hr)	740		51	321	22	11
VOC Emissions (g/hr)	881		61	383	26	13
Dilemma Vehicles (#)	0		0	0	0	0
Queue Length 50th (ft)	~533		60	248	39	0
Queue Length 95th (ft)	#766		#169	403	81	21
Internal Link Dist (ft)	2454			1011	985	
Turn Bay Length (ft)			250		250	
Base Capacity (vph)	2027		306	2741	284	951
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0

Lanes, Volumes, Timings  
 19: Brenton Manor Ave. & SR 544

07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.94		0.69	0.71	0.27	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 84.6  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 19.7  
 Intersection Capacity Utilization 81.2%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 88.8  
 70th %ile Actuated Cycle: 86.6  
 50th %ile Actuated Cycle: 85.1  
 30th %ile Actuated Cycle: 82.6  
 10th %ile Actuated Cycle: 80  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 19: Brenton Manor Ave. & SR 544



Lanes, Volumes, Timings  
 19: Brenton Manor Ave. & SR 544

07/06/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Volume (vph)	1959	92	112	1708	150	137
Future Volume (vph)	1959	92	112	1708	150	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		260	250		250	0
Storage Lanes		0	1		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.993					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3477	0	1719	3505	1719	1538
Flt Permitted			0.055		0.950	
Satd. Flow (perm)	3477	0	100	3505	1719	1538
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	8					141
Link Speed (mph)	30			30	30	
Link Distance (ft)	2534			1091	1065	
Travel Time (s)	57.6			24.8	24.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	3%	5%	5%	3%	5%	5%
Adj. Flow (vph)	2020	95	115	1761	155	141
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2115	0	115	1761	155	141
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	0	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2		1	2	1	1
Detector Template	Thru		Left	Thru	Left	Right
Leading Detector (ft)	100		20	100	20	20
Trailing Detector (ft)	0		0	0	0	0
Detector 1 Position(ft)	0		0	0	0	0
Detector 1 Size(ft)	6		20	6	20	20
Detector 1 Type	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	2		1	6	3	

Lanes, Volumes, Timings  
 19: Brenton Manor Ave. & SR 544

07/06/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases			6			2
Detector Phase	2		1	6	3	2
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	20.0		11.0	24.0	20.0	20.0
Total Split (s)	73.0		17.0	90.0	20.0	73.0
Total Split (%)	66.4%		15.5%	81.8%	18.2%	66.4%
Maximum Green (s)	67.0		11.0	84.0	14.0	67.0
Yellow Time (s)	4.5		4.5	4.5	4.5	4.5
All-Red Time (s)	1.5		1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0		6.0	6.0	6.0	6.0
Lead/Lag	Lag		Lead			Lag
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	Min		None	None	Min	Min
Act Effct Green (s)	67.1		81.4	81.4	12.8	67.1
Actuated g/C Ratio	0.63		0.77	0.77	0.12	0.63
v/c Ratio	0.96		0.57	0.66	0.75	0.14
Control Delay	31.8		26.6	7.4	67.9	1.8
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	31.8		26.6	7.4	67.9	1.8
LOS	C		C	A	E	A
Approach Delay	31.8			8.6	36.4	
Approach LOS	C			A	D	
90th %ile Green (s)	67.0		11.0	84.0	14.0	67.0
90th %ile Term Code	Max		Max	Hold	Max	Max
70th %ile Green (s)	67.0		10.1	83.1	14.0	67.0
70th %ile Term Code	Max		Gap	Hold	Max	Max
50th %ile Green (s)	67.0		8.0	81.0	14.0	67.0
50th %ile Term Code	Max		Gap	Hold	Max	Max
30th %ile Green (s)	67.0		6.7	79.7	12.9	67.0
30th %ile Term Code	Max		Gap	Hold	Gap	Max
10th %ile Green (s)	67.0		5.9	78.9	9.5	67.0
10th %ile Term Code	Max		Gap	Hold	Gap	Max
Stops (vph)	1643		50	734	136	10
Fuel Used(gal)	63		2	21	4	1
CO Emissions (g/hr)	4398		128	1479	285	87
NOx Emissions (g/hr)	856		25	288	55	17
VOC Emissions (g/hr)	1019		30	343	66	20
Dilemma Vehicles (#)	0		0	0	0	0
Queue Length 50th (ft)	667		25	258	103	0
Queue Length 95th (ft)	#956		84	317	#200	24
Internal Link Dist (ft)	2454			1011	985	
Turn Bay Length (ft)			250		250	
Base Capacity (vph)	2198		244	2774	226	1022
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0

Lanes, Volumes, Timings  
 19: Brenton Manor Ave. & SR 544

07/06/2023

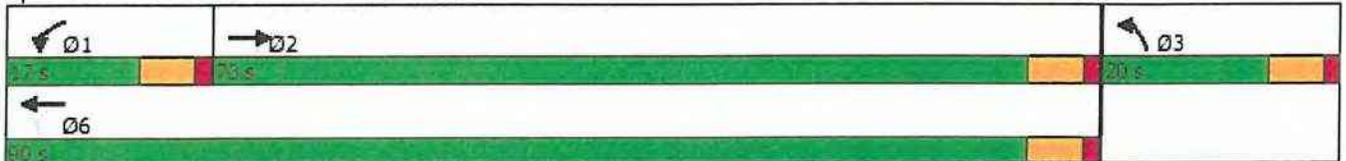


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Reduced v/c Ratio	0.96		0.47	0.63	0.69	0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 110  
 Actuated Cycle Length: 106.2  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.96  
 Intersection Signal Delay: 22.0  
 Intersection Capacity Utilization 86.6%  
 Analysis Period (min) 15  
 90th %ile Actuated Cycle: 110  
 70th %ile Actuated Cycle: 109.1  
 50th %ile Actuated Cycle: 107  
 30th %ile Actuated Cycle: 104.6  
 10th %ile Actuated Cycle: 100.4  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 19: Brenton Manor Ave. & SR 544

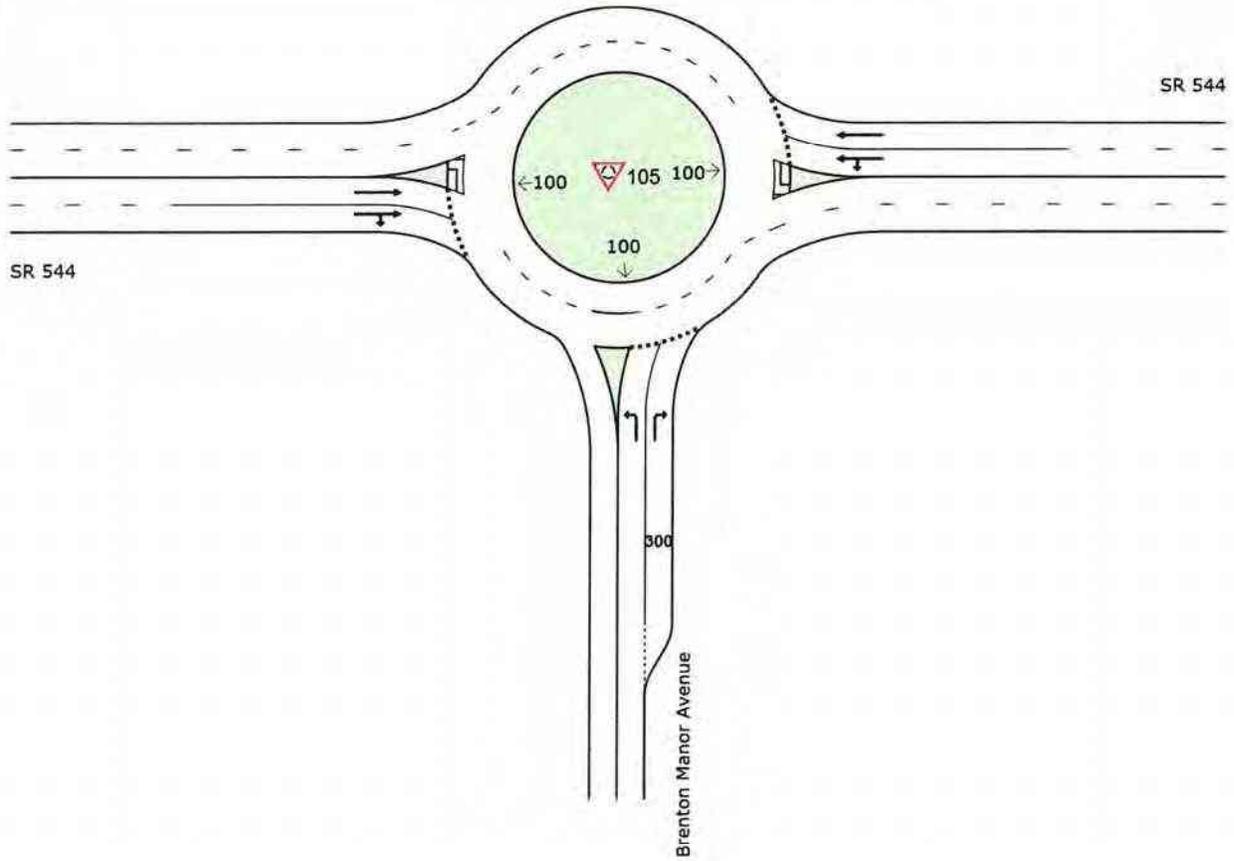


# SITE LAYOUT

 Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. ]	[ Dist ]				
South: Brenton Manor Avenue														
3	L2	73	5.0	77	5.0	0.324	23.9	LOS C	1.1	27.5	0.86	0.92	1.10	25.8
18	R2	83	5.0	87	5.0	0.308	19.7	LOS C	1.0	26.1	0.84	0.89	1.04	27.7
Approach		156	5.0	164	5.0	0.324	21.7	LOS C	1.1	27.5	0.85	0.91	1.07	26.8
East: SR 544														
1	L2	200	5.0	211	5.0	0.859	21.4	LOS C	13.0	339.0	0.73	0.39	0.73	27.8
6	T1	1851	5.0	1948	5.0	0.859	21.4	LOS C	13.0	339.0	0.73	0.39	0.73	28.0
Approach		2051	5.0	2159	5.0	0.859	21.4	LOS C	13.0	339.0	0.73	0.39	0.73	28.0
West: SR 544														
2	T1	1661	5.0	1748	5.0	0.866	24.1	LOS C	28.9	752.7	0.95	1.29	2.01	27.2
12	R2	158	5.0	166	5.0	0.866	24.1	LOS C	28.9	752.7	0.95	1.29	2.01	26.5
Approach		1819	5.0	1915	5.0	0.866	24.1	LOS C	28.9	752.7	0.95	1.29	2.01	27.2
All Vehicles		4026	5.0	4238	5.0	0.866	22.6	LOS C	28.9	752.7	0.83	0.82	1.32	27.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\AM Pk Hr\SR 544\_Brenton Manor Ave\_2045 AM Pk Hr\_Build Alt 2.sip9

# LANE SUMMARY

Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV %						[ Veh	Dist ] ft				
South: Brenton Manor Avenue													
Lane 1	77	5.0	237	0.324	100	23.9	LOS C	1.1	27.5	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	87	5.0	284	0.308	100	19.7	LOS C	1.0	26.1	Short	300	0.0	NA
Approach	164	5.0		0.324		21.7	LOS C	1.1	27.5				
East: SR 544													
Lane 1	1079	5.0	1257	0.859	100	21.4	LOS C	13.0	339.0	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	1079	5.0	1257	0.859	100	21.4	LOS C	13.0	339.0	Full	1600	0.0	0.0
Approach	2159	5.0		0.859		21.4	LOS C	13.0	339.0				
West: SR 544													
Lane 1	957	5.0	1106	0.866	100	24.1	LOS C	28.9	752.7	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	957	5.0	1106	0.866	100	24.1	LOS C	28.9	752.7	Full	1600	0.0	0.0
Approach	1915	5.0		0.866		24.1	LOS C	28.9	752.7				
Intersection	4238	5.0		0.866		22.6	LOS C	28.9	752.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Brenton Manor Avenue										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
From S To Exit:	W	E								
Lane 1	77	-	77	5.0	237	0.324	100	NA	NA	
Lane 2	-	87	87	5.0	284	0.308	100	0.0	1	
Approach	77	87	164	5.0		0.324				
East: SR 544										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Lane No.	
From E To Exit:	S	W								
Lane 1	211	869	1079	5.0	1257	0.859	100	NA	NA	

Lane 2	-	1079	1079	5.0	1257	0.859	100	NA	NA
Approach	211	1948	2159	5.0		0.859			

West: SR 544

Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	E	S			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	957	-	957	5.0	1106	0.866	100	NA	NA
Lane 2	791	166	957	5.0	1106	0.866	100	NA	NA
Approach	1748	166	1915	5.0		0.866			
Total %HV Deg.Satn (v/c)									
Intersection	4238	5.0		0.866					

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

### Merge Analysis

Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity Rate veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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South Exit: Brenton Manor Avenue

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

East Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

West Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

# SITE LAYOUT

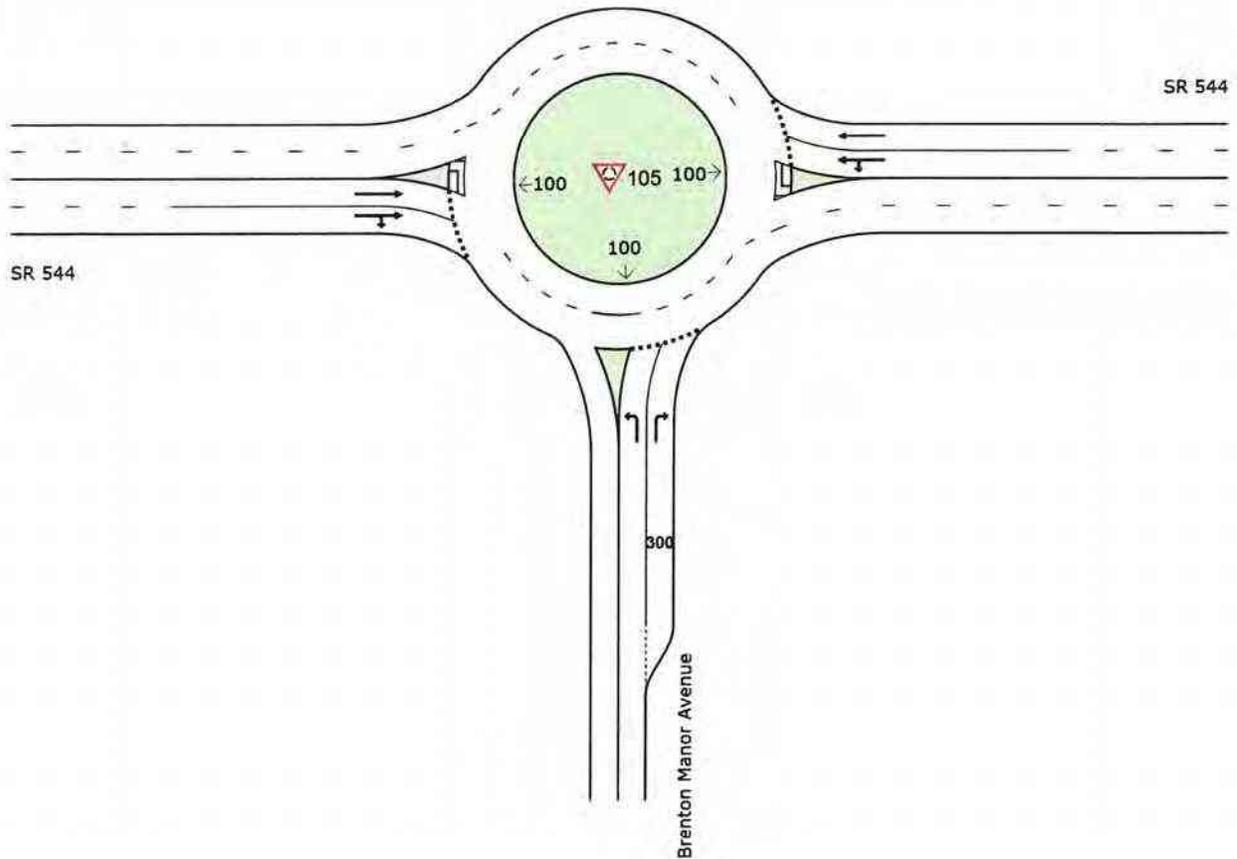
Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

 Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
South: Brenton Manor Avenue														
3	L2	150	5.0	155	5.0	0.670	45.8	LOS E	2.8	73.1	0.93	1.14	1.79	20.8
18	R2	137	5.0	141	5.0	0.745	63.5	LOS F	3.3	85.8	0.95	1.21	2.03	17.9
Approach		287	5.0	296	5.0	0.745	54.3	LOS F	3.3	85.8	0.94	1.17	1.91	19.4
East: SR 544														
1	L2	112	5.0	115	5.0	0.790	17.3	LOS C	17.1	439.3	0.77	0.73	1.11	29.4
6	T1	1708	3.0	1761	3.0	0.790	17.2	LOS C	17.2	440.3	0.77	0.73	1.11	29.6
Approach		1820	3.1	1876	3.1	0.790	17.3	LOS C	17.2	440.3	0.77	0.73	1.11	29.6
West: SR 544														
2	T1	1959	3.0	2020	3.0	0.857	21.5	LOS C	21.1	541.1	0.87	0.68	1.09	28.1
12	R2	92	5.0	95	5.0	0.857	21.6	LOS C	21.0	539.5	0.87	0.68	1.08	27.3
Approach		2051	3.1	2114	3.1	0.857	21.5	LOS C	21.1	541.1	0.87	0.68	1.09	28.1
All Vehicles		4158	3.2	4287	3.2	0.857	21.9	LOS C	21.1	541.1	0.83	0.74	1.15	27.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\PM Pk Hr\SR 544\_Brenton Manor Ave\_2045 PM Pk Hr\_Build Alt 2.sip9

# LANE SUMMARY

Site: 105 [SR 544/Brenton Manor Avenue Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %]						[ Veh	Dist ] ft				
South: Brenton Manor Avenue													
Lane 1 <sup>d</sup>	155	5.0	231	0.670	100	45.8	LOS E	2.8	73.1	Full	1600	0.0	0.0
Lane 2	141	5.0	190	0.745	100	63.5	LOS F	3.3	85.8	Short	300	0.0	NA
Approach	296	5.0		0.745		54.3	LOS F	3.3	85.8				
East: SR 544													
Lane 1	937	3.2	1186	0.790	100	17.3	LOS C	17.1	439.3	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	939	3.0	1189	0.790	100	17.2	LOS C	17.2	440.3	Full	1600	0.0	0.0
Approach	1876	3.1		0.790		17.3	LOS C	17.2	440.3				
West: SR 544													
Lane 1 <sup>d</sup>	1058	3.0	1235	0.857	100	21.5	LOS C	21.1	541.1	Full	1600	0.0	0.0
Lane 2	1056	3.2	1232	0.857	100	21.5	LOS C	21.0	539.5	Full	1600	0.0	0.0
Approach	2114	3.1		0.857		21.5	LOS C	21.1	541.1				
Intersection	4287	3.2		0.857		21.9	LOS C	21.1	541.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
South: Brenton Manor Avenue										
Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
From S To Exit:	W	E								
Lane 1	155	-	155	5.0	231	0.670	100	NA	NA	
Lane 2	-	141	141	5.0	190	0.745	100	0.0	1	
Approach	155	141	296	5.0		0.745				
East: SR 544										
Mov.	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL %	Ov. Ov. %	Ov. Lane No.
From E To Exit:	S	W								
Lane 1	115	822	937	3.2	1186	0.790	100	NA	NA	

Lane 2	-	939	939	3.0	1189	0.790	100	NA	NA
Approach	115	1761	1876	3.1		0.790			

West: SR 544

Mov.	T1	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W					veh/h	Satn	Util.	SL	Lane
To Exit:	E	S				v/c	%	%	No.
Lane 1	1058	-	1058	3.0	1235	0.857	100	NA	NA
Lane 2	961	95	1056	3.2	1232	0.857	100	NA	NA
Approach	2020	95	2114	3.1		0.857			

	Total	%HV	Deg.	Satn (v/c)
Intersection	4287	3.2		0.857

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	

South Exit: Brenton Manor Avenue

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

East Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

West Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	885	774	158	57	538	345	73	45	38	253	143	1338
Future Volume (vph)	885	774	158	57	538	345	73	45	38	253	143	1338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		0	350		350	250		0	500		400
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frnt		0.975				0.850		0.931				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3352	0	1719	3438	1538	1719	1685	0	1719	1810	2707
Flt Permitted	0.950			0.253			0.950			0.950		
Satd. Flow (perm)	3335	3352	0	458	3438	1538	1719	1685	0	1719	1810	2707
Right Turn on Red			Yes			Yes		Yes		Yes		Yes
Satd. Flow (RTOR)		20				363		27				418
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2642			1091			1065			1791	
Travel Time (s)		60.0			24.8			24.2			40.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	932	815	166	60	566	363	77	47	40	266	151	1408
Shared Lane Traffic (%)												
Lane Group Flow (vph)	932	981	0	60	566	363	77	87	0	266	151	1408
Enter Blocked Intersection	No											
Lane Alignment	Left	Left	Right									
Median Width(ft)		0			0			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8						
Detector Phase	7	4		3	8	8	2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0		11.0	24.0	24.0	21.0	21.0		24.0	24.0	
Total Split (s)	48.0	51.0		27.0	30.0	30.0	23.0	23.0		29.0	29.0	
Total Split (%)	36.9%	39.2%		20.8%	23.1%	23.1%	17.7%	17.7%		22.3%	22.3%	
Maximum Green (s)	42.0	45.0		21.0	24.0	24.0	17.0	17.0		23.0	23.0	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	None	
Act Effct Green (s)	41.5	58.4		23.9	23.9	23.9	17.7	17.7		23.0	23.0	64.5
Actuated g/C Ratio	0.32	0.45		0.18	0.18	0.18	0.14	0.14		0.18	0.18	0.50
v/c Ratio	0.88	0.65		0.34	0.90	0.63	0.33	0.35		0.88	0.47	0.91
Control Delay	52.2	30.5		11.3	24.4	18.1	55.7	39.9		77.2	56.0	20.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.2	30.5		11.3	24.4	18.1	55.7	39.9		77.2	56.0	20.8
LOS	D	C		B	C	B	E	D		E	E	C
Approach Delay		41.1			21.3			47.3			32.0	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	379	334		31	268	264	60	46		234	112	314
Queue Length 95th (ft)	466	431		m31	m273	m269	112	100		m#356	m167	400
Internal Link Dist (ft)		2562			1011			985			1711	
Turn Bay Length (ft)	575			350		350	250			500		400
Base Capacity (vph)	1077	1516		287	634	579	233	251		304	320	1562
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.87	0.65		0.21	0.89	0.63	0.33	0.35		0.88	0.47	0.90

Intersection Summary

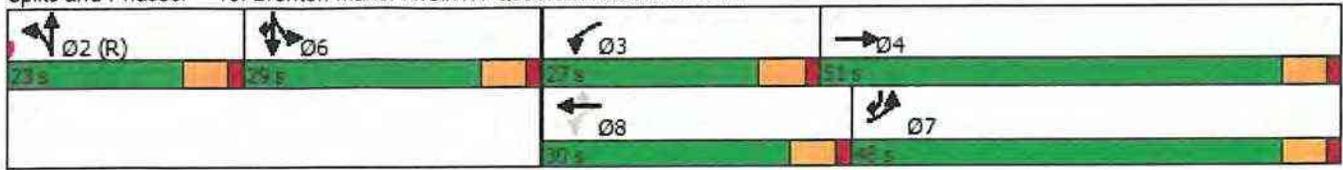
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 83 (64%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 100  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.91  
 Intersection Signal Delay: 33.9  
 Intersection Capacity Utilization 80.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021

Splits and Phases: 19: Brenton Manor Ave./NW Quadrant Road & SR 544



Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	980	1012	92	33	493	296	150	67	70	358	79	1195
Future Volume (vph)	980	1012	92	33	493	296	150	67	70	358	79	1195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	575		0	350		350	250		0	500		400
Storage Lanes	2		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frnt		0.987				0.850		0.923				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3454	0	1719	3505	1538	1752	1687	0	1752	1810	2760
Flt Permitted	0.950			0.294			0.950			0.950		
Satd. Flow (perm)	3335	3454	0	532	3505	1538	1752	1687	0	1752	1810	2760
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8				305		33				173
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		2642			1091			1065			1791	
Travel Time (s)		60.0			24.8			24.2			40.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	5%	3%	5%	5%	3%	5%	3%	5%	3%	3%	5%	3%
Adj. Flow (vph)	1010	1043	95	34	508	305	155	69	72	369	81	1232
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1010	1138	0	34	508	305	155	141	0	369	81	1232
Enter Blocked Intersection	No	No	No	No	No	No						
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		pm+pt	NA	Perm	Split	NA		Split	NA	pt+ov
Protected Phases	7	4		3	8		2	2		6	6	6 7

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8						
Detector Phase	7	4		3	8	8	2	2		6	6	6 7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
Minimum Split (s)	11.0	24.0		11.0	24.0	24.0	21.0	21.0		24.0	24.0	
Total Split (s)	48.0	52.0		21.0	25.0	25.0	21.0	21.0		36.0	36.0	
Total Split (%)	36.9%	40.0%		16.2%	19.2%	19.2%	16.2%	16.2%		27.7%	27.7%	
Maximum Green (s)	42.0	46.0		15.0	19.0	19.0	15.0	15.0		30.0	30.0	
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5	1.5	1.5	1.5		1.5	1.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead						
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes						
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	C-Max	C-Max		None	None	
Act Effct Green (s)	42.0	58.0		19.0	19.0	19.0	15.0	15.0		30.0	30.0	72.0
Actuated g/C Ratio	0.32	0.45		0.15	0.15	0.15	0.12	0.12		0.23	0.23	0.55
v/c Ratio	0.94	0.74		0.23	0.99	0.63	0.77	0.63		0.91	0.19	0.77
Control Delay	59.0	34.4		10.8	48.4	20.5	80.2	55.4		77.0	47.4	15.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	59.0	34.4		10.8	48.4	20.5	80.2	55.4		77.0	47.4	15.3
LOS	E	C		B	D	C	F	E		E	D	B
Approach Delay		46.0			36.9			68.4			30.4	
Approach LOS		D			D			E			C	
Queue Length 50th (ft)	425	435		18	228	217	129	88		315	56	264
Queue Length 95th (ft)	#557	546		m19	#349	m312	#238	161		#487	m88	336
Internal Link Dist (ft)		2562			1011			985			1711	
Turn Bay Length (ft)	575			350		350	250			500		400
Base Capacity (vph)	1077	1546		214	512	485	202	223		404	417	1605
Starvation Cap Reductn	0	0		0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.94	0.74		0.16	0.99	0.63	0.77	0.63		0.91	0.19	0.77

Intersection Summary

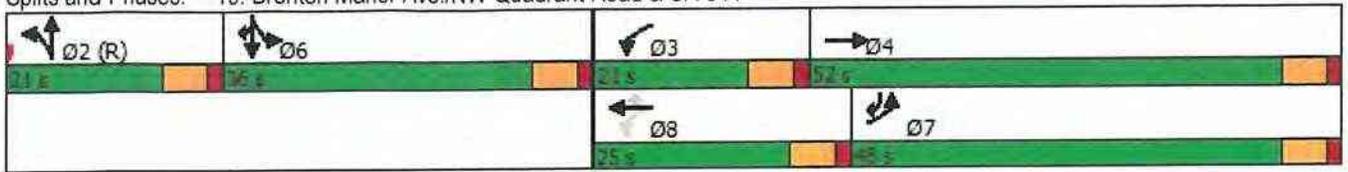
Area Type: Other  
 Cycle Length: 130  
 Actuated Cycle Length: 130  
 Offset: 73 (56%), Referenced to phase 2:NBT, Start of Green  
 Natural Cycle: 110  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.99  
 Intersection Signal Delay: 40.5 Intersection LOS: D  
 Intersection Capacity Utilization 89.2% ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.  
 m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

19: Brenton Manor Ave./NW Quadrant Road & SR 544

11/29/2021

Splits and Phases: 19: Brenton Manor Ave./NW Quadrant Road & SR 544

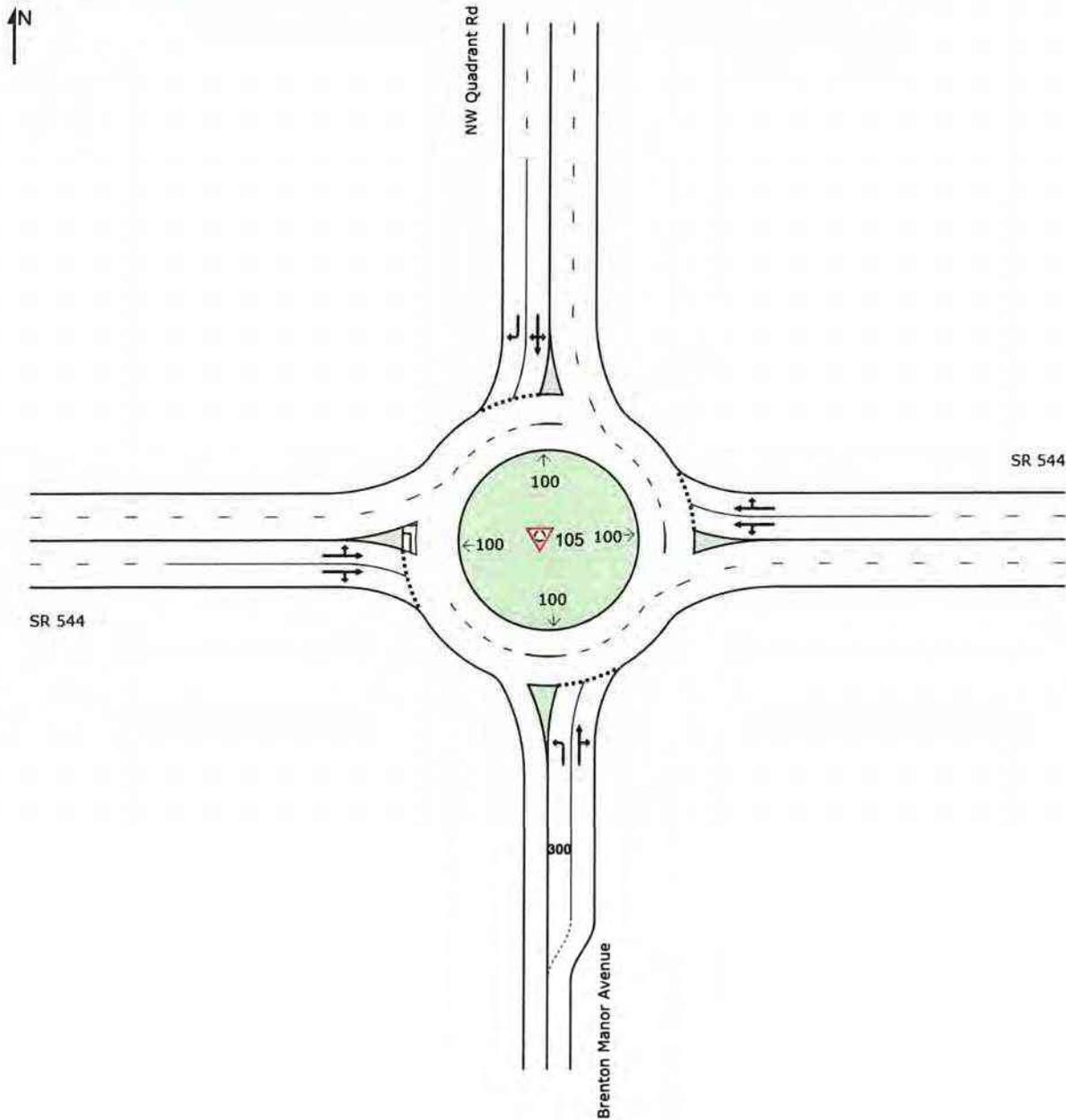


# SITE LAYOUT

Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection  
(Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

**Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection  
(Site Folder: General)]**

Design Year (2045) AM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh veh ]	[ Dist ft ]				
South: Brenton Manor Avenue														
3	L2	73	5.0	77	5.0	0.380	30.3	LOS D	1.3	32.6	0.89	0.97	1.22	24.1
8	T1	45	3.0	49	3.0	0.359	24.2	LOS C	1.2	30.9	0.88	0.95	1.17	27.1
18	R2	38	5.0	40	5.0	0.359	24.5	LOS C	1.2	30.9	0.88	0.95	1.17	26.4
Approach		156	4.4	166	4.4	0.380	27.1	LOS D	1.3	32.6	0.88	0.96	1.19	25.4
East: SR 544														
1	L2	57	5.0	60	5.0	0.993	69.5	LOS F	16.5	429.4	0.97	1.94	4.33	17.6
6	T1	538	5.0	566	5.0	0.993	68.2	LOS F	18.1	466.2	0.97	1.95	4.37	17.8
16	R2	345	3.0	375	3.0	0.993	64.5	LOS F	18.1	466.2	0.98	1.99	4.46	17.9
Approach		940	4.3	1001	4.3	0.993	66.9	LOS F	18.1	466.2	0.97	1.97	4.40	17.8
North: RoadName														
7	L2	253	3.0	275	3.0	1.346	184.7	LOS F	88.0	2251.9	1.00	4.38	11.39	9.2
4	T1	143	3.0	155	3.0	1.346	184.7	LOS F	88.0	2251.9	1.00	4.38	11.39	9.2
14	R2	1338	3.0	1454	3.0	1.346	183.2	LOS F	96.6	2472.4	1.00	4.56	11.81	9.2
Approach		1734	3.0	1885	3.0	1.346	183.6	LOS F	96.6	2472.4	1.00	4.52	11.71	9.2
West: SR 544														
5	L2	885	3.0	962	3.0	1.019	54.6	LOS F	48.4	1238.5	1.00	2.33	4.27	19.3
2	T1	774	5.0	815	5.0	1.019	55.0	LOS F	48.4	1238.5	1.00	2.35	4.29	19.8
12	R2	158	5.0	166	5.0	1.019	55.0	LOS F	47.6	1238.8	1.00	2.35	4.29	19.5
Approach		1817	4.0	1943	4.0	1.019	54.8	LOS F	48.4	1238.8	1.00	2.34	4.28	19.5
All Vehicles		4647	3.7	4995	3.7	1.346	104.9	LOS F	96.6	2472.4	0.99	3.04	7.01	13.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\AM Pk Hr\SR 544\_NWQR\_Brenton Manor Ave\_2045 AM Pk Hr\_Build Alt 2.sip9

# LANE SUMMARY

Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection  
(Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	[ HV ] %						[ Veh	[ Dist ] ft				
South: Brenton Manor Avenue													
Lane 1	77	5.0	202	0.380	100	30.3	LOS D	1.3	32.6	Short	300	0.0	NA
Lane 2 <sup>d</sup>	89	3.9	248	0.359	100	24.3	LOS C	1.2	30.9	Full	1600	0.0	0.0
Approach	166	4.4		0.380		27.1	LOS D	1.3	32.6				
East: SR 544													
Lane 1	465	5.0	469	0.993	100	69.5	LOS F	16.5	429.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	536	3.6	540	0.993	100	64.6	LOS F	18.1	466.2	Full	1600	0.0	0.0
Approach	1001	4.3		0.993		66.9	LOS F	18.1	466.2				
North: RoadName													
Lane 1	894	3.0	665	1.346	100	184.7	LOS F	88.0	2251.9	Full	1600	0.0	16.2
Lane 2 <sup>d</sup>	991	3.0	736	1.346	100	182.5	LOS F	96.6	2472.4	Full	1600	0.0	19.8
Approach	1885	3.0		1.346		183.6	LOS F	96.6	2472.4				
West: SR 544													
Lane 1 <sup>d</sup>	981	3.0	963	1.019	100	54.6	LOS F	48.4	1238.5	Full	1600	0.0	0.0
Lane 2	962	5.0	945	1.019	100	55.0	LOS F	47.6	1238.8	Full	1600	0.0	0.0
Approach	1943	4.0		1.019		54.8	LOS F	48.4	1238.8				
Intersection	4995	3.7		1.346		104.9	LOS F	96.6	2472.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.  
 Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.  
 LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).  
 Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).  
 Roundabout Capacity Model: US HCM 6.  
 Delay Model: HCM Delay Formula (Geometric Delay is not included).  
 Queue Model: HCM Queue Formula.  
 Gap-Acceptance Capacity: Traditional M1.  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Brenton Manor Avenue											
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From S To Exit:	W	N	E								
Lane 1	77	-	-	77	5.0	202	0.380	100	0.0	2	
Lane 2	-	49	40	89	3.9	248	0.359	100	NA	NA	
Approach	77	49	40	166	4.4		0.380				
East: SR 544											

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit:	S	W	N							
Lane 1	60	405	-	465	5.0	469	0.993	100	NA	NA
Lane 2	-	161	375	536	3.6	540	0.993	100	NA	NA
Approach	60	566	375	1001	4.3		0.993			
North: RoadName										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	E	S	W							
Lane 1	275	155	464	894	3.0	665	1.346	100	NA	NA
Lane 2	-	-	991	991	3.0	736	1.346	100	NA	NA
Approach	275	155	1454	1885	3.0		1.346			
West: SR 544										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	E	S							
Lane 1	962	19	-	981	3.0	963	1.019	100	NA	NA
Lane 2	-	796	166	962	5.0	945	1.019	100	NA	NA
Approach	962	815	166	1943	4.0		1.019			
Total %HV Deg. Satn (v/c)										
Intersection	4995	3.7		1.346						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

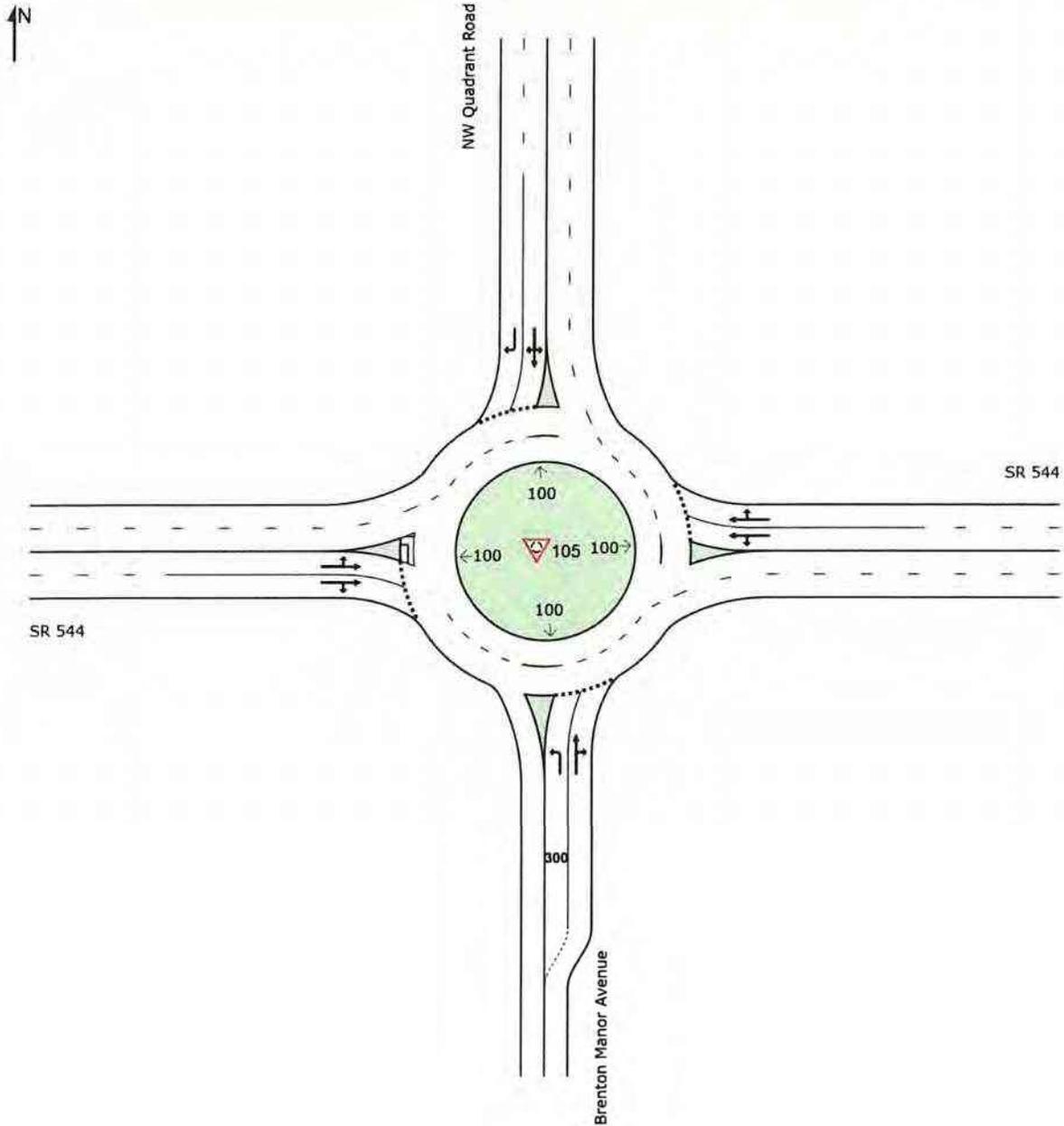
Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Brenton Manor Avenue												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: SR 544												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
North Exit: RoadName												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
West Exit: SR 544												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# SITE LAYOUT

Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection  
(Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection  
(Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
South: Brenton Manor Avenue														
3	L2	150	5.0	155	5.0	0.706	51.5	LOS F	3.0	78.4	0.94	1.17	1.89	19.8
8	T1	67	3.0	73	3.0	0.795	72.9	LOS F	3.8	97.0	0.96	1.26	2.21	17.1
18	R2	70	5.0	72	5.0	0.795	73.3	LOS F	3.8	97.0	0.96	1.26	2.21	16.8
Approach		287	4.5	300	4.5	0.795	62.0	LOS F	3.8	97.0	0.95	1.21	2.04	18.3
East: SR 544														
1	L2	33	5.0	34	5.0	0.892	49.8	LOS E	9.5	243.5	0.93	1.50	2.95	20.8
6	T1	493	3.0	508	3.0	0.892	48.4	LOS E	10.1	259.0	0.93	1.50	2.95	21.0
16	R2	296	3.0	322	3.0	0.892	45.3	LOS E	10.1	259.0	0.93	1.51	2.98	21.1
Approach		822	3.1	864	3.1	0.892	47.3	LOS E	10.1	259.0	0.93	1.51	2.96	21.0
North: NW Quadrant Road														
7	L2	358	3.0	389	3.0	1.246	143.5	LOS F	69.3	1773.2	1.00	3.78	9.47	11.1
4	T1	79	3.0	86	3.0	1.246	143.5	LOS F	69.3	1773.2	1.00	3.78	9.47	11.1
14	R2	1195	3.0	1299	3.0	1.246	141.8	LOS F	75.8	1940.0	1.00	3.92	9.80	11.0
Approach		1632	3.0	1774	3.0	1.246	142.3	LOS F	75.8	1940.0	1.00	3.88	9.71	11.0
West: SR 544														
5	L2	980	3.0	1065	3.0	1.188	113.5	LOS F	85.6	2190.2	1.00	3.56	7.39	13.0
2	T1	1012	3.0	1043	3.0	1.188	113.5	LOS F	85.6	2190.2	1.00	3.57	7.39	13.2
12	R2	92	5.0	95	5.0	1.188	113.6	LOS F	85.4	2189.9	1.00	3.57	7.39	13.0
Approach		2084	3.1	2203	3.1	1.188	113.5	LOS F	85.6	2190.2	1.00	3.57	7.39	13.1
All Vehicles		4825	3.1	5141	3.1	1.246	109.3	LOS F	85.6	2190.2	0.99	3.19	7.14	13.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\PM Pk Hr\SR 544\_NWQR\_Brenton Manor Ave\_2045 PM Pk Hr\_Build Alt 2.sip9

# LANE SUMMARY

Site: 105 [SR 544/NW QR/Brenton Manor Avenue Intersection]  
 (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h ]	[ HV % ]						[ Veh ]	[ Dist ] ft				
South: Brenton Manor Avenue													
Lane 1 <sup>d</sup>	155	5.0	219	0.706	100	51.5	LOS F	3.0	78.4	Short	300	0.0	NA
Lane 2	145	4.0	182	0.795	100	73.1	LOS F	3.8	97.0	Full	1600	0.0	0.0
Approach	300	4.5		0.795		62.0	LOS F	3.8	97.0				
East: SR 544													
Lane 1	403	3.2	452	0.892	100	49.6	LOS E	9.5	243.5	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	461	3.0	516	0.892	100	45.3	LOS E	10.1	259.0	Full	1600	0.0	0.0
Approach	864	3.1		0.892		47.3	LOS E	10.1	259.0				
North: NW Quadrant Road													
Lane 1	842	3.0	676	1.246	100	143.5	LOS F	69.3	1773.2	Full	1600	0.0	8.1
Lane 2 <sup>d</sup>	932	3.0	748	1.246	100	141.1	LOS F	75.8	1940.0	Full	1600	0.0	11.0
Approach	1774	3.0		1.246		142.3	LOS F	75.8	1940.0				
West: SR 544													
Lane 1 <sup>d</sup>	1103	3.0	928	1.188	100	113.5	LOS F	85.6	2190.2	Full	1600	0.0	15.2
Lane 2	1101	3.2	926	1.188	100	113.5	LOS F	85.4	2189.9	Full	1600	0.0	15.2
Approach	2203	3.1		1.188		113.5	LOS F	85.6	2190.2				
Intersection	5141	3.1		1.246		109.3	LOS F	85.6	2190.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
 Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)											
South: Brenton Manor Avenue											
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
From S To Exit:	W	N	E								
Lane 1	155	-	-	155	5.0	219	0.706	100	0.0	2	
Lane 2	-	73	72	145	4.0	182	0.795	100	NA	NA	
Approach	155	73	72	300	4.5		0.795				
East: SR 544											

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit:	S	W	N							
Lane 1	34	369	-	403	3.2	452	0.892	100	NA	NA
Lane 2	-	139	322	461	3.0	516	0.892	100	NA	NA
Approach	34	508	322	864	3.1		0.892			
North: NW Quadrant Road										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	E	S	W							
Lane 1	389	86	367	842	3.0	676	1.246	100	NA	NA
Lane 2	-	-	932	932	3.0	748	1.246	100	NA	NA
Approach	389	86	1299	1774	3.0		1.246			
West: SR 544										
Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From W To Exit:	N	E	S							
Lane 1	1065	37	-	1103	3.0	928	1.188	100	NA	NA
Lane 2	-	1006	95	1101	3.2	926	1.188	100	NA	NA
Approach	1065	1043	95	2203	3.1		1.188			
Total %HV Deg. Satn (v/c)										
Intersection	5141	3.1		1.246						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane % veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
South Exit: Brenton Manor Avenue												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
East Exit: SR 544												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
North Exit: NW Quadrant Road												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.
West Exit: SR 544												
Merge Type: <b>Not Applied</b>												
Full Length Lane	1											Merge Analysis not applied.
Full Length Lane	2											Merge Analysis not applied.

# Florida Department of Transportation

## Intersection Control Evaluation (ICE) Form

### Stage 1: Screening

Intersection Control Evaluation Form 750-010-003

To fulfill the requirements of Stage 1 (Screening) of FDOT's ICE procedures, complete the following form and append all supporting documentation. Completed forms can be submitted to the District Traffic Operations Engineer (DTOE) and District Design Engineer (DDE) for the project's approval. Selections must be made in the "Intersection Type" and "Project Funding Source" cells below for the appropriate Stage 1 and Stage 2 forms to fully populate.

