SIGNAL WARRANT ANALYSIS

HOWLAND BOULEVARD AND FERNANDA DRIVE

CITY OF DELTONA, VOLUSIA COUNTY



Prepared for:

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TPD No. 5427.2

PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer properly registered in the State of Florida practicing with Traffic Planning & Design, Inc., a corporation authorized to operate as an engineering business, EB-3702, 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:	Fernanda Place – Phase 3
LOCATION:	City of Deltona, Volusia County
CLIENT:	Galvin Land Services, LLC

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.



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INTRODUCTION

This signal warrant analysis was conducted in order to determine the need of and justification for the installation of a traffic signal at the intersection of Howland Boulevard and Fernanda Drive/Goldenhills Street in the City of Deltona, Volusia County. This analysis was performed to determine if a signal would become warranted due to the construction of Phase 3 of the Fernanda Place development, which is accessed via Fernanda Drive. **Figure 1** depicts the intersection location and area roadway network. Fernanda Place is a single family residential development consisting of 251 dwelling units located on the north side of Fernanda Drive, approximately 0.4 miles east of Howland Boulevard. Phase 3 of the development consists of 101 single family dwelling units located on the south side of Fernanda Drive.







Fernanda Place - SWA Project № 5427.2 **Figure 1**

Intersection Location



EXISTING TRAFFIC CONDITIONS

Howland Boulevard is a four-lane divided roadway with a posted speed limit of 45 mph. Based on FDOT counts made in 2022, it carries a daily traffic volume of approximately 26,500 vehicles per day adjacent to the intersection.

Intersection Configuration

The existing lane configuration at the intersection of Howland Boulevard and Fernanda Drive/Goldenhills Street is illustrated in **Figure 2**. In addition to the two through lanes in each direction, Howland Boulevard has a two-way-left-turn lane in the northbound and southbound directions, and a right-turn lane in the northbound direction. Fernanda Drive has an exclusive right turn lane as well as a shared through/left lane. Goldenhills Street has a single-lane approach.

Hourly Traffic Counts

Hourly traffic counts were obtained at each intersection approach by TPD personnel. These counts were made on February 20th, 2024, by 15-minute intervals and are included in **Appendix A**. The counts, summarized by the hour, are shown in **Table 1** along with the hourly variation of the existing traffic for each approach. Additionally, turning movement counts were collected for the westbound approach of the intersection for the hours of 6 A.M. to 7 P.M. in 15-minute intervals. The turning movement counts are summarized in **Table 2**. These existing traffic volumes will be used in the signal warrant analysis along with trips to be generated by Phase 3 of the development.











				Appr	oach			
Time	Northbound	(Howland Blvd	Southbound (Howland Blvd)	Eastbound (C	Goldenhills St)	Westbound (Fernanda Dr)
	Volume	% per Hour	Volume	% per Hour	Volume	% per Hour	Volume	% per Hour
12-1 A.M.	45	0.49%	22	0.26%	0	0.00%	2	0.24%
1-2 A.M.	33	0.36%	16	0.19%	1	0.16%	1	0.12%
2-3 A.M.	25	0.27%	24	0.28%	1	0.16%	5	0.60%
3-4 A.M.	20	0.22%	43	0.50%	5	0.80%	7	0.83%
4-5 A.M.	26	0.28%	117	1.37%	1	0.16%	20	2.38%
5-6 A.M.	86	0.94%	331	3.87%	20	3.22%	39	4.64%
6-7 A.M.	150	1.64%	678	7.94%	38	6.11%	56	6.67%
7-8 A.M.	423	4.62%	1,081	12.66%	88	14.15%	124	14.76%
8-9 A.M.	546	5.96%	759	8.89%	68	10.93%	71	8.45%
9-10 A.M.	347	3.79%	471	5.51%	53	8.52%	38	4.52%
10-11 A.M.	370	4.04%	411	4.81%	19	3.05%	43	5.12%
11-12 P.M.	412	4.50%	415	4.86%	17	2.73%	30	3.57%
12-1 P.M.	464	5.07%	425	4.98%	27	4.34%	39	4.64%
1-2 P.M.	475	5.19%	434	5.08%	30	4.82%	28	3.33%
2-3 P.M.	584	6.38%	557	6.52%	27	4.34%	47	5.60%
3-4 P.M.	883	9.65%	562	6.58%	42	6.75%	48	5.71%
4-5 P.M.	981	10.72%	515	6.03%	92	14.79%	55	6.55%
5-6 P.M.	1,127	12.31%	509	5.96%	30	4.82%	61	7.26%
6-7 P.M.	911	9.95%	409	4.79%	31	4.98%	46	5.48%
7-8 P.M.	470	5.13%	240	2.81%	13	2.09%	39	4.64%
8-9 P.M.	283	3.09%	236	2.76%	7	1.13%	17	2.02%
9-10 P.M.	220	2.40%	152	1.78%	6	0.96%	16	1.90%
10-11 P.M.	186	2.03%	92	1.08%	5	0.80%	3	0.36%
11-12 P.M.	88	0.96%	43	0.50%	1	0.16%	5	0.60%
Total:	9,155	100%	8,542	100%	622	100%	840	100%

