

**930 Howland Boulevard
Deltona, Florida**

Rezoning Traffic Impact Analysis

**Prepared for: Blackfin Partners
By: LTG, Inc.
July 2025**



PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer properly registered in the State of Florida practicing with LTG, Inc., a corporation authorized to operate as an engineering business, F030424608005, by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluations, findings, opinions, conclusions, or technical advice attached hereto for:

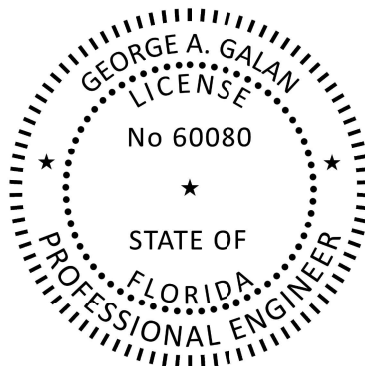
PROJECT: 930 Howland Boulevard– Traffic Impact Analysis
LOCATION: Deltona, Florida
CLIENT: Blackfin Partners
JOB #: 6383.02

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

Prepared by:

LTG, Inc.

1450 West Granada Boulevard, Suite 2
Ormond Beach, FL 32174
Vendor No. F030424608005
386/257-2571



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1450 WEST GRANADA BOULEVARD, SUITE
2
ORMOND BEACH, FL 32174
VENDOR NO. F030424608005
GEORGE A. GALAN, P.E. NO. 60080*

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1 INTRODUCTION

LTG, Inc. has been retained by Blackfin Partners to prepare a Rezoning Traffic Impact Analysis (RTIA) for the proposed 930 Howland Boulevard development located at 930 Howland Boulevard in Deltona, Florida. **Figure 1-1** shows the location of the development relative to the surrounding roadway network. The land use quantities and descriptions for the development are summarized below:

- Mini Warehouse (Self Storage) = 67,631 square-feet,
- Mini Warehouse (Self Storage) = 57 covered RV/boat spaces, and
- Fast Food Restaurant with Drive Through Window = 4,380 square-feet

The anticipated build-out year for the full development is 2027. Access to and from the development will be provided via one full access driveway along Howland Boulevard. A conceptual plan is provided as **Appendix A**.

1.1 Study Area

The study area consists of the following intersections and roadway segments as approved in the RTIA methodology letter submitted to the City of Deltona (provided as **Appendix B**):

Intersections

- Howland Boulevard at Elkcam Boulevard
- Howland Boulevard at Newmark Drive
- Howland Boulevard at Courtland Boulevard
- Howland Boulevard at Fort Smith Boulevard
- Howland Boulevard at SR 415
- Howland Boulevard at Full Access Project Driveway (future conditions)

Roadway Segments

- Howland Boulevard from Fort Smith Boulevard to Courtland Boulevard (provides access)

1.2 Planned Roadway Improvements

Information on the programmed or planned roadway improvements in the area was obtained from the Florida Department of Transportation (FDOT) Five-Year Work Program and the Volusia Flagler Transportation Planning Organization (VFTPO) Long Range Transportation Plan. At this time, there are no programmed or planned roadway improvements funded for construction in the next five years within the study area.



**930 Howland
Boulevard**



NTS

Location Map

Project No.: 6383.02

Figure 1-1



LTG

*Engineering
& Planning*

2 EXISTING ANALYSIS

The study area intersections and roadway segments were analyzed under existing conditions to determine the most current operational status of the network.

2.1 Existing Traffic Determination

Turning movement counts were collected for the study area intersections on May 1st, 2025 during the AM and PM peak hours. The turning movement counts were adjusted by the FDOT Seasonal Factor specified for the week the data was collected (≥ 1). **Figure 2-1** shows the existing AM and PM peak hour traffic volumes at the study area intersections. The raw turning movement counts and the FDOT Peak Season Factor Category Report are provided as **Appendix C**.

Seasonally adjusted PM peak hour tube counts, as made available by the Volusia County Traffic Engineering Division, were used for the study area roadway segments.

2.2 Intersection Analysis

The operating conditions at the study area intersections were evaluated using *Synchro*. **Table 2-1** presents the existing AM and PM peak hour Level of Service (LOS) at the study area intersections. The traffic signal timing sheets for the signalized intersections are provided as **Appendix D** and the *Synchro* summary sheets are provided as **Appendix E**.

As indicated in the table, all intersections are currently operating within the adopted LOS.

2.3 Roadway Segment Analysis

The existing PM peak hour two-way LOS for the study area roadway segments are presented in **Table 2-2**.

As indicated in the table, all roadway segments are currently operating within the peak hour capacity.

Table 2-1: Existing Intersection LOS

Intersection	Adopted LOS	Control Type	Time Period	EB		WB		NB		SB		Overall	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Howland Blvd at Elkcam Blvd	E	Traffic Signal	AM	28.6	C	29.4	C	26.8	C	26.0	C	27.4	C
			PM	36.2	D	32.4	C	35.6	D	34.0	C	34.6	C
2. Howland Blvd at Newmark Dr	E	Traffic Signal	AM	25.7	C	41.7	D	23.0	C	35.9	D	30.4	C
			PM	26.8	C	39.4	D	22.3	C	28.7	C	26.3	C
3. Howland Blvd at Courtland Blvd	E	Traffic Signal	AM	42.9	D	39.3	D	24.0	C	34.3	C	33.5	C
			PM	31.2	C	39.1	D	25.5	C	22.5	C	26.5	C
4. Howland Blvd at Fort Smith Blvd	E	Traffic Signal	AM	41.8	D	41.5	D	24.4	C	43.2	D	39.7	D
			PM	33.8	C	31.1	C	23.2	C	32.5	C	27.7	C
5. Howland Blvd at SR 415	E	Traffic Signal	AM	52.9	D	-	-	15.6	B	26.7	C	38.2	D
			PM	24.3	C	-	-	9.6	A	18.1	B	13.6	B

Table 2-2: Existing Roadway Segment LOS

Roadway	Segment	No. of Lanes	Adopted LOS	AADT	Existing PM Peak Hour Two-Way Volume	Peak Hour Two-Way Capacity at Adopted LOS	Existing PM Volume Exceeds Capacity?
Howland Blvd	Courtland Blvd	4	E	15,900	1,320	3,410	No
*No. of Lanes, Adopted LOS, AADT, Existing PM Peak Hour Volume, and Peak Hour Capacity obtained from the most recent Volusia County Traffic Count Spreadsheets.							

3 2027 BACKGROUND ANALYSIS

The study area intersections and roadway segments were analyzed to determine potential impacts of 2027 background traffic and to investigate any needed mitigation.

3.1 Background Traffic Determination

Growth rates were determined using 5 and 10 years of historical AADT, FDOT Traffic Trends software, and the methods outlined in Volusia County's Segment Growth Rates and Vested Trips Instructions Policy. The background traffic determination is provided as **Appendix F**. **Figure 3-1** and **Figure 3-2** show the background AM and PM peak hour traffic volumes, respectively, at the study area intersections.

3.2 Intersection Analysis

Table 3-1 presents the background AM and PM peak hour LOS at the study area intersections. The *Synchro* summary sheets are provided as **Appendix G**.

As indicated in the table, all intersections operate within the adopted LOS under 2027 background conditions.

3.3 Roadway Segment Analysis

The background PM peak hour two-way LOS for the study area roadway segments are presented in **Table 3-2**.

As indicated in the table, the roadway segment is anticipated to operate within the peak hour capacity under 2027 background conditions.

4 2027 BUILD-OUT ANALYSIS

The study area intersections and roadway segments were analyzed to determine potential impacts of 2027 build-out traffic and to investigate any needed mitigation.

4.1 Build-Out Traffic Determination

Project-related traffic was applied using the information contained in this section. **Figure 4-1**, **Figure 4-2**, **Figure 4-3** and **Figure 4-4** show the build-out AM and PM peak hour traffic volumes, respectively, at the study area intersections.

4.1.1 Trip Generation

The trip generation, as approved in the TIA methodology letter, is presented in **Table 4-1** and **Table 4-2**.

Table 4-1: Gross Trip Generation

Time Period	Land Use	ITE LUC	Trip Rate Equation	Size	Units	Percent Entering	Percent Exiting	Trips Entering	Trips Exiting	Total Trips
Daily	Mini Warehouse (Self Storage)	151	$T=18.86(X)-4.09$	0.570	Storage Units (100s)	50%	50%	4	4	8
	Mini Warehouse (Self Storage)	151	$T=1.45(X)$	67.631	KSF	50%	50%	49	49	98
	Fast Food with Drive-Through	934	$T=467.48(X)$	4.380	KSF	50%	50%	1,024	1,024	2,048
Totals:								1,077	1,077	2,154
AM Peak Hour	Mini Warehouse (Self Storage)	151	$T=1.21(X)$	0.570	Storage Units (100s)	51%	49%	1	0	1
	Mini Warehouse (Self Storage)	151	$T=0.09(X)$	67.631	KSF	59%	41%	4	2	6
	Fast Food with Drive-Through	934	$T=44.61(X)$	4.380	KSF	51%	49%	99	96	195
Totals:								104	98	202
PM Peak Hour	Mini Warehouse (Self Storage)	151	$T=1.68(X)$	0.570	Storage Units (100s)	50%	50%	1	1	2
	Mini Warehouse (Self Storage)	151	$T=0.15(X)$	67.631	KSF	47%	53%	5	5	10
	Fast Food with Drive-Through	934	$T=33.03(X)$	4.380	KSF	52%	48%	75	70	145
Totals:								81	76	157

Table 4-2: Net Trip Generation

Time Period	ITE LUC	Total Trips			Pass-By Trips			New External Trips		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
AM Peak Hour	151	1	0	1	0	0	0	1	0	1
	151	4	2	6	0	0	0	4	2	6
	934	99	96	195	50	48	98	49	48	97
Totals:		104	98	202	50	48	98	54	50	104
PM Peak Hour	151	1	1	2	0	0	0	1	1	2
	151	5	5	10	0	0	0	5	5	10
	934	75	70	145	42	38	80	33	32	65
Totals:		81	76	157	42	38	80	39	38	77

4.1.2 Trip Distribution & Assignment

The trip distribution, as approved in the TIA methodology letter, is provided as **Appendix H**. The final step in the analysis was to assign the project-related traffic to the roadway network using the trip generation and distribution.

4.2 Intersection Analysis

Table 4-3 presents the build-out AM and PM peak hour LOS at the study area intersections. The *Synchro* summary sheets are provided as **Appendix I**.

As indicated in the table, all intersections are anticipated to operate within the adopted LOS under 2027 build-out conditions.

4.3 Roadway Segment Analysis

The build-out PM peak hour two-way LOS for the study area roadway segments are presented in **Table 4-4**.

As indicated in the table, all roadway segments are anticipated to operate within the peak hour capacity under 2027 build-out conditions.

4.4 Queue Length & Turn Lane Analysis

A queue length analysis was conducted to determine recommended turn lane lengths for existing turn lanes at the study area intersections. The Synchro results were used to obtain the 95th percentile queue lengths expected for each exclusive turn lane during the AM and PM peak hours. Turn lane requirements were evaluated using the Volusia County's Land Development Code Section 72-619 Table VI and FDOT Design Manual Exhibit 212-1. The resulting recommended turn lane lengths for the study area intersections are provided as **Appendix J**. **Table 4-5** presents a summary of the maximum required turn lane lengths under existing, background, and build-out conditions.

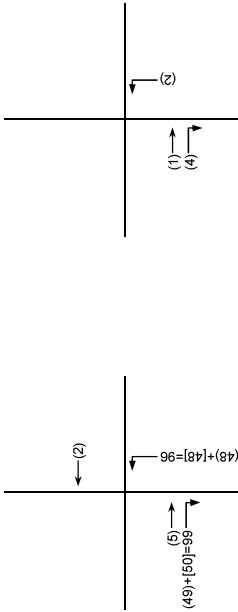
As indicated in the table, there is one anticipated turn lane deficiencies due to the addition of project trips.

7

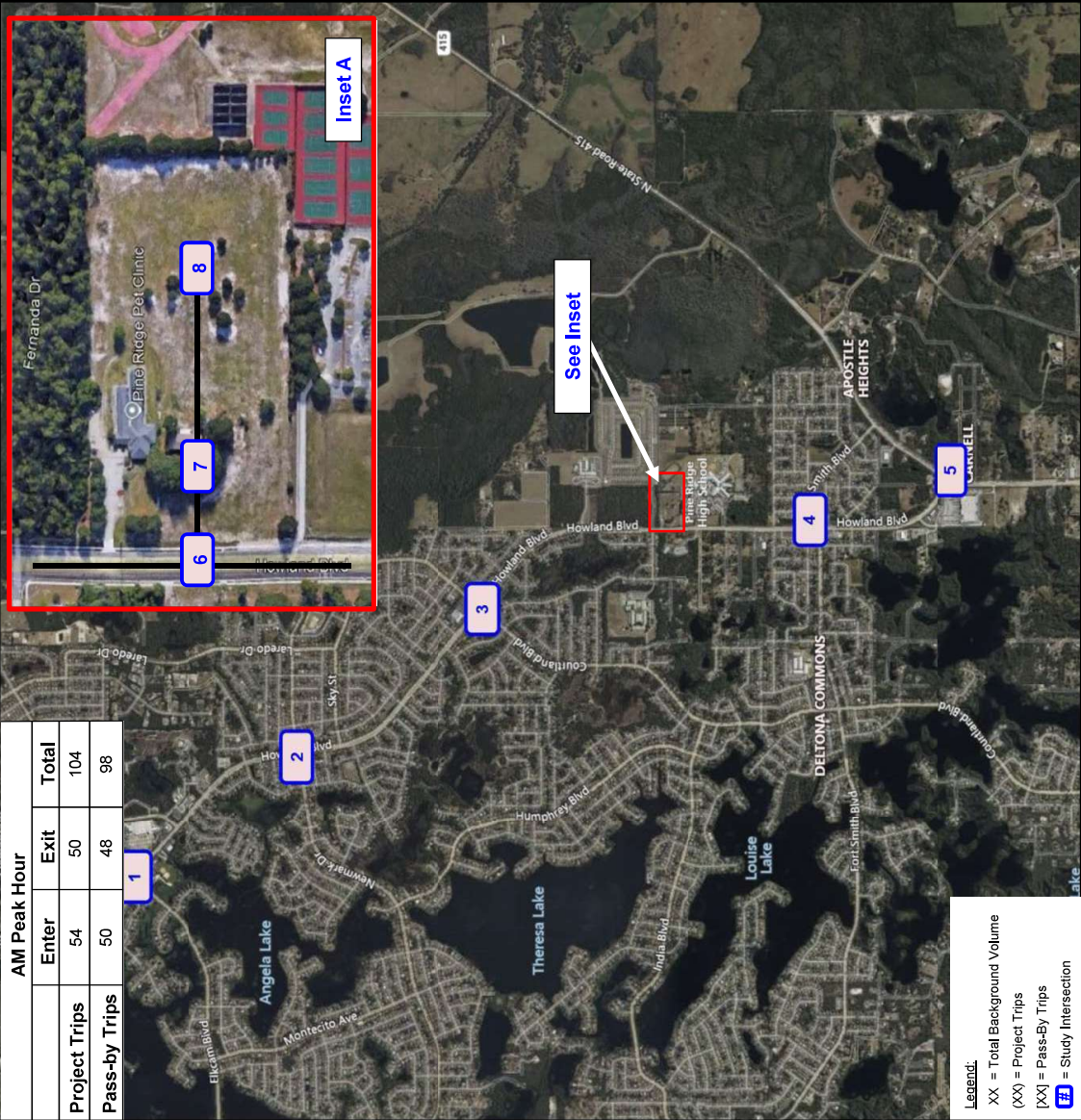
Project Driveway at Fast Food Restaurant

8

Project Driveway at Storage Facility



AM Peak Hour			
	Enter	Exit	Total
Project Trips	54	50	104
Pass-by Trips	50	48	98



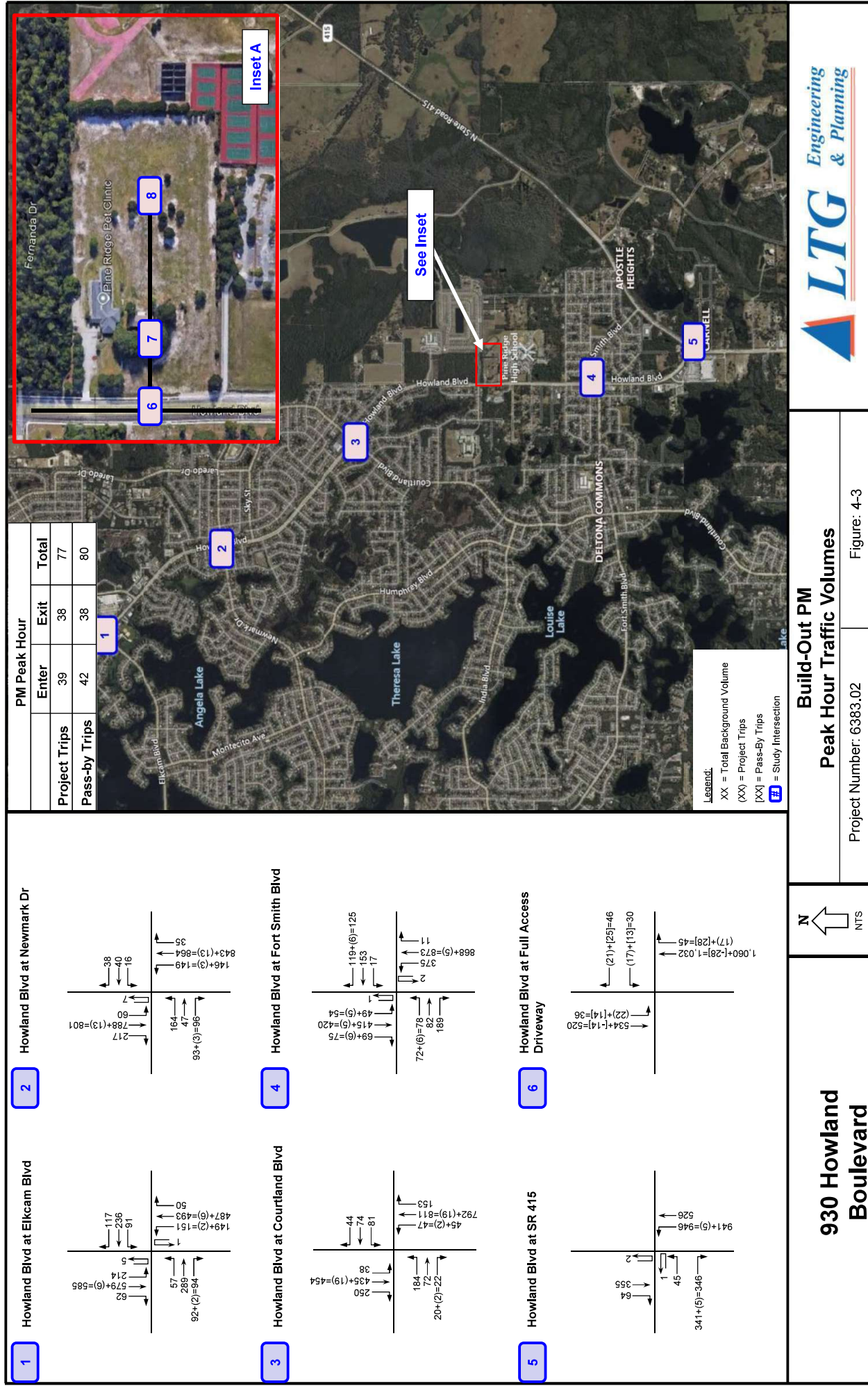


Table 4-3: Build-Out Intersection LOS

Intersection	Adopted LOS	Control Type	Time Period	EB		WB		NB		SB		Overall	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	Max V/C
1. Howland Blvd at Elkcarn Blvd	E	Traffic Signal	AM	29.3	C	29.6	C	27.5	C	26.9	C	28.0	C 0.790
			PM	37.8	D	33.5	C	37.0	D	35.5	D	36.0	D 0.860
2. Howland Blvd at Newmark Dr	E	Traffic Signal	AM	27.1	C	44.1	D	23.9	C	40.1	D	32.9	C 0.860
			PM	28.0	C	41.3	D	23.4	C	31.2	C	28.0	C 0.840
3. Howland Blvd at Courtland Blvd	E	Traffic Signal	AM	45.0	D	42.0	D	25.0	C	38.2	D	36.2	D 0.850
			PM	32.5	C	40.8	D	26.9	C	23.2	C	27.6	C 0.770
4. Howland Blvd at Fort Smith Blvd	E	Traffic Signal	AM	44.8	D	44.0	D	26.0	C	50.6	D	44.6	D 0.930
			PM	34.8	C	32.5	C	24.4	C	34.4	C	29.1	C 0.830
5. Howland Blvd at SR 415	E	Traffic Signal	AM	68.7	E			15.6	B	27.2	C	46.8	D 1.070
			PM	24.8	C			10.8	B	19.2	B	14.7	B 0.820
6. Howland Blvd at Full Access Driveway	E	TWSC	AM			24.2	C	0.0	NR*	0.35	NR*	1.4	NR* 0.356
			PM			26.8	D	0.0	NR*	0.73	NR*	1.4	NR* 0.328
7. Project Driveway at Fast Food Restaurant	E	TWSC	AM	0.0	NR*	0.0	NR*	9.3	A			4.4	NR* 0.107
			PM	0.0	NR*	0.0	NR*	9.0	A			4.0	NR* 0.077
8. Project Driveway at Storage Facility	E	TWSC	AM	0.0	NR*			0.0	NR*	0.0	A	0.0	NR* 0.000
			PM	0.0	NR*			0.0	NR*	0.0	NR*	0.0	NR* 0.000

Table 4-4: Build-Out Roadway Segment LOS

Roadway	Segment	No. of Lanes	Adopted LOS	Existing PM Peak Hour Two-Way Volume	Total 2027 Background Volume	Project Distribution	Project Trips	Total 2027 Build-Out Volume	Peak Hour Two-Way Capacity at Adopted LOS	Build-Out PM Volume Exceeds Peak Hour Capacity?
Howland Blvd	Courtland Blvd	4	E	1,320	1,452	100.0%	77	1,529	3,410	No
	Fort Smith Blvd									

Table 4-5: Queue Length & Turn Lane Analysis

Intersection	Turn Lane	Existing Lane Length (ft)	Existing Maximum Required Turn Lane Length (ft)		Background Maximum Required Turn Lane Length (ft)		Build-Out Maximum Required Turn Lane Length (ft)		Deficiency Due To Build-Out (ft)
			AM/PM	Length	AM/PM	Length	AM/PM	Length	
Howland Blvd at Newmark Dr	NBL	325	AM	450	PM	450	AM	475	25

*The two longest turn lane lengths are highlighted. The deficiency due to build-out is determined by taking the difference between the build-out maximum required turn lane length and the greatest turn length between the existing lane length, the existing maximum required turn lane length, and the background maximum required turn lane length.

4.5 Safety Analysis

At the request of Volusia County Traffic Operations staff, an analysis of the existing crash data was conducted using data provided from crash reports (2020-2024) for the development access points and all intersections where build-out improvements are proposed. Since there are no intersections with proposed build-out improvements, a safety analysis was not included.

4.6 Alternative Mode Analysis

An alternative mode analysis has been conducted to determine existing and proposed alternate modes of transportation within the immediate study area.

4.6.1 School Proximity

It is noted that the proposed development is located within approximately two miles of Pine Ridge High School, Heritage Middle School, Sunrise Elementary School, and Pride Elementary School.

4.6.2 Votran

Votran, Volusia County's public transportation system, provides transportation alternatives to all urban areas of the county via fixed-route buses and paratransit vehicles. The frequency of most routes is one hour, with a few operating on the half-hour. Standard daily service is provided from 6 AM to 7 PM, Monday through Saturday, with a limited fixed-route service at night and on Sunday. At this time, Votran does not provide service within the vicinity of the proposed development.

4.6.3 Sidewalk Connectivity

Per Volusia County's Land Development Code, the development will be required to provide sidewalk connectivity to the development. There is existing sidewalk located along the eastside and westside of Howland Boulevard adjacent to the proposed development.

4.6.4 Bicycle Suitability & Trails

The current Suitability/Comfort Levels for bicycle users are presented in **Table 4-6**. A bicycle suitability map and trail map are provided as **Appendix K**. The SR 415 Trail is the only trail located within a 3-mile radius of the development.

Table 4-6: Suitability/Comfort Levels for Bicycle Users

Roadway	Segment		Suitability/Comfort Level
Howland Boulevard	Newmark Drive	SR 415	Low Comfort
Newmark Drive	Howland Boulevard	Courtland Boulevard	Medium Comfort
Courtland Boulevard	Newmark Drive	Doyle Road	Medium Comfort
India Boulevard	Fort Smith Boulevard	Howland Boulevard	Medium Comfort
Fort Smith Boulevard	India Boulevard	Courtland Boulevard	High Comfort
	Courtland Boulevard	SR 415	Medium Comfort
SR 415	Doyle Road	Acorn Lake Road	Medium Comfort
	Acorn Lake Road	Osceola Tram Road	Extremely Low Comfort

As indicated in the table, the area mainly consists of Medium comfort levels for bicycle users.

4.7 Site Access Review

Access to and from the development will be provided via one full access driveway along Howland Boulevard. Additionally, at the request of Volusia County, The requirements for turn lanes were evaluated using Volusia County's Land Development Code Section 72-619, the FDOT Design Manual Exhibit 212-1, and a posted speed of 45 miles per hour along Howland Boulevard. The results are presented below:

Howland Boulevard at Full Access Project Driveway:

- A 240-ft (includes deceleration and 50-ft taper) northbound right turn lane is required based on the posted speed limit.
- A 240-ft (includes deceleration and 50-ft taper) southbound left turn is required based on peak hour volumes.
 - Currently, a two-way left-turn lane exists along Howland Boulevard adjacent to the project driveway. A section of the two-way left-turn lane will need to be restriped for the exclusive southbound left-turn lane required for the proposed development.

Additionally, the queueing for both land uses was examined based on the number of vehicles entering and exiting during the peak hours.

For the Fast Food land use, approximately 8 vehicles can queue within the provided drive through as shown in **Appendix A**. Based on the maximum anticipated project volumes and pass-by trips projected to enter and exit the Fast Food restaurant (84 vehicles entering and 81 during the AM peak hour, includes pass-by), approximately 1.4 vehicles per minute are expected to enter and exit the Fast Food driveway. The storage provided on site is expected to provide sufficient queueing space for vehicles entering.

For the Storage land use, the maximum anticipated project volumes anticipated to enter and exit the Storage land use (6 vehicles entering and 6 vehicles exiting during the PM peak hour), resulting in approximately less than 1 vehicle per minute entering and exiting the Storage driveway.

5 CONCLUSION

This study was conducted to evaluate the impact of the proposed 930 Howland Boulevard development on the surrounding roadway network in Deltona, Florida.

5.1 Recommended Improvements

There are no intersections and segment improvements in the study area.

The results of the queue length and turn lane analysis indicate that there are one turn lane that are anticipated to be deficient due to the addition of project trips. **Table 5-1** presents a summary of the maximum required turn lane lengths under existing, background, and build-out conditions.

Table 5-1: Queue Length & Turn Lane Improvements

Intersection	Turn Lane	Existing Lane Length (ft)	Existing Maximum Required Turn Lane Length (ft)		Background Maximum Required Turn Lane Length (ft)		Build-Out Maximum Required Turn Lane Length (ft)		Deficiency Due To Build-Out (ft)
			AM/PM	Length	AM/PM	Length	AM/PM	Length	
Howland Blvd at Newmark Dr	NBL	325	AM	450	PM	450	AM	475	25

The recommended improvements eligible for proportionate share, the estimated improvement cost, and proportionate share calculations are to be negotiated once the TIA results are accepted.

5.2 Site Access

Access to and from the development will be provided via one full access driveway along Howland Boulevard. Additionally, at the request of Volusia County, The requirements for turn lanes were evaluated using Volusia County's Land Development Code Section 72-619, the FDOT Design Manual Exhibit 212-1, and a posted speed of 45 miles per hour along Howland Boulevard. The results are presented below:

Howland Boulevard at Full Access Project Driveway:

- A 240-ft (includes deceleration and 50-ft taper) northbound right turn lane is required based on the posted speed limit.
- A 240-ft (includes deceleration and 50-ft taper) southbound left turn is required based on peak hour volumes.
 - Currently, a two-way left-turn lane exists along Howland Boulevard adjacent to the project driveway. A section of the two-way left-turn lane will need to be restriped for the exclusive southbound left-turn lane required for the proposed development.

Based on the results of this analysis and the recommendations provided above, the 930 Howland Boulevard development is recommended for approval.

APPENDIX A

Conceptual Site Plan

APPENDIX B

TIA Methodology Letter

Via Email: jentwistle@deltonafl.gov

Ref: 6383.01

March 31, 2025

Jessica Entwistle
Assistant Director
Planning and Development Services
2345 Providence Blvd
Deltona, FL 32725

Re: 930 Howland Boulevard – Rezoning Traffic Impact Analysis (RTIA) – Methodology Letter
Deltona, Florida

Dear Ms. Entwistle:

LTG, Inc. (LTG) has been retained by Blackfin Partners to prepare a Rezoning Traffic Impact Analysis (RTIA) for the proposed development known as 930 Howland Boulevard. The development is located at 930 Howland Boulevard in the City of Deltona, Florida. Access is proposed via a full access driveway along Howland Boulevard. Build-out of the proposed development is anticipated by 2027. **Figure 1** shows the location of the project relative to the surrounding road network. A layout of the proposed site is attached as **Exhibit A**. The development will consist of the following land uses:

- Mini Warehouse (Self Storage) = 67,631 square-feet, 57 covered RV/boat spaces
- Fast Food Restaurant with Drive Through Window = 3,700 square-feet

The City has adopted the Volusia Flagler Transportation Planning Organization (R2CTPO) TIA guidelines. In accordance with these guidelines, this letter outlines the proposed methodology by which the analysis will be conducted. The analysis will be based on the latest concurrency information obtained from the Volusia County Traffic Engineering Department, the City Public Works and/or Development Services Departments, and the Florida Department of Transportation (FDOT).

Analysis Period

Roadway segments will be analyzed based on PM peak-hour two-way traffic and the intersections will be analyzed for AM and PM peak-hours. The analysis will be conducted under 2025 existing conditions, 2027 background conditions, and 2027 build-out conditions. The AM and PM peak-hour turning movement counts will be collected on a typical weekday (Tuesday, Wednesday, or Thursday) between the hours of 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. The traffic counts will be adjusted by the FDOT Seasonal Factor (SF), specified for the week the data is collected. SF values less than 1.0 will not be applied.

Project Trip Generation

The daily, AM and PM peak hour trip generation for the proposed development was determined using the trip generation rates published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 11th Edition. The resulting gross trip generation is presented in **Table 1**.



**930 Howland
Boulevard**



NTS

Location Map

Project No.: 6383.01

Figure 1



Table 1
Gross Trip Generation
930 Howland Boulevard

Time Period	Land Use	ITE LUC	Trip Rate Equation	Size	Units	Percent Entering	Percent Exiting	Trips Entering	Trips Exiting	Total Trips
Daily	Mini Warehouse (Self Storage)	151	$T=18.86(X)-4.09$	0.570	Storage Units (100s)	50%	50%	4	4	8
			$T=1.45(X)$	67.631	KSF	50%	50%	49	49	98
	Fast Food with Drive-Through	934	$T=467.48(X)$	3.700	KSF	50%	50%	865	865	1,730
Totals:								918	918	1,836
AM Peak Hour	Mini Warehouse (Self Storage)	151	$T=1.21(X)$	0.570	Storage Units (100s)	51%	49%	1	0	1
			$T=0.09(X)$	67.631	KSF	59%	41%	4	2	6
	Fast Food with Drive-Through	934	$T=44.61(X)$	3.7	KSF	51%	49%	84	81	165
Totals:								89	83	172
PM Peak Hour	Mini Warehouse (Self Storage)	151	$T=1.68(X)$	0.57	Storage Units (100s)	50%	50%	1	1	2
			$T=0.15(X)$	67.631	KSF	47%	53%	5	5	10
	Fast Food with Drive-Through	934	$T=33.03(X)$	3.7	KSF	52%	48%	63	59	122
Totals:								69	65	134

*Covered boat storage = storage units

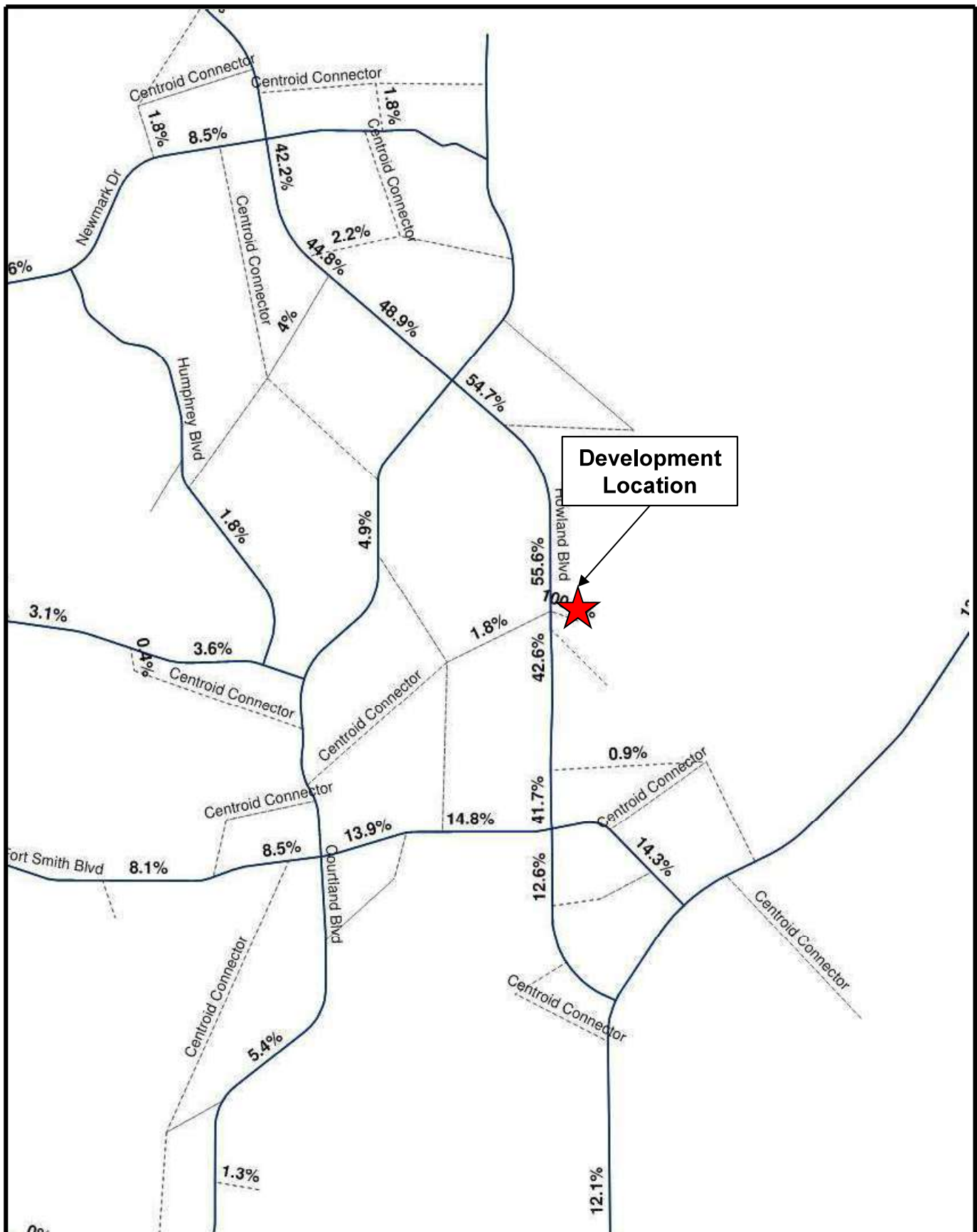
The pass-by trips were calculated using procedures outlined in the ITE Trip Generation Handbook, 3rd Edition and reviewed to ensure that they did not exceed the established threshold of 14% of the adjacent roadway traffic volume for non-state facilities. Pass-by trips were deducted from the gross trip generation and the resulting net new external AM and PM peak-hour trips are provided in **Table 2**. In analysis of the site-access intersections with major roads, the pass-by trips shall be included and separately identified.