Project Name	SR 544 PD&E Study (MLK Blvd Intersection)		FDOT Project #	440273-1-22-01	
Submitted By	G. Root/A. Senyushkina	Agency/Company		Date	4/15/2022
Email	<a href="mailto:groot@aimengr.com">groot@aimengr.com</a>	FDOT District	District 1	County	Polk
Project Locality (City/Town/Village)	Winter Haven				
Intersection Type	At-Grade Intersection	FDOT Context Classification	C4 - Urban General		
Project Funding Source	Federal	Project Type	Corridor Improvement Project		
Project Purpose (What is the catalyst for this project and why is it being undertaken?)	The purpose of this project is to widen SR 544 (currently a two-lane undivided roadway) to a four-lane divided roadway. The need for additional capacity on SR 544 is due to the projected traffic volumes expected to travel on this roadway as a result of the future growth in residential and non-residential land uses forecasted by the Polk Transportation Planning Organization. This project will also enhance mobility options for pedestrians and bicyclists by providing facilities where they do not currently exist.				
Project Setting Description (Describe the area surrounding the intersection)	There are gas stations/convenience stores in the northeast and southeast quadrants of the intersection and an AutoZone auto parts store in the southwest quadrant. The building in the northwest quadrant of the intersection is a tax preparation service (Electro Tax Service).				
Multimodal Context (Describe the pedestrian, bicycle, and transit activity in the area and the potential for activity based on surrounding land uses and development patterns)	Sidewalks exist on all four legs of the intersection. There are no designated bike lanes in the vicinity of this intersection. Transit service is provided on three of the four intersection legs. In 2017, there were 67 pedestrians and 34 bicyclists crossing the intersection during a 12-hour period. In addition, in 2018 there were 38 pedestrians and 19 bicyclists crossing this intersection during an 8-hour period. The existing levels of bicycle/pedestrian activity in this area are expected to continue in the future.				

Major Street Information									
Route #:	SR 544/SR 549	Route Name(s)	Lucerne Park Road (north leg)/1st Street N. (south leg)			Milepost	3.693		
Existing Control Type	Signal		Existing AADT	20,900	Design Year AADT	31,500			
Design Vehicle	Interstate Semitrailer (WB-62)		Control Vehicle	Interstate Semitrailer (WB-62)					
Primary Functional Classification	Urban Minor Arterial				Design Speed (mph)	35			
Secondary Functional Classification (if app.)					Target Speed (mph) [if app.]	35			
Approach #1	Direction	Northbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along	Both sides of the approach		Left-Turn	1				
	Crosswalk on Approach?	Yes		Left-Through	1				
	On-Street Bike Facilities?	No		Through		Left	494	Left	527
	Multi-Use Path?	No		Left-Through-Right		Through	659	Through	833
	Scheduled Bus Service?	Yes		Through-Right		Right	209	Right	244
	Bus Stop on Approach?	No		Right-Turn	1	Daily Truck %		3.7%	
Approach #2	Direction	Southbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes	
	Sidewalks along:	Both sides of the approach		Left-Turn	1				
	Crosswalk on Approach?	Yes		Left-Through					
	On-Street Bike Facilities?	No		Through	2	Left	67	Left	55
	Multi-Use Path?	No		Left-Through-Right		Through	952	Through	731
	Scheduled Bus Service?	Yes		Through-Right		Right	442	Right	483
	Bus Stop on Approach?	No		Right-Turn	1	Daily Truck %		6.9%	

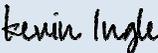
Minor Street Information										
Route #:	SR 544(west leg)	Route Name(s)	Martin Luther King Boulevard				Milepost (if app.)	3.69		
Existing Control Type	Signal		Existing AADT	19,000		Design Year AADT	31,500			
Design Vehicle	Intermediate Semitrailer (WB-40)		Control Vehicle	Intermediate Semitrailer (WB-40)						
Primary Functional Classification			Urban Minor Arterial			Design Speed (mph)	40			
Secondary Functional Classification (if app.)						Target Speed (mph) [if app.]				
Approach #1	Direction	Westbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Both sides of the approach		Left-Turn	1					
	Crosswalk on Approach?	Yes		Left-Through						
	On-Street Bike Facilities?	No		Through	1	Left	169	Left	201	
	Multi-Use Path?	No		Left-Through-Right		Through	810	Through	871	
	Scheduled Bus Service?	Yes		Through-Right		Right	32	Right	25	
	Bus Stop on Approach?	No		Right-Turn		Daily Truck %		3.8%		
Approach #2	Direction	Eastbound		Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:	Both sides of the approach		Left-Turn	1					
	Crosswalk on Approach?	Yes		Left-Through						
	On-Street Bike Facilities?	No		Through	1	Left	593	Left	545	
	Multi-Use Path?	No		Left-Through-Right		Through	802	Through	694	
	Scheduled Bus Service?	No		Through-Right		Right	513	Right	453	
	Bus Stop on Approach?	No		Right-Turn		1	Daily Truck %		5.4%	
Approach #3	Direction			Number of Lanes		Study Period #1 Traffic Volumes		Study Period #2 Traffic Volumes		
	Sidewalks along:			Left-Turn						
	Crosswalk on Approach?			Left-Through						
	On-Street Bike Facilities?			Through		Left		Left		
	Multi-Use Path?			Left-Through-Right		Through		Through		
	Scheduled Bus Service?			Through-Right		Right		Right		
	Bus Stop on Approach?			Right-Turn		Daily Truck %				

## Crash History (Existing Intersections Only)

Append the most recent five-years of crash data for the intersection from the CAR System. If the crash data evidences any issues relating to safety performance, discuss briefly here:

There were 179 crashes reported at this intersection during the six-year period from 2014 through 2019. These crashes resulted in 67 injuries and no fatalities. The most prevalent crash types are rear-end crashes (91), left-turn/angle crashes (33) and same direction sideswipe crashes (21). A bicycle crash occurred on Martin Luther King Boulevard approximately 190 feet east of SR 544 and another occurred at the SR 544/Avenue U intersection.

Control Strategy Evaluation							
Provide a brief justification as to why each of the following control strategies should be advanced or not. Justification should consider potential environmental impacts.							
Control Strategy	CAP-X Outputs			SPICE Outputs		Strategy to Be Advanced?	Justification
	V/C Ratio		Multimodal Score	Crash Prediction Rank	SSI Rank		
Two-Way Stop-Controlled						No	This is an existing signalized intersection.
All-Way Stop-Controlled						No	This is an existing signalized intersection.
Signalized Control	1.25	1.19	2.4	3	30	Yes	Provides some operational and safety benefits with minimal R/W impacts. Avoids any Environmental Justice (EJ) issues.
Roundabout	2.34	2.57	2.8	1	67	No	R/W impacts to businesses in all four quadrants. Significantly overcapacity during both peak hours.
Median U-Turn	1.06	1.18	3.1	2	48	No	Would require additional improvements on MLK Boulevard (including additional traffic signals).
RCUT (Signalized)	1.83	1.87	3.1	4	54	No	Would require additional improvements on MLK Boulevard. Highest number of fatal/injury crashes. Significantly overcapacity during both peak hours.
RCUT (Unsignalized)						No	This is an existing signalized intersection.
Jughandle						No	Significant R/W impacts & residential relocations, resulting in Environmental Justice (EJ) issues.
Displaced Left-Turn						No	Significant R/W impacts and business relocations.
Continuous Green Tee						No	This is an existing signalized intersection.
Quadrant Roadway	0.84 (SE) / 0.87 (SW)	0.87 (SE) / 0.97 (SW)	2.2 / 2.2			No	Additional R/W needed. Additional improvements needed on MLK Blvd & SR 549. Will not eliminate overcapacity conditions on SR 544 north of MLK Blvd.
Thru-Cut						No	Eliminating thru movements between two State roadways (SR 544 & SR 549) is not appropriate. Would require additional MLK Blvd improvements
Quadrant Roadway	1.22 (NE) / 1.00 (NW)	1.17 (NE) / 1.08 (NW)	2.2 / 2.2			No	Increased volumes on local streets. Could result in more bike/ped crashes. Significant R/W impacts and possible residential relocations. EJ issues.
Partial Median U-Turn	1.13	1.41	3.1			No	Would require additional improvements on MLK Blvd.

Resolution				
To be filled out by FDOT District Traffic Operations Engineer and District Design Engineer				
Project Determination		Identified Control Strategy Approved		
Comments	The PD&E study limits end at the north side curb return of SR 544. This study does not include MLK Blvd or SR 549. This intersection is constrained due to adjacent land uses. The recommended improvement avoids significant R/W impacts to a low income minority neighborhood (Florence Villa), avoids EJ issues, and improves bicycle/pedestrian safety on the north leg of the intersection.			
DTOE Name	Mark Mathes	Signature	DocuSigned by:  4/19/2022   2:30 PM EDT	Date
DDE Name	Kevin Ingle	Signature	DocuSigned by:  4/20/2022   7:50 AM EDT	Date

HSMV_Rep_Agency_Re_Reporting_Form_Type	Crash_Date	Crash_Tim	City	County	Crash_Street	Intersecting_Street	Offset_Dist	Offset_Dirc	Crash_Typ	Vehicles	Non_Motorist	Fatalities	Injuries	Alcohol_Re	Distraction	Drug_Relat	Estimated_
84110653	2014-0008	12:00 AM	Winter	Hav Polk	SR 544	SR 549	0		Unknown	2	0	0	0	N	N	N	\$100
84110703	2014-0031	6:22 PM	Winter	Hav Polk	SR 549	AVENUE U NW	0		Bicycle	1	1	0	1	N	N	N	\$500
84110787	2014-0076	2:53 PM	Winter	Hav Polk	SR 544	SR 549	0		Unknown	2	0	0	0	N	N	N	\$750
84110851	2014-0110	10:01 AM	Winter	Hav Polk	SR 549	AVE T	10	South	Sideswipe	2	0	0	1	N	N	N	\$7,000
84110883	2014-0129	6:41 PM	Winter	Hav Polk	SR 544	SR 549	200	East	Angle	2	0	0	0	N	N	N	\$6,500
84110900	2014-0139	2:53 PM	Winter	Hav Polk	SR 544	SR 549	0		Head On	2	0	0	0	N	N	N	\$2,200
84110916	2004-0144	9:00 AM	Winter	Hav Polk	SR 549	AVE T	50	North	Rear End	2	0	0	1	N	N	N	\$1,000
84110946	2014-0154	8:44 PM	Winter	Hav Polk	SR 544	SR 549	200	West	Rear End	2	0	0	1	N	N	N	\$0
84110955	2014-0164	3:15 PM	Winter	Hav Polk	SR 544	SR 549	200	West	Rear End	2	0	0	1	N	Y	N	\$2,000
84111062	2014-0206	2:42 AM	Winter	Hav Polk	STATE ROAD 544	STATE ROAD 549	100	East	Other	1	0	0	0	N	N	N	\$500
84111228	2014-0286	5:19 PM	Winter	Hav Polk	SR 544	1ST ST N	200	North	Rear End	2	0	0	0	N	N	N	\$500
84111248	2014-0312	9:54 PM	Winter	Hav Polk	SR 549	SR 544	0		Rear End	2	0	0	1	N	N	N	\$1,500
84111311	2014-0337	5:29 PM	Winter	Hav Polk	AVE T NE	SR 549	0		Rear End	3	0	0	0	N	N	N	\$300
84111319	2014-0319	12:42 PM	Winter	Hav Polk	SR 544	AVENUE U NW	0		Rear End	2	0	0	0	N	N	N	\$500
84111340	2014-0348	1:05 PM	Winter	Hav Polk	SR 544	1ST ST N	150	West	Head On	2	0	0	0	N	N	N	\$8,000
84111445	2014-0426	11:20 AM	Winter	Hav Polk	SR 544	SR 549	50	West	Unknown	2	0	0	0	N	N	N	\$800
84111590	2014-0520	12:15 PM	Winter	Hav Polk	STATE ROAD 549	STATE ROAD 544	0		Left Turn	2	0	0	2	N	Y	N	\$30,000
84111655	2014-0553	10:33 PM	Winter	Hav Polk	SR 544	SR 549	0		Left Turn	2	0	0	1	N	N	N	\$3,000
84111663	2014-0555	5:01 PM	Winter	Hav Polk	SR 549	SR 544	0		Rear End	2	0	0	1	N	Y	N	\$2,000
84111695	2014-0583	11:08 PM	Winter	Hav Polk	SR 549	SR 544	0		Off Road	1	0	0	0	N	N	N	\$12,000
84111745	2014-0607	5:47 PM	Winter	Hav Polk	AVE T NE	SR 549	25	East	Rear End	2	0	0	1	N	N	N	\$3,500
84111747	2014-0610	12:47 PM	Winter	Hav Polk	AVENUE T NE	1ST ST N	100	East	Sideswipe	2	0	0	1	N	N	N	\$4,000
84111748	2014-0603	7:50 PM	Winter	Hav Polk	AVE T NE	SR 549	0		Unknown	2	0	0	0	N	N	N	\$8,000
84111776	2014-0627	1:45 AM	Winter	Hav Polk	SR 549	AVENUE T NE	0		Sideswipe	2	0	0	0	Y	N	N	\$2,000
84111789	2014-0635	10:50 AM	Winter	Hav Polk	SR 549	SR 544	100	South	Rear End	2	0	0	0	N	N	N	\$300
84111865	2014-0671	11:50 PM	Winter	Hav Polk	AVE T NE	SR 549	0		Left Turn	2	0	0	1	N	N	N	\$5,500
84111940	2014-0706	1:40 PM	Winter	Hav Polk	SR 549	SR 544	50	South	Rear End	2	0	0	0	N	N	N	\$200
84996743	2014-0757	8:48 PM	Winter	Hav Polk	SR 544	SR 549	0		Left Turn	2	0	0	0	N	N	N	\$3,000
84996838	2014-0797	7:10 PM	Winter	Hav Polk	SR 544	SR 549	100	West	Rear End	2	0	0	1	N	N	N	\$0
84996969	2015-0028	7:40 AM	Winter	Hav Polk	SR 544	SR 549	20	West	Sideswipe	2	0	0	0	N	N	N	\$5,500
84996978	2015-0036	2:10 PM	Winter	Hav Polk	STATE ROAD 544	STATE ROAD 549	100	East	Other	2	0	0	1	N	N	N	\$7,000
84997044	2015-0061	1:17 PM	Winter	Hav Polk	SR 549	SR 544	100	South	Unknown	3	0	0	0	N	N	N	\$7,000
84997101	2015-0081	4:41 PM	Winter	Hav Polk	AVENUE T NE	SR 549	0		Rear End	2	0	0	0	N	Y	N	\$3,500
84997102	2015-0081	4:35 PM	Winter	Hav Polk	SR 544	SR 549	0		Rear End	2	0	0	0	N	N	N	\$2,000
84997148	2015-0104	4:10 PM	Winter	Hav Polk	AVE T NE	SR 544	50	East	Rear End	2	0	0	0	N	N	N	\$0
84997236	2015-0139	5:00 PM	Winter	Hav Polk	SR 544	1ST ST N	100	West	Rear End	2	0	0	0	N	N	N	\$0
84997239	2015-0130	4:19 PM	Winter	Hav Polk	SR 544	1ST ST N	150	West	Rear End	2	0	0	1	N	N	N	\$200
84997260	2015-0145	2:21 PM	Winter	Hav Polk	SR 549	AVE T	40	North	Unknown	2	0	0	0	N	N	N	\$200
84997431	2015-0222	5:47 PM	Winter	Hav Polk	SR 544	SR 549	53	West	Left Turn	2	0	0	1	N	N	N	\$5,000
84997535	2015-0283	12:30 PM	Winter	Hav Polk	SR 544	SR 549	100	West	Rear End	2	0	0	0	N	N	N	\$100
84997617	2015-0332	1:05 PM	Winter	Hav Polk	AVE T NE	S.R. 549	100	East	Rear End	2	0	0	0	N	N	N	\$3,000
84997637	2015-0324	6:00 PM	Winter	Hav Polk	SR 544	AVENUE U NE	50	North	Angle	3	0	0	3	N	Y	N	\$2,100
84997648	2015-0341	6:00 PM	Winter	Hav Polk	AVENUE T NE	SR 549	50	East	Rear End	2	0	0	0	N	N	N	\$6,000
84997708	2015-0372	6:53 PM	Winter	Hav Polk	SR 544	SR 549	100	West	Rear End	2	0	0	0	N	N	N	\$1,500
84997728	2015-0377	10:20 AM	Winter	Hav Polk	AVENUE T NE	SR 549	0		Unknown	2	0	0	0	N	N	N	\$0
84997743	2015-0390	12:30 PM	Winter	Hav Polk	AVE T NE	SR 549	50	East	Other	2	0	0	2	N	N	N	\$2,500
84997753	2015-0395	8:45 AM	Winter	Hav Polk	SR 544	SR 549	20	West	Rear End	2	0	0	2	N	N	N	\$500
84997817	2015-0433	9:05 AM	Winter	Hav Polk	SR 549	SR 544	20	South	Rear End	2	0	0	0	N	N	N	\$1,000
84997831	2015-0438	1:45 PM	Winter	Hav Polk	SR 544	SR 549	20	West	Rear End	2	0	0	0	N	N	N	\$1,000
84997898	2015-0475	2:08 AM	Winter	Hav Polk	SR 544	SR 549	0		Left Turn	2	0	0	0	N	N	N	\$2,000
84998025	2015-0534	1:59 PM	Winter	Hav Polk	SR 544	AVENUE U NE	400	North	Sideswipe	2	0	0	1	N	N	N	\$1,500
84998067	2015-0565	10:24 AM	Winter	Hav Polk	SR 549	SR 544	0		Other	2	0	0	0	N	N	N	\$2,000
84998136	2015-0588	1:50 PM	Winter	Hav Polk	SR 549	SR 544	20	South	Rear End	2	0	0	1	N	N	N	\$500
84998143	2015-0597	1:55 PM	Winter	Hav Polk	SR 544	SR 549	0		Rear End	2	0	0	0	N	N	N	\$2,500

84998167	2015-0578	Winter Hav Long	9/28/2015	4:04 PM	Winter Hav Polk	SR 544	SR 549	50 West	Rear End	3	0	0	0	N	N	N	\$2,000
84998172	2015-0611	Winter Hav Long	10/13/2015	9:29 AM	Winter Hav Polk	STATE ROAD 544	STATE ROAD 549	15 West	Unknown	2	0	0	0	N	N	N	\$3,000
84998199	2015-0618	Winter Hav Short	10/15/2015	5:11 PM	Winter Hav Polk	SR 544	SR 549	300 West	Unknown	2	0	0	0	N	N	N	\$1,000
84998267	2015-0652	Winter Hav Short	10/30/2015	1:00 PM	Winter Hav Polk	STATE ROAD 544	STATE ROAD 549	20 West	Sideswipe	2	0	0	0	N	N	N	\$2,000
84998289	2015-0664	Winter Hav Long	11/5/2015	12:15 AM	Winter Hav Polk	SR 544	SR 549	0	Left Turn	2	0	0	1	N	Y	N	\$55,000
84998300	2015-0670	Winter Hav Long	11/7/2015	9:14 PM	Winter Hav Polk	SR 544	SR 549	0	Rollover	1	0	0	1	N	N	N	\$500
84998349	2015-0692	Winter Hav Short	11/18/2015	11:02 AM	Winter Hav Polk	SR 549	SR 544	300 South	Rear End	2	0	0	0	N	N	N	\$0
84998387	2015-0712	Winter Hav Long	11/29/2015	11:54 AM	Winter Hav Polk	SR 544	SR 549	0	Unknown	2	0	0	0	N	N	N	\$1,000
84998394	2015-0717	Winter Hav Short	12/1/2015	6:19 PM	Winter Hav Polk	SR 549	AVE T NE	0	Rear End	2	0	0	0	N	N	N	\$400
84998416	2015-0721	Winter Hav Long	12/3/2015	12:39 PM	Winter Hav Polk	STATE RD 549	STATE ROAD 544	10 North	Rear End	2	0	0	1	N	N	N	\$400
84998459	2015-0742	Winter Hav Short	12/12/2015	6:13 PM	Winter Hav Polk	SR 544	SR 549	50 West	Unknown	2	0	0	0	N	N	N	\$0
84998460	2015-0743	Winter Hav Short	12/13/2015	1:24 PM	Winter Hav Polk	SR 544	SR 549	300 East	Sideswipe	2	0	0	0	N	N	N	\$600
84998469	2015-0747	Winter Hav Short	12/15/2015	10:20 AM	Winter Hav Polk	SR 544	SR 549	20 East	Rear End	2	0	0	0	N	Y	N	\$0
84998472	2015-0748	Winter Hav Long	12/15/2015	2:39 PM	Winter Hav Polk	SR 544	SR 549	20 East	Rear End	2	0	0	0	N	N	N	\$12,000
84998531	2015-0773	Winter Hav Long	12/25/2015	6:40 PM	Winter Hav Polk	1ST ST N	SR 544	0	Rear End	2	0	0	0	N	Y	N	\$500
84998544	2015-0773	Winter Hav Short	12/25/2015	2:00 PM	Winter Hav Polk	SR 549	SR 544	0	Other	2	0	0	0	N	N	N	\$1,000
84998582	2016-0001	Winter Hav Long	1/1/2016	2:07 PM	Winter Hav Polk	SR 549	SR 544	0	Off Road	1	0	0	1	N	N	N	\$100
84998605	2016-0016	Winter Hav Long	1/7/2016	4:00 PM	Winter Hav Polk	SR 549	SR 544	0	Left Turn	2	0	0	0	N	N	N	\$7,000
84998648	2016-0038	Winter Hav Long	1/18/2016	6:10 PM	Winter Hav Polk	AVENUE T NE	SR 549	50 East	Rear End	2	0	0	1	N	N	N	\$3,000
86440029	2016-0079	Winter Hav Short	2/4/2016	6:33 PM	Winter Hav Polk	SR 544	SR 549	0	Sideswipe	2	0	0	0	N	N	N	\$2,000
86440045	2016-0077	Winter Hav Short	2/4/2016	7:08 AM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	0	N	N	N	\$0
86440056	2016-0090	Winter Hav Long	2/9/2016	5:14 PM	Winter Hav Polk	AVENUE T NE	SR549	0	Rear End	2	0	0	0	N	N	N	\$500
86440158	2016-0115	Winter Hav Short	2/20/2016	2:07 AM	Winter Hav Polk	SR 544	SR 549	0	Unknown	2	0	0	0	N	N	N	\$500
86440215	2016-0155	Winter Hav Long	3/9/2016	9:50 PM	Winter Hav Polk	SR 549	SR 544	200 South	Rear End	3	0	0	4	N	N	N	\$1,700
86440370	2016-0210	Winter Hav Long	4/1/2016	8:45 PM	Winter Hav Polk	SR 549	SR 544	200 South	Rear End	2	0	0	0	N	N	N	\$600
86440482	2016-0271	Winter Hav Short	4/25/2016	2:35 PM	Winter Hav Polk	SR 544	SR 549	20 South	Rear End	2	0	0	0	N	N	N	\$5,500
86440541	2016-0304	Winter Hav Short	5/8/2016	3:49 PM	Winter Hav Polk	SR 544	SR 549	0	Unknown	2	0	0	0	N	N	N	\$0
86440553	2016-0301	Winter Hav Long	5/6/2016	3:45 PM	Winter Hav Polk	SR 544	SR 549	50 North	Rear End	2	0	0	1	N	N	N	\$4,000
86440568	2016-0315	Winter Hav Short	5/12/2016	9:05 AM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	0	N	N	N	\$200
86440648	2016-0360	Winter Hav Long	6/1/2016	8:52 AM	Winter Hav Polk	AVE T NE	SR 549	150 East	Unknown	2	0	0	1	N	N	N	\$6,000
86440706	2016-0382	Winter Hav Short	6/11/2016	10:04 AM	Winter Hav Polk	AVENUE T NE	SR 549	0	Rear End	2	0	0	0	N	N	N	\$300
86440769	2016-0412	Winter Hav Short	6/25/2016	6:45 PM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	0	N	N	N	\$0
86440904	2016-0488	Winter Hav Long	7/31/2016	11:29 AM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	2	N	N	N	\$1,000
86440916	2016-0492	Winter Hav Short	8/2/2016	12:59 PM	Winter Hav Polk	SR 544	SR 549	0	Left Turn	2	0	0	0	N	N	N	\$2,000
86440917	2016-0490	Winter Hav Long	8/1/2016	2:04 PM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	4	N	N	N	\$700
86440918	2016-0494	Winter Hav Short	8/3/2016	9:10 AM	Winter Hav Polk	SR 544	SR 549	200 West	Unknown	2	0	0	0	N	N	N	\$2,500
86440934	2016-0500	Winter Hav Short	8/5/2016	11:19 AM	Winter Hav Polk	SR 544	SR 549	0	Unknown	2	0	0	0	N	N	N	\$550
86441018	2016-0542	Winter Hav Short	8/22/2016	9:50 AM	Winter Hav Polk	SR 544	SR 549	60 West	Unknown	2	0	0	0	N	N	N	\$0
86441024	2016-0540	Winter Hav Long	8/21/2016	5:40 PM	Winter Hav Polk	SR 544	SR 549	0	Other	1	0	0	1	N	N	N	\$1,000
86441203	2016-0625	Winter Hav Long	9/26/2016	6:16 PM	Winter Hav Polk	SR 544	SR 549	0	Sideswipe	2	0	0	0	N	N	N	\$1,000
86441204	2016-0635	Winter Hav Short	10/1/2016	4:24 PM	Winter Hav Polk	SR 549	SR 544	0	Rear End	2	0	0	0	N	N	N	\$0
86441323	2016-0688	Winter Hav Short	10/25/2016	7:49 PM	Winter Hav Polk	SR 544	SR 549	20 West	Rear End	2	0	0	0	N	N	N	\$500
86441379	2016-0718	Winter Hav Short	11/7/2016	11:30 AM	Winter Hav Polk	SR 549	SR 544	75 South	Sideswipe	2	0	0	0	N	N	N	\$2,000
86441381	2016-0720	Winter Hav Short	11/7/2016	6:10 PM	Winter Hav Polk	SR544	SR 549	40 West	Rear End	2	0	0	0	N	N	N	\$0
86441390	2016-0723	Winter Hav Short	11/9/2016	8:05 AM	Winter Hav Polk	SR 544	SR 549	50 West	Rear End	2	0	0	0	N	N	N	\$1,000
86441392	2016-0714	Winter Hav Long	11/5/2016	11:20 AM	Winter Hav Polk	SR 544	SR 549	0	Angle	2	0	0	0	N	N	N	\$5,000
86441409	2016-0732	Winter Hav Short	11/12/2016	10:00 PM	Winter Hav Polk	SR 549	SR 544	0	Sideswipe	2	0	0	0	N	N	N	\$300
86441410	2016-0732	Winter Hav Short	11/12/2016	8:15 PM	Winter Hav Polk	AVENUE T NE	SR 549	300 East	Unknown	2	0	0	0	N	N	N	\$0
86441457	2016-0762	Winter Hav Short	11/26/2016	1:07 PM	Winter Hav Polk	AVENUE T NE	STATE ROAD 549	0	Rear End	2	0	0	0	N	N	N	\$0
86441485	2016-0771	Winter Hav Short	11/30/2016	6:31 AM	Winter Hav Polk	SR 544	STATE ROAD 549	0	Rear End	2	0	0	0	N	N	N	\$0
86441486	2016-0776	Winter Hav Long	12/1/2016	6:15 PM	Winter Hav Polk	SR 544	SR 549	50 West	Left Turn	2	0	0	0	N	N	N	\$2,000
86441495	2016-0780	Winter Hav Long	12/3/2016	2:02 PM	Winter Hav Polk	SR 544	SR 549	50 West	Left Turn	2	0	0	0	N	N	N	\$2,000
86441502	2016-0775	Winter Hav Short	12/1/2016	12:17 PM	Winter Hav Polk	STATE ROAD 544	STATE ROAD 549	5 West	Rear End	2	0	0	0	N	N	N	\$900
86441544	2016-0792	Winter Hav Long	12/8/2016	3:23 PM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	0	N	N	N	\$500
86441551	2016-0804	Winter Hav Short	12/13/2016	9:22 PM	Winter Hav Polk	SR 549	SR 544	0	Angle	2	0	0	0	N	N	N	\$0

86441573	2016-0814	Winter Hav Long	12/18/2016	6:10 AM	Winter Hav Polk	SR 544	AVE U NW	0	Off Road	1	0	0	0	N	Y	N	\$10,000
86441581	2016-0812	Winter Hav Long	12/16/2016	5:30 PM	Winter Hav Polk	SR 544	SR 549	0	Rear End	2	0	0	0	1	N	N	\$1,000
86441593	2016-0803	Winter Hav Long	12/13/2016	6:40 PM	Winter Hav Polk	AVENUE T NE	SR 549	0	Head On	2	0	0	0	0	N	N	\$10,000
86441635	2016-0842	Winter Hav Short	12/31/2016	8:40 AM	Winter Hav Polk	SR 549	SR 544	0	Sideswipe	2	0	0	0	0	N	N	\$1,000
86441780	2017-0073	Winter Hav Short	2/2/2017	9:35 AM	Winter Hav Polk	SR 544	SR 549	100 West	Unknown	2	0	0	0	0	N	N	\$1,750
86441795	2017-0079	Winter Hav Short	2/4/2017	2:45 PM	Winter Hav Polk	SR 544	SR 549	0	Unknown	2	0	0	0	0	N	N	\$0
86441834	2017-0090	Winter Hav Short	2/9/2017	3:40 PM	Winter Hav Polk	SR 549	AVENUE T NE	15 North	Head On	2	0	0	0	0	N	N	\$0
86441871	2017-0112	Winter Hav Short	2/19/2017	3:00 PM	Winter Hav Polk	SR 549	SR 544	0	Sideswipe	2	0	0	0	0	N	N	\$200
86441889	2017-0115	Winter Hav Short	2/21/2017	10:56 AM	Winter Hav Polk	STATE ROAD 549	STATE ROAD 544	10 North	Rear End	2	0	0	0	0	N	N	\$450
86441891	2017-0117	Winter Hav Short	2/22/2017	8:20 AM	Winter Hav Polk	SR 544	AVE U NE	0	Rear End	2	0	0	0	0	N	N	\$3,500
86441896	2017-0118	Winter Hav Short	2/22/2017	2:30 PM	Winter Hav Polk	SR 544	SR 549	20 West	Sideswipe	2	0	0	0	0	N	N	\$7,000
86993422	2017-0191	Winter Hav Long	3/27/2017	7:41 AM	Winter Hav Polk	SR 544	SR 549	100 West	Rear End	3	0	0	0	0	N	N	\$2,500
86993513	2017-0214	Winter Hav Long	4/4/2017	6:01 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Left Turn	2	0	0	0	0	N	N	\$1,500
86993566	2017-0252	Winter Hav Short	4/19/2017	8:35 PM	Winter Hav Polk	SR 549	AVE T NE	20 South	Rear End	2	0	0	0	0	N	N	\$0
86993655	2017-0296	Winter Hav Short	5/6/2017	7:04 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	170 West	Unknown	2	0	0	0	0	N	N	\$400
86993656	2017-0294	Winter Hav Short	5/5/2017	8:41 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	203 West	Rear End	2	0	0	0	0	N	N	\$100
86993713	2017-0311	Winter Hav Short	5/13/2017	9:58 PM	Winter Hav Polk	SR 549	SR 544	20 South	Unknown	2	0	0	0	0	N	N	\$2,000
86993726	2017-0322	Winter Hav Long	5/17/2017	9:08 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Sideswipe	2	0	0	0	0	N	N	\$500
86993780	2017-0354	Winter Hav Long	6/1/2017	10:23 AM	Winter Hav Polk	AVENUE T NW	1ST ST N	112 West	Rear End	2	0	0	0	1	N	N	\$0
86993837	2017-0364	Winter Hav Long	6/5/2017	3:10 PM	Winter Hav Polk	LUCERNE PARK RD	1ST ST N	0 North	Rear End	2	0	0	0	1	N	N	\$300
86993891	2017-0396	Winter Hav Long	6/19/2017	5:48 PM	Winter Hav Polk	AVENUE T NW	SR 549	0	Rear End	2	0	0	0	0	N	N	\$100
86993971	2017-0445	Winter Hav Short	7/11/2017	7:36 AM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Rear End	2	0	0	0	0	N	N	\$1,500
86994003	2017-0461	Winter Hav Short	7/17/2017	7:02 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Head On	2	0	0	0	0	N	N	\$600
86994027	2017-0469	Winter Hav Long	7/20/2017	1:54 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	192 West	Unknown	2	1	0	0	1	N	N	\$5,000
86994047	2017-0445	Winter Hav Long	7/11/2017	1:02 AM	Winter Hav Polk	1ST ST N	AVENUE T NW	0	Angle	2	0	0	0	0	N	N	\$3,000
86994054	2017-0474	Winter Hav Short	7/22/2017	9:08 PM	Winter Hav Polk	1ST ST N	SR 544	50 South	Rear End	2	0	0	0	0	N	N	\$1,500
86994100	2017-0505	Winter Hav Long	8/4/2017	5:49 PM	Winter Hav Polk	LUCERNE PARK RD	1ST ST N	303 North	Rear End	2	0	0	0	0	N	N	\$8,000
86994213	2017-0559	Winter Hav Short	8/28/2017	8:53 AM	Winter Hav Polk	AVENUE T NW	1ST ST N	76 West	Rear End	2	0	0	0	0	N	N	\$100
86994282	2017-0587	Winter Hav Long	9/8/2017	3:06 PM	Winter Hav Polk	AVENUE T NE	1ST ST N	305 East	Other	2	0	0	0	0	N	N	\$6,000
86994326	2017-0613	Winter Hav Long	9/21/2017	3:25 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Rear End	2	0	0	0	0	N	N	\$1,100
86994327	2017-0347	Polk Co SO Short	7/28/2017	2:50 PM	Winter Hav Polk	LUCERNE PARK RD(SR 544)	AVE T NW	100 North	Rear End	2	0	0	0	0	N	N	\$350
87549182	2017-0663	Winter Hav Long	10/12/2017	9:01 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Left Turn	2	0	0	0	0	N	N	\$12,000
87549220	2017-0678	Winter Hav Short	10/18/2017	3:15 PM	Winter Hav Polk	1ST ST N	AVENUE T NW	0	Sideswipe	2	0	0	0	0	N	N	\$3,000
87549324	2017-0732	Winter Hav Short	11/10/2017	4:06 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	142 West	Unknown	2	0	0	0	0	N	N	\$500
87549341	2017-0742	Winter Hav Long	11/15/2017	5:50 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	111 South	Sideswipe	2	0	0	0	0	N	N	\$100
87549360	2017-0749	Winter Hav Long	11/18/2017	4:21 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Left Turn	2	0	0	0	1	N	N	\$10,000
87549489	2017-0808	Winter Hav Long	12/13/2017	6:00 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Rear End	2	0	0	0	0	N	N	\$5,000
87549512	2017-0822	Winter Hav Short	12/19/2017	7:45 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	123 West	Unknown	2	0	0	0	0	N	N	\$0
87549625	2018-0030	Winter Hav Short	1/14/2018	12:33 PM	Winter Hav Polk	1ST ST N	AVENUE T NW	104 South	Other	2	0	0	0	0	N	N	\$4,500
87549680	2018-0058	Winter Hav Long	1/26/2018	2:35 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	100 West	Other	2	0	0	0	0	N	N	\$350
87549694	2018-0071	Winter Hav Short	2/1/2018	6:47 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Left Turn	2	0	0	0	0	N	N	\$5,000
87549758	2018-0100	Winter Hav Short	2/14/2018	4:20 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	146 West	Rear End	3	0	0	0	0	N	N	\$500
87549835	2018-0135	Winter Hav Short	2/28/2018	7:20 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Unknown	2	0	0	0	0	N	N	\$400
87549858	2018-0140	Winter Hav Long	3/2/2018	1:58 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Other	2	0	0	0	0	N	N	\$2,000
87549964	2018-0188	Winter Hav Long	3/22/2018	5:14 PM	Winter Hav Polk	AVENUE T NW	AVENUE T NW	215 East	Unknown	2	0	0	0	0	N	N	\$100
87549981	2018-0189	Winter Hav Long	3/22/2018	12:22 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	25 South	Sideswipe	2	0	0	0	0	N	N	\$300
87550014	2018-0211	Winter Hav Short	4/2/2018	3:41 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	182 West	Rear End	2	0	0	0	0	N	N	\$600
87550117	2018-0256	Winter Hav Long	4/21/2018	2:30 PM	Winter Hav Polk	1ST ST N/AVE T	AVENUE T NE	0	Left Turn	2	0	0	0	0	N	N	\$1,500
87550154	2018-0272	Winter Hav Long	4/30/2018	9:34 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Left Turn	2	0	0	0	0	N	N	\$15,000
87550200	2018-0286	Winter Hav Short	5/5/2018	12:23 PM	Winter Hav Polk	AVENUE T NE	1ST ST N	0	Unknown	2	0	0	0	0	N	N	\$0
87550223	2018-0306	Winter Hav Long	5/12/2018	10:46 AM	Winter Hav Polk	AVENUE T NE	1ST ST N	97 East	Other	2	0	0	0	1	N	N	\$150
87550239	2018-0309	Winter Hav Short	5/13/2018	6:40 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Unknown	2	0	0	0	0	N	N	\$0
87550239	2018-0293	Winter Hav Short	5/8/2018	7:45 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Rear End	2	0	0	0	0	Y	N	\$200
87550247	2018-0315	Winter Hav Long	5/15/2018	3:40 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	30 North	Rear End	2	0	0	0	0	N	N	\$1,500
87550343	2018-0360	Winter Hav Short	6/2/2018	11:20 AM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Unknown	2	0	0	0	0	N	N	\$0

87550480	2018-0424	Winter Hav Long	6/28/2018	2:13 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	79 West	Left Turn	2	0	0	1	N	N	N	\$3,000
87550510	2018-0432	Winter Hav Short	7/2/2018	11:45 AM	Winter Hav Polk	AVENUE T NW	1ST ST N	100 West	Rear End	2	0	0	0	N	N	N	\$900
87550515	2018-0438	Winter Hav Short	7/5/2018	7:49 AM	Winter Hav Polk	1ST ST N	AVENUE T NW	0	Unknown	2	0	0	0	N	N	N	\$2,100
87550765	2018-0551	Winter Hav Short	8/27/2018	1:41 PM	Winter Hav Polk	AVENUE U NW	1ST ST N	36 West	Unknown	2	0	0	0	N	N	N	\$3,000
87550875	2018-0605	Winter Hav Short	9/18/2018	3:12 PM	Winter Hav Polk	1ST ST N	AVENUE T NW	53 South	Unknown	2	0	0	0	N	N	N	\$500
87550889	2018-0611	Winter Hav Short	9/21/2018	2:06 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Unknown	2	0	0	0	N	N	N	\$1,000
87550896	2018-0617	Winter Hav Long	9/24/2018	4:19 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	170 West	Unknown	2	0	0	1	N	N	N	\$0
87550902	2018-0612	Winter Hav Long	9/21/2018	9:30 PM	Winter Hav Polk	MLK BLVD NW	1ST ST N	212 West	Unknown	2	0	0	0	N	N	N	\$2,000
87550923	2018-0632	Winter Hav Long	9/30/2018	3:01 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Unknown	2	0	0	0	N	N	N	\$1,000
87550927	2018-0632	Winter Hav Long	9/30/2018	12:45 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	0	Left Turn	2	0	0	4	N	N	N	\$30,000
87551060	2018-0685	Winter Hav Long	10/24/2018	1:35 PM	Winter Hav Polk	1ST ST N	AVENUE U NW	62 South	Rear End	5	0	0	3	N	N	N	\$30,000
87551065	2018-0691	Winter Hav Short	10/26/2018	6:29 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	180 West	Left Turn	2	0	0	0	N	N	N	\$1,000
89118679	2019-0156	Winter Hav Short	3/8/2019	7:12 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	119 South	Unknown	2	0	0	0	N	N	N	\$0
89119433	2019-0203	Winter Hav Long	3/29/2019	1:50 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	107 South	Rear End	2	0	0	2	Y	Y	N	\$4,000
89119454	2019-0213	Winter Hav Short	4/2/2019	6:36 AM	Winter Hav Polk	1ST ST N	AVENUE T NE	68 South	Rear End	2	0	0	0	N	N	N	\$4,000
89119465	2019-0216	Winter Hav Long	4/3/2019	1:40 PM	Winter Hav Polk	AVENUE T NE	1ST ST N	0	Rear End	2	0	0	0	N	N	N	\$1,500
89119560	2019-0254	Winter Hav Long	4/18/2019	1:46 PM	Winter Hav Polk	LUCERNE PARK RD	1ST ST N	309 North	Rear End	3	0	0	2	N	Y	N	\$23,000
89119594	2019-0276	Winter Hav Long	4/27/2019	9:31 PM	Winter Hav Polk	AVENUE T NW	1ST ST N	0	Sideswipe	2	0	0	0	N	N	N	\$100
89119630	2019-0297	Winter Hav Short	5/6/2019	9:53 AM	Winter Hav Polk	LUCERNE PARK RD	1ST ST N	230 North	Rear End	2	0	0	0	N	N	N	\$600
89119654	2019-0311	Winter Hav Long	5/12/2019	11:25 AM	Winter Hav Polk	AVENUE T NE	1ST ST N	307 East	Rear End	2	0	0	0	N	N	N	\$500
89119682	2019-0320	Winter Hav Long	5/16/2019	12:32 PM	Winter Hav Polk	1ST ST N	AVENUE T NE	92 South	Rear End	2	0	0	0	N	N	N	\$1,000
89119777	2019-0358	Winter Hav Long	6/2/2019	9:33 PM	Winter Hav Polk	AVENUE T NE	1ST ST N	314 East	Other	2	0	0	0	N	N	N	\$5,250
89119829	2019-0382	Winter Hav Long	6/13/2019	1:10 PM	Winter Hav Polk	1ST ST N	AVENUE T NW	0	Left Turn	2	0	0	0	N	N	N	\$1,000
89120278	2019-0551	Winter Hav Long	8/29/2019	9:24 AM	Winter Hav Polk	1ST STREET NORTH	STATE ROAD 544	0	Rear End	2	0	0	2	N	N	N	\$200

Weather_C	Light_Cond	Street_Nur	Crash_Type_D	Crash_Typ	Crash_Sew	Within_City	Manner_of_Cr	First_Harmful	First_HE_Locati	First_HE_Relat	First_HE_V	Type_of_Inter	Road_Sys_I	Type_of_SI	Road_Surf	Contrib_Cir	Contrib_Cir	Contrib_Cir	Contrib_Cir	Contrib_Cir	School_Bus
Clear	Daylight		Unknown		Property D Y		Angle	Motor Vehicle Off Roadway	Non-Junction	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Dark - Lighted		Bicycle	S	Injury Y		Front to Front	Pedalcycle On Roadway	Intersection-R Y			Other	State	Curb	Dry	None					N
Clear	Daylight		Unknown		Property D Y																N
Clear	Daylight		Same Direction	S	Injury Y		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Dry	None					N
Rain	Dark - Lighted		Right Angle	NE	Property D Y		Angle	Motor Vehicle On Roadway	Other	N		Other	State	Curb	Wet	Road Surface Condition					N
Clear	Daylight		Head On		Property D Y		Front to Front	Motor Vehicle On Roadway	Intersection	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End	S	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Dry	None					N
Clear	Dark - Lighted		Rear End	E	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	Local	Curb	Dry	None					N
Clear	Daylight		Rear End	E	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Dry	None					N
Rain	Dark - Lighted		Single Vehicle	E	Property D Y		Other	Ran Off Roadw	Off Roadway	Unknown	Y	Not at Interse	State	Paved	Wet	Road Surface Condition					N
Cloudy	Daylight		Rear End	S	Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Not at Interse	State	Curb	Dry	None					N
Clear	Dark - Lighted		Rear End	N	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Rear End	W	Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Head On		Property D Y		Sideswipe, Sar	Motor Vehicle Off Roadway	Other	N		Not at Interse	State	Curb	Dry	None					N
Clear	Daylight*		Unknown		Property D Y																N
Clear	Daylight		Left Rear	S	Injury Y		Angle	Motor Vehicle On Roadway	Intersection-R Y			Four-Way Inte State	Paved	Dry	None						N
Clear	Dark - Lighted		Left Rear	N	Injury Y		Angle	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte State	Paved	Dry	None						N
Clear	Daylight		Rear End	N	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte Local	Curb	Dry	None						N
Rain	Dark - Lighted		Off Road	N	Property D Y		Angle	Curb Shoulder	Intersection	N		Four-Way Inte State	Curb	Wet	None						N
Clear	Daylight		Rear End	W	Injury Y		Front to Rear	Motor Vehicle On Roadway	Intersection-R N			Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Same Direction	E	Injury Y		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	Local	Paved	Wet	None					N
Clear	Dark - Lighted		Same Direction	N	Property D Y		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	Y		Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight*		Rear End		Property D Y																N
Clear	Dark - Lighted		Left Entering	W	Injury Y		Angle	Motor Vehicle On Roadway	Intersection-R Y			Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	Local	Paved	Dry	None					N
Clear	Dark - Lighted		Left Entering	E	Property D Y		Front to Front	Motor Vehicle On Roadway	Intersection	N		Four-Way Inte Local	Paved	Dry	None						N
Clear	Dark - Unknown Light		Rear End	E	Injury Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Same Direction	Sideswipe	Property D Y		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Wet	None					N
Clear	Daylight		Other	E	Injury Y		Angle	Motor Vehicle On Roadway	Through Road	N		Not at Interse	State	Paved	Dry	None					N
Clear	Daylight*		Unknown		Property D Y																N
Clear	Dawn		Rear End	W	Property D Y		Front to Rear	Motor Vehicle On Roadway	Intersection-R N			Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Rear End	S	Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Local	Curb	Dry	None						N
Clear	Daylight		Rear End	E	Property D Y		Front to Rear	Motor Vehicle On Roadway	Intersection-R N			Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Unknown		Property D Y		Angle	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Dry	None					N
Clear	Daylight		Left Entering	W	Injury Y		Angle	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Four-Way Inte Local	Curb	Dry	None						N
Rain	Daylight		Right Angle	N	Injury Y		Other	Motor Vehicle On Roadway	Other	Y		Not at Interse	State	Paved	Wet	Road Surface Condition					N
Clear	Daylight		Rear End	W	Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	Local	Paved	Dry	Unknown					N
Rain	Dusk		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Wet	Road Surface Condition					N
Clear	Daylight*		Unknown		Property D Y																N
Clear	Daylight		Other	E	Injury Y		Angle	Motor Vehicle On Roadway	Driveway/Alle	N		Four-Way Inte Local	Curb	Dry	None						N
Clear	Daylight		Rear End		Injury Y		Front to Rear	Motor Vehicle On Roadway	Other	N		Four-Way Inte Local	Curb	Dry	None						N
Cloudy	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Four-Way Inte State	Curb	Wet							N
Cloudy	Daylight		Rear End		Property D Y		Front to Rear	Motor Vehicle On Roadway		N		Four-Way Inte State	Curb	Dry	None						N
Clear	Dark - Lighted		Left Rear	N	Property D Y		Angle	Motor Vehicle On Roadway	Intersection	N		Four-Way Inte State	Curb	Dry	None						N
Cloudy	Daylight		Same Direction	E	Injury Y		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Curb	Dry	None					N
Clear	Daylight		Other	S	Property D Y		Other	Motor Vehicle On Roadway	Intersection	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End	N	Injury N		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Four-Way Inte State	Curb	Dry	None						N
Clear	Daylight		Rear End	W	Property D Y		Front to Rear	Motor Vehicle On Roadway	Through Road	N		Not at Interse	State	Paved	Dry	None					N