Table 1Existing Hourly Traffic Volumes



-	Westbound Appro	oach (Fernanda Dr)
lime	Left + Thru Lane Volume	Right Lane Volume
6-7 A.M.	43	13
7-8 A.M.	66	58
8-9 A.M.	53	17
9-10 A.M.	28	11
10-11 A.M.	24	19
11-12 P.M.	18	12
12-1 P.M.	24	16
1-2 P.M.	19	9
2-3 P.M.	26	21
3-4 P.M.	27	22
4-5 P.M.	28	25
5-6 P.M.	32	32
6-7 P.M.	23	23
Total:	411	278

Table 2Turning Movement Count Summary



DEVELOPMENT GENERATED TRAFFIC

Phase 3 of the Fernanda Place development will consist of 101 single-family dwelling units. In order to determine the impact of this development to the existing traffic volumes at the study intersection, trip generation and distribution analysis was conducted.

Trip Generation

In a traffic study conducted in February 2024, trip generation calculations were conducted in order to determine the impact of the traffic generated by the Phase 3 of the development. The trip generation calculations are summarized below in **Table 3**, which shows that Phase 3 of the development will generate 1,018 new daily trips, of which 509 will enter the site and 509 will exit the site. These trips will be combined with the existing traffic for use in the analysis. The detailed ITE worksheets are included in **Appendix B**.

Table 3Trip Generation Summary

	Land Llag	Sizo	Daily					
TTE Code	Lanu Ose	5120	Rate**	Enter	Exit	Total		
210	Single-Family Detached Housing	101 DU*	10.08	509	509	1,018		

* DU = Dwelling Unit

** $R^2 > 0.75$, therefore Equations used

Trip Distribution

The February 2024 traffic study included an estimation of the distribution of the project trips using the CFRPM model. The trip distribution of the project, as shown in **Figure 3**, shows that 45% of the project traffic will enter/exit the site from Howland Boulevard to the north of Fernanda Drive, and 55% of the project traffic will enter/exit the site from Howland Boulevard to the south of Fernanda Drive. This distribution will be used to assign the project trips to the study intersection for use in the analysis. The detailed model output plots are included in Appendix B.











Hourly Variation of Project Trips

In order to determine the hourly variation of the project trips entering the study intersection, analysis was conducted using both the hourly variation of existing traffic and hourly variation rates obtained from ITE. Fernanda Drive is the only access to the Fernanda Place development; therefore, all 509 exiting project trips will enter the study intersection from Fernanda Drive (the westbound approach). Additionally, it should be noted that Fernanda Drive provides access only to the Fernanda Place development and nothing else, so the existing traffic counts in the westbound direction consist entirely of exiting-trips generated by the completed Fernanda Place development the hourly variation of these existing exiting-trips was used to determine the hourly variation of the project trips entering the study intersection from Fernanda Drive. Additionally, the trip distribution obtained from the traffic study was used to distribute the project trips to the left and right lanes of the westbound approach.

Similarly, the project trips entering the study intersection from Howland Boulevard are those trips that are entering the project site. These trips were distributed to the northbound and southbound approaches of the intersection according to the trip distribution determined in the traffic study. It was determined that 280 project trips will enter the study intersection from the northbound approach and 229 project trips will enter the study intersection from the southbound approach per day. While the project trips on Fernanda Drive are those that are exiting the project site, the project trips on Howland Boulevard are those that are entering the project site; therefore, the hourly variation of the existing counts is not applicable to the project trips on Howland Boulevard. Instead, hourly variation rates were obtained from ITE in order to determine the hourly variation of the project trips entering the study intersection from Howland Boulevard. The hourly variation rates obtained from ITE are included in Appendix B.