Table 2
Net External Trip Generation
930 Howland Boulevard

Time Period	ITE LUC	Total Trips			Internal Trips			Pass-By Trips			New External Trips		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
AM Peak Hour	151	1	0	1	0	0	0	0	0	0	1	0	1
	151	4	2	6	0	0	0	0	0	0	4	2	6
	934	84	81	165	0	0	0	42	41	83	42	40	82
Totals:		89	83	172	0	0	0	42	41	83	47	42	89
PM Peak Hour	151	1	1	2	0	0	0	0	0	0	1	1	2
	151	5	5	10	0	0	0	0	0	0	5	5	10
	934	63	59	122	0	0	0	35	32	67	28	27	55
Totals:		69	65	134	0	0	0	35	32	67	34	33	67

Project Trip Distribution

The Central Florida Regional Planning Model, version 7 (CFRPM) was used to obtain the project trip distribution for the proposed development. A select zone analysis was completed for model base year 2027 and resulted in the project trip distribution shown in **Figure 2**. This project trip distribution will be used in evaluating roadway segment significance and will be used to distribute project traffic at external intersections.



930 Howland
Boulevard



NTS

Project Trip Distribution

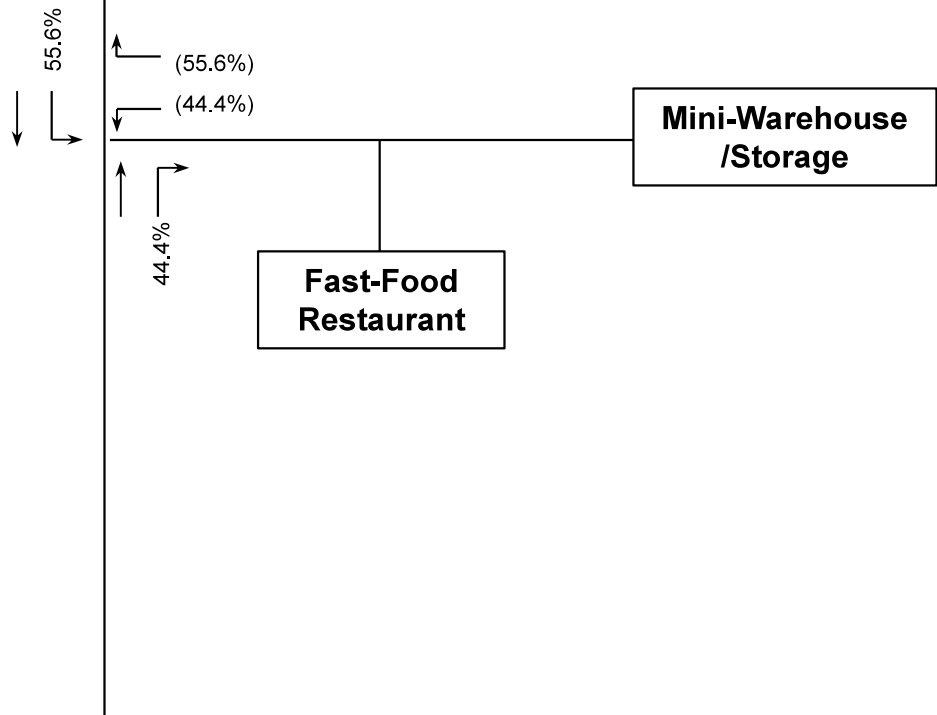
Project No.: 6383.01

Figure 2A



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& Planning



X% = Entering Traffic Distribution
(X%) = Exiting Traffic Distribution

**930 Howland
Boulevard**



NTS

**Project Trip
Distribution at the
Project Driveway**

Project No.: 6383.01

Figure 2B



LTG

*Engineering
& Planning*

Planned Roadway Improvements

Information on programmed or planned roadway improvements in the area of interest was obtained from the FDOT Five-Year Work Program, Volusia County, the City of Deltona 5-Year Road Program, the Volusia Flagler TPO Long Range Transportation Plan, and previously approved projects. At this time, there are no capacity enhancing improvements within the study area.

Study Area

Per the VFTPO guidelines, projects must include all roadway segments to which the site has direct connections, that are impacted by the proposed project to within three percent or greater of the peak hour two-way adopted level of service (LOS) capacity, major intersections along the significant segments, and roadway segments that have been designated as “critical” or “near critical” by Volusia County within the site traffic influenced segments.

Critical and near critical roadways are defined by Volusia County as roadways with a volume to capacity (v/c) ratio that is equal to or greater than 1.0 and 0.90, respectively. **Figure 3** depicts the critical and near critical roadway segments within the area.

Using the project trip distribution, PM peak hour project trips were assigned to the roadway network to determine the roadway segments that are impacted by the proposed project to within three percent or greater of the peak hour two-way adopted LOS capacity. **Table 3** presents the significance test on area roadways for the proposed development.

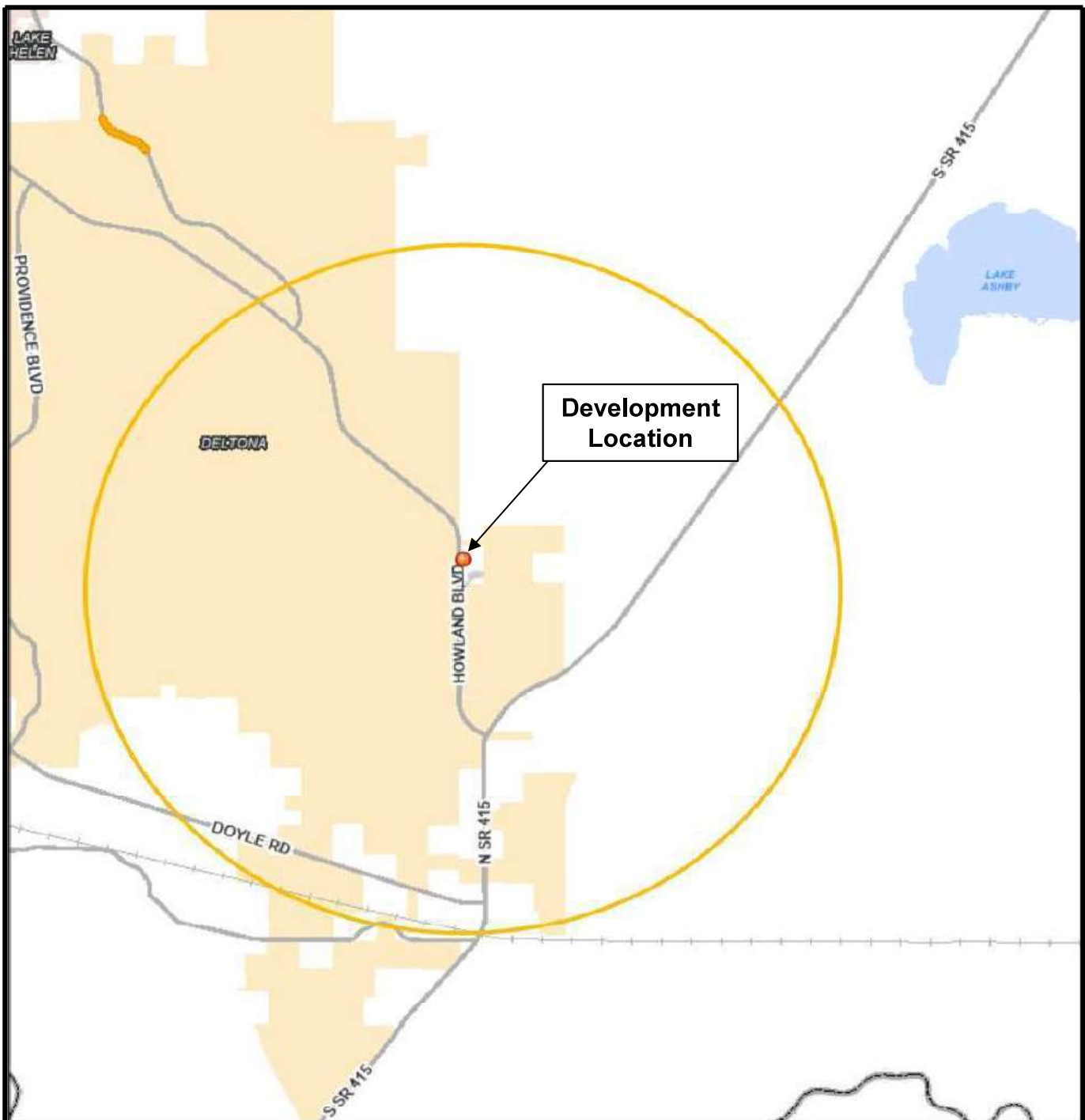
Based on the results of the significance test and the critical/near critical roadway segments in the area, the following intersections and roadway segments will be included in the study:

Roadway Segments:

- Howland Boulevard from Fort Smith Boulevard to Courtland Boulevard (provides access)

Intersections:

- Howland Boulevard at Elkcarn Boulevard
- Howland Boulevard at Newmark Drive
- Howland Boulevard at Courtland Boulevard
- Howland Boulevard at Fort Smith Boulevard
- Howland Boulevard at SR 415



**930 Howland
Boulevard**



Critical Map

Project No.: 6383.01

Figure 3



Table 3
Significance Test
930 Howland Boulevard

Roadway	Segment		No. of Lanes	Adopted LOS ¹	Adopted LOS ²	Peak Hour Two-Way Capacity at Project Distribution	PM Peak Hour Two-Way		
							Project Trips	Impact of LOS	3% Significant?
Howland Blvd	Elkcam Blvd	Lake Helen-Osteen Rd	4	E	3,410	21.1%	14	0.41%	No
	Lake Helen-Osteen Rd	Newmark Dr	4	E	3,410	34.1%	23	0.67%	No
	Newmark Dr	Courtland Blvd	4	E	3,410	48.9%	33	0.96%	No
	Courtland Blvd	Ft Smith Blvd	4	E	3,410	100.0%	67	1.96%	No
	Ft Smith Blvd	SR 415	4	E	3,410	12.6%	8	0.25%	No
SR 415	Enterprise-Osteen Rd	Howland Blvd	4	D	3,580	12.1%	8	0.23%	No
	Howland Blvd	Acorn Lake Rd	4	D	3,580	13.9%	9	0.26%	No
	Acorn Lake Rd	SR 44	2	C	1,620	13.9%	9	0.57%	No
Doyle Rd	Saxon Blvd	Courtland Blvd	2	E	1,230	3.6%	2	0.20%	No
	Courtland Blvd	Howland Blvd	2	E	1,230	0.0%	0	0.00%	No
Courtland Blvd	Doyle Rd	Ft Smith Blvd	2	E	1,230	5.4%	4	0.29%	No
	Ft Smith Blvd	Howland Blvd	2	E	1,230	4.9%	3	0.27%	No
Ft Smith Rd	Normandy Blvd	Courtland Blvd	2	E	1,230	8.5%	6	0.46%	No
	Courtland Blvd	Howland Blvd	2	E	1,230	14.8%	10	0.81%	No
	Howland Blvd	SR 415	2	E	1,230	14.3%	10	0.78%	No

¹Per Comprehensive Plan of Jurisdiction.

²Obtained from the most recent Volusia County Traffic Count Spreadsheet.

Critical

Near Critical

Direct Access

2027 Build-Out Traffic

The build-out traffic will be developed by the sum of the background traffic (derived from historical growth rates and/or vested trips as identified by Volusia County and the City of Deltona) and the estimated project traffic. Growth rates for each study area roadway segment will be determined based on Volusia County's Segment Growth Rates and Vested Trips Instructions Policy flow chart (attached as **Exhibit B**). Per Volusia County directive, exponential regression will not be used to determine growth and 2020 AADTs will not be used.

Any vested trips that are required to be included in the background assessment on the study area roadway segments or at the intersections will need to be provided by the city or county for use in the analysis. All improvements funded for construction within the first three years of the five-year work program will be considered in the future analysis.

Segment Analysis – Existing, Background, and Build-Out Conditions

Segment analyses will be conducted under PM peak hour two-way conditions. If the future projected volume is expected to exceed the maximum service volume of a roadway segment, a transportation analysis may be conducted to determine service volume specific to that segment. The procedures documented in the latest version of the FDOT *Quality/Level of Service Handbook* will be used to determine specific capacity, if necessary.

Intersection Analysis – AM and PM Peak Hours (Existing, Background, and Build-Out Conditions)

Intersections will be analyzed under both AM and PM peak hour conditions. The operating conditions for both the existing and future conditions at the signalized and unsignalized intersections will be analyzed using the latest version of *Highway Capacity Software 7* (HCS) or *Synchro 12*. This software utilizes the procedures outlined in

Chapters 19 and 20 of the HCM 7th Edition *Highway Capacity Manual*, titled "Two-Way Stop Control Intersections" and "Signalized Intersections," respectively.

Alternative Mode Analysis

An alternate mode analysis will be conducted which will evaluate present and programmed bike, pedestrian, and transit mobility options. Planned bicycle and pedestrian connections within the development will be identified. Votran shall be notified of the proposed project (land use and intensity), and comments shall be requested for potential future routes.

Site Access Analysis

A site access analysis based on the proposed preliminary plan and driveway geometry will be included in the analysis. The current driveway spacing and turn lane criteria adopted by the maintaining agency will be used to evaluate any necessary access improvements or recommendations.

Additionally, a safety analysis will be conducted at the proposed project driveways. The safety analysis, currently required by Volusia County, will be conducted by reviewing the most recent available five (5) years of crash data. A crash summary will be provided for each intersection with build-out improvements. Applicable crash countermeasures or Crash Modification Factors (CMF) from the CMF Clearinghouse will be provided to mitigate identified crashes and/or safety issues due to the recommendation(s) made under build-out conditions. Crash data will be obtained from the Volusia County Traffic Engineering Division.

Mitigation Recommendations

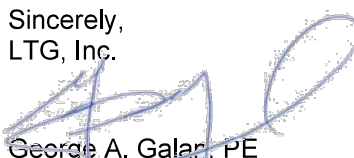
Per Volusia CTE, mitigation recommendations will be provided for all study area roadway segments and intersections that are currently operating or projected to operate outside of the adopted LOS. Improvements to address volume to capacity (v/c) ratios greater than 1.0 will only be addressed if needed to achieve adopted LOS.

All proposed mitigation improvements will be consistent with the appropriate City and County Comprehensive Plan Transportation Element. If roadway widening is proposed on a county facility beyond that which is indicated on the County's adopted Future Number of Lanes Map (or allowed by the County Traffic Engineer if such an amendment is pending), an alternative mitigation improvement project will be proposed. Recommendations to intersections and roadway segments within the study area will be provided, as applicable, in accordance with the roadway jurisdiction level-of-service standards. Mitigation recommendations may also include site access related improvements, mobility enhancement for alternative modes of travel, and for improved operational safety.

It is understood that this methodology will remain valid for a period of six (6) months from the date of approval.

Please review and advise if you agree with the proposed methodology or provide comments relating to preferred revisions. If you have any questions, please contact me at 386-257-2571.

Sincerely,
LTG, Inc.


George A. Galan, PE
Director of Traffic Operations

Attachments:

Exhibit A: Conceptual Site Plan

Exhibit B: Volusia County Background Growth Policy

EXHIBIT A

Conceptual Site Plan

[illegible]

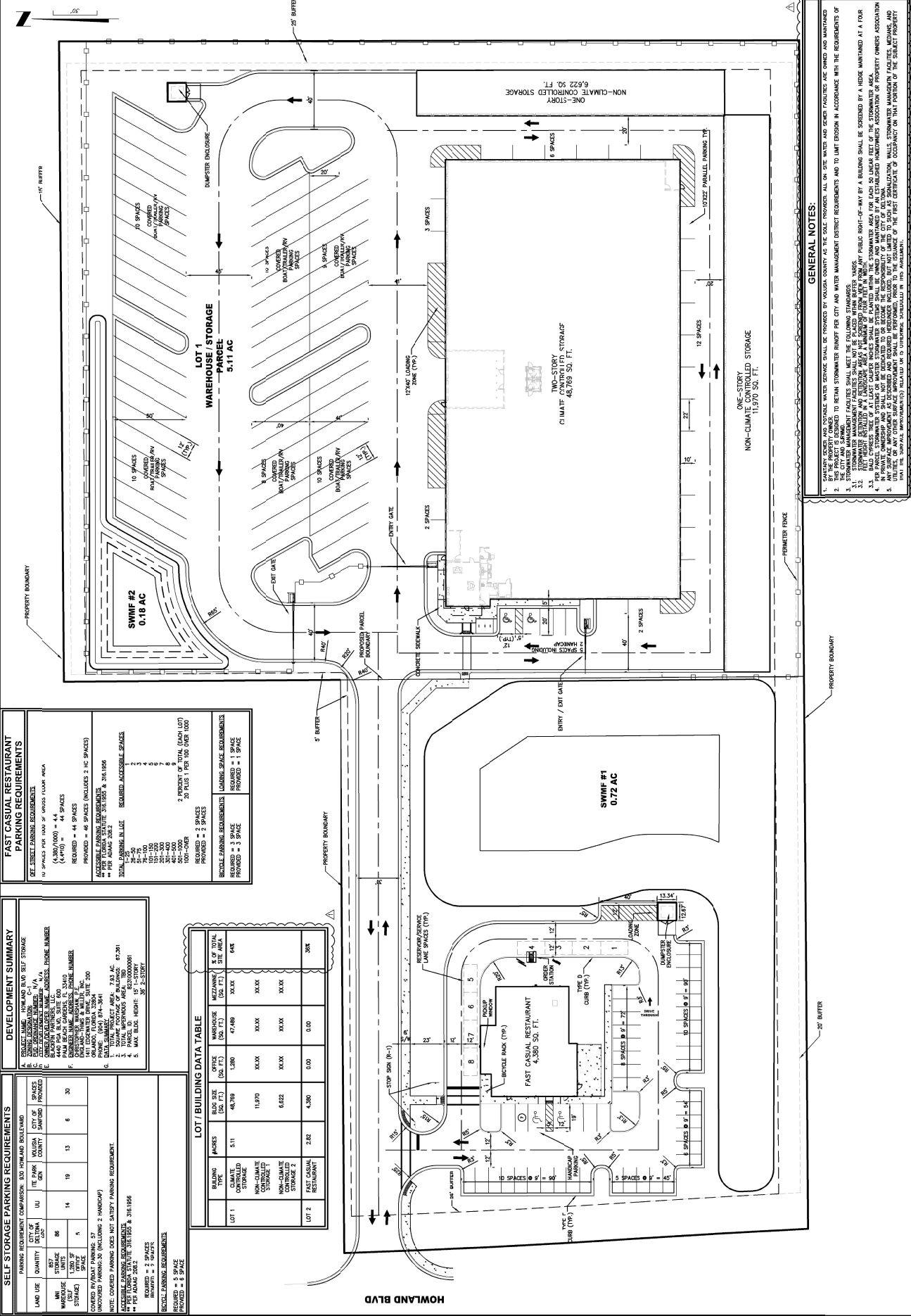
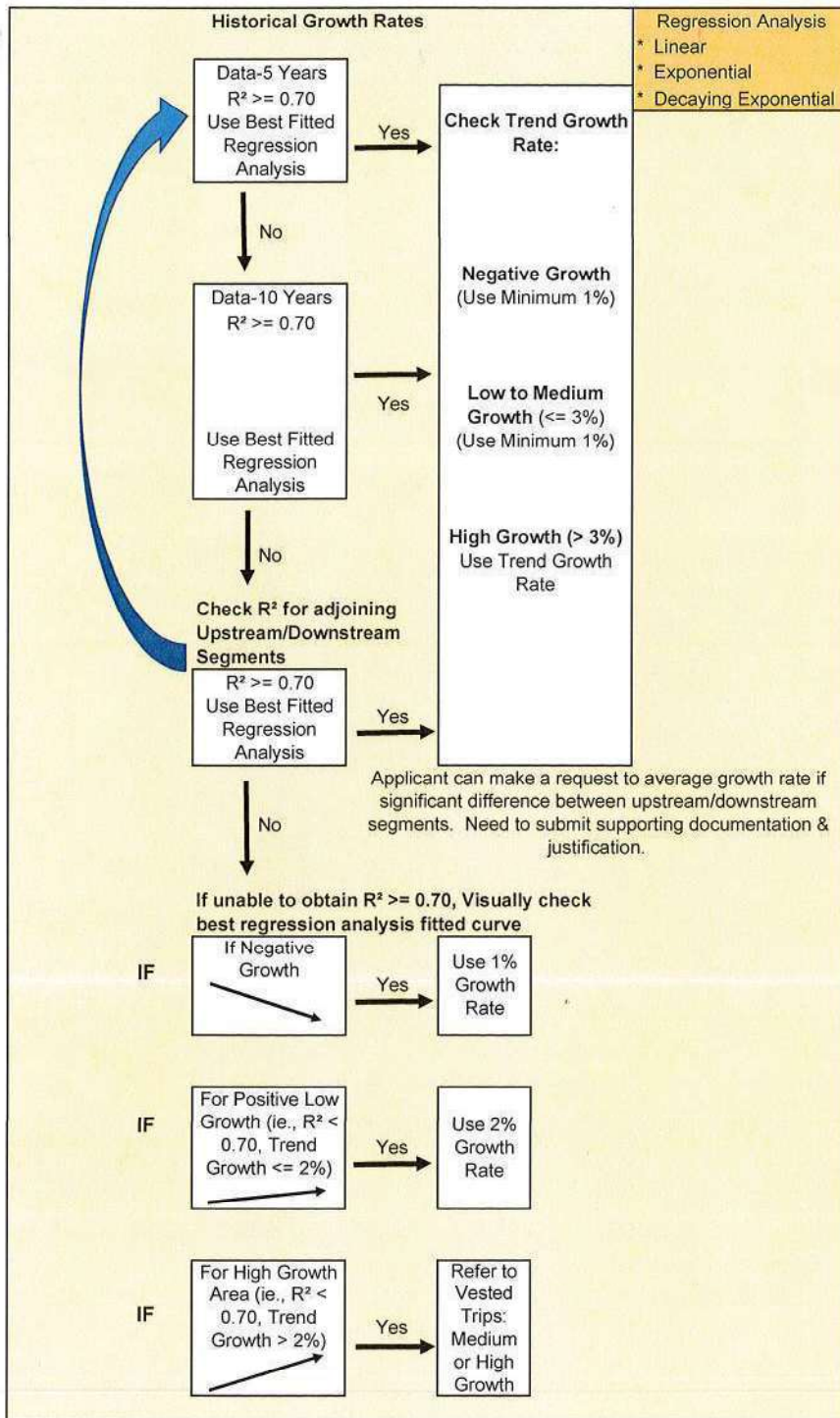


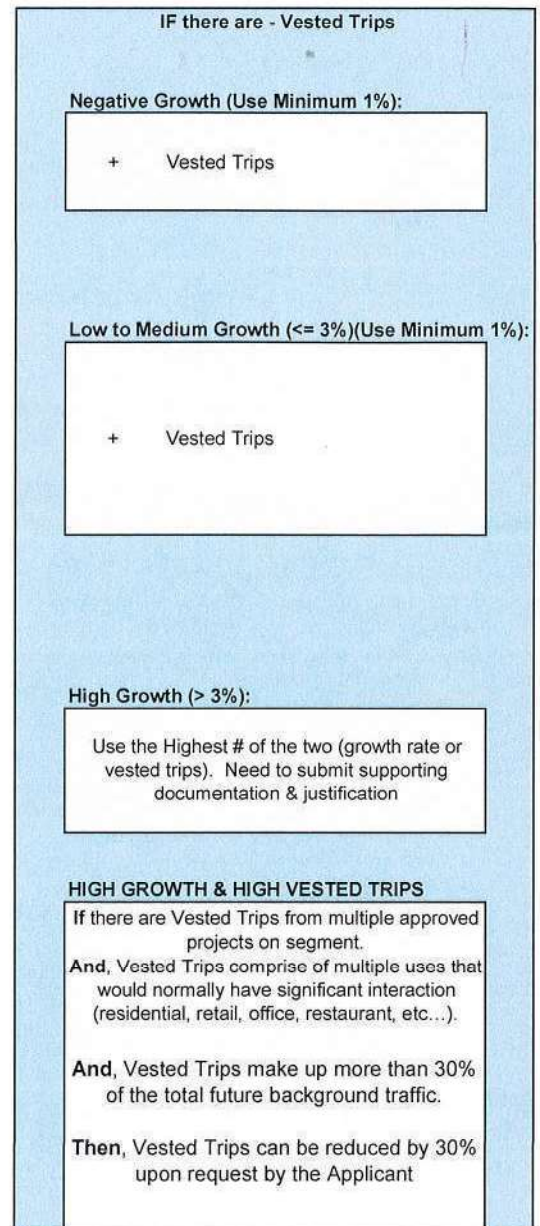
EXHIBIT B

Volusia County Background Growth Policy

Volusia County's Segment Growth Rates and Vested Trips Instructions Policy



AND



Signed: _____

Jon E. Cheney
 Jon E. Cheney, P.E.

Date: _____

8/27/2020

APPENDIX C

Raw Turning Movement Counts and FDOT Seasonal Factors



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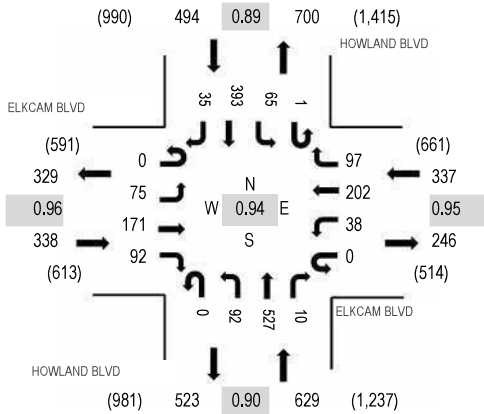
Location: 1 HOWLAND BLVD & ELKCAM BLVD AM

Date: Thursday, May 1, 2025

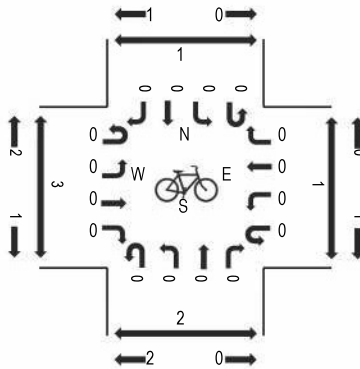
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

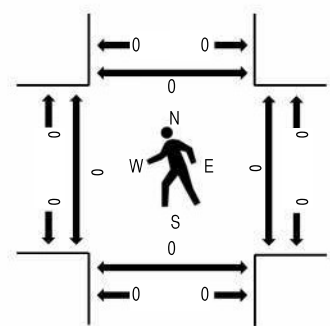
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ELKCAM BLVD Eastbound				ELKCAM BLVD Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	23	27	18	0	6	53	37	0	10	130	2	0	18	74	5	403	1,773	2	0	0	0
7:15 AM	0	21	40	19	0	7	56	28	0	27	147	4	0	16	106	6	477	1,798	0	0	0	0
7:30 AM	0	13	42	31	0	9	64	22	0	26	118	1	1	12	95	13	447	1,763	0	0	0	0
7:45 AM	0	17	44	27	0	12	48	24	0	19	127	2	0	16	102	8	446	1,754	0	0	0	0
8:00 AM	0	24	45	15	0	10	34	23	0	20	135	3	0	21	90	8	428	1,728	0	0	0	0
8:15 AM	0	21	24	15	0	7	35	36	0	19	149	12	1	27	89	7	442		0	1	1	0
8:30 AM	0	13	33	14	0	7	39	28	0	22	131	6	1	37	100	7	438		0	0	0	0
8:45 AM	0	19	42	26	0	13	35	28	0	26	96	5	2	35	89	4	420		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1	0	0	0	0	0	0	2	0	0	1	4	0	8
Lights	0	72	170	89	0	38	200	96	0	90	519	10	1	63	383	35	1,766
Mediums	0	3	1	2	0	0	2	1	0	2	6	0	0	1	6	0	24
Total	0	75	171	92	0	38	202	97	0	92	527	10	1	65	393	35	1,798

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		2.1%				0.9%				1.6%				2.4%			1.8%
Heavy Vehicle %	0.0%	4.0%	0.6%	3.3%	0.0%	0.0%	1.0%	1.0%	0.0%	2.2%	1.5%	0.0%	0.0%	3.1%	2.5%	0.0%	1.8%
Peak Hour Factor		0.96				0.95				0.90				0.89			0.94
Peak Hour Factor	0.00	0.80	0.95	0.77	0.00	0.79	0.86	0.80	0.00	0.85	0.91	0.54	0.50	0.81	0.93	0.69	0.94



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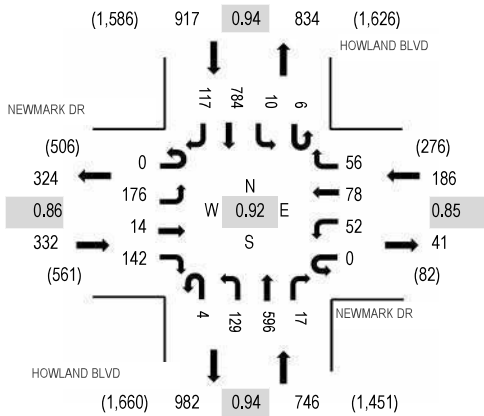
Location: 2 HOWLAND BLVD & NEWMARK DR AM

Date: Thursday, May 1, 2025

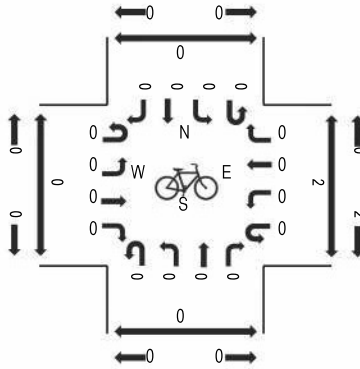
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

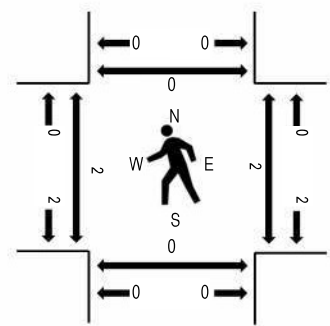
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NEWMARK DR Eastbound				NEWMARK DR Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	45	0	36	0	12	24	19	0	30	137	0	2	1	164	24	494	2,181	0	0	0	0
7:15 AM	0	53	7	36	0	13	16	23	1	30	158	5	1	4	200	44	591	2,166	0	0	0	0
7:30 AM	0	39	2	34	0	19	18	6	2	51	131	3	2	3	216	18	544	2,013	2	1	0	0
7:45 AM	0	39	5	36	0	8	20	8	1	18	170	9	1	2	204	31	552	1,855	0	1	0	0
8:00 AM	0	34	4	21	0	11	13	10	3	20	155	1	0	5	185	17	479	1,693	0	0	0	0
8:15 AM	0	36	5	15	0	4	10	11	0	27	173	4	2	4	128	19	438		0	0	0	0
8:30 AM	0	39	5	20	0	1	3	9	2	21	135	0	0	2	137	12	386		0	0	0	0
8:45 AM	0	31	6	13	0	4	8	6	0	12	151	1	0	4	134	20	390		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4
Lights	0	173	13	142	0	50	78	56	4	129	586	17	6	10	772	117	2,153
Mediums	0	3	1	0	0	2	0	0	0	0	9	0	0	0	9	0	24
Total	0	176	14	142	0	52	78	56	4	129	596	17	6	10	784	117	2,181

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		1.2%				1.1%				1.3%				1.3%			1.3%
Heavy Vehicle %	0.0%	1.7%	7.1%	0.0%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	1.5%	0.0%	1.3%
Peak Hour Factor		0.86				0.85				0.94				0.94			0.92
Peak Hour Factor	0.00	0.83	0.83	0.99	0.00	0.68	0.81	0.61	0.58	0.63	0.91	0.50	0.75	0.75	0.93	0.66	0.92



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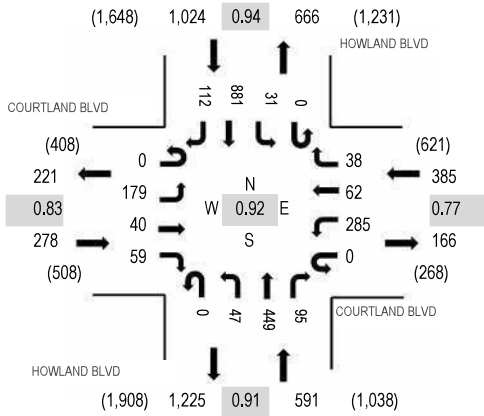
Location: 3 HOWLAND BLVD & COURTLAND BLVD AM

Date: Thursday, May 1, 2025

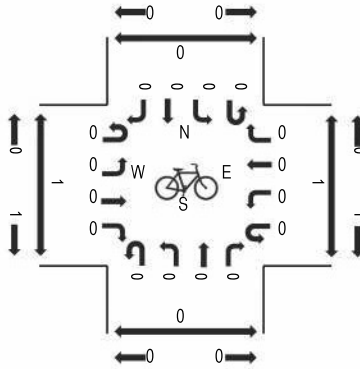
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

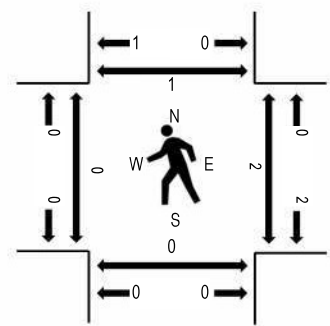
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COURTLAND BLVD Eastbound				COURTLAND BLVD Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	37	8	15	0	69	10	6	0	4	79	8	0	2	162	19	419	2,163	0	0	0	0
7:15 AM	0	50	7	14	0	78	17	7	0	11	85	15	0	10	233	29	556	2,278	0	2	0	0
7:30 AM	0	43	8	14	0	97	24	9	0	15	109	29	0	8	239	25	620	2,107	0	0	0	0
7:45 AM	0	49	18	18	0	63	9	10	0	10	121	28	0	6	208	28	568	1,881	0	0	0	1
8:00 AM	0	37	7	13	0	47	12	12	0	11	134	23	0	7	201	30	534	1,652	0	0	0	0
8:15 AM	0	46	7	8	0	40	10	4	0	11	111	10	0	1	120	17	385		0	0	0	0
8:30 AM	0	34	10	7	0	25	17	7	0	9	99	15	0	9	124	38	394		0	0	0	1
8:45 AM	0	38	14	6	0	17	18	13	0	3	91	7	0	11	90	31	339		0	0	0	1

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	0	0	0	1	3	0	5
Lights	0	177	39	59	0	282	62	36	0	46	443	94	0	30	866	112	2,246
Mediums	0	2	1	0	0	3	0	1	0	1	6	1	0	0	12	0	27
Total	0	179	40	59	0	285	62	38	0	47	449	95	0	31	881	112	2,278

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		1.1%				1.3%				1.4%				1.6%			1.4%
Heavy Vehicle %	0.0%	1.1%	2.5%	0.0%	0.0%	1.1%	0.0%	5.3%	0.0%	2.1%	1.3%	1.1%	0.0%	3.2%	1.7%	0.0%	1.4%
Peak Hour Factor		0.83				0.77				0.91				0.94			0.92
Peak Hour Factor	0.00	0.90	0.58	0.85	0.00	0.79	0.65	0.79	0.00	0.78	0.89	0.82	0.00	0.78	0.92	0.76	0.92

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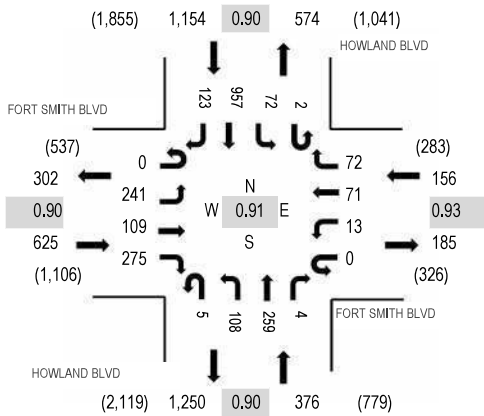
Location: 4 HOWLAND BLVD & FORT SMITH BLVD AM