Clear	Daylight	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Acceleration/TN	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y	Angle	Motor Vehicle On Roadway	Through Road N	Four-Way Inte State	Paved	Dry	Other	None	N
Clear	Daylight	Unknown		Property D Y									
Clear	Daylight	Same Directio	E	Property D Y	Angle	Motor Vehicle On Roadway	Intersection N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Left Entering	E	Injury Y	Angle	Motor Vehicle On Roadway	Intersection N	Four-Way Inte State	Curb	Dry	None	None	N
Rain	Dark - Lighted	Rollover	E	Injury Y	Other	Overturn/Roll On Roadway	Non-Junction N	Four-Way Inte State	Curb	Wet	Road Surface Condition	None	N
Clear	Daylight*	Rear End		Property D Y									
Cloudy	Daylight	Unknown		Property D Y	Angle	Motor Vehicle On Roadway	Other N	Five-Point, or I State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Rear End	N	Property D Y	Front to Rear	Motor Vehicle On Roadway	Other N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Rear End	N	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y									
Clear	Daylight	Same Directio	E	Property D Y	Sideswipe, Sar	Motor Vehicle On Roadway	Y	Four-Way Inte State	Curb	Dry		None	N
Clear	Daylight*	Rear End		Property D Y									
Clear	Daylight	Head On	NS	Injury Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Other State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Rear End	S	Property D Y	Front to Rear	Other Non-Fix On Roadway	Intersection N	Y-Intersection Local	Unpaved	Dry	None	None	N
Clear	Daylight	Other	S	Property D Y	Angle	Motor Vehicle On Roadway	Intersection N		Dry		None	None	N
Clear	Daylight	Off Road	N	Injury Y	Front to Front	Tree (standing Off Roadway	Non-Junction N	Y-Intersection State	Unpaved	Dry	None	None	N
Cloudy	Daylight	Left Rear	E	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Five-Point, or I State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Rear End	E	Injury Y	Front to Rear	Other Non-Fix On Roadway	Non-Junction N	Not at Interse Local	Curb	Dry	None	None	N
Clear	Dark - Lighted	Same Directio	E	Property D Y	Angle	Motor Vehicle On Roadway	N		Dry		None	None	N
Clear	Daylight	Rear End	S	Property D Y				T-Intersection State	Curb	Dry			
Clear	Daylight	Rear End		Property D Y	Front to Rear	Motor Vehicle On Roadway	Through Road N	Four-Way Inte Local	Unpaved	Dry	None	None	N
Clear	Dark - Lighted	Unknown		Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N		Dry		None	None	N
Clear	Dark - Lighted	Rear End	N	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Paved	Dry	None	None	N
Clear	Dark - Lighted	Rear End	N	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	T-Intersection State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	N	Property D Y	Front to Rear	Motor Vehicle On Roadway	N	Four-Way Inte State	Curb	Dry			
Clear	Daylight*	Unknown		Property D Y									
Clear	Daylight	Rear End	S	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Injury Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse Local	Curb	Dry	None	None	N
Clear	Daylight*	Rear End	W	Property D Y	Front to Rear	Motor Vehicle On Roadway	N				None	None	N
Clear	Daylight	Rear End		Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N		Dry		None	None	N
Clear	Daylight	Rear End	E	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Left Entering	W	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Injury Y	Front to Rear	Other Non-Fix On Roadway	Other Y	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y	Angle	Motor Vehicle On Roadway	N	Four-Way Inte State	Curb	Dry			
Clear	Daylight*	Unknown		Property D Y									
Clear	Daylight	Unknown		Property D Y				Not at Interse State	Curb	Oil	Road Surface Condition	Other	N
Cloudy	Daylight	Single Vehicle	S	Injury Y	Other	Other Non-Col On Roadway	Intersection N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Same Directio	N	Property D Y	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Paved	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y					Dry				
Clear	Daylight	Rear End		Property D Y	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y									
Clear	Daylight	Rear End		Property D Y	Angle	Motor Vehicle On Roadway	N	Four-Way Inte State	Curb	Dry			
Clear	Daylight	Right Angle	SE	Property D Y	Angle	Other Non-Fix On Roadway	Intersection N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Same Direction	Sideswipe	Property D Y	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction N		Dry		None	None	N
Clear	Daylight	Unknown		Property D Y									
Clear	Daylight	Rear End	W	Property D Y					Dry				
Clear	Dawn	Rear End	E	Property D Y					Dry				
Clear	Dark - Lighted	Left Entering	W	Property D Y	Front to Front	Motor Vehicle On Roadway	Driveway/Alle	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Left Entering	N	Property D Y	Other	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Through Road N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Dark - Not Lighted	Right Angle	NE	Property D Y	Front to Front	Motor Vehicle On Roadway	Intersection Y		Dry	None	None	None	N

Clear	Dark - Lighted	Off Road	S	Property D Y	Other	Other Fixed Oloff Roadway	Non-Junction N	T-Intersection State	Curb	Dry	None	None	N
Clear	Dusk	Rear End	E	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Head On	E	Property D Y	Front to Front	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte Local	Curb	Dry	None	None	N
Clear	Daylight	Same Directio	S	Property D Y	Sidewise, Sar	Other Non-Fix On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight*	Unknown		Property D Y									
Clear	Daylight*	Head On	N	Property D Y						Dry	None	None	
Clear	Daylight	Same Directio	S	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	N			Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Cloudy	Daylight	Rear End	S	Property D Y	Front to Rear	Motor Vehicle On Roadway	Y	Four-Way Inte State	Curb	Wet			N
Clear	Daylight	Same Direction	Sidewise	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	N	Four-Way Inte State	Curb	Dry			N
Clear	Dawn	Rear End	N	Property D Y	Front to Rear	Motor Vehicle On Roadway	Intersection-R N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Left Entering	E	Property D Y	Other	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Rear End	N	Property D Y	Front to Rear	On Roadway	N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y		Motor Vehicle in Transport	Non-Junction N	State		Dry			
Clear	Daylight	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Other N	Four-Way Inte State	Curb		None	None	N
Clear	Dark - Lighted	Unknown		Property D Y				Not at Interse State					
Clear	Daylight	Same Direction	Sidewise	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	Intersection-R N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Cloudy	Daylight	Rear End	S	Injury Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Unpaved	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Other State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y				State					
Clear	Daylight	Head On	S	Property D Y	Front to Front	Motor Vehicle On Roadway	N	State			None	None	N
Clear	Daylight	Unknown		Injury Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Right Angle	SE	Property D Y	Unknown	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y				State					
Clear	Daylight	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Cloudy	Daylight	Other	E	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse Local	Curb	Dry	None	None	N
Clear	Daylight	Rear End	E	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	Intersection N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y	Front to Rear	Motor Vehicle On Roadway	Intersection-R N	Not at Interse County	Curb	Dry	None	None	N
Clear	Dark - Lighted	Left Entering	E	Property D Y	Front to Front	Motor Vehicle On Roadway	Unknown N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Same Directio	S	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	Y
Clear	Daylight	Unknown		Property D Y									
Clear	Dusk	Same Direction	Sidewise	Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Left Entering	E	Injury Y	Front to Front	Other Non-Fix On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	Glare	N
Clear	Dark - Lighted	Rear End	E	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y				State			None	None	
Clear	Daylight	Other		Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Other		Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte Local	Paved	Dry	None	None	N
Clear	Dusk	Left Rear		Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End		Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y				State			None	None	
Clear	Daylight	Other		Property D Y	Front to Rear	Motor Vehicle On Roadway	Other N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y	Sidewise, Sar	Motor Vehicle On Roadway	Non-Junction N	Not at Interse Local	Curb	Dry	None	None	N
Clear	Daylight	Same Direction	Sidewise	Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Dry	None	None	N
Clear	Daylight	Rear End		Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse Local	Paved	Dry	None	None	N
Clear	Daylight	Left Entering		Property D Y	Other	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte Local	Curb	Dry	None	None	N
Clear	Daylight	Left Entering		Property D Y	Angle	Motor Vehicle On Roadway	Non-Junction N	Four-Way Inte State	Paved	Dry	None	None	N
Clear	Daylight	Unknown	W	Property D Y		Other Non-Fixed Object	N	Local		Dry	None	None	N
Cloudy	Daylight	Other	W	Injury Y	Front to Rear	Motor Vehicle On Roadway	Intersection-R N	Four-Way Inte Local	Curb	Dry	None	None	N
Clear	Daylight	Unknown		Property D Y				Four-Way Inte State	Curb				
Clear	Daylight	Rear End	S	Property D Y	Front to Rear	Other Non-Fix On Roadway	Non-Junction N	Four-Way Inte State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	Not at Interse State	Curb	Wet	None	None	N
Clear	Daylight*	Unknown		Property D Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction N	State			None	None	N

Cloudy	Daylight	Left Leaving	N	Injury	Y	Angle	Motor Vehicle On Roadway	Intersection-R	N	Four-Way Inte	State	Curb	Wet	Road Surface Condition	None	N
Clear	Daylight	Rear End	E	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Clear	Daylight	Unknown	S	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	State		Curb	Dry	None	None	N
Clear	Daylight	Unknown	S	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Other	N	Not at Interse	Local	Paved	Dry	None	None	N
Clear	Daylight	Unknown	S	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte	State	Curb	Dry	None	None	N
Clear	Daylight	Unknown	S	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte	Local	Paved	Dry	None	None	N
Rain	Daylight	Unknown	E	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	State	Paved	Wet	None	None	N
Clear	Dark - Lighted	Unknown	N	Property D	Y	Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	State	Paved	Dry	None	None	N
Clear	Dark - Lighted	Unknown	N	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte	State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Left Entering	E	Injury	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte	State	Curb	Dry	None	None	N
Clear	Daylight	Rear End	S	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Clear	Daylight	Left Entering	W	Property D	Y	Front to Front	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Paved	Dry	None	None	N
Clear	Dark - Lighted	Rear End	N	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	State	Curb	Dry	None	None	N
Clear	Dark - Lighted	Rear End	N	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	State		Curb	Dry	None	None	N
Clear	Daylight	Rear End	W	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Intersection	N	Four-Way Inte	Local	Paved	Dry	None	None	N
Clear	Daylight	Rear End	S	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Clear	Dark - Unknown Light	Same Direction	Sideswipe	Property D	Y	Sideswipe, Sar	Other Non-Fix On Roadway	Non-Junction	N	Four-Way Inte	State	Paved	Dry	Unknown	Unknown	N
Clear	Daylight	Rear End	S	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Paved	Dry	None	None	N
Clear	Daylight	Rear End	S	Property D	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Clear	Dark - Lighted	Other	W	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Not at Interse	Local	Curb	Dry	None	None	N
Rain	Other	Left Entering	W	Property D	Y	Angle	Motor Vehicle On Roadway	Non-Junction	N	Four-Way Inte	State	Paved	Wet	None	Weather Conditions	Y
Clear	Daylight	Rear End	S	Injury	Y	Front to Rear	Motor Vehicle On Roadway	Non-Junction	N	T-Intersection	State	Curb	Dry	None	None	N

Work_Zone	Type_of_W	Loc_in_Wo	Workers_ir	Law_Enfor	Mopeds	Motorcycle	Passengers	Bicyclists	Pedestrian	Fatalities	Injuries	Ur
N					0	0	1	0	0	0	0	0
N					0	0	0	1	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	1	0	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	3	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	2	0	0	0	0	0
N					0	0	2	0	0	0	0	0
N					0	0	4	0	0	0	0	0
N					0	0	5	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	2	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	4	0	0	0	0	0
N					0	0	0	0	0	0	0	0
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N					0	1	0	0	0	0	0	0
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N					0	0	3	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	3	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	4	0	0	0	0	0
N					0	0	0	0	0	0	0	0
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N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	0	0	0	0	0	0
N					0	0	1	0	0	0	0	0
N					0	0	3	0	0	0	0	0

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N	0	0	0	0	0	0
N	0	0	2	0	0	0
N	0	0	0	0	0	0

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N	0	0	3	0	0	0
N	0	0	0	0	0	0
N	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	4	0	0	0
	0	0	2	0	0	0
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N	0	0	1	0	0	0
N	0	0	0	0	0	0
N	0	0	2	0	0	0
N	0	0	1	0	0	0
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N	0	0	0	0	0	0
N	0	0	0	0	0	0
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N	0	0	0	0	0	0
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N	0	0	1	0	0	0
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N	0	0	0	0	0	0
N	0	0	6	0	0	0
N	0	0	1	0	0	0
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N	0	0	0	0	0	0
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N	0	0	3	0	0	0
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N	0	0	0	0	0	0

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N	0	0	1	0	0	0
N	0	0	1	0	0	0
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N	0	0	2	0	0	0
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N	0	0	0	0	0	0
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N	0	0	1	0	0	0
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N	0	0	0	0	0	0
N	0	0	0	0	0	0
N	0	0	1	0	0	0
N	0	0	0	0	0	0
N	0	0	1	0	0	0
N	0	0	1	0	0	0
N	0	0	8	0	0	0
N	0	0	2	0	0	0

Crash Number	Location Mile Post	Roadway Id	Crash Date	Crash Year	On Road	Intersecting Road	First Harmful Event	Manner Of Collision	Light Condition	Weather Condition
849977140	3.852	16140000	6/24/2015	2015	SR 544	AVE U NW	Motor Vehicle In Transport	Other (See Narrative)	Daylight	Clear
849985600	3.693	16140000	1/2/2016	2016	SR 544	SR 549	Motor Vehicle In Transport	Front To Rear	Daylight	Clear
860838210	3.707	16140000	11/18/2015	2015	LUCERNE PARK RD	AVE T NW	Motor Vehicle In Transport	Front To Rear	Dark-Lighted	Clear
864415370	3.693	16140000	12/6/2016	2016	SR 549	AVE T NE	Motor Vehicle In Transport	Angle	Daylight	Clear
869934370	3.693	16140000	3/27/2017	2017	SR 549	AVE T NE	Motor Vehicle In Transport	Other (See Narrative)	Dark-Lighted	Clear
875500750	3.688	16140000	4/14/2018	2018	SR 544	AVE T NW	Motor Vehicle In Transport	Angle	Daylight	Clear

Surface Condition	Junction	Site Location	Alcohol Drugs Involvement	Number of Fatalities	Number of Injured	Total Crash Damage Amount	Crash Status
Dry	Non-Junction	Not At Intersection/Rx/Bridge	No			100	Q/C Completed - Loc Verified
Dry	Non-Junction	At Intersection	No				Q/C Completed - Loc Verified
Dry	Non-Junction	Influenced By Intersection	No		1	50	Q/C Not To Be Done On Crash
Dry	Intersection-Related	At Intersection	No				Q/C Completed - Loc Verified
Dry	Intersection-Related	At Intersection	No				Q/C Completed - Loc Verified
Dry	Non-Junction	Not At Intersection/Rx/Bridge	No				Q/C Completed - Loc Verified

# CERTIFICATION

AGENCY: Florida Department of Transportation District One  
801 North Broadway Avenue  
Bartow, Florida 33831-1249

I hereby certify that I am a registered professional engineer in the State of Florida and that I have supervised the preparation of, and approved the analysis, findings, opinions, conclusions and technical advice hereby reported for:

REPORT: SR 544/Old Lucerne Park Road (East End) Intersection Control Evaluation (ICE) - Stage 1

PROJECT: SR 544 Project Development and Environment (PD&E) Study

LOCATION: SR 544 from Martin Luther King Boulevard to SR 17  
Polk County, Florida

ROADWAY ID: 16140000

MILEPOST No: 8.965

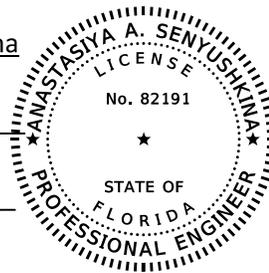
FPID No.: 440273-1-22-01

I acknowledge that the procedures and references used to develop the information contained in this memorandum are standard to the professional practice of transportation engineering as applied through professional judgement and experience.

Engineer in Responsible Charge: Anastasiya A. Senyushkina

Professional Registration No.: 82191

Date: 9/9/2022





# AIM Engineering & Surveying, Inc.

## MEMORANDUM

Tampa Office  
201 E. Kennedy Boulevard, Suite 1800  
Tampa, Florida 33602  
813-627-4144  
www.aimengr.com

**Date:** September 9, 2022

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**To:** David C. Turley, P.E. – FDOT District One DEMO Project Manager  
Abra Horne – FDOT District One Planning and Environmental Administrator

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**From:** Greg Root/Anastasiya Senyushkina, P.E.

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**Subject:** SR 544/Old Lucerne Park Road (east end) Intersection (Polk County) – Stage 1+  
Intersection Control Evaluation

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### INTRODUCTION/PROJECT BACKGROUND

This memorandum documents the Intersection Control Evaluation (ICE) conducted for the Old Lucerne Park Road (east end) intersection. This analysis was conducted in support of the SR 544 Project Development & Environment (PD&E) Study from Martin Luther King Boulevard to SR 17 in Polk County. The length of this study corridor is approximately 8.1 miles. This memorandum documents the Stage 1 CAP-X and SPICE analyses, as well as the more detailed traffic operations analyses conducted using the SYNCHRO and SIDRA software. The opening year (2025) and design year (2045) Average Annual Daily Traffic (AADT) volumes documented in the FDOT approved Project Traffic Analysis Report (PTAR) are provided in **Appendix A**, along with the 2045 a.m. and p.m. peak hour volumes documented in this same report.

### EXISTING INTERSECTION CHARACTERISTICS

The east end of Old Lucerne Park Road intersects SR 544 from the north at a T- intersection. This roadway intersects SR 544 at a 90-degree angle; however, it curves to the right approximately 125 feet northwest of the intersection stop bar. The north leg is controlled by a stop sign. A Chevron gas station/convenience store is located in the northwest quadrant of the intersection and Lake 'n Golf Estates is located on the north side of SR 544 and Old Lucerne Park Road. Access to and from this manufactured home community is provided on both SR 544 (via Brentwood Drive) and on Old Lucerne Park Road (via Westchester Drive). Brentwood Drive is located approximately 400 feet to the east of the Old Lucerne Park Road intersection, while Westchester Drive is located approximately 325 feet northwest of this intersection. An aerial image depicting the Old Lucerne Park Road intersection (**Figure 1**) is provided in **Appendix A**.

Approximately 175 feet east of Brentwood Drive, there is a bridge over the Lake Hamilton canal. Although the land on the south side of SR 544 is currently undeveloped, there is a large residential development (i.e., The Harbor at Lake Henry) currently going through the permit approval process. The proposed entrance/exit for this residential development is located approximately 950 feet southwest of the Lucerne Park Road intersection. Another future residential development (i.e., Tuscany Village) is located in between SR 544 and Old Lucerne Park Road. This development is

proposing access to both SR 544 and Old Lucerne Park Road. In addition, Duke Energy is currently in the process of acquiring an easement for the construction of a 230-kilovolt transmission line to be located on the south side of SR 544. An aerial image depicting the Old Lucerne Park Road intersection, the two proposed residential developments, the Lake Hamilton canal and the Lake Hamilton Drive intersection (**Figure 2**) is also provided in **Appendix A**.

The posted speed limit on SR 544 in the vicinity of this intersection is 50 miles per hour (mph). The posted speed limit on Old Lucerne Park Road is 40 mph; however, there is a 15 mph advisory speed sign in the southbound direction in advance of the horizontal curve. SR 544 is a two-lane undivided roadway with 12-foot travel lanes and 5-foot paved shoulders; however, there is a painted median that extends from Old Lucerne Park Road to Brentwood Drive. There are no sidewalks in the vicinity of the intersection.

Crash data was provided by District One for the years 2014 through 2019. The data sources were the FDOT's Crash Analysis Reporting System (CARS) and Signal Four Analytics. This intersection has experienced 10 crashes over this period, resulting in 11 injuries and no fatalities. The most prevalent crash types are left-turn/angle crashes (4), rear-end crashes (3) and head-on crashes (2). There were no bicycle or pedestrian crashes.

## **INTERSECTION CONTROL EVALUATION**

The PD&E study goals are to determine the location and conceptual design of the improvement(s) that satisfy the purpose and need for the project, while also minimizing the impacts to the natural and social environment and satisfying the requirements of the National Environmental Policy Act (NEPA). The proposed typical section in this area is a four-lane divided roadway that consists of two 11-foot inside travel lanes, two 12-foot outside travel lanes, a 22-foot raised median and 10-foot shared use paths on both sides of the road. The design speed and target speed is 45 mph.

FDOT District One conducted a traffic signal warrant analysis for this intersection in 2018. Traffic counts were conducted on January 30, 2018 and a delay study was conducted on March 14, 2018. The results of this study indicated that a traffic signal was warranted at this intersection. Both Warrant 1A (eight-hour minimum vehicular volume) and Warrant 2 (four-hour minimum vehicular volume) were satisfied. A copy of the SR 544 at Old Lucerne Park Road Signal Warrant Analysis (dated April 17, 2018) is provided in **Appendix B**.

The following alternative intersection control strategies were initially analyzed for this intersection:

- Two-way stop control
- All-way stop control
- Conventional traffic signal
- Green-T signalized intersection
- Unsignalized Restricted Crossing U-Turn (RCUT) intersection
- Signalized RCUT intersection
- Median U-Turn (MUT) intersection
- Two-lane (SR 544) x one-lane (Old Lucerne Park Road) roundabout
- Two-lane x two-lane roundabout

The results of the CAP-X and SPICE analyses are summarized in **Table 1**, which is provided in **Appendix C**. The CAP-X and SPICE analysis summary sheets for this intersection are also provided in **Appendix C**.

Based on the high v/c ratios estimated for the two-way stop control, all-way stop control, and unsignalized RCUT intersections, these alternatives were eliminated from any further consideration. The continuous Green-T signalized intersection was also eliminated from further consideration because this type of intersection control strategy would not provide positive speed control and help to facilitate the 45 mph target speed. In addition, the distance between the Old Lucerne Park Road intersection and the Lake Hamilton Drive intersection is approximately 1,000 feet. This distance was not viewed as being sufficient to provide (and transition out) an auxiliary lane for the Old Lucerne Park Road left-turn vehicles, as well as an eastbound left-turn lane at the Lake Hamilton Drive intersection. The signalized RCUT and Partial MUT alternatives were eliminated from further consideration due to the additional right-of-way that would be needed for u-turn bulb-outs west and east of this intersection. The roundabout alternatives were projected to have the lowest number of future fatal and injury crashes (31), as well as the highest opening year and design year Safe System for Intersections (SSI) scores of the remaining alternatives

Design year peak hour SYNCHRO and SIDRA analyses were subsequently conducted for the conventional signalized intersection and the roundabout alternatives and the results are summarized in **Table 2**, which is provided in **Appendix D**. The overall average vehicle delays for these two alternatives are very similar. In the a.m. peak hour, these delays range between 19.6 seconds per vehicle and 22.9 seconds per vehicle. In the p.m. peak hour, these delays range between 15.6 seconds per vehicle and 16.4 seconds per vehicle. In addition, all of the individual movements for both alternatives are projected to operate with v/c ratios less than 1.00 during both peak hours. The design year SYNCHRO and SIDRA analysis summary sheets are also provided in **Appendix D**.

Geometric improvement concepts were developed for both of these alternatives and these are provided in **Appendix E**. The roundabout improvement concept impacts eight parcels, requires approximately 0.80 acres of right-of-way and results in one business relocation (i.e., the Chevron gas station). In comparison, the conventional signalized intersection impacts four parcels, requires approximately 0.18 acres of right-of-way and does not result in any business relocations. Both alternatives were presented at the SR 544 Alternatives Public Meeting held on February 8, 2022.

## **RECOMMENDED INTERSECTION CONTROL STRATEGY**

Although the implementation of a roundabout at the SR 544/Old Lucerne Park Road (east end) intersection would result in larger right-of-way impacts (including the need to acquire the Chevron gas station), it would also provide positive speed control and result in a lower number of fatal and injury crashes as compared to a conventional signalized intersection. Although the current posted speed limit in the vicinity of this intersection is 50 mph, the proposed SR 544 typical section and horizontal alignment is based on a 45 mph target speed. A roundabout would help to facilitate slower vehicle speeds east and west of this intersection. A roundabout is also estimated to have significantly higher SSI scores as compared to a conventional signalized intersection. Consequently, a roundabout is recommended for the Old Lucerne Park Road (east end) intersection.

## **Appendix A**

Existing and Future Year Traffic Volumes

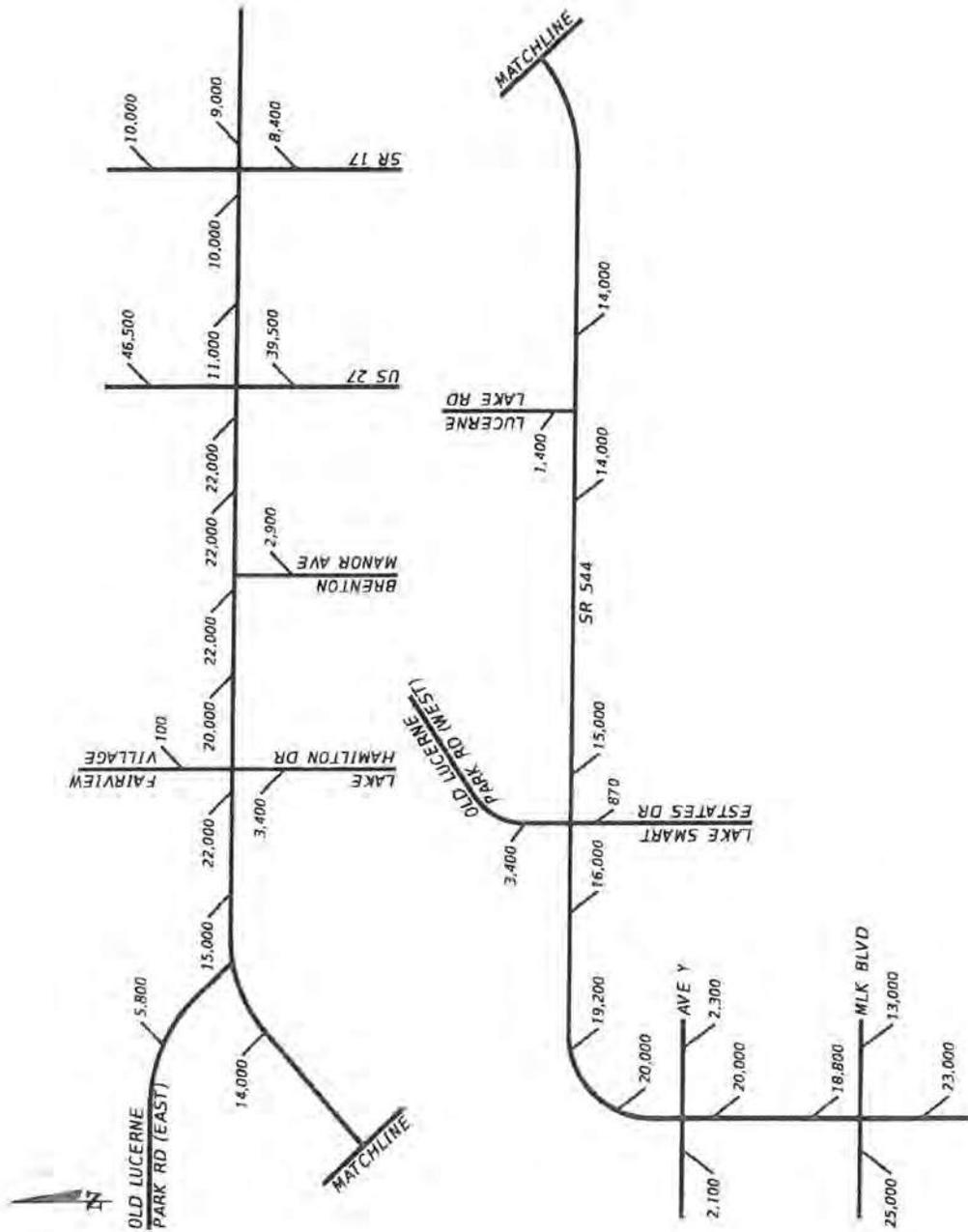


Figure 2-2: Existing (2019) AADT Volumes

**Table 2-2: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Mainline)**

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
South of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	21,686	0.96	0.95	19,778	1.0319	20,409	20,000	23,000	21,500	23,000 <sup>(8)</sup>
North of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	17,212	0.96	0.95	15,697	1.0319	15,198	16,000	18,800	17,400	18,800 <sup>(9)</sup>
South of Avenue Y <sup>(7)</sup>	2/16/2016	19,748	0.96	0.97	18,389	1.0988	20,206	20,000	n/a	n/a	20,000
North of Avenue Y <sup>(7)</sup>	2/16/2016	19,936	0.96	0.97	18,564	1.0988	20,399	20,000	n/a	n/a	20,000
South of Lake Conine Drive									19,200		19,200
West of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	16,214	1.01	0.94	15,394	1.0577	16,282	16,000	n/a	n/a	16,000
East of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	15,212	1.01	0.94	14,442	1.0543	15,226	15,000	n/a	n/a	15,000
West of Lucerne Lake Road	10/1/2019	14,506	1.03	0.94	14,045	1.0000	14,045	14,000	14,000	14,000	14,000
East of Lucerne Lake Road	10/1/2019	14,608	1.03	0.94	14,143	1.0000	14,143	14,000	n/a	n/a	14,000
West of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	18,070	1.01	0.94	17,155	1.0706	18,367	18,000	14,000	16,000	14,000 <sup>(10)</sup>
East of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	14,682	1.01	0.94	13,939	1.0706	14,923	15,000	n/a	n/a	15,000
West of Lake Hamilton Drive/Fairview Village	10/1/2019	22,630	1.03	0.94	21,910	1.0000	21,910	22,000	n/a	n/a	22,000
East of Lake Hamilton Drive/Fairview Village	10/1/2019	20,472	1.03	0.94	19,821	1.0000	19,821	20,000	n/a	n/a	20,000
West of Brenton Manor Avenue	10/1/2019	23,035	1.03	0.94	22,302	1.0000	22,302	22,000	n/a	n/a	22,000
East of Brenton Manor Avenue	10/1/2019	23,127	1.03	0.94	22,392	1.0000	22,392	22,000	n/a	n/a	22,000
West of Hide-A-Way Lane (Hidden Cove Entr)									21,000		21,000
West of US 27	10/1/2019	22,701	1.03	0.94	21,979	1.0000	21,979	22,000	n/a	n/a	22,000
East of US 27	10/1/2019	10,954	1.03	0.94	10,606	1.0000	10,606	11,000	11,000	11,000	11,000
West of SR 17	10/1/2019	10,500	1.03	0.94	10,166	1.0000	10,166	10,000	n/a	n/a	10,000
East of SR 17	10/1/2019	9,534	1.03	0.94	9,231	1.0000	9,231	9,200	8,800	9,000	9,000

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 21,000 vpd for the last five years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 16,000 vpd for the last five years.

<sup>(10)</sup> FDOT count station value was used because the 2018 AADT volume at this permanent count station was equal to 13,600 vpd.

**Table 2-3: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Cross Streets)**

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
M. L. King Boulevard West of SR 544 <sup>(7)</sup>	4/17/2018	26,560	0.96	0.95	24,223	1.0319	24,995	25,000	25,000	25,000	25,000
M. L. King Boulevard East of SR 544 <sup>(7)</sup>	4/17/2018	13,582	0.96	0.95	12,387	1.0319	12,782	13,000	13,500	13,250	13,000
Avenue Y West of SR 544 <sup>(7)</sup>	2/16/2016	1,960	0.96	1.00	1,882	1.0988	2,068	2,100	n/a	n/a	2,100
Avenue Y East of SR 544 <sup>(7)</sup>	2/16/2016	2,174	0.96	1.00	2,087	1.0988	2,293	2,300	n/a	n/a	2,300
Old Lucerne Park Road (west end) North of SR 544 <sup>(7)</sup>	1/9/2018	3,206	1.01	0.98	3,173	1.0560	3,351	3,400	n/a	n/a	3,400
Lake Smart Estates Drive South of SR 544 <sup>(7)</sup>	1/9/2018	862	1.01	1.00	871	1.0000	871	870	n/a	n/a	870
Lucerne Lake Road North of SR 544	10/1/2019	1,730	1.03	0.81	1,443	1.0000	1,443	1,400	n/a	n/a	1,400
Old Lucerne Park Road (east end) North of SR 544 <sup>(7)</sup>	1/9/2018	5,454	1.01	0.98	5,398	1.0706	5,779	5,800	n/a	n/a	5,800
Fairview Village North of SR 544	10/1/2019	96	1.03	1.00	99	1.0000	99	100	n/a	n/a	100
Lake Hamilton Drive South of SR 544	10/1/2019	3,344	1.03	1.00	3,444	1.0000	3,444	3,400	n/a	n/a	3,400
Brenton Manor Avenue South of SR 544	10/1/2019	2,916	1.03	0.98	2,943	1.0000	2,943	2,900	n/a	n/a	2,900
US 27 North of SR 544	10/1/2019	45,009	1.04	0.94	44,001	1.0000	44,001	44,000	46,500	45,250	46,500 <sup>(8)</sup>
US 27 South of SR 544	10/1/2019	34,554	1.04	0.94	33,780	1.0000	33,780	34,000	39,500	36,750	39,500 <sup>(8)</sup>
SR 17 North of SR 544	10/1/2019	10,764	1.03	0.95	10,533	1.0000	10,533	11,000	9,700	10,350	10,000
SR 17 South of SR 544	10/1/2019	8,680	1.03	0.95	8,493	1.0000	8,493	8,500	8,300	8,400	8,400

Note: Red font denotes assumed values used for this study.

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 44,000 vpd for the last four years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 34,000 vpd for four of the last five years.

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2021 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 3106 - SR 544 W OF HIDDEN COVE, 0.5 MI W OF SR 25/US 27

YEAR	AADT	DIRECTION 1	DIRECTION 2	*K FACTOR	D FACTOR	T FACTOR
2021	25000 C	E 12500	W 12500	9.00	55.30	10.00
2020	19900 C	E 10000	W 9900	9.00	53.40	8.40
2019	21000 C	E 10500	W 10500	9.00	56.00	7.60
2018	21000 C	E 10500	W 10500	9.00	54.50	9.40
2017	19500 C	E 9800	W 9700	9.00	54.50	8.80
2016	16900 C	E 8400	W 8500	9.00	53.30	10.70
2015	16100 C	E 7900	W 8200	9.00	55.70	9.30
2014	15000 S	E 7500	W 7500	9.00	55.60	9.50
2013	14800 F	E 7400	W 7400	9.00	55.90	9.50
2012	14800 C	E 7400	W 7400	9.00	55.80	9.50
2011	15900 S	E 7900	W 8000	9.00	55.70	9.10
2010	16100 F	E 8000	W 8100	9.55	56.07	9.20
2009	16300 C	E 8100	W 8200	9.36	56.35	9.20
2008	14800 C	E 7300	W 7500	9.78	55.29	10.40
2007	16300 C	E 8200	W 8100	9.66	55.30	10.30
2006	16500 C	E 8300	W 8200	9.62	55.83	9.70

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

**Table 3-17: SR 544 Cross Streets Existing and Future Year Peak Hour Truck Percentages**

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 - 5:45)			Avg. Truck %	2025/2045 Truck %
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %		
Martin Luther King Blvd	NB LT	269	7	2.6%	299	0	0.0%		
	NB TH	275	11	4.0%	413	3	0.7%		
	NB RT	119	1	0.8%	139	0	0.0%		
	NB APPROACH	663	19	2.9%	851	3	0.4%	1.6%	2.0%
	WB LT	134	5	3.7%	113	2	1.8%		
	WB TH	462	10	2.2%	366	6	1.6%		
	WB RT	14	2	14.3%	9	0	0.0%		
	WB APPROACH	610	17	2.8%	488	8	1.6%	2.2%	2.0%
	EB LT	208	12	5.8%	243	13	5.3%		
	EB TH	330	7	2.1%	409	9	2.2%		
EB RT	419	6	1.4%	309	3	1.0%			
EB APPROACH	957	25	2.6%	961	25	2.6%	2.6%	3.0%	
Avenue Y <sup>(1)</sup>	WB LT	17	0	0.0%	13	0	0.0%		
	WB TH	15	0	0.0%	17	0	0.0%		
	WB RT	25	1	4.0%	34	1	2.9%		
	WB APPROACH	57	1	1.8%	64	1	1.6%	1.7%	2.0%
	EB LT	19	2	10.5%	36	2	5.6%		
	EB TH	10	1	10.0%	14	0	0.0%		
EB RT	8	0	0.0%	28	0	0.0%			
EB APPROACH	37	3	8.1%	78	2	2.6%	2.6%	3.0%	
Old Lucerne Park Rd (West End)	NB TH	0	0	0.0%	N/A	N/A	N/A		
	NB RT	14	0	0.0%	N/A	N/A	N/A		
	NB APPROACH	14	0	0.0%	N/A	N/A	N/A	0.0%	0.0%
	SB LT	3	0	0.0%	N/A	N/A	N/A		
	SB TH	1	0	0.0%	N/A	N/A	N/A		
SB RT	149	4	2.7%	N/A	N/A	N/A			
SB APPROACH	153	4	2.6%	N/A	N/A	N/A	2.6%	3.0%	
Lucerne Lake Rd	SB LT	16	11	68.8%	17	8	47.1%		
	SB RT	25	9	36.0%	24	8	33.3%		
	SB APPROACH	41	20	48.8%	41	16	39.0%	43.9%	44.0%
Old Lucerne Park Rd (East End) <sup>(4)</sup>	SB LT	174	13	7.5%	126	8	6.3%		
	SB RT	4	0	0.0%	4	0	0.0%		
	SB APPROACH	178	13	7.3%	130	8	6.2%	6.7%	7.0%
Lake Hamilton Dr	NB LT	14	1	7.1%	19	1	5.3%		
	NB TH	0	0	0.0%	1	0	0.0%		
	NB RT	134	6	4.5%	105	2	1.9%		
	NB APPROACH	148	7	4.7%	125	3	2.4%	3.6%	4.0%
	SB LT	0	0	0.0%	1	0	0.0%		
	SB TH	0	0	0.0%	0	0	0.0%		
	SB RT	2	0	0.0%	1	0	0.0%		
SB APPROACH	2	0	0.0%	2	0	0.0%	0.0%	0.0%	
Brenton Manor Ave	NB LT	58	5	8.6%	65	2	3.1%		
	NB RT	75	5	6.7%	42	0	0.0%		
	NB APPROACH	133	10	7.5%	107	2	1.9%	4.7%	5.0%
US 27	NB LT	238	5	2.1%	165	8	4.8%		
	NB TH	1,075	80	7.4%	1,060	78	7.4%		
	NB RT	76	6	7.9%	110	1	0.9%		
	NB APPROACH	1,389	91	6.6%	1,335	87	6.5%	6.5%	(5)
	SB LT	79	13	16.5%	138	10	7.2%		
	SB TH	762	88	11.5%	1,157	62	5.4%		
SB RT	500	31	6.2%	541	25	4.6%			
SB APPROACH	1,341	132	9.8%	1,836	97	5.3%	7.6%	(5)	
SR 17	NB LT	79	9	11.4%	61	6	9.8%		
	NB TH	244	6	2.5%	180	5	2.8%		
	NB RT	57	2	3.5%	76	3	3.9%		
	NB APPROACH	380	17	4.5%	317	14	4.4%	4.4%	(5)
	SB LT	55	5	9.1%	77	0	0.0%		
	SB TH	217	10	4.6%	251	6	2.4%		
SB RT	92	14	15.2%	141	6	4.3%			
SB APPROACH	364	29	8.0%	469	12	2.6%	5.3%	(5)	

<sup>(1)</sup> Turning movement count data was not available for the 7:15 to 8:15 a.m. time period. The 8:00 to 9:00 a.m. time period was used for this location.

<sup>(2)</sup> Average peak hour truck percentage not calculated due to disparity in peak hour approach volumes. P.M. peak hour percentage recommended for use.

<sup>(3)</sup> A.M. peak hour percentages only.

<sup>(4)</sup> Turning movement count data was not available for the 4:45 to 5:45 p.m. time period. The 4:00 to 5:00 p.m. time period was used for this location.

<sup>(5)</sup> Alternate methodologies were used to derive the recommended a.m. and p.m. peak hour truck percentages for US 27 and SR 17.

A review of the existing a.m. and p.m. peak hour truck volumes indicates that, with one exception, the a.m. peak hour volumes are higher than the p.m. peak hour volumes. The ratio of the a.m. and p.m. peak hour truck volume was calculated for each location and then the overall average ratio for the study corridor was calculated. The average overall ratio was equal to 1.50. A revised estimate of the 2025 and 2045 a.m. peak hour truck volumes was obtained by multiplying the initial estimate of the 2025 and 2045 a.m. peak hour truck volumes by 1.50. The revised 2025 and 2045 a.m. peak hour truck volumes are also provided in **Table 3-9** and Table 3-10. The final recommended 2045 and 2025 peak hour truck volumes and percentages are provided in **Table 3-11** and **Table 3-12**, respectively. Based on these assumptions, the following SR 544 mainline peak hour truck percentages (i.e.,  $T_{PKHR}$ -factors) are recommended for use in the SR 544 PD&E study:

Opening Year (2025) – AM Peak Hour

- 5.6% from Martin Luther King Boulevard to US 27
- 9.6% from US 27 to SR 17

Opening Year (2025) – PM Peak Hour

- 3.7% from Martin Luther King Boulevard to US 27
- 6.4% from US 27 to SR 17

Design Year (2045) – AM Peak Hour

- 4.5% from Martin Luther King Boulevard to US 27
- 8.1 % from US 27 to SR 17

Design Year (2045) – PM Peak Hour

- 3.0% from Martin Luther King Boulevard to US 27
- 5.4 % from US 27 to SR 17

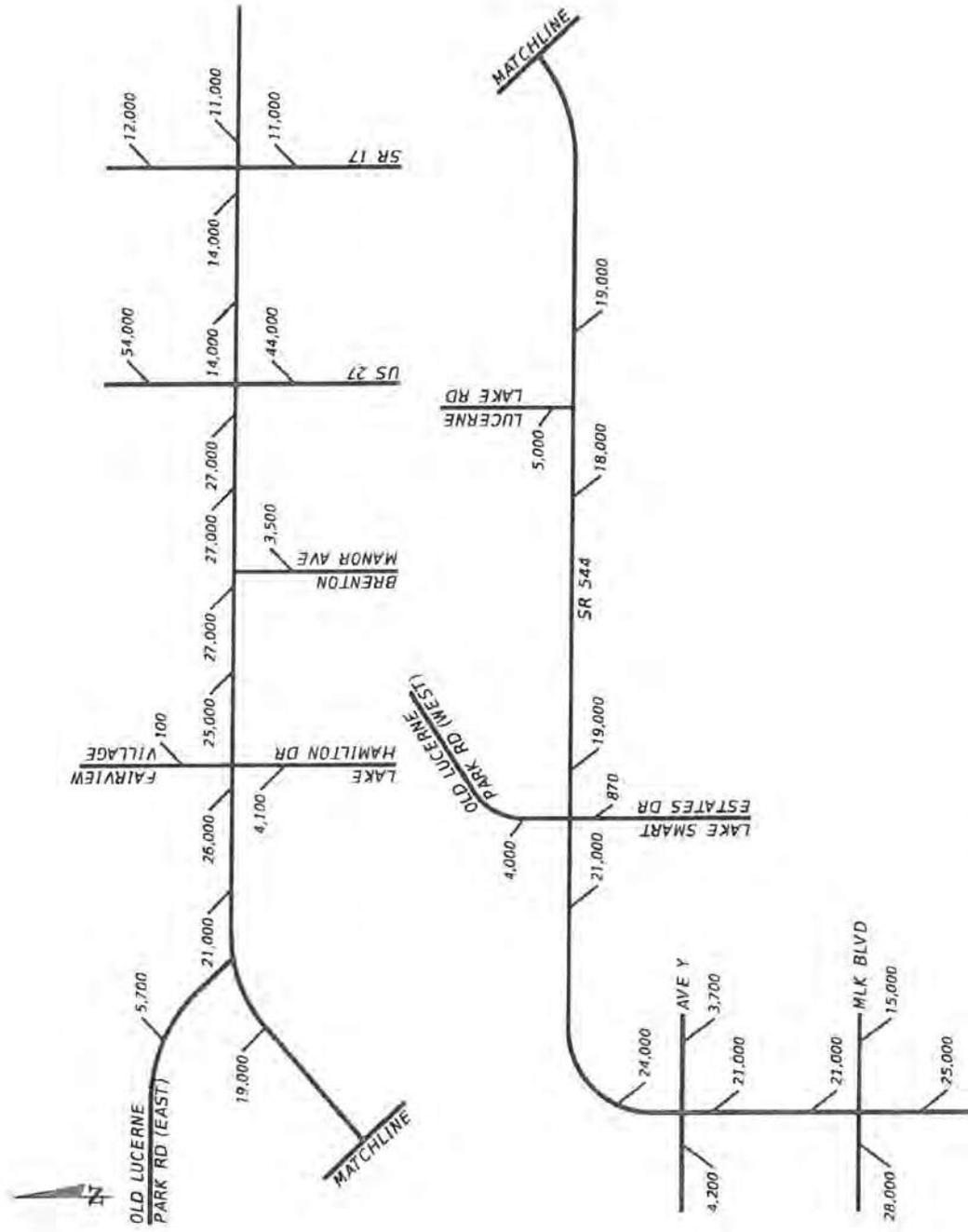


Figure 3-11: Opening Year (2025) AADT Volumes –Build Alternative No. 2

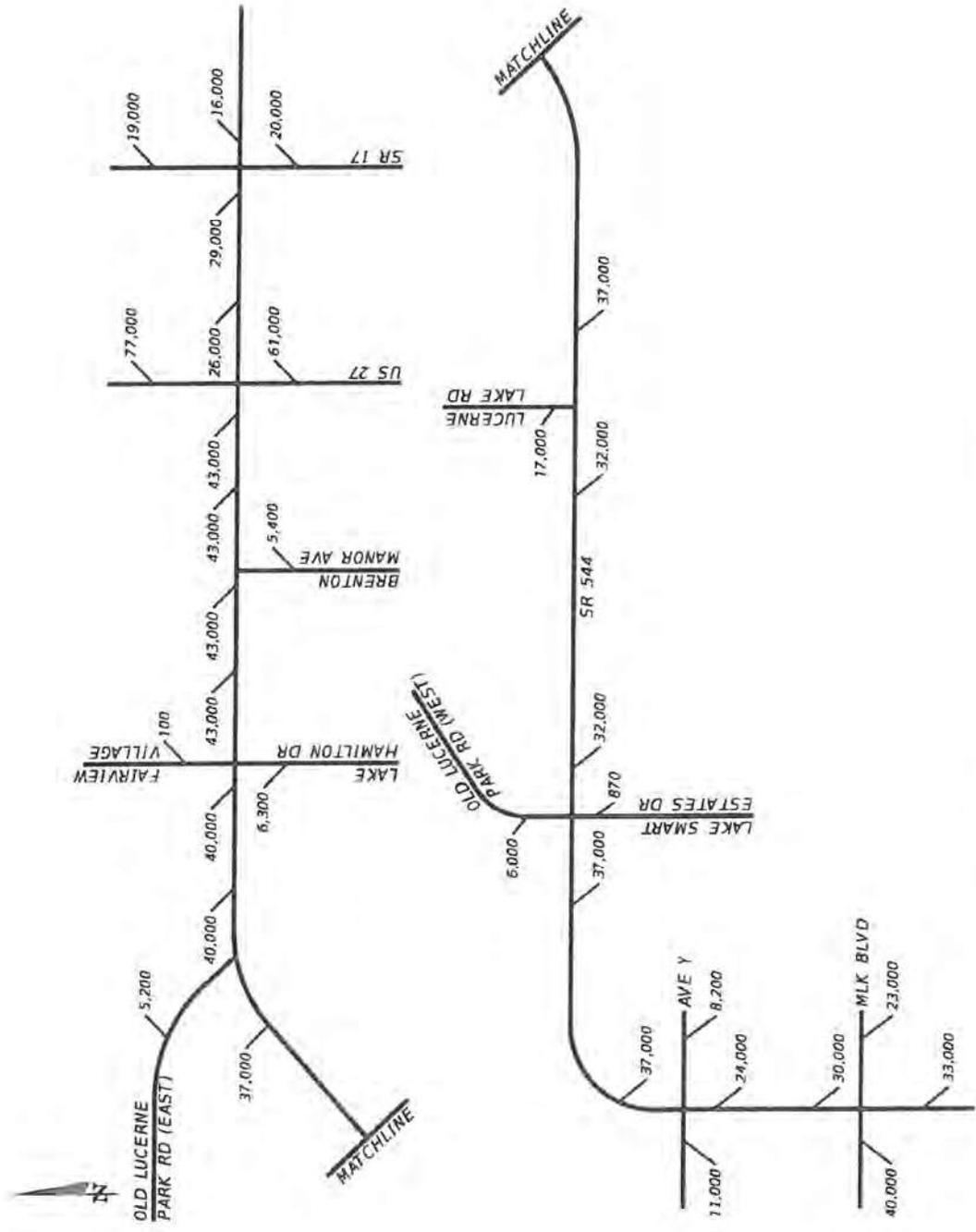


Figure 3-7: Design Year (2045) AADT Volumes – Build Alternative No. 2

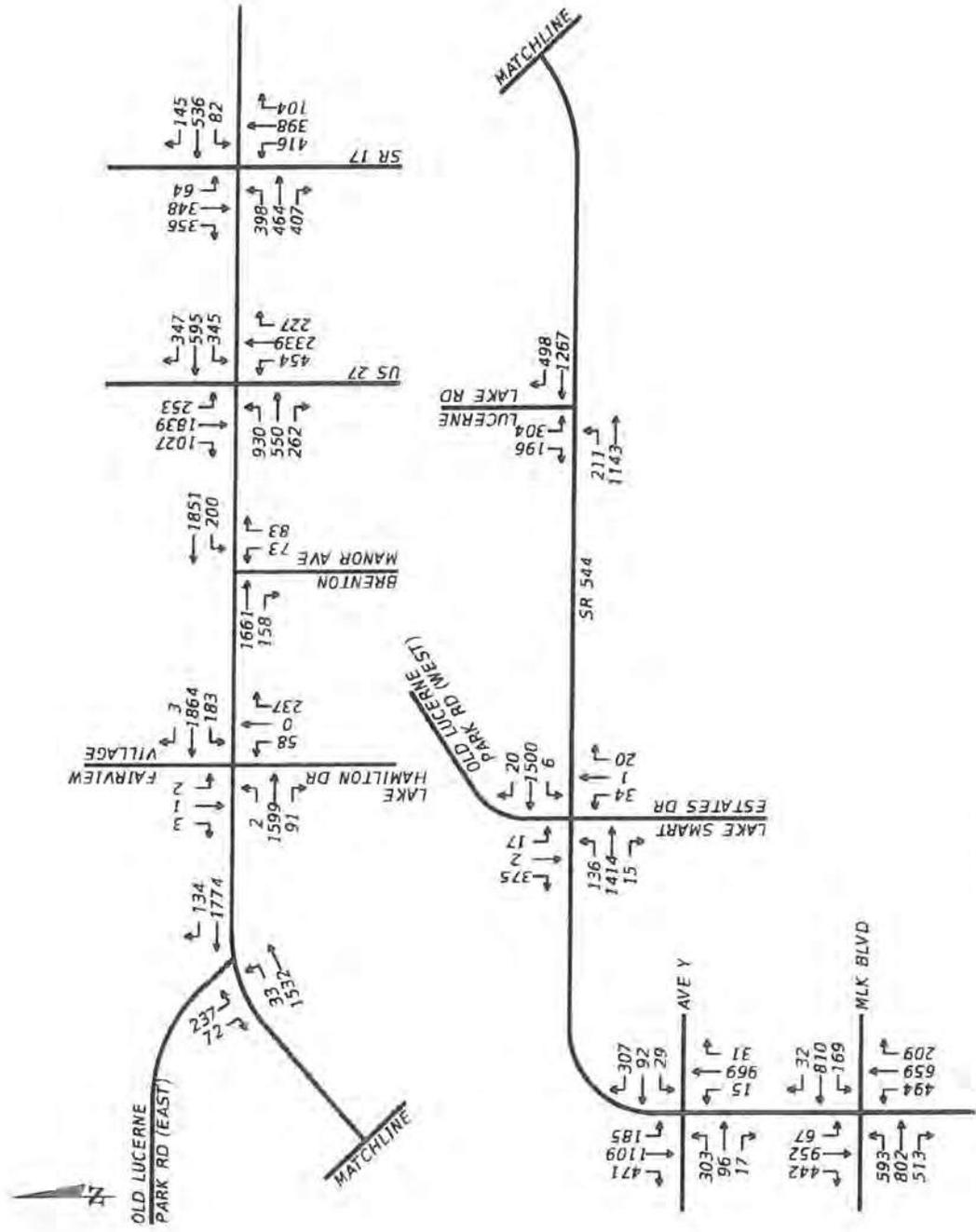


Figure 3-21: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2

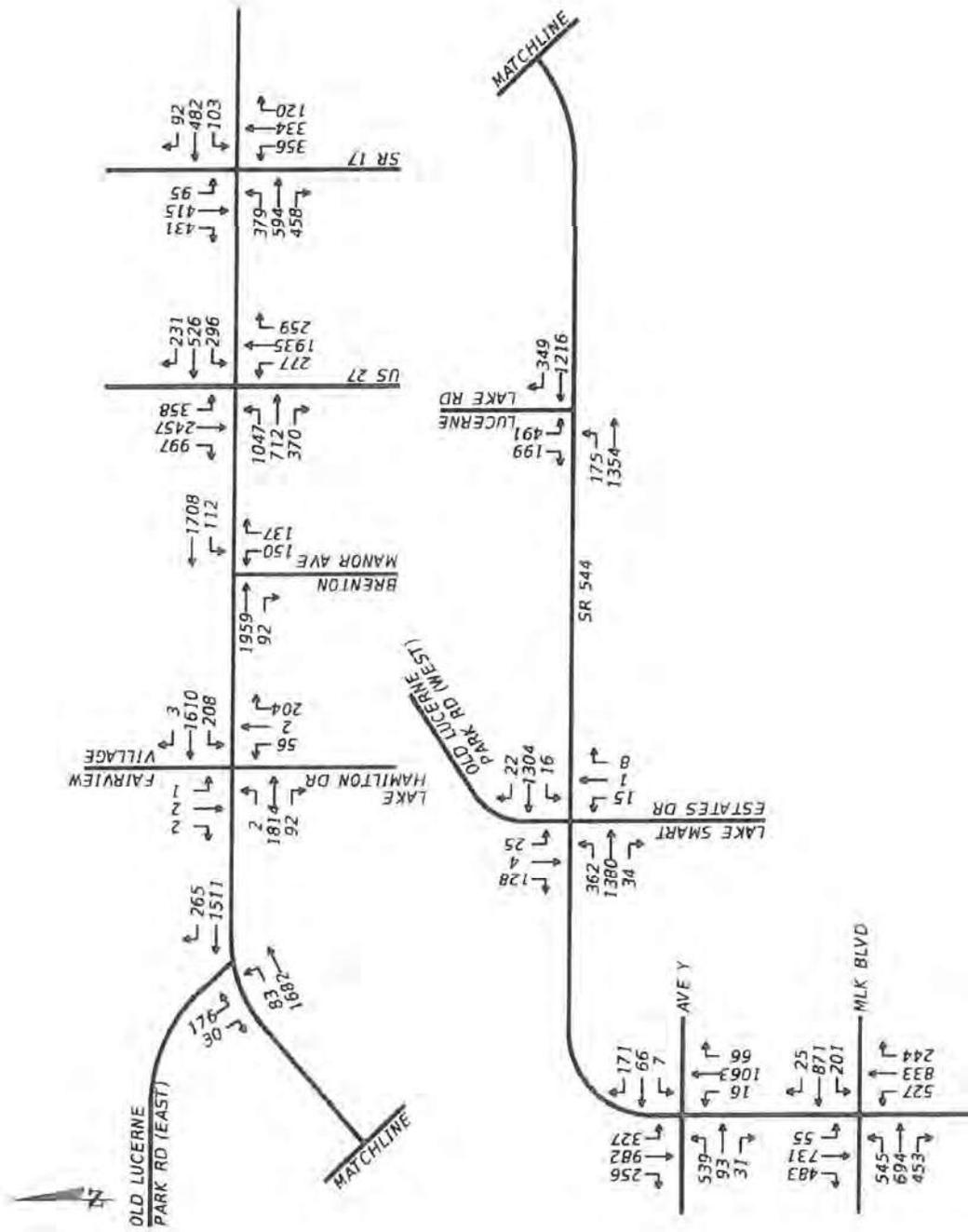


Figure 3-22: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2

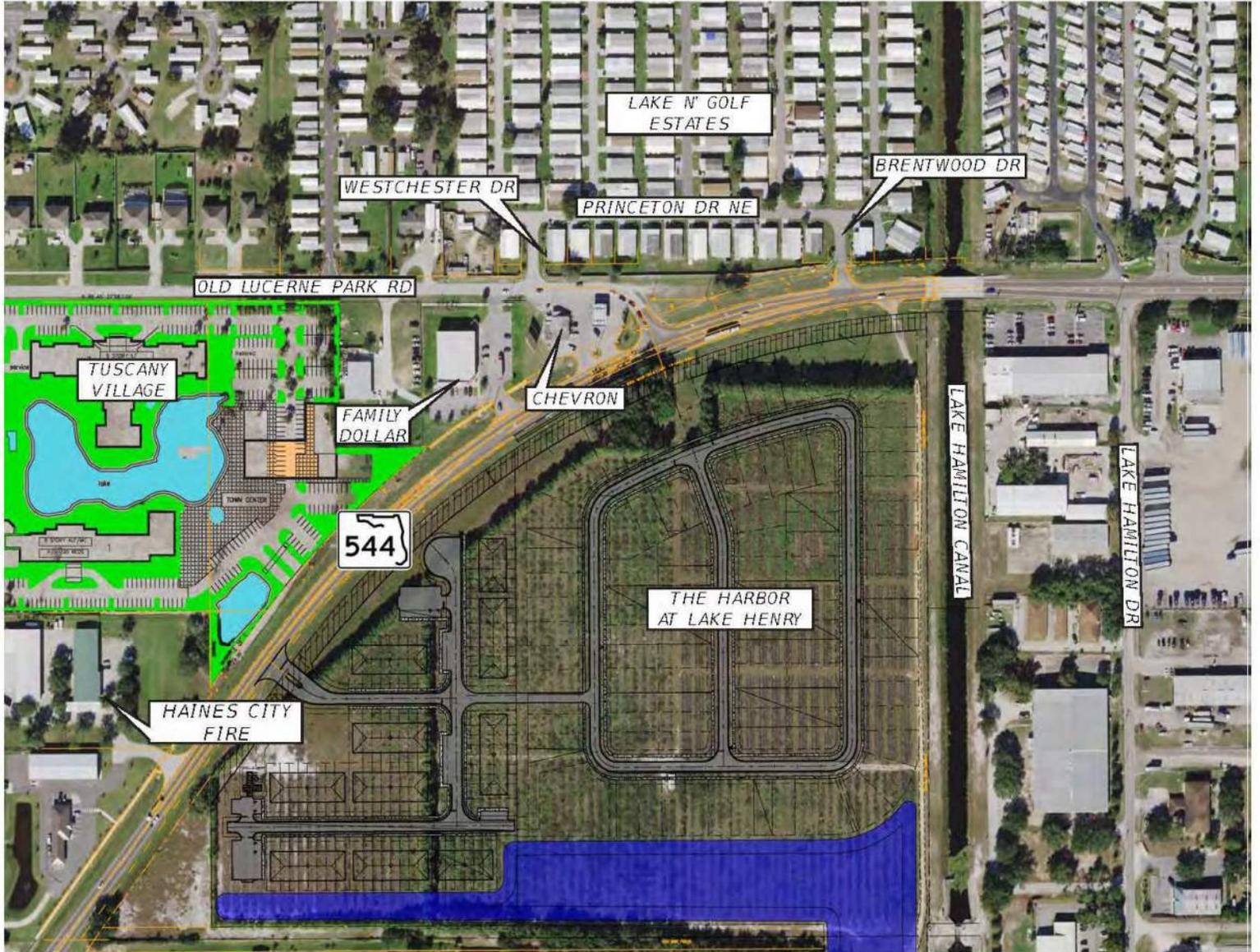
LAKE HAMILTON DRIVE INTERSECTION  
DESIGN YEAR (2045) PEAK HOUR APPROACH TRUCK PERCENTAGES

AM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
2	0.00	1599	0.05	91	0.04	1692	83.59	4.9%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
183	0.04	1864	0.05	3	0.00	2050	100.52	4.9%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
58	0.04	0	0.00	237	0.04	295	11.8	4.0%
PM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
2	0.00	1814	0.03	92	0.04	1908	58.1	3.0%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
208	0.04	1610	0.03	3	0.00	1821	56.62	3.1%
NB LT		NB TH		NB RT		NB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
56	0.04	2	0.00	204	0.04	262	10.4	4.0%

Figure 1: Existing SR 544/Old Lucerne Park Road (East End) Intersection



Figure 2: SR 544/Old Lucerne Park Road (East End) Intersection Surrounding Area



## **Appendix B**

### Traffic Signal Warrant Analysis



## *Florida Department of Transportation*

**RICK SCOTT**  
GOVERNOR

801 North Broadway Avenue  
Bartow, FL 33830

**MIKE DEW**  
SECRETARY

### **MEMORANDUM**

**Date:** April 17, 2018

**To:** Nathan Kautz, P.E., Traffic Services Engineer III

**From:** Lorraine Edwards, Traffic Specialist IV

**CC:** Tanya King, P.E., Traffic Services Engineer II

**Subject:** Signal Warrant Analysis for SR 544 at Old Lucerne Park Road  
Roadway Section: 16140-000, M.P. 8.965

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Upon receiving a request from a citizen, the Traffic Operations Office conducted a signal warrant analysis at the intersection of SR 544 and Old Lucerne Park Road. Traffic count data and delay studies were conducted at this intersection on February 7, 2018 and March 14, 2018 respectively.

A signal warrant analysis was performed using the procedure outlined in the Manual on Uniform Traffic Control Devices (MUTCD). The 8-hour traffic volumes were analyzed (see attached) for all nine warrants. The analysis shows that the 105 volume threshold for Warrant 1A was met. The eight hour volumes ranged from 126 vehicles between 4 PM and 5 PM to 179 vehicles between 8 AM and 9 AM. Warrant 1B was also considered, which accounts for delay at the intersection. The department considers excessive delay to be greater than or equal to 60 seconds. The delay at this intersection ranged from 31 seconds in the morning to 47 seconds in the afternoon for the southbound left turn approach, therefore Warrant 1B is not met.

Crashes were also evaluated at this intersection for the past three years (2015-2018). The only crashes that are considered correctable by a signal are angle crashes. There has to be five angle crashes per year for a signal to be considered at this intersection. In the past three years, no angle crashes occurred at this intersection.

Based on the analysis, the SR 544 at Old Lucerne Park Road intersection meets warrants for a signal. Therefore, careful consideration should be given to the installation of a traffic signal at this intersection.

### Summary of Signal Warrant Analysis

Warrant		Applicable	Satisfied	Comments
1A	Minimum Vehicular Volume	Yes	Yes	The side street traffic volumes meet the requirements of this warrant.
1B	Interruption of Continuous Traffic	No	No	The side street traffic does not suffer excessive delay. Therefore, this Warrant is not applicable.
2	Four Hour Vehicular Volume	Yes	Yes	The side street traffic volumes meet the requirements of this warrant.
3	Peak Hour	No	No	This warrant is not applicable. It is intended to be applied only in unusual cases, such as office complexes, manufacturing plants, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.
4	Pedestrian Volume	Yes	No	There were no observed pedestrians during the study period.
5	School Crossing	No	No	This warrant is not applicable.
6	Coordinated Signal System	No	No	This warrant is not applicable.
7	Crash Experience	Yes	No	Correctable (angle) crashes were not reported during the required 12-month period, which falls below the 5-crash minimum. Therefore, this warrant is not satisfied.
8	Roadway Network	No	No	This warrant is not applicable.
9	Grade Crossing	No	No	This warrant is not applicable.

Warrant 1A and Warrant 2 are satisfied for the intersection of SR 544 at Old Lucerne Park Road.

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
 Minor Street: **Old Lucerne Park Road** Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)?  Yes  No  
 2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No  
 "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"  70%  100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

*Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied for eight hours.*  Yes  No  
*Warrant 1 is also satisfied if both Condition A and Condition B are "80%" satisfied.*  Yes  No

**Condition A - Minimum Vehicular Volume**

*Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.* 100% Satisfied:  Yes  No  
 80% Satisfied:  Yes  No  
 70% Satisfied:  Yes  No  N/A

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

<sup>a</sup> Basic Minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00
<b>Major</b>	1,084	1,013	972	963	1,084	1,221	1,282	1,248
<b>Minor</b>	174	179	146	153	173	163	156	126

Existing Volumes

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

**Condition B - Interruption of Continuous Traffic**

*Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.*

Applicable:  Yes  No

100% Satisfied:  Yes  No

80% Satisfied:  Yes  No

70% Satisfied:  Yes  No  N/A

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

<sup>a</sup> Basic Minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

*Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.*

Eight Highest Hours								
Street	7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00
<b>Major</b>	1,084	1,013	972	963	1,084	1,221	1,282	1,248
<b>Minor</b>	174	179	146	153	173	163	156	126

**Existing Volumes**

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 - Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544**  
 Minor Street: **Old Lucerne Park Road**

Lanes: **1**  
 Lanes: **1**

Major Approach Speed: **50**  
 Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)?  Yes  No
  2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"  Yes  No

**WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME**

*If all four points lie above the appropriate line, then the warrant is satisfied.*

Applicable:  Yes  No  
 Satisfied:  Yes  No

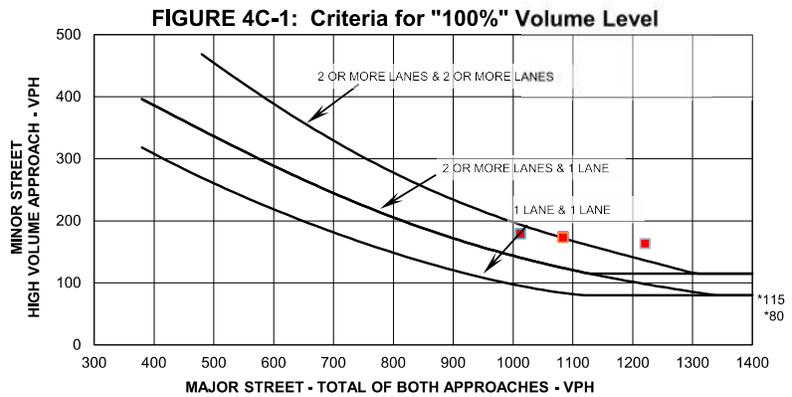
**100% Volume Level**

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00 - 8:00	1084	174
8:00 - 9:00	1013	179
13:00 - 14:00	1084	173
14:00 - 15:00	1221	163

**70% Volume Level**

Four Highest Hours	Volumes	
	Major Street	Minor Street
7:00 - 8:00	1084	174
8:00 - 9:00	1013	179
13:00 - 14:00	1084	173
14:00 - 15:00	1221	163

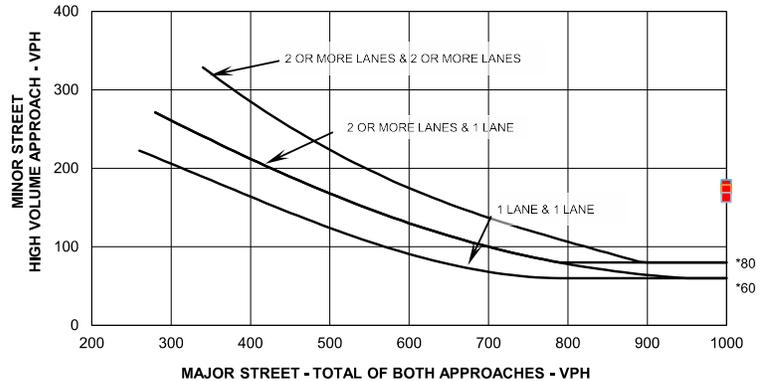
Plot four volume combinations on the applicable figure below.



\* Note: 115 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 80 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

**FIGURE 4C-2: Criteria for "70%" Volume Level**

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



\* Note: 80 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 60 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

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 County: **16 - Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544**  
 Minor Street: **Old Lucerne Park Road**

Lanes: **1** Major Approach Speed: **50**  
 Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph (70 km/h)?  Yes  No
  2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"  70%  100%

**WARRANT 3 - PEAK HOUR**

If all three criteria are fulfilled **or** the plotted point lies above the appropriate line, then the warrant is satisfied.

Applicable:  Yes  No  
 Satisfied:  Yes  No

Unusual condition justifying use of warrant:

None

Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.

Peak Hour 100% Volume		
Time	Major Vol.	Minor Vol.
12:00 AM	0	0

Peak Hour 70% Volume		
Time	Major Vol.	Minor Vol.
12:00 AM	0	0

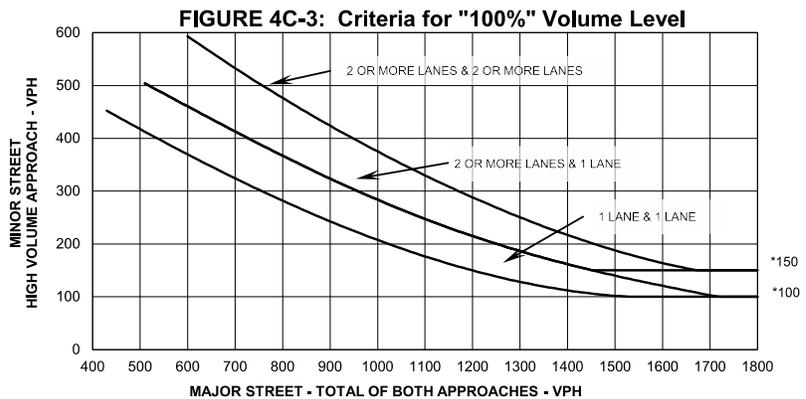
**Criteria**

1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

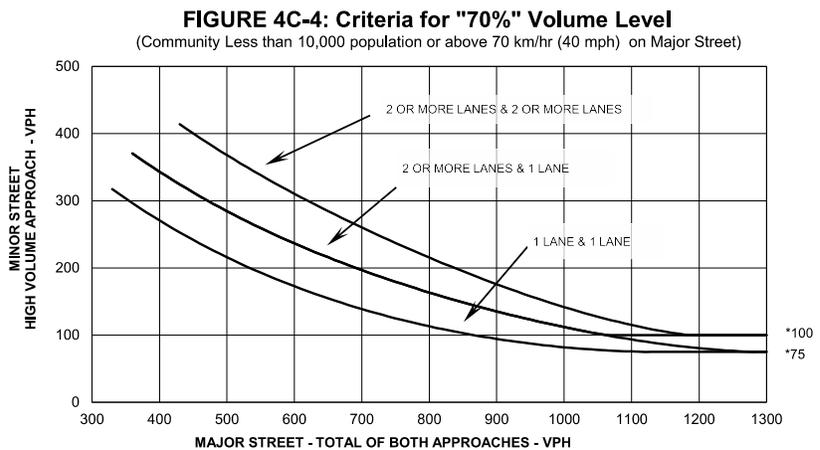
2. Volume on Minor Approach One-Direction *(vehicles per hour)		
Approach Lanes	1	2
Volume Criteria*	100	150
Volume*		
Fulfilled?:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

3. Total Intersection Entering Volume *(vehicles per hour)		
No. of Approaches	3	4
Volume Criteria*	650	800
Volume*	1,192	
Fulfilled?:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Plot volume combination on the applicable figure below.



\* Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume threshold for a minor street approach with one lane.



\* Note: 100 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 75 vph applies as the lower threshold volume threshold for a minor street approach with one lane.

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
 Minor Street: **Old Lucerne Park Road** Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**WARRANT 5 - SCHOOL CROSSING**

*Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.*

Applicable:  Yes  No  
 Satisfied:  Yes  No

Criteria				Fulfilled?	
				Yes	No
1. There are a minimum of 20 students crossing the major street during the highest crossing hour.	Students:	Hour:			X
	0				
2. There are fewer adequate gaps in the major street traffic stream during the period when the children are using the established school crossing than the number of minutes in the same period.	Minutes:	Gaps:			X
3. The nearest traffic signal along the major street is located more than 300 ft. (90 m) away, or the nearest signal is within 300 ft. (90 m) but the proposed traffic signal will not restrict the progressive movement of traffic.				X	

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

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 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
 Minor Street: **Old Lucerne Park Road** Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**WARRANT 6 - COORDINATED SIGNAL SYSTEM**

*Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.).*

Applicable:  Yes  No  
 Satisfied:  Yes  No

Criteria	Fulfilled?	
	Yes	No
1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.		X
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.		X

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020 01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
 Minor Street: **Old Lucerne Park Road** Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**WARRANT 7 - CRASH EXPERIENCE**

*Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.*

Applicable:  Yes  No  
 Satisfied:  Yes  No

Criteria		Hour	Volume		Met?		Fulfilled?			
			Major	Minor	Yes	No	Yes	No		
1. One of the warrants to the right is met.	Warrant 1, Condition A (80% satisfied)						No		No	
	Warrant 1, Condition B (80% satisfied)						No			
	Warrant 4, Pedestrian Volume at 80% of volume requirements: # ped/hr for four (4) hours or # ped/hr for one (1) hour.						No			
2. Adequate trial of other remedial measure has failed to reduce crash frequency.	Measure tried:	None								No
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-month period.	Observed Crash Types:	Angle	Number of crashes per 12 months:		0				No	

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544**  
 Minor Street: **Old Lucerne Park Road**

Lanes: **1**      Major Approach Speed: **50**  
 Lanes: **1**      Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**WARRANT 8 - ROADWAY NETWORK**

*Record hours where criteria are fulfilled, and the corresponding volume or other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the Major Route characteristics listed.*

Applicable:  Yes  No  
 Satisfied:  Yes  No

Criteria						Met?		Fulfilled?	
						Yes	No	Yes	No
1.	Both of the criteria to the right are met.	a. Total entering volume of at least 1,000 veh/hr during a typical weekday peak hour.		Entering Volume:			X	X	
		b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.		Warrant:	1	2			3
				Satisfied?:					
2.	Total entering volume at least 1,000 veh/hr for each of any 5 hrs of a non-normal business day (Sat. or Sun.)		← Hour	X	X	X	X		
			← Volume						

Characteristics of Major Routes			Met?		Fulfilled?	
			Yes	No	Yes	No
1.	Part of the street or highway system that serves as the principal roadway network for through traffic flow.		Major Street:			X
			Minor Street:			
2.	Rural or suburban highway outside of, entering, or traversing a city.		Major Street:			X
			Minor Street:			
3.	Appears as a major route on an official plan.		Major Street:			X
			Minor Street:			

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
 TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
 County: **16 – Polk**  
 District: **One**

Engineer: **LE**  
 Date: **April 16, 2018**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **50**  
 Minor Street: **Old Lucerne Park Road** Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Approach Lane Criteria**

1. How many approach lanes are there at the track crossing?  1  2 or more  
 If there is 1 lane, use Figure 4C-9 and if there are 2 or more, use Figure 4C-10.  Fig 4C-9  Fig 4C-10

**WARRANT 9 - INTERSECTION NEAR A GRADE CROSSING**

*This signal warrant should be applied only after adequate consideration has been given to other alternatives or after a trial of an alternative has failed to alleviate the safety concerns associated with the grade crossing.*

Indicate if both criteria are fulfilled in the boxes provided. The warrant is **Applicable:**  Yes  No  
 satisfied if both criteria are met. **Satisfied:**  Yes  No

Criteria	Fulfilled?	
	Yes	No
1. A grade crossing exists on an approach controlled by a STOP or YIELD sign and the center of the track nearest to the intersection is within 140 feet of the stop line or yield line on the approach; and	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. During the highest traffic volume hour during which the rail uses the crossing, the plotted point falls above the applicable curve for the existing combination of approach lanes over the track and the distance D (clear storage distance).	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*Use the following tables (4C-2, 4C-3, and 4C-4 to appropriately adjust the minor-street approach volume).*

**Inputs**

Occurrences of Rail traffic per day  
 % of High Occupancy Buses on Minor-Street Approach  
 Enter D (feet)  
 % of Tractor-Trailer Trucks on Minor-Street Approach

0%
136
2.00%

**Adjustment Factors from Tables**

1.00
0.50

**Table 4C-2. Adjustment Factor for Daily Frequency of Rail Traffic**

Rail Traffic per Day	Adjustment Factor
1	0.67
2	0.91
3 to 5	1
6 to 8	1.18
9 to 11	1.25
12 or more	1.33

**Table 4C-3. Adjustment Factor for Percentage of High-Occupancy Buses**

% of High-Occupancy Buses* on Minor Street Approach	Adjustment Factor
0%	1
2%	1.09
4%	1.19
6% or more	1.32

\* A high-occupancy bus is defined as a bus occupied by at least 20 people

**Table 4C-4. Adjustment Factor for Percentage of Tractor-Trailer Trucks**

% of Tractor-Trailer Trucks on Minor-Street Approach	Adjustment Factor	
	D less than 70 feet	D of 70 feet or more
0% to 2.5%	0.50	0.50
2.6% to 7.5%	0.75	0.75
7.6% to 12.5%	1.00	1.00
12.6% to 17.5%	2.30	1.15
17.6% to 22.5%	2.70	1.35
22.6% to 27.5%	3.28	1.64
More than 27.5%	4.18	2.09

Input the major and minor street volumes before adjustment factors are applied

1 Approach Lane		
136	805	162

D (ft) Major Vol. Minor Vol.

After adjustment factors are applied

1 Approach Lane w/Factors		
136	805	

D (ft) Major Vol. Minor Vol.

Input D and the major and minor street volumes before adjustment factors are applied

2 or more Approach Lanes		
136	805	162

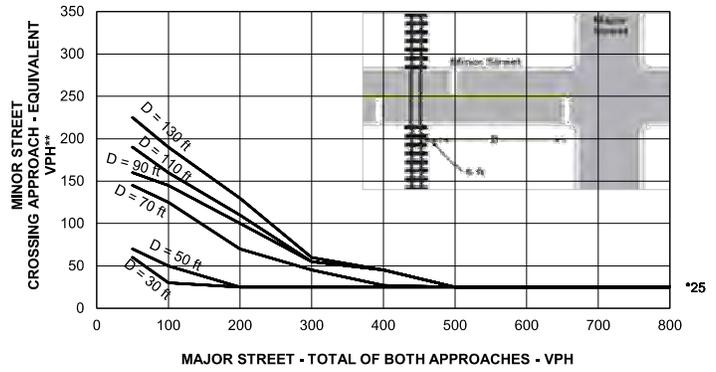
D (ft) Major Vol. Minor Vol.

After adjustment factors are applied

2+ Approach Lane w/Factors		
136	805	

D (ft) Major Vol. Minor Vol.

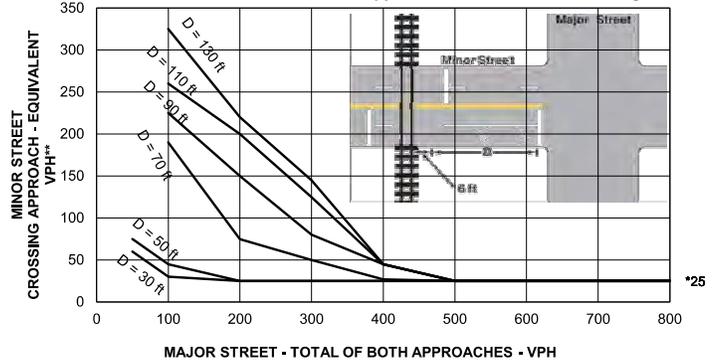
FIGURE 4C-9: Criteria for 1 Approach Lane at the Track Crossing



\* Note: 25 vph applies as the lower threshold volume

\*\* Note: VPH after applying the adjustment factors in Tables 4C-2, 4C, and or 4C-4, if appropriate

FIGURE 4C-10: Criteria for 2+ Approach Lanes at Track Crossing



\* Note: 25 vph applies as the lower threshold volume

\*\* Note: VPH after applying the adjustment factors in Tables 4C-2, 4C, and or 4C-4, if appropriate

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

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TRAFFIC ENGINEERING - 11/14

City: **Winter Heaven**  
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District: **One**

Engineer: **LE**  
Date: **April 16, 2018**

Major Street: **SR 544**  
Minor Street: **Old Lucerne Park Road**

Lanes: **1** Major Approach Speed: **50**  
Lanes: **1** Minor Approach Speed: **40**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**CONCLUSIONS**

Remarks: **Warrant 1A & Warrant 2 are satisfied for the intersection.**

**WARRANTS SATISFIED:**

<input checked="" type="checkbox"/> Warrant 1	<input type="checkbox"/> Not Applicable
<input checked="" type="checkbox"/> Warrant 2	<input type="checkbox"/> Not Applicable
<input type="checkbox"/> Warrant 3	<input checked="" type="checkbox"/> Not Applicable
<input checked="" type="checkbox"/> Warrant 4	<input type="checkbox"/> Not Applicable
<input type="checkbox"/> Warrant 5	<input checked="" type="checkbox"/> Not Applicable
<input type="checkbox"/> Warrant 6	<input checked="" type="checkbox"/> Not Applicable
<input checked="" type="checkbox"/> Warrant 7	<input type="checkbox"/> Not Applicable
<input type="checkbox"/> Warrant 8	<input checked="" type="checkbox"/> Not Applicable
<input type="checkbox"/> Warrant 9	<input checked="" type="checkbox"/> Not Applicable

## **Appendix**

**Composite Study**  
**24-Hour Approach Count**  
**8-Hour Turning Movement Count**  
**Intersection Delay Studies**  
**SR 544 at Old Lucerne Park Road**

**POLK COUNTY**  
**SECTION 16140000**  
**MILEPOST 8.965**

**District Wide Traffic Studies**  
**Contract Number C-9K44**  
**Financial Project No. 436417-1-32-01**  
**Task Work Order No. 84**

**Prepared For:**  
**Florida Department of Transportation**  
**District 1**



**March 2018**

## PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered engineer in the State of Florida practicing with Faller, Davis & Associates, authorized to operate as an engineering business (Certificate of Authorization No. 5864), and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

PROJECT: District Wide Traffic Studies

FPID NO: 436417-1-32-01

REPORT: Composite Study – 24-Hour Approach Count, 8-Hour Turning Movement Count, and Intersection Delay Studies for SR 544 at Old Lucerne Park Road in Polk County, Florida.

The attached Composite Study contains depictions of existing field conditions and traffic volumes for the above referenced project. I acknowledge that the procedures and references used to develop the conclusions contained in this document are standard to the professional practice of civil engineering as applied through professional judgment and experience.

The 24-hour approach count was conducted by others, and a summary table is included for reference.



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SIGNED AND SEALED BY:*



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NOT CONSIDERED SIGNED AND SEALED.  
THE SIGNATURE MUST BE VERIFIED  
ON THE ELECTRONIC COPIES.*

SIGNATURE:

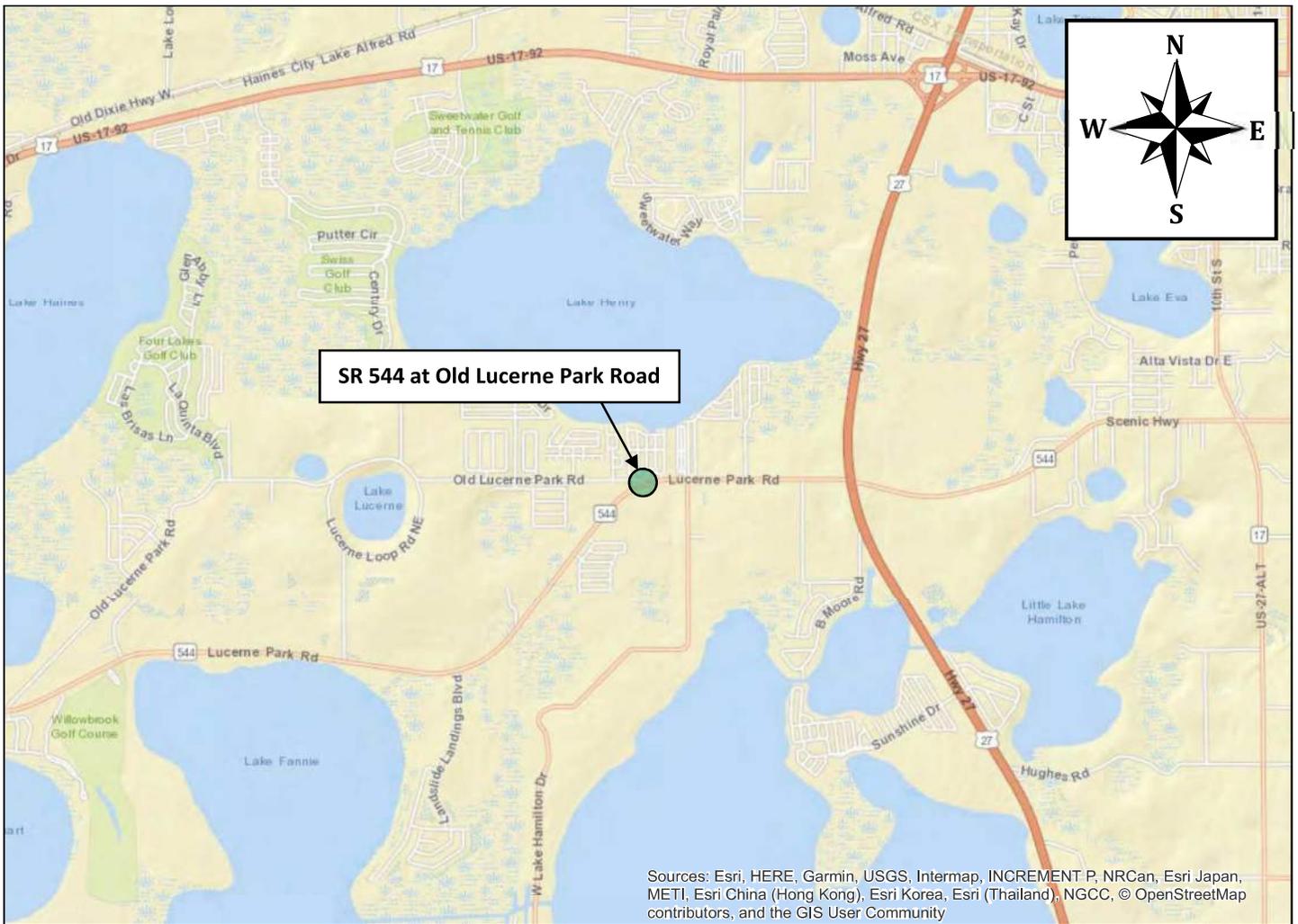
DATE: March 28<sup>th</sup>, 2018

NAME: Richard S. Jardim  
P.E. NUMBER: 60127  
PHONE: (407) 644-2116

Faller, Davis & Associates, Inc.  
2301 Maitland Center Parkway  
Suite 265  
Maitland, Florida 32751  
Certificate of Authorization No.: 5864

## INTRODUCTION

The Florida Department of Transportation has retained Faller, Davis & Associates, Inc. to conduct a 24-hour approach count, an 8-hour turning movement count, and intersection delay studies at the intersection of SR 544 at Old Lucerne Park Road in Polk County, Florida. The analysis methods used in conducting this study are consistent with those set forth in the current version of the Manual on Uniform Traffic Studies and District One guidelines and procedures.



**Project Location Map**

## Traffic Volumes

Twenty-four-hour machine approach counts were collected on the approaches to the intersection. According to these counts, approximately 2,700 southbound, 9,000 eastbound, and 7,300 westbound vehicles approached the intersection on the day of the count.

### 24-Hour Approach Count Summary

TIME BEGIN	SB	N/S TOTAL	EB	WB	E/W TOTAL	GRAND TOTAL
0:00	13	13	66	60	126	<b>139</b>
1:00	6	6	56	74	130	<b>136</b>
2:00	3	3	40	51	91	<b>94</b>
3:00	19	19	93	54	147	<b>166</b>
4:00	31	31	117	72	189	<b>220</b>
5:00	76	76	237	145	382	<b>458</b>
6:00	150	150	350	323	673	<b>823</b>
7:00	227	227	472	578	1,050	<b>1,277</b>
8:00	176	176	471	502	973	<b>1,149</b>
9:00	177	177	414	406	820	<b>997</b>
10:00	215	215	488	416	904	<b>1,119</b>
11:00	208	208	550	464	1,014	<b>1,222</b>
12:00	183	183	540	438	978	<b>1,161</b>
13:00	229	229	659	479	1,138	<b>1,367</b>
14:00	156	156	620	602	1,222	<b>1,378</b>
15:00	186	186	718	485	1,203	<b>1,389</b>
16:00	163	163	671	527	1,198	<b>1,361</b>
17:00	154	154	720	511	1,231	<b>1,385</b>
18:00	117	117	568	365	933	<b>1,050</b>
19:00	82	82	404	274	678	<b>760</b>
20:00	71	71	312	180	492	<b>563</b>
21:00	48	48	203	132	335	<b>383</b>
22:00	24	24	161	134	295	<b>319</b>
23:00	13	13	105	69	174	<b>187</b>
TOTAL	2,727	2,727	9,035	7,341	16,376	<b>19,103</b>

**Turning Movement Count Summary**

An 8-hour turning movement count was conducted at the intersection from 7:00 to 9:00 AM, 10:00 AM to 12:00 PM, and 1:00 to 5:00 PM.

**Turning Movement Count Summary**

TIME BEGIN - END	Old Lucerne Park Road SOUTHBOUND				SR 544 EASTBOUND				SR 544 WESTBOUND			
	U	L	T	R	U	L	T	R	U	L	T	R
<b>7:00 - 8:00</b>	0	174	0	5	0	2	473	0	0	0	520	89
<b>8:00 - 9:00</b>	0	179	0	6	0	1	421	0	0	0	495	96
<b>10:00 - 11:00</b>	0	146	0	14	0	12	396	0	0	0	425	139
<b>11:00 - 12:00</b>	0	153	0	10	0	26	369	0	0	0	414	154
<b>13:00 - 14:00</b>	0	173	0	10	0	2	462	0	0	0	422	198
<b>14:00 - 15:00</b>	0	163	0	5	0	19	469	0	0	0	531	202
<b>15:00 - 16:00</b>	0	156	0	8	0	21	528	0	0	0	527	206
<b>16:00 - 17:00</b>	0	126	0	4	0	12	537	0	0	0	480	219
<b>TOTAL</b>	<b>0</b>	<b>1,270</b>	<b>0</b>	<b>62</b>	<b>0</b>	<b>95</b>	<b>3,655</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,814</b>	<b>1,303</b>
<b>Percentage</b>	0.0%	95.3%	0.0%	4.7%	0.0%	2.5%	97.5%	0.0%	0.0%	0.0%	74.5%	25.5%
<b>Maximum</b>	0	179	0	14	0	26	537	0	0	0	531	219
<b>Minimum</b>	0	126	0	4	0	1	369	0	0	0	414	89
<b>Total Heavy Veh</b>	51		0	1	1		326	0	0		320	44
<b>% Heavy Veh</b>	4.0%		0.0%	1.6%	1.1%		8.9%	0.0%	0.0%		8.4%	3.4%

8-hour turning movement count, pedestrian, and bicycle data is presented in further detail in the appendix.

## Intersection Delay

Intersection delay studies were performed for the southbound movement during the morning and afternoon peak periods. The delay data is summarized below and is presented in detail in the appendix.