Summarized in **Table 4** are the hourly variations of the project trips entering the study intersection at each intersection approach. It should be noted that the traffic study did not assign any project trips to Goldenhills Street, therefore no project trips are assigned to the eastbound approach for use in the Signal Warrant Analysis. These project trips will be combined with the existing traffic counts in order to determine the total traffic volumes for use in the analysis. The total traffic volumes per hour are summarized in **Table 5**, along with the total volume of both approaches for the Major Street and the critical volume for the Minor Street, which are the volumes to be used in the analysis.



Time	Northbour Bl	ld (Howland ∣vd)	Southbour Bl	nd (Howland Ivd)	We	stbound (Ferna	nda Dr)
Time	%*	Volume	%*	Volume	%**	Left + Thru Lane	Right Lane
12-1 A.M.	0.5%	1	0.5%	1	0.24%	1	0
1-2 A.M.	0.2%	1	0.2%	0	0.12%	1	0
2-3 A.M.	0.3%	1	0.3%	1	0.60%	2	1
3-4 A.M.	0.2%	1	0.2%	0	0.83%	2	2
4-5 A.M.	0.3%	1	0.3%	1	2.38%	7	5
5-6 A.M.	0.5%	1	0.5%	1	4.64%	13	11
6-7 A.M.	1.6%	4	1.6%	4	6.67%	19	15
7-8 A.M.	3.1%	9	3.1%	7	14.76%	41	34
8-9 A.M.	3.8%	11	3.8%	9	8.45%	24	19
9-10 A.M.	3.3%	9	3.3%	8	4.52%	13	10
10-11 A.M.	4.2%	12	4.2%	10	5.12%	14	12
11-12 P.M.	5.4%	15	5.4%	12	3.57%	10	8
12-1 P.M.	5.7%	16	5.7%	13	4.64%	13	11
1-2 P.M.	6.1%	17	6.1%	14	3.33%	9	8
2-3 P.M.	7.1%	20	7.1%	16	5.60%	14	14
3-4 P.M.	8.7%	24	8.7%	20	5.71%	16	13
4-5 P.M.	10.5%	29	10.5%	24	6.55%	18	15
5-6 P.M.	10.0%	28	10.0%	23	7.26%	20	17
6-7 P.M.	8.5%	24	8.5%	19	5.48%	15	13
7-8 P.M.	6.1%	17	6.1%	14	4.64%	13	11
8-9 P.M.	6.1%	17	6.1%	14	2.02%	6	4
9-10 P.M.	4.4%	12	4.4%	10	1.90%	6	4
10-11 P.M.	2.1%	6	2.1%	5	0.36%	1	1
11-12 P.M.	1.3%	4	1.3%	3	0.60%	2	1
Total:	100.0%	280	100.0%	229	100.0%	280	229

Table 4Hourly Variation of Project Trips

* ITE Hourly Variation rates

** Obtained from Existing Counts



			Major S	Street - Howla	and Boulev	ard		Minor Street - Goldenhills Street/Fernanda Dr				
Time	No	orhtbound		So	uthbound		Total Both	Eastbound	We	estbound		Critical
	Existing	Project	Total	Existing	Project	Total	Approaches	Existing	Existing	Project	Total	Volume*
12-1 A.M.	45	1	46	22	1	23	69	0	2	1	3	3
1-2 A.M.	33	1	34	16	0	16	50	1	1	1	2	2
2-3 A.M.	25	1	26	24	1	25	51	1	5	3	8	8
3-4 A.M.	20	1	21	43	0	43	64	5	7	4	11	11
4-5 A.M.	26	1	27	117	1	118	145	1	20	12	32	32
5-6 A.M.	86	1	87	331	1	332	419	20	39	24	63	63
6-7 A.M.	150	4	154	678	4	682	836	38	56	34	90	90
7-8 A.M.	423	9	432	1,081	7	1,088	1,520	88	124	75	199	199
8-9 A.M.	546	11	557	759	9	768	1,325	68	71	43	114	114
9-10 A.M.	347	9	356	471	8	479	835	53	38	23	61	61
10-11 A.M.	370	12	382	411	10	421	803	19	43	26	69	69
11-12 P.M.	412	15	427	415	12	427	854	17	30	18	48	48
12-1 P.M.	464	16	480	425	13	438	918	27	39	24	63	63
1-2 P.M.	475	17	492	434	14	448	940	30	28	17	45	45
2-3 P.M.	584	20	604	557	16	573	1,177	27	47	28	75	75
3-4 P.M.	883	24	907	562	20	582	1,489	42	48	29	77	77
4-5 P.M.	981	29	1,010	515	24	539	1,549	92	55	33	88	92
5-6 P.M.	1,127	28	1,155	509	23	532	1,687	30	61	37	98	98
6-7 P.M.	911	24	935	409	19	428	1,363	31	46	28	74	74
7-8 P.M.	470	17	487	240	14	254	741	13	39	24	63	63
8-9 P.M.	283	17	300	236	14	250	550	7	17	10	27	27
9-10 P.M.	220	12	232	152	10	162	394	6	16	10	26	26
10-11 P.M.	186	6	192	92	5	97	289	5	3	2	5	5
11-12 P.M.	88	4	92	43	3	46	138	1	5	3	8	8