Date: Thursday, May 1, 2025

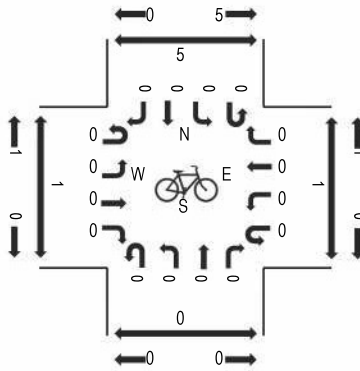
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

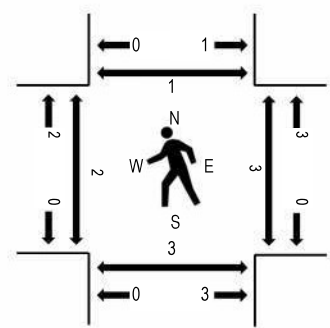
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FORT SMITH BLVD				FORT SMITH BLVD				HOWLAND BLVD				HOWLAND BLVD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
7:00 AM	0	31	22	67	0	1	12	12	1	23	50	2	0	15	219	3	458	2,237	0	0	0	0
7:15 AM	0	28	42	72	0	5	17	18	2	23	56	1	0	18	272	12	566	2,311	0	1	1	0
7:30 AM	0	54	32	91	0	3	18	21	1	27	68	0	1	16	285	17	634	2,232	0	0	0	0
7:45 AM	0	76	19	65	0	5	17	15	0	27	69	1	1	20	223	41	579	2,020	2	1	1	0
8:00 AM	0	83	16	47	0	0	19	18	2	31	66	2	0	18	177	53	532	1,786	0	1	1	1
8:15 AM	0	58	22	73	0	5	15	17	0	34	75	1	0	13	141	33	487		0	1	2	0
8:30 AM	0	28	26	69	0	2	18	10	1	34	82	2	0	13	122	15	422		0	0	1	0
8:45 AM	0	14	16	55	0	3	15	17	1	24	73	0	0	9	109	9	345		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3
Lights	0	239	109	274	0	13	70	72	5	105	251	4	2	72	943	121	2,280
Mediums	0	2	0	1	0	0	1	0	0	3	7	0	0	0	12	2	28
Total	0	241	109	275	0	13	71	72	5	108	259	4	2	72	957	123	2,311

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		0.5%				0.6%				2.9%				1.4%			1.3%
Heavy Vehicle %	0.0%	0.8%	0.0%	0.4%	0.0%	0.0%	1.4%	0.0%	0.0%	2.8%	3.1%	0.0%	0.0%	0.0%	1.5%	1.6%	1.3%
Peak Hour Factor		0.90				0.93				0.90				0.90			0.91
Peak Hour Factor	0.00	0.82	0.68	0.81	0.00	0.70	0.93	0.86	0.63	0.93	0.90	0.75	0.50	0.90	0.88	0.68	0.91



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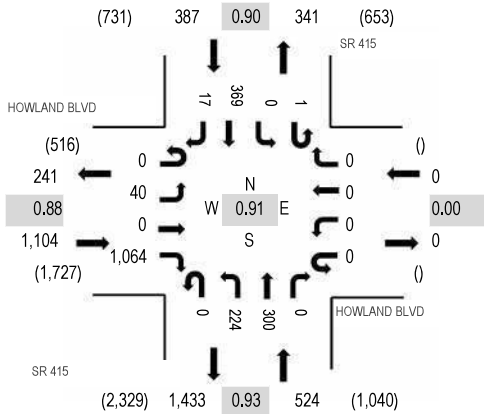
Location: 5 SR 415 & HOWLAND BLVD AM

Date: Thursday, May 1, 2025

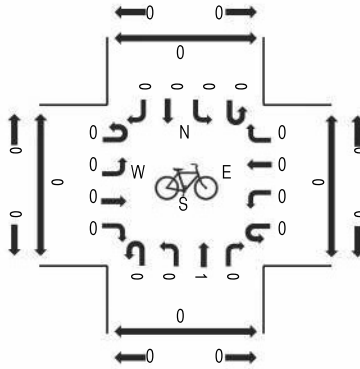
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:30 AM - 07:45 AM

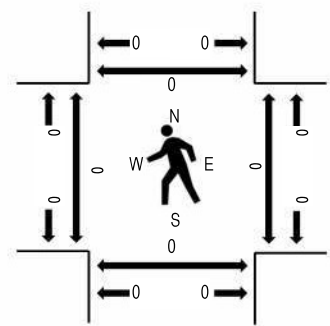
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HOWLAND BLVD Eastbound				HOWLAND BLVD Westbound				SR 415 Northbound				SR 415 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	8	0	240	0	0	0	0	0	46	74	0	0	0	105	2	475	2,015	0	0	0	0
7:15 AM	0	9	0	303	0	0	0	0	0	55	77	0	0	0	93	4	541	1,985	0	0	0	0
7:30 AM	0	11	0	293	0	0	0	0	0	60	88	0	0	0	93	6	551	1,824	0	0	0	0
7:45 AM	0	12	0	228	0	0	0	0	0	63	61	0	1	0	78	5	448	1,621	0	0	0	0
8:00 AM	0	9	0	193	0	0	0	0	0	58	87	0	0	0	90	8	445	1,483	0	0	0	0
8:15 AM	2	10	0	154	0	0	0	0	0	55	66	0	1	0	86	6	380		0	0	0	0
8:30 AM	1	14	0	127	0	0	0	0	0	75	59	0	0	0	65	7	348		0	0	0	0
8:45 AM	0	8	0	105	0	0	0	0	0	58	58	0	0	0	76	5	310		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	3	0	0	0	0	0	1	5	0	0	0	1	0	10
Lights	0	39	0	1,051	0	0	0	0	0	216	282	0	1	0	365	17	1,971
Mediums	0	1	0	10	0	0	0	0	0	7	13	0	0	0	3	0	34
Total	0	40	0	1,064	0	0	0	0	0	224	300	0	1	0	369	17	2,015

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		1.3%				0.0%				5.0%				1.0%			2.2%
Heavy Vehicle %	0.0%	2.5%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	3.6%	6.0%	0.0%	0.0%	0.0%	1.1%	0.0%	2.2%
Peak Hour Factor		0.88				0.00				0.93				0.90			0.91
Peak Hour Factor	0.38	0.80	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.84	0.89	0.00	0.50	0.00	0.88	0.81	0.91

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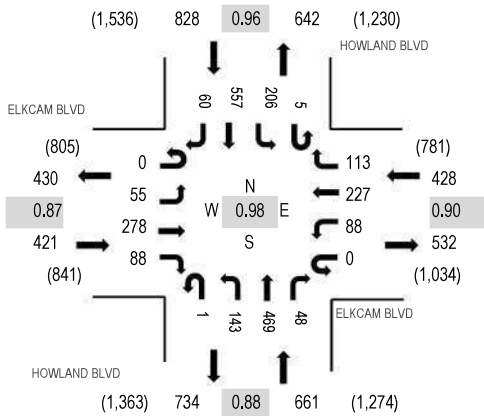
Location: 1 HOWLAND BLVD & ELKCAM BLVD PM

Date: Thursday, May 1, 2025

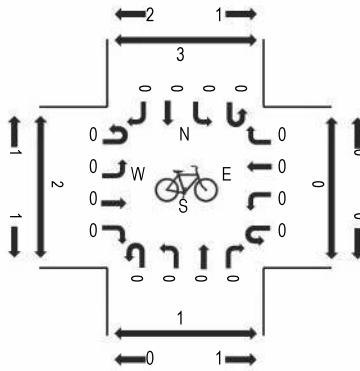
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

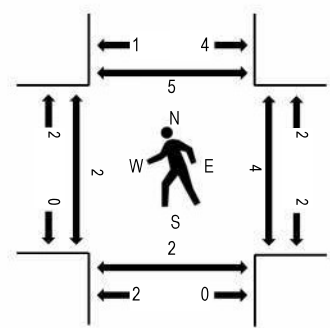
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ELKCAM BLVD				ELKCAM BLVD				HOWLAND BLVD				HOWLAND BLVD				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
4:00 PM	0	14	60	20	0	21	38	28	0	35	85	11	0	38	90	15	455	2,094	0	0	0	0
4:15 PM	0	21	82	20	0	15	38	23	0	37	120	14	1	42	131	10	554	2,235	0	1	0	1
4:30 PM	1	19	60	26	1	22	38	27	0	36	93	17	2	50	120	17	529	2,279	0	0	1	1
4:45 PM	0	20	64	13	1	24	55	22	0	37	112	16	1	46	127	18	556	2,327	1	0	0	1
5:00 PM	0	16	62	26	0	21	54	23	0	45	128	21	2	52	129	17	596	2,338	1	0	1	0
5:15 PM	0	14	74	13	0	26	66	27	0	34	125	10	1	51	144	13	598		1	3	0	3
5:30 PM	0	14	79	25	0	19	48	37	0	35	110	7	2	60	129	12	577		0	0	0	1
5:45 PM	0	11	63	24	0	22	59	26	1	29	106	10	0	43	155	18	567		0	1	1	1

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	3
Lights	0	55	277	87	0	87	226	113	1	143	465	48	5	206	553	60	2,326
Mediums	0	0	1	0	0	0	1	0	0	0	3	0	0	0	4	0	9
Total	0	55	278	88	0	88	227	113	1	143	469	48	5	206	557	60	2,338

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		0.5%				0.5%				0.6%				0.5%			0.5%
Heavy Vehicle %	0.0%	0.0%	0.4%	1.1%	0.0%	1.1%	0.4%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	0.7%	0.0%	0.5%
Peak Hour Factor		0.87				0.90				0.88				0.96			0.98
Peak Hour Factor	0.25	0.90	0.88	0.85	0.50	0.89	0.86	0.76	0.25	0.86	0.93	0.81	0.75	0.87	0.90	0.90	0.98



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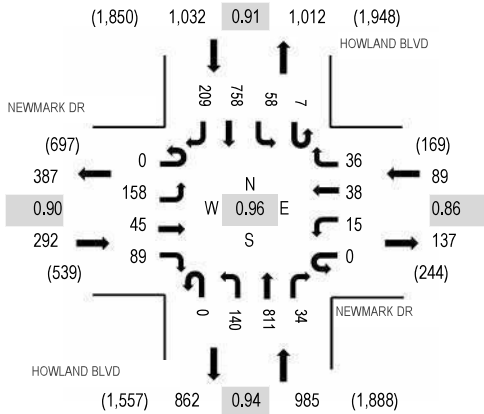
Location: 2 HOWLAND BLVD & NEWMARK DR PM

Date: Thursday, May 1, 2025

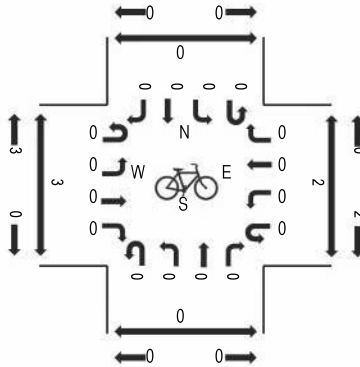
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:45 PM - 06:00 PM

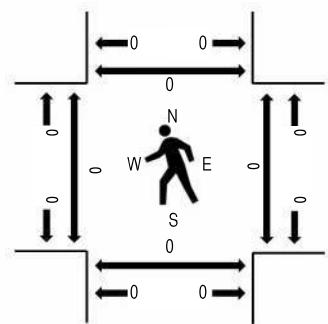
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NEWMARK DR Eastbound				NEWMARK DR Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	34	7	18	0	5	8	7	0	26	157	3	0	10	156	42	473	2,048	0	0	0	0
4:15 PM	0	37	15	15	0	2	7	11	0	29	187	5	0	11	150	25	494	2,192	0	0	0	0
4:30 PM	0	39	10	13	0	6	12	8	0	37	195	6	3	11	146	34	520	2,295	0	0	0	0
4:45 PM	0	34	8	17	0	3	5	6	0	35	216	7	2	14	164	50	561	2,335	0	0	0	1
5:00 PM	0	48	11	22	0	4	9	9	0	33	220	15	2	10	187	47	617	2,398	0	0	0	0
5:15 PM	0	48	12	20	0	1	9	7	0	32	201	9	2	8	203	45	597		0	0	0	0
5:30 PM	0	28	12	17	0	4	11	11	0	31	198	5	1	16	167	59	560		0	0	0	0
5:45 PM	0	34	10	30	0	6	9	9	0	44	192	5	2	24	201	58	624		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
Lights	0	158	45	89	0	14	36	36	0	140	807	34	7	58	753	209	2,386
Mediums	0	0	0	0	0	1	2	0	0	0	3	0	0	0	4	0	10
Total	0	158	45	89	0	15	38	36	0	140	811	34	7	58	758	209	2,398

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %	0.0%				3.4%				0.4%				0.5%				0.5%
Heavy Vehicle %	0.0%	0.0%	0.0%	0.0%	0.0%	6.7%	5.3%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.7%	0.0%	0.5%
Peak Hour Factor	0.90				0.86				0.94				0.91				0.96
Peak Hour Factor	0.00	0.88	0.94	0.74	0.00	0.67	0.86	0.82	0.00	0.80	0.95	0.62	0.75	0.60	0.93	0.89	0.96



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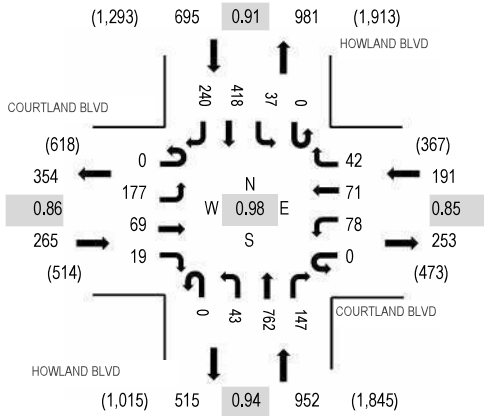
Location: 3 HOWLAND BLVD & COURTLAND BLVD PM

Date: Thursday, May 1, 2025

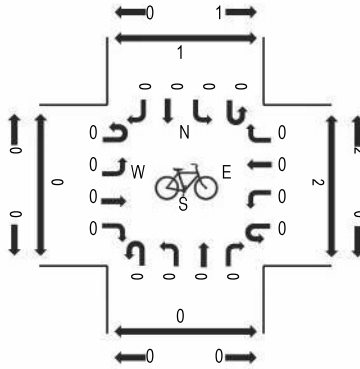
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

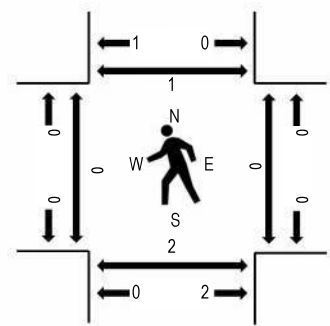
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	COURTLAND BLVD Eastbound				COURTLAND BLVD Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	41	11	5	0	17	16	9	0	9	146	24	0	10	101	43	432	1,916	0	0	0	0
4:15 PM	0	44	19	4	0	10	8	6	0	8	195	36	0	9	102	36	477	1,981	0	0	1	0
4:30 PM	0	36	18	3	0	34	16	10	0	11	191	33	0	8	88	38	486	2,041	1	0	0	1
4:45 PM	0	44	16	8	0	22	18	10	0	13	200	27	0	9	106	48	521	2,089	0	0	0	0
5:00 PM	0	44	14	5	0	16	12	8	0	11	186	31	0	9	107	54	497	2,103	0	0	0	1
5:15 PM	0	39	20	3	0	26	21	14	0	11	194	34	0	7	94	74	537		0	0	0	0
5:30 PM	0	53	20	6	0	15	16	9	0	8	203	44	0	7	98	55	534		0	0	1	0
5:45 PM	0	41	15	5	0	21	22	11	0	13	179	38	0	14	119	57	535		0	0	1	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3
Lights	0	176	68	19	0	77	71	42	0	43	759	143	0	37	412	240	2,087
Mediums	0	0	1	0	0	1	0	0	0	0	3	3	0	0	5	0	13
Total	0	177	69	19	0	78	71	42	0	43	762	147	0	37	418	240	2,103

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %	0.8%				0.5%				0.7%				0.9%				0.8%
Heavy Vehicle %	0.0%	0.6%	1.4%	0.0%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	0.4%	2.7%	0.0%	0.0%	1.4%	0.0%	0.8%
Peak Hour Factor	0.86				0.85				0.94				0.91				0.98
Peak Hour Factor	0.00	0.85	0.88	0.69	0.00	0.72	0.81	0.75	0.00	0.88	0.96	0.84	0.00	0.66	0.88	0.81	0.98



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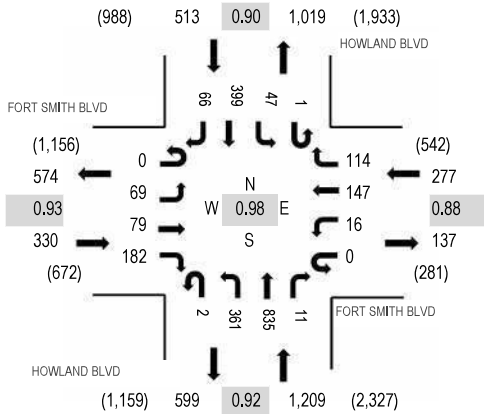
Location: 4 HOWLAND BLVD & FORT SMITH BLVD PM

Date: Thursday, May 1, 2025

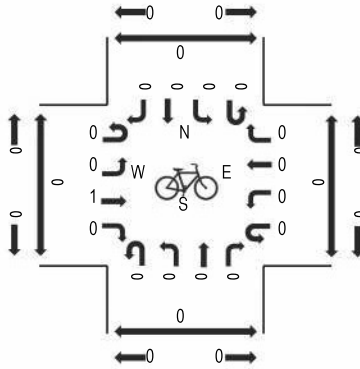
Peak Hour: 05:00 PM - 06:00 PM

Peak 15-Minutes: 05:45 PM - 06:00 PM

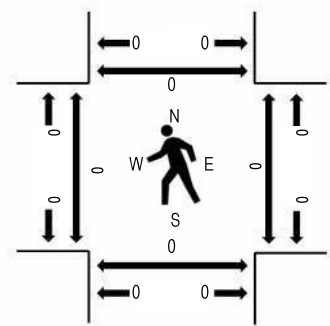
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FORT SMITH BLVD Eastbound				FORT SMITH BLVD Westbound				HOWLAND BLVD Northbound				HOWLAND BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	12	23	56	0	7	32	21	1	89	143	2	0	8	97	19	510	2,200	0	0	0	2
4:15 PM	0	16	25	42	0	1	38	21	1	91	207	3	0	17	80	16	558	2,257	1	0	1	0
4:30 PM	0	16	19	47	0	7	38	29	2	97	201	0	0	17	65	22	560	2,280	0	1	0	1
4:45 PM	0	22	19	45	0	2	37	32	2	82	194	3	0	8	105	21	572	2,305	0	0	0	0
5:00 PM	0	19	18	55	0	5	35	28	1	76	200	0	0	15	91	24	567	2,329	0	0	0	0
5:15 PM	0	14	20	40	0	4	35	20	1	104	217	6	1	10	95	14	581		0	0	0	0
5:30 PM	0	19	21	32	0	2	43	34	0	90	221	2	0	10	103	8	585		0	0	0	0
5:45 PM	0	17	20	55	0	5	34	32	0	91	197	3	0	12	110	20	596		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	4
Lights	0	69	77	182	0	16	147	113	2	360	828	11	1	43	396	66	2,311
Mediums	0	0	1	0	0	0	0	1	0	0	6	0	0	4	2	0	14
Total	0	69	79	182	0	16	147	114	2	361	835	11	1	47	399	66	2,329

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %	0.6%				0.4%				0.7%				1.4%				0.8%
Heavy Vehicle %	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.3%	0.8%	0.0%	0.0%	8.5%	0.8%	0.0%	0.8%
Peak Hour Factor	0.93				0.88				0.92				0.90				0.98
Peak Hour Factor	0.00	0.84	0.86	0.85	0.00	0.64	0.87	0.84	0.75	0.87	0.94	0.46	0.25	0.84	0.91	0.86	0.98



(303) 216-2439
www.alltrafficdata.net

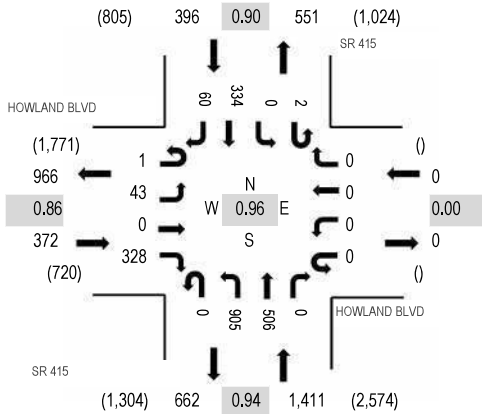
Location: 5 SR 415 & HOWLAND BLVD PM

Date: Thursday, May 1, 2025

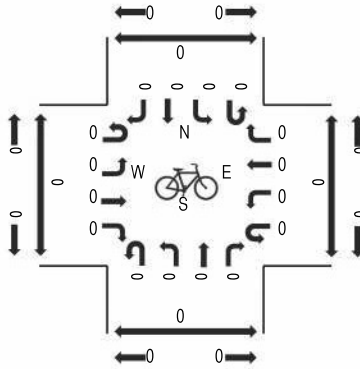
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

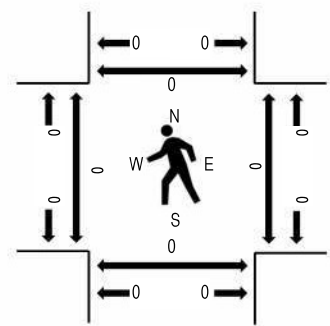
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HOWLAND BLVD Eastbound				HOWLAND BLVD Westbound				SR 415 Northbound				SR 415 Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	8	0	75	0	0	0	0	0	172	99	0	2	0	75	21	452	2,009	0	0	0	0
4:15 PM	0	15	0	70	0	0	0	0	0	200	126	0	1	0	83	12	507	2,097	0	0	0	0
4:30 PM	1	12	0	80	0	0	0	0	0	211	114	0	1	0	93	19	531	2,158	0	0	0	0
4:45 PM	0	8	0	71	0	0	0	0	0	216	126	0	1	0	82	15	519	2,179	0	0	0	0
5:00 PM	1	18	0	92	0	0	0	0	0	202	129	0	1	0	80	17	540	2,090	0	0	0	0
5:15 PM	0	7	0	88	0	0	0	0	0	250	126	0	0	0	85	12	568		0	0	0	0
5:30 PM	0	10	0	77	0	0	0	0	0	237	125	0	0	0	87	16	552		0	0	0	0
5:45 PM	0	8	0	79	0	0	0	0	0	154	87	0	0	0	87	15	430		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1	0	0	0	0	0	2	5	0	0	0	3	1	12
Lights	1	43	0	321	0	0	0	0	0	896	495	0	2	0	327	58	2,143
Mediums	0	0	0	6	0	0	0	0	0	7	6	0	0	0	4	1	24
Total	1	43	0	328	0	0	0	0	0	905	506	0	2	0	334	60	2,179

Heavy Vehicle Percentage and Peak Hour Factor

	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Heavy Vehicle %		1.9%				0.0%				1.4%				2.3%			1.7%
Heavy Vehicle %	0.0%	0.0%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	2.2%	0.0%	0.0%	0.0%	2.1%	3.3%	1.7%
Peak Hour Factor		0.86				0.00				0.94				0.90			0.96
Peak Hour Factor	0.50	0.74	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.91	0.98	0.00	0.63	0.00	0.91	0.80	0.96

2024 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
 CATEGORY: 7900 VOLUSIA COUNTYWIDE

			MOCF: 0.97	
WEEK	DATES	SF	PSCF	
=====				
1	01/01/2024 - 01/06/2024	1.00	1.03	
2	01/07/2024 - 01/13/2024	1.02	1.05	
3	01/14/2024 - 01/20/2024	1.04	1.07	
4	01/21/2024 - 01/27/2024	1.03	1.06	
5	01/28/2024 - 02/03/2024	1.01	1.04	
6	02/04/2024 - 02/10/2024	0.99	1.02	
* 7	02/11/2024 - 02/17/2024	0.97	1.00	
* 8	02/18/2024 - 02/24/2024	0.97	1.00	
* 9	02/25/2024 - 03/02/2024	0.97	1.00	
*10	03/03/2024 - 03/09/2024	0.96	0.99	
*11	03/10/2024 - 03/16/2024	0.96	0.99	
*12	03/17/2024 - 03/23/2024	0.96	0.99	
*13	03/24/2024 - 03/30/2024	0.96	0.99	
*14	03/31/2024 - 04/06/2024	0.96	0.99	
*15	04/07/2024 - 04/13/2024	0.97	1.00	
*16	04/14/2024 - 04/20/2024	0.97	1.00	
*17	04/21/2024 - 04/27/2024	0.97	1.00	
*18	04/28/2024 - 05/04/2024	0.98	1.01	
*19	05/05/2024 - 05/11/2024	0.98	1.01	
20	05/12/2024 - 05/18/2024	0.99	1.02	
21	05/19/2024 - 05/25/2024	0.99	1.02	
22	05/26/2024 - 06/01/2024	1.00	1.03	
23	06/02/2024 - 06/08/2024	1.01	1.04	
24	06/09/2024 - 06/15/2024	1.01	1.04	
25	06/16/2024 - 06/22/2024	1.02	1.05	
26	06/23/2024 - 06/29/2024	1.02	1.05	
27	06/30/2024 - 07/06/2024	1.03	1.06	
28	07/07/2024 - 07/13/2024	1.03	1.06	
29	07/14/2024 - 07/20/2024	1.04	1.07	
30	07/21/2024 - 07/27/2024	1.03	1.06	
31	07/28/2024 - 08/03/2024	1.02	1.05	
32	08/04/2024 - 08/10/2024	1.01	1.04	
33	08/11/2024 - 08/17/2024	1.00	1.03	
34	08/18/2024 - 08/24/2024	1.01	1.04	
35	08/25/2024 - 08/31/2024	1.01	1.04	
36	09/01/2024 - 09/07/2024	1.02	1.05	
37	09/08/2024 - 09/14/2024	1.02	1.05	
38	09/15/2024 - 09/21/2024	1.02	1.05	
39	09/22/2024 - 09/28/2024	1.02	1.05	
40	09/29/2024 - 10/05/2024	1.01	1.04	
41	10/06/2024 - 10/12/2024	1.00	1.03	
42	10/13/2024 - 10/19/2024	1.00	1.03	
43	10/20/2024 - 10/26/2024	1.01	1.04	
44	10/27/2024 - 11/02/2024	1.03	1.06	
45	11/03/2024 - 11/09/2024	1.04	1.07	
46	11/10/2024 - 11/16/2024	1.05	1.08	
47	11/17/2024 - 11/23/2024	1.04	1.07	
48	11/24/2024 - 11/30/2024	1.03	1.06	
49	12/01/2024 - 12/07/2024	1.02	1.05	
50	12/08/2024 - 12/14/2024	1.01	1.04	
51	12/15/2024 - 12/21/2024	1.00	1.03	
52	12/22/2024 - 12/28/2024	1.02	1.05	
53	12/29/2024 - 12/31/2024	1.04	1.07	

* PEAK SEASON

04-MAR-2025 16:32:53

830UPD

5_7900_PKSEASON.TXT

APPENDIX D

Traffic Signal Timing Sheets

Volusia County, FL



MOVING TRAFFIC FORWARD

318 - Howland Blvd @ Courtland - Cobalt [REDACTED] - Econolite Type
- Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N-L	S-T	E-L	W-T	S-L	N-T	W-L	E-T	N	N	N	N	N	N	N	N
Min Green	5	15	5	6	5	15	5	6	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	18	0	23	0	18	0	23	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	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	0.0	0.0	0.0
Max1	20	45	20	20	20	45	20	20	35	35	35	35	35	35	35	35
Max2	0	0	0	40	0	0	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	60	0	0	0	60	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	10.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	4.0	4.5	5.0	5.0	4.5	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	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	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	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	0.0	0.0	0.0

Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	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	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	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	0.0	0.0	0.0

Volusia County, FL*MOVING TRAFFIC FORWARD*

318 - Howland Blvd @ Courtland - Cobalt [REDACTED] Econolite Type
- Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #1 - "1"**

Event	Action Plan	Start Time
1	11	00:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Volusia County, FL



MOVING TRAFFIC FORWARD

162 - Howland Blvd @ Elkcarn - ASC/3 [REDACTED] - Econolite Type -
ASC/3

Controller Timing Plan (MM) 2-1

Plan 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	12	5	7	5	12	5	7	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	20	0	25	0	20	0	25	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	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	0.0	0.0	0.0
Max1	35	45	20	35	20	45	20	45	35	35	35	35	35	35	35	35
Max2	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	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	0.0	0.0	0.0
Yellow	5.1	5.1	4.5	4.5	5.1	5.1	4.5	4.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	3.5	3.5	4.0	4.0	3.5	3.5	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	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	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	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	0.0	0.0	0.0

Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	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	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	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	0.0	0.0	0.0

Volusia County, FL*MOVING TRAFFIC FORWARD*

162 - Howland Blvd @ Elkcam - ASC/3 - [REDACTED] Econolite Type -
ASC/3

Time Base Day Plan/Schedule
Day Plan (MM) 5-3**Day Plan #1**

Event	Action Plan	Start Time
1	11	00:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Volusia County, FL



MOVING TRAFFIC FORWARD

441 - Howland Blvd @ SR-415 - Cobalt [REDACTED] - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N-L	S-T	E-L	W-T	S-L	N-T	W-L	E-T	N	N	N	N	N	N	N	N
Min Green	5	15	5	5	5	15	0	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	7	0	7	0	0	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	30	0	28	0	0	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	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	0.0	0.0	0.0
Max1	23	50	30	20	20	50	0	30	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	0	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	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	0.0	0.0	0.0
Yellow	4.5	4.5	4.5	4.5	5.0	5.0	0.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	2.5	2.0	2.0	2.0	3.5	3.0	0.0	3.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	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	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	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	0.0	0.0	0.0

Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	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	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	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	0.0	0.0	0.0

Volusia County, FL



MOVING TRAFFIC FORWARD

441 - Howland Blvd @ SR-415 - Cobalt [REDACTED] - Econolite Type - Cobalt

Controller Overlaps Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green
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Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green
A	1	Yes	No	No	No		No	No	.
A	2	No	No	No	Yes		No	No	.
A	3	Yes	No	No	No		No	No	.
A	4	Yes	No	No	No		No	No	.
A	5	Yes	No	No	No		No	No	.
B	1	Yes	No	No	No		No	No	.
B	2	No	No	No	Yes		No	No	.
B	3	No	No	No	Yes		No	No	.
B	4	Yes	No	No	No		No	No	.
B	5	Yes	No	No	No		No	No	.

PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable
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Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5

F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

Volusia County, FL

MOVING TRAFFIC FORWARD

441 - Howland Blvd @ SR-415 - Cobalt [REDACTED] - Econolite Type -
Cobalt

Controller Pedestrian Overlaps**Vehicle / Pedestrian Overlaps (MM) 2-3**

Included	Pedestrian Overlaps
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Volusia County, FL*MOVING TRAFFIC FORWARD*

441 - Howland Blvd @ SR-415 - Cobalt [REDACTED] - Econolite Type -
Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1 - "1"

Event	Action Plan	Start Time
1	11	00:00

Schedule (MM) 5-4**Schedule Number - 1**

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET										
LOCATION:		Ft. Smith Blvd & Howland Blvd			ISOLATED:		☒		DATE: 4/2/2025	
SIGNAL #:		267			CO-ORD:		☐		Design By: Sean Castello	
System #:		-								
Controller Timing Chart										
PHASE	1	2	3	4	5	6	7	8		
DIRECTION	SBL	NB	WBL	EB	NBL	SB	EBL	WB		
TURN TYPE	PERM/PROT	-	PERM/PROT	-	PERM/PROT	-	PERM/PROT	-		
MIN GREEN	5	17	5	7	5	17	5	7		
EXTENSION	4	4	4	3	4	3	4	3		
CLEARANCE	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
ALL RED	2.0	2.5	2.0	2.5	2.0	2.5	2.0	2.5		
WALK		7		7		7		7		
FDW		20		25		20		26		
MAX 1	25	45 65	20	35 45	40	45	30	35		
MAX 2										
MAX 3		60		60		60		60		
ADJUST		10		10		10		10		
RECALL		MIN		-		MIN		-		
DETECTOR	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK		
FLASH		YELLOW		RED		YELLOW		RED		
SET										
CLEAR										
BASE DAY	1	2	3	4	5	6	7	Crosswalk Length		
MON #1	TIME	0:00						P2		
	PLAN	FREE						64 Feet		
TUES#1	TIME	0:00						P4		
	PLAN	FREE						76 Feet		
WED #1	TIME	0:00						P6		
	PLAN	FREE						61 Feet		
THU #1	TIME	0:00						P8		
	PLAN	FREE						75 Feet		
FRI #1	TIME	0:00						SIGNAL OWNER		
	PLAN	FREE						County		
SAT #2	TIME	0:00						LED		
	PLAN	FREE						YES		
SUN #3	TIME	0:00								
	PLAN	FREE								
CONTROLLER TYPE		CONDITION OF OVERHEAD		OK		PROM NUMBER		P8		
ECONOLITE ASC/3		OVERHEAD STREET NAMES		YES				75 Feet		
PHASES:	8Φ	ILLUMINATED STREET NAMES		NO				SIGNAL OWNER		
CABINET TYPE	V	PRE-EMPTION		NO		IP ADDRESS		County		
CABINET DATE	03/2016	PRE-EMPTION TYPE		N/A		-		LED	YES	
REMARKS:										
TEMP. CONSTRUCTION TIMES										
1234 5678										

COUNTY OF VOLUSIA TRAFFIC SIGNAL TIMING SHEET

LOCATION: Howland Blvd & Newmark Drive
Deltona

ISOLATED: ☒ X

DATE: 5/12/2025

SIGNAL #: 292

CO-ORD:

Design By: M. Tobin

System #: -

Controller Timing Chart

PHASE		1	2	3	4	5	6	7	8		
DIRECTION		NBL	SB	EBL	WB	SBL	NB	-	EB		
TURN TYPE		PERM/PROT	-	PERM/PROT	-	PERM/PROT	-	-	-		
MIN GREEN		5	12	5	7	5	12		7		
EXTENSION		3	3	3	3	3	3		3		
CLEARANCE		5.0	5.0	5.0	4.0	5.0	5.0		4.0		
ALL RED		3.0	3.5	3.0	3.5	3.5	3.0		3.5		
WALK		-	7	-	7	-	7		7		
FDW		-	17	-	24	-	17		24		
MAX 1		15	40	15	25	15	40		25 48		
MAX 2		-	-		-	-	-		-		
MAX 3		-	-		-	-	-		-		
ADJUST		-	-		-	-	-		-		
RECALL		-	MIN	-	-	-	MIN		-		
DETECTOR		NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK		NON-LOCK		
FLASH		-	YELLOW	-	RED	-	YELLOW		RED		
SET		-	-	-	-	-	-		-		
CLEAR		-	-	-	-	-	-		-		
BASE DAY		1	2	3	4	5	6	7	Crosswalk Length		
MON #1	TIME	00:01-00:00							P2		
	PLAN	FREE									
TUES#1	TIME	00:01-00:00							59 Feet		
	PLAN	FREE									
WED #1	TIME	00:01-00:00							P4		
	PLAN	FREE									
THU #1	TIME	00:01-00:00							84 Feet		
	PLAN	FREE									
FRI #1	TIME	00:01-00:00							P6		
	PLAN	FREE									
SAT #2	TIME	00:01-00:00							44 Feet		
	PLAN	FREE									
SUN #3	TIME	00:01-00:00							P8		
	PLAN	FREE									
CONTROLLER TYPE		CONDITION OF OVERHEAD			New 11/2009		PROM NUMBER		P8		
3000E		OVERHEAD STREET NAMES			NO				84 Feet		
PHASES:		8Φ	ILLUMINATED STREET NAMES			YES		8216A 3.7.3		SIGNAL OWNER	
CABINET TYPE		V	PRE-EMPTION			NO		IP ADDRESS		County	
CABINET DATE		-	PRE-EMPTION TYPE			N/A		-		LED	YES

REMARKS:

1	2	4
5	6	8

APPENDIX E

Synchro Summary Sheets – Existing Conditions

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

												
Movement	SEU	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (veh/h)	1	65	393	35	92	527	10	75	171	92	38	202
Future Volume (veh/h)	1	65	393	35	92	527	10	75	171	92	38	202
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln		1856	1856	1870	1870	1870	1870	1841	1870	1856	1870	1870
Adj Flow Rate, veh/h		69	418	37	98	561	11	80	182	98	40	215
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		3	3	2	2	2	2	4	2	3	2	2
Cap, veh/h		257	690	61	302	785	15	260	233	125	229	287
Arrive On Green		0.05	0.21	0.21	0.06	0.22	0.22	0.06	0.20	0.20	0.04	0.19
Sat Flow, veh/h		1767	3277	289	1781	3565	70	1753	1144	616	1781	1541
Grp Volume(v), veh/h		69	224	231	98	279	293	80	0	280	40	0
Grp Sat Flow(s),veh/h/ln		1767	1763	1804	1781	1777	1858	1753	0	1760	1781	0
Q Serve(g_s), s		2.1	8.1	8.2	3.0	10.3	10.3	2.6	0.0	10.6	1.3	0.0
Cycle Q Clear(g_c), s		2.1	8.1	8.2	3.0	10.3	10.3	2.6	0.0	10.6	1.3	0.0
Prop In Lane		1.00		0.16	1.00		0.04	1.00		0.35	1.00	
Lane Grp Cap(c), veh/h		257	371	380	302	391	409	260	0	359	229	0
V/C Ratio(X)		0.27	0.60	0.61	0.32	0.71	0.71	0.31	0.00	0.78	0.17	0.00
Avail Cap(c_a), veh/h		665	1125	1151	696	1134	1185	659	0	1123	1044	0
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		20.6	25.2	25.2	20.3	25.4	25.4	21.9	0.0	26.6	22.3	0.0
Incr Delay (d2), s/veh		0.6	1.6	1.6	0.6	2.4	2.3	0.7	0.0	3.7	0.4	0.0
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		1.5	6.0	6.2	2.1	7.4	7.7	1.9	0.0	8.0	0.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		21.2	26.8	26.8	20.9	27.9	27.8	22.5	0.0	30.3	22.7	0.0
LnGrp LOS		C	C	C	C	C	C	C		C	C	
Approach Vol, veh/h		524			670			360			294	
Approach Delay, s/veh		26.0			26.8			28.6			29.4	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.3	23.0	12.9	23.3	12.6	21.7	12.2	24.0				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	3.3	12.6	5.0	10.2	4.6	11.3	4.1	12.3				
Green Ext Time (p_c), s	0.1	1.7	0.2	2.8	0.1	1.6	0.1	3.3				
Intersection Summary												
HCM 7th Control Delay, s/veh			27.4									
HCM 7th LOS			C									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025



Movement	SWR
Lane Configurations	
Traffic Volume (veh/h)	37
Future Volume (veh/h)	37
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1856
Adj Flow Rate, veh/h	39
Peak Hour Factor	0.94
Percent Heavy Veh, %	3
Cap, veh/h	52
Arrive On Green	0.19
Sat Flow, veh/h	279
Grp Volume(v), veh/h	254
Grp Sat Flow(s),veh/h/ln	1820
Q Serve(g_s), s	9.3
Cycle Q Clear(g_c), s	9.3
Prop In Lane	0.15
Lane Grp Cap(c), veh/h	339
V/C Ratio(X)	0.75
Avail Cap(c_a), veh/h	1548
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	27.1
Incr Delay (d2), s/veh	3.3
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	7.4
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	30.5
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary

2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	176	14	142	52	78	56	4	129	596	17	6	10
Future Volume (veh/h)	176	14	142	52	78	56	4	129	596	17	6	10
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1796	1870	1841	1870	1870		1870	1870	1870		1870
Adj Flow Rate, veh/h	191	15	154	57	85	61		140	648	18		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92		0.92
Percent Heavy Veh, %	2	7	2	4	2	2		2	2	2		2
Cap, veh/h	413	47	486	102	116	73		247	1348	37		287
Arrive On Green	0.11	0.35	0.35	0.15	0.15	0.15		0.07	0.38	0.38		0.01
Sat Flow, veh/h	1781	137	1406	352	763	479		1781	3532	98		1781
Grp Volume(v), veh/h	191	0	169	203	0	0		140	326	340		11
Grp Sat Flow(s),veh/h/ln	1781	0	1543	1595	0	0		1781	1777	1853		1781
Q Serve(g_s), s	8.1	0.0	7.6	8.8	0.0	0.0		4.8	13.1	13.1		0.4
Cycle Q Clear(g_c), s	8.1	0.0	7.6	11.6	0.0	0.0		4.8	13.1	13.1		0.4
Prop In Lane	1.00		0.91	0.28		0.30		1.00		0.05		1.00
Lane Grp Cap(c), veh/h	413	0	534	292	0	0		247	678	707		287
V/C Ratio(X)	0.46	0.00	0.32	0.70	0.00	0.00		0.57	0.48	0.48		0.04
Avail Cap(c_a), veh/h	502	0	783	466	0	0		401	752	784		546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	27.3	0.0	22.7	38.7	0.0	0.0		22.5	22.1	22.1		21.0
Incr Delay (d2), s/veh	0.8	0.0	0.3	3.0	0.0	0.0		2.0	0.5	0.5		0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	6.2	0.0	4.9	8.2	0.0	0.0		3.6	8.9	9.2		0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.1	0.0	23.1	41.7	0.0	0.0		24.5	22.7	22.6		21.1
LnGrp LOS	C		C	D				C	C	C		C
Approach Vol, veh/h	360			203				806				
Approach Delay, s/veh	25.7			41.7				23.0				
Approach LOS	C			D				C				
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	14.9	39.5	18.3	21.9	9.8	44.6		40.2				
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5		7.5				
Max Green Setting (Gmax), s	50	40.0	15.0	25.0	15.0	* 40		48.0				
Max Q Clear Time (g_c+I1), s	6.8	26.1	10.1	13.6	2.4	15.1		9.6				
Green Ext Time (p_c), s	0.2	4.9	0.2	0.8	0.0	3.7		1.1				

Intersection Summary

HCM 7th Control Delay, s/veh 30.4
HCM 7th LOS C

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary
2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	784	117
Future Volume (veh/h)	784	117
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	852	127
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	1017	152
Arrive On Green	0.33	0.33
Sat Flow, veh/h	3102	462
Grp Volume(v), veh/h	488	491
Grp Sat Flow(s),veh/h/ln	1777	1787
Q Serve(g_s), s	24.1	24.1
Cycle Q Clear(g_c), s	24.1	24.1
Prop In Lane		0.26
Lane Grp Cap(c), veh/h	582	586
V/C Ratio(X)	0.84	0.84
Avail Cap(c_a), veh/h	752	756
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	1.00
Uniform Delay (d), s/veh	29.5	29.5
Incr Delay (d2), s/veh	6.6	6.6
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	15.9	15.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	36.0	36.0
LnGrp LOS	D	D
Approach Vol, veh/h	990	
Approach Delay, s/veh	35.9	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary
3: Courtland Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	31	881	112	47	449	95	179	40	59	285	62	38
Future Volume (veh/h)	31	881	112	47	449	95	179	40	59	285	62	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1870	1870	1870	1870	1870	1870	1856	1870	1870	1870	1826
Adj Flow Rate, veh/h	34	958	122	51	488	103	195	43	64	310	67	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	2	2	2	2	3	2	2	2	5
Cap, veh/h	332	1175	150	190	1104	232	397	59	87	418	162	99
Arrive On Green	0.03	0.37	0.37	0.04	0.38	0.38	0.12	0.09	0.09	0.18	0.15	0.15
Sat Flow, veh/h	1767	3171	404	1781	2923	614	1781	673	1002	1781	1086	665
Grp Volume(v), veh/h	34	537	543	51	296	295	195	0	107	310	0	108
Grp Sat Flow(s),veh/h/ln	1767	1777	1798	1781	1777	1760	1781	0	1675	1781	0	1751
Q Serve(g_s), s	1.2	27.4	27.4	1.8	12.5	12.6	9.8	0.0	6.3	15.6	0.0	5.6
Cycle Q Clear(g_c), s	1.2	27.4	27.4	1.8	12.5	12.6	9.8	0.0	6.3	15.6	0.0	5.6
Prop In Lane	1.00		0.22	1.00		0.35	1.00		0.60	1.00		0.38
Lane Grp Cap(c), veh/h	332	658	666	190	671	665	397	0	146	418	0	260
V/C Ratio(X)	0.10	0.82	0.82	0.27	0.44	0.44	0.49	0.00	0.73	0.74	0.00	0.41
Avail Cap(c_a), veh/h	629	795	804	477	795	787	537	0	333	457	0	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.1	28.6	28.6	22.3	23.4	23.4	35.5	0.0	44.8	33.1	0.0	38.9
Incr Delay (d2), s/veh	0.1	6.2	6.1	0.8	0.6	0.7	0.9	0.0	9.8	5.8	0.0	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	17.6	17.8	1.3	8.7	8.7	7.7	0.0	5.3	11.6	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.3	34.8	34.7	23.0	24.0	24.1	36.5	0.0	54.6	38.9	0.0	40.4
LnGrp LOS	B	C	C	C	C	C	D		D	D		D
Approach Vol, veh/h	1114				642		302				418	
Approach Delay, s/veh	34.3				24.0		42.9				39.3	
Approach LOS	C				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.3	45.8	19.6	23.0	11.6	46.5	25.8	16.7				
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8				
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20				
Max Q Clear Time (g_c+I1), s	3.8	29.4	11.8	7.6	3.2	14.6	17.6	8.3				
Green Ext Time (p_c), s	0.1	7.8	0.3	0.5	0.0	5.1	0.2	0.5				

Intersection Summary

HCM 7th Control Delay, s/veh	33.5
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary 4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	241	109	275	13	71	72	5	108	259	4	2	72
Future Volume (veh/h)	241	109	275	13	71	72	5	108	259	4	2	72
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		1856	1856	1870		1870
Adj Flow Rate, veh/h	265	120	302	14	78	79		119	285	4		79
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		0.91	0.91	0.91		0.91
Percent Heavy Veh, %	2	2	2	2	2	2		3	3	2		2
Cap, veh/h	471	134	338	133	288	244		203	1392	20		511
Arrive On Green	0.15	0.29	0.29	0.02	0.15	0.15		0.06	0.39	0.39		0.04
Sat Flow, veh/h	1781	471	1186	1781	1870	1585		1767	3559	50		1781
Grp Volume(v), veh/h	265	0	422	14	78	79		119	141	148		79
Grp Sat Flow(s),veh/h/ln	1781	0	1657	1781	1870	1585		1767	1763	1847		1781
Q Serve(g_s), s	13.0	0.0	26.8	0.7	4.0	4.9		4.5	5.8	5.8		3.0
Cycle Q Clear(g_c), s	13.0	0.0	26.8	0.7	4.0	4.9		4.5	5.8	5.8		3.0
Prop In Lane	1.00		0.72	1.00		1.00		1.00		0.03		1.00
Lane Grp Cap(c), veh/h	471	0	472	133	288	244		203	690	722		511
V/C Ratio(X)	0.56	0.00	0.89	0.11	0.27	0.32		0.58	0.20	0.20		0.15
Avail Cap(c_a), veh/h	697	0	680	430	597	506		739	965	1011		841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(l)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	30.1	0.0	37.6	38.8	40.9	41.3		25.6	22.1	22.1		19.6
Incr Delay (d2), s/veh	1.5	0.0	10.6	0.5	0.5	0.8		3.8	0.2	0.2		0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	9.6	0.0	17.6	0.6	3.4	3.5		3.5	4.2	4.4		2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.6	0.0	48.2	39.3	41.4	42.0		29.4	22.3	22.3		19.8
LnGrp LOS	C		D	D	D	D		C	C	C		B
Approach Vol, veh/h	687			171				408				
Approach Delay, s/veh	41.8			41.5				24.4				
Approach LOS	D			D				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	50.4	8.7	38.7	13.8	48.3	23.1	24.4				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	5.0	7.8	2.7	28.8	6.5	36.2	15.0	6.9				
Green Ext Time (p_c), s	0.2	2.4	0.0	2.5	0.5	4.6	1.1	0.6				

Intersection Summary

HCM 7th Control Delay, s/veh 39.7
HCM 7th LOS D

Notes

User approved ignoring U-Turning movement.

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	957	123
Future Volume (veh/h)	957	123
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	1052	135
Peak Hour Factor	0.91	0.91
Percent Heavy Veh, %	2	2
Cap, veh/h	1180	151
Arrive On Green	0.37	0.37
Sat Flow, veh/h	3168	406
Grp Volume(v), veh/h	590	597
Grp Sat Flow(s),veh/h/ln	1777	1797
Q Serve(g_s), s	34.2	34.2
Cycle Q Clear(g_c), s	34.2	34.2
Prop In Lane		0.23
Lane Grp Cap(c), veh/h	662	669
V/C Ratio(X)	0.89	0.89
Avail Cap(c_a), veh/h	730	738
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	32.3	32.3
Incr Delay (d2), s/veh	12.4	12.5
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	22.6	22.8
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	44.7	44.8
LnGrp LOS	D	D
Approach Vol, veh/h	1266	
Approach Delay, s/veh	43.2	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary
5: SR 415 & Howland Blvd

Timing Plan: AM Peak Hour
06/10/2025

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	40	1064	224	300	1	369	17
Future Volume (veh/h)	40	1064	224	300	1	369	17
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1856	1870	1841	1811		1870	1870
Adj Flow Rate, veh/h	44	1169	246	330		405	19
Peak Hour Factor	0.91	0.91	0.91	0.91		0.91	0.91
Percent Heavy Veh, %	3	2	4	6		2	2
Cap, veh/h	723	1142	635	1304		727	324
Arrive On Green	0.41	0.41	0.08	0.38		0.20	0.20
Sat Flow, veh/h	1767	2790	3401	3532		3647	1585
Grp Volume(v), veh/h	44	1169	246	330		405	19
Grp Sat Flow(s),veh/h/ln	1767	1395	1700	1721		1777	1585
Q Serve(g_s), s	1.1	30.0	3.1	4.8		7.5	0.7
Cycle Q Clear(g_c), s	1.1	30.0	3.1	4.8		7.5	0.7
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	723	1142	635	1304		727	324
V/C Ratio(X)	0.06	1.02	0.39	0.25		0.56	0.06
Avail Cap(c_a), veh/h	723	1142	1434	2348		2425	1082
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	13.1	21.6	15.1	15.6		26.2	23.5
Incr Delay (d2), s/veh	0.0	32.8	0.4	0.1		0.7	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	19.7	1.8	3.0		5.3	0.4
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	13.1	54.4	15.5	15.7		26.8	23.5
LnGrp LOS	B	F	B	B		C	C
Approach Vol, veh/h	1213			576		424	
Approach Delay, s/veh	52.9			15.6		26.7	
Approach LOS	D			B		C	
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	12.8	23.0				35.8	37.5
Change Period (Y+Rc), s	7.0	* 8				8.0	7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0	30.0
Max Q Clear Time (g_c+I1), s	5.1	9.5				6.8	32.0
Green Ext Time (p_c), s	0.7	2.6				2.1	0.0

Intersection Summary

HCM 7th Control Delay, s/veh 38.2
HCM 7th LOS D

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025

												
Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEL	NET	NER	SWL
Lane Configurations												
Traffic Volume (veh/h)	5	206	557	60	1	143	469	48	55	278	88	88
Future Volume (veh/h)	5	206	557	60	1	143	469	48	55	278	88	88
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No				No				No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		217	586	63		151	494	51	58	293	93	93
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		342	761	82		286	664	68	234	343	109	225
Arrive On Green		0.12	0.24	0.24		0.09	0.20	0.20	0.04	0.25	0.25	0.06
Sat Flow, veh/h		1781	3237	347		1781	3252	335	1781	1361	432	1781
Grp Volume(v), veh/h		217	321	328		151	269	276	58	0	386	93
Grp Sat Flow(s),veh/h/ln		1781	1777	1808		1781	1777	1810	1781	0	1793	1781
Q Serve(g_s), s		8.7	15.7	15.7		6.1	13.2	13.3	2.2	0.0	19.1	3.5
Cycle Q Clear(g_c), s		8.7	15.7	15.7		6.1	13.2	13.3	2.2	0.0	19.1	3.5
Prop In Lane		1.00		0.19		1.00		0.18	1.00		0.24	1.00
Lane Grp Cap(c), veh/h		342	418	425		286	363	369	234	0	452	225
V/C Ratio(X)		0.63	0.77	0.77		0.53	0.74	0.75	0.25	0.00	0.85	0.41
Avail Cap(c_a), veh/h		513	860	875		512	860	877	543	0	868	795
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh		25.5	33.2	33.2		26.5	34.7	34.7	25.4	0.0	33.1	25.6
Incr Delay (d2), s/veh		1.9	3.0	3.0		1.5	3.0	3.0	0.5	0.0	4.7	1.2
Initial Q Delay(d3), s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		6.7	11.2	11.4		4.6	9.6	9.8	1.7	0.0	13.3	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		27.4	36.2	36.2		28.0	37.7	37.8	25.9	0.0	37.8	26.8
LnGrp LOS		C	D	D		C	D	D	C		D	C
Approach Vol, veh/h			866				696			444		
Approach Delay, s/veh			34.0				35.6			36.2		
Approach LOS			C				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	32.0	16.7	30.3	12.5	33.4	19.6	27.5				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	5.5	21.1	8.1	17.7	4.2	19.3	10.7	15.3				
Green Ext Time (p_c), s	0.2	2.4	0.3	4.1	0.1	2.4	0.4	3.1				
Intersection Summary												
HCM 7th Control Delay, s/veh			34.6									
HCM 7th LOS			C									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025



Movement	SWT	SWR
Lane Configurations		
Traffic Volume (veh/h)	227	113
Future Volume (veh/h)	227	113
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	239	119
Peak Hour Factor	0.95	0.95
Percent Heavy Veh, %	2	2
Cap, veh/h	314	157
Arrive On Green	0.27	0.27
Sat Flow, veh/h	1178	587
Grp Volume(v), veh/h	0	358
Grp Sat Flow(s),veh/h/ln	0	1765
Q Serve(g_s), s	0.0	17.3
Cycle Q Clear(g_c), s	0.0	17.3
Prop In Lane		0.33
Lane Grp Cap(c), veh/h	0	471
V/C Ratio(X)	0.00	0.76
Avail Cap(c_a), veh/h	0	1139
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.3
Incr Delay (d2), s/veh	0.0	2.6
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	11.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	0.0	33.9
LnGrp LOS		C
Approach Vol, veh/h	451	
Approach Delay, s/veh	32.4	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	158	45	89	15	38	36	140	811	34	7	58	758
Future Volume (veh/h)	158	45	89	15	38	36	140	811	34	7	58	758
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No			No					No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1826	1870	1870	1870	1870		1870	1870
Adj Flow Rate, veh/h	166	47	94	16	40	38	147	854	36		61	798
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
Percent Heavy Veh, %	2	2	2	7	5	2	2	2	2		2	2
Cap, veh/h	397	158	316	65	66	55	270	1314	55		276	974
Arrive On Green	0.11	0.28	0.28	0.08	0.08	0.08	0.08	0.38	0.38		0.05	0.35
Sat Flow, veh/h	1781	557	1113	176	789	655	1781	3474	146		1781	2752
Grp Volume(v), veh/h	166	0	141	94	0	0	147	437	453		61	515
Grp Sat Flow(s),veh/h/ln	1781	0	1670	1620	0	0	1781	1777	1844		1781	1777
Q Serve(g_s), s	6.8	0.0	5.5	2.2	0.0	0.0	4.3	17.0	17.0		1.8	22.1
Cycle Q Clear(g_c), s	6.8	0.0	5.5	4.7	0.0	0.0	4.3	17.0	17.0		1.8	22.1
Prop In Lane	1.00		0.67	0.17		0.40	1.00		0.08		1.00	
Lane Grp Cap(c), veh/h	397	0	475	186	0	0	270	672	697		276	629
V/C Ratio(X)	0.42	0.00	0.30	0.51	0.00	0.00	0.54	0.65	0.65		0.22	0.82
Avail Cap(c_a), veh/h	529	0	957	524	0	0	455	848	880		514	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	28.6	0.0	23.4	37.3	0.0	0.0	18.8	21.5	21.5		17.1	24.6
Incr Delay (d2), s/veh	0.7	0.0	0.3	2.1	0.0	0.0	1.7	1.2	1.1		0.4	4.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln	5.1	0.0	3.8	3.5	0.0	0.0	3.0	10.7	11.1		1.2	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.3	0.0	23.8	39.4	0.0	0.0	20.5	22.7	22.6		17.5	29.3
LnGrp LOS	C		C	D			C	C	C		B	C
Approach Vol, veh/h	307		94			1037			1079			
Approach Delay, s/veh	26.8		39.4			22.3			28.7			
Approach LOS	C		D			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	8					
Phs Duration (G+Y+Rc), s	14.3	38.2	16.8	14.5	12.3	40.2	31.3					
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5	7.5					
Max Green Setting (Gmax), s	50	40.0	15.0	25.0	15.0	* 40	48.0					
Max Q Clear Time (g_c+I1), s	6.3	24.1	8.8	6.7	3.8	19.0	7.5					
Green Ext Time (p_c), s	0.2	5.6	0.2	0.4	0.1	5.1	0.9					

Intersection Summary

HCM 7th Control Delay, s/veh 26.3
HCM 7th LOS C

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary
2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	209
Future Volume (veh/h)	209
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1870
Adj Flow Rate, veh/h	220
Peak Hour Factor	0.95
Percent Heavy Veh, %	2
Cap, veh/h	269
Arrive On Green	0.35
Sat Flow, veh/h	759
Grp Volume(v), veh/h	503
Grp Sat Flow(s),veh/h/ln	1734
Q Serve(g_s), s	22.1
Cycle Q Clear(g_c), s	22.1
Prop In Lane	0.44
Lane Grp Cap(c), veh/h	614
V/C Ratio(X)	0.82
Avail Cap(c_a), veh/h	828
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	24.6
Incr Delay (d2), s/veh	4.8
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	13.9
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	29.4
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary
3: Courtland Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	37	418	240	43	762	147	177	69	19	78	71	42
Future Volume (veh/h)	37	418	240	43	762	147	177	69	19	78	71	42
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	440	253	45	802	155	186	73	20	82	75	44
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
Percent Heavy Veh, %	2	2	2	2	2	3	2	2	2	2	2	2
Cap, veh/h	223	782	446	301	1074	208	335	215	59	312	106	62
Arrive On Green	0.04	0.36	0.36	0.04	0.36	0.36	0.12	0.15	0.15	0.06	0.10	0.10
Sat Flow, veh/h	1781	2180	1243	1781	2970	574	1781	1413	387	1781	1105	648
Grp Volume(v), veh/h	39	358	335	45	480	477	186	0	93	82	0	119
Grp Sat Flow(s),veh/h/ln	1781	1777	1647	1781	1777	1767	1781	0	1801	1781	0	1754
Q Serve(g_s), s	1.1	13.5	13.7	1.3	19.8	19.8	7.7	0.0	3.9	3.4	0.0	5.5
Cycle Q Clear(g_c), s	1.1	13.5	13.7	1.3	19.8	19.8	7.7	0.0	3.9	3.4	0.0	5.5
Prop In Lane	1.00		0.76	1.00		0.32	1.00		0.22	1.00		0.37
Lane Grp Cap(c), veh/h	223	637	590	301	643	639	335	0	273	312	0	169
V/C Ratio(X)	0.17	0.56	0.57	0.15	0.75	0.75	0.55	0.00	0.34	0.26	0.00	0.70
Avail Cap(c_a), veh/h	585	956	885	658	956	950	551	0	430	637	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	21.6	21.6	16.8	23.4	23.4	29.0	0.0	31.7	31.5	0.0	36.7
Incr Delay (d2), s/veh	0.4	1.1	1.2	0.2	2.5	2.5	1.4	0.0	1.0	0.4	0.0	7.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	9.1	8.6	0.9	12.5	12.4	5.9	0.0	3.1	2.6	0.0	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	18.5	22.7	22.8	17.0	25.9	25.9	30.5	0.0	32.8	31.9	0.0	44.1
LnGrp LOS	B	C	C	B	C	C	C		C	C		D
Approach Vol, veh/h	732				1002				279			
Approach Delay, s/veh	22.5				25.5				31.2			
Approach LOS	C				C				C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.7	38.5	17.4	16.1	11.5	38.8	12.7	20.7				
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8				
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20				
Max Q Clear Time (g_c+I1), s	3.3	15.7	9.7	7.5	3.1	21.8	5.4	5.9				
Green Ext Time (p_c), s	0.1	6.3	0.3	0.6	0.0	8.5	0.1	0.4				

Intersection Summary

HCM 7th Control Delay, s/veh	26.5
HCM 7th LOS	C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	69	79	182	16	147	114	2	361	835	11	1	47
Future Volume (veh/h)	69	79	182	16	147	114	2	361	835	11	1	47
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1856	1870	1707	1870	1870		1870	1870	1870		1767
Adj Flow Rate, veh/h	77	88	202	18	163	127		401	928	12		52
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90		0.90
Percent Heavy Veh, %	2	3	2	13	2	2		2	2	2		9
Cap, veh/h	293	107	246	166	343	291		524	1343	17		245
Arrive On Green	0.05	0.21	0.21	0.02	0.18	0.18		0.21	0.37	0.37		0.04
Sat Flow, veh/h	1781	500	1148	1626	1870	1585		1781	3592	46		1682
Grp Volume(v), veh/h	77	0	290	18	163	127		401	459	481		52
Grp Sat Flow(s),veh/h/ln	1781	0	1649	1626	1870	1585		1781	1777	1862		1682
Q Serve(g_s), s	2.9	0.0	13.9	0.7	6.5	5.9		13.5	18.1	18.1		2.0
Cycle Q Clear(g_c), s	2.9	0.0	13.9	0.7	6.5	5.9		13.5	18.1	18.1		2.0
Prop In Lane	1.00		0.70	1.00		1.00		1.00		0.02		1.00
Lane Grp Cap(c), veh/h	293	0	353	166	343	291		524	664	696		245
V/C Ratio(X)	0.26	0.00	0.82	0.11	0.48	0.44		0.77	0.69	0.69		0.21
Avail Cap(c_a), veh/h	845	0	894	525	789	668		1006	1284	1346		681
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	25.7	0.0	31.1	27.4	30.3	30.1		18.5	21.9	21.9		24.4
Incr Delay (d2), s/veh	0.7	0.0	4.8	0.4	1.0	1.0		3.4	1.8	1.8		0.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	2.2	0.0	9.7	0.5	5.2	4.0		9.1	11.4	11.8		1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.3	0.0	35.8	27.8	31.4	31.1		21.9	23.8	23.7		25.0
LnGrp LOS	C		D	C	C	C		C	C	C		C
Approach Vol, veh/h	367			308				1341				
Approach Delay, s/veh	33.8			31.1				23.2				
Approach LOS	C			C				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	38.5	8.7	25.3	24.5	24.5	11.3	22.7				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	4.0	20.1	2.7	15.9	15.5	13.3	4.9	8.5				
Green Ext Time (p_c), s	0.1	9.7	0.0	1.9	2.0	2.9	0.3	1.3				
Intersection Summary												
HCM 7th Control Delay, s/veh	27.7											
HCM 7th LOS	C											
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	399	66
Future Volume (veh/h)	399	66
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	443	73
Peak Hour Factor	0.90	0.90
Percent Heavy Veh, %	2	2
Cap, veh/h	626	103
Arrive On Green	0.20	0.20
Sat Flow, veh/h	3057	501
Grp Volume(v), veh/h	256	260
Grp Sat Flow(s),veh/h/ln	1777	1780
Q Serve(g_s), s	11.1	11.3
Cycle Q Clear(g_c), s	11.1	11.3
Prop In Lane		0.28
Lane Grp Cap(c), veh/h	364	365
V/C Ratio(X)	0.70	0.71
Avail Cap(c_a), veh/h	963	965
HCM Platoon Ratio	1.00	1.00
Upstream Filter(l)	1.00	1.00
Uniform Delay (d), s/veh	30.7	30.7
Incr Delay (d2), s/veh	2.5	2.6
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.2	8.3
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	33.2	33.3
LnGrp LOS	C	C
Approach Vol, veh/h	568	
Approach Delay, s/veh	32.5	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary
5: SR 415 & Howland Blvd

Timing Plan: PM Peak Hour
06/10/2025



Movement	EBU	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations		↩	↩↩	↩↩	↩↩	↩	↩↩	↩
Traffic Volume (veh/h)	1	43	328	905	506	2	334	60
Future Volume (veh/h)	1	43	328	905	506	2	334	60
Initial Q (Qb), veh		0	0	0	0		0	0
Lane Width Adj.		1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00				1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach		No			No		No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870		1870	1856
Adj Flow Rate, veh/h		45	345	953	533		352	63
Peak Hour Factor		0.95	0.95	0.95	0.95		0.95	0.95
Percent Heavy Veh, %		2	2	2	2		2	3
Cap, veh/h		310	485	1219	1997		908	402
Arrive On Green		0.17	0.17	0.19	0.56		0.26	0.26
Sat Flow, veh/h		1781	2790	3456	3647		3647	1572
Grp Volume(v), veh/h		45	345	953	533		352	63
Grp Sat Flow(s),veh/h/ln		1781	1395	1728	1777		1777	1572
Q Serve(g_s), s		1.3	6.8	5.6	4.5		4.8	1.8
Cycle Q Clear(g_c), s		1.3	6.8	5.6	4.5		4.8	1.8
Prop In Lane		1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h		310	485	1219	1997		908	402
V/C Ratio(X)		0.15	0.71	0.78	0.27		0.39	0.16
Avail Cap(c_a), veh/h		911	1426	1927	3028		3028	1340
HCM Platoon Ratio		1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh		20.5	22.8	10.1	6.6		18.0	16.9
Incr Delay (d2), s/veh		0.2	1.9	1.1	0.1		0.3	0.2
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln		0.9	3.7	5.2	2.1		3.1	1.0
Unsig. Movement Delay, s/veh								
LnGrp Delay(d), s/veh		20.7	24.8	11.2	6.7		18.3	17.1
LnGrp LOS		C	C	B	A		B	B
Approach Vol, veh/h		390			1486		415	
Approach Delay, s/veh		24.3			9.6		18.1	
Approach LOS		C			A		B	
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.0	23.0				41.0		17.7
Change Period (Y+Rc), s	7.0	* 8				8.0		7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0		30.0
Max Q Clear Time (g_c+I1), s	7.6	6.8				6.5		8.8
Green Ext Time (p_c), s	3.4	2.4				3.6		1.4

Intersection Summary

HCM 7th Control Delay, s/veh	13.6
HCM 7th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

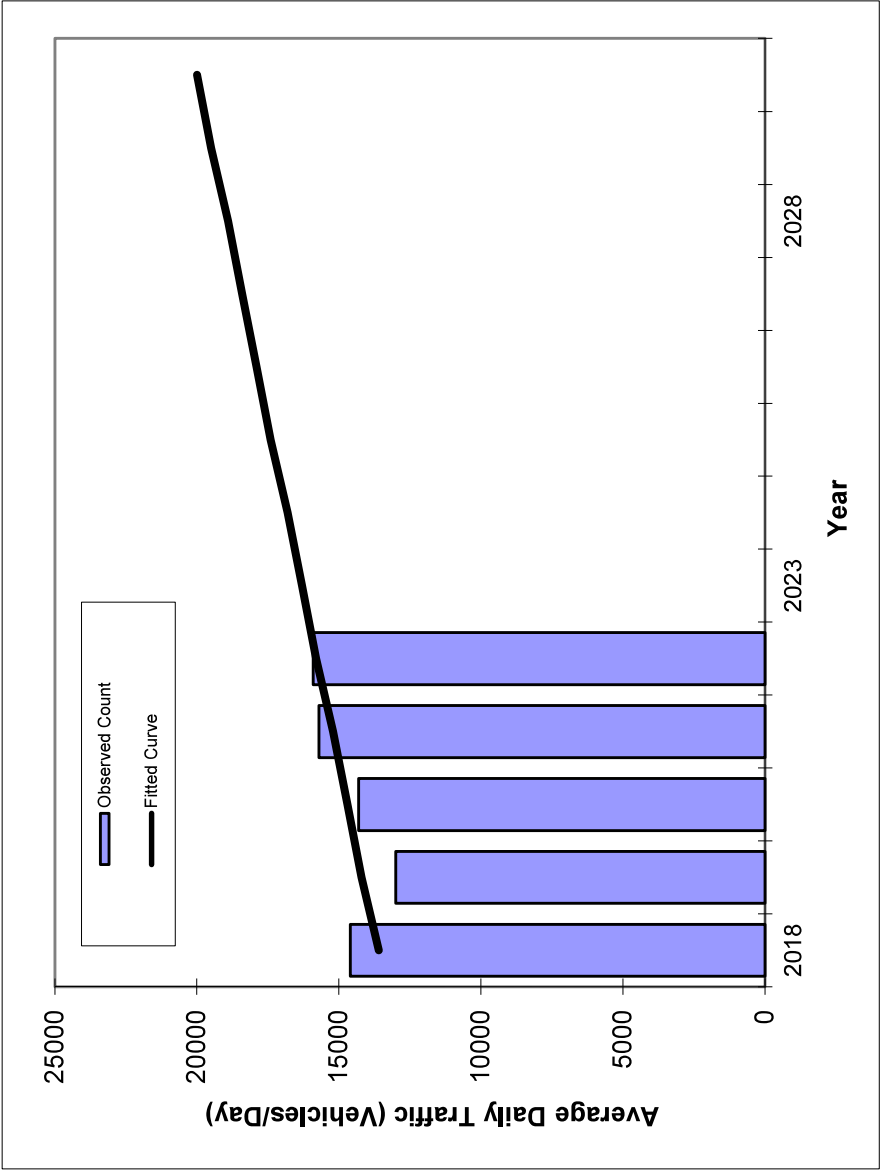
APPENDIX F

Background Traffic Determination

TRAFFIC TRENDS

Howland Blvd -- Courtland Blvd to Fort Smith Blvd

County:	Volusia
Station #:	913
Highway:	Howland Blvd



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	14600	13600
2019	13000	14200
2020	14300	14700
2021	15700	15200
2022	15900	15800
2025 Opening Year Trend		
2025	N/A	17400
2026 Mid-Year Trend		
2026	N/A	17900
2027 Design Year Trend		
2027	N/A	18400
TRANPLAN Forecasts/Trends		