### Summary of Delay Studies

Movement	Period	Time	Maximum Queue (Veh)	Average Delay per Vehicle (Sec)	Volume (Veh/Hr)	Total Delay (Veh-Sec)	Total Delay (Veh-Hr)	Maximum Stopped Time (Min-Sec)
Southbound	Morning	7:00 - 8:00	7	31	179	5,549	1.54	2' - 18"
	Afternoon	15:00 - 16:00	9	47	158	7,426	2.06	2' - 21"



### VEHICLE TURNING MOVEMENT COUNT

SECTION: 16140000  
 STATE ROUTE: SR 544  
 OBSERVER: FDA  
 WEATHER: Good  
 NORTHBOUND APPROACH: N/A  
 SOUTHBOUND APPROACH: Old Lucerne Park Road

CITY: Winter Haven  
 INTERSECTING ROUTE: Old Lucerne Park Road  
 DATE OF COUNT: 1/30/18  
 ROAD CONDITION: Good  
 EASTBOUND APPROACH: SR 544  
 WESTBOUND APPROACH: SR 544  
 COUNT PERIODS: 7:00 - 9:00 AM, 10:00 AM - 12:00 PM, 1:00 - 5:00 PM

COUNTY: Polk  
 MILEPOST: 8.965  
 COMPLETED BY: ZCP  
 DATE COMPLETED: 2/7/18

#### ALL VEHICLES / ALL MOVEMENTS

Direction Start Time	Northbound				Total	Southbound				NS Total	Eastbound				Total	Westbound				EW Total	Grand Total	
	NBU	NBL	NBT	NBR		SBU	SBL	SBT	SBR		EBU	EBL	EBT	EBR		WBU	WBL	WBT	WBR			
7:00 AM	0	0	0	0	0	37	0	3	40	40	0	0	83	0	83	0	0	107	19	126	209	249
7:15 AM	0	0	0	0	0	45	0	2	47	47	0	0	121	0	121	0	0	119	24	143	264	311
7:30 AM	0	0	0	0	0	50	0	0	50	50	0	1	150	0	151	0	0	143	25	168	319	369
7:45 AM	0	0	0	0	0	42	0	0	42	42	0	1	119	0	120	0	0	151	21	172	282	334
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>174</b>	<b>0</b>	<b>5</b>	<b>179</b>	<b>179</b>	<b>0</b>	<b>2</b>	<b>473</b>	<b>0</b>	<b>475</b>	<b>0</b>	<b>0</b>	<b>520</b>	<b>89</b>	<b>609</b>	<b>1,084</b>	<b>1,263</b>
8:00 AM	0	0	0	0	0	37	0	2	39	39	0	0	123	0	123	0	0	136	20	156	279	318
8:15 AM	0	0	0	0	0	45	0	1	46	46	0	0	97	0	97	0	0	132	21	153	250	296
8:30 AM	0	0	0	0	0	62	0	2	64	64	0	0	104	0	104	0	0	110	27	137	241	305
8:45 AM	0	0	0	0	0	35	0	1	36	36	0	1	97	0	98	0	0	117	28	145	243	279
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>179</b>	<b>0</b>	<b>6</b>	<b>185</b>	<b>185</b>	<b>0</b>	<b>1</b>	<b>421</b>	<b>0</b>	<b>422</b>	<b>0</b>	<b>0</b>	<b>495</b>	<b>96</b>	<b>591</b>	<b>1,013</b>	<b>1,198</b>
10:00 AM	0	0	0	0	0	36	0	1	37	37	0	5	103	0	108	0	0	104	40	144	252	289
10:15 AM	0	0	0	0	0	38	0	5	43	43	0	3	99	0	102	0	0	127	33	160	262	305
10:30 AM	0	0	0	0	0	38	0	6	44	44	0	2	93	0	95	0	0	101	36	137	232	276
10:45 AM	0	0	0	0	0	34	0	2	36	36	0	2	101	0	103	0	0	93	30	123	226	262
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>146</b>	<b>0</b>	<b>14</b>	<b>160</b>	<b>160</b>	<b>0</b>	<b>12</b>	<b>396</b>	<b>0</b>	<b>408</b>	<b>0</b>	<b>0</b>	<b>425</b>	<b>139</b>	<b>564</b>	<b>972</b>	<b>1,132</b>
11:00 AM	0	0	0	0	0	29	0	1	30	30	0	7	71	0	78	0	0	97	36	133	211	241
11:15 AM	0	0	0	0	0	52	0	4	56	56	0	7	94	0	101	0	0	117	41	158	259	315
11:30 AM	0	0	0	0	0	42	0	3	45	45	0	1	105	0	106	0	0	112	34	146	252	297
11:45 AM	0	0	0	0	0	30	0	2	32	32	0	11	99	0	110	0	0	88	43	131	241	273
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>153</b>	<b>0</b>	<b>10</b>	<b>163</b>	<b>163</b>	<b>0</b>	<b>26</b>	<b>369</b>	<b>0</b>	<b>395</b>	<b>0</b>	<b>0</b>	<b>414</b>	<b>154</b>	<b>568</b>	<b>963</b>	<b>1,126</b>
1:00 PM	0	0	0	0	0	50	0	3	53	53	0	0	101	0	101	0	0	90	43	133	234	287
1:15 PM	0	0	0	0	0	44	0	5	49	49	0	0	112	0	112	0	0	108	52	160	272	321
1:30 PM	0	0	0	0	0	38	0	1	39	39	0	1	134	0	135	0	0	103	50	153	288	327
1:45 PM	0	0	0	0	0	41	0	1	42	42	0	1	115	0	116	0	0	121	53	174	290	332
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>173</b>	<b>0</b>	<b>10</b>	<b>183</b>	<b>183</b>	<b>0</b>	<b>2</b>	<b>462</b>	<b>0</b>	<b>464</b>	<b>0</b>	<b>0</b>	<b>422</b>	<b>198</b>	<b>620</b>	<b>1,084</b>	<b>1,267</b>
2:00 PM	0	0	0	0	0	49	0	1	50	50	0	8	113	0	121	0	0	135	43	178	299	349
2:15 PM	0	0	0	0	0	46	0	2	48	48	0	6	121	0	127	0	0	132	54	186	313	361
2:30 PM	0	0	0	0	0	40	0	1	41	41	0	2	114	0	116	0	0	122	57	179	295	336
2:45 PM	0	0	0	0	0	28	0	1	29	29	0	3	121	0	124	0	0	142	48	190	314	343
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>163</b>	<b>0</b>	<b>5</b>	<b>168</b>	<b>168</b>	<b>0</b>	<b>19</b>	<b>469</b>	<b>0</b>	<b>488</b>	<b>0</b>	<b>0</b>	<b>531</b>	<b>202</b>	<b>733</b>	<b>1,221</b>	<b>1,389</b>
3:00 PM	0	0	0	0	0	39	0	3	42	42	0	7	142	0	149	0	0	112	60	172	321	363
3:15 PM	0	0	0	0	0	28	0	0	28	28	0	5	131	0	136	0	0	139	50	189	325	353
3:30 PM	0	0	0	0	0	49	0	1	50	50	0	2	139	0	141	0	0	156	50	206	347	397
3:45 PM	0	0	0	0	0	40	0	4	44	44	0	7	116	0	123	0	0	120	46	166	289	333
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>156</b>	<b>0</b>	<b>8</b>	<b>164</b>	<b>164</b>	<b>0</b>	<b>21</b>	<b>528</b>	<b>0</b>	<b>549</b>	<b>0</b>	<b>0</b>	<b>527</b>	<b>206</b>	<b>733</b>	<b>1,282</b>	<b>1,446</b>
4:00 PM	0	0	0	0	0	37	0	3	40	40	0	1	124	0	125	0	0	109	47	156	281	321
4:15 PM	0	0	0	0	0	27	0	0	27	27	0	4	143	0	147	0	0	119	55	174	321	348
4:30 PM	0	0	0	0	0	28	0	1	29	29	0	3	120	0	123	0	0	125	55	180	303	332
4:45 PM	0	0	0	0	0	34	0	0	34	34	0	4	150	0	154	0	0	127	62	189	343	377
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>126</b>	<b>0</b>	<b>4</b>	<b>130</b>	<b>130</b>	<b>0</b>	<b>12</b>	<b>537</b>	<b>0</b>	<b>549</b>	<b>0</b>	<b>0</b>	<b>480</b>	<b>219</b>	<b>699</b>	<b>1,248</b>	<b>1,378</b>

**VEHICLE TURNING MOVEMENT COUNT**

SECTION: 16140000  
 STATE ROUTE: SR 544  
 OBSERVER: FDA  
 WEATHER: Good  
 NORTHBOUND APPROACH: N/A  
 SOUTHBOUND APPROACH: Old Lucerne Park Road

CITY: Winter Haven  
 INTERSECTING ROUTE: Old Lucerne Park Road  
 DATE OF COUNT: 1/30/18  
 ROAD CONDITION: Good  
 EASTBOUND APPROACH: SR 544  
 WESTBOUND APPROACH: SR 544  
 COUNT PERIODS: 7:00 - 9:00 AM, 10:00 AM - 12:00 PM, 1:00 - 5:00 PM

COUNTY: Polk  
 MILEPOST: 8.965  
 COMPLETED BY: ZCP  
 DATE COMPLETED: 2/7/18

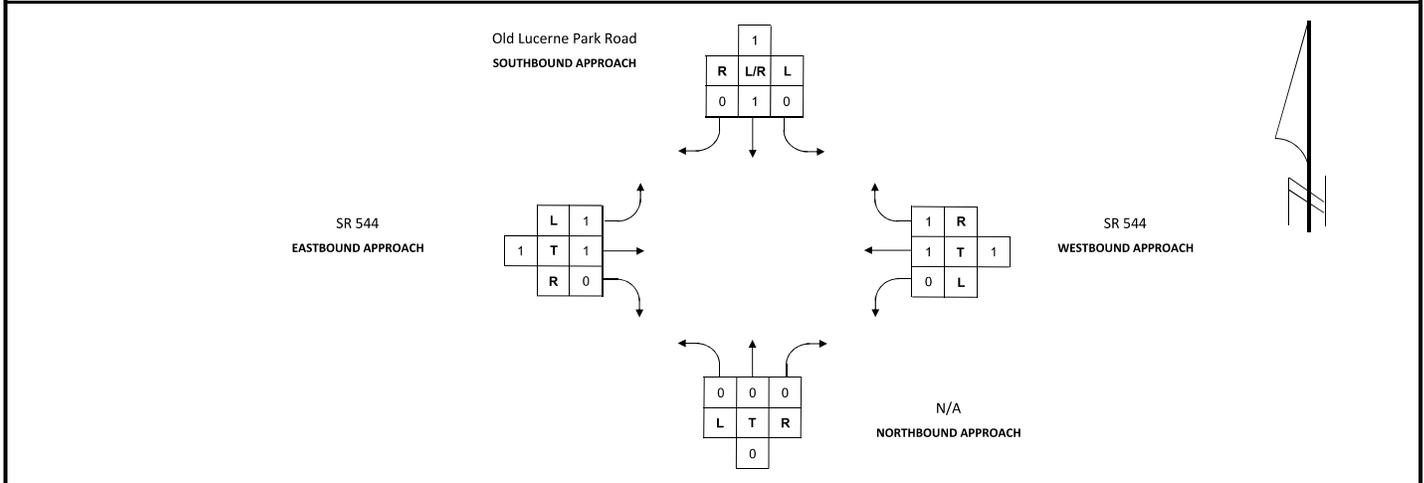
**HEAVY VEHICLES (TRUCKS + BUSES)**

Direction	Northbound					Southbound					Eastbound					Westbound					EW Total	Grand Total	
	NBU	NBL	NBT	NBR	Total	SBU	SBL	SBT	SBR	Total	NS Total	EBU	EBL	EBT	EBR	Total	WBU	WBL	WBT	WBR			Total
7:00 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	7	0	7	0	0	10	5	15	22	24
7:15 AM	0	0	0	0	0	0	3	0	0	3	3	0	0	8	0	8	0	0	7	4	11	19	22
7:30 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	3	0	3	0	0	8	0	8	11	13
7:45 AM	0	0	0	0	0	0	3	0	0	3	3	0	1	14	0	15	0	0	18	2	20	35	38
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>1</b>	<b>32</b>	<b>0</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>43</b>	<b>11</b>	<b>54</b>	<b>87</b>	<b>97</b>
8:00 AM	0	0	0	0	0	0	5	0	0	5	5	0	0	15	0	15	0	0	10	2	12	27	32
8:15 AM	0	0	0	0	0	0	4	0	0	4	4	0	0	13	0	13	0	0	8	3	11	24	28
8:30 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	9	0	9	0	0	10	1	11	20	22
8:45 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	10	0	10	0	0	16	2	18	28	29
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>8</b>	<b>52</b>	<b>99</b>	<b>111</b>
10:00 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	5	0	5	0	0	9	2	11	16	17
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	17	0	0	9	0	9	26	26
10:30 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	16	0	16	0	0	11	2	13	29	31
10:45 AM	0	0	0	0	0	0	2	0	0	2	2	0	0	20	0	20	0	0	8	0	8	28	30
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>4</b>	<b>41</b>	<b>99</b>	<b>104</b>
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	0	0	11	1	12	19	19
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	0	0	6	1	7	21	21
11:30 AM	0	0	0	0	0	0	1	0	0	1	1	0	0	12	0	12	0	0	8	0	8	20	21
11:45 AM	0	0	0	0	0	0	4	0	0	4	4	0	0	9	0	9	0	0	8	1	9	18	22
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>0</b>	<b>42</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>3</b>	<b>36</b>	<b>78</b>	<b>83</b>
1:00 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	12	0	12	0	0	6	1	7	19	20
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	6	0	6	12	12
1:30 PM	0	0	0	0	0	0	1	0	1	2	2	0	0	11	0	11	0	0	7	1	8	19	21
1:45 PM	0	0	0	0	0	0	2	0	0	2	2	0	0	12	0	12	0	0	11	1	12	24	26
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>0</b>	<b>41</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>3</b>	<b>33</b>	<b>74</b>	<b>79</b>
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11	0	0	14	0	14	25	25
2:15 PM	0	0	0	0	0	0	3	0	0	3	3	0	0	8	0	8	0	0	13	3	16	24	27
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	17	0	17	23	23
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	0	12	0	12	22	22
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>3</b>	<b>59</b>	<b>94</b>	<b>97</b>
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	10	2	12	15	15
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	11	0	0	12	0	12	23	23
3:30 PM	0	0	0	0	0	0	2	0	0	2	2	0	0	12	0	12	0	0	16	2	18	30	32
3:45 PM	0	0	0	0	0	0	2	0	0	2	2	0	0	10	0	10	0	0	8	3	11	21	23
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>0</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>46</b>	<b>7</b>	<b>53</b>	<b>89</b>	<b>93</b>
4:00 PM	0	0	0	0	0	0	2	0	0	2	2	0	0	11	0	11	0	0	7	1	8	19	21
4:15 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	5	0	5	0	0	13	1	14	19	20
4:30 PM	0	0	0	0	0	0	2	0	0	2	2	0	0	6	0	6	0	0	5	2	7	13	15
4:45 PM	0	0	0	0	0	0	3	0	0	3	3	0	0	13	0	13	0	0	6	1	7	20	23
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>35</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>5</b>	<b>36</b>	<b>71</b>	<b>79</b>

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION:	16140000	CITY:	Winter Haven	COUNTY:	Polk
STATE ROUTE:	SR 544	INTERSECTING ROUTE:	Old Lucerne Park Road	MILEPOST:	8.965
OBSERVER:	FDA	DATE:	1/30/18	COMPLETED BY:	ZCP
WEATHER:	Good	ROAD CONDITION:	Good	DATE COMPLETED:	2/7/18
REMARKS:	_____				



TIME	NORTHBOUND					SOUTHBOUND					TOTAL	EASTBOUND					WESTBOUND					TOTAL
	U	L	T	R	TOT	U	L	T	R	TOT		N/S	U	L	T	R	TOT	U	L	T	R	
7:00 - 8:00	0	0	0	0	0	0	174	0	5	179	179	0	2	473	0	475	0	0	520	89	609	1,084
8:00 - 9:00	0	0	0	0	0	0	179	0	6	185	185	0	1	421	0	422	0	0	495	96	591	1,013
10:00 - 11:00	0	0	0	0	0	0	146	0	14	160	160	0	12	396	0	408	0	0	425	139	564	972
11:00 - 12:00	0	0	0	0	0	0	153	0	10	163	163	0	26	369	0	395	0	0	414	154	568	963
13:00 - 14:00	0	0	0	0	0	0	173	0	10	183	183	0	2	462	0	464	0	0	422	198	620	1,084
14:00 - 15:00	0	0	0	0	0	0	163	0	5	168	168	0	19	469	0	488	0	0	531	202	733	1,221
15:00 - 16:00	0	0	0	0	0	0	156	0	8	164	164	0	21	528	0	549	0	0	527	206	733	1,282
16:00 - 17:00	0	0	0	0	0	0	126	0	4	130	130	0	12	537	0	549	0	0	480	219	699	1,248
TOTAL	0	0	0	0	0	0	1,270	0	62	1,332	1,332	0	95	3,655	0	3,750	0	0	3,814	1,303	5,117	8,867

Percentage	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	95.3%	0.0%	4.7%	100.0%	N/A	0.0%	2.5%	97.5%	0.0%	100.0%	0.0%	0.0%	74.5%	25.5%	100.0%	N/A
Maximum	0	0	0	0	0	0	179	0	14	185	185	0	26	537	0	549	0	0	531	219	733	1,282
Minimum	0	0	0	0	0	0	126	0	4	130	130	0	1	369	0	395	0	0	414	89	564	963
Total Heavy Veh	0	0	0	0	0	51	0	1	52	52	52	1	326	0	327	0	0	320	44	364	691	
% Heavy Veh	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	0.0%	1.6%	3.9%	3.9%	3.9%	1.1%	8.9%	0.0%	8.7%	0.0%	0.0%	8.4%	3.4%	7.1%	7.8%	

**FLORIDA DEPARTMENT OF TRANSPORTATION**  
**PEDESTRIAN MOVEMENT SUMMARY**

SECTION 16140000  
 STATE ROUTE SR 544  
 OBSERVER FDA  
 COUNTY Polk  
 MILEPOST 8.965  
 COUNT HOURS 7:00 - 9:00 AM, 10:00 AM - 12:00 PM, 1:00 - 5:00 PM

CITY Winter Haven  
 INTERSECTING ROUTE Old Lucerne Park Road  
 DATE OF COUNT 1/30/18  
 WEATHER Good  
 COMPLETED BY ZCP  
 DATE 2/7/18

**Old Lucerne Park Road**

7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	Total
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

**SOUTHBOUND APPROACH**

SR 544

7:00 - 8:00	0	0	0
8:00 - 9:00	0	0	0
10:00 - 11:00	0	0	0
11:00 - 12:00	0	0	0
13:00 - 14:00	0	0	0
14:00 - 15:00	0	0	0
15:00 - 16:00	0	0	0
16:00 - 17:00	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

**EASTBOUND APPROACH**

**WESTBOUND APPROACH**

SR 544

7:00 - 8:00	0	0	0
8:00 - 9:00	0	0	0
10:00 - 11:00	0	0	0
11:00 - 12:00	0	0	0
13:00 - 14:00	0	0	0
14:00 - 15:00	0	0	0
15:00 - 16:00	0	0	0
16:00 - 17:00	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

**NORTHBOUND APPROACH**

7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	Total
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

**N/A**

FLORIDA DEPARTMENT OF TRANSPORTATION

BICYCLE MOVEMENT SUMMARY

SECTION 16140000  
 STATE ROUTE SR 544  
 OBSERVER FDA  
 COUNTY Polk  
 MILEPOST 8.965  
 COUNT HOURS 7:00 - 9:00 AM, 10:00 AM - 12:00 PM, 1:00 - 5:00 PM

CITY Winter Haven  
 INTERSECTING ROUTE Old Lucerne Park Road  
 DATE OF COUNT 1/30/18  
 WEATHER Good  
 COMPLETED BY ZCP  
 DATE 2/7/18

Old Lucerne Park Road

7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	Total
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

SOUTHBOUND APPROACH

SR 544

7:00 - 8:00	0	0	0
8:00 - 9:00	0	0	0
10:00 - 11:00	0	0	0
11:00 - 12:00	0	0	0
13:00 - 14:00	0	0	0
14:00 - 15:00	0	0	0
15:00 - 16:00	0	0	0
16:00 - 17:00	0	0	0
Total	0	0	0

EASTBOUND APPROACH

WESTBOUND APPROACH

SR 544

7:00 - 8:00	0	0	0
8:00 - 9:00	0	0	0
10:00 - 11:00	0	0	0
11:00 - 12:00	0	0	0
13:00 - 14:00	0	0	0
14:00 - 15:00	0	0	0
15:00 - 16:00	0	0	0
16:00 - 17:00	0	0	0
Total	0	0	0

NORTHBOUND APPROACH

7:00 - 8:00	8:00 - 9:00	10:00 - 11:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	Total
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

N/A

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

SR 544 at Old Lucerne Park Road  
Stop Sign Delay Study  
7:00 -8:00

File Name : 475.84 AMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 1

L n.	No.	Joined Queue	Released From Queue	Delay
1	2	07:01:56	07:01:58	2
1	3	07:02:15	07:02:23	8
1	4	07:02:26	07:02:28	2
1	5	07:02:32	07:02:41	9
1	6	07:02:33	07:02:54	21
1	7	07:03:03	07:03:22	19
1	8	07:03:05	07:03:27	22
1	9	07:03:19	07:03:50	31
1	10	07:04:21	07:04:26	5
1	11	07:04:39	07:04:46	7
1	12	07:04:43	07:04:48	5
1	13	07:05:00	07:05:02	2
1	14	07:05:41	07:05:47	6
1	15	07:05:54	07:06:00	6
1	16	07:05:57	07:06:04	7
1	17	07:06:05	07:06:12	7
1	18	07:06:36	07:06:40	4
1	19	07:07:09	07:08:20	71
1	20	07:07:12	07:08:21	69
1	21	07:07:19	07:08:22	63
1	22	07:07:33	07:08:24	51
1	23	07:08:12	07:08:47	35
1	24	07:08:36	07:08:54	18
1	25	07:08:36	07:09:22	46
1	26	07:09:44	07:09:47	3
1	27	07:10:05	07:10:18	13
1	28	07:11:08	07:11:35	27
1	29	07:11:22	07:11:48	26
1	30	07:11:23	07:11:50	27
1	31	07:11:44	07:12:08	24
1	32	07:11:56	07:12:08	12
1	33	07:11:58	07:12:31	33
1	34	07:12:03	07:12:33	30
1	35	07:12:15	07:12:48	33
1	36	07:12:21	07:12:49	28
1	37	07:12:22	07:12:50	28
1	38	07:12:24	07:13:05	41
1	39	07:12:28	07:13:07	39
1	40	07:12:43	07:13:11	28
1	41	07:12:55	07:13:33	38
1	42	07:12:57	07:13:34	37
1	43	07:13:16	07:13:35	19
1	44	07:13:17	07:13:38	21
1	45	07:13:46	07:13:53	7
1	46	07:13:57	07:14:13	16
1	47	07:14:20	07:14:47	27
1	48	07:14:44	07:14:48	4
1	49	07:15:19	07:15:25	6
1	50	07:15:23	07:15:29	6
1	51	07:15:39	07:15:45	6
1	52	07:15:42	07:15:53	11
1	53	07:15:51	07:16:09	18
1	54	07:16:02	07:16:09	7
1	55	07:16:02	07:16:47	45
1	56	07:16:39	07:16:48	9
1	57	07:16:45	07:16:56	11
1	58	07:17:30	07:17:41	11
1	59	07:17:32	07:17:49	17
1	60	07:17:36	07:18:11	35
1	61	07:17:38	07:18:18	40

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

File Name : 475.84 AMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 2

L n.	No.	Joined Queue	Released From Queue	Delay	
1	62	07:18:02	07:18:18	16	
1	63	07:18:04	07:18:20	16	
1	64	07:18:06	07:18:41	35	
1	65	07:18:09	07:18:42	33	
1	66	07:18:44	07:18:49	5	
1	67	07:19:23	07:19:27	4	
1	68	07:19:29	07:19:40	11	
1	69	07:19:34	07:19:49	15	
1	70	07:19:47	07:19:52	5	
1	71	07:20:15	07:20:22	7	
1	72	07:21:27	07:21:28	1	
1	73	07:21:30	07:21:54	24	
1	74	07:21:32	07:21:57	25	
1	75	07:21:53	07:22:07	14	
1	76	07:22:13	07:22:23	10	
1	77	07:22:26	07:22:29	3	
1	78	07:22:43	07:22:47	4	
1	79	07:22:46	07:23:01	15	
1	80	07:22:59	07:23:04	5	
1	81	07:24:10	07:25:07	57	
1	82	07:24:13	07:25:24	71	
1	83	07:24:31	07:25:48	77	
1	84	07:25:22	07:26:06	44	
1	85	07:25:26	07:26:15	49	
1	86	07:26:11	07:26:20	9	
1	87	07:27:54	07:28:04	10	
1	88	07:28:02	07:28:12	10	
1	89	07:28:03	07:28:14	11	
1	90	07:28:15	07:28:21	6	
1	91	07:29:06	07:29:19	13	
1	92	07:29:33	07:29:47	14	
1	93	07:29:33	07:29:51	18	
1	94	07:29:40	07:30:03	23	
1	95	07:30:06	07:30:15	9	
1	96	07:30:10	07:30:18	8	
1	97	07:30:37	07:31:12	35	
1	98	07:30:38	07:31:28	50	
1	99	07:30:52	07:31:34	42	
1	100	07:31:01	07:31:37	36	
1	101	07:32:08	07:33:20	72	
1	102	07:32:20	07:33:22	62	
1	103	07:33:02	07:33:33	31	
1	104	07:33:24	07:33:53	29	
1	105	07:33:57	07:34:17	20	
1	106	07:34:09	07:34:23	14	
1	107	07:34:52	07:35:00	8	
1	108	07:34:54	07:35:00	6	
1	109	07:36:12	07:36:28	16	
1	110	07:36:51	07:37:15	24	
1	111	07:37:16	07:37:23	7	
1	112	07:37:21	07:37:39	18	
1	113	07:37:32	07:37:42	10	
1	114	07:37:44	07:38:24	40	
1	115	07:37:59	07:38:42	43	
1	116	07:38:20	07:38:56	36	
1	117	07:39:05	07:39:10	5	
1	118	07:39:18	07:39:26	8	
1	119	07:39:21	07:39:37	16	
1	120	07:39:31	07:39:40	9	
1	121	07:39:43	07:39:58	15	
1	122	07:39:48	07:40:03	15	
1	123	07:40:14	07:40:33	19	

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

File Name : 475.84 AMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 3

L n.	No.	Joined Queue	Released From Queue	Delay	
1	124	07:40:26	07:40:45	19	
1	125	07:40:32	07:40:47	15	
1	126	07:40:36	07:40:58	22	
1	127	07:40:49	07:41:00	11	
1	128	07:41:36	07:41:52	16	
1	129	07:42:09	07:42:21	12	
1	130	07:42:14	07:42:24	10	
1	131	07:42:19	07:42:29	10	
1	132	07:42:35	07:42:45	10	
1	133	07:42:54	07:43:25	31	
1	134	07:43:08	07:43:34	26	
1	135	07:43:11	07:43:37	26	
1	136	07:43:13	07:43:47	34	
1	137	07:43:18	07:43:56	38	
1	138	07:43:21	07:45:07	106	
1	139	07:43:23	07:45:09	106	
1	140	07:43:44	07:45:11	87	
1	141	07:44:23	07:45:27	64	
1	142	07:44:31	07:45:29	58	
1	143	07:44:40	07:45:50	70	
1	144	07:45:14	07:47:12	118	
1	145	07:45:37	07:47:16	99	
1	146	07:45:39	07:47:25	106	
1	147	07:46:00	07:47:29	89	
1	148	07:46:21	07:47:57	96	
1	149	07:46:33	07:48:14	101	
1	150	07:46:35	07:48:53	138	
1	151	07:48:19	07:49:04	45	
1	152	07:49:16	07:49:40	24	
1	153	07:49:26	07:50:06	40	
1	154	07:50:18	07:50:56	38	
1	155	07:50:26	07:51:24	58	
1	156	07:51:01	07:51:25	24	
1	157	07:51:26	07:51:32	6	
1	158	07:51:48	07:52:09	21	
1	159	07:52:07	07:52:16	9	
1	160	07:52:54	07:53:06	12	
1	161	07:53:04	07:53:21	17	
1	162	07:53:10	07:54:07	57	
1	163	07:53:10	07:54:27	77	
1	164	07:53:12	07:54:28	76	
1	165	07:53:12	07:54:38	86	
1	166	07:54:11	07:54:44	33	
1	167	07:55:20	07:55:52	32	
1	168	07:55:42	07:56:01	19	
1	169	07:55:44	07:56:38	54	
1	170	07:55:59	07:56:51	52	
1	171	07:56:08	07:57:40	92	
1	172	07:56:12	07:57:43	91	
1	173	07:56:17	07:57:49	92	
1	174	07:56:21	07:57:49	88	
1	175	07:57:05	07:57:50	45	
1	176	07:57:05	07:58:08	63	
1	177	07:57:12	07:58:19	67	
1	178	07:57:56	07:58:33	37	
1	179	07:59:28	07:59:58	30	
1	180	07:59:33	08:00:00	27	

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

File Name : 475.84 AMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 4

## Summary Information:

07:00:00 - 08:00:00	Southbound
Total Vehicle Count:	179
Delayed Vehicle Count:	179
Through Vehicle Count:	0
Average Stopped Time:	31.24
Maximum Stopped Time:	138
Min. Secs. for Delay:	0
Average Queue:	1.60
Queue Density:	2.45
Maximum Queue:	7
Delay in Vehicle Hour:	1.61
Total Delay:	5592

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

SR 544 at Old Lucerne Park Road  
Stop Sign Delay Study  
15:00 - 16:00

File Name : 475.84 PMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 1

L n.	No.	Joined Queue	Released From Queue	Delay	
1	4	15:00:00	15:01:07	67	
1	5	15:00:02	15:01:15	73	
1	6	15:00:41	15:01:38	57	
1	7	15:00:52	15:01:47	55	
1	8	15:00:54	15:01:48	54	
1	9	15:01:29	15:01:49	20	
1	10	15:01:40	15:01:50	10	
1	11	15:01:54	15:02:01	7	
1	12	15:01:55	15:02:05	10	
1	13	15:02:00	15:02:06	6	
1	14	15:02:02	15:02:57	55	
1	15	15:02:49	15:03:14	25	
1	16	15:03:10	15:03:44	34	
1	17	15:03:35	15:03:47	12	
1	18	15:03:41	15:04:15	34	
1	19	15:03:46	15:04:16	30	
1	20	15:04:02	15:04:27	25	
1	21	15:04:24	15:04:44	20	
1	22	15:04:25	15:04:51	26	
1	23	15:05:01	15:05:09	8	
1	24	15:05:17	15:05:34	17	
1	25	15:05:22	15:05:42	20	
1	26	15:05:34	15:05:43	9	
1	27	15:06:00	15:06:30	30	
1	28	15:06:09	15:06:41	32	
1	29	15:07:00	15:07:04	4	
1	30	15:07:58	15:08:21	23	
1	31	15:08:00	15:08:23	23	
1	32	15:08:50	15:08:56	6	
1	33	15:09:03	15:10:05	62	
1	34	15:09:30	15:10:33	63	
1	35	15:09:43	15:10:35	52	
1	36	15:09:52	15:11:14	82	
1	37	15:10:32	15:11:15	43	
1	38	15:11:24	15:11:54	30	
1	39	15:12:03	15:12:33	30	
1	40	15:12:18	15:13:07	49	
1	41	15:12:40	15:14:30	110	
1	42	15:13:23	15:14:31	68	
1	43	15:14:19	15:14:39	20	
1	44	15:15:03	15:15:40	37	
1	45	15:15:20	15:16:02	42	
1	46	15:16:32	15:16:43	11	
1	47	15:16:39	15:16:56	17	
1	48	15:17:01	15:17:21	20	
1	49	15:17:06	15:17:29	23	
1	50	15:17:27	15:18:02	35	
1	51	15:18:19	15:18:41	22	
1	52	15:18:54	15:19:06	12	
1	53	15:19:09	15:19:43	34	
1	54	15:20:53	15:21:06	13	
1	55	15:21:12	15:21:23	11	
1	56	15:21:51	15:21:59	8	
1	57	15:21:57	15:22:00	3	
1	58	15:22:10	15:22:33	23	
1	59	15:23:26	15:23:35	9	
1	60	15:24:13	15:26:03	110	
1	61	15:24:30	15:26:09	99	
1	62	15:24:33	15:26:16	103	
1	63	15:24:48	15:26:20	92	

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

File Name : 475.84 PMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 2

L n.	No.	Joined Queue	Released From Queue	Delay	
1	64	15:24:54	15:26:23	89	
1	65	15:25:09	15:26:32	83	
1	66	15:25:23	15:26:44	81	
1	67	15:25:43	15:26:56	73	
1	68	15:26:11	15:27:00	49	
1	69	15:26:11	15:27:22	71	
1	70	15:27:23	15:27:34	11	
1	71	15:27:35	15:28:24	49	
1	72	15:28:14	15:28:45	31	
1	73	15:28:21	15:28:49	28	
1	74	15:28:32	15:29:43	71	
1	75	15:29:32	15:29:53	21	
1	76	15:29:41	15:30:02	21	
1	77	15:29:50	15:31:07	77	
1	78	15:30:37	15:31:15	38	
1	79	15:31:19	15:32:22	63	
1	80	15:31:49	15:32:33	44	
1	81	15:32:16	15:32:37	21	
1	82	15:32:42	15:32:52	10	
1	83	15:33:14	15:33:31	17	
1	84	15:33:21	15:33:33	12	
1	85	15:33:26	15:34:39	73	
1	86	15:34:16	15:34:40	24	
1	87	15:34:26	15:35:01	35	
1	88	15:34:32	15:35:12	40	
1	89	15:34:52	15:35:33	41	
1	90	15:35:04	15:36:12	68	
1	91	15:35:08	15:36:42	94	
1	92	15:35:10	15:37:21	131	
1	93	15:35:41	15:37:38	117	
1	94	15:35:43	15:38:04	141	
1	95	15:36:24	15:38:11	107	
1	96	15:36:25	15:38:19	114	
1	97	15:36:25	15:38:20	115	
1	98	15:36:35	15:38:21	106	
1	99	15:37:14	15:38:25	71	
1	100	15:37:18	15:38:39	81	
1	101	15:37:35	15:38:40	65	
1	102	15:38:17	15:38:42	25	
1	103	15:38:32	15:40:38	126	
1	104	15:38:36	15:40:38	122	
1	105	15:39:29	15:41:01	92	
1	106	15:40:25	15:42:46	141	
1	107	15:40:32	15:42:46	134	
1	108	15:40:33	15:42:47	134	
1	109	15:40:33	15:42:52	139	
1	110	15:42:21	15:42:57	36	
1	111	15:42:23	15:43:03	40	
1	112	15:42:31	15:43:12	41	
1	113	15:42:36	15:43:15	39	
1	114	15:44:40	15:44:54	14	
1	115	15:44:40	15:45:11	31	
1	116	15:44:53	15:45:21	28	
1	117	15:45:06	15:45:30	24	
1	118	15:45:19	15:45:35	16	
1	119	15:45:23	15:45:49	26	
1	120	15:45:24	15:45:56	32	
1	121	15:45:32	15:45:58	26	
1	122	15:46:02	15:46:08	6	
1	123	15:46:03	15:46:15	12	
1	124	15:46:06	15:46:16	10	
1	125	15:46:13	15:46:19	6	

# Faller, Davis & Associates, Inc.

2301 Maitland Center Parkway, Suite 265  
Maitland, Florida 32751

File Name : 475.84 PMSSDS  
Site Code : 00000000  
Start Date : 3/14/2018  
Page No : 3

L n.	No.	Joined Queue	Released From Queue	Delay	
1	126	15:46:31	15:46:39	8	
1	127	15:46:39	15:46:44	5	
1	128	15:46:42	15:46:47	5	
1	129	15:47:10	15:47:18	8	
1	130	15:47:16	15:47:27	11	
1	131	15:48:25	15:49:08	43	
1	132	15:49:21	15:49:29	8	
1	133	15:50:04	15:50:20	16	
1	134	15:50:53	15:51:10	17	
1	135	15:51:24	15:51:43	19	
1	136	15:51:36	15:52:21	45	
1	137	15:52:02	15:52:29	27	
1	138	15:52:10	15:52:38	28	
1	139	15:52:11	15:52:43	32	
1	140	15:52:12	15:53:04	52	
1	141	15:53:19	15:53:39	20	
1	142	15:53:22	15:53:54	32	
1	143	15:53:28	15:53:59	31	
1	144	15:53:44	15:54:19	35	
1	145	15:54:03	15:55:10	67	
1	146	15:54:06	15:55:19	73	
1	147	15:54:26	15:56:31	125	
1	148	15:55:01	15:56:49	108	
1	149	15:55:16	15:57:02	106	
1	150	15:55:35	15:57:09	94	
1	151	15:55:55	15:57:11	76	
1	152	15:56:11	15:57:11	60	
1	153	15:56:15	15:57:22	67	
1	154	15:56:23	15:57:36	73	
1	155	15:56:25	15:58:03	98	
1	156	15:57:38	15:59:12	94	
1	157	15:58:33	15:59:14	41	
1	158	15:58:38	15:59:39	61	
1	159	15:59:33	15:59:56	23	
1	160	15:59:36	15:59:59	23	

## Summary Information:

15:00:00 - 16:00:00		Southbound
Total Vehicle Count:		158
Delayed Vehicle Count:		158
Through Vehicle Count:		0
Average Stopped Time:		47.18
Maximum Stopped Time:		141
Min. Secs. for Delay:		0
Average Queue:		2.07
Queue Density:		2.65
Maximum Queue:		9
Delay in Vehicle Hour:		2.07
Total Delay:		7455

## **Appendix C**

CAP-X and SPICE Analysis Summary Sheets

**Table 1: Stage 1 ICE Analysis Summary - Old Lucerne Park Road (East) Intersection**

Intersection Type	2045 V/C Ratios		Life-Cycle Crashes		SSI Scores	
	AM Peak Hour	PM Peak Hour	Total	Fatal & Injury	Opening Year	Design Year
Two-Way Stop Control	<b>84.26</b>	<b>74.43</b>	111	32	49	26
All-Way Stop Control	<b>2.65</b>	<b>2.59</b>	69	19	87	78
Traffic Signal	0.71	0.62	174	59	71	52
Continuous Green-T	0.71	0.61	167	50	78	61
Unsignalized RCUT	<b>5.60</b>	<b>2.33</b>	n/a	n/a	69	50
Signalized RCUT	0.73	0.64	353	92	77	61
Median U-Turn	0.73	0.65	148	41	n/a	n/a
Roundabout (2EW x 1NS)	<b>1.17</b>	0.82	157	31	86	75
Roundabout (2EW x 2NS)	<b>1.08</b>	0.82	157	31	86	75

**Red font denotes a v/c ratio > 1.00**

Lowest number of crashes of all alternatives analyzed

n/a = No Safety Performance Function (SPF) available

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Old Lucerne Park Road (East End)
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	N

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	33	1532	0	5.00%	0.00%
Westbound	0	0	1774	134	5.00%	0.00%
Southbound	0	237	0	72	7.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.71	1	4.8	Fair	Fair	Good
Continuous Green T N	0.71	1	3.0	Poor	Poor	Good
Signalized Restricted Crossing U-Turn E-W	0.73	3	6.3	Good	Good	Fair
Median U-Turn E-W	0.73	3	6.3	Good	Good	Fair
2 X 2	1.08	5	5.6	Fair	Good	Good
1NS X 2EW	1.17	6	5.6	Fair	Good	Good
All-Way Stop Control	2.65	7	6.7	Good	Good	Good
Unsignalized Restricted Crossing U-Turn E-W	5.60	8	4.4	Fair	Fair	Fair
Two-Way Stop Control E-W	84.26	9	3.7	Poor	Fair	Good
--	--	--	--	--	--	--

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Old Lucerne Park Road (East End)
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	33	1532	0	5.00%	0.00%
Westbound	0	0	1774	134	5.00%	0.00%
Southbound	0	237	0	72	7.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95	/	0.85	/	/
Suggested	<b>0.80</b>	<b>0.95</b>	/	<b>0.85</b>	/	/
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
Two-Way Stop Control	E-W	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
All-Way Stop Control	FULL	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
Continuous Green T	N	/	/	/	/	/	1	/	1	/	1	2	/	/	/	2	1
Signalized Restricted Crossing U-Turn	E-W	/	/	/	0	/	/	/	1	1	1	2	0	0	0	2	1
Unsignalized Restricted Crossing U-Turn	E-W	/	/	/	0	/	/	/	1	1	1	2	0	0	0	2	1
Median U-Turn	E-W	/	/	0	0	/	/	0	1	1	/	2	0	1	/	2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1250	<u>0.71</u>	0.71	Fair	Fair	Good
Two-Way Stop Control	<a href="#">E-W</a>									--	<u>84.26</u>	84.26	Poor	Fair	Good
All-Way Stop Control	<a href="#">FULL</a>									3979	<u>2.65</u>	2.65	Good	Good	Good
Continuous Green T	<a href="#">N</a>									1236	<u>0.71</u>	0.71	Poor	Poor	Good
Signalized Restricted Crossing U-Turn	<a href="#">E-W</a>	1321	<u>0.73</u>	932	<u>0.52</u>	1002	<u>0.56</u>	1140	<u>0.63</u>			0.73	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<a href="#">E-W</a>	1863	<u>5.60</u>	1863	<u>0.00</u>	2004	<u>0.00</u>	1644	<u>0.85</u>			5.60	Fair	Fair	Fair
Median U-Turn	<a href="#">E-W</a>					1046	<u>0.58</u>	1140	<u>0.63</u>	1321	<u>0.73</u>	0.73	Good	Good	Fair



# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Old Lucerne Park Road (East End)
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	N

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	83	1682	0	3.00%	0.00%
Westbound	0	0	1511	265	4.00%	0.00%
Southbound	0	176	0	30	7.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold		2-phase signal		<b>Suggested = 1800</b>	<b>1800</b>	
		3-phase signal		<b>Suggested = 1750</b>	<b>1750</b>	
		4-phase signal		<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Continuous Green T N	0.61	1	3.0	Poor	Poor	Good
Traffic Signal	0.62	2	4.8	Fair	Fair	Good
Signalized Restricted Crossing U-Turn E-W	0.64	3	6.3	Good	Good	Fair
Median U-Turn E-W	0.65	4	6.3	Good	Good	Fair
1NS X 2EW	0.82	5	5.6	Fair	Good	Good
2 X 2	0.82	5	5.6	Fair	Good	Good
Unsignalized Restricted Crossing U-Turn E-W	2.33	7	4.4	Fair	Fair	Fair
All-Way Stop Control	2.59	8	6.7	Good	Good	Good
Two-Way Stop Control E-W	74.43	9	3.7	Poor	Fair	Good
--	--	--	--	--	--	--

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Old Lucerne Park Road (East End)
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	83	1682	0	3.00%	0.00%
Westbound	0	0	1511	265	4.00%	0.00%
Southbound	0	176	0	30	7.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
Two-Way Stop Control	E-W	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
All-Way Stop Control	FULL	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
Continuous Green T	N	/	/	/	/	/	1	/	1	/	1	2	/	/	/	2	1
Signalized Restricted Crossing U-Turn	E-W	/	/	/	0	/	/	/	1	1	1	2	0	0	0	2	1
Unsignalized Restricted Crossing U-Turn	E-W	/	/	/	0	/	/	/	1	1	1	2	0	0	0	2	1
Median U-Turn	E-W	/	/	0	0	/	0	1	1	/	2	0	1	/	2	1	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

## Results for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<a href="#">FULL</a>									1083	<u>0.62</u>	0.62	Fair	Fair	Good
Two-Way Stop Control	<a href="#">E-W</a>									--	<u>74.43</u>	74.43	Poor	Fair	Good
All-Way Stop Control	<a href="#">FULL</a>									3884	<u>2.59</u>	2.59	Good	Good	Good
Continuous Green T	<a href="#">N</a>									1073	<u>0.61</u>	0.61	Poor	Poor	Good
Signalized Restricted Crossing U-Turn	<a href="#">E-W</a>	1044	<u>0.58</u>	960	<u>0.53</u>	924	<u>0.51</u>	1144	<u>0.64</u>			0.64	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<a href="#">E-W</a>	1571	<u>2.33</u>	1920	<u>0.00</u>	1847	<u>0.00</u>	1817	<u>0.73</u>			2.33	Fair	Fair	Fair
Median U-Turn	<a href="#">E-W</a>					1030	<u>0.57</u>	1144	<u>0.64</u>	1167	<u>0.65</u>	0.65	Good	Good	Fair



Federal Highway Administration (FHWA)  
Safety Performance for Intersection Control Evaluation Tool  
**Results**

Summary of crash prediction results for each alternative

**Project Information**

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type	At-Grade Intersections
Intersection:	SR 544/Old Lucerne Park Road (East End)	Opening Year	2025
Agency:	FDOT District One	Design Year	2045
Project Reference:	FPID No.: 440273-1-22-01	Facility Type	On Urban and Suburban Arterial
City:	Polk County	Number of Legs	3-leg
State:	Florida	L-Way/2-Way	2-way Intersecting 2-way
Date:	7/8/2022	# of Major Street Lanes (both directions)	5 or fewer
Analyst:	AIM Engineering & Surveying, Inc.	Major Street Approach Speed	Less than 55 mph

**Crash Prediction Summary**

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	SSI Score		
								Open Year	Design Year	Rank
Traffic Signal	Total	5.59	10.95	173.64	6	Yes	Calibrated SPF	71	52	5
	Fatal & Injury	1.95	3.65	58.84						
Minor Road Stop	Total	3.60	6.94	110.79	3	Yes	Calibrated SPF w/ EB	49	26	7
	Fatal & Injury	1.05	2.00	31.98						
All Way Stop	Total	2.56	3.98	68.98	1	N/A	N/A	87	78	1
	Fatal & Injury	0.71	1.07	18.80						
2-lane Roundabout	Total	5.36	9.63	156.91	2	No	Uncalibrated SPF	86	75	2
	Fatal & Injury	1.00	2.01	31.35						
Median U-Turn (MUT)	Total	4.75	9.31	147.60	4	N/A	CMF	--	--	--
	Fatal & Injury	1.36	2.55	41.19						
Signalized RCUT	Total	11.27	22.33	353.11	7	Yes	Uncalibrated SPF	77	61	3
	Fatal & Injury	3.00	5.71	91.77						
Unsignalized RCUT	Total	No SPF	No SPF	No SPF	--	Yes	Uncalibrated SPF	69	50	6
	Fatal & Injury	No SPF	No SPF	No SPF						
Continuous Green-T Intersection	Total	5.37	10.52	166.70	5	N/A	CMF	78	61	4
	Fatal & Injury	1.66	3.10	50.01						
Other 1*	Total	No SPF	No SPF	No SPF	--	N/A	CMF	--	--	--
	Fatal & Injury	No SPF	No SPF	No SPF						
Other 2*	Total	No SPF	No SPF	No SPF	--	N/A	CMF	--	--	--
	Fatal & Injury	No SPF	No SPF	No SPF						

## **Appendix D**

SYNCHRO and SIDRA Analysis Summary Sheets

**Table 2: Design Year (2045) Peak Hour Operational Analysis Summary - Old Lucerne Park Road (East) Intersection**

AM Peak Hour							
Intersection	Movement	Signalized Intersection			Roundabout		
		V/C	Avg. Delay	LOS	V/C	Avg. Delay	LOS
Old Lucerne Park Rd (east end)	SB LT	0.79	55.5	E	0.71	51.3	F
	SB RT	0.16	22.3	C	0.71	46.7	E
	SB Approach	n/a	47.7	D	n/a	50.2	F
	WB TH	0.94	30.8	C	0.77	15.1	C
	WB RT	0.11	0.5	A	0.77	15.2	C
	WB Approach	n/a	28.6	C	n/a	15.1	C
	EB LT	0.19	7.5	A	0.79	19.6	C
	EB TH	0.69	11.0	B	0.79	19.0	C
	EB Approach	n/a	11.0	B	n/a	19.0	C
ALL	n/a	22.9	C	n/a	19.6	C	
PM Peak Hour							
Intersection	Movement	Signalized Intersection			Roundabout		
		V/C	Avg. Delay	LOS	V/C	Avg. Delay	LOS
Old Lucerne Park Rd (east end)	SB LT	0.63	45.8	D	0.34	19.1	C
	SB RT	0.06	12.7	B	0.34	17.6	C
	SB Approach	n/a	41.0	D	n/a	18.9	C
	WB TH	0.80	20.1	C	0.73	13.6	B
	WB RT	0.21	0.7	A	0.73	13.8	B
	WB Approach	n/a	17.2	B	n/a	13.6	B
	EB LT	0.38	11.8	B	0.81	19.4	C
	EB TH	0.73	10.9	B	0.81	18.8	C
	EB Approach	n/a	10.9	B	n/a	18.8	C
ALL	n/a	15.6	B	n/a	16.4	C	

Lanes, Volumes, Timings  
 15: SR 544 & Old Lucerne Park Rd. (East)

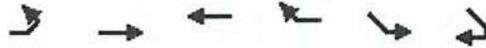
01/05/2021



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	33	1532	1774	134	237	72
Future Volume (vph)	33	1532	1774	134	237	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	425			250	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Fr <sub>t</sub>				0.850		0.850
Fl <sub>t</sub> Protected	0.950				0.950	
Satd. Flow (prot)	1687	3438	3438	1509	1687	1509
Fl <sub>t</sub> Permitted	0.067				0.950	
Satd. Flow (perm)	119	3438	3438	1509	1687	1509
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				141		8
Link Speed (mph)		30	30		30	
Link Distance (ft)		9058	1011		169	
Travel Time (s)		205.9	23.0		3.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	5%	5%	7%	7%	7%
Adj. Flow (vph)	35	1613	1867	141	249	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	1613	1867	141	249	76
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	5	5	7
Permitted Phases	4			8		5
Detector Phase	7	4	8	5	5	7
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	11.0
Total Split (s)	15.0	74.0	59.0	26.0	26.0	15.0
Total Split (%)	15.0%	74.0%	59.0%	26.0%	26.0%	15.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	63.5	63.5	53.9	78.8	17.4	29.8
Actuated g/C Ratio	0.68	0.68	0.58	0.85	0.19	0.32
v/c Ratio	0.19	0.69	0.94	0.11	0.79	0.16
Control Delay	7.5	11.0	30.8	0.5	55.5	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	11.0	30.8	0.5	55.5	22.3
LOS	A	B	C	A	E	C
Approach Delay		11.0	28.6		47.7	
Approach LOS		B	C		D	
Stops (vph)	10	851	1404	4	212	44

Lanes, Volumes, Timings  
 15: SR 544 & Old Lucerne Park Rd. (East)

01/05/2021

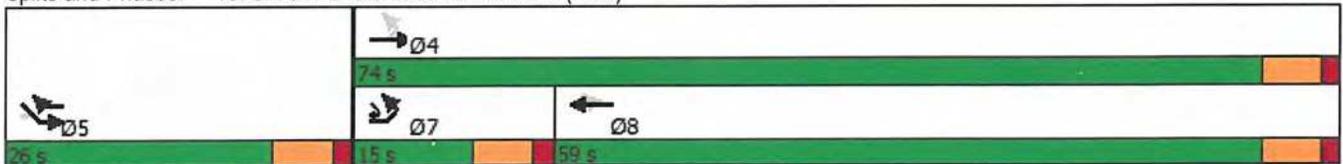


Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Fuel Used(gal)	2	116	33	1	4	1
CO Emissions (g/hr)	170	8132	2296	76	291	46
NOx Emissions (g/hr)	33	1582	447	15	57	9
VOC Emissions (g/hr)	39	1885	532	18	67	11
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	6	287	571	0	145	29
Queue Length 95th (ft)	16	362	#786	9	#262	64
Internal Link Dist (ft)		8978	931		89	
Turn Bay Length (ft)	425			250		200
Base Capacity (vph)	234	2537	1991	1310	366	533
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.64	0.94	0.11	0.68	0.14

Intersection Summary

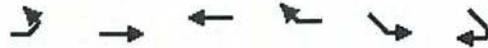
Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 93  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.94  
 Intersection Signal Delay: 22.9  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.2%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 15: SR 544 & Old Lucerne Park Rd. (East)



Lanes, Volumes, Timings  
15: SR 544 & Old Lucerne Park Rd. (East)

01/05/2021



Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (vph)	83	1682	1511	265	176	30
Future Volume (vph)	83	1682	1511	265	176	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	425			250	0	200
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frnt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1687	3505	3505	1509	1687	1509
Flt Permitted	0.075				0.950	
Satd. Flow (perm)	133	3505	3505	1509	1687	1509
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				273		20
Link Speed (mph)		30	30		30	
Link Distance (ft)		9058	1011		169	
Travel Time (s)		205.9	23.0		3.8	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	7%	3%	3%	7%	7%	7%
Adj. Flow (vph)	86	1734	1558	273	181	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	1734	1558	273	181	31
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	5	5	7
Permitted Phases	4			8		5
Detector Phase	7	4	8	5	5	7
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	11.0
Total Split (s)	15.0	74.0	59.0	26.0	26.0	15.0
Total Split (%)	15.0%	74.0%	59.0%	26.0%	26.0%	15.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	57.4	57.4	47.3	70.1	14.5	28.4
Actuated g/C Ratio	0.68	0.68	0.56	0.83	0.17	0.34
v/c Ratio	0.38	0.73	0.80	0.21	0.63	0.06
Control Delay	11.8	10.9	20.1	0.7	45.8	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	10.9	20.1	0.7	45.8	12.7
LOS	B	B	C	A	D	B
Approach Delay		10.9	17.2		41.0	
Approach LOS		B	B		D	
Stops (vph)	27	949	1130	7	154	12

Lanes, Volumes, Timings  
 15: SR 544 & Old Lucerne Park Rd. (East)