Table 5 Total Traffic Volumes

* Eastbound or Westbound approach volume, whichever is greater



SIGNAL WARRANT ANALYSIS

The signal warrant analysis was conducted in accordance with the procedures of the **Manual on Uniform Control Devices** (MUTCD) for streets and highways. According to the MUTCD, traffic signals should not be considered for installation unless one or more of the nine warrants specified therein are met and an engineering study justifies the need.

Applicable Warrants

The warrants applicable to this analysis are Warrant 1 – Eight Hour Vehicular Volume (Conditions A and B) and Warrant 2 – Four Hour Volume.

For Warrant 1, the Minimum Vehicular Volume (Condition A) is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption Continuous Traffic (Condition B) is intended for application at locations where Condition A is not satisfied and where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delays or conflict in entering/crossing the major street. The MUTCD specifies that the minimum volume warrants are satisfied when for each of any eight hours of an average day the volumes are greater than the threshold values given in **Table 6.** Since the posted speed limit on Howland Boulevard is greater than 40 mph, the 70% threshold values given in the table will be used in the analysis.

For Warrant 2, the Four-Hour Vehicular volume signal warrant, conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. This warrant is satisfied when for each of any four hours of an average day, the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor street approach (one direction only) all fall above the applicable curve in **Figure 4** of the MUTCD for the existing combination of lanes.

The six warrants determined not to be applicable for the intersection under study are:

Warrant	3	-	Peak Hour (not applicable)
	4	-	Pedestrian Volume (no pedestrian traffic)
	5	-	School Crossing (there is no school crossing)
	6	-	Coordinated Signal System (not an objective)
	7	-	Crash Experience (data not available)
	8	-	Roadway Network (not applicable)
	9	-	Intersection Near a Grade Crossing



Condition A-Minimum Vehicular Volume									
Number of Lan Traffic on Ead	es for Moving ch Approach	Vel (Total)	Vehicles Per Hour on Major Street (Total of both Approaches) *					Higher et ly)	
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1 Lane	1 Lane	500	400	350	280	150	120	105	84
2 + Lanes	1 Lane	600	480	420	336	150	120	105	84
2 + Lanes	2 + Lanes	600	480	420	336	200	160	140	112
1 Lane	2 + Lanes	500	400	350	280	200	160	140	112
	Conditior	n B-Intei	ruptior	n of Con	tinuous	s Traffic			
Number of Lan Traffic on Ead	es for Moving ch Approach	Vel (Total	hicles P Major of both	er Hour Street Approac	on hes) *	Vehicle Vo (O	es Per H lume M ne Diree	lour on I inor Stre ction On	Higher et ly)
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1 Lane	1 Lane	750	600	525	420	75	60	53	42
2 + Lanes	1 Lane	900	720	630	504	75	60	53	42
2 + Lanes	2 + Lanes	900	720	630	504	100	80	70	56
1 Lane	2 + Lanes	750	600	525	420	100	80	70	56

Table 6 Warrant 1 – Eight-Hour Vehicular Volume

* When the 85-percentile speed of Major Street exceeds 40 mph, the 70% minimum volume thresholds values are used.

Source: *Manual on Uniform Traffic Control Devices*, 11th Edition, U.S. Department of Transportation, Federal Highway Administration.