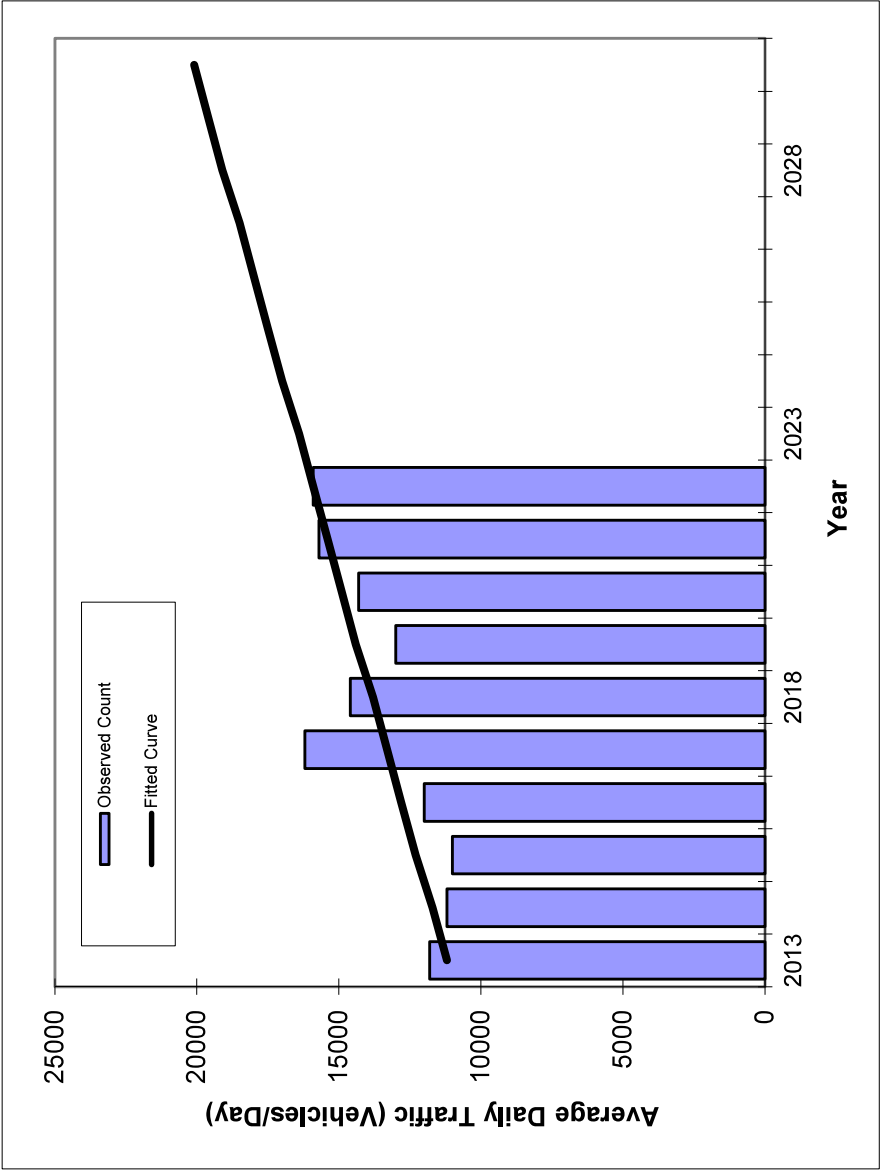
** Annual Trend Increase:	530
Trend R-squared:	51.1%
Trend Annual Historic Growth Rate:	4.04%
Trend Growth Rate (2022 to Design Year):	3.29%
Printed:	8-Jun-25
Straight Line Growth Option	

*Axle-Adjusted

TRAFFIC TRENDS

Howland Blvd -- Courtland Blvd to Fort Smith Blvd

County:	Volusia
Station #:	913
Highway:	Howland Blvd



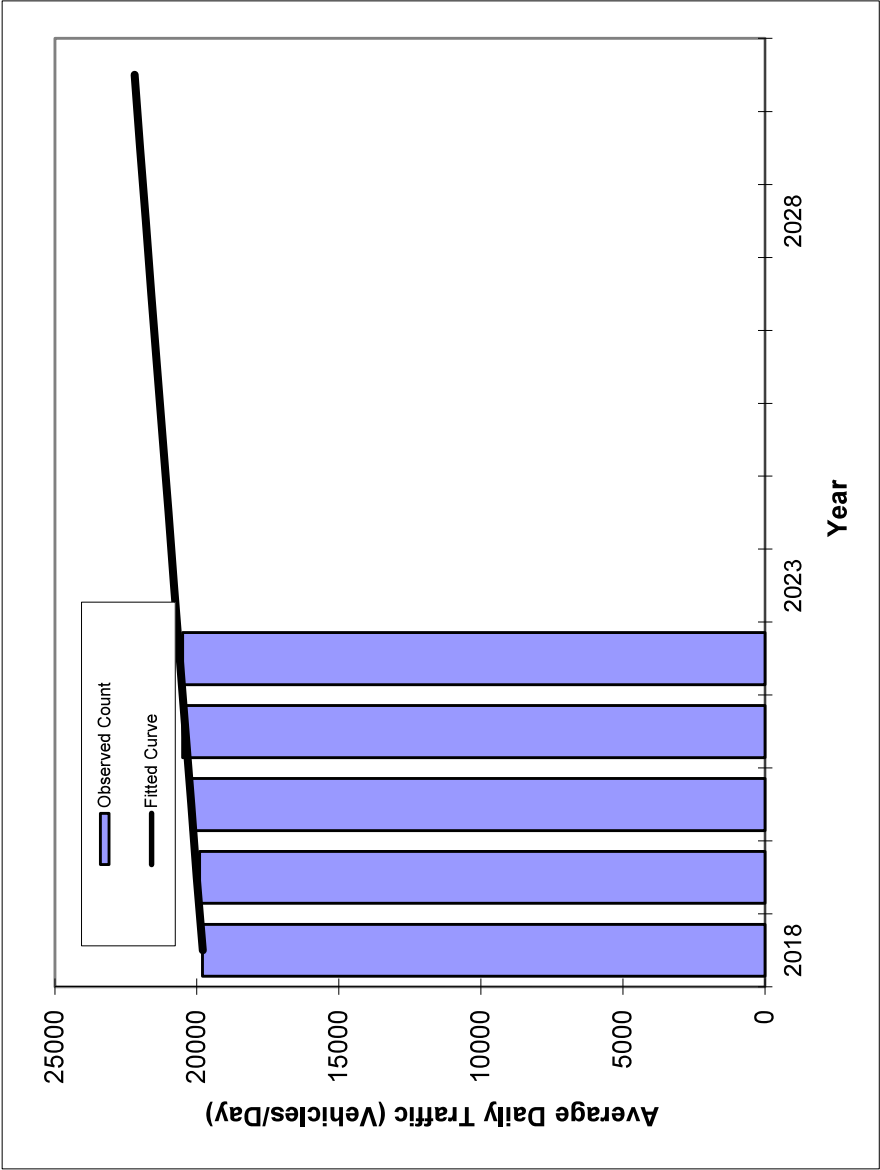
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2013	11800	11200
2014	11200	11700
2015	11000	12300
2016	12000	12800
2017	16200	13300
2018	14600	13800
2019	13000	14400
2020	14300	14900
2021	15700	15400
2022	15900	15900
2025 Opening Year Trend		
2025	N/A	17500
2026 Mid-Year Trend		
2026	N/A	18000
2027 Design Year Trend		
2027	N/A	18500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

** Annual Trend Increase:	523
Trend R-squared:	61.6%
Trend Annual Historic Growth Rate:	4.66%
Trend Growth Rate (2022 to Design Year):	3.27%
Printed:	8-Jun-25
Straight Line Growth Option	

TRAFFIC TRENDS **SR 415 -- Enterprise Osteen Rd to Howland Blvd**

County:	Volusia
Station #:	437
Highway:	SR 415



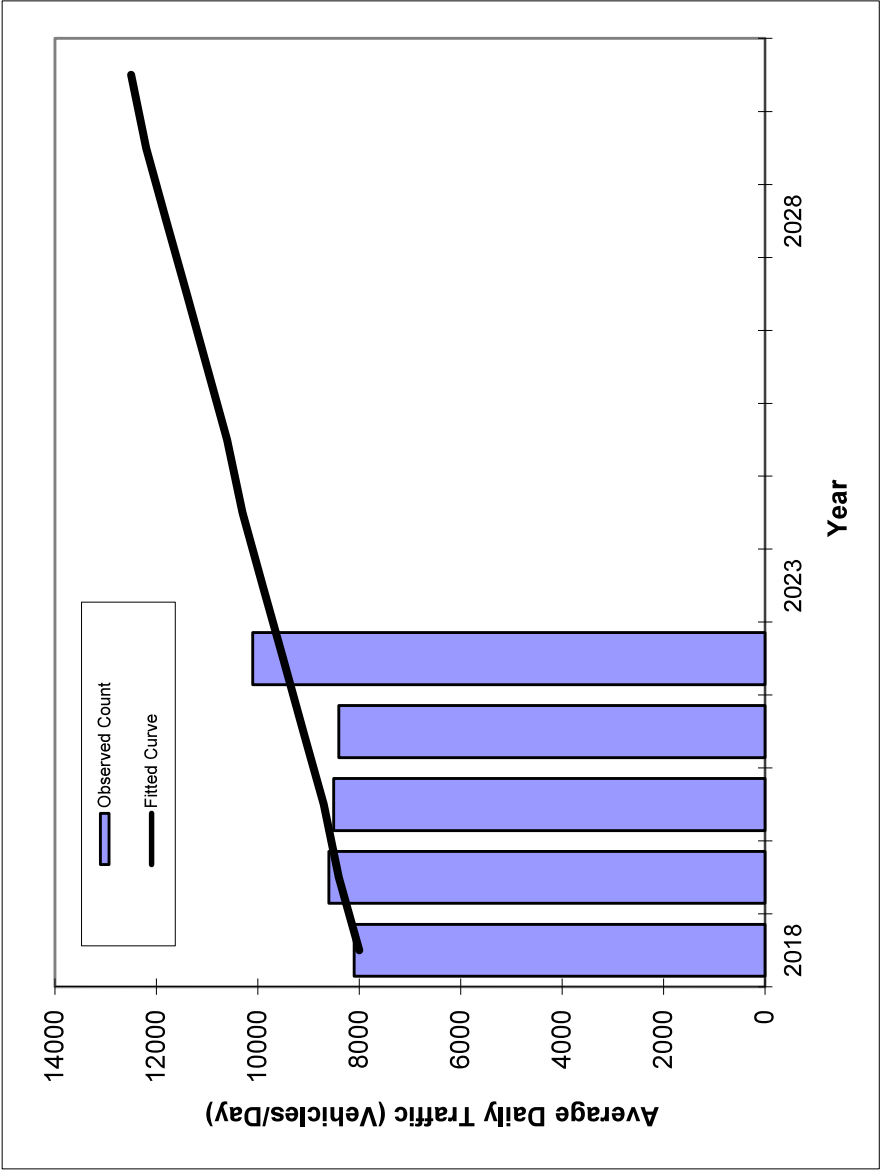
** Annual Trend Increase:	200
Trend R-squared:	93.5%
Trend Annual Historic Growth Rate:	1.01%
Trend Growth Rate (2022 to Design Year):	0.97%
Printed:	8-Jun-25
Straight Line Growth Option	

Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	19800	19800
2019	19900	20000
2020	20200	20200
2021	20500	20400
2022	20500	20600
2025 Opening Year Trend		
2025	N/A	21200
2026 Mid-Year Trend		
2026	N/A	21400
2027 Design Year Trend		
2027	N/A	21600
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

TRAFFIC TRENDS **SR 415 -- Howland Blvd to Acorn Lake Rd**

County:	Volusia
Station #:	321
Highway:	SR 415

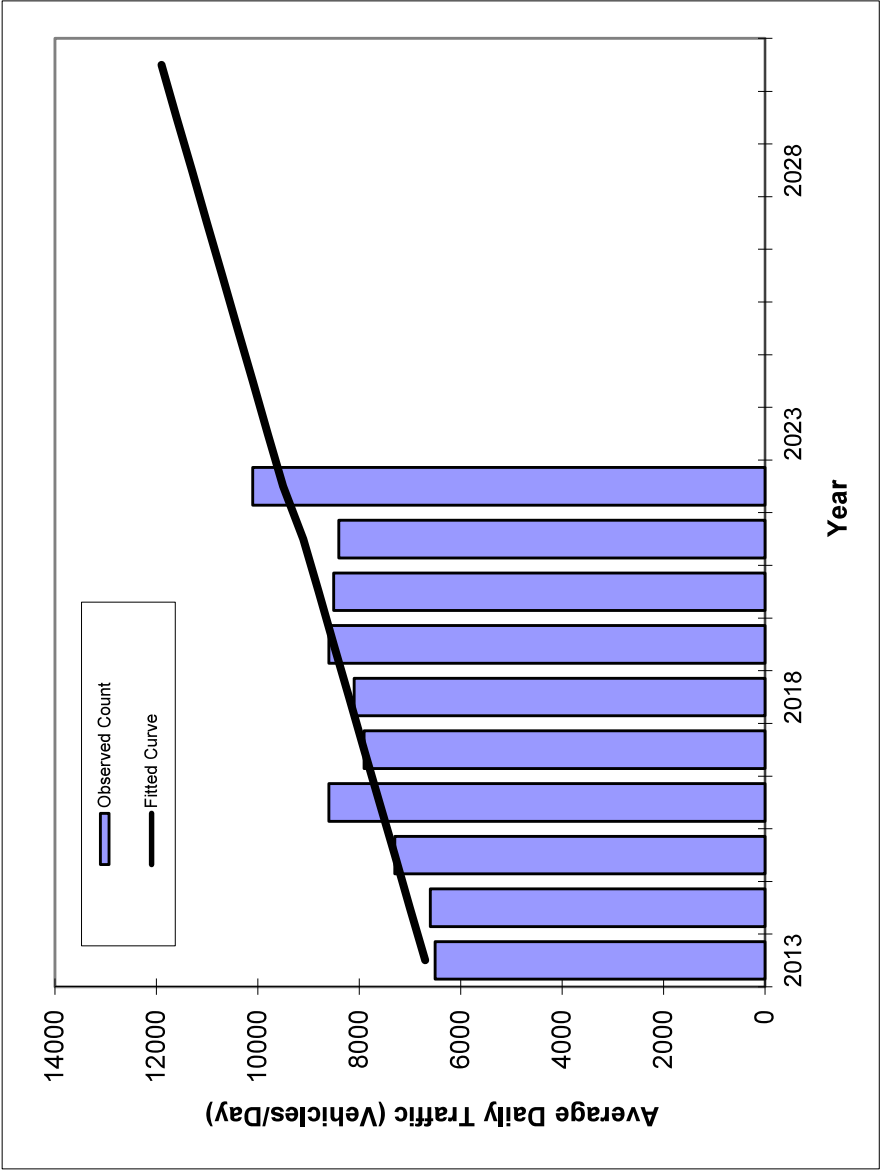


** Annual Trend Increase:	380
Trend R-squared:	58.9%
Trend Annual Historic Growth Rate:	4.69%
Trend Growth Rate (2022 to Design Year):	4.00%
Printed:	8-Jun-25
Straight Line Growth Option	

Year	Traffic (ADT/AADT)
Count*	Trend**
2018	8100
2019	8600
2020	8500
2021	8400
2022	10100
2023	10600
2024	11000
2025	11400
2026	11800
2027	12200
2028	12600
2029	13000
2030	13400
2031	13800
2032	14200
2033	14600
2034	15000
2035	15400
2036	15800
2037	16200
2038	16600
2039	17000
2040	17400
2041	17800
2042	18200
2043	18600
2044	19000
2045	19400
2046	19800
2047	20200
2048	20600
2049	21000
2050	21400
2051	21800
2052	22200
2053	22600
2054	23000
2055	23400
2056	23800
2057	24200
2058	24600
2059	25000
2060	25400
2061	25800
2062	26200
2063	26600
2064	27000
2065	27400
2066	27800
2067	28200
2068	28600
2069	29000
2070	29400
2071	29800
2072	30200
2073	30600
2074	31000
2075	31400
2076	31800
2077	32200
2078	32600
2079	33000
2080	33400
2081	33800
2082	34200
2083	34600
2084	35000
2085	35400
2086	35800
2087	36200
2088	36600
2089	37000
2090	37400
2091	37800
2092	38200
2093	38600
2094	39000
2095	39400
2096	39800
2097	40200
2098	40600
2099	41000
2100	41400
2101	41800
2102	42200
2103	42600
2104	43000
2105	43400
2106	43800
2107	44200
2108	44600
2109	45000
2110	45400
2111	45800
2112	46200
2113	46600
2114	47000
2115	47400
2116	47800
2117	48200
2118	48600
2119	49000
2120	49400
2121	49800
2122	50200
2123	50600
2124	51000
2125	51400
2126	51800
2127	52200
2128	52600
2129	53000
2130	53400
2131	53800
2132	54200
2133	54600
2134	55000
2135	55400
2136	55800
2137	56200
2138	56600
2139	57000
2140	57400
2141	57800
2142	58200
2143	58600
2144	59000
2145	59400
2146	59800
2147	60200
2148	60600
2149	61000
2150	61400
2151	61800
2152	62200
2153	62600
2154	63000
2155	63400
2156	63800
2157	64200
2158	64600
2159	65000
2160	65400
2161	65800
2162	66200
2163	66600
2164	67000
2165	67400
2166	67800
2167	68200
2168	68600
2169	69000
2170	69400
2171	69800
2172	70200
2173	70600
2174	71000
2175	71400
2176	71800
2177	72200
2178	72600
2179	73000
2180	73400
2181	73800
2182	74200
2183	74600
2184	75000
2185	75400
2186	75800
2187	76200
2188	76600
2189	77000
2190	77400
2191	77800
2192	78200
2193	78600
2194	79000
2195	79400
2196	79800
2197	80200
2198	80600
2199	81000
2200	81400
2201	81800
2202	82200
2203	82600
2204	83000
2205	83400
2206	83800
2207	84200
2208	84600
2209	85000
2210	85400
2211	85800
2212	86200
2213	86600
2214	87000
2215	87400
2216	87800
2217	88200
2218	88600
2219	89000
2220	89400
2221	89800
2222	90200
2223	90600
2224	91000
2225	91400
2226	91800
2227	92200
2228	92600
2229	93000
2230	93400
2231	93800
2232	94200
2233	94600
2234	95000
2235	95400
2236	95800
2237	96200
2238	96600
2239	97000
2240	97400
2241	97800
2242	98200
2243	98600
2244	99000
2245	99400
2246	99800
2247	100200
2248	100600
2249	101000
2250	101400
2251	101800
2252	102200
2253	102600
2254	103000
2255	103400
2256	103800
2257	104200
2258	104600
2259	105000
2260	105400
2261	105800
2262	106200
2263	106600
2264	107000
2265	107400
2266	107800
2267	108200
2268	108600
2269	109000
2270	109400
2271	109800
2272	110200
2273	110600
2274	111000
2275	111400
2276	111800
2277	112200
2278	112600
2279	113000
2280	113400
2281	113800
2282	114200
2283	114600
2284	115000
2285	115400
2286	115800
2287	116200
2288	116600
2289	117000
2290	117400
2291	117800
2292	118200
2293	118600
2294	119000
2295	119400
2296	119800
2297	120200
2298	120600
2299	121000
2300	121400
2301	121800
2302	122200
2303	122600
2304	123000
2305	123400
2306	123800
2307	124200
2308	124600
2309	125000
2310	125400
2311	125800
2312	126200
2313	126600
2314	127000
2315	127400
2316	127800
2317	128200
2318	128600
2319	129000
2320	129400
2321	129800
2322	130200
2323	130600
2324	131000
2325	131400
2326	131800
2327	132200
2328	132600
2329	133000
2330	133400
2331	133800
2332	134200
2333	134600
2334	135000
2335	135400
2336	135800
2337	136200
2338	136600
2339	137000
2340	137400
2341	137800
2342	138200
2343	138600
2344	139000
2345	139400
2346	139800
2347	140200
2348	140600
2349	141000
2350	141400
2351	141800
2352	142200
2353	142600
2354	143000
2355	143400
2356	143800
2357	144200
2358	144600
2359	145000
2360	145400
2361	145800
2362	146200
2363	146600
2364	147000
2365	147400
2366	147800
2367	148200
2368	148600
2369	149000
2370	149400
2371	149800
2372	150200
2373	150600
2374	151000
2375	151400
2376	151800
2377	152200
2378	152600
2379	153000
2380	153400
2381	153800
2382	154200
2383	154600
2384	155000
2385	155400
2386	155800
2387	156200
2388	156600
2389	157000
2390	157400
2391	157800
2392	158200
2393	158600
2394	159000
2395	159400
2396	159800
2397	160200
2398	160600
2399	161000
2400	161400
2401	161800
2402	162200
2403	162600
2404	163000
2405	163400
2406	163800
2407	164200
2408	164600
2409	165000
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2414	167000
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2416	167800
2417	168200
2418	168600
2419	169000
2420	169400
2421	169800
2422	170200
2423	170600
2424	171000
2425	171400
2426	171800
2427	172200
2428	172600
2429	173000
2430	173400
2431	173800
2432	174200
2433	174600
2434	175000
2435	175400
2436	175800
2437	176200
2438	176600
2439	177000
2440	177400
2441	177800
2442	178200
2443	178600
2444	179000
2445	179400
2446	179800
2447	180200
2448	180600
2449	181000
2450	181400
2451	181800
2452	182200
2453	182600
2454	183000
2455	183400
2456	183800
2457	184200
2458	184600
2459	185000

TRAFFIC TRENDS **SR 415 -- Howland Blvd to Acorn Lake Rd**

County:	Volusia
Station #:	321
Highway:	SR 415



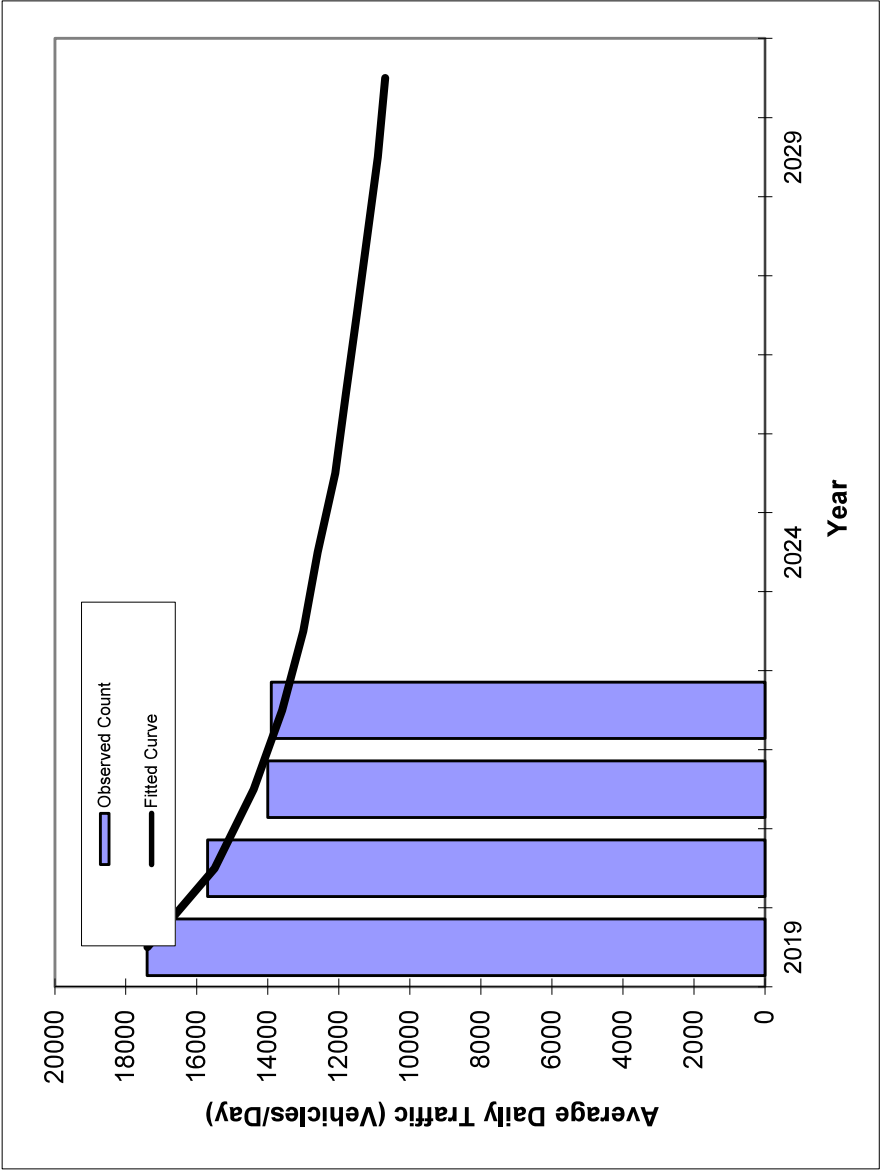
** Annual Trend Increase:	310
Trend R-squared:	77.7%
Trend Annual Historic Growth Rate:	4.64%
Trend Growth Rate (2022 to Design Year):	3.16%
Printed:	8-Jun-25
Straight Line Growth Option	

Year	Traffic (ADT/AADT)	
	Count*	Trend**
2013	6500	6700
2014	6600	7000
2015	7300	7300
2016	8600	7600
2017	7900	7900
2018	8100	8200
2019	8600	8500
2020	8500	8800
2021	8400	9100
2022	10100	9500
2025 Opening Year Trend		
2025	N/A	10400
2026 Mid-Year Trend		
2026	N/A	10700
2027 Design Year Trend		
2027	N/A	11000
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

TRAFFIC TRENDS **Howland Blvd -- Providence Blvd to Elkcam Blvd**

County:	Volusia
Station #:	906
Highway:	Howland Blvd



Trend R-squared:	96.6%
Compounded Annual Historic Growth Rate:	-7.81%
Compounded Growth Rate (2022 to Design Year):	-2.84%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

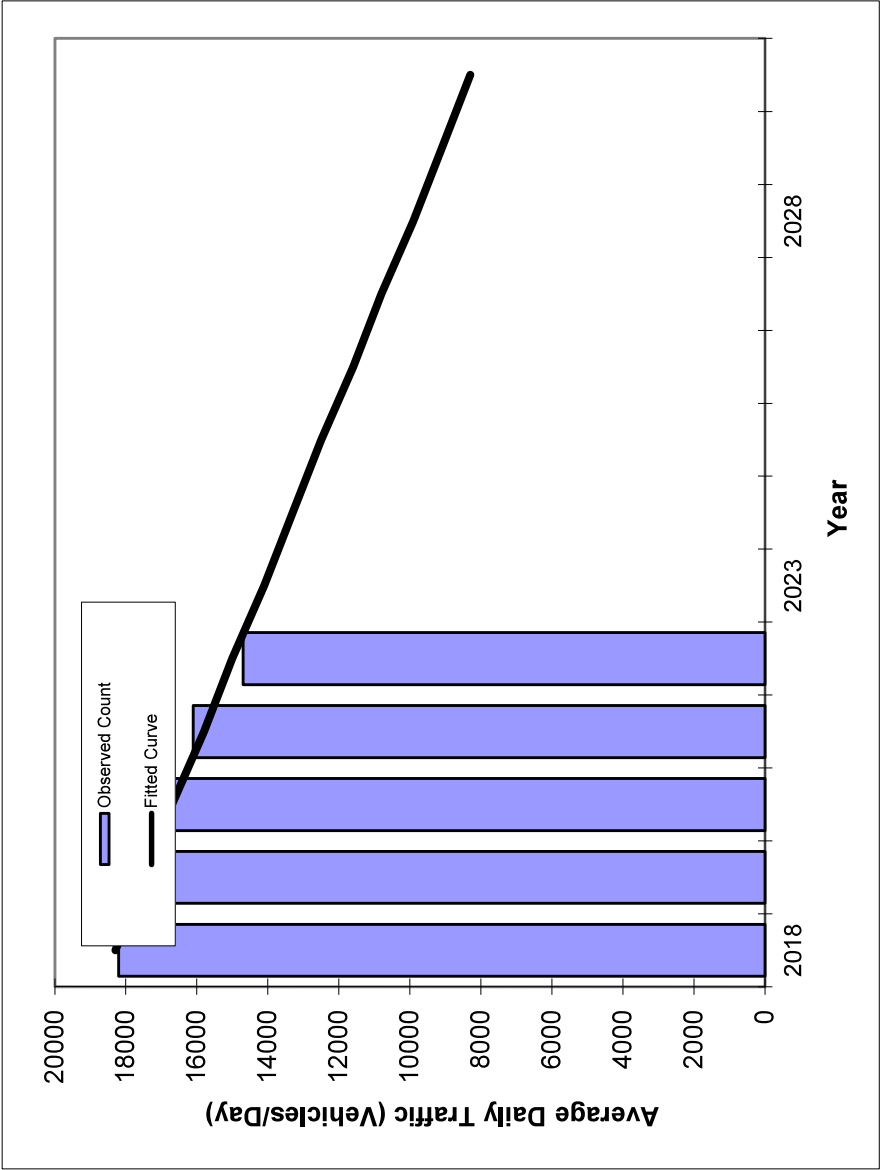
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2019	17400	17400
2020	15700	15500
2021	14000	14400
2022	13900	13600
2025 Opening Year Trend		
2025	N/A	12100
2026 Mid-Year Trend		
2026	N/A	11800
2027 Design Year Trend		
2027	N/A	11500
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

TRAFFIC TRENDS

Howland Blvd -- Elkcam to Lake Helen Osteen

County:	Volusia
Station #:	908
Highway:	Howland Blvd



** Annual Trend Increase:	-840
Trend R-squared:	97.3%
Trend Annual Historic Growth Rate:	-4.51%
Trend Growth Rate (2022 to Design Year):	-5.60%
Printed:	8-Jun-25
Straight Line Growth Option	

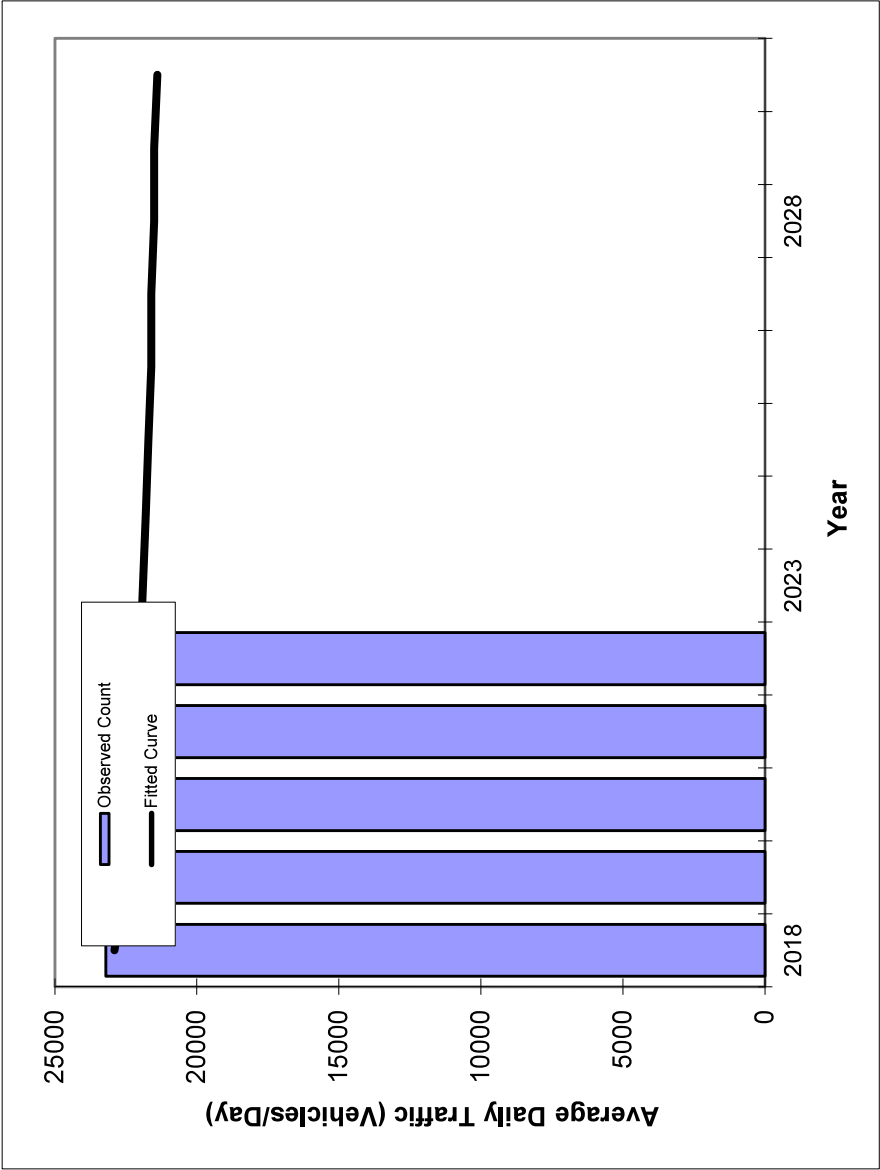
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	18200	18300
2019	17500	17500
2020	16800	16700
2021	16100	15800
2022	14700	15000
2025 Opening Year Trend		
2025	N/A	12500
2026 Mid-Year Trend		
2026	N/A	11600
2027 Design Year Trend		
2027	N/A	10800
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

TRAFFIC TRENDS

Howland Blvd -- Lake Helen Osteen to Newmark Dr

County:	Volusia
Station #:	909
Highway:	Howland Blvd



Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	23200	22900
2019	21900	22500
2020	22300	22300
2021	22600	22100
2022	21800	22000
2025 Opening Year Trend		
2025	N/A	21700
2026 Mid-Year Trend		
2026	N/A	21600
2027 Design Year Trend		
2027	N/A	21600
TRANPLAN Forecasts/Trends		

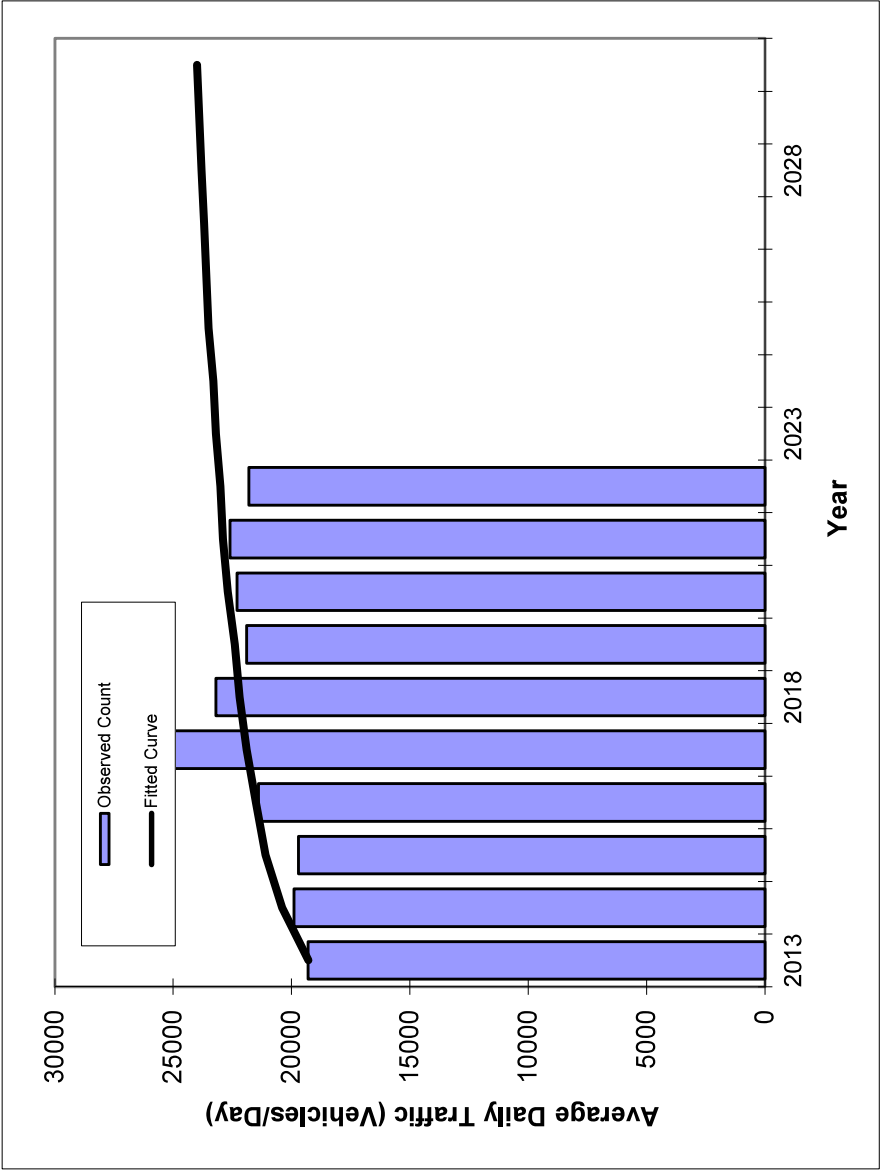
*Axle-Adjusted

Trend R-squared:	43.5%
Compounded Annual Historic Growth Rate:	-1.00%
Compounded Growth Rate (2022 to Design Year):	-0.27%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