01/05/2021

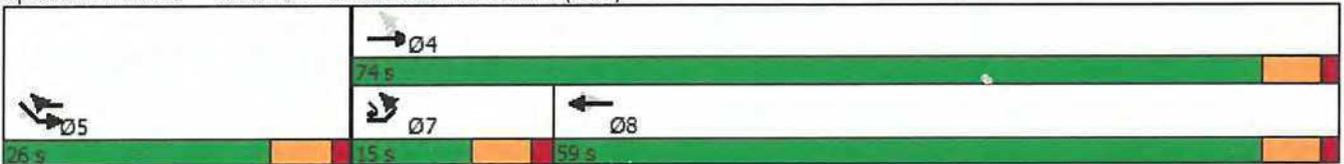


Lane Group	EBL	EBT	WBT	WBR	SEL	SER
Fuel Used(gal)	6	128	24	2	3	0
CO Emissions (g/hr)	434	8930	1701	151	191	13
NOx Emissions (g/hr)	84	1738	331	29	37	2
VOC Emissions (g/hr)	101	2070	394	35	44	3
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	13	265	356	0	102	5
Queue Length 95th (ft)	44	409	526	14	175	24
Internal Link Dist (ft)		8978	931		89	
Turn Bay Length (ft)	425			250		200
Base Capacity (vph)	265	2766	2311	1338	422	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.63	0.67	0.20	0.43	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 84.6  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 15.6  
 Intersection LOS: B  
 Intersection Capacity Utilization 71.1%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 15: SR 544 & Old Lucerne Park Rd. (East)



# SITE LAYOUT

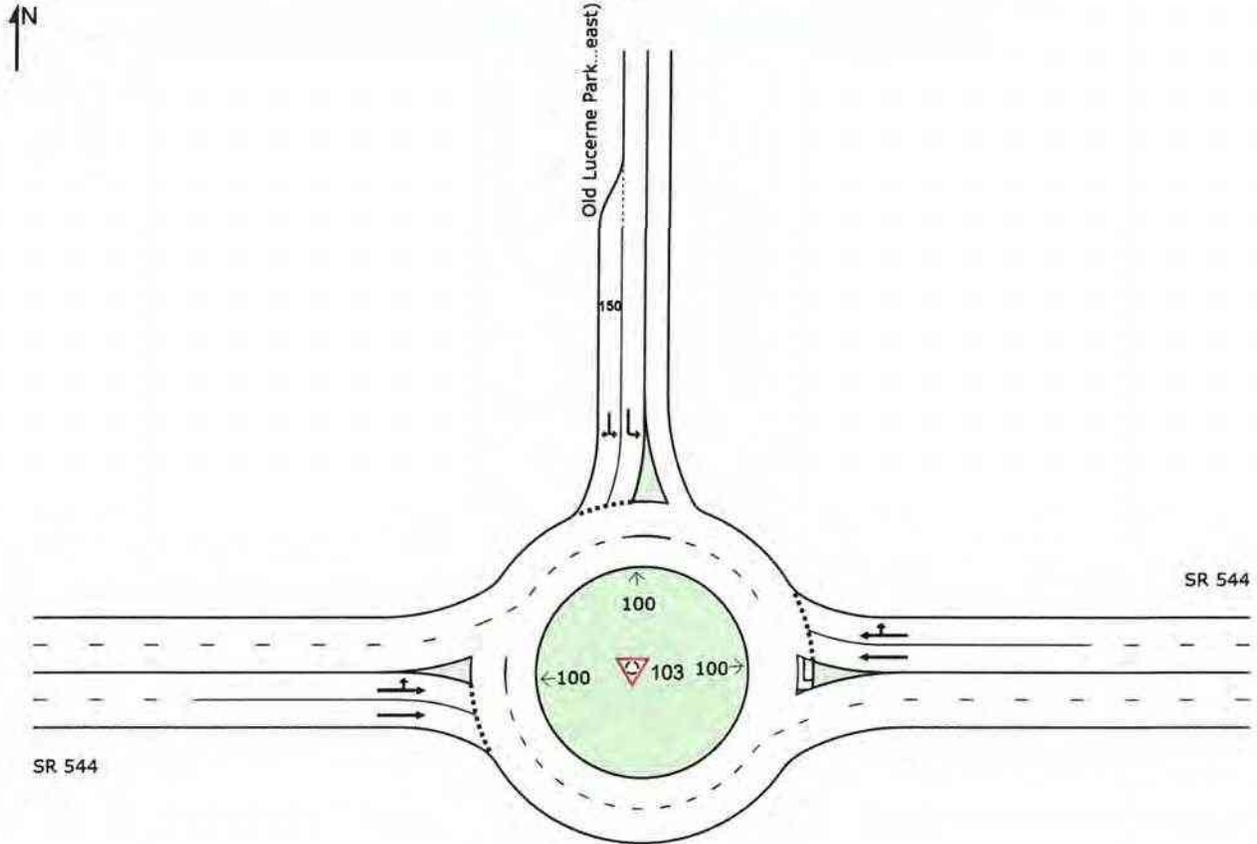
Site: 103 [SR 544/Old Lucerne Park Rd (east end) Intersection  
(Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

**Site: 103 [SR 544/Old Lucerne Park Rd (east end) Intersection (Site Folder: General)]**

Design Year (2045) AM Peak Hour - Build Alt 2  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver No. Cycles	Aver Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist. ft				
East: SR 544														
6	T1	1774	5.0	1867	5.0	0.769	15.1	LOS C	9.6	250.5	0.38	0.15	0.38	30.5
16	R2	134	7.0	141	7.0	0.769	15.2	LOS C	9.5	248.8	0.38	0.15	0.38	29.6
Approach		1908	5.1	2008	5.1	0.769	15.1	LOS C	9.6	250.5	0.38	0.15	0.38	30.4
North: Old Lucerne Park Rd (east)														
7	L2	237	7.0	249	7.0	0.710	51.3	LOS F	3.2	84.6	0.93	1.18	1.92	19.9
14	R2	72	7.0	76	7.0	0.710	46.7	LOS E	3.2	84.6	0.93	1.18	1.92	20.4
Approach		309	7.0	325	7.0	0.710	50.2	LOS F	3.2	84.6	0.93	1.18	1.92	20.0
West: SR 544														
5	L2	33	7.0	35	7.0	0.791	19.6	LOS C	17.1	445.2	0.82	1.09	1.65	28.7
2	T1	1532	5.0	1613	5.0	0.791	19.0	LOS C	17.4	453.5	0.81	1.07	1.63	28.9
Approach		1565	5.0	1647	5.0	0.791	19.0	LOS C	17.4	453.5	0.81	1.07	1.63	28.9
All Vehicles		3782	5.3	3981	5.3	0.791	19.6	LOS C	17.4	453.5	0.60	0.61	1.02	28.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\AM Pk Hr\SR 544\_OLP Rd\_East\_2045 AM Pk Hr\_Build Alt 2.sip9

# SITE LAYOUT

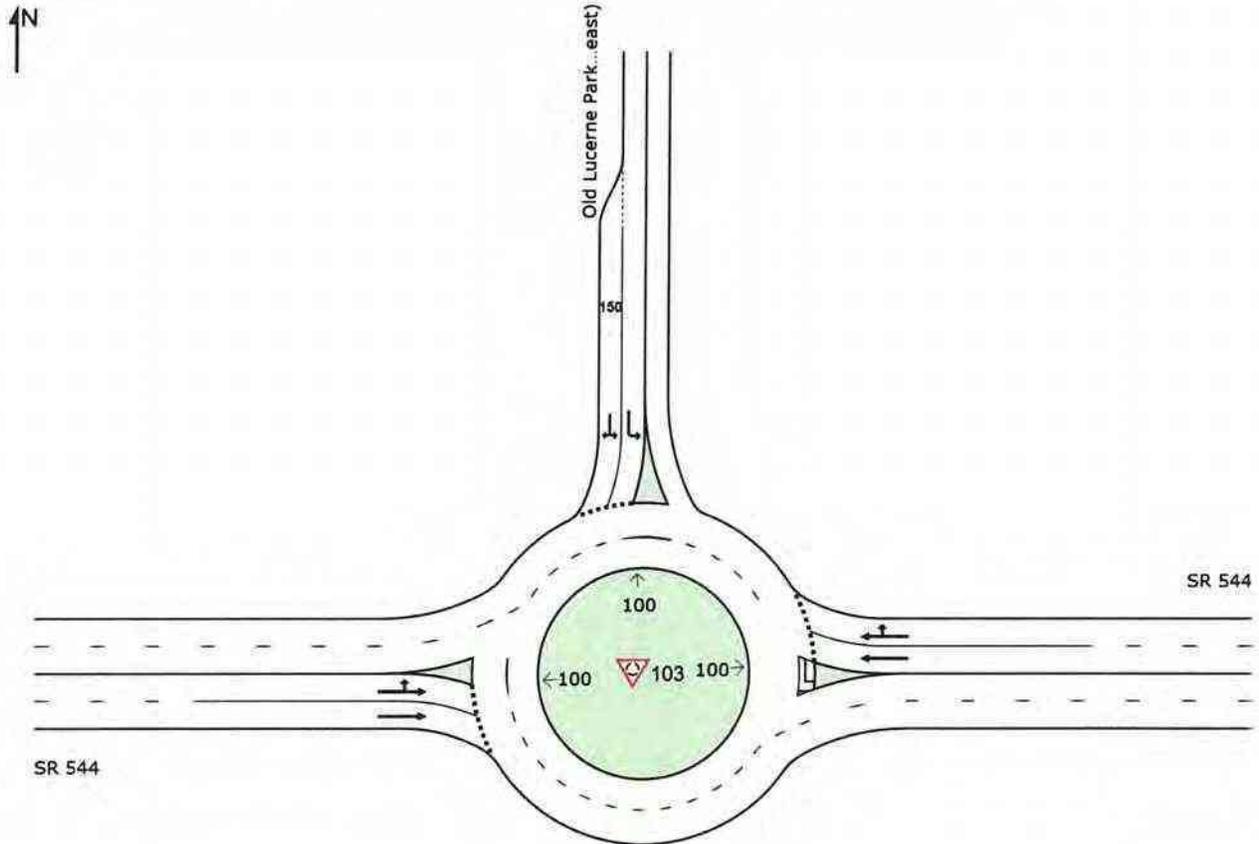
Site: 103 [SR 544/Old Lucerne Park Rd (east end) Intersection  
(Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



## MOVEMENT SUMMARY

Site: 103 [SR 544/Old Lucerne Park Rd (east end) Intersection  
(Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: SR 544														
6	T1	1511	3.0	1558	3.0	0.726	13.6	LOS B	7.7	195.9	0.53	0.29	0.53	31.1
16	R2	265	7.0	273	7.0	0.726	13.8	LOS B	7.4	191.4	0.53	0.29	0.53	30.1
Approach		1776	3.6	1831	3.6	0.726	13.6	LOS B	7.7	195.9	0.53	0.29	0.53	31.0
North: Old Lucerne Park Rd (east)														
7	L2	176	7.0	181	7.0	0.338	19.1	LOS C	1.2	30.7	0.82	0.88	1.06	27.4
14	R2	30	7.0	31	7.0	0.338	17.6	LOS C	1.2	30.7	0.81	0.87	1.05	27.3
Approach		206	7.0	212	7.0	0.338	18.9	LOS C	1.2	30.7	0.82	0.88	1.06	27.4
West: SR 544														
5	L2	83	7.0	86	7.0	0.805	19.4	LOS C	20.4	523.7	0.82	0.96	1.45	28.7
2	T1	1682	3.0	1734	3.0	0.805	18.8	LOS C	20.4	523.1	0.81	0.93	1.42	29.0
Approach		1765	3.2	1820	3.2	0.805	18.8	LOS C	20.4	523.7	0.81	0.93	1.42	29.0
All Vehicles		3747	3.6	3863	3.6	0.805	16.4	LOS C	20.4	523.7	0.68	0.63	0.98	29.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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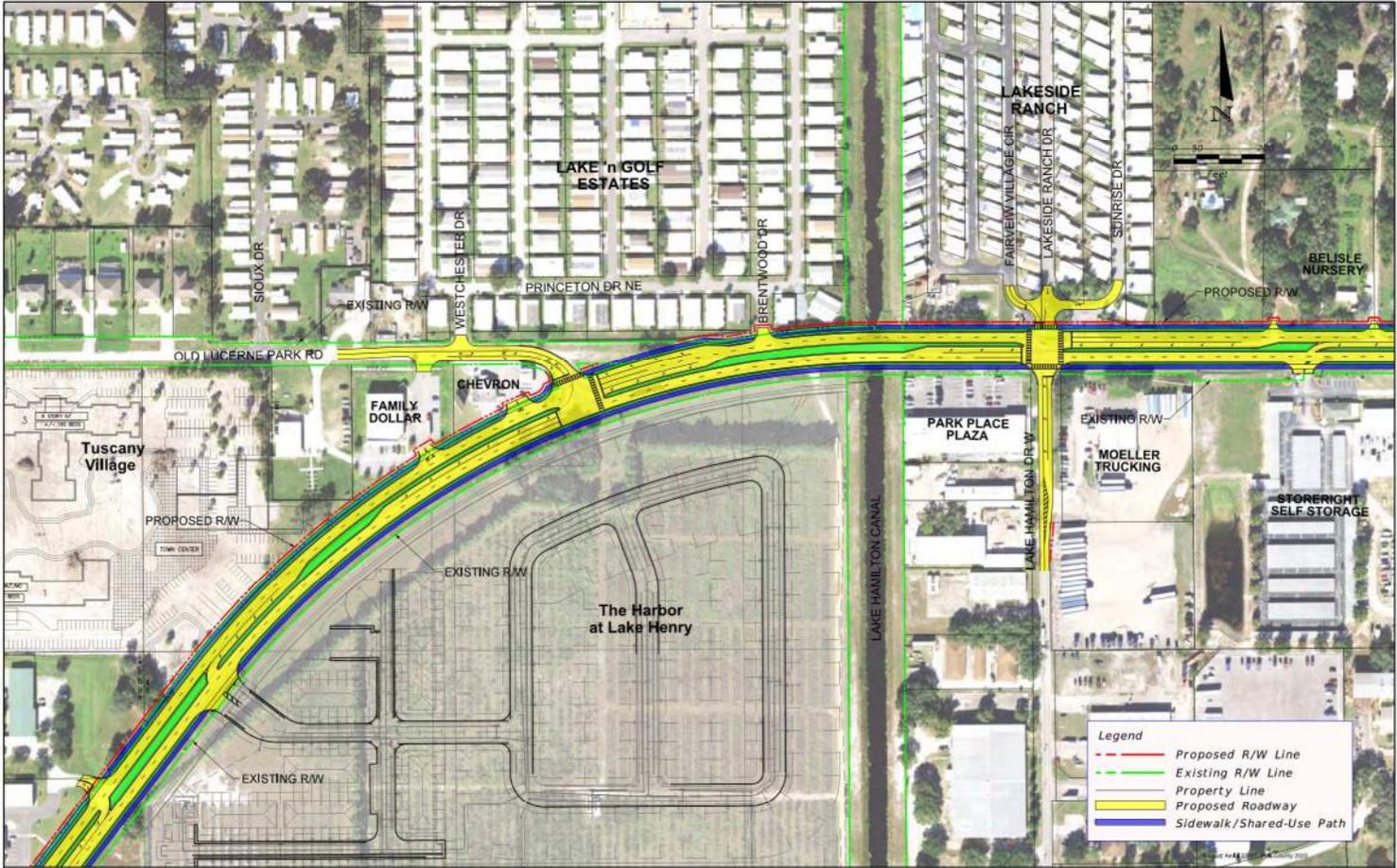
Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\Roundabouts\Design Year 2045\PM Pk Hr\SR 544\_OLP Rd\_East\_2045 PM Pk Hr\_Build Alt 2.sip9

## **Appendix E**

Roundabout and Signalized Intersection Preliminary Geometric Concepts



DATE		DESCRIPTION		REVISIONS		DATE		DESCRIPTION															
<table border="0" style="width:100%"> <tr> <td style="width:35%"> <b>ENGINEER OF RECORD</b>            Mark D. Hales, PE            PE No. 62430            Inwood Consulting Engineers, Inc.            3000 Dovera Drive, Suite 200            Oviedo, Florida 32765         </td> <td style="width:35%; text-align: center;">           STATE OF FLORIDA            DEPARTMENT OF TRANSPORTATION         </td> <td style="width:20%; text-align: center;"> <b>SR 544 PD&amp;E STUDY</b>  <b>OLD LUCERNE PARK ROAD EAST</b>  <b>ROUNDBOUT ALTERNATIVE</b> </td> <td style="width:10%; text-align: center;">           SHEET            NO.  <b>1</b> </td> </tr> <tr> <td>ROAD NO.</td> <td>COUNTY</td> <td>FINANCIAL PROJECT ID</td> <td colspan="7"></td> </tr> </table>										<b>ENGINEER OF RECORD</b> Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	<b>SR 544 PD&amp;E STUDY</b> <b>OLD LUCERNE PARK ROAD EAST</b> <b>ROUNDBOUT ALTERNATIVE</b>	SHEET NO. <b>1</b>	ROAD NO.	COUNTY	FINANCIAL PROJECT ID							
<b>ENGINEER OF RECORD</b> Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	<b>SR 544 PD&amp;E STUDY</b> <b>OLD LUCERNE PARK ROAD EAST</b> <b>ROUNDBOUT ALTERNATIVE</b>	SHEET NO. <b>1</b>																				
ROAD NO.	COUNTY	FINANCIAL PROJECT ID																					



DATE	DESCRIPTION	REVISIONS	DATE	DESCRIPTION

<b>ENGINEER OF RECORD</b> Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765		STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION	<b>SR 544 PD&amp;E STUDY</b> <b>OLD LUCERNE PARK ROAD EAST</b> <b>SIGNALIZED ALTERNATIVE</b>	SHEET NO. 1
ROAD NO.	COUNTY	FINANCIAL PROJECT ID		

# CERTIFICATION

AGENCY: Florida Department of Transportation District One  
801 North Broadway Avenue  
Bartow, Florida 33831-1249

I hereby certify that I am a registered professional engineer in the State of Florida and that I have supervised the preparation of, and approved the analysis, findings, opinions, conclusions and technical advice hereby reported for:

REPORT: SR 544/Lucerne Loop Road Intersection Control Evaluation (ICE) - Stage 1

PROJECT: SR 544 Project Development and Environment (PD&E) Study

LOCATION: SR 544 from Martin Luther King Boulevard to SR 17  
Polk County, Florida

ROADWAY ID: 16140000

MILEPOST No: 7.284

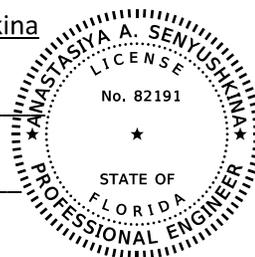
FPID No.: 440273-1-22-01

I acknowledge that the procedures and references used to develop the information contained in this memorandum are standard to the professional practice of transportation engineering as applied through professional judgement and experience.

Engineer in Responsible Charge: Anastasiya A. Senyushkina

Professional Registration No.: 82191

Date: 1/17/2023





# AIM Engineering & Surveying, Inc.

## MEMORANDUM

Tampa Office  
201 E. Kennedy Boulevard, Suite 1800  
Tampa, Florida 33602  
813-627-4144  
www.aimengr.com

**Date:** January 17, 2023

---

**To:** David C. Turley, P.E. – FDOT District One DEMO Project Manager  
Abra Horne – FDOT District One Planning and Environmental Administrator

---

**From:** Greg Root/Anastasiya Senyushkina, P.E.

---

**Subject:** SR 544/Lucerne Loop Road Intersection (Polk County) – Revised Stage 1+  
Intersection Control Evaluation

---

### INTRODUCTION/PROJECT BACKGROUND

This memorandum documents the Intersection Control Evaluation (ICE) conducted for the Lucerne Loop Road intersection. This analysis was conducted in support of the SR 544 Project Development & Environment (PD&E) Study from Martin Luther King Boulevard to SR 17 in Polk County. The length of this study corridor is approximately 8.1 miles. SR 544 is a two-lane undivided roadway with 12-foot travel lanes and 5-foot paved shoulders; however, there is a painted median that extends from Lucerne Loop Road to the beginning of the eastbound left-turn lane providing access to the Wal-Mart distribution center employee parking lot. There are no sidewalks in the vicinity of the intersection. The proposed SR 544 typical section in this area is a four-lane divided roadway that consists of two 11-foot inside travel lanes, two 12-foot outside travel lanes, a 22-foot raised median and 10-foot shared use paths on both sides of the road. The design speed and target speed is 45 miles per hour (mph).

This memorandum documents the Stage 1 CAP-X and SPICE analyses, as well as the more detailed traffic operations analyses conducted using the SYNCHRO and SIDRA software. The opening year (2025) and design year (2045) Average Annual Daily Traffic (AADT) volumes documented in the FDOT approved Project Traffic Analysis Report (PTAR) are provided in **Appendix A**, along with the 2045 a.m. and p.m. peak hour volumes documented in this same report.

### EXISTING INTERSECTION CHARACTERISTICS

Lucerne Loop Road intersects SR 544 from the north at a T-intersection. The intersection is controlled by a flashing beacon with flashing yellow displayed on SR 544 and flashing red displayed on the cross street. Lucerne Loop Road provides access to a Wal-Mart distribution center, Forterra Pipe & Precast and a small residential community located around Lake Lucerne. This access to the Wal-Mart distribution center is for trucks only. The immediately adjacent area in the northeast and northwest intersection quadrants is vacant. The south side of SR 544 is comprised of wetlands and Lake Fannie. The parcel in the southeast quadrant is owned by the Lake Region Lakes Management District. An aerial image of the intersection is provided in **Figure 1**, while an aerial image of the adjacent land uses is provided in **Figure 2**. Both of these aeriels are provided in **Appendix A**. The posted speed limits on SR 544 and Lucerne Loop Road in the vicinity of this intersection are 55 mph and 25 mph.

Crash data was provided by District One for the years 2014 through 2019. The data sources were the FDOT's Crash Analysis Reporting System (CARS) and Signal Four Analytics. The crash data is included in **Appendix A**. This intersection has experienced six crashes over this period, resulting in four injuries and no fatalities. Three of these crashes were rear-end crashes. There were no bicycle or pedestrian crashes.

## **INTERSECTION CONTROL EVALUATION**

The PD&E study goals are to determine the location and conceptual design of the improvement(s) that satisfy the purpose and need for the project, while also minimizing the impacts to the natural and social environment and satisfying the requirements of the National Environmental Policy Act (NEPA). An evaluation was conducted using the October 2019 traffic count data provided by District One to determine whether these volumes satisfy Traffic Signal Warrant No. 1 of the Manual on Uniform Traffic Control Devices. The results indicated the eight highest hourly volumes did not satisfy Condition A (Minimum Vehicular Volume) or Condition B (Interruption of Continuous Traffic); however, it should be noted that Condition B was very close to being satisfied. The two-way volume on SR 544 exceeds the minimum volume for all eight hours at the 100% threshold and the Lucerne Loop Road approach volume exceeds the 70% minimum threshold during two of the eight hours. The Lucerne Loop Road approach volumes during the other six hours range between 43 vehicles and 52 vehicles per hour. Since the 70% minimum threshold volume is equal to 53 vehicles per hour there is a strong possibility that Condition B could be satisfied in the very near future. This evaluation is provided in **Appendix B**.

The following alternative intersection control strategies were initially analyzed for this intersection:

- Two-way stop control
- All-way stop control
- Conventional traffic signal
- Green-T signalized intersection
- Unsignalized Restricted Crossing U-Turn (RCUT) intersection
- Signalized RCUT intersection
- Median U-Turn (MUT) intersection
- Two-lane (SR 544) x one-lane (Lucerne Loop Road) roundabout
- Two-lane x two-lane roundabout

The results of the 2045 CAP-X and SPICE analyses are summarized in **Table 1**, while the CAP-X and SPICE analysis summary sheets for this intersection are also provided in **Appendix C**. Based on the high v/c ratios, the two-way stop control, all-way stop control and unsignalized RCUT intersections were eliminated from any further consideration. The signalized RCUT and Partial MUT alternatives were eliminated from further consideration due to the additional right-of-way that would be needed for u-turn bulb-outs west and east of this intersection. There is a significant volume of trucks entering and exiting SR 544 at this intersection and it is not practical to require these large vehicles to make u-turns when traveling to and from the Wal-Mart distribution center. The Green-T signalized intersection was also eliminated from further consideration for two primary reasons. First, this type of intersection would not provide positive speed control and help to facilitate the 45 mph target speed. Second, the distance between the Lucerne Loop Road intersection and the beginning of the taper for the eastbound left-turn lane into the Wal-Mart employee parking lot is only 600 feet. The implementation of a Green-T intersection would require the provision of an acceleration lane on SR 544 to allow the

**Table 1: Stage 1 ICE Analysis Summary - Lucerne Loop Road Intersection**

Intersection Type	2045 V/C Ratios		Life-Cycle Crashes		SSI Scores	
	AM Peak Hour	PM Peak Hour	Total	Fatal & Injury	Opening Year	Design Year
Two-Way Stop Control	<b>9,553.05</b>	<b>705.91</b>	78	23	55	22
All-Way Stop Control	<b>2.85</b>	<b>2.93</b>	73	20	89	76
Traffic Signal	0.70	0.73	190	61	74	49
Green-T	0.82	0.93	183	52	80	58
Unsignalized RCUT	<b>9.19</b>	<b>10.49</b>	n/a	n/a	73	50
Signalized RCUT	0.88	<b>1.03</b>	230	79	80	61
Median U-Turn	1.00	<b>1.11</b>	162	43	n/a	n/a
Roundabout (2EW x 1NS)	<b>1.82</b>	<b>2.30</b>	208	42	87	75
Roundabout (2 x 2)	<b>1.29</b>	<b>1.89</b>	208	42	87	75
<b>Red font denotes a v/c ratio &gt; 1.00</b>						
Lowest number of crashes of all alternatives analyzed						
n/a = No Safety Performance Function (SPF) available						

southbound left-turn vehicles to increase their speed prior to merging with the eastbound vehicles traveling in the inside through lane. A 600-foot acceleration lane was not viewed as being adequate for large trucks to accelerate to 45 mph prior to merging with through traffic.

Design year peak hour SYNCHRO and SIDRA analyses were subsequently conducted for a conventional signalized intersection and a roundabout and the results are summarized in **Table 2**. The overall average vehicle delays for the conventional signalized intersection are projected to be approximately 23 seconds per vehicle (sec/veh) and 25 sec/veh vehicle in the a.m. and p.m. peak hours, respectively. The overall average vehicle delays for the roundabout are projected to be approximately 14 sec/veh and 31 sec/vehicle in the a.m. and p.m. peak hours, respectively. The design year SYNCHRO and SIDRA analysis summary sheets are provided in **Appendix D**. Yield controlled right-turn bypass lanes were provided on the north and east legs of the roundabout, while an exclusive eastbound left-turn lane was provided on the west leg.

**Table 2: Design Year (2045) Peak Hour Operational Analysis Summary - Lucerne Loop Road Intersection**

AM Peak Hour						
Intersection Approach	Signalized Intersection			Roundabout		
	Max V/C <sup>(1)</sup>	Avg. Delay	LOS	Max V/C <sup>(1)</sup>	Avg. Delay	LOS
Southbound	0.70	35.2	D	0.20	3.7	A
Westbound	0.90	27.1	C	0.71	15.2	C
Eastbound	0.77	13.5	B	0.69	15.2	C
Overall	0.90	23.1	C	0.71	13.6	B
PM Peak Hour						
Intersection Approach	Signalized Intersection			Roundabout		
	Max V/C <sup>(1)</sup>	Avg. Delay	LOS	Max V/C <sup>(1)</sup>	Avg. Delay	LOS
Southbound	0.87	42.1	D	0.33	4.0	A
Westbound	0.88	27.1	C	0.60	11.3	B
Eastbound	0.71	15.1	B	1.04	64.1	F
Overall	0.88	25.0	C	1.04	31.3	D

<sup>(1)</sup> Highest volume-to-capacity ratio for the individual movements on this approach

Geometric improvement concepts were initially developed for these two intersection control strategies and are provided in **Appendix E**. The provision of a westbound right-turn bypass lane would have a negative impact on the access to the existing pump station in the northeast quadrant of the intersection. Consequently, additional SIDRA analyses were conducted for a roundabout alternative that did not provide a westbound right-turn bypass lane. These results are provided in **Table 3**. The westbound approach was projected to operate slightly over capacity in the a.m. peak hour with an average delay of approximately 54 seconds/vehicle with the elimination of the right-turn bypass lane. In addition, the eastbound approach was projected to operate slightly over capacity in the p.m. peak hour with an average delay of approximately 64 seconds/vehicle. Since minor overcapacity conditions were projected to occur during both peak hours, additional analyses were conducted to identify the year when the capacity of the roundabout would be exceeded. The additional analyses indicate that the capacity will be reached in 2044 (i.e., one year prior to the design year). These results are also summarized in **Table 3**. The revised roundabout concept is also provided in **Appendix E**.

<b>Table 3: Design Year (2045) and Interim Year (2044) Peak Hour Operational Analysis Summary - Lucerne Loop Road Roundabout without Westbound Right-Turn Bypass Lane</b>						
Design Year (2045)						
Intersection Approach	AM Peak Hour			PM Peak Hour		
	Max V/C <sup>(1)</sup>	Avg. Delay	LOS	Max V/C <sup>(1)</sup>	Avg. Delay	LOS
Southbound	0.20	3.3	A	0.33	3.8	A
Westbound	1.01	54.1	F	0.84	23.5	C
Eastbound	0.69	15.2	C	1.04	64.1	F
Overall	1.01	32.5	D	1.04	36.3	E
Interim Year (2044)						
Intersection Approach	AM Peak Hour			PM Peak Hour		
	Max V/C <sup>(1)</sup>	Avg. Delay	LOS	Max V/C <sup>(1)</sup>	Avg. Delay	LOS
Southbound	0.20	3.3	A	0.31	3.7	A
Westbound	0.98	45.0	E	0.81	21.0	C
Eastbound	0.66	14.2	B	1.00	52.5	F
Overall	0.98	27.7	D	1.00	30.6	D

<sup>(1)</sup> Highest volume-to-capacity ratio for the individual movements on this approach

The revised roundabout improvement concept impacts five parcels and requires approximately 1.08 acres of right-of-way. The signalized intersection improvement concept impacts three parcels and requires approximately 0.38 acres of right-of-way. Neither concept requires any residential or business relocations. The roundabout improvement concept impacts approximately 0.16 acres of wetlands and approximately 0.70 acres of floodplains, while the signalized intersection concept impacts approximately 0.11 acres of wetlands and approximately 0.18 acres of floodplains.

## RECOMMENDED INTERSECTION CONTROL STRATEGY

Although the implementation of a roundabout would result in larger right-of-way impacts, it would also provide positive speed control and result in fewer fatal and injury crashes compared to a conventional signalized intersection. The current posted speed limit in this area is 55 mph; however, the proposed SR 544 typical section is based on a 45 mph design/target speed. A roundabout will help to facilitate slower vehicle speeds east and west of this intersection. A roundabout is also projected to have a much higher SSI score compared to a conventional signalized intersection. The opening year and design year SSI scores for the roundabout are 87 and 75, respectively. The opening year and design year SSI scores for a conventional signalized intersection are 74 and 49, respectively. Consequently, a roundabout is recommended for the Lucerne Loop Road intersection at this time.

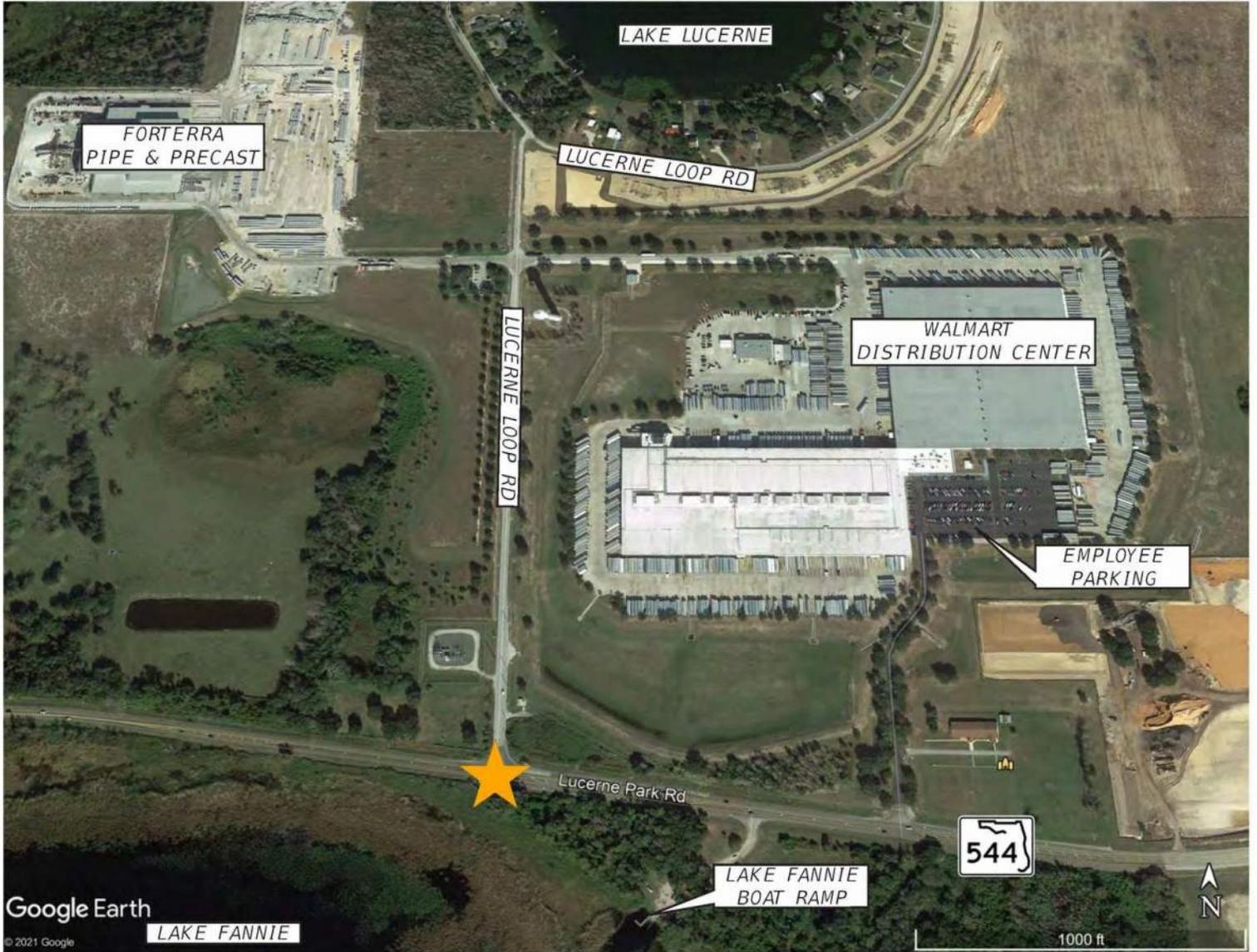
## **Appendix A**

Existing Geometry, Existing/Future Year Traffic Volumes and Historic Crash  
Data

Figure 1: Existing SR 544 / Lucerne Loop Road Intersection



Figure 2: Surrounding Land Uses



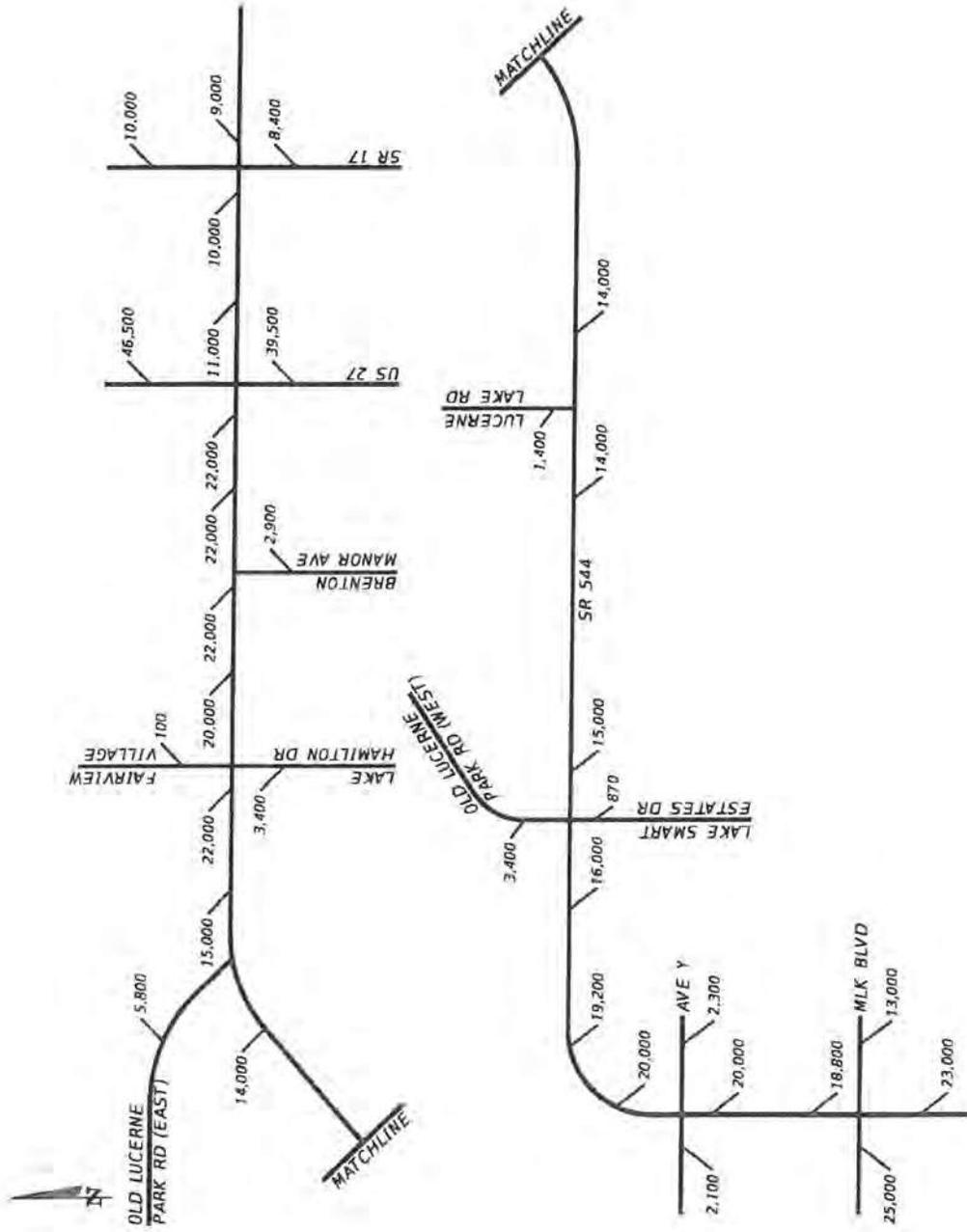


Figure 2-2: Existing (2019) AADT Volumes

**Table 2-2: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Mainline)**

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
South of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	21,686	0.96	0.95	19,778	1.0319	20,409	20,000	23,000	21,500	23,000 <sup>(8)</sup>
North of M. L. King Boulevard <sup>(7)</sup>	4/17/2018	17,212	0.96	0.95	15,697	1.0319	15,198	16,000	18,800	17,400	18,800 <sup>(9)</sup>
South of Avenue Y <sup>(7)</sup>	2/16/2016	19,748	0.96	0.97	18,389	1.0988	20,206	20,000	n/a	n/a	20,000
North of Avenue Y <sup>(7)</sup>	2/16/2016	19,936	0.96	0.97	18,564	1.0988	20,399	20,000	n/a	n/a	20,000
South of Lake Conine Drive									19,200		19,200
West of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	16,214	1.01	0.94	15,394	1.0577	16,282	16,000	n/a	n/a	16,000
East of Old Lucerne Park Road (west end) <sup>(7)</sup>	1/9/2018	15,212	1.01	0.94	14,442	1.0543	15,226	15,000	n/a	n/a	15,000
West of Lucerne Lake Road	10/1/2019	14,506	1.03	0.94	14,045	1.0000	14,045	14,000	14,000	14,000	14,000
East of Lucerne Lake Road	10/1/2019	14,608	1.03	0.94	14,143	1.0000	14,143	14,000	n/a	n/a	14,000
West of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	18,070	1.01	0.94	17,155	1.0706	18,367	18,000	14,000	16,000	14,000 <sup>(10)</sup>
East of Old Lucerne Park Road (east end) <sup>(7)</sup>	1/9/2018	14,682	1.01	0.94	13,939	1.0706	14,923	15,000	n/a	n/a	15,000
West of Lake Hamilton Drive/Fairview Village	10/1/2019	22,630	1.03	0.94	21,910	1.0000	21,910	22,000	n/a	n/a	22,000
East of Lake Hamilton Drive/Fairview Village	10/1/2019	20,472	1.03	0.94	19,821	1.0000	19,821	20,000	n/a	n/a	20,000
West of Brenton Manor Avenue	10/1/2019	23,035	1.03	0.94	22,302	1.0000	22,302	22,000	n/a	n/a	22,000
East of Brenton Manor Avenue	10/1/2019	23,127	1.03	0.94	22,392	1.0000	22,392	22,000	n/a	n/a	22,000
West of Hide-A-Way Lane (Hidden Cove Entr)									21,000		21,000
West of US 27	10/1/2019	22,701	1.03	0.94	21,979	1.0000	21,979	22,000	n/a	n/a	22,000
East of US 27	10/1/2019	10,954	1.03	0.94	10,606	1.0000	10,606	11,000	11,000	11,000	11,000
West of SR 17	10/1/2019	10,500	1.03	0.94	10,166	1.0000	10,166	10,000	n/a	n/a	10,000
East of SR 17	10/1/2019	9,534	1.03	0.94	9,231	1.0000	9,231	9,200	8,800	9,000	9,000

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 21,000 vpd for the last five years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 16,000 vpd for the last five years.

<sup>(10)</sup> FDOT count station value was used because the 2018 AADT volume at this permanent count station was equal to 13,600 vpd.

Table 2-3: Twenty-Four Hour Volume Counts and Existing (2019) AADT Volumes (SR 544 Cross Streets)

Location	Date	Count	SF <sup>(1)</sup>	AF <sup>(2)</sup>	AADT <sup>(3)</sup>	Growth Factor	2019 AADT <sup>(4)</sup>	2019 AADT <sup>(5)</sup>	2019 AADT <sup>(6)</sup>	Average	Final 2019 AADT
M. L. King Boulevard West of SR 544 <sup>(7)</sup>	4/17/2018	26,560	0.96	0.95	24,223	1.0319	24,995	25,000	25,000	25,000	25,000
M. L. King Boulevard East of SR 544 <sup>(7)</sup>	4/17/2018	13,582	0.96	0.95	12,387	1.0319	12,782	13,000	13,500	13,250	13,000
Avenue Y West of SR 544 <sup>(7)</sup>	2/16/2016	1,960	0.96	1.00	1,882	1.0988	2,068	2,100	n/a	n/a	2,100
Avenue Y East of SR 544 <sup>(7)</sup>	2/16/2016	2,174	0.96	1.00	2,087	1.0988	2,293	2,300	n/a	n/a	2,300
Old Lucerne Park Road (west end) North of SR 544 <sup>(7)</sup>	1/9/2018	3,206	1.01	0.98	3,173	1.0560	3,351	3,400	n/a	n/a	3,400
Lake Smart Estates Drive South of SR 544 <sup>(7)</sup>	1/9/2018	862	1.01	1.00	871	1.0000	871	870	n/a	n/a	870
Lucerne Lake Road North of SR 544	10/1/2019	1,730	1.03	0.81	1,443	1.0000	1,443	1,400	n/a	n/a	1,400
Old Lucerne Park Road (east end) North of SR 544 <sup>(7)</sup>	1/9/2018	5,454	1.01	0.98	5,398	1.0706	5,779	5,800	n/a	n/a	5,800
Fairview Village North of SR 544	10/1/2019	96	1.03	1.00	99	1.0000	99	100	n/a	n/a	100
Lake Hamilton Drive South of SR 544	10/1/2019	3,344	1.03	1.00	3,444	1.0000	3,444	3,400	n/a	n/a	3,400
Brenton Manor Avenue South of SR 544	10/1/2019	2,916	1.03	0.98	2,943	1.0000	2,943	2,900	n/a	n/a	2,900
US 27 North of SR 544	10/1/2019	45,009	1.04	0.94	44,001	1.0000	44,001	44,000	46,500	45,250	46,500 <sup>(8)</sup>
US 27 South of SR 544	10/1/2019	34,554	1.04	0.94	33,780	1.0000	33,780	34,000	39,500	36,750	39,500 <sup>(8)</sup>
SR 17 North of SR 544	10/1/2019	10,764	1.03	0.95	10,533	1.0000	10,533	11,000	9,700	10,350	10,000
SR 17 South of SR 544	10/1/2019	8,680	1.03	0.95	8,493	1.0000	8,493	8,500	8,300	8,400	8,400

Note: Red font denotes assumed values used for this study.

<sup>(1)</sup> SF = Weekly Seasonal Adjustment Factor

<sup>(2)</sup> AF = Axle Adjustment Factor

<sup>(3)</sup> AADT = Count x SF x AF

<sup>(4)</sup> 2019 AADT = AADT x Growth Factor

<sup>(5)</sup> 2019 AADT (rounded)

<sup>(6)</sup> 2019 AADT obtained from the FDOT Florida Traffic Online website

<sup>(7)</sup> Approach count only at this location. The two-way volume was assumed to be equal to twice the approach volume.

<sup>(8)</sup> FDOT count station value was used because the AADT volume has been greater than 44,000 vpd for the last four years.

<sup>(9)</sup> FDOT count station value was used because the AADT volume has been greater than 34,000 vpd for four of the last five years.

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2019 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0009 - SR 544 E OF WINTER HAVEN BOULEVARD N OF LK FANNIE

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2019	14000 C	E	7100	W	6900	9.00	56.00	8.60
2018	13800 C	E	7000	W	6800	9.00	54.50	8.60
2017	12500 C	E	6300	W	6200	9.00	54.50	9.90
2016	12600 C	E	6200	W	6400	9.00	53.30	9.10
2015	11500 C	E	5600	W	5900	9.00	55.70	8.40
2014	10600 S	E	5300	W	5300	9.00	55.60	9.70
2013	10400 F	E	5200	W	5200	9.00	55.90	9.70
2012	10400 C	E	5200	W	5200	9.00	55.80	9.70
2011	11100 S	E	5500	W	5600	9.00	55.70	8.20
2010	11100 F	E	5500	W	5600	9.55	56.07	8.20
2009	11300 C	E	5600	W	5700	9.36	56.35	8.20
2008	10700 C	E	5300	W	5400	9.78	55.29	9.70
2007	11300 C	E	5700	W	5600	9.66	55.30	9.10
2006	13300 C	E	6600	W	6700	9.62	55.83	11.90
2005	11500 C	E	5600	W	5900	9.30	54.80	3.60
2004	13500 C	E	6700	W	6800	9.50	55.70	3.60

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

FLORIDA DEPARTMENT OF TRANSPORTATION  
 TRANSPORTATION STATISTICS OFFICE  
 2019 HISTORICAL AADT REPORT

COUNTY: 16 - POLK

SITE: 0275 - SR-544, 0.24 MI W CR-544/OLD LUCERNE PK RD, POLK CO.