Figure 4 Four-Hour Vehicular Volume Warrant Chart





Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane

Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



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



Warrant Analysis

As described in the Intersection Configuration section of the report, Howland Boulevard has 2 or more approach lanes in each direction, and Fernanda Drive has both a shared through/left lane and an exclusive right turn lane at the study intersection. According to the MUTCD, right-turning traffic should not be considered for a minor street approach with a shared through/left lane and exclusive right turn lane where the right-turning traffic enters the major street with minimal conflict. Therefore, the Signal Warrant analysis was conducted for two scenarios: Dual Lane Minor Approach, and Single Lane Minor Approach. Summarized below in **Table 7** are the hourly traffic volumes from 6:00 A.M. to 7:00 P.M., along with an assessment of the applicable signal warrants for the Dual Lane Minor Approach scenario. As can be seen from the table, the minimum volume requirements of Warrant 1B and Warrant 2 are satisfied for the Dual Lane Minor Approach scenario. Similarly, summarized in **Table 8** are the hourly traffic volumes and assessment of the applicable signal warrants for the applicable signal warrants for the Single Lane Minor Approach scenario. As can be seen, the minimum volume requirements are not met for either Warrant 1 or Warrant 2 for this scenario. The completed FDOT Traffic Signal Warrant Summary forms are included in **Appendix C**.

	Howland Blvd	Mi	nor Approach			Warrant	
Hour	(Total Both Approaches)	Goldenhills St - EB	Fernanda Dr - WB	Critical Volume	1A	1B	2
6-7 A.M.	836	38	90	90		X	
7-8 A.M.	1,520	88	199	199	Х	X	X
8-9 A.M.	1,325	68	114	114		X	X
9-10 A.M.	835	53	61	61			
10-11 A.M.	803	19	69	69			
11-12 P.M.	854	17	48	48			
12-1 P.M.	918	27	63	63			
1-2 P.M.	940	30	45	45			
2-3 P.M.	1,177	27	75	75		X	
3-4 P.M.	1,489	42	77	77		X	
4-5 P.M.	1,549	92	88	92		X	X
5-6 P.M.	1,687	30	98	98		X	X
6-7 P.M.	1,363	31	74	74		X	
			Hour	s Required:	8	8	4
			Hour	s Satisfied:	1	8	4

Table 7 Signal Warrant Analysis – Dual Lane Minor Approach



			Mino	r Approac	h			Warrant	
	Howland		Ferr	anda Dr -	WB				
Hour	Bivd (Total Both Approaches)	Goldenhills St - EB	Existing (Left only)	Project (Left only)	Total Left Lane Volume	Critical Volume	1A	1B	2
6-7 A.M.	836	38	43	19	62	62		X	
7-8 A.M.	1,520	88	66	41	107	107	Х	X	X
8-9 A.M.	1,325	68	53	24	77	77		X	
9-10 A.M.	835	53	28	13	41	53			
10-11 A.M.	803	19	24	14	38	38			
11-12 P.M.	854	17	18	10	28	28			
12-1 P.M.	918	27	24	13	37	37			
1-2 P.M.	940	30	19	9	28	30			
2-3 P.M.	1,177	27	26	15	41	41			
3-4 P.M.	1,489	42	27	16	43	43			
4-5 P.M.	1,549	92	28	18	46	92		X	X
5-6 P.M.	1,687	30	32	20	52	52			
6-7 P.M.	1,363	31	23	15	38	38			
					Hours F	Required:	8	8	4
					Hours	Satisfied:	1	4	2

 Table 8

 Signal Warrant Analysis – Single Lane Minor Approach

Intersection Capacity Analysis

In order to determine which scenario is applicable to the study intersection, intersection capacity analysis results were obtained from the February 2024 traffic study. The analysis was conducted using the existing intersection geometry and control, along with projected volumes for the A.M. and P.M. peak hours. The projected peak hour volumes used in the analysis are shown in **Figure 5**, and the results of the analysis are summarized in **Table 9**. As can be seen from the table, the right turn lane on the westbound approach operates at Level of Service "B" with minimal delay; therefore, the right-turning traffic on the westbound approach should not be considered and the Single Lane Minor Approach scenario is more applicable to the study intersection. It should also be noted that all approaches of the study intersection capacity analysis worksheets are included in **Appendix D**.





Fernanda Place -Project № 5427.2 Figure 5 Projected A.M./P.M. Peak Hour Volumes



WB EB NB SB Time Period Control Left/Thru Lane Right Lane Intersection Delay LOS Delay LOS Delay LOS Delay LOS Delay LOS A.M. 17.4 С 39.8 Е В 10.3 0.8 0.3 А А Howland Blvd