TRAFFIC TRENDS

Howland Blvd -- Lake Helen Osteen to Newmark Dr

County:	Volusia
Station #:	909
Highway:	Howland Blvd



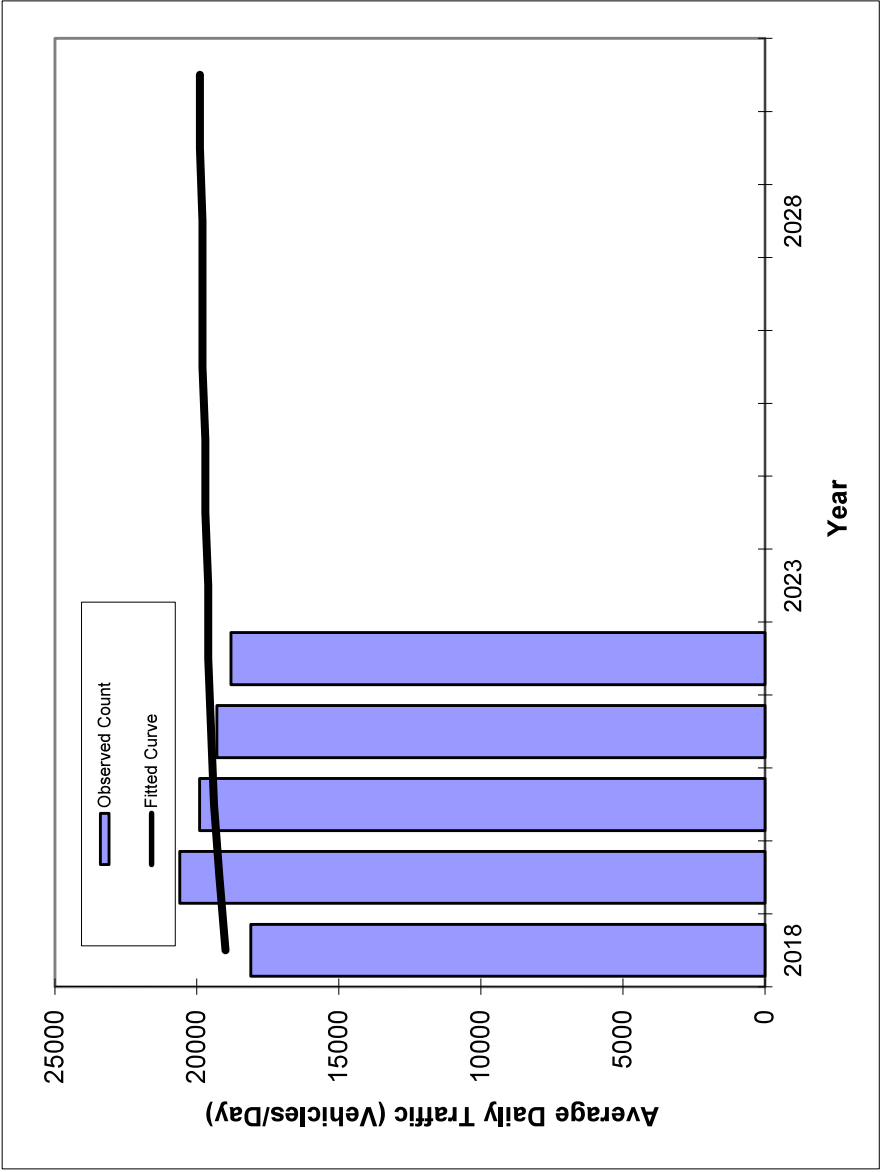
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2013	19300	19300
2014	19900	20400
2015	19700	21100
2016	21400	21500
2017	25300	21900
2018	23200	22200
2019	21900	22400
2020	22300	22700
2021	22600	22900
2022	21800	23000
2025 Opening Year Trend		
2025	N/A	23500
2026 Mid-Year Trend		
2026	N/A	23600
2027 Design Year Trend		
2027	N/A	23700
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	43.3%
Compounded Annual Historic Growth Rate:	1.49%
Compounded Growth Rate (2022 to Design Year):	0.43%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

TRAFFIC TRENDS **Howland Blvd -- Newmark Dr to Courtland Blvd**

County:	Volusia
Station #:	911
Highway:	Howland Blvd



Trend R-squared:	5.3%
Compounded Annual Historic Growth Rate:	0.13%
Compounded Growth Rate (2022 to Design Year):	0.41%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

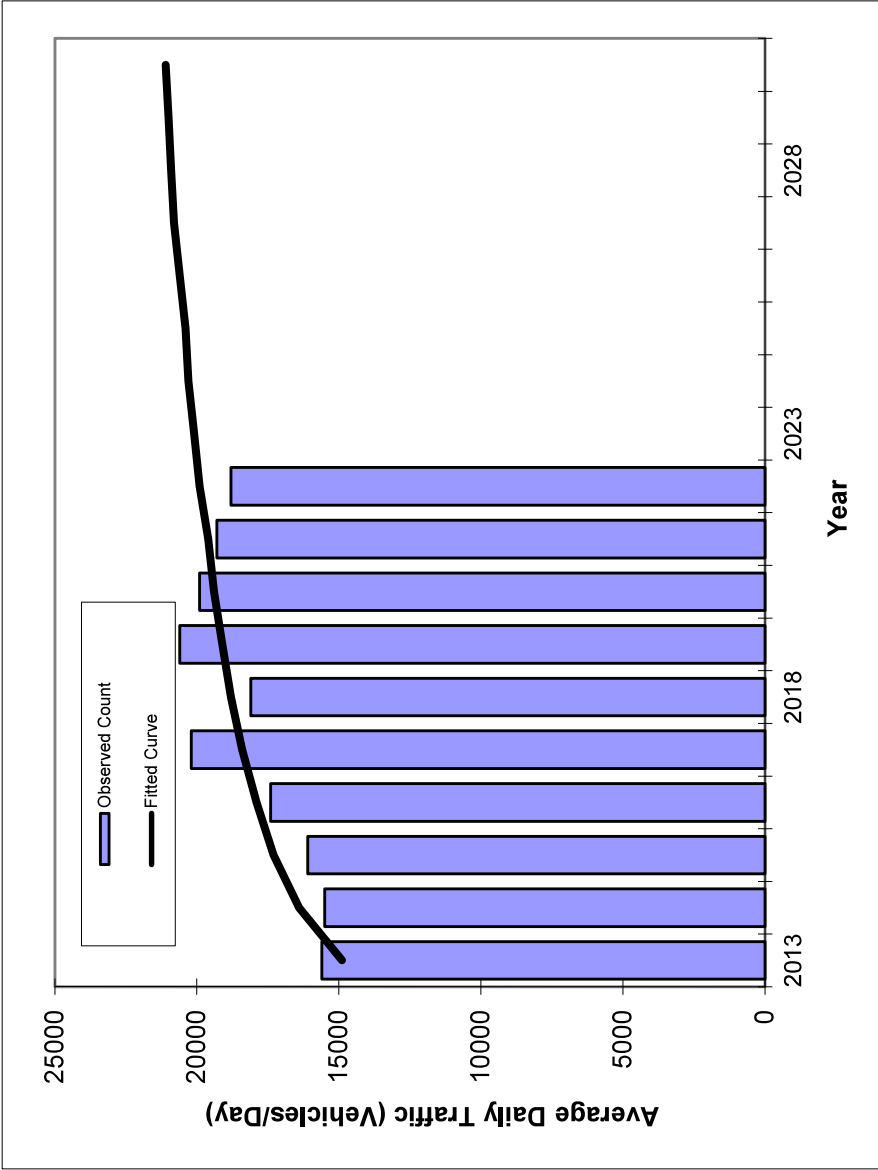
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	18100	19000
2019	20600	19200
2020	19900	19400
2021	19300	19500
2022	18800	19600
2025 Opening Year Trend		
2025	N/A	19700
2026 Mid-Year Trend		
2026	N/A	19800
2027 Design Year Trend		
2027	N/A	19800
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

TRAFFIC TRENDS

Howland Blvd -- Newmark Dr to Courtland Blvd

County:	Volusia
Station #:	911
Highway:	Howland Blvd



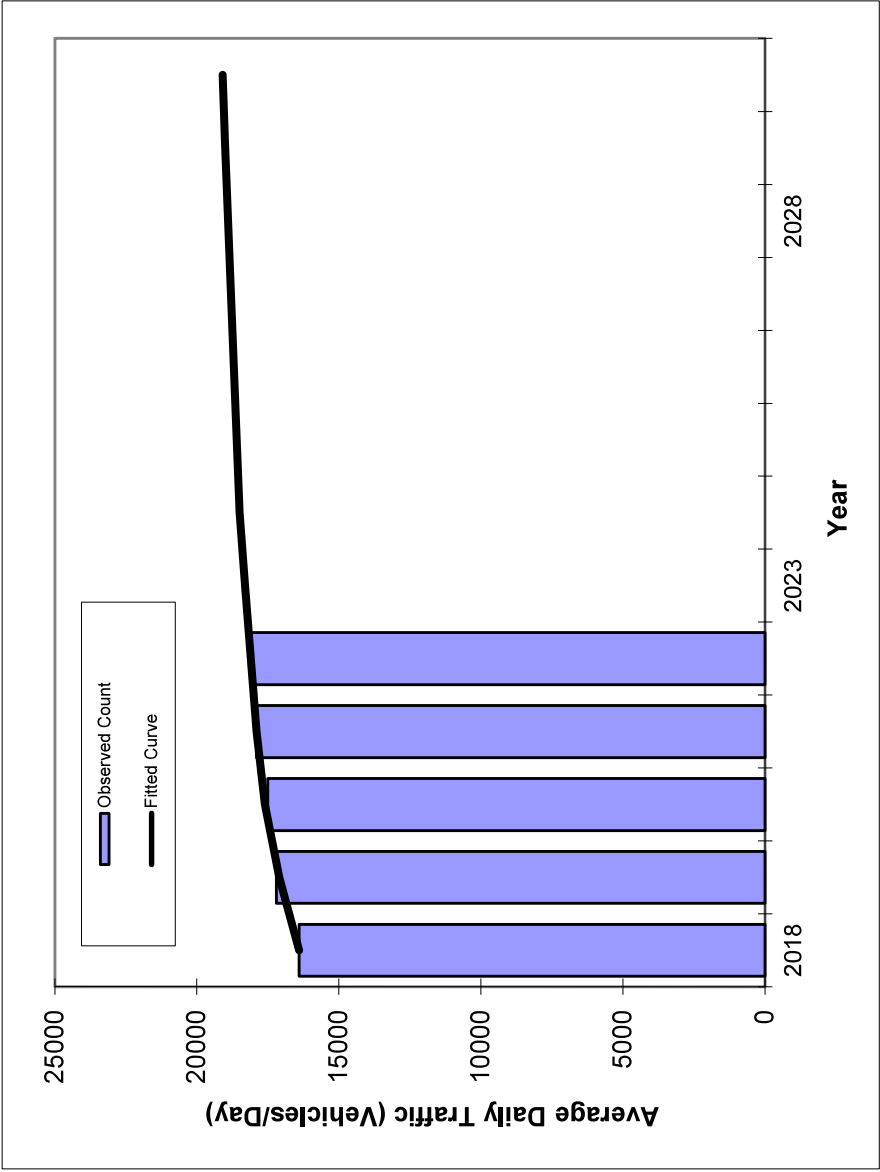
Year	Traffic (ADT/AADT)	
	Count*	Trend**
2013	15600	14900
2014	15500	16400
2015	16100	17300
2016	17400	17900
2017	20200	18400
2018	18100	18800
2019	20600	19100
2020	19900	19400
2021	19300	19600
2022	18800	19900
2025 Opening Year Trend		
2025	N/A	20400
2026 Mid-Year Trend		
2026	N/A	20600
2027 Design Year Trend		
2027	N/A	20800
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

Trend R-squared:	68.6%
Compounded Annual Historic Growth Rate:	2.81%
Compounded Growth Rate (2022 to Design Year):	0.39%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

TRAFFIC TRENDS **Howland Blvd -- Fort Smith Blvd to SR 415**

County:	Volusia
Station #:	915
Highway:	Howland Blvd



Trend R-squared:	99.5%
Compounded Annual Historic Growth Rate:	2.33%
Compounded Growth Rate (2022 to Design Year):	0.66%
Printed:	8-Jun-25
Decaying Exponential Growth Option	

Year	Traffic (ADT/AADT)	
	Count*	Trend**
2018	16400	16400
2019	17200	17100
2020	17500	17600
2021	17900	17900
2022	18100	18100
2025 Opening Year Trend		
2025	N/A	18600
2026 Mid-Year Trend		
2026	N/A	18700
2027 Design Year Trend		
2027	N/A	18800
TRANPLAN Forecasts/Trends		

*Axle-Adjusted

APPENDIX G

Synchro Summary Sheets – Background Conditions

HCM 7th Signalized Intersection Summary

1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour

06/23/2025

												
Movement	SEU	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (veh/h)	1	68	409	36	96	548	10	78	178	96	40	210
Future Volume (veh/h)	1	68	409	36	96	548	10	78	178	96	40	210
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln		1856	1856	1870	1870	1870	1870	1841	1870	1856	1870	1870
Adj Flow Rate, veh/h		72	435	38	102	583	11	83	189	102	43	223
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		3	3	2	2	2	2	4	2	3	2	2
Cap, veh/h		254	703	61	300	806	15	260	239	129	228	298
Arrive On Green		0.05	0.21	0.21	0.06	0.23	0.23	0.06	0.21	0.21	0.04	0.19
Sat Flow, veh/h		1767	3281	286	1781	3568	67	1753	1143	617	1781	1544
Grp Volume(v), veh/h		72	233	240	102	290	304	83	0	291	43	0
Grp Sat Flow(s),veh/h/ln		1767	1763	1804	1781	1777	1858	1753	0	1759	1781	0
Q Serve(g_s), s		2.3	8.7	8.7	3.2	10.9	11.0	2.7	0.0	11.4	1.4	0.0
Cycle Q Clear(g_c), s		2.3	8.7	8.7	3.2	10.9	11.0	2.7	0.0	11.4	1.4	0.0
Prop In Lane		1.00		0.16	1.00		0.04	1.00		0.35	1.00	
Lane Grp Cap(c), veh/h		254	378	386	300	401	420	260	0	368	228	0
V/C Ratio(X)		0.28	0.62	0.62	0.34	0.72	0.72	0.32	0.00	0.79	0.19	0.00
Avail Cap(c_a), veh/h		648	1095	1120	677	1104	1154	646	0	1093	1017	0
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		21.1	25.8	25.8	20.6	26.0	26.0	22.2	0.0	27.1	22.6	0.0
Incr Delay (d2), s/veh		0.6	1.6	1.6	0.7	2.5	2.4	0.7	0.0	3.8	0.4	0.0
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		1.6	6.4	6.7	2.2	7.9	8.2	2.0	0.0	8.5	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		21.7	27.4	27.4	21.3	28.4	28.3	22.9	0.0	30.9	23.0	0.0
LnGrp LOS		C	C	C	C	C	C	C		C	C	
Approach Vol, veh/h			545			696			374			306
Approach Delay, s/veh			26.7			27.3			29.2			29.6
Approach LOS			C			C			C			C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	23.8	13.2	24.0	12.7	22.6	12.3	24.9				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	3.4	13.4	5.2	10.7	4.7	11.9	4.3	13.0				
Green Ext Time (p_c), s	0.1	1.8	0.2	2.9	0.1	1.6	0.1	3.4				
Intersection Summary												
HCM 7th Control Delay, s/veh			27.9									
HCM 7th LOS			C									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025



Movement	SWR
Lane Configurations	
Traffic Volume (veh/h)	38
Future Volume (veh/h)	38
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1856
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.94
Percent Heavy Veh, %	3
Cap, veh/h	54
Arrive On Green	0.19
Sat Flow, veh/h	277
Grp Volume(v), veh/h	263
Grp Sat Flow(s),veh/h/ln	1821
Q Serve(g_s), s	9.9
Cycle Q Clear(g_c), s	9.9
Prop In Lane	0.15
Lane Grp Cap(c), veh/h	352
V/C Ratio(X)	0.75
Avail Cap(c_a), veh/h	1508
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	27.6
Incr Delay (d2), s/veh	3.2
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	7.8
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	30.7
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary

2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	183	15	148	54	81	58	4	134	620	18	6	10
Future Volume (veh/h)	183	15	148	54	81	58	4	134	620	18	6	10
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1796	1870	1841	1870	1870		1870	1870	1870		1870
Adj Flow Rate, veh/h	199	16	161	59	88	63		146	674	20		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92		0.92
Percent Heavy Veh, %	2	7	2	4	2	2		2	2	2		2
Cap, veh/h	412	49	489	102	118	74		242	1375	41		281
Arrive On Green	0.11	0.35	0.35	0.16	0.16	0.16		0.07	0.39	0.39		0.01
Sat Flow, veh/h	1781	140	1404	356	757	477		1781	3524	105		1781
Grp Volume(v), veh/h	199	0	177	210	0	0		146	340	354		11
Grp Sat Flow(s),veh/h/ln	1781	0	1544	1589	0	0		1781	1777	1852		1781
Q Serve(g_s), s	8.8	0.0	8.3	9.8	0.0	0.0		5.2	14.2	14.2		0.4
Cycle Q Clear(g_c), s	8.8	0.0	8.3	12.6	0.0	0.0		5.2	14.2	14.2		0.4
Prop In Lane	1.00		0.91	0.28		0.30		1.00		0.06		1.00
Lane Grp Cap(c), veh/h	412	0	538	295	0	0		242	693	722		281
V/C Ratio(X)	0.48	0.00	0.33	0.71	0.00	0.00		0.60	0.49	0.49		0.04
Avail Cap(c_a), veh/h	484	0	751	445	0	0		381	720	750		528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	28.2	0.0	23.7	40.3	0.0	0.0		23.5	22.7	22.7		21.5
Incr Delay (d2), s/veh	0.9	0.0	0.4	3.2	0.0	0.0		2.4	0.5	0.5		0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	6.8	0.0	5.4	8.8	0.0	0.0		3.9	9.5	9.8		0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.1	0.0	24.0	43.5	0.0	0.0		25.9	23.2	23.2		21.6
LnGrp LOS	C		C	D				C	C	C		C
Approach Vol, veh/h	376			210				840				
Approach Delay, s/veh	26.7			43.5				23.7				
Approach LOS	C			D				C				
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	15.3	41.5	19.0	22.9	9.8	47.0		41.9				
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5		7.5				
Max Green Setting (Gmax), s	15.0	40.0	15.0	25.0	15.0	* 40		48.0				
Max Q Clear Time (g_c+I1), s	7.2	28.3	10.8	14.6	2.4	16.2		10.3				
Green Ext Time (p_c), s	0.2	4.7	0.2	0.8	0.0	3.9		1.1				
Intersection Summary												
HCM 7th Control Delay, s/veh				32.2								
HCM 7th LOS				C								
Notes												
User approved ignoring U-Turning movement.												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 7th Signalized Intersection Summary
2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025



Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	816	122
Future Volume (veh/h)	816	122
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	887	133
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	1037	155
Arrive On Green	0.33	0.33
Sat Flow, veh/h	3099	465
Grp Volume(v), veh/h	509	511
Grp Sat Flow(s),veh/h/ln	1777	1787
Q Serve(g_s), s	26.3	26.3
Cycle Q Clear(g_c), s	26.3	26.3
Prop In Lane		0.26
Lane Grp Cap(c), veh/h	595	598
V/C Ratio(X)	0.86	0.86
Avail Cap(c_a), veh/h	720	724
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	30.6	30.6
Incr Delay (d2), s/veh	8.5	8.5
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	17.5	17.6
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	39.1	39.1
LnGrp LOS	D	D
Approach Vol, veh/h	1031	
Approach Delay, s/veh	38.9	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

3: Courtland Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025

																														
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR																		
Lane Configurations																														
Traffic Volume (veh/h)	32	916	116	49	467	99	186	42	61	296	64	39																		
Future Volume (veh/h)	32	916	116	49	467	99	186	42	61	296	64	39																		
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0																		
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																		
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00																		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																		
Work Zone On Approach		No			No			No			No																			
Adj Sat Flow, veh/h/ln	1856	1870	1870	1870	1870	1870	1870	1856	1870	1870	1870	1826																		
Adj Flow Rate, veh/h	35	996	126	53	508	108	202	46	66	322	70	42																		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92																		
Percent Heavy Veh, %	3	2	2	2	2	2	2	3	2	2	2	5																		
Cap, veh/h	325	1192	151	181	1117	236	402	61	88	422	166	100																		
Arrive On Green	0.03	0.38	0.38	0.04	0.38	0.38	0.12	0.09	0.09	0.18	0.15	0.15																		
Sat Flow, veh/h	1767	3174	401	1781	2919	617	1781	689	989	1781	1095	657																		
Grp Volume(v), veh/h	35	557	565	53	308	308	202	0	112	322	0	112																		
Grp Sat Flow(s),veh/h/ln	1767	1777	1798	1781	1777	1759	1781	0	1678	1781	0	1752																		
Q Serve(g_s), s	1.2	29.7	29.8	1.9	13.5	13.6	10.5	0.0	6.8	16.7	0.0	6.0																		
Cycle Q Clear(g_c), s	1.2	29.7	29.8	1.9	13.5	13.6	10.5	0.0	6.8	16.7	0.0	6.0																		
Prop In Lane	1.00		0.22	1.00		0.35	1.00		0.59	1.00		0.38																		
Lane Grp Cap(c), veh/h	325	667	675	181	680	673	402	0	149	422	0	266																		
V/C Ratio(X)	0.11	0.84	0.84	0.29	0.45	0.46	0.50	0.00	0.75	0.76	0.00	0.42																		
Avail Cap(c_a), veh/h	610	768	777	456	768	761	526	0	322	442	0	337																		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00																		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00																		
Uniform Delay (d), s/veh	19.6	29.6	29.6	23.2	24.0	24.0	36.5	0.0	46.3	33.8	0.0	40.0																		
Incr Delay (d2), s/veh	0.1	7.7	7.6	0.9	0.7	0.7	1.0	0.0	10.2	7.4	0.0	1.5																		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0																		
%ile BackOfQ(95%),veh/ln	0.9	19.1	19.3	1.4	9.3	9.3	8.1	0.0	5.8	12.5	0.0	4.8																		
Unsig. Movement Delay, s/veh																														
LnGrp Delay(d), s/veh	19.7	37.3	37.2	24.1	24.7	24.7	37.4	0.0	56.4	41.2	0.0	41.5																		
LnGrp LOS	B	D	D	C	C	C	D		E	D		D																		
Approach Vol, veh/h	1157				669				314		434																			
Approach Delay, s/veh	36.7				24.7				44.2		41.2																			
Approach LOS	D				C				D		D																			
Timer - Assigned Phs	1	2	3	4	5	6	7	8																						
Phs Duration (G+Y+Rc), s	12.4	47.6	20.3	23.8	11.7	48.3	26.8	17.3																						
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8																						
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20																						
Max Q Clear Time (g_c+I1), s	3.9	31.8	12.5	8.0	3.2	15.6	18.7	8.8																						
Green Ext Time (p_c), s	0.1	7.3	0.3	0.5	0.0	5.4	0.1	0.5																						
Intersection Summary																														
HCM 7th Control Delay, s/veh	35.3																													
HCM 7th LOS	D																													
Notes																														
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.																														

HCM 7th Signalized Intersection Summary

4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour

06/23/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	251	113	286	14	74	75	5	112	269	4	2	75
Future Volume (veh/h)	251	113	286	14	74	75	5	112	269	4	2	75
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		1856	1856	1870		1870
Adj Flow Rate, veh/h	276	124	314	15	81	82		123	296	4		82
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		0.91	0.91	0.91		0.91
Percent Heavy Veh, %	2	2	2	2	2	2		3	3	2		2
Cap, veh/h	478	137	348	129	297	252		194	1402	19		507
Arrive On Green	0.15	0.29	0.29	0.02	0.16	0.16		0.06	0.39	0.39		0.04
Sat Flow, veh/h	1781	469	1188	1781	1870	1585		1767	3562	48		1781
Grp Volume(v), veh/h	276	0	438	15	81	82		123	146	154		82
Grp Sat Flow(s),veh/h/ln	1781	0	1657	1781	1870	1585		1767	1763	1847		1781
Q Serve(g_s), s	14.2	0.0	29.2	0.8	4.4	5.3		4.8	6.3	6.3		3.2
Cycle Q Clear(g_c), s	14.2	0.0	29.2	0.8	4.4	5.3		4.8	6.3	6.3		3.2
Prop In Lane	1.00		0.72	1.00		1.00		1.00		0.03		1.00
Lane Grp Cap(c), veh/h	478	0	485	129	297	252		194	694	727		507
V/C Ratio(X)	0.58	0.00	0.90	0.12	0.27	0.33		0.63	0.21	0.21		0.16
Avail Cap(c_a), veh/h	677	0	650	410	571	484		699	922	966		817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	31.0	0.0	39.0	40.2	42.4	42.8		27.1	23.0	23.0		20.4
Incr Delay (d2), s/veh	1.6	0.0	13.1	0.6	0.5	0.7		4.8	0.2	0.2		0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	10.3	0.0	19.3	0.7	3.7	3.8		3.9	4.6	4.8		2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	32.6	0.0	52.1	40.7	42.9	43.5		31.9	23.2	23.2		20.6
LnGrp LOS	C		D	D	D	D		C	C	C		C
Approach Vol, veh/h	714			178				423				
Approach Delay, s/veh	44.5			43.0				25.7				
Approach LOS	D			D				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	52.6	8.9	41.1	14.2	50.5	24.2	25.7				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	5.2	8.3	2.8	31.2	6.8	39.9	16.2	7.3				
Green Ext Time (p_c), s	0.3	2.5	0.0	2.4	0.5	3.1	1.1	0.7				
Intersection Summary												
HCM 7th Control Delay, s/veh	43.8											
HCM 7th LOS	D											
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	995	128
Future Volume (veh/h)	995	128
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	1093	141
Peak Hour Factor	0.91	0.91
Percent Heavy Veh, %	2	2
Cap, veh/h	1187	153
Arrive On Green	0.38	0.38
Sat Flow, veh/h	3166	408
Grp Volume(v), veh/h	613	621
Grp Sat Flow(s),veh/h/ln	1777	1797
Q Serve(g_s), s	37.7	37.9
Cycle Q Clear(g_c), s	37.7	37.9
Prop In Lane		0.23
Lane Grp Cap(c), veh/h	666	674
V/C Ratio(X)	0.92	0.92
Avail Cap(c_a), veh/h	697	705
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	34.2	34.2
Incr Delay (d2), s/veh	17.0	17.2
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	25.5	25.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	51.2	51.5
LnGrp LOS	D	D
Approach Vol, veh/h	1316	
Approach Delay, s/veh	49.4	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

5: SR 415 & Howland Blvd

Timing Plan: AM Peak Hour
06/23/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	42	1106	233	312	1	392	18
Future Volume (veh/h)	42	1106	233	312	1	392	18
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1856	1870	1841	1811		1870	1870
Adj Flow Rate, veh/h	46	1215	256	343		431	20
Peak Hour Factor	0.91	0.91	0.91	0.91		0.91	0.91
Percent Heavy Veh, %	3	2	4	6		2	2
Cap, veh/h	722	1140	641	1309		726	324
Arrive On Green	0.41	0.41	0.08	0.38		0.20	0.20
Sat Flow, veh/h	1767	2790	3401	3532		3647	1585
Grp Volume(v), veh/h	46	1215	256	343		431	20
Grp Sat Flow(s), veh/h/ln	1767	1395	1700	1721		1777	1585
Q Serve(g_s), s	1.2	30.0	3.2	5.0		8.1	0.7
Cycle Q Clear(g_c), s	1.2	30.0	3.2	5.0		8.1	0.7
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	722	1140	641	1309		726	324
V/C Ratio(X)	0.06	1.07	0.40	0.26		0.59	0.06
Avail Cap(c_a), veh/h	722	1140	1431	2343		2419	1079
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	13.2	21.7	15.0	15.7		26.5	23.5
Incr Delay (d2), s/veh	0.0	46.2	0.4	0.1		0.8	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	22.9	1.9	3.1		5.7	0.5
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	13.2	67.9	15.4	15.8		27.2	23.6
LnGrp LOS	B	F	B	B		C	C
Approach Vol, veh/h	1261			599		451	
Approach Delay, s/veh	65.9			15.6		27.1	
Approach LOS	E			B		C	
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	12.9	23.0				35.9	37.5
Change Period (Y+Rc), s	7.0	* 8				8.0	7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0	30.0
Max Q Clear Time (g_c+I1), s	5.2	10.1				7.0	32.0
Green Ext Time (p_c), s	0.8	2.8				2.2	0.0

Intersection Summary

HCM 7th Control Delay, s/veh 45.3
HCM 7th LOS D

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary

1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

												
Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEL	NET	NER	SWL
Lane Configurations												
Traffic Volume (veh/h)	5	214	579	62	1	149	487	50	57	289	92	91
Future Volume (veh/h)	5	214	579	62	1	149	487	50	57	289	92	91
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No				No				No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		225	609	65		157	513	53	60	304	97	96
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		342	780	83		284	681	70	231	352	112	221
Arrive On Green		0.12	0.24	0.24		0.09	0.21	0.21	0.04	0.26	0.26	0.06
Sat Flow, veh/h		1781	3240	345		1781	3252	335	1781	1359	434	1781
Grp Volume(v), veh/h		225	334	340		157	280	286	60	0	401	96
Grp Sat Flow(s), veh/h/ln		1781	1777	1808		1781	1777	1810	1781	0	1792	1781
Q Serve(g_s), s		9.4	17.0	17.1		6.6	14.3	14.4	2.4	0.0	20.7	3.8
Cycle Q Clear(g_c), s		9.4	17.0	17.1		6.6	14.3	14.4	2.4	0.0	20.7	3.8
Prop In Lane		1.00		0.19		1.00		0.19	1.00		0.24	1.00
Lane Grp Cap(c), veh/h		342	428	435		284	372	379	231	0	465	221
V/C Ratio(X)		0.66	0.78	0.78		0.55	0.75	0.76	0.26	0.00	0.86	0.43
Avail Cap(c_a), veh/h		493	825	840		491	825	840	525	0	832	763
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh		26.3	34.4	34.4		27.4	36.0	36.0	26.1	0.0	34.3	26.4
Incr Delay (d2), s/veh		2.2	3.1	3.1		1.7	3.1	3.1	0.6	0.0	4.9	1.3
Initial Q Delay(d3), s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		7.3	12.0	12.2		5.0	10.3	10.5	1.8	0.0	14.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		28.5	37.5	37.5		29.1	39.0	39.1	26.7	0.0	39.1	27.7
LnGrp LOS		C	D	D		C	D	D	C		D	C
Approach Vol, veh/h			899				723			461		
Approach Delay, s/veh			35.3				36.9			37.5		
Approach LOS			D				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	33.7	17.2	31.8	12.6	35.3	20.3	28.8				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	5.8	22.7	8.6	19.1	4.4	20.7	11.4	16.4				
Green Ext Time (p_c), s	0.2	2.4	0.3	4.2	0.1	2.5	0.4	3.2				
Intersection Summary												
HCM 7th Control Delay, s/veh			35.8									
HCM 7th LOS			D									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025



Movement	SWT	SWR
Lane Configurations		
Traffic Volume (veh/h)	236	117
Future Volume (veh/h)	236	117
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	248	123
Peak Hour Factor	0.95	0.95
Percent Heavy Veh, %	2	2
Cap, veh/h	325	161
Arrive On Green	0.28	0.28
Sat Flow, veh/h	1180	585
Grp Volume(v), veh/h	0	371
Grp Sat Flow(s),veh/h/ln	0	1765
Q Serve(g_s), s	0.0	18.7
Cycle Q Clear(g_c), s	0.0	18.7
Prop In Lane		0.33
Lane Grp Cap(c), veh/h	0	486
V/C Ratio(X)	0.00	0.76
Avail Cap(c_a), veh/h	0	1093
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.2
Incr Delay (d2), s/veh	0.0	2.5
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.7
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	0.0	34.8
LnGrp LOS		C
Approach Vol, veh/h	467	
Approach Delay, s/veh	33.3	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary 2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT			
Lane Configurations															
Traffic Volume (veh/h)	164	47	93	16	40	38	146	843	35	7	60	788			
Future Volume (veh/h)	164	47	93	16	40	38	146	843	35	7	60	788			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0			
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00			
Work Zone On Approach	No			No			No					No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1826	1870	1870	1870	1870		1870	1870			
Adj Flow Rate, veh/h	173	49	98	17	42	40	154	887	37		63	829			
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			
Percent Heavy Veh, %	2	2	2	7	5	2	2	2	2		2	2			
Cap, veh/h	396	159	319	64	68	56	265	1346	56		270	994			
Arrive On Green	0.11	0.29	0.29	0.09	0.09	0.09	0.08	0.39	0.39		0.04	0.36			
Sat Flow, veh/h	1781	557	1113	177	787	654	1781	3476	145		1781	2754			
Grp Volume(v), veh/h	173	0	147	99	0	0	154	453	471		63	535			
Grp Sat Flow(s),veh/h/ln	1781	0	1670	1618	0	0	1781	1777	1844		1781	1777			
Q Serve(g_s), s	7.3	0.0	6.0	2.5	0.0	0.0	4.6	18.3	18.3		1.9	23.9			
Cycle Q Clear(g_c), s	7.3	0.0	6.0	5.1	0.0	0.0	4.6	18.3	18.3		1.9	23.9			
Prop In Lane	1.00		0.67	0.17		0.40	1.00		0.08		1.00				
Lane Grp Cap(c), veh/h	396	0	478	188	0	0	265	688	714		270	642			
V/C Ratio(X)	0.44	0.00	0.31	0.53	0.00	0.00	0.58	0.66	0.66		0.23	0.83			
Avail Cap(c_a), veh/h	511	0	922	505	0	0	436	817	848		497	817			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00			
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00		1.00	1.00			
Uniform Delay (d), s/veh	29.5	0.0	24.3	38.6	0.0	0.0	19.6	21.9	21.9		17.5	25.4			
Incr Delay (d2), s/veh	0.8	0.0	0.4	2.3	0.0	0.0	2.0	1.5	1.5		0.4	6.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0			
%ile BackOfQ(95%),veh/ln	5.6	0.0	4.2	3.8	0.0	0.0	3.3	11.5	11.8		1.3	15.4			
Unsig. Movement Delay, s/veh															
LnGrp Delay(d), s/veh	30.3	0.0	24.7	40.9	0.0	0.0	21.6	23.4	23.4		18.0	31.4			
LnGrp LOS	C		C	D			C	C	C		B	C			
Approach Vol, veh/h	320			99			1078			1120					
Approach Delay, s/veh	27.7			40.9			23.1			30.7					
Approach LOS	C			D			C			C					
Timer - Assigned Phs	1	2	3	4	5	6	8								
Phs Duration (G+Y+Rc), s	14.7	39.9	17.4	15.0	12.4	42.2	32.4								
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5	7.5								
Max Green Setting (Gmax), s	15.0	40.0	15.0	25.0	15.0	* 40	48.0								
Max Q Clear Time (g_c+I1), s	6.6	25.9	9.3	7.1	3.9	20.3	8.0								
Green Ext Time (p_c), s	0.2	5.5	0.2	0.4	0.1	5.3	0.9								

Intersection Summary

HCM 7th Control Delay, s/veh 27.6
HCM 7th LOS C

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary
2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	217
Future Volume (veh/h)	217
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1870
Adj Flow Rate, veh/h	228
Peak Hour Factor	0.95
Percent Heavy Veh, %	2
Cap, veh/h	273
Arrive On Green	0.36
Sat Flow, veh/h	757
Grp Volume(v), veh/h	522
Grp Sat Flow(s),veh/h/ln	1734
Q Serve(g_s), s	23.9
Cycle Q Clear(g_c), s	23.9
Prop In Lane	0.44
Lane Grp Cap(c), veh/h	626
V/C Ratio(X)	0.83
Avail Cap(c_a), veh/h	797
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	25.4
Incr Delay (d2), s/veh	6.1
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	15.1
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	31.5
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary

3: Courtland Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	38	435	250	45	792	153	187	72	20	81	74	44
Future Volume (veh/h)	38	435	250	45	792	153	187	72	20	81	74	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	458	263	47	834	161	197	76	21	85	78	46
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
Percent Heavy Veh, %	2	2	2	2	2	3	2	2	2	2	2	2
Cap, veh/h	216	796	454	295	1095	211	339	222	61	314	108	64
Arrive On Green	0.04	0.37	0.37	0.04	0.37	0.37	0.12	0.16	0.16	0.06	0.10	0.10
Sat Flow, veh/h	1781	2180	1244	1781	2971	573	1781	1410	390	1781	1103	650
Grp Volume(v), veh/h	40	373	348	47	499	496	197	0	97	85	0	124
Grp Sat Flow(s),veh/h/ln	1781	1777	1647	1781	1777	1767	1781	0	1800	1781	0	1753
Q Serve(g_s), s	1.2	14.6	14.8	1.4	21.4	21.4	8.4	0.0	4.2	3.7	0.0	6.0
Cycle Q Clear(g_c), s	1.2	14.6	14.8	1.4	21.4	21.4	8.4	0.0	4.2	3.7	0.0	6.0
Prop In Lane	1.00		0.76	1.00		0.32	1.00		0.22	1.00		0.37
Lane Grp Cap(c), veh/h	216	649	602	295	655	652	339	0	283	314	0	172
V/C Ratio(X)	0.19	0.57	0.58	0.16	0.76	0.76	0.58	0.00	0.34	0.27	0.00	0.72
Avail Cap(c_a), veh/h	563	921	854	636	921	916	531	0	415	621	0	404
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	22.1	22.2	17.2	24.0	24.0	29.8	0.0	32.6	32.4	0.0	38.0
Incr Delay (d2), s/veh	0.4	1.1	1.3	0.2	3.1	3.1	1.6	0.0	1.0	0.5	0.0	7.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	9.7	9.2	1.0	13.4	13.4	6.5	0.0	3.3	2.8	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.1	23.3	23.4	17.4	27.2	27.2	31.4	0.0	33.6	32.9	0.0	45.7
LnGrp LOS	B	C	C	B	C	C	C		C	C		D
Approach Vol, veh/h		761			1042			294			209	
Approach Delay, s/veh		23.1			26.7			32.1			40.5	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.9	40.2	18.2	16.5	11.6	40.5	13.1	21.6				
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8				
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20				
Max Q Clear Time (g_c+I1), s	3.4	16.8	10.4	8.0	3.2	23.4	5.7	6.2				
Green Ext Time (p_c), s	0.1	6.6	0.4	0.6	0.1	8.6	0.1	0.4				

Intersection Summary

HCM 7th Control Delay, s/veh 27.5
HCM 7th LOS C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary 4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	72	82	189	17	153	119	2	375	868	11	1	49
Future Volume (veh/h)	72	82	189	17	153	119	2	375	868	11	1	49
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1856	1870	1707	1870	1870		1870	1870	1870		1767
Adj Flow Rate, veh/h	80	91	210	19	170	132		417	964	12		54
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90		0.90
Percent Heavy Veh, %	2	3	2	13	2	2		2	2	2		9
Cap, veh/h	294	110	253	164	352	299		523	1358	17		237
Arrive On Green	0.05	0.22	0.22	0.02	0.19	0.19		0.22	0.38	0.38		0.04
Sat Flow, veh/h	1781	498	1150	1626	1870	1585		1781	3594	45		1682
Grp Volume(v), veh/h	80	0	301	19	170	132		417	477	499		54
Grp Sat Flow(s),veh/h/ln	1781	0	1649	1626	1870	1585		1781	1777	1862		1682
Q Serve(g_s), s	3.1	0.0	14.9	0.8	7.0	6.3		14.6	19.5	19.5		2.1
Cycle Q Clear(g_c), s	3.1	0.0	14.9	0.8	7.0	6.3		14.6	19.5	19.5		2.1
Prop In Lane	1.00		0.70	1.00		1.00		1.00		0.02		1.00
Lane Grp Cap(c), veh/h	294	0	363	164	352	299		523	671	704		237
V/C Ratio(X)	0.27	0.00	0.83	0.12	0.48	0.44		0.80	0.71	0.71		0.23
Avail Cap(c_a), veh/h	823	0	866	509	764	648		967	1244	1304		657
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	26.1	0.0	31.9	28.0	31.0	30.8		19.2	22.7	22.7		25.4
Incr Delay (d2), s/veh	0.7	0.0	4.9	0.4	1.0	1.0		4.0	2.0	1.9		0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	2.4	0.0	10.3	0.6	5.6	4.4		9.8	12.3	12.7		1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.8	0.0	36.8	28.4	32.1	31.8		23.2	24.6	24.6		26.1
LnGrp LOS	C		D	C	C	C		C	C	C		C
Approach Vol, veh/h	381			321				1393				
Approach Delay, s/veh	34.7			31.7				24.2				
Approach LOS	C			C				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	39.9	8.8	26.4	25.7	24.8	11.6	23.6				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	4.1	21.5	2.8	16.9	16.6	14.3	5.1	9.0				
Green Ext Time (p_c), s	0.2	10.2	0.0	1.9	2.1	3.1	0.3	1.3				
Intersection Summary												
HCM 7th Control Delay, s/veh	28.8											
HCM 7th LOS	C											
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	415	69
Future Volume (veh/h)	415	69
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	461	77
Peak Hour Factor	0.90	0.90
Percent Heavy Veh, %	2	2
Cap, veh/h	617	102
Arrive On Green	0.20	0.20
Sat Flow, veh/h	3050	506
Grp Volume(v), veh/h	268	270
Grp Sat Flow(s),veh/h/ln	1777	1779
Q Serve(g_s), s	12.1	12.3
Cycle Q Clear(g_c), s	12.1	12.3
Prop In Lane		0.28
Lane Grp Cap(c), veh/h	359	360
V/C Ratio(X)	0.74	0.75
Avail Cap(c_a), veh/h	933	934
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	32.1	32.2
Incr Delay (d2), s/veh	3.1	3.2
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	8.9	9.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	35.2	35.3
LnGrp LOS	D	D
Approach Vol, veh/h	592	
Approach Delay, s/veh	34.4	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary 5: SR 415 & Howland Blvd

Timing Plan: PM Peak Hour
06/30/2025



Movement	EBU	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations		↩	↩↩	↩↩	↩↩	↩	↩↩	↩
Traffic Volume (veh/h)	1	45	341	941	526	2	355	64
Future Volume (veh/h)	1	45	341	941	526	2	355	64
Initial Q (Qb), veh		0	0	0	0		0	0
Lane Width Adj.		1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00				1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No				No		No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870		1870	1856
Adj Flow Rate, veh/h		47	359	991	554		374	67
Peak Hour Factor		0.95	0.95	0.95	0.95		0.95	0.95
Percent Heavy Veh, %		2	2	2	2		2	3
Cap, veh/h		318	498	1215	2000		889	393
Arrive On Green		0.18	0.18	0.20	0.56		0.25	0.25
Sat Flow, veh/h		1781	2790	3456	3647		3647	1572
Grp Volume(v), veh/h		47	359	991	554		374	67
Grp Sat Flow(s),veh/h/ln		1781	1395	1728	1777		1777	1572
Q Serve(g_s), s		1.3	7.3	6.3	4.8		5.3	2.0
Cycle Q Clear(g_c), s		1.3	7.3	6.3	4.8		5.3	2.0
Prop In Lane		1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h		318	498	1215	2000		889	393
V/C Ratio(X)		0.15	0.72	0.82	0.28		0.42	0.17
Avail Cap(c_a), veh/h		891	1396	1864	2963		2963	1311
HCM Platoon Ratio		1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh		20.8	23.2	10.9	6.8		18.8	17.6
Incr Delay (d2), s/veh		0.2	2.0	1.7	0.1		0.3	0.2
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln		0.9	4.0	5.7	2.2		3.4	1.2
Unsig. Movement Delay, s/veh								
LnGrp Delay(d), s/veh		21.0	25.2	12.6	6.9		19.2	17.8
LnGrp LOS		C	C	B	A		B	B
Approach Vol, veh/h	406				1545		441	
Approach Delay, s/veh	24.7				10.5		19.0	
Approach LOS	C				B		B	
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	18.8	23.0				41.8		18.2
Change Period (Y+Rc), s	7.0	* 8				8.0		7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0		30.0
Max Q Clear Time (g_c+I1), s	8.3	7.3				6.8		9.3
Green Ext Time (p_c), s	3.5	2.6				3.7		1.4

Intersection Summary

HCM 7th Control Delay, s/veh	14.5
HCM 7th LOS	B

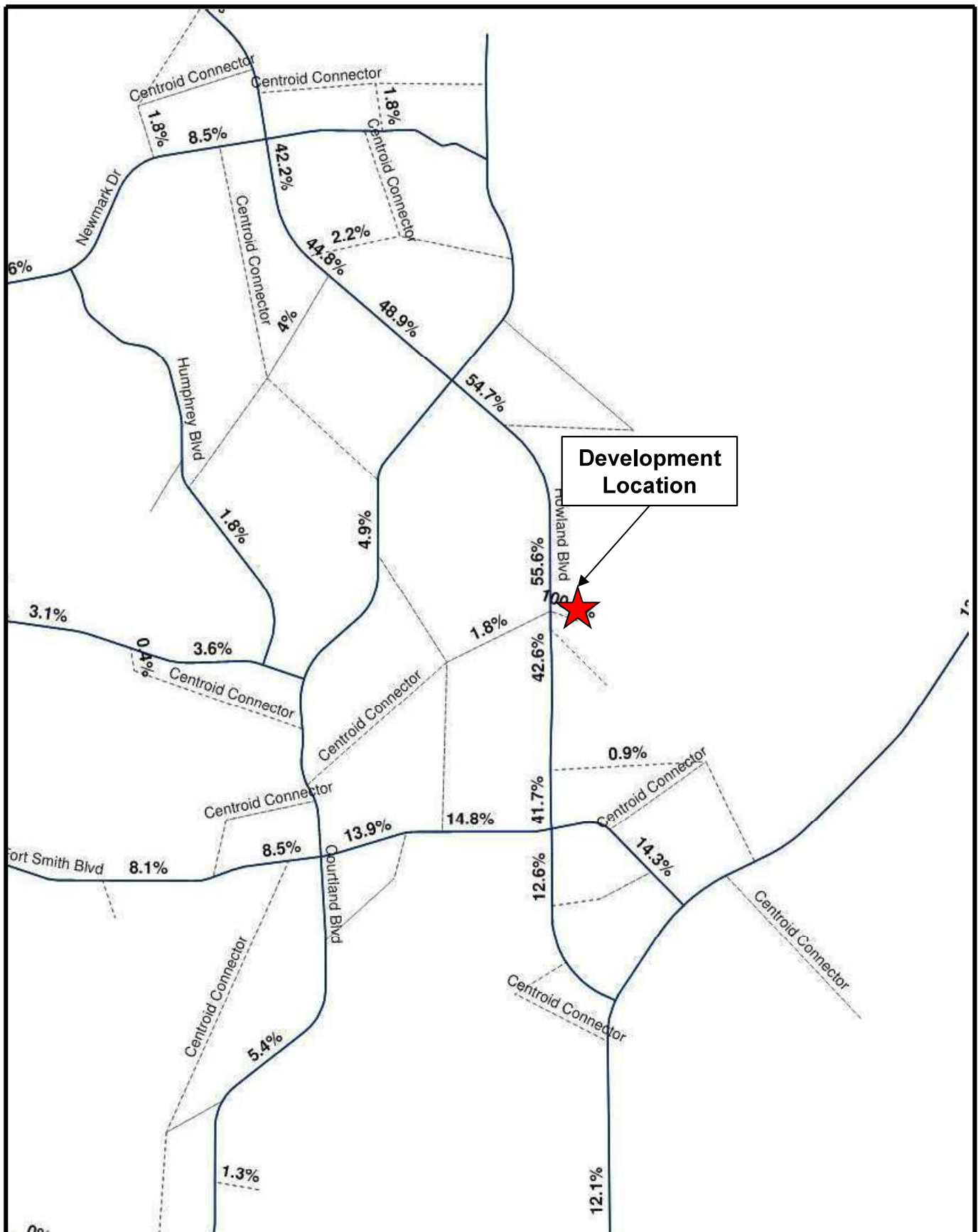
Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX H

Trip Distribution



930 Howland
Boulevard



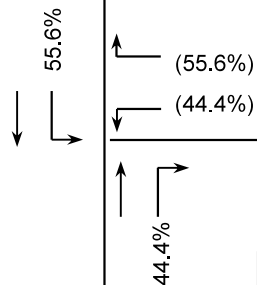
NTS

Project Trip
Distribution

Project No.: 6383.02



LTG Engineering
& Planning



X% = Entering Traffic Distribution
(X%) = Exiting Traffic Distribution

**930 Howland
Boulevard**



NTS

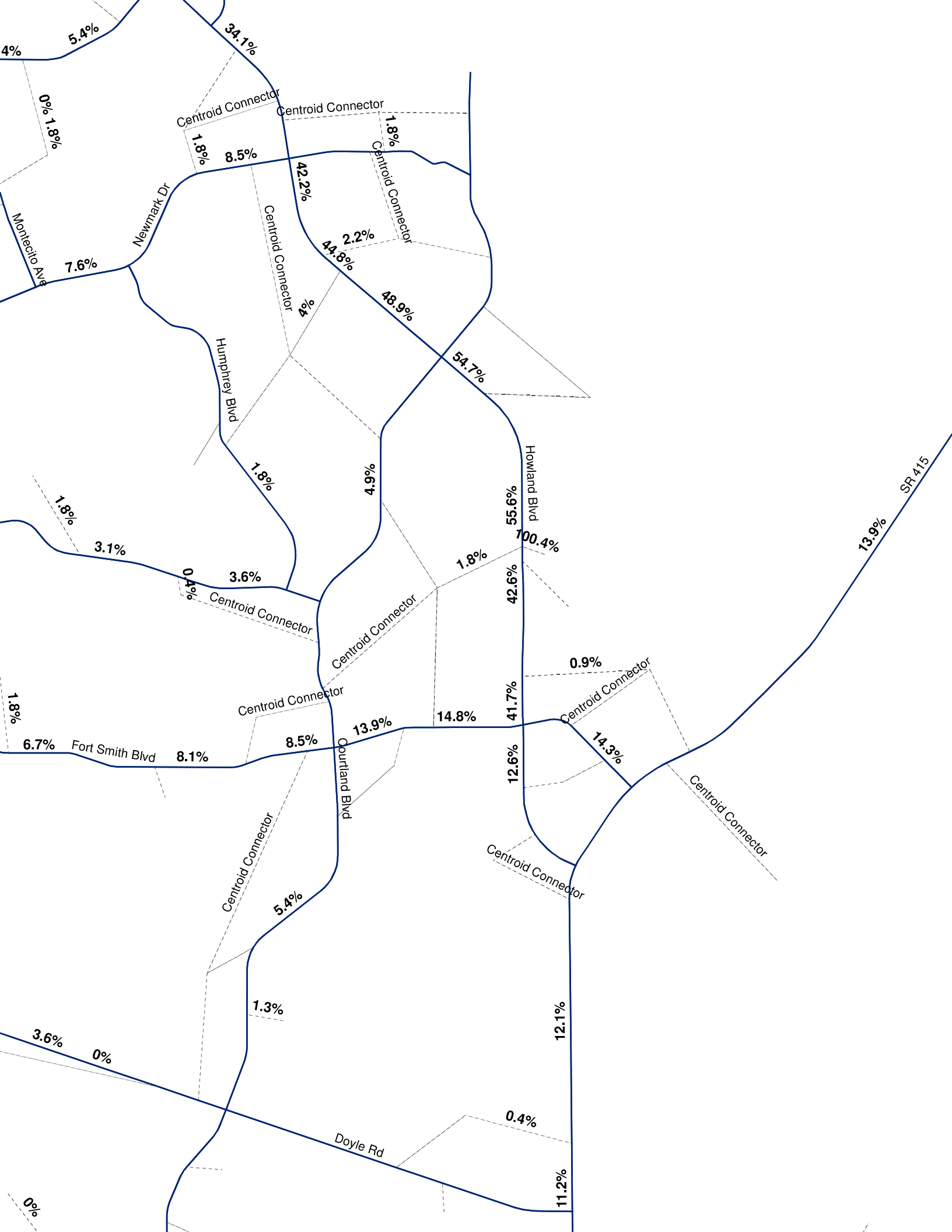
**Project Trip
Distribution at the
Project Driveway**

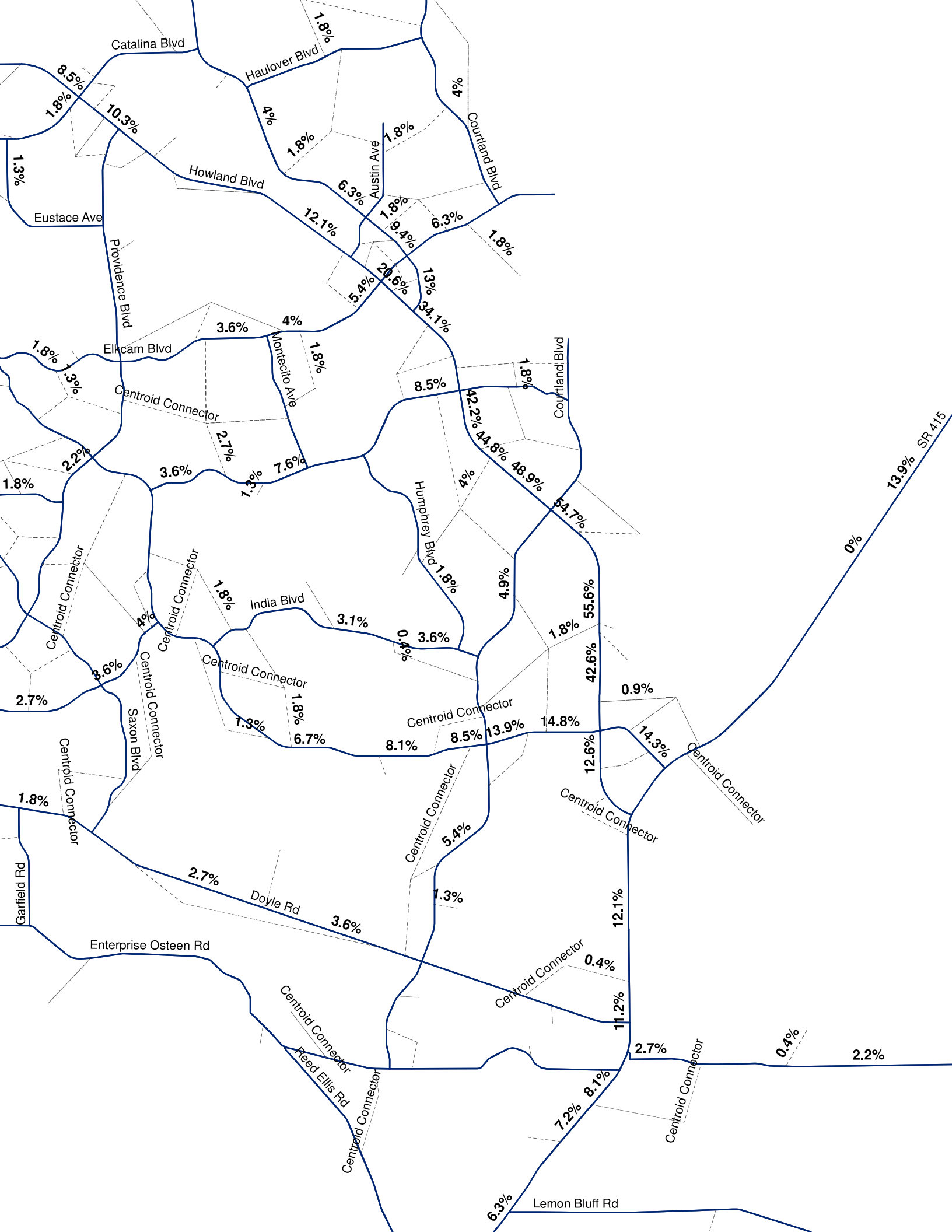
Project No.: 6383.02

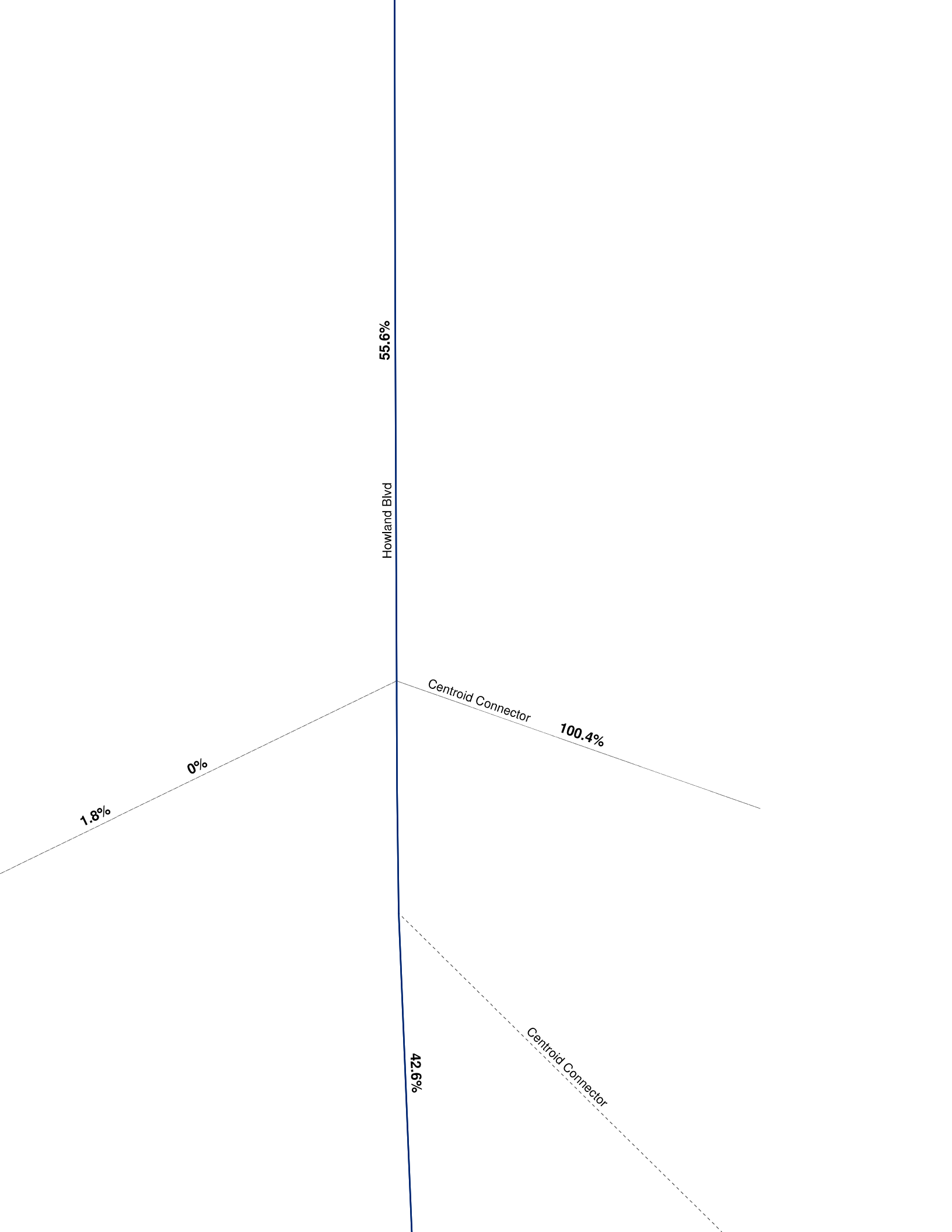


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& Planning*







APPENDIX I

Synchro Summary Sheets – Build-Out Conditions

HCM 7th Signalized Intersection Summary

1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025

												
Movement	SEU	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT
Lane Configurations												
Traffic Volume (veh/h)	1	68	417	36	99	556	10	78	178	99	40	210
Future Volume (veh/h)	1	68	417	36	99	556	10	78	178	99	40	210
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln		1856	1856	1870	1870	1870	1870	1841	1870	1856	1870	1870
Adj Flow Rate, veh/h		72	444	38	105	591	11	83	189	105	43	223
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		3	3	2	2	2	2	4	2	3	2	2
Cap, veh/h		252	705	60	300	814	15	262	238	132	227	301
Arrive On Green		0.05	0.21	0.21	0.07	0.23	0.23	0.06	0.21	0.21	0.04	0.20
Sat Flow, veh/h		1767	3288	280	1781	3569	66	1753	1130	628	1781	1544
Grp Volume(v), veh/h		72	237	245	105	294	308	83	0	294	43	0
Grp Sat Flow(s),veh/h/ln		1767	1763	1805	1781	1777	1858	1753	0	1757	1781	0
Q Serve(g_s), s		2.3	8.9	9.0	3.3	11.2	11.2	2.7	0.0	11.6	1.4	0.0
Cycle Q Clear(g_c), s		2.3	8.9	9.0	3.3	11.2	11.2	2.7	0.0	11.6	1.4	0.0
Prop In Lane		1.00		0.16	1.00		0.04	1.00		0.36	1.00	
Lane Grp Cap(c), veh/h		252	378	387	300	405	424	262	0	371	227	0
V/C Ratio(X)		0.29	0.63	0.63	0.35	0.73	0.73	0.32	0.00	0.79	0.19	0.00
Avail Cap(c_a), veh/h		643	1087	1113	670	1095	1146	644	0	1083	1010	0
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)		1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		21.2	26.0	26.1	20.7	26.1	26.1	22.2	0.0	27.3	22.7	0.0
Incr Delay (d2), s/veh		0.6	1.7	1.7	0.7	2.5	2.4	0.7	0.0	3.8	0.4	0.0
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		1.7	6.6	6.9	2.3	8.0	8.3	2.0	0.0	8.6	1.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		21.8	27.7	27.8	21.4	28.6	28.5	22.9	0.0	31.1	23.1	0.0
LnGrp LOS		C	C	C	C	C	C	C		C	C	
Approach Vol, veh/h			554			707			377			306
Approach Delay, s/veh			27.0			27.5			29.3			29.6
Approach LOS			C			C			C			C
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	24.0	13.3	24.2	12.7	22.8	12.3	25.1				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	3.4	13.6	5.3	11.0	4.7	11.9	4.3	13.2				
Green Ext Time (p_c), s	0.1	1.8	0.2	3.0	0.1	1.6	0.1	3.5				
Intersection Summary												
HCM 7th Control Delay, s/veh			28.0									
HCM 7th LOS			C									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025



Movement	SWR
Lane Configurations	
Traffic Volume (veh/h)	38
Future Volume (veh/h)	38
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1856
Adj Flow Rate, veh/h	40
Peak Hour Factor	0.94
Percent Heavy Veh, %	3
Cap, veh/h	54
Arrive On Green	0.20
Sat Flow, veh/h	277
Grp Volume(v), veh/h	263
Grp Sat Flow(s),veh/h/ln	1821
Q Serve(g_s), s	9.9
Cycle Q Clear(g_c), s	9.9
Prop In Lane	0.15
Lane Grp Cap(c), veh/h	355
V/C Ratio(X)	0.74
Avail Cap(c_a), veh/h	1496
HCM Platoon Ratio	1.00
Upstream Filter(l)	1.00
Uniform Delay (d), s/veh	27.6
Incr Delay (d2), s/veh	3.0
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	7.8
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	30.7
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary

2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	183	15	153	54	81	58	4	138	637	18	6	10
Future Volume (veh/h)	183	15	153	54	81	58	4	138	637	18	6	10
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1796	1870	1841	1870	1870		1870	1870	1870		1870
Adj Flow Rate, veh/h	199	16	166	59	88	63		150	692	20		11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		0.92	0.92	0.92		0.92
Percent Heavy Veh, %	2	7	2	4	2	2		2	2	2		2
Cap, veh/h	409	47	488	102	118	74		241	1392	40		278
Arrive On Green	0.11	0.35	0.35	0.16	0.16	0.16		0.07	0.39	0.39		0.01
Sat Flow, veh/h	1781	136	1407	356	755	476		1781	3527	102		1781
Grp Volume(v), veh/h	199	0	182	210	0	0		150	348	364		11
Grp Sat Flow(s),veh/h/ln	1781	0	1543	1587	0	0		1781	1777	1852		1781
Q Serve(g_s), s	9.0	0.0	8.7	10.0	0.0	0.0		5.4	14.8	14.8		0.4
Cycle Q Clear(g_c), s	9.0	0.0	8.7	12.8	0.0	0.0		5.4	14.8	14.8		0.4
Prop In Lane	1.00		0.91	0.28		0.30		1.00		0.06		1.00
Lane Grp Cap(c), veh/h	409	0	535	293	0	0		241	702	731		278
V/C Ratio(X)	0.49	0.00	0.34	0.72	0.00	0.00		0.62	0.50	0.50		0.04
Avail Cap(c_a), veh/h	478	0	741	439	0	0		375	711	741		521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	28.6	0.0	24.2	40.9	0.0	0.0		23.8	22.8	22.8		21.6
Incr Delay (d2), s/veh	0.9	0.0	0.4	3.3	0.0	0.0		2.6	0.5	0.5		0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	6.9	0.0	5.7	8.9	0.0	0.0		4.1	9.8	10.2		0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.5	0.0	24.5	44.1	0.0	0.0		26.4	23.3	23.3		21.6
LnGrp LOS	C		C	D				C	C	C		C
Approach Vol, veh/h	381			210				862				
Approach Delay, s/veh	27.1			44.1				23.9				
Approach LOS	C			D				C				
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	15.5	42.3	19.1	23.1	9.8	48.0		42.2				
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5		7.5				
Max Green Setting (Gmax), s	15.0	40.0	15.0	25.0	15.0	* 40		48.0				
Max Q Clear Time (g_c+I1), s	7.4	29.3	11.0	14.8	2.4	16.8		10.7				
Green Ext Time (p_c), s	0.2	4.6	0.2	0.8	0.0	4.0		1.2				

Intersection Summary

HCM 7th Control Delay, s/veh	32.9
HCM 7th LOS	C

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary 2: Newmark Dr & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025



Movement	SBT	SBR
Lane Configurations	↑↑	→
Traffic Volume (veh/h)	834	122
Future Volume (veh/h)	834	122
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	907	133
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	1051	154
Arrive On Green	0.34	0.34
Sat Flow, veh/h	3109	456
Grp Volume(v), veh/h	518	522
Grp Sat Flow(s),veh/h/ln	1777	1788
Q Serve(g_s), s	27.3	27.3
Cycle Q Clear(g_c), s	27.3	27.3
Prop In Lane		0.25
Lane Grp Cap(c), veh/h	601	605
V/C Ratio(X)	0.86	0.86
Avail Cap(c_a), veh/h	711	715
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	30.9	30.9
Incr Delay (d2), s/veh	9.4	9.4
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	18.2	18.3
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	40.3	40.3
LnGrp LOS	D	D
Approach Vol, veh/h	1051	
Approach Delay, s/veh	40.1	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

3: Courtland Blvd & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	32	942	116	51	491	99	186	42	64	296	64	39
Future Volume (veh/h)	32	942	116	51	491	99	186	42	64	296	64	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1870	1870	1870	1870	1870	1870	1856	1870	1870	1870	1826
Adj Flow Rate, veh/h	35	1024	126	55	534	108	202	46	70	322	70	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	2	2	2	2	2	2	3	2	2	2	5
Cap, veh/h	317	1207	148	177	1139	229	403	61	92	418	168	101
Arrive On Green	0.03	0.38	0.38	0.04	0.39	0.39	0.12	0.09	0.09	0.18	0.15	0.15
Sat Flow, veh/h	1767	3185	392	1781	2947	594	1781	664	1010	1781	1095	657
Grp Volume(v), veh/h	35	571	579	55	321	321	202	0	116	322	0	112
Grp Sat Flow(s),veh/h/ln	1767	1777	1800	1781	1777	1764	1781	0	1674	1781	0	1752
Q Serve(g_s), s	1.3	31.1	31.2	2.0	14.3	14.4	10.6	0.0	7.2	16.9	0.0	6.1
Cycle Q Clear(g_c), s	1.3	31.1	31.2	2.0	14.3	14.4	10.6	0.0	7.2	16.9	0.0	6.1
Prop In Lane	1.00		0.22	1.00		0.34	1.00		0.60	1.00		0.38
Lane Grp Cap(c), veh/h	317	674	682	177	687	682	403	0	153	418	0	269
V/C Ratio(X)	0.11	0.85	0.85	0.31	0.47	0.47	0.50	0.00	0.76	0.77	0.00	0.42
Avail Cap(c_a), veh/h	598	756	766	446	756	750	522	0	316	435	0	331
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	30.0	30.1	23.7	24.3	24.3	36.9	0.0	46.9	34.2	0.0	40.5
Incr Delay (d2), s/veh	0.2	8.7	8.7	1.0	0.7	0.7	1.0	0.0	10.4	7.9	0.0	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.9	20.1	20.3	1.5	9.7	9.8	8.2	0.0	6.1	12.7	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.9	38.8	38.8	24.7	25.0	25.0	37.9	0.0	57.3	42.1	0.0	41.9
LnGrp LOS	B	D	D	C	C	C	D		E	D		D
Approach Vol, veh/h	1185		697			318			434			
Approach Delay, s/veh	38.2		25.0			45.0			42.0			
Approach LOS	D		C			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	48.6	20.4	24.3	11.7	49.4	27.0	17.7				
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8				
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20				
Max Q Clear Time (g_c+I1), s	4.0	33.2	12.6	8.1	3.3	16.4	18.9	9.2				
Green Ext Time (p_c), s	0.1	6.9	0.3	0.5	0.0	5.6	0.1	0.5				
Intersection Summary												
HCM 7th Control Delay, s/veh	36.2											
HCM 7th LOS	D											
Notes												
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 7th Signalized Intersection Summary

4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	259	113	286	14	74	83	5	112	276	4	2	82
Future Volume (veh/h)	259	113	286	14	74	83	5	112	276	4	2	82
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870		1856	1856	1870		1870
Adj Flow Rate, veh/h	285	124	314	15	81	91		123	303	4		90
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91		0.91	0.91	0.91		0.91
Percent Heavy Veh, %	2	2	2	2	2	2		3	3	2		2
Cap, veh/h	479	137	347	128	288	244		191	1396	18		507
Arrive On Green	0.16	0.29	0.29	0.02	0.15	0.15		0.06	0.39	0.39		0.05
Sat Flow, veh/h	1781	469	1188	1781	1870	1585		1767	3563	47		1781
Grp Volume(v), veh/h	285	0	438	15	81	91		123	150	157		90
Grp Sat Flow(s),veh/h/ln	1781	0	1657	1781	1870	1585		1767	1763	1847		1781
Q Serve(g_s), s	14.8	0.0	29.3	0.8	4.4	5.9		4.8	6.5	6.5		3.5
Cycle Q Clear(g_c), s	14.8	0.0	29.3	0.8	4.4	5.9		4.8	6.5	6.5		3.5
Prop In Lane	1.00		0.72	1.00		1.00		1.00		0.03		1.00
Lane Grp Cap(c), veh/h	479	0	484	128	288	244		191	691	724		507
V/C Ratio(X)	0.60	0.00	0.90	0.12	0.28	0.37		0.64	0.22	0.22		0.18
Avail Cap(c_a), veh/h	666	0	647	408	568	481		694	918	962		808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	31.4	0.0	39.2	40.8	43.1	43.8		27.3	23.3	23.3		20.2
Incr Delay (d2), s/veh	1.7	0.0	13.3	0.6	0.5	0.9		5.0	0.2	0.2		0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	10.6	0.0	19.4	0.7	3.7	4.3		3.9	4.8	5.0		2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	33.1	0.0	52.5	41.4	43.7	44.7		32.3	23.5	23.5		20.5
LnGrp LOS	C		D	D	D	D		C	C	C		C
Approach Vol, veh/h	723			187				430				
Approach Delay, s/veh	44.8			44.0				26.0				
Approach LOS	D			D				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.5	52.7	8.9	41.2	14.2	50.9	24.9	25.2				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	5.5	8.5	2.8	31.3	6.8	40.7	16.8	7.9				
Green Ext Time (p_c), s	0.3	2.5	0.0	2.4	0.5	2.7	1.1	0.7				
Intersection Summary												
HCM 7th Control Delay, s/veh	44.6											
HCM 7th LOS	D											
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025



Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	1001	135
Future Volume (veh/h)	1001	135
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	1100	148
Peak Hour Factor	0.91	0.91
Percent Heavy Veh, %	2	2
Cap, veh/h	1186	159
Arrive On Green	0.38	0.38
Sat Flow, veh/h	3148	423
Grp Volume(v), veh/h	620	628
Grp Sat Flow(s),veh/h/ln	1777	1794
Q Serve(g_s), s	38.5	38.7
Cycle Q Clear(g_c), s	38.5	38.7
Prop In Lane		0.24
Lane Grp Cap(c), veh/h	669	676
V/C Ratio(X)	0.93	0.93
Avail Cap(c_a), veh/h	694	701
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	34.4	34.4
Incr Delay (d2), s/veh	18.2	18.5
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	26.1	26.5
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	52.5	52.9
LnGrp LOS	D	D
Approach Vol, veh/h	1338	
Approach Delay, s/veh	50.6	
Approach LOS	D	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

5: SR 415 & Howland Blvd

Timing Plan: AM Peak Hour
07/14/2025



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	42	1112	240	312	1	392	18
Future Volume (veh/h)	42	1112	240	312	1	392	18
Initial Q (Qb), veh	0	0	0	0		0	0
Lane Width Adj.	1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00				1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach	No			No		No	
Adj Sat Flow, veh/h/ln	1856	1870	1841	1811		1870	1870
Adj Flow Rate, veh/h	46	1222	264	343		431	20
Peak Hour Factor	0.91	0.91	0.91	0.91		0.91	0.91
Percent Heavy Veh, %	3	2	4	6		2	2
Cap, veh/h	721	1138	645	1313		725	323
Arrive On Green	0.41	0.41	0.08	0.38		0.20	0.20
Sat Flow, veh/h	1767	2790	3401	3532		3647	1585
Grp Volume(v), veh/h	46	1222	264	343		431	20
Grp Sat Flow(s), veh/h/ln	1767	1395	1700	1721		1777	1585
Q Serve(g_s), s	1.2	30.0	3.3	5.0		8.1	0.7
Cycle Q Clear(g_c), s	1.2	30.0	3.3	5.0		8.1	0.7
Prop In Lane	1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h	721	1138	645	1313		725	323
V/C Ratio(X)	0.06	1.07	0.41	0.26		0.59	0.06
Avail Cap(c_a), veh/h	721	1138	1428	2339		2415	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh	13.2	21.8	15.0	15.6		26.5	23.6
Incr Delay (d2), s/veh	0.0	49.0	0.4	0.1		0.8	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln	0.7	23.6	2.0	3.1		5.8	0.5
Unsig. Movement Delay, s/veh							
LnGrp Delay(d), s/veh	13.3	70.8	15.4	15.7		27.3	23.7
LnGrp LOS	B	F	B	B		C	C
Approach Vol, veh/h	1268			607		451	
Approach Delay, s/veh	68.7			15.6		27.2	
Approach LOS	E			B		C	
Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	13.1	23.0				36.1	37.5
Change Period (Y+Rc), s	7.0	* 8				8.0	7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0	30.0
Max Q Clear Time (g_c+I1), s	5.3	10.1				7.0	32.0
Green Ext Time (p_c), s	0.8	2.8				2.2	0.0

Intersection Summary

HCM 7th Control Delay, s/veh 46.8
HCM 7th LOS D

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	60	564	57	47	1183
Future Vol, veh/h	38	60	564	57	47	1183
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	240	240	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	63	594	60	49	1245

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1938	594	0	0	654
Stage 1	594	-	-	-	-
Stage 2	1344	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	72	505	-	-	933
Stage 1	552	-	-	-	-
Stage 2	243	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	68	505	-	-	933
Mov Cap-2 Maneuver	173	-	-	-	-
Stage 1	552	-	-	-	-
Stage 2	230	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	24.16	0	0.35
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	290	933
HCM Lane V/C Ratio	-	-	0.356	0.053
HCM Ctrl Dly (s/v)	-	-	24.2	9.1
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.6	0.2

Intersection						
Int Delay, s/veh	4.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	5	99	0	2	96	0
Future Vol, veh/h	5	99	0	2	96	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	104	0	2	101	0

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	109	0	59	57
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	2	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1481	-	947	1009
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	1021	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1481	-	947	1009
Mov Cap-2 Maneuver	-	-	-	-	947	-
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	1021	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	9.25
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	947	-	-	1481	-
HCM Lane V/C Ratio	0.107	-	-	-	-
HCM Ctrl Dly (s/v)	9.3	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

HCM 7th TWSC
8: Storage Driveway & Project Driveway

Timing Plan: AM Peak Hour
07/14/2025

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	4	0	0	0	2	0	0	0	0	0
Future Vol, veh/h	0	1	4	0	0	0	2	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	4	0	0	0	2	0	0	0	0	0

Major/Minor	Major1			Minor1			Minor2		
Conflicting Flow All	-	0	0		3	3	3	1	5
Stage 1	-	-	-		3	3	-	0	0
Stage 2	-	-	-		0	0	-	1	5
Critical Hdwy	-	-	-		7.12	6.52	6.22	7.12	6.52
Critical Hdwy Stg 1	-	-	-		6.12	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-		-	-	-	6.12	5.52
Follow-up Hdwy	-	-	-		3.518	4.018	3.318	3.518	4.018
Pot Cap-1 Maneuver	0	-	-		1019	892	1081	1022	890
Stage 1	0	-	-		1019	893	-	-	-
Stage 2	0	-	-		-	-	-	1022	891
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-		-	892	1081	1022	890
Mov Cap-2 Maneuver	-	-	-		-	892	-	1022	890
Stage 1	-	-	-		1019	893	-	-	-
Stage 2	-	-	-		-	-	-	1022	891

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	0		0
HCM LOS		-	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Ctrl Dly (s/v)	-	-	-	0
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	-

HCM 7th Signalized Intersection Summary

1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour

07/14/2025

												
Movement	SEU	SEL	SET	SER	NWU	NWL	NWT	NWR	NEL	NET	NER	SWL
Lane Configurations												
Traffic Volume (veh/h)	5	214	585	62	1	151	493	50	57	289	94	91
Future Volume (veh/h)	5	214	585	62	1	151	493	50	57	289	94	91
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Lane Width Adj.		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		1.00	1.00		1.00	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No				No			No			
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		225	616	65		159	519	53	60	304	99	96
Peak Hour Factor		0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		341	786	83		284	690	70	232	352	114	220
Arrive On Green		0.12	0.24	0.24		0.09	0.21	0.21	0.04	0.26	0.26	0.06
Sat Flow, veh/h		1781	3244	342		1781	3256	332	1781	1351	440	1781
Grp Volume(v), veh/h		225	337	344		159	283	289	60	0	403	96
Grp Sat Flow(s), veh/h/ln		1781	1777	1809		1781	1777	1811	1781	0	1791	1781
Q Serve(g_s), s		9.4	17.3	17.4		6.7	14.6	14.7	2.4	0.0	21.0	3.8
Cycle Q Clear(g_c), s		9.4	17.3	17.4		6.7	14.6	14.7	2.4	0.0	21.0	3.8
Prop In Lane		1.00		0.19		1.00		0.18	1.00		0.25	1.00
Lane Grp Cap(c), veh/h		341	431	438		284	377	384	232	0	466	220
V/C Ratio(X)		0.66	0.78	0.78		0.56	0.75	0.75	0.26	0.00	0.86	0.44
Avail Cap(c_a), veh/h		490	818	833		487	818	833	523	0	824	756
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh		26.4	34.6	34.7		27.5	36.1	36.1	26.3	0.0	34.5	26.6
Incr Delay (d2), s/veh		2.2	3.2	3.1		1.7	3.0	3.0	0.6	0.0	4.9	1.4
Initial Q Delay(d3), s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln		7.3	12.2	12.4		5.1	10.4	10.6	1.8	0.0	14.5	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh		28.6	37.8	37.8		29.2	39.1	39.1	26.9	0.0	39.5	27.9
LnGrp LOS		C	D	D		C	D	D	C		D	C
Approach Vol, veh/h			906				731			463		
Approach Delay, s/veh			35.5				37.0			37.8		
Approach LOS			D				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	34.0	17.3	32.2	12.6	35.6	20.3	29.2				
Change Period (Y+Rc), s	8.6	8.6	8.5	8.5	8.6	8.6	8.5	8.5				
Max Green Setting (Gmax), s	35.0	45.0	20.0	45.0	20.0	60.0	20.0	45.0				
Max Q Clear Time (g_c+I1), s	5.8	23.0	8.7	19.4	4.4	20.8	11.4	16.7				
Green Ext Time (p_c), s	0.2	2.4	0.3	4.3	0.1	2.5	0.4	3.2				
Intersection Summary												
HCM 7th Control Delay, s/veh			36.0									
HCM 7th LOS			D									
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
1: Elkcarn Blvd & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025



Movement	SWT	SWR
Lane Configurations		
Traffic Volume (veh/h)	236	117
Future Volume (veh/h)	236	117
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	248	123
Peak Hour Factor	0.95	0.95
Percent Heavy Veh, %	2	2
Cap, veh/h	326	162
Arrive On Green	0.28	0.28
Sat Flow, veh/h	1180	585
Grp Volume(v), veh/h	0	371
Grp Sat Flow(s),veh/h/ln	0	1765
Q Serve(g_s), s	0.0	18.8
Cycle Q Clear(g_c), s	0.0	18.8
Prop In Lane		0.33
Lane Grp Cap(c), veh/h	0	488
V/C Ratio(X)	0.00	0.76
Avail Cap(c_a), veh/h	0	1083
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.4
Incr Delay (d2), s/veh	0.0	2.5
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.0	12.8
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	0.0	34.9
LnGrp LOS		C
Approach Vol, veh/h	467	
Approach Delay, s/veh	33.5	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025

																																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT																					
Lane Configurations																																	
Traffic Volume (veh/h)	164	47	96	16	40	38	149	864	35	7	60	801																					
Future Volume (veh/h)	164	47	96	16	40	38	149	864	35	7	60	801																					
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0		0	0																					
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00																					
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00		1.00																						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00																					
Work Zone On Approach	No			No			No					No																					
Adj Sat Flow, veh/h/ln	1870	1870	1870	1796	1826	1870	1870	1870	1870		1870	1870																					
Adj Flow Rate, veh/h	173	49	101	17	42	40	157	909	37		63	843																					
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																					
Percent Heavy Veh, %	2	2	2	7	5	2	2	2	2		2	2																					
Cap, veh/h	394	155	320	63	68	56	265	1361	55		266	1006																					
Arrive On Green	0.11	0.28	0.28	0.09	0.09	0.09	0.08	0.39	0.39		0.04	0.36																					
Sat Flow, veh/h	1781	545	1123	177	787	654	1781	3480	142		1781	2765																					
Grp Volume(v), veh/h	173	0	150	99	0	0	157	464	482		63	542																					
Grp Sat Flow(s),veh/h/ln	1781	0	1668	1618	0	0	1781	1777	1845		1781	1777																					
Q Serve(g_s), s	7.4	0.0	6.2	2.6	0.0	0.0	4.7	18.9	18.9		1.9	24.5																					
Cycle Q Clear(g_c), s	7.4	0.0	6.2	5.2	0.0	0.0	4.7	18.9	18.9		1.9	24.5																					
Prop In Lane	1.00		0.67	0.17		0.40	1.00		0.08		1.00																						
Lane Grp Cap(c), veh/h	394	0	475	187	0	0	265	695	722		266	647																					
V/C Ratio(X)	0.44	0.00	0.32	0.53	0.00	0.00	0.59	0.67	0.67		0.24	0.84																					
Avail Cap(c_a), veh/h	506	0	913	500	0	0	431	810	841		491	810																					
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00																					
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00		1.00	1.00																					
Uniform Delay (d), s/veh	29.8	0.0	24.6	39.0	0.0	0.0	19.8	22.0	22.0		17.6	25.5																					
Incr Delay (d2), s/veh	0.8	0.0	0.4	2.3	0.0	0.0	2.1	1.7	1.6		0.5	6.3																					
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0																					
%ile BackOfQ(95%),veh/ln	5.6	0.0	4.3	3.8	0.0	0.0	3.4	11.9	12.2		1.3	15.7																					
Unsig. Movement Delay, s/veh																																	
LnGrp Delay(d), s/veh	30.6	0.0	25.0	41.3	0.0	0.0	21.9	23.7	23.7		18.1	31.9																					
LnGrp LOS	C		C	D			C	C	C		B	C																					
Approach Vol, veh/h	323			99			1103			1134																							
Approach Delay, s/veh	28.0			41.3			23.4			31.2																							
Approach LOS	C			D			C			C																							
Timer - Assigned Phs	1	2	3	4	5	6	8																										
Phs Duration (G+Y+Rc), s	14.8	40.4	17.5	15.0	12.4	42.8	32.5																										
Change Period (Y+Rc), s	8.0	8.5	8.0	7.5	8.5	* 8.5	7.5																										
Max Green Setting (Gmax), s	15.0	40.0	15.0	25.0	15.0	* 40	48.0																										
Max Q Clear Time (g_c+I1), s	6.7	26.5	9.4	7.2	3.9	20.9	8.2																										
Green Ext Time (p_c), s	0.2	5.4	0.2	0.4	0.1	5.4	0.9																										
Intersection Summary																																	
HCM 7th Control Delay, s/veh	28.0																																
HCM 7th LOS	C																																
Notes																																	
User approved ignoring U-Turning movement.																																	
* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.																																	

HCM 7th Signalized Intersection Summary
2: Newmark Dr & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025

Movement	SBR
Lane Configurations	
Traffic Volume (veh/h)	217
Future Volume (veh/h)	217
Initial Q (Qb), veh	0
Lane Width Adj.	1.00
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Work Zone On Approach	
Adj Sat Flow, veh/h/ln	1870
Adj Flow Rate, veh/h	228
Peak Hour Factor	0.95
Percent Heavy Veh, %	2
Cap, veh/h	272
Arrive On Green	0.36
Sat Flow, veh/h	748
Grp Volume(v), veh/h	529
Grp Sat Flow(s),veh/h/ln	1736
Q Serve(g_s), s	24.5
Cycle Q Clear(g_c), s	24.5
Prop In Lane	0.43
Lane Grp Cap(c), veh/h	632
V/C Ratio(X)	0.84
Avail Cap(c_a), veh/h	791
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	25.5
Incr Delay (d2), s/veh	6.5
Initial Q Delay(d3), s/veh	0.0
%ile BackOfQ(95%),veh/ln	15.5
Unsig. Movement Delay, s/veh	
LnGrp Delay(d), s/veh	32.1
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer - Assigned Phs	

HCM 7th Signalized Intersection Summary

3: Courtland Blvd & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	38	454	250	47	811	153	184	72	22	81	74	44
Future Volume (veh/h)	38	454	250	47	811	153	184	72	22	81	74	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	478	263	49	854	161	194	76	23	85	78	46
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
Percent Heavy Veh, %	2	2	2	2	2	3	2	2	2	2	2	2
Cap, veh/h	214	819	448	293	1115	210	335	214	65	313	108	64
Arrive On Green	0.04	0.37	0.37	0.04	0.37	0.37	0.12	0.16	0.16	0.06	0.10	0.10
Sat Flow, veh/h	1781	2216	1213	1781	2984	562	1781	1378	417	1781	1103	650
Grp Volume(v), veh/h	40	383	358	49	509	506	194	0	99	85	0	124
Grp Sat Flow(s),veh/h/ln	1781	1777	1652	1781	1777	1769	1781	0	1795	1781	0	1753
Q Serve(g_s), s	1.2	15.1	15.3	1.5	22.0	22.0	8.3	0.0	4.3	3.7	0.0	6.0
Cycle Q Clear(g_c), s	1.2	15.1	15.3	1.5	22.0	22.0	8.3	0.0	4.3	3.7	0.0	6.0
Prop In Lane	1.00		0.73	1.00		0.32	1.00		0.23	1.00		0.37
Lane Grp Cap(c), veh/h	214	656	610	293	664	661	335	0	279	313	0	172
V/C Ratio(X)	0.19	0.58	0.59	0.17	0.77	0.77	0.58	0.00	0.36	0.27	0.00	0.72
Avail Cap(c_a), veh/h	558	914	850	629	914	910	527	0	410	617	0	401
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.7	22.2	22.2	17.1	24.0	24.0	30.2	0.0	33.0	32.7	0.0	38.3
Incr Delay (d2), s/veh	0.4	1.2	1.3	0.3	3.3	3.3	1.6	0.0	1.1	0.5	0.0	7.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.8	10.0	9.5	1.0	13.8	13.8	6.5	0.0	3.4	2.9	0.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	19.1	23.3	23.5	17.4	27.4	27.4	31.7	0.0	34.1	33.1	0.0	46.1
LnGrp LOS	B	C	C	B	C	C	C		C	C		D
Approach Vol, veh/h		781			1064			293			209	
Approach Delay, s/veh		23.2			26.9			32.5			40.8	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	40.8	18.1	16.6	11.6	41.2	13.1	21.6				
Change Period (Y+Rc), s	8.5	8.5	7.5	8.0	8.5	8.5	8.0	* 8				
Max Green Setting (Gmax), s	20.0	45.0	20.0	20.0	20.0	45.0	20.0	* 20				
Max Q Clear Time (g_c+I1), s	3.5	17.3	10.3	8.0	3.2	24.0	5.7	6.3				
Green Ext Time (p_c), s	0.1	6.7	0.4	0.6	0.1	8.7	0.1	0.5				

Intersection Summary

HCM 7th Control Delay, s/veh 27.6
HCM 7th LOS C

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th Signalized Intersection Summary 4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (veh/h)	78	82	189	17	153	125	2	375	873	11	1	54
Future Volume (veh/h)	78	82	189	17	153	125	2	375	873	11	1	54
Initial Q (Qb), veh	0	0	0	0	0	0		0	0	0		0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00		1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Work Zone On Approach	No			No				No				
Adj Sat Flow, veh/h/ln	1870	1856	1870	1707	1870	1870		1870	1870	1870		1767
Adj Flow Rate, veh/h	87	91	210	19	170	139		417	970	12		60
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90		0.90
Percent Heavy Veh, %	2	3	2	13	2	2		2	2	2		9
Cap, veh/h	295	110	253	163	343	291		521	1361	17		238
Arrive On Green	0.06	0.22	0.22	0.02	0.18	0.18		0.22	0.38	0.38		0.04
Sat Flow, veh/h	1781	498	1150	1626	1870	1585		1781	3595	44		1682
Grp Volume(v), veh/h	87	0	301	19	170	139		417	479	503		60
Grp Sat Flow(s),veh/h/ln	1781	0	1649	1626	1870	1585		1781	1777	1862		1682
Q Serve(g_s), s	3.4	0.0	15.0	0.8	7.0	6.8		14.6	19.8	19.8		2.4
Cycle Q Clear(g_c), s	3.4	0.0	15.0	0.8	7.0	6.8		14.6	19.8	19.8		2.4
Prop In Lane	1.00		0.70	1.00		1.00		1.00		0.02		1.00
Lane Grp Cap(c), veh/h	295	0	363	163	343	291		521	673	705		238
V/C Ratio(X)	0.29	0.00	0.83	0.12	0.50	0.48		0.80	0.71	0.71		0.25
Avail Cap(c_a), veh/h	812	0	860	505	759	643		960	1236	1295		652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Uniform Delay (d), s/veh	26.4	0.0	32.1	28.5	31.6	31.5		19.2	22.8	22.8		25.3
Incr Delay (d2), s/veh	0.8	0.0	4.9	0.4	1.1	1.2		4.1	2.0	1.9		0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0
%ile BackOfQ(95%),veh/ln	2.6	0.0	10.3	0.6	5.7	0.2		9.8	12.4	12.9		1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	27.2	0.0	37.0	28.9	32.8	32.8		23.3	24.8	24.7		26.1
LnGrp LOS	C		D	C	C	C		C	C	C		C
Approach Vol, veh/h	388			328				1399				
Approach Delay, s/veh	34.8			32.5				24.4				
Approach LOS	C			C				C				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	40.2	8.8	26.5	25.7	25.3	12.0	23.3				
Change Period (Y+Rc), s	7.0	7.5	7.0	7.5	7.0	7.5	7.0	7.5				
Max Green Setting (Gmax), s	25.0	60.0	20.0	45.0	40.0	45.0	30.0	35.0				
Max Q Clear Time (g_c+I1), s	4.4	21.8	2.8	17.0	16.6	14.6	5.4	9.0				
Green Ext Time (p_c), s	0.2	10.2	0.0	1.9	2.1	3.1	0.3	1.4				
Intersection Summary												
HCM 7th Control Delay, s/veh	29.1											
HCM 7th LOS	C											
Notes												
User approved ignoring U-Turning movement.												

HCM 7th Signalized Intersection Summary
4: Fort Smith Blvd & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025



Movement	SBT	SBR
Lane Configurations	↑↑	
Traffic Volume (veh/h)	420	75
Future Volume (veh/h)	420	75
Initial Q (Qb), veh	0	0
Lane Width Adj.	1.00	1.00
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	467	83
Peak Hour Factor	0.90	0.90
Percent Heavy Veh, %	2	2
Cap, veh/h	622	110
Arrive On Green	0.21	0.21
Sat Flow, veh/h	3018	533
Grp Volume(v), veh/h	274	276
Grp Sat Flow(s),veh/h/ln	1777	1774
Q Serve(g_s), s	12.5	12.6
Cycle Q Clear(g_c), s	12.5	12.6
Prop In Lane		0.30
Lane Grp Cap(c), veh/h	366	366
V/C Ratio(X)	0.75	0.76
Avail Cap(c_a), veh/h	927	925
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	32.2	32.2
Incr Delay (d2), s/veh	3.1	3.2
Initial Q Delay(d3), s/veh	0.0	0.0
%ile BackOfQ(95%),veh/ln	9.1	9.2
Unsig. Movement Delay, s/veh		
LnGrp Delay(d), s/veh	35.2	35.4
LnGrp LOS	D	D
Approach Vol, veh/h	610	
Approach Delay, s/veh	34.4	
Approach LOS	C	
Timer - Assigned Phs		

HCM 7th Signalized Intersection Summary

5: SR 415 & Howland Blvd

Timing Plan: PM Peak Hour
07/14/2025



Movement	EBU	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (veh/h)	1	45	346	946	526	2	355	64
Future Volume (veh/h)	1	45	346	946	526	2	355	64
Initial Q (Qb), veh		0	0	0	0		0	0
Lane Width Adj.		1.00	1.00	1.00	1.00		1.00	1.00
Ped-Bike Adj(A_pbT)		1.00	1.00	1.00				1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00		1.00	1.00
Work Zone On Approach		No			No		No	
Adj Sat Flow, veh/h/ln		1870	1870	1870	1870		1870	1856
Adj Flow Rate, veh/h		47	364	996	554		374	67
Peak Hour Factor		0.95	0.95	0.95	0.95		0.95	0.95
Percent Heavy Veh, %		2	2	2	2		2	3
Cap, veh/h		321	503	1219	2000		883	391
Arrive On Green		0.18	0.18	0.20	0.56		0.25	0.25
Sat Flow, veh/h		1781	2790	3456	3647		3647	1572
Grp Volume(v), veh/h		47	364	996	554		374	67
Grp Sat Flow(s),veh/h/ln		1781	1395	1728	1777		1777	1572
Q Serve(g_s), s		1.3	7.4	6.5	4.9		5.3	2.0
Cycle Q Clear(g_c), s		1.3	7.4	6.5	4.9		5.3	2.0
Prop In Lane		1.00	1.00	1.00				1.00
Lane Grp Cap(c), veh/h		321	503	1219	2000		883	391
V/C Ratio(X)		0.15	0.72	0.82	0.28		0.42	0.17
Avail Cap(c_a), veh/h		886	1387	1850	2944		2944	1303
HCM Platoon Ratio		1.00	1.00	1.00	1.00		1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00		1.00	1.00
Uniform Delay (d), s/veh		20.8	23.3	11.1	6.8		19.0	17.8
Incr Delay (d2), s/veh		0.2	2.0	1.8	0.1		0.3	0.2
Initial Q Delay(d3), s/veh		0.0	0.0	0.0	0.0		0.0	0.0
%ile BackOfQ(95%),veh/ln		0.9	4.1	5.8	2.3		3.5	1.2
Unsig. Movement Delay, s/veh								
LnGrp Delay(d), s/veh		21.0	25.3	12.9	6.9		19.4	18.0
LnGrp LOS		C	C	B	A		B	B
Approach Vol, veh/h		411			1550		441	
Approach Delay, s/veh		24.8			10.8		19.2	
Approach LOS		C			B		B	
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	19.0	23.0				42.0		18.4
Change Period (Y+Rc), s	7.0	* 8				8.0		7.5
Max Green Setting (Gmax), s	23.0	* 50				50.0		30.0
Max Q Clear Time (g_c+I1), s	8.5	7.3				6.9		9.4
Green Ext Time (p_c), s	3.5	2.6				3.7		1.5

Intersection Summary

HCM 7th Control Delay, s/veh	14.7
HCM 7th LOS	B

Notes

User approved ignoring U-Turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 7th TWSC
6: Howland Blvd & Project Driveway

Timing Plan: PM Peak Hour
07/14/2025

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	46	1032	45	36	520
Future Vol, veh/h	30	46	1032	45	36	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	240	240	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	48	1086	47	38	547

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1709	1086	0	0	1134	0
Stage 1	1086	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	100	263	-	-	616	-
Stage 1	324	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	94	263	-	-	616	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	324	-	-	-	-	-
Stage 2	502	-	-	-	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	26.79	0	0.73
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	244	616
HCM Lane V/C Ratio	-	-	0.328	0.061
HCM Ctrl Dly (s/v)	-	-	26.8	11.2
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	1.4	0.2

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	75	0	6	70	0
Future Vol, veh/h	6	75	0	6	70	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	79	0	6	74	0

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	85	0	52	46
Stage 1	-	-	-	-	46	-
Stage 2	-	-	-	-	6	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1511	-	956	1024
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	1017	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1511	-	956	1024
Mov Cap-2 Maneuver	-	-	-	-	956	-
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	1017	-

Approach	EB	WB	NB
HCM Ctrl Dly, s/v	0	0	9.08
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	956	-	-	1511	-
HCM Lane V/C Ratio	0.077	-	-	-	-
HCM Ctrl Dly (s/v)	9.1	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM 7th TWSC
8: Storage Driveway & Project Driveway

Timing Plan: PM Peak Hour
07/14/2025

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↱						↱			↱	
Traffic Vol, veh/h	0	1	5	0	0	0	5	0	0	0	0	1
Future Vol, veh/h	0	1	5	0	0	0	5	0	0	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1	5	0	0	0	5	0	0	0	0	1

Major/Minor	Major1			Minor1		Minor2			
Conflicting Flow All	-	0	0	4	4	4	1	6	0
Stage 1	-	-	-	4	4	-	0	0	-
Stage 2	-	-	-	0	0	-	1	6	-
Critical Hdwy	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1018	892	1080	1022	889	-
Stage 1	0	-	-	1019	893	-	-	-	-
Stage 2	0	-	-	-	-	-	1022	890	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	-	892	1080	1022	889	-
Mov Cap-2 Maneuver	-	-	-	-	892	-	1022	889	-
Stage 1	-	-	-	1019	893	-	-	-	-
Stage 2	-	-	-	-	-	-	1022	890	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	0		
HCM LOS		-	-

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	SBLn1
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Ctrl Dly (s/v)	-	-	-	-
HCM Lane LOS	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-

APPENDIX J

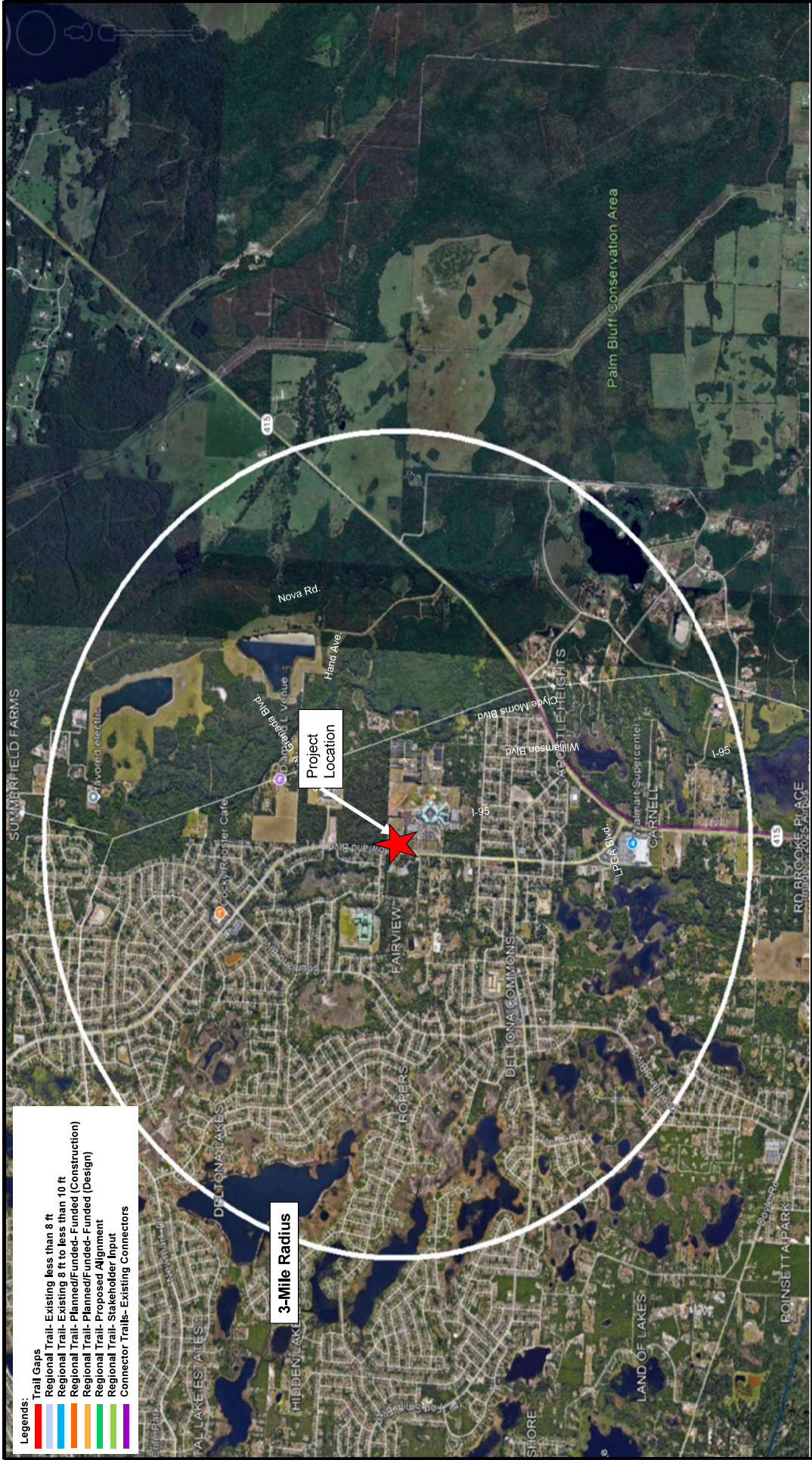
Queue Length & Turn Lane Analysis

Intersection	Turn Lane	Posted Speed Limit (mph)	Existing Lane Length (ft)	Required Deceleration (ft/s²)	Existing				Background				Build-Out			
					# of Lanes	95th Percentile Queue Length (veh x 25 ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	# of Lanes	95th Percentile Queue Length (veh x 25 ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)	# of Lanes	95th Percentile Queue Length (veh x 25 ft)	Total Required Turn Lane Length (ft)	Lane Length Deficiency (ft)
AM																
Howland Blvd at Ellicam Blvd	EBL	35	325	185	1	50	235	0	1	50	235	0	1	50	235	0
	WBL	35	400	185	1	25	210	0	1	25	210	0	1	25	210	0
	NBL	45	325	350	1	75	425	100	1	75	425	100	1	75	425	100
	SBL	35	475	185	1	50	235	0	1	50	235	0	1	50	235	0
Howland Blvd at Newmark Dr	EBL	35	435	185	1	175	360	0	1	175	360	0	1	175	360	0
	NBL	45	325	350	1	100	450	125	1	100	450	125	1	125	475	150
	SBL	45	325	350	1	25	375	50	1	25	375	50	1	25	375	50
	EBL	35	485	185	1	200	385	0	1	225	410	0	1	225	410	0
Howland Blvd at Courtland Blvd	WBL	35	335	185	1	300	485	150	1	325	510	175	1	325	510	175
	NBL	45	385	350	1	50	400	15	1	50	400	15	1	50	400	15
	SBL	45	285	350	1	25	375	90	1	25	375	90	1	25	375	90
	EBL	50	325	405	1	250	655	330	1	275	680	355	1	275	680	355
Howland Blvd at Fort Smith Blvd	WBL	50	295	405	1	25	430	135	1	25	430	135	1	25	430	135
	WBR	50	215	405	1	100	505	290	1	100	505	290	1	125	530	315
	NBL	50	385	405	1	100	505	120	1	100	505	120	1	100	505	120
	SBL	50	435	405	1	75	480	45	1	75	480	45	1	75	480	45
Howland Blvd at SR 415	EBL	50	395	405	1	25	430	35	1	25	430	35	1	25	430	35
	NBL	50	535	405	2	50	455	0	2	50	455	0	2	50	455	0
	SBR	50	275	405	1	25	430	155	1	25	430	155	1	25	430	155
PM																
Howland Blvd at Ellicam Blvd	EBL	35	325	185	1	50	235	0	1	50	235	0	1	50	235	0
	WBL	35	400	185	1	75	260	0	1	75	260	0	1	75	260	0
	NBL	45	325	350	1	125	475	150	1	125	475	150	1	125	475	150
	SBL	35	475	185	1	175	360	0	1	175	360	0	1	175	360	0
Howland Blvd at Newmark Dr	EBL	35	435	185	1	150	335	0	1	150	335	0	1	150	335	0
	NBL	45	325	350	1	75	425	100	1	100	450	125	1	100	450	125
	SBL	45	325	350	1	50	400	75	1	50	400	75	1	50	400	75
	EBL	35	485	185	1	150	335	0	1	175	360	0	1	175	360	0
Howland Blvd at Courtland Blvd	WBL	35	335	185	1	75	260	0	1	75	260	0	1	75	260	0
	NBL	45	385	350	1	25	375	0	1	25	375	0	1	25	375	0
	SBL	45	285	350	1	25	375	90	1	25	375	90	1	25	375	90
	EBL	50	325	405	1	75	480	155	1	75	480	155	1	75	480	155
Howland Blvd at Fort Smith Blvd	WBL	50	295	405	1	25	430	135	1	25	430	135	1	25	430	135
	WBR	50	215	405	1	100	505	290	1	125	530	315	1	25	430	215
	NBL	50	385	405	1	250	655	270	1	250	655	270	1	250	655	270
	SBL	50	435	405	1	50	455	20	1	50	455	20	1	50	455	20
Howland Blvd at SR 415	EBL	50	395	405	1	25	430	35	1	25	430	35	1	25	430	35
	NBL	50	535	405	2	150	555	20	2	150	555	20	2	150	555	20
	SBR	50	275	405	1	25	430	155	1	50	455	180	1	50	455	180

*Based upon Volusia County LDC Section 72-619 Table VI and the latest FDOT Design Manual.

APPENDIX K

Alternative Mode Analysis



930 Howland Boulevard	 N NTS		Trail Gaps, Regional Trail Segments and Connector Trails Map Project No.: 6383.02 Appendix
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