YEAR	AADT	DIRECTION 1		DIRECTION 2		*K FACTOR	D FACTOR	T FACTOR
2019	13993 C	E	7006	W	6987	9.00	52.90	9.70
2018	13593 C	E	6853	W	6740	9.00	52.50	9.70
2017	12690 C	E	6384	W	6306	9.00	52.90	9.80
2016	11835 C	E	5903	W	5932	9.00	52.10	10.30
2015	10912 C	E	5383	W	5529	9.00	53.10	9.90
2014	10413 C	E	5147	W	5266	9.00	53.60	10.00
2013	10133 C	E	5037	W	5096	9.00	53.70	9.90
2012	10013 C	E	4969	W	5044	9.00	53.80	9.50
2011	10119 C	E	5022	W	5097	9.00	53.80	9.60
2010	10549 C	E	5216	W	5333	9.81	52.32	9.80
2009	10547 C	E	5224	W	5323	9.49	51.55	10.20
2008	10590 C	E	5248	W	5342	10.05	51.87	11.40
2007	10730 C	E	5338	W	5392	9.34	53.49	11.50
2006	10899 C	E	5450	W	5449	9.18	52.61	11.70
2005	11000 S	E		W		10.30	56.20	12.30
2004	10500 F	E		W		9.70	51.90	8.30

AADT FLAGS: C = COMPUTED; E = MANUAL ESTIMATE; F = FIRST YEAR ESTIMATE  
 S = SECOND YEAR ESTIMATE; T = THIRD YEAR ESTIMATE; R = FOURTH YEAR ESTIMATE  
 V = FIFTH YEAR ESTIMATE; 6 = SIXTH YEAR ESTIMATE; X = UNKNOWN  
 \*K FACTOR: STARTING WITH YEAR 2011 IS STANDARDK, PRIOR YEARS ARE K30 VALUES

**Table 3-17: SR 544 Cross Streets Existing and Future Year Peak Hour Truck Percentages**

Intersection	Movement	AM Peak Hour (7:15 - 8:15)			PM Peak Hour (4:45 - 5:45)			Avg. Truck %	2025/2045 Truck %
		Total Volume	Truck Volume	Truck %	Total Volume	Truck Volume	Truck %		
Martin Luther King Blvd	NB LT	269	7	2.6%	299	0	0.0%		
	NB TH	275	11	4.0%	413	3	0.7%		
	NB RT	119	1	0.8%	139	0	0.0%		
	NB APPROACH	663	19	2.9%	851	3	0.4%	1.6%	2.0%
	WB LT	134	5	3.7%	113	2	1.8%		
	WB TH	462	10	2.2%	366	6	1.6%		
	WB RT	14	2	14.3%	9	0	0.0%		
	WB APPROACH	610	17	2.8%	488	8	1.6%	2.2%	2.0%
	EB LT	208	12	5.8%	243	13	5.3%		
	EB TH	330	7	2.1%	409	9	2.2%		
EB RT	419	6	1.4%	309	3	1.0%			
EB APPROACH	957	25	2.6%	961	25	2.6%	2.6%	3.0%	
Avenue Y <sup>(1)</sup>	WB LT	17	0	0.0%	13	0	0.0%		
	WB TH	15	0	0.0%	17	0	0.0%		
	WB RT	25	1	4.0%	34	1	2.9%		
	WB APPROACH	57	1	1.8%	64	1	1.6%	1.7%	2.0%
	EB LT	19	2	10.5%	36	2	5.6%		
	EB TH	10	1	10.0%	14	0	0.0%		
EB RT	8	0	0.0%	28	0	0.0%			
EB APPROACH	37	3	8.1%	78	2	2.6%	2.6%	3.0%	
Old Lucerne Park Rd (West End)	NB TH	0	0	0.0%	N/A	N/A	N/A		
	NB RT	14	0	0.0%	N/A	N/A	N/A		
	NB APPROACH	14	0	0.0%	N/A	N/A	N/A	0.0%	0.0%
	SB LT	3	0	0.0%	N/A	N/A	N/A		
	SB TH	1	0	0.0%	N/A	N/A	N/A		
SB RT	149	4	2.7%	N/A	N/A	N/A			
SB APPROACH	153	4	2.6%	N/A	N/A	N/A	2.6%	3.0%	
Lucerne Lake Rd	SB LT	16	11	68.8%	17	8	47.1%		
	SB RT	25	9	36.0%	24	8	33.3%		
	SB APPROACH	41	20	48.8%	41	16	39.0%	43.9%	44.0%
Old Lucerne Park Rd (East End) <sup>(4)</sup>	SB LT	174	13	7.5%	126	8	6.3%		
	SB RT	4	0	0.0%	4	0	0.0%		
	SB APPROACH	178	13	7.3%	130	8	6.2%	6.7%	7.0%
Lake Hamilton Dr	NB LT	14	1	7.1%	19	1	5.3%		
	NB TH	0	0	0.0%	1	0	0.0%		
	NB RT	134	6	4.5%	105	2	1.9%		
	NB APPROACH	148	7	4.7%	125	3	2.4%	3.6%	4.0%
	SB LT	0	0	0.0%	1	0	0.0%		
	SB TH	0	0	0.0%	0	0	0.0%		
	SB RT	2	0	0.0%	1	0	0.0%		
SB APPROACH	2	0	0.0%	2	0	0.0%	0.0%	0.0%	
Brenton Manor Ave	NB LT	58	5	8.6%	65	2	3.1%		
	NB RT	75	5	6.7%	42	0	0.0%		
	NB APPROACH	133	10	7.5%	107	2	1.9%	4.7%	5.0%
US 27	NB LT	238	5	2.1%	165	8	4.8%		
	NB TH	1,075	80	7.4%	1,060	78	7.4%		
	NB RT	76	6	7.9%	110	1	0.9%		
	NB APPROACH	1,389	91	6.6%	1,335	87	6.5%	6.5%	(5)
	SB LT	79	13	16.5%	138	10	7.2%		
	SB TH	762	88	11.5%	1,157	62	5.4%		
SB RT	500	31	6.2%	541	25	4.6%			
SB APPROACH	1,341	132	9.8%	1,836	97	5.3%	7.6%	(5)	
SR 17	NB LT	79	9	11.4%	61	6	9.8%		
	NB TH	244	6	2.5%	180	5	2.8%		
	NB RT	57	2	3.5%	76	3	3.9%		
	NB APPROACH	380	17	4.5%	317	14	4.4%	4.4%	(5)
	SB LT	55	5	9.1%	77	0	0.0%		
	SB TH	217	10	4.6%	251	6	2.4%		
SB RT	92	14	15.2%	141	6	4.3%			
SB APPROACH	364	29	8.0%	469	12	2.6%	5.3%	(5)	

<sup>(1)</sup> Turning movement count data was not available for the 7:15 to 8:15 a.m. time period. The 8:00 to 9:00 a.m. time period was used for this location.

<sup>(2)</sup> Average peak hour truck percentage not calculated due to disparity in peak hour approach volumes. P.M. peak hour percentage recommended for use.

<sup>(3)</sup> A.M. peak hour percentages only.

<sup>(4)</sup> Turning movement count data was not available for the 4:45 to 5:45 p.m. time period. The 4:00 to 5:00 p.m. time period was used for this location.

<sup>(5)</sup> Alternate methodologies were used to derive the recommended a.m. and p.m. peak hour truck percentages for US 27 and SR 17.

A review of the existing a.m. and p.m. peak hour truck volumes indicates that, with one exception, the a.m. peak hour volumes are higher than the p.m. peak hour volumes. The ratio of the a.m. and p.m. peak hour truck volume was calculated for each location and then the overall average ratio for the study corridor was calculated. The average overall ratio was equal to 1.50. A revised estimate of the 2025 and 2045 a.m. peak hour truck volumes was obtained by multiplying the initial estimate of the 2025 and 2045 a.m. peak hour truck volumes by 1.50. The revised 2025 and 2045 a.m. peak hour truck volumes are also provided in **Table 3-9** and Table 3-10. The final recommended 2045 and 2025 peak hour truck volumes and percentages are provided in **Table 3-11** and **Table 3-12**, respectively. Based on these assumptions, the following SR 544 mainline peak hour truck percentages (i.e.,  $T_{PKHR}$ -factors) are recommended for use in the SR 544 PD&E study:

Opening Year (2025) – AM Peak Hour

- 5.6% from Martin Luther King Boulevard to US 27
- 9.6% from US 27 to SR 17

Opening Year (2025) – PM Peak Hour

- 3.7% from Martin Luther King Boulevard to US 27
- 6.4% from US 27 to SR 17

Design Year (2045) – AM Peak Hour

- 4.5% from Martin Luther King Boulevard to US 27
- 8.1 % from US 27 to SR 17

Design Year (2045) – PM Peak Hour

- 3.0% from Martin Luther King Boulevard to US 27
- 5.4 % from US 27 to SR 17

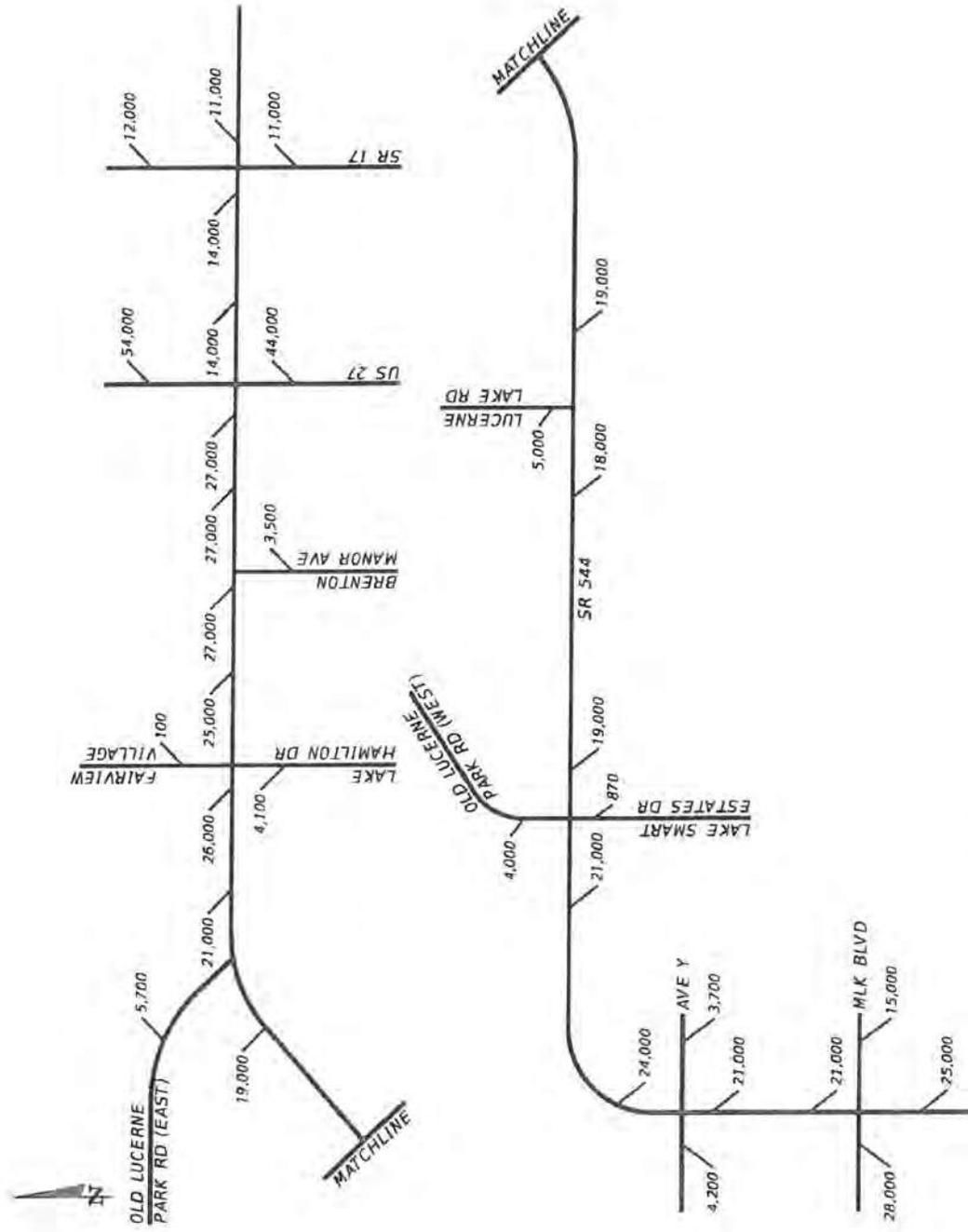


Figure 3-11: Opening Year (2025) AADT Volumes –Build Alternative No. 2



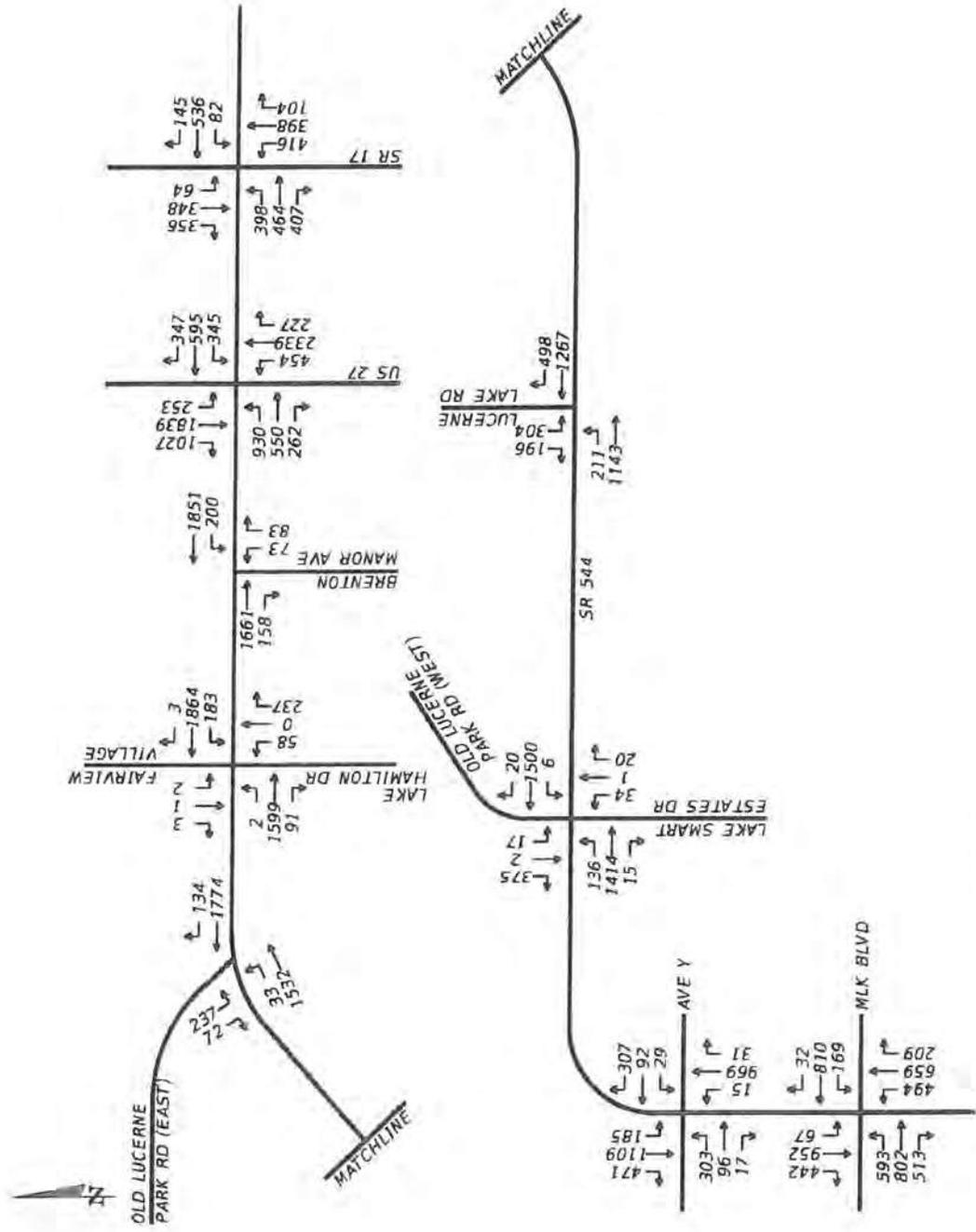


Figure 3-21: Design Year (2045) A.M. Peak Hour Intersection Volumes – Build Alternative No. 2

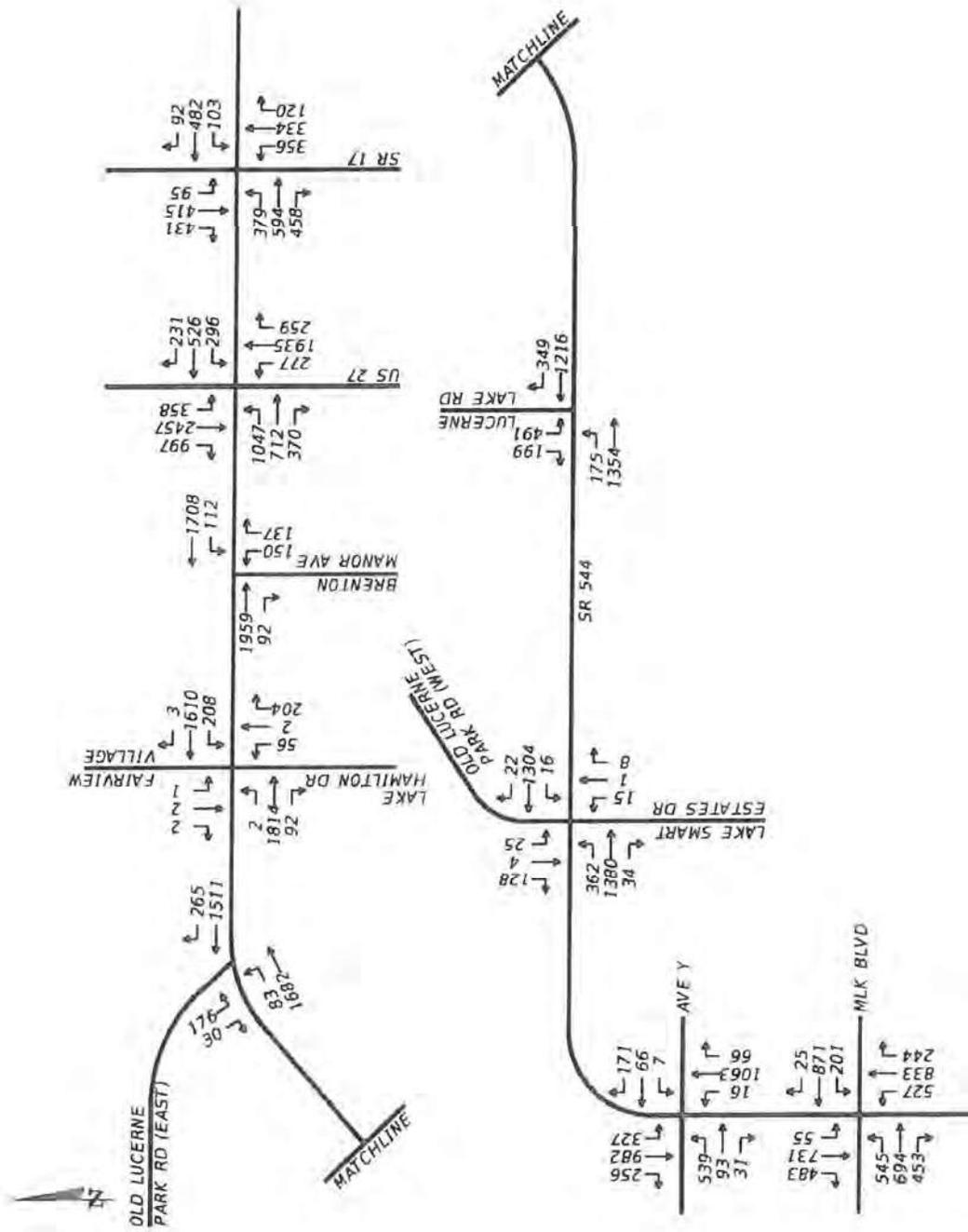


Figure 3-22: Design Year (2045) P.M. Peak Hour Intersection Volumes – Build Alternative No. 2

LUCERNE LOOP ROAD INTERSECTION  
DESIGN YEAR (2045) PEAK HOUR APPROACH TRUCK PERCENTAGES

AM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
211	0.44	1143	0.05	0	0.00	1354	150	11.1%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
0	0.00	1267	0.05	498	0.44	1765	282	16.0%
PM PEAK HOUR								
EB LT		EB TH		EB RT		EB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
175	0.44	1354	0.03	0	0.00	1529	118	7.7%
WB LT		WB TH		WB RT		WB APPROACH		
Vol.	Truck %	Vol.	Truck %	Vol.	Truck %	Vol.	Truck Vol.	Truck %
0	0.00	1216	0.03	349	0.44	1565	190	12.1%

HSMV_Rej	Agency_Re	Reporting_Form_Type	Crash_Date	Crash_Tim	City	County	Crash_Street	Intersecting_Street	Offset_Dis	Offset_Dir	Crash_Typ	Vehicles	Non_Motorist	Fatalities	Injuries	Alcohol_Rt	Distraction	Drug_Relat	Estimated_
87549551	2017-0832	Winter Hav Long	12/24/2017	12:40 PM	Winter Hav Polk		LUCERNE PARK RD	LUCERNE LOOP	135 East		Rear End	2	0	0	0	N	N	N	\$3,000
87549776	2018-0107	Winter Hav Long	2/17/2018	7:38 AM	Winter Hav Polk		LUCERNE LOOP	LUCERNE PARK RD	0		Left Turn	2	0	0	0	N	N	N	\$105,000
87550508	2018-0433	Winter Hav Long	7/2/2018	5:35 PM	Winter Hav Polk		LUCERNE LOOP	LUCERNE PARK RD	209 North		Rear End	2	0	0	0	N	N	N	\$100
89119800	2019-0366	Winter Hav Short	6/6/2019	12:39 PM	Winter Hav Polk		LUCERNE PARK RD	LUCERNE LOOP	0		Rear End	2	0	0	0	N	N	N	\$1,000

Weather_Condition	Light_Condition	Street_Nbr	Crash_Type_D	Crash_Typ	Crash_Sev	Within_Cit	Manner_of_Cr	First_Harmful	First_HE_Locati	First_HE_Relat	First_HE_V	Type_of_Inter	Road_Sys	Type_of_S	Road_Surf	Contrib_Ci	Contrib_Ci	Contrib_Ci	Contrib_Ci	Contrib_Ci	School_Bu	Work_Zon	
Clear	Daylight		Rear End	E	Property DY		Sideswipe, Sar	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	State	Unpaved	Dry	None					None	N	N
Fog, Smog	Daylight		Left Entering		Property DY		Angle	Other Non-Fix On Roadway	Non-Junction	N		T-Intersection	Local	Unpaved	Dry	None				Weather Conditions	N	N	
Clear	Daylight		Rear End	S	Property DY		Front to Rear	Motor Vehicle On Roadway	Non-Junction	N		Not at Interse	Local	Unpaved	Dry	None					None	N	N
Clear	Daylight		Rear End	W	Property DY		Angle	Motor Vehicle On Roadway	Non-Junction	N		T-Intersection	State	Unpaved	Dry	None					None	N	N



Crash Number	Location Mile Post	Roadway Id	Crash Date	Crash Year	On Road	Intersecting Road	First Harmful Event	Manner Of Collision	Light Condition	Weather Condition
864410570	7.284	16140000	8/31/2016	2016	SR 544	LUCERNE LOOP RD	Motor Vehicle In Transport	Other (See Narrative)	Daylight	Cloudy
869400670	7.227	16140000	10/18/2017	2017	SR 544	LUCERNE LOOP RD	Motor Vehicle In Transport	Sideswipe, Opposite Direction	Daylight	Clear

Surface Condition	Junction	Site Location	Alcohol Drugs Involvement	Number of Fatalities	Number of Injured	Total Crash Damage Amount	Crash Status
Wet	Through Roadway	At Intersection	No			500	Q/C Completed - Loc Verified
Dry	Non-Junction	Not At Intersection/Rx/Bridge	No		4	500	Q/C Completed - Loc Verified

## **Appendix B**

Traffic Signal Warrant No. 1 Evaluation

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

Form 750-020-01  
TRAFFIC ENGINEERING  
October 2020

City: **Winter Haven**  
County: **16 - Polk**  
District: **One**

Engineer: **AIM Engineering**  
Date: **May 4, 2022**

Major Street: **SR 544** Lanes: **1** Major Approach Speed: **55**  
Minor Street: **Lucerne Loop Rd** Lanes: **1** Minor Approach Speed: **25**

MUTCD Electronic Reference to Chapter 4: <http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf>

**Volume Level Criteria**

1. Is the posted speed or 85th-percentile of major street > 40 mph?  Yes  No
2. Is the intersection in a built-up area of an isolated community with a population < 10,000?  Yes  No
- "70%" volume level **may** be used if Question 1 **or** 2 above is answered "Yes"  MAY  70%  100%

**WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME**

Warrant 1 is satisfied if Condition A **or** Condition B is "100%" satisfied for eight hours.  Yes  No

Warrant 1 is also satisfied if both Condition A **and** Condition B are "80%" satisfied (should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems).  Yes  No

Warrant 1 is satisfied if Condition A **or** Condition B is "70%" satisfied for eight hours.  Yes  No

**Condition A - Minimum Vehicular Volume**

Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

Applicable:  Yes  No  
100% Satisfied:  Yes  No  
80% Satisfied:  Yes  No  
70% Satisfied:  Yes  No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	500	400	350	150	120	105
2 or more	1	600	480	420	150	120	105
2 or more	2 or more	600	480	420	200	160	140
1	2 or more	500	400	350	200	160	140

<sup>a</sup> Basic Minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.

Street	Eight Highest Hours							
	7 am - 8 am	8 am - 9 am	11 am - 12 pm	1 pm - 2 pm	2 pm - 3 pm	3 pm - 4 pm	4 pm - 5 pm	5 pm - 6 pm
Major	1,097	906	843	921	972	943	1,031	1,100
Minor	44	52	49	54	56	52	46	43

Existing Volumes

State of Florida Department of Transportation  
**TRAFFIC SIGNAL WARRANT SUMMARY**

**Condition B - Interruption of Continuous Traffic**

*Condition B is intended for application where Condition A is not satisfied and the traffic volume on a major street is so heavy that traffic on the minor intersecting street suffers excessive delay or conflict in entering or crossing the major street.*

Applicable:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
100% Satisfied:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
80% Satisfied:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
70% Satisfied:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

Number of Lanes for moving traffic on each approach		Vehicles per hour on major-street (total of both approaches)			Vehicles per hour on minor-street (one direction only)		
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

<sup>a</sup> Basic Minimum hourly volume

<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures

<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

*Record 8 highest hours and the corresponding major-street and minor-street volumes in the Instructions Sheet.*

Eight Highest Hours								
Street	7 am - 8 am	8 am - 9 am	11 am - 12 pm	1 pm - 2 pm	2 pm - 3 pm	3 pm - 4 pm	4 pm - 5 pm	5 pm - 6 pm
<b>Major</b>	1,097	906	843	921	972	943	1,031	1,100
<b>Minor</b>	44	52	49	54	56	52	46	43

**Existing Volumes**

## **Appendix C**

CAP-X and SPICE Analysis Summary Sheets

# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Lucerne Loop Road
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	N

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	211	1143	0	11.00%	0.00%
Westbound	0	0	1267	498	16.00%	0.00%
Southbound	0	304	0	196	44.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	1800	
	3-phase signal			<b>Suggested = 1750</b>	1750	
	4-phase signal			<b>Suggested = 1700</b>	1700	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.70	<b>1</b>	4.8	<b>Fair</b>	<b>Fair</b>	<b>Good</b>
Continuous Green T N	0.82	<b>2</b>	3.0	<b>Poor</b>	<b>Poor</b>	<b>Good</b>
Signalized Restricted Crossing U-Turn E-W	0.88	<b>3</b>	6.3	<b>Good</b>	<b>Good</b>	<b>Fair</b>
Median U-Turn E-W	1.00	<b>4</b>	6.3	<b>Good</b>	<b>Good</b>	<b>Fair</b>
2 X 2	1.29	<b>5</b>	5.6	<b>Fair</b>	<b>Good</b>	<b>Good</b>
1NS X 2EW	1.82	<b>6</b>	5.6	<b>Fair</b>	<b>Good</b>	<b>Good</b>
All-Way Stop Control	2.85	<b>7</b>	6.7	<b>Good</b>	<b>Good</b>	<b>Good</b>
Unsignalized Restricted Crossing U-Turn E-W	9.19	<b>8</b>	4.4	<b>Fair</b>	<b>Fair</b>	<b>Fair</b>
Two-Way Stop Control E-W	9553.05	<b>9</b>	3.7	<b>Poor</b>	<b>Fair</b>	<b>Good</b>
--	--	--	--	--	--	--

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Lucerne Loop Road
Date:	Design Year (2045) AM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	211	1143	0	11.00%	0.00%
Westbound	0	0	1267	498	16.00%	0.00%
Southbound	0	304	0	196	44.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95	/	0.85	/	/
Suggested	<b>0.80</b>	<b>0.95</b>	/	<b>0.85</b>	/	/
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	<b>1800</b>	
	3-phase signal			<b>Suggested = 1750</b>	<b>1750</b>	
	4-phase signal			<b>Suggested = 1700</b>	<b>1700</b>	

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

Number of Lanes for Non-roundabout Intersections																	
TYPE OF INTERSECTION	Sheet	Northbound			Southbound			Eastbound			Westbound						
		U	L	T R	U	L	T R	U	L	T R	U	L	T R				
Traffic Signal	<b>FULL</b>	/	0	0	0	/	2	0	1	/	1	2	0	/	0	2	1
Two-Way Stop Control	<b>E-W</b>	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
All-Way Stop Control	<b>FULL</b>	/	0	0	0	/	1	0	1	/	1	2	0	/	0	2	1
Continuous Green T	<b>N</b>	/	/	/	/	/	1	/	1	/	1	2	/	/	/	2	1
Signalized Restricted Crossing U-Turn	<b>E-W</b>	/	/	/	0	/	/	/	1	0	1	2	0	1	0	2	1
Unsignalized Restricted Crossing U-Turn	<b>E-W</b>	/	/	/	0	/	/	/	1	0	1	2	0	1	0	2	1
Median U-Turn	<b>E-W</b>	/	/	0	0	/	0	1	1	/	2	0	1	/	2	1	

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

Results for Non-roundabout Intersections															
TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<b>FULL</b>	/	/	/	/	/	/	/	/	1224	<b>0.70</b>	<b>0.70</b>	Fair	Fair	Good
Two-Way Stop Control	<b>E-W</b>	/	/	/	/	/	/	/	/	-	<b>#####</b>	<b>9553.05</b>	Poor	Fair	Good
All-Way Stop Control	<b>FULL</b>	/	/	/	/	/	/	/	/	4271	<b>2.85</b>	<b>2.85</b>	Good	Good	Good
Continuous Green T	<b>N</b>	/	/	/	/	/	/	/	/	1442	<b>0.82</b>	<b>0.82</b>	Poor	Poor	Good
Signalized Restricted Crossing U-Turn	<b>E-W</b>	1582	<b>0.88</b>	854	<b>0.47</b>	1024	<b>0.57</b>	1299	<b>0.72</b>	/	/	<b>0.88</b>	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<b>F-W</b>	1170	<b>0.49</b>	1707	<b>0.00</b>	2048	<b>0.00</b>	1503	<b>1.13</b>	/	/	<b>0.49</b>	Fair	Fair	Fair



# Capacity Analysis for Planning of Junctions

Summary Report - Page 1 of 2

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Lucerne Loop Road
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Which leg is the minor street?	N

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	175	1354	0	8.00%	0.00%
Westbound	0	0	1216	349	12.00%	0.00%
Southbound	0	491	0	199	44.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				<b>Suggested = 2.00</b>	2.00	
FDOT Context Zone		<b>C3C-Suburban Commercial</b>				
Critical Lane Volume Threshold	2-phase signal			<b>Suggested = 1800</b>	1800	
	3-phase signal			<b>Suggested = 1750</b>	1750	
	4-phase signal			<b>Suggested = 1700</b>	1700	

# Capacity Analysis for Planning of Junctions

Summary Report - Page 2 of 2

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
Traffic Signal	0.73	<b>1</b>	4.8	<b>Fair</b>	<b>Fair</b>	<b>Good</b>
Continuous Green T N	0.93	<b>2</b>	3.0	<b>Poor</b>	<b>Poor</b>	<b>Good</b>
Signalized Restricted Crossing U-Turn E-W	1.03	<b>3</b>	6.3	<b>Good</b>	<b>Good</b>	<b>Fair</b>
Median U-Turn E-W	1.11	<b>4</b>	6.3	<b>Good</b>	<b>Good</b>	<b>Fair</b>
2 X 2	1.89	<b>5</b>	5.6	<b>Fair</b>	<b>Good</b>	<b>Good</b>
1NS X 2EW	2.30	<b>6</b>	5.6	<b>Fair</b>	<b>Good</b>	<b>Good</b>
All-Way Stop Control	2.93	<b>7</b>	6.7	<b>Good</b>	<b>Good</b>	<b>Good</b>
Unsignalized Restricted Crossing U-Turn E-W	10.49	<b>8</b>	4.4	<b>Fair</b>	<b>Fair</b>	<b>Fair</b>
Two-Way Stop Control E-W	705.91	<b>9</b>	3.7	<b>Poor</b>	<b>Fair</b>	<b>Good</b>
--	--	--	--	--	--	--

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 1 of 4

Project Name:	SR 544 PD&E Study from MLK Boulevard to SR 17
Project Number:	FPID No. 440273-1-22-01
Location:	SR 544/Lucerne Loop Road
Date:	Design Year (2045) PM Peak Hour
Number of Intersection Legs:	3
Major Street Direction:	East-West

Traffic Volume Demand						
	Volume (Veh/hr)				Percent (%)	
	U-Turn 	Left 	Thru 	Right 	Heavy Vehicles	Volume Growth
Eastbound	0	175	1354	0	8.00%	0.00%
Westbound	0	0	1216	349	12.00%	0.00%
Southbound	0	491	0	199	44.00%	0.00%
Northbound	0	0	0	0	0.00%	0.00%
Adjustment Factor	0.80	0.95		0.85		
Suggested	<b>0.80</b>	<b>0.95</b>		<b>0.85</b>		
Truck to PCE Factor				Suggested = 2.00		2.00
FDOT Context Zone		C3C-Suburban Commercial				
Critical Lane Volume Threshold	2-phase signal			Suggested = 1800		1800
	3-phase signal			Suggested = 1750		1750
	4-phase signal			Suggested = 1700		1700

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 2 of 4

Number of Lanes for Non-roundabout Intersections															
TYPE OF INTERSECTION	Sheet	Northbound			Southbound			Eastbound			Westbound				
		U	L	T R	U	L	T R	U	L	T R	U	L	T R		
Traffic Signal	<u>FULL</u>	0	0	0	2	0	1	1	2	0	0	2	1		
Two-Way Stop Control	<u>E-W</u>	0	0	0	1	0	1	1	2	0	0	2	1		
All-Way Stop Control	<u>FULL</u>	0	0	0	1	0	1	1	2	0	0	2	1		
Continuous Green T	<u>N</u>				1		1	1	2			2	1		
Signalized Restricted Crossing U-Turn	<u>E-W</u>			0			1	0	1	2	0	1	0	2	1
Unsignalized Restricted Crossing U-Turn	<u>E-W</u>			0			1	0	1	2	0	1	0	2	1
Median U-Turn	<u>E-W</u>			0	0	1	1	2	0	1	2	0	1	2	1

Number of Lanes for Interchanges																	
TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R

# Capacity Analysis for Planning of Junctions

Detailed Report - Page 3 of 4

Results for Non-roundabout Intersections															
TYPE OF INTERSECTION	Sheet	Zone 1 (North)		Zone 2 (South)		Zone 3 (East)		Zone 4 (West)		Zone 5 (Center)		Overall v/c Ratio	Pedestrian Accommodations	Bicycle Accommodations	Transit Accommodations
		CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C	CLV	V/C				
Traffic Signal	<u>FULL</u>									1272	<u>0.73</u>	0.73	Fair	Fair	Good
Two-Way Stop Control	<u>E-W</u>									-	<u>705.91</u>	705.91	Poor	Fair	Good
All-Way Stop Control	<u>FULL</u>									4398	<u>2.93</u>	2.93	Good	Good	Good
Continuous Green T	<u>N</u>									1624	<u>0.93</u>	0.93	Poor	Poor	Good
Signalized Restricted Crossing U-Turn	<u>E-W</u>	1850	<u>1.03</u>	1085	<u>0.60</u>	877	<u>0.49</u>	1709	<u>0.95</u>			1.03	Good	Good	Fair
Unsignalized Restricted Crossing U-Turn	<u>F-W</u>	1362	<u>10.48</u>	2169	<u>0.00</u>	1753	<u>0.00</u>	1851	<u>2.56</u>			10.48	Fair	Fair	Fair



Federal Highway Administration (FHWA)  
Safety Performance for Intersection Control Evaluation Tool

Results

Summary of crash prediction results for each alternative

Project Information

Project Name:	SR 544 PD&E Study from MLK Blvd to SR 17	Intersection Type	At-Grade Intersections
Intersection:	SR 544/Lucerne Loop Road	Opening Year	2025
Agency:	FDOT District One	Design Year	2045
Project Reference:	FPID No.: 440273-1-22-01	Facility Type	On Urban and Suburban Arterial
City:	Polk County	Number of Legs	3-leg
State:	Florida	L-Way/2-Way	2-way Intersecting 2-way
Date:	12/1/2022	# of Major Street Lanes (both directions)	5 or fewer
Analyst:	AIM Engineering & Surveying, Inc.	Major Street Approach Speed	Less than 55 mph

Crash Prediction Summary

Control Strategy	Crash Type	Opening Year	Design Year	Total Project Life Cycle	Crash Prediction Rank	AADT Within SPF Prediction Range?	Source of Prediction	SSI Score		
								Open Year	Design Year	Rank
Traffic Signal	Total	4.97	13.37	190.15	6	No	Calibrated SPF	74	49	6
	Fatal & Injury	1.76	4.11	61.38						
Minor Road Stop	Total	1.82	5.75	77.76	2	No	Calibrated SPF w/ EB	55	22	7
	Fatal & Injury	0.62	1.62	23.31						
All Way Stop	Total	2.38	4.57	73.42	1	N/A	N/A	89	76	1
	Fatal & Injury	0.66	1.22	19.92						
2-lane Roundabout	Total	5.89	14.01	207.74	3	No	Uncalibrated SPF	87	75	2
	Fatal & Injury	1.06	2.97	41.57						
Median U-Turn (MUT)	Total	4.22	11.37	161.63	4	N/A	CMF	--	--	--
	Fatal & Injury	1.23	2.87	42.96						
Signalized RCUT	Total	9.15	17.42	230.34	7	Yes	Uncalibrated SPF	80	61	3
	Fatal & Injury	1.58	6.31	79.41						
Unsignalized RCUT	Total	No SPF	No SPF	No SPF	--	No	Uncalibrated SPF	73	50	5
	Fatal & Injury	No SPF	No SPF	No SPF						
Continuous Green-T Intersection	Total	4.77	12.84	182.54	5	N/A	CMF	80	58	4
	Fatal & Injury	1.49	3.49	52.17						
Other 1*	Total	No SPF	No SPF	No SPF	--	N/A	CMF	--	--	--
	Fatal & Injury	No SPF	No SPF	No SPF						
Other 2*	Total	No SPF	No SPF	No SPF	--	N/A	CMF	--	--	--
	Fatal & Injury	No SPF	No SPF	No SPF						

## **Appendix D**

SYNCHRO and SIDRA Analysis Summary Sheets

Lanes, Volumes, Timings  
13: SR 544 & Lucerne Loop Rd.

05/16/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	211	1143	1267	498	304	196
Future Volume (vph)	211	1143	1267	498	304	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	650			550	500	500
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frnt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1253	3438	3438	1122	2432	1122
Flt Permitted	0.087				0.950	
Satd. Flow (perm)	115	3438	3438	1122	2432	1122
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				319		14
Link Speed (mph)		30	30		30	
Link Distance (ft)		1390	9058		2343	
Travel Time (s)		31.6	205.9		53.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	44%	5%	5%	44%	44%	44%
Adj. Flow (vph)	222	1203	1334	524	320	206
Shared Lane Traffic (%)						
Lane Group Flow (vph)	222	1203	1334	524	320	206
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases	4			8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	11.0
Total Split (s)	25.0	73.0	48.0	27.0	27.0	25.0
Total Split (%)	25.0%	73.0%	48.0%	27.0%	27.0%	25.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	63.2	63.2	39.8	63.2	17.3	40.7
Actuated g/C Ratio	0.68	0.68	0.43	0.68	0.19	0.44
v/c Ratio	0.77	0.51	0.90	0.61	0.70	0.41
Control Delay	40.7	8.4	35.4	6.1	45.2	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	8.4	35.4	6.1	45.2	19.7
LOS	D	A	D	A	D	B
Approach Delay		13.5	27.1		35.2	
Approach LOS		B	C		D	
Stops (vph)	130	513	1078	105	272	117

Lanes, Volumes, Timings  
 13: SR 544 & Lucerne Loop Rd.

05/16/2022

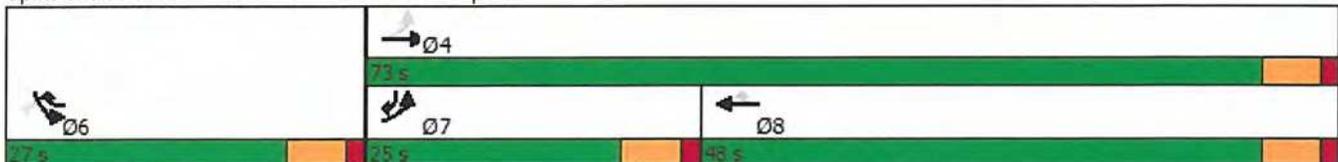


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Fuel Used(gal)	16	76	105	36	10	5
CO Emissions (g/hr)	1097	5342	7309	2542	689	350
NOx Emissions (g/hr)	213	1039	1422	495	134	68
VOC Emissions (g/hr)	254	1238	1694	589	160	81
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	90	167	396	44	96	78
Queue Length 95th (ft)	#210	231	#563	122	143	137
Internal Link Dist (ft)		1310	8978		2263	
Turn Bay Length (ft)	650			550	500	500
Base Capacity (vph)	315	2523	1581	901	559	524
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.48	0.84	0.58	0.57	0.39

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 92.7  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.90  
 Intersection Signal Delay: 23.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 70.4%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: SR 544 & Lucerne Loop Rd.



Lanes, Volumes, Timings  
13: SR 544 & Lucerne Loop Rd.

05/16/2022



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	175	1354	1216	349	491	199
Future Volume (vph)	175	1354	1216	349	491	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	650			550	500	500
Storage Lanes	1			1	1	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frnt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1253	3505	3505	1122	2432	1122
Flt Permitted	0.090				0.950	
Satd. Flow (perm)	119	3505	3505	1122	2432	1122
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				360		17
Link Speed (mph)		30	30		30	
Link Distance (ft)		1390	9058		2343	
Travel Time (s)		31.6	205.9		53.3	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles (%)	44%	3%	3%	44%	44%	44%
Adj. Flow (vph)	180	1396	1254	360	506	205
Shared Lane Traffic (%)						
Lane Group Flow (vph)	180	1396	1254	360	506	205
Turn Type	pm+pt	NA	NA	pm+ov	Prot	pm+ov
Protected Phases	7	4	8	6	6	7
Permitted Phases	4			8		6
Detector Phase	7	4	8	6	6	7
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	24.0	24.0	11.0
Total Split (s)	23.0	70.0	47.0	30.0	30.0	23.0
Total Split (%)	23.0%	70.0%	47.0%	30.0%	30.0%	23.0%
Yellow Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Recall Mode	None	None	None	Min	Min	None
Act Effct Green (s)	58.9	58.9	38.2	66.8	22.5	43.2
Actuated g/C Ratio	0.63	0.63	0.41	0.71	0.24	0.46
v/c Ratio	0.71	0.63	0.88	0.40	0.87	0.39
Control Delay	37.0	12.3	34.4	1.9	51.8	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	12.3	34.4	1.9	51.8	18.1
LOS	D	B	C	A	D	B
Approach Delay		15.1	27.1		42.1	
Approach LOS		B	C		D	
Stops (vph)	106	768	1046	15	433	115

Lanes, Volumes, Timings  
 13: SR 544 & Lucerne Loop Rd.

05/16/2022

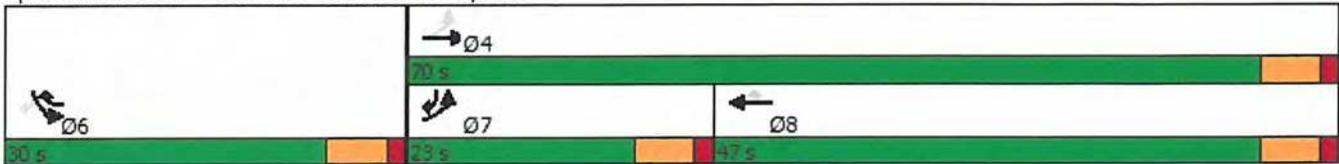


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Fuel Used(gal)	13	92	100	25	17	5
CO Emissions (g/hr)	900	6464	7002	1738	1156	350
NOx Emissions (g/hr)	175	1258	1362	338	225	68
VOC Emissions (g/hr)	209	1498	1623	403	268	81
Dilemma Vehicles (#)	0	0	0	0	0	0
Queue Length 50th (ft)	67	254	378	0	159	74
Queue Length 95th (ft)	#157	318	#480	24	#250	132
Internal Link Dist (ft)		1310	8978		2263	
Turn Bay Length (ft)	650			550	500	500
Base Capacity (vph)	283	2431	1558	919	632	558
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.57	0.80	0.39	0.80	0.37

Intersection Summary

Area Type: Other  
 Cycle Length: 100  
 Actuated Cycle Length: 93.6  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.88  
 Intersection Signal Delay: 25.0  
 Intersection LOS: C  
 Intersection Capacity Utilization 72.3%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 13: SR 544 & Lucerne Loop Rd.

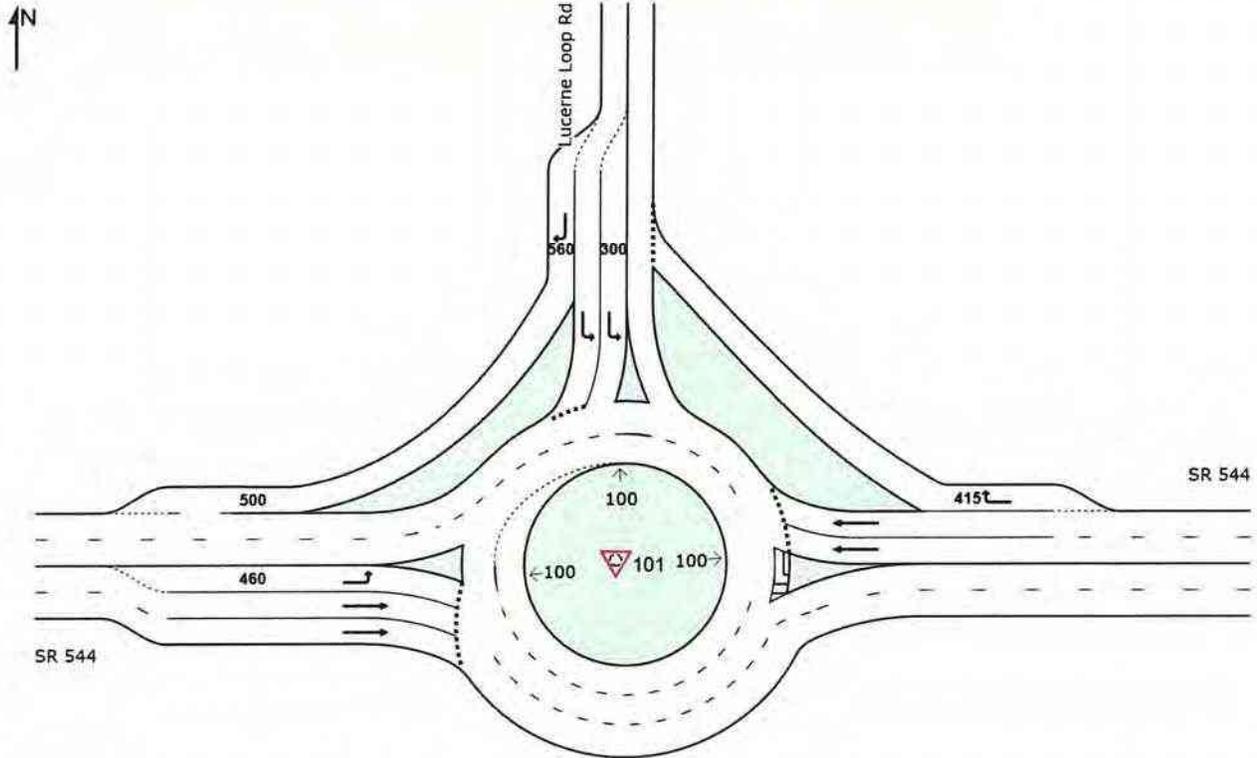


# SITE LAYOUT

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: SR 544														
6	T1	1267	5.0	1334	5.0	0.660	13.5	LOS B	8.1	211.2	0.70	0.81	1.14	31.3
16	R2	498	44.0	524	44.0	0.711	19.5	LOS C	7.8	263.1	0.59	0.92	1.39	27.3
Approach		1765	16.0	1858	16.0	0.711	15.2	LOS C	8.1	263.1	0.67	0.84	1.21	30.1
North: Lucerne Loop Rd														
7	L2	304	44.0	320	44.0	0.203	3.1	LOS A	0.5	16.3	0.13	0.13	0.13	32.1
14	R2	196	44.0	206	44.0	0.177	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		500	44.0	526	44.0	0.203	3.7	LOS A	0.5	16.3	0.08	0.08	0.08	33.5
West: SR 544														
5	L2	211	44.0	222	44.0	0.362	11.0	LOS B	1.1	35.9	0.53	0.50	0.53	29.0
2	T1	1143	5.0	1203	5.0	0.685	16.0	LOS C	7.9	206.1	0.76	1.03	1.44	29.8
Approach		1354	11.1	1425	11.1	0.685	15.2	LOS C	7.9	206.1	0.73	0.94	1.30	29.7
All Vehicles		3619	18.0	3809	18.0	0.711	13.6	LOS B	8.1	263.1	0.61	0.77	1.09	30.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\TrafficTo FDOT\SR 544 Intersection Control Evaluation Memorandum\SR 544\_Lucerne Loop Rd ICE Memo\Updated SIDRA Analyses from FDOT\SR 544\_Lucerne Loop Rd\_2045 AM Pk Hr\_Build Alt 2\_Rev.sip9

# LANE SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) AM Peak Hour - Build Alt 2  
 Site Category: (None)  
 Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %						[ Veh	Dist. ] ft				
East: SR 544													
Lane 1	667	5.0	1011	0.660	100	13.5	LOS B	8.1	211.2	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	667	5.0	1011	0.660	100	13.5	LOS B	8.1	211.2	Full	1600	0.0	0.0
Lane 3	524	44.0	737	0.711	100	19.5	LOS C	7.8	263.1	Short	415	0.0	NA
Approach	1858	16.0		0.711		15.2	LOS C	8.1	263.1				
North: Lucerne Loop Rd													
Lane 1 <sup>d</sup>	265	44.0	1307	0.203	100	0.1	LOS A	0.0	0.0	Short	300	0.0	NA
Lane 2	55	44.0	269	0.203	100	18.3	LOS C	0.5	16.3	Full	1600	0.0	0.0
Lane 3	206	44.0	1163	0.177	100	4.5	LOS A	0.0	0.0	Short	560	0.0	NA
Approach	526	44.0		0.203		3.7	LOS A	0.5	16.3				
West: SR 544													
Lane 1	222	44.0	614	0.362	100	11.0	LOS B	1.1	35.9	Short	460	0.0	NA
Lane 2	577	5.0	841	0.685	100	16.5	LOS C	7.8	201.5	Full	1600	0.0	0.0
Lane 3 <sup>d</sup>	626	5.0	914	0.685	100	15.5	LOS C	7.9	206.1	Full	1600	0.0	0.0
Approach	1425	11.1		0.685		15.2	LOS C	7.9	206.1				
Intersection	3809	18.0		0.711		13.6	LOS B	8.1	263.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

Approach Lane Flows (veh/h)										
East: SR 544										
Mov. From E To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
	W	N								
Lane 1	667	-	667	5.0	1011	0.660	100	NA	NA	
Lane 2	667	-	667	5.0	1011	0.660	100	NA	NA	
Lane 3	-	524	524	44.0	737	0.711	100	0.0	2	
Approach	1334	524	1858	16.0		0.711				
North: Lucerne Loop Rd										

Mov.	L2	R2	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From N To Exit:	E	W			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	265	-	265	44.0	1307	0.203	100	0.0	2
Lane 2	55	-	55	44.0	269	0.203	100	NA	NA
Lane 3	-	206	206	44.0	1163	0.177	100	0.0	2
Approach	320	206	526	44.0		0.203			

West: SR 544

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E			veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	222	-	222	44.0	614	0.362	100	0.0	2
Lane 2	-	577	577	5.0	841	0.685	100	NA	NA
Lane 3	-	626	626	5.0	914	0.685	100	NA	NA
Approach	222	1203	1425	11.1		0.685			

Total	%HV	Deg Satn (v/c)
-------	-----	----------------

Intersection 3809 18.0 0.711

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

**Merge Analysis**

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Capacity veh/h	Deg Satn v/c	Min. Delay sec	Merge Delay sec	
<b>East Exit: SR 544</b>											
<b>Merge Type: Not Applied</b>											
	Full Length Lane	1									
	Full Length Lane	2									
<b>North Exit: Lucerne Loop Rd</b>											
<b>Merge Type: Not Applied</b>											
	Full Length Lane	1									
<b>West Exit: SR 544</b>											
<b>Merge Type: Priority</b>											
	Exit Short Lane	3	500	0.0	667	700	3.00	2.00	206	1212 0.170 3.0 4.4	
	Merge Lane	2	-	100.0	Merge Lane is not Opposed			667	1800 0.370	0.0	0.0

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Rd ICE Memo\Updated SIDRA Analyses from FDOT\SR 544\_Lucerne Loop Rd\_2045 AM Pk Hr\_Build Alt 2\_Rev.sip9

# SITE LAYOUT

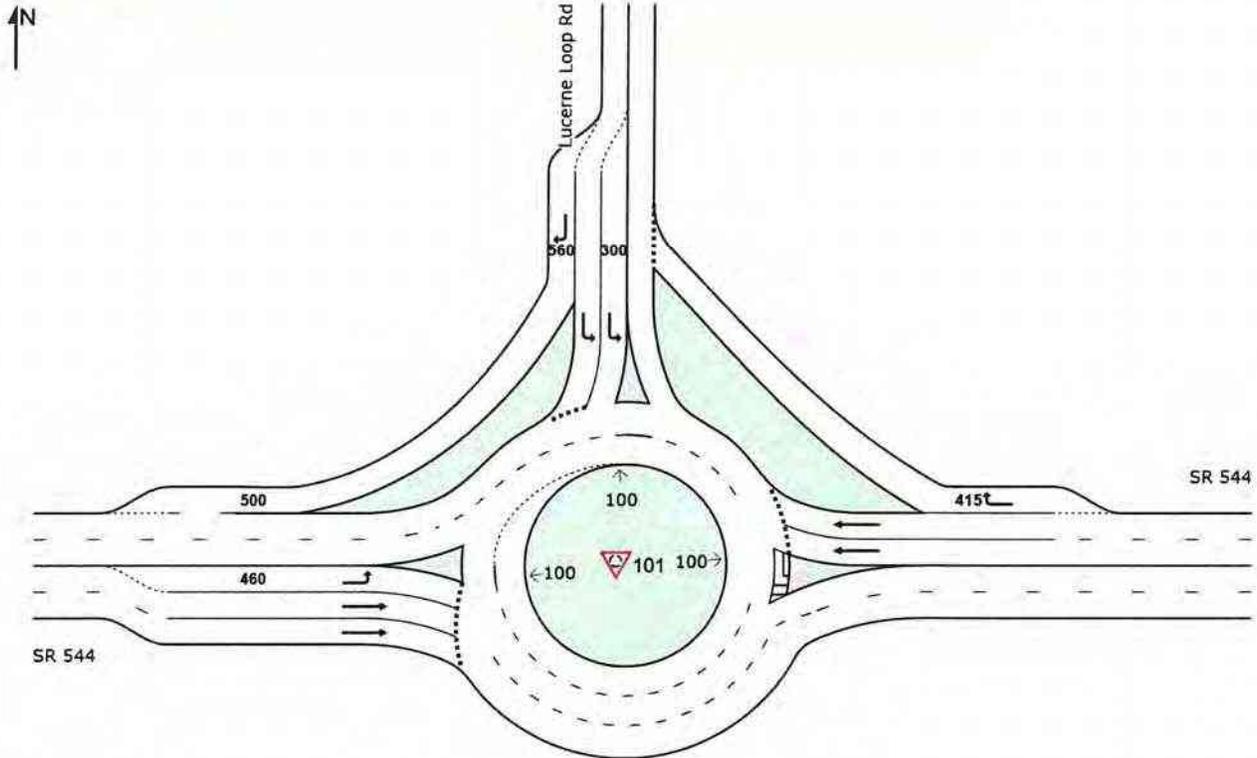
Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\Traffic\To FDOT\SR 544 Intersection Control Evaluation Memorandum\SR 544\_Lucerne Loop Rd ICE Memo\Updated SIDRA Analyses from FDOT\SR 544\_Lucerne Loop Rd\_2045 PM Pk Hr\_Build Alt 2\_Rev.sip9

# MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh veh	Dist ] ft				
East: SR 544														
6	T1	1216	5.0	1280	5.0	0.602	11.4	LOS B	5.7	147.5	0.62	0.59	0.80	32.2
16	R2	349	44.0	367	44.0	0.474	11.1	LOS B	1.7	56.2	0.46	0.36	0.46	30.4
Approach		1565	13.7	1647	13.7	0.602	11.3	LOS B	5.7	147.5	0.58	0.54	0.73	31.8
North: Lucerne Loop Rd														
7	L2	491	44.0	517	44.0	0.325	3.7	LOS A	0.9	30.1	0.14	0.15	0.18	31.9
14	R2	199	44.0	209	44.0	0.180	4.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		690	44.0	726	44.0	0.325	4.0	LOS A	0.9	30.1	0.10	0.11	0.13	32.9
West: SR 544														
5	L2	175	44.0	184	44.0	0.390	14.3	LOS B	1.3	43.6	0.63	0.72	0.88	27.9
2	T1	1354	5.0	1425	5.0	1.043	70.5	LOS F	33.3	865.4	1.00	2.45	5.39	17.4
Approach		1529	9.5	1609	9.5	1.043	64.1	LOS F	33.3	865.4	0.96	2.25	4.87	18.2
All Vehicles		3784	17.5	3983	17.5	1.043	31.3	LOS D	33.3	865.4	0.64	1.15	2.29	24.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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## LANE SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 2

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV %						[ Veh	Dist ] ft				
East: SR 544													
Lane 1	640	5.0	1062	0.602	100	11.4	LOS B	5.7	147.5	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	640	5.0	1062	0.602	100	11.4	LOS B	5.7	147.5	Full	1600	0.0	0.0
Lane 3	367	44.0	775	0.474	100	11.1	LOS B	1.7	56.2	Short	415	0.0	NA
Approach	1647	13.7		0.602		11.3	LOS B	5.7	147.5				
North: Lucerne Loop Rd													
Lane 1 <sup>d</sup>	425	44.0	1307	0.325	100	0.2	LOS A	0.0	0.0	Short	300	0.0	NA
Lane 2	92	44.0	283	0.325	100	20.9	LOS C	0.9	30.1	Full	1600	0.0	0.0
Lane 3	209	44.0	1163	0.180	100	4.4	LOS A	0.0	0.0	Short	560	0.0	NA
Approach	726	44.0		0.325		4.0	LOS A	0.9	30.1				
West: SR 544													
Lane 1	184	44.0	473	0.390	100	14.3	LOS B	1.3	43.6	Short	460	0.0	NA
Lane 2	676	5.0	648	1.043	100	72.1	LOS F	30.8	800.4	Full	1600	0.0	0.0
Lane 3 <sup>d</sup>	749	5.0	718	1.043	100	69.1	LOS F	33.3	865.4	Full	1600	0.0	0.0
Approach	1609	9.5		1.043		64.1	LOS F	33.3	865.4				
Intersection	3983	17.5		1.043		31.3	LOS D	33.3	865.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

### Approach Lane Flows (veh/h)

East: SR 544

Mov. From E To Exit:	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	W	N							
Lane 1	640	-	640	5.0	1062	0.602	100	NA	NA
Lane 2	640	-	640	5.0	1062	0.602	100	NA	NA
Lane 3	-	367	367	44.0	775	0.474	100	0.0	2
Approach	1280	367	1647	13.7		0.602			

North: Lucerne Loop Rd

Mov. From N To Exit:	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	425	-	425	44.0	1307	0.325	100	0.0	2
Lane 2	92	-	92	44.0	283	0.325	100	NA	NA
Lane 3	-	209	209	44.0	1163	0.180	100	0.0	2
Approach	517	209	726	44.0		0.325			

West: SR 544

Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	184	-	184	44.0	473	0.390	100	0.0	2
Lane 2	-	676	676	5.0	648	1.043	100	NA	NA
Lane 3	-	749	749	5.0	718	1.043	100	NA	NA
Approach	184	1425	1609	9.5		1.043			

	Total	%HV	Deg. Satn (v/c)
Intersection	3983	17.5	1.043

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

**Merge Analysis**

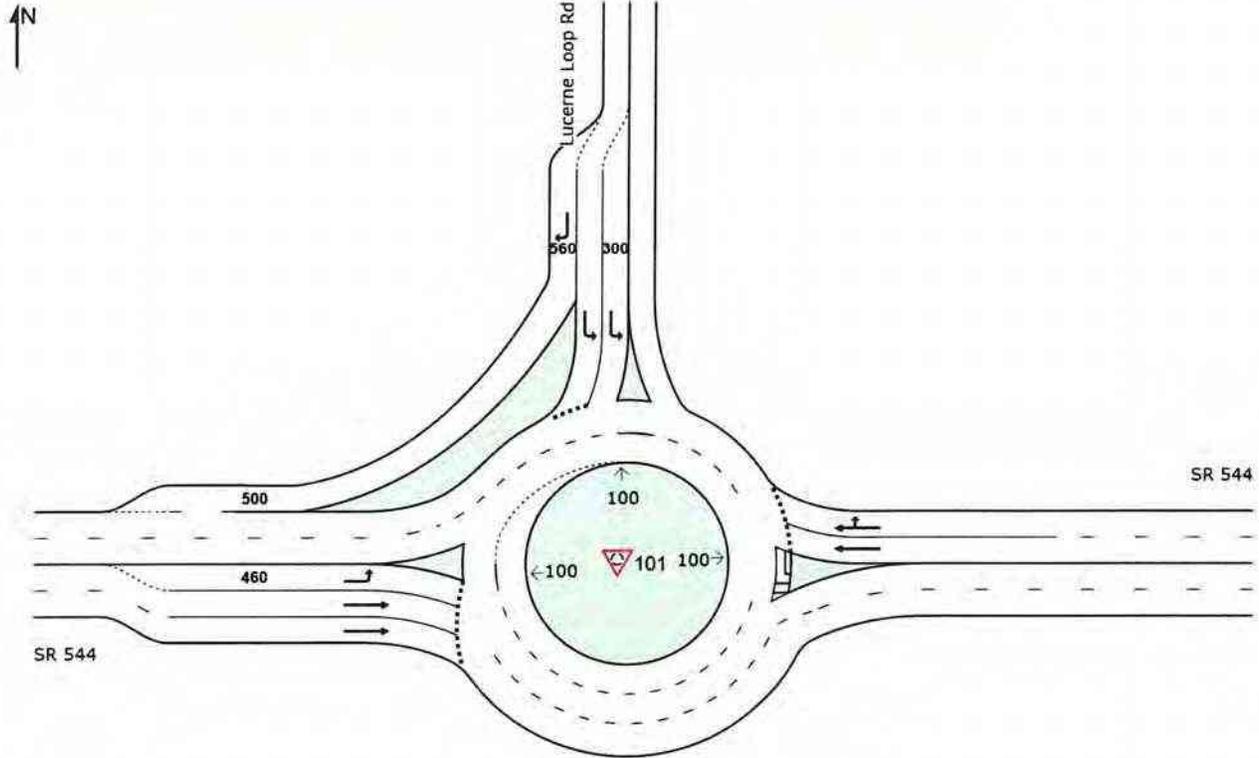
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap pcu/h	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
<b>East Exit: SR 544</b>												
<b>Merge Type: Not Applied</b>												
Full Length Lane	1											
Full Length Lane	2											
<b>North Exit: Lucerne Loop Rd</b>												
<b>Merge Type: Not Applied</b>												
Full Length Lane	1											
<b>West Exit: SR 544</b>												
<b>Merge Type: Priority</b>												
Exit Short Lane	3	500	0.0	640	672	3.00	2.00	209	1232	0.170	2.9	4.4
Merge Lane	2	-	100.0				Merge Lane is not Opposed	640	1800	0.356	0.0	0.0

# SITE LAYOUT

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2045) AM Peak Hour - Build Alt 3  
Site Category: (None)  
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2045) AM Peak Hour - Build Alt 3  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver No Cycles	Aver Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist ft ]				
East: SR 544														
6	T1	1267	5.0	1334	5.0	1.012	52.7	LOS F	53.5	1391.6	1.00	2.29	4.00	20.3
16	R2	498	44.0	524	44.0	1.012	57.4	LOS F	45.6	1410.4	1.00	2.48	4.23	18.8
Approach		1765	16.0	1858	16.0	1.012	54.1	LOS F	53.5	1410.4	1.00	2.34	4.06	19.8
North: Lucerne Loop Rd														
7	L2	304	44.0	320	44.0	0.203	3.1	LOS A	0.5	16.3	0.13	0.13	0.13	32.1
14	R2	196	44.0	206	44.0	0.177	3.5	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		500	44.0	526	44.0	0.203	3.3	LOS A	0.5	16.3	0.08	0.08	0.08	33.5
West: SR 544														
5	L2	211	44.0	222	44.0	0.362	11.0	LOS B	1.1	35.9	0.53	0.50	0.53	29.0
2	T1	1143	5.0	1203	5.0	0.685	16.0	LOS C	7.9	206.1	0.76	1.03	1.44	29.8
Approach		1354	11.1	1425	11.1	0.685	15.2	LOS C	7.9	206.1	0.73	0.94	1.30	29.7
All Vehicles		3619	18.0	3809	18.0	1.012	32.5	LOS D	53.5	1410.4	0.77	1.51	2.48	24.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane 1	265	-	265	44.0	1307	0.203	100	0.0	2
Lane 2	55	-	55	44.0	271	0.203	100	NA	NA
Lane 3	-	206	206	44.0	1163	0.177	100	0.0	2
Approach	320	206	526	44.0		0.203			

West: SR 544

Mov.	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob	Ov.
From W To Exit:	N	E			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	222	-	222	44.0	614	0.362	100	0.0	2
Lane 2	-	577	577	5.0	841	0.685	100	NA	NA
Lane 3	-	626	626	5.0	914	0.685	100	NA	NA
Approach	222	1203	1425	11.1		0.685			

	Total	%HV	Deg.Satn (v/c)
Intersection	3809	18.0	1.012

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

**Merge Analysis**

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min Delay sec	Merge Delay sec
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East Exit: SR 544

Merge Type: **Not Applied**

- Full Length Lane 1 Merge Analysis not applied.
- Full Length Lane 2 Merge Analysis not applied.

North Exit: Lucerne Loop Rd

Merge Type: **Not Applied**

- Full Length Lane 1 Merge Analysis not applied.

West Exit: SR 544

Merge Type: **Priority**

Exit Short Lane	3	500	0.0	306	322	3.00	2.00	206	1503	0.137	2.4	3.5
Merge Lane	2	-	100.0	Merge Lane is not Opposed				306	1800	0.170	0.0	0.0

# SITE LAYOUT

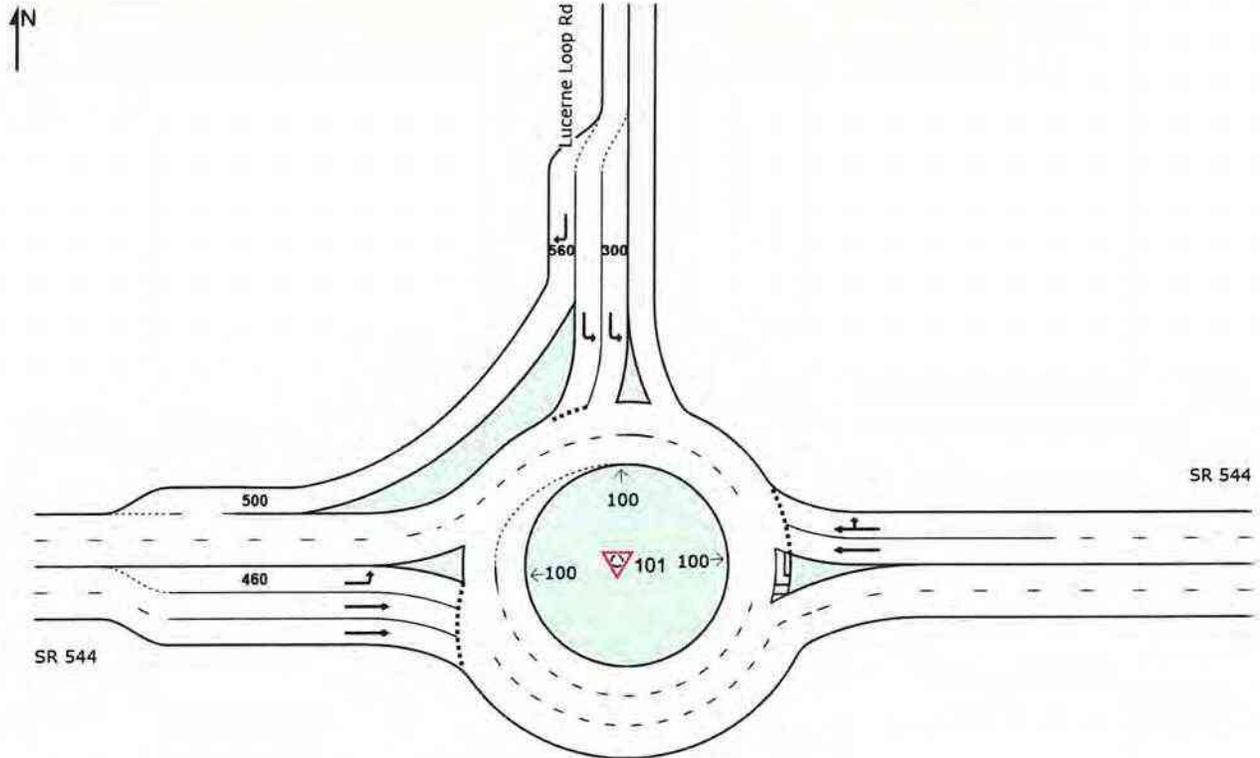
Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 3

Site Category: (None)

Roundabout

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## MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Design Year (2045) PM Peak Hour - Build Alt 3

Site Category: (None)

Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver No. Cycles	Aver Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: SR 544														
6	T1	1216	5.0	1280	5.0	0.838	22.9	LOS C	23.0	599.1	0.85	1.25	1.95	27.7
16	R2	349	44.0	367	44.0	0.838	25.6	LOS D	19.3	575.3	0.73	1.22	1.93	25.7
Approach		1565	13.7	1647	13.7	0.838	23.5	LOS C	23.0	599.1	0.83	1.25	1.94	27.2
North: Lucerne Loop Rd														
7	L2	491	44.0	517	44.0	0.325	3.7	LOS A	0.9	30.1	0.14	0.15	0.18	31.9
14	R2	199	44.0	209	44.0	0.180	3.7	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		690	44.0	726	44.0	0.325	3.8	LOS A	0.9	30.1	0.10	0.11	0.13	32.9
West: SR 544														
5	L2	175	44.0	184	44.0	0.390	14.3	LOS B	1.3	43.6	0.63	0.72	0.88	27.9
2	T1	1354	5.0	1425	5.0	1.043	70.5	LOS F	33.3	865.4	1.00	2.45	5.39	17.4
Approach		1529	9.5	1609	9.5	1.043	64.1	LOS F	33.3	865.4	0.96	2.25	4.87	18.2
All Vehicles		3784	17.5	3983	17.5	1.043	36.3	LOS E	33.3	865.4	0.75	1.44	2.80	23.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane 1	425	-	425	44.0	1307	0.325	100	0.0	2
Lane 2	92	-	92	44.0	283	0.325	100	NA	NA
Lane 3	-	209	209	44.0	1163	0.180	100	0.0	2
Approach	517	209	726	44.0		0.325			

West: SR 544

Mov	L2	T1	Total	%HV	Cap.	Deg.	Lane	Prob.	Ov.
From W To Exit:	N	E			veh/h	Satn v/c	Util. %	SL %	Lane No.
Lane 1	184	-	184	44.0	473	0.390	100	0.0	2
Lane 2	-	676	676	5.0	648	1.043	100	NA	NA
Lane 3	-	749	749	5.0	718	1.043	100	NA	NA
Approach	184	1425	1609	9.5		1.043			

Total	%HV	Deg.	Satn (v/c)
Intersection	3983	17.5	1.043

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Lane Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec	
East Exit: SR 544													
Merge Type: <b>Not Applied</b>													
	Full Length Lane	1	Merge Analysis not applied.										
	Full Length Lane	2	Merge Analysis not applied.										
North Exit: Lucerne Loop Rd													
Merge Type: <b>Not Applied</b>													
	Full Length Lane	1	Merge Analysis not applied.										
West Exit: SR 544													
Merge Type: <b>Priority</b>													
	Exit Short Lane	3	500	0.0	390	409	3.00	2.00	209	1431	0.146	2.5	3.7
	Merge Lane	2	-	100.0	Merge Lane is not Opposed			390	1800	0.216	0.0	0.0	

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Project: T:\PROJECTS\2 - DISTRICT 1\D1\_SR 544\TrafficTo FDOT\SR 544 Intersection Control Evaluation Memorandum\SR 544\_Lucerne Loop Rd ICE Memo\Updated SIDRA Analyses from FDOT\SR 544\_Lucerne Loop Rd\_2045 PM Pk Hr\_Build Alt 3.sip9

# SITE LAYOUT

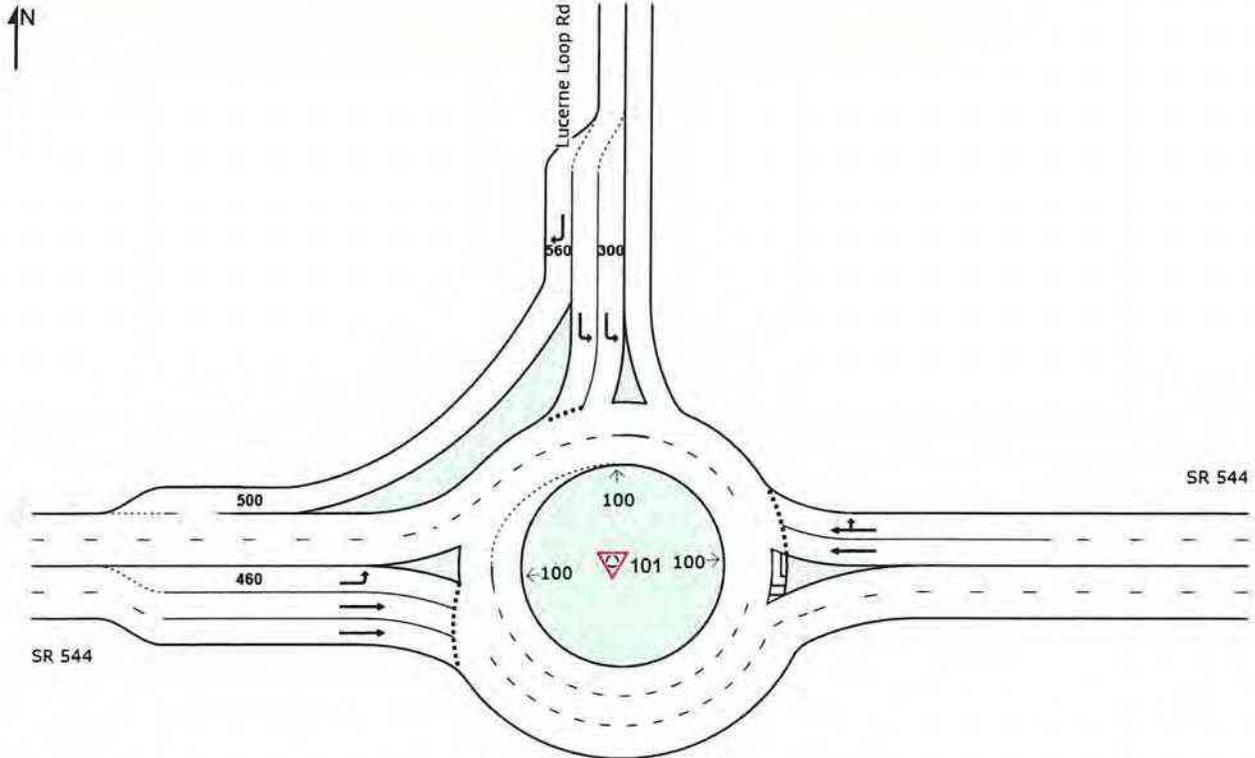
Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2044) AM Peak Hour - Build Alt 3

Site Category: (None)

Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



# MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2044) AM Peak Hour - Build Alt 3  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg Satn	Aver Delay	Level of Service	95% BACK OF QUEUE		Prop Que	Effective Stop Rate	Aver No Cycles	Aver Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] ft				
East: SR 544														
6	T1	1240	5.0	1305	5.0	0.976	43.8	LOS E	44.5	1157.4	0.97	2.02	3.45	22.0
16	R2	480	44.0	505	44.0	0.976	48.2	LOS E	35.5	1093.5	0.86	2.10	3.57	20.4
Approach		1720	15.9	1811	15.9	0.976	45.0	LOS E	44.5	1157.4	0.94	2.04	3.48	21.6
North: Lucerne Loop Rd														
7	L2	293	44.0	308	44.0	0.195	3.1	LOS A	0.5	15.7	0.13	0.13	0.13	32.1
14	R2	189	44.0	199	44.0	0.171	3.4	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		482	44.0	507	44.0	0.195	3.3	LOS A	0.5	15.7	0.08	0.08	0.08	33.5
West: SR 544														
5	L2	204	44.0	215	44.0	0.345	10.5	LOS B	1.0	34.1	0.52	0.48	0.52	29.2
2	T1	1118	5.0	1177	5.0	0.661	14.8	LOS B	7.2	187.0	0.74	0.96	1.33	30.3
Approach		1322	11.0	1392	11.0	0.661	14.2	LOS B	7.2	187.0	0.70	0.89	1.20	30.1
All Vehicles		3524	17.9	3709	17.9	0.976	27.7	LOS D	44.5	1157.4	0.73	1.34	2.16	25.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# LANE SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2044) AM Peak Hour - Build Alt 3

Site Category: (None)

Roundabout

Lane Use and Performance													
	DEMAND FLOWS		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	[ Total veh/h	HV ] %						[ Veh	Dist ] ft				
East: SR 544													
Lane 1 <sup>d</sup>	996	5.0	1021	0.976	100	42.8	LOS E	44.5	1157.4	Full	1600	0.0	0.0
Lane 2	814	29.2	834	0.976	100	47.7	LOS E	35.5	1093.5	Full	1600	0.0	0.0
Approach	1811	15.9		0.976		45.0	LOS E	44.5	1157.4				
North: Lucerne Loop Rd													
Lane 1 <sup>d</sup>	255	44.0	1307	0.195	100	0.1	LOS A	0.0	0.0	Short	300	0.0	NA
Lane 2	54	44.0	276	0.195	100	17.7	LOS C	0.5	15.7	Full	1600	0.0	0.0
Lane 3	199	44.0	1163	0.171	100	3.5	LOS A	0.0	0.0	Short	560	0.0	NA
Approach	507	44.0		0.195		3.3	LOS A	0.5	15.7				
West: SR 544													
Lane 1	215	44.0	623	0.345	100	10.5	LOS B	1.0	34.1	Short	460	0.0	NA
Lane 2	564	5.0	854	0.661	100	15.3	LOS C	7.1	183.6	Full	1600	0.0	0.0
Lane 3 <sup>d</sup>	612	5.0	927	0.661	100	14.4	LOS B	7.2	187.0	Full	1600	0.0	0.0
Approach	1392	11.0		0.661		14.2	LOS B	7.2	187.0				
Intersection	3709	17.9		0.976		27.7	LOS D	44.5	1157.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

## Approach Lane Flows (veh/h)

East: SR 544

Mov.	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit:	W	N							
Lane 1	996	-	996	5.0	1021	0.976	100	NA	NA
Lane 2	309	505	814	29.2	834	0.976	100	NA	NA
Approach	1305	505	1811	15.9		0.976			

North: Lucerne Loop Rd

Mov.	L2	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From N To Exit:	E	W							

Lane 1	255	-	255	44.0	1307	0.195	100	0.0	2
Lane 2	54	-	54	44.0	276	0.195	100	NA	NA
Lane 3	-	199	199	44.0	1163	0.171	100	0.0	2
Approach	308	199	507	44.0		0.195			

West: SR 544

Mov.	L2	T1	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane No.
From W To Exit:	N	E			veh/h	v/c	%	%	
Lane 1	215	-	215	44.0	623	0.345	100	0.0	2
Lane 2	-	564	564	5.0	854	0.661	100	NA	NA
Lane 3	-	612	612	5.0	927	0.661	100	NA	NA
Approach	215	1177	1392	11.0		0.661			
Total %HV Deg. Satn (v/c)									

Intersection 3709 17.9 0.976

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

### Merge Analysis

Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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East Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

North Exit: Lucerne Loop Rd

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

West Exit: SR 544

Merge Type: **Priority**

Exit Short Lane 3 500 0.0 309 324 3.00 2.00 199 1501 0.133 2.4 3.4

Merge Lane 2 - 100.0 Merge Lane is not Opposed 309 1800 0.172 0.0 0.0

# SITE LAYOUT

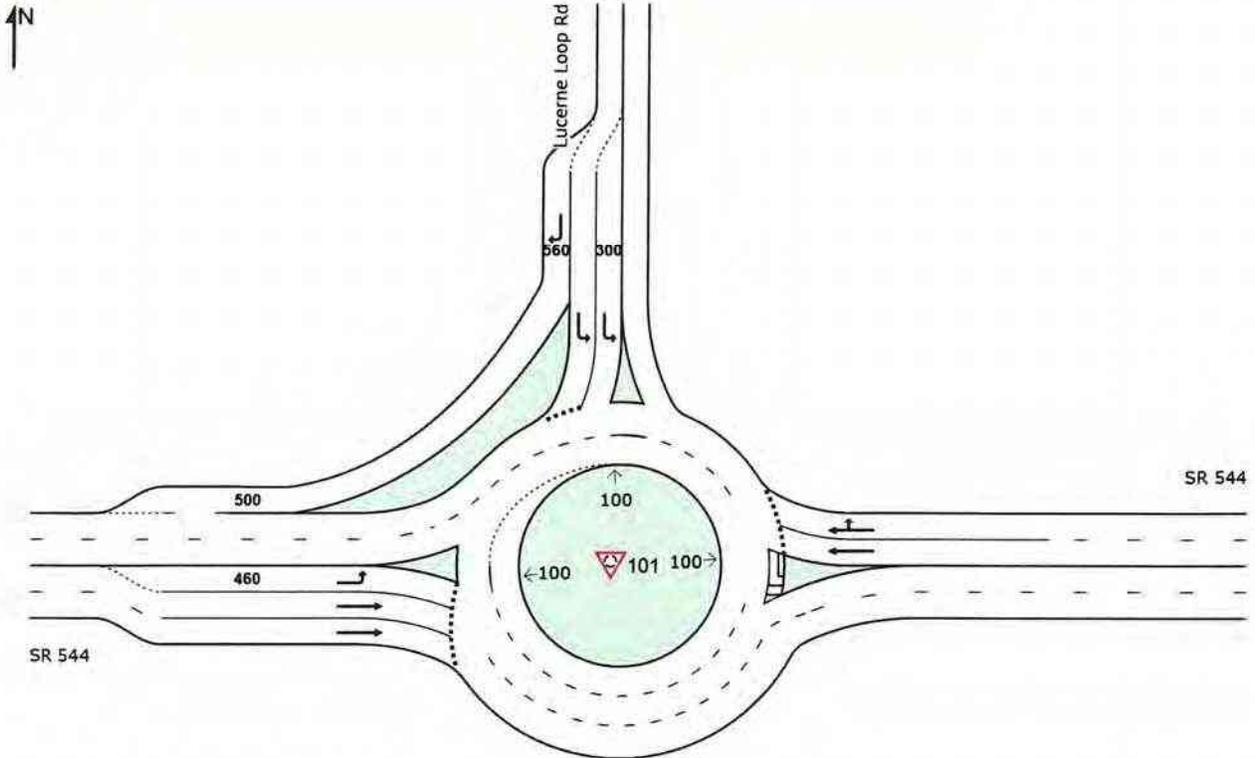
Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2044) PM Peak Hour - Build Alt 3

Site Category: (None)

Roundabout

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# MOVEMENT SUMMARY

Site: 101 [SR 544/Lucerne Loop Road Intersection (Site Folder: General)]

Interim Year (2044) PM Peak Hour - Build Alt 3  
 Site Category: (None)  
 Roundabout

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h ]	[ HV % ]	[ Total veh/h ]	[ HV % ]				[ Veh. veh ]	[ Dist. ft ]				
East: SR 544														
6	T1	1189	5.0	1252	5.0	0.809	20.4	LOS C	19.8	515.6	0.81	1.11	1.71	28.5
16	R2	336	44.0	354	44.0	0.809	23.0	LOS C	16.6	494.8	0.69	1.09	1.69	26.5
Approach		1525	13.6	1605	13.6	0.809	21.0	LOS C	19.8	515.6	0.78	1.11	1.70	28.0
North: Lucerne Loop Rd														
7	L2	473	44.0	498	44.0	0.312	3.6	LOS A	0.8	28.5	0.14	0.15	0.18	31.9
14	R2	192	44.0	202	44.0	0.174	3.6	LOS A	0.0	0.0	0.00	0.00	0.00	36.0
Approach		665	44.0	700	44.0	0.312	3.7	LOS A	0.8	28.5	0.10	0.11	0.13	32.9
West: SR 544														
5	L2	169	44.0	178	44.0	0.367	13.5	LOS B	1.2	39.1	0.61	0.68	0.79	28.2
2	T1	1326	5.0	1396	5.0	0.997	57.5	LOS F	26.9	700.6	1.00	2.17	4.49	19.3
Approach		1495	9.4	1574	9.4	0.997	52.5	LOS F	26.9	700.6	0.96	2.00	4.07	20.0
All Vehicles		3685	17.4	3879	17.4	0.997	30.6	LOS D	26.9	700.6	0.73	1.29	2.38	24.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

Delay Model: HCM Delay Formula (Geometric Delay is not included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Lane 1	407	-	407	44.0	1307	0.312	100	0.0	2
Lane 2	91	-	91	44.0	291	0.312	100	NA	NA
Lane 3	-	202	202	44.0	1163	0.174	100	0.0	2
Approach	498	202	700	44.0		0.312			

West: SR 544

Mov. From W To Exit:	L2	T1	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
	N	E							
Lane 1	178	-	178	44.0	485	0.367	100	0.0	2
Lane 2	-	663	663	5.0	665	0.997	100	NA	NA
Lane 3	-	733	733	5.0	735	0.997	100	NA	NA
Approach	178	1396	1574	9.4		0.997			
<b>Total %HV Deg. Satn (v/c)</b>									

Intersection 3879 17.4 0.997

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

**Merge Analysis**

Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate % veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
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East Exit: SR 544

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

Full Length Lane 2 Merge Analysis not applied.

North Exit: Lucerne Loop Rd

Merge Type: **Not Applied**

Full Length Lane 1 Merge Analysis not applied.

West Exit: SR 544

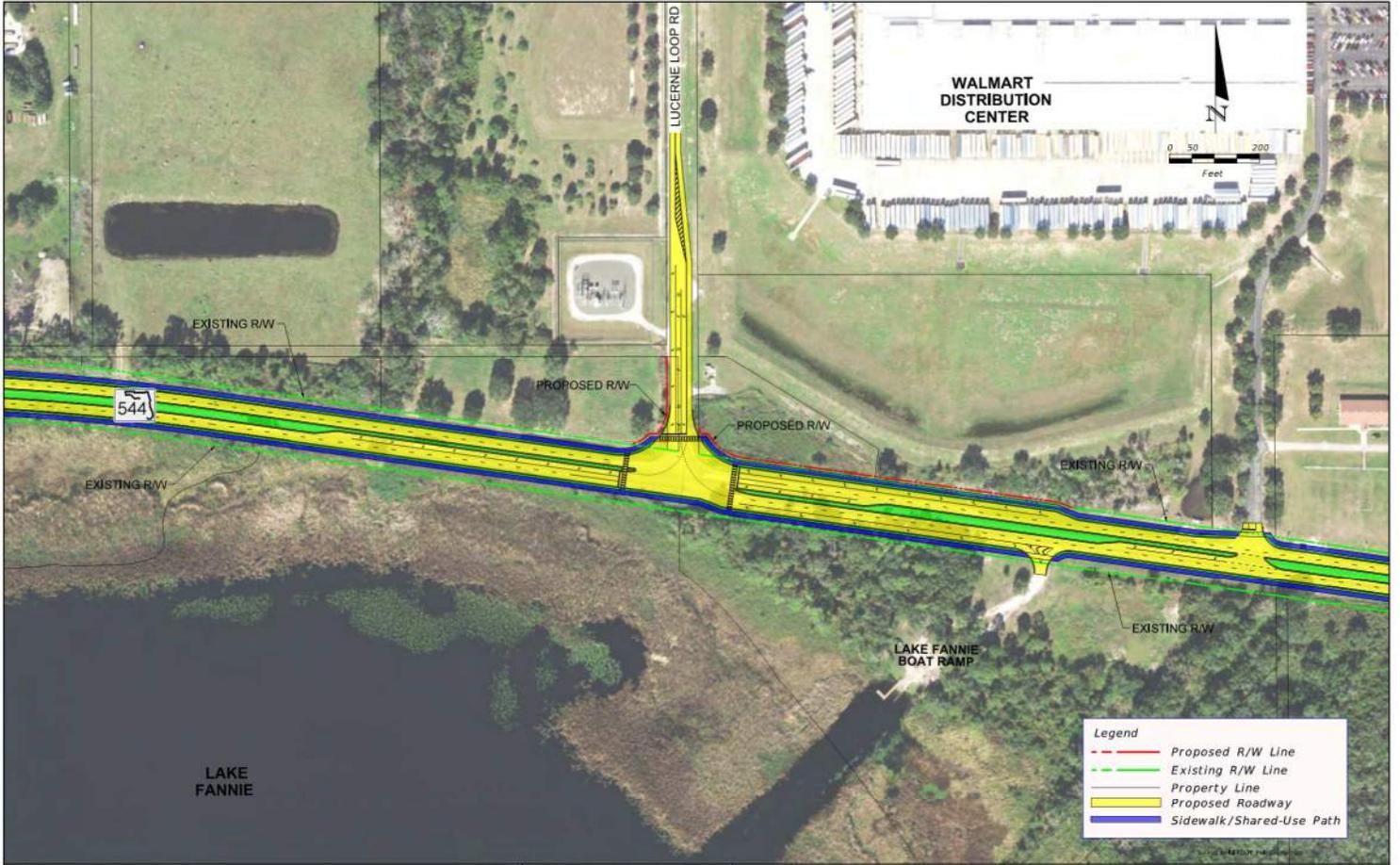
Merge Type: **Priority**

Exit Short Lane 3 500 0.0 385 404 3.00 2.00 202 1435 0.141 2.5 3.6

Merge Lane 2 - 100.0 Merge Lane is not Opposed 385 1800 0.214 0.0 0.0

## **Appendix E**

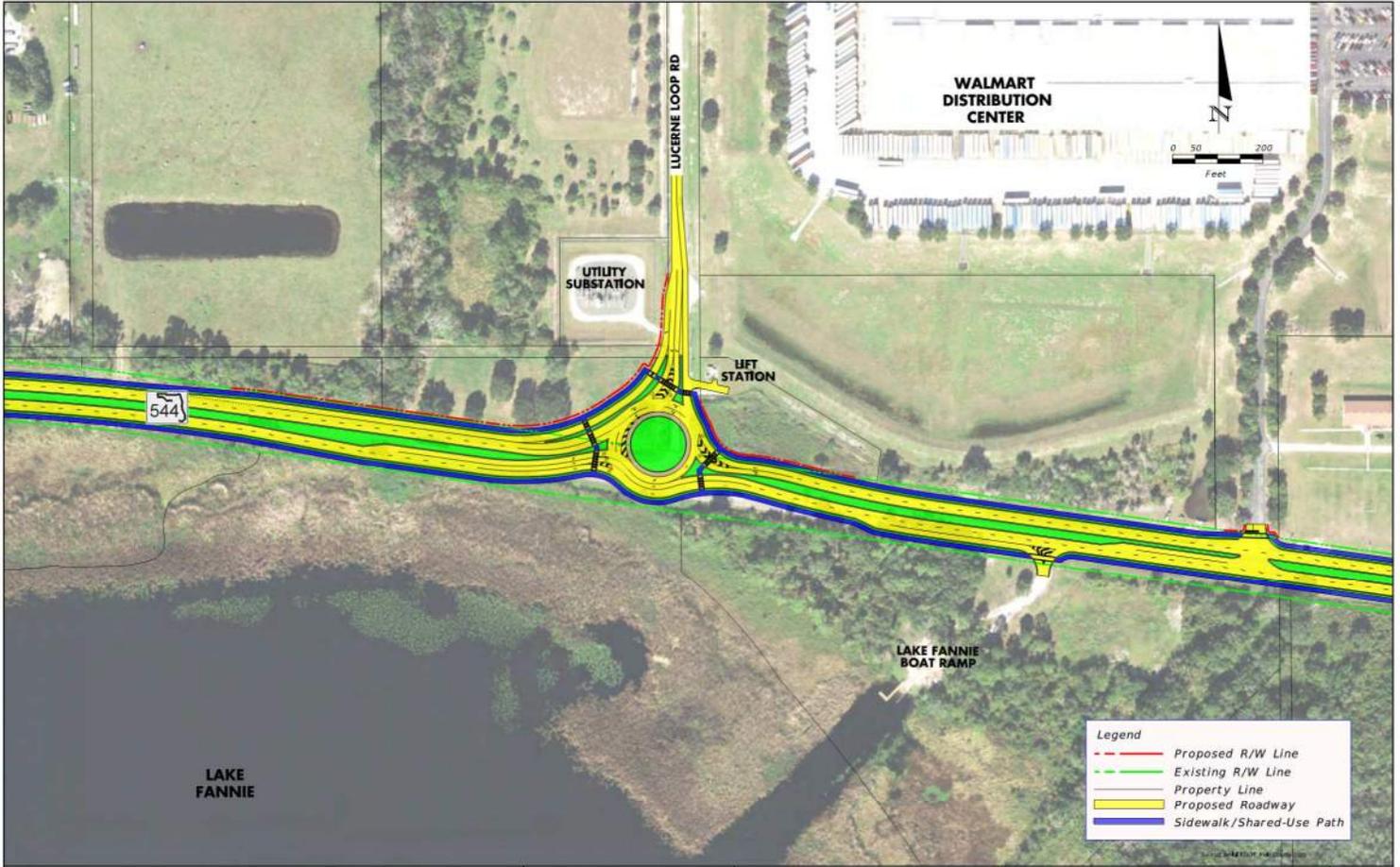
Roundabout and Signalized Intersection Preliminary Geometric Concepts



REVISIONS		ENGINEER OF RECORD		STATE OF FLORIDA			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	DEPARTMENT OF TRANSPORTATION	ROAD NO.	COUNTY	
						FINANCIAL PROJECT ID	2
Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Oviedo, Florida 32765				<b>SR 544 PD&amp;E STUDY</b> <b>LUCERNE LOOP RD</b> <b>SIGNALIZED ALTERNATIVE</b>			



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DATE	DESCRIPTION	DATE	DESCRIPTION	DEPARTMENT OF TRANSPORTATION	ROAD NO.	COUNTY		
				Mark D. Hales, PE PE No. 62430 Inwood Consulting Engineers, Inc. 3000 Dovera Drive, Suite 200 Dorado, Florida 32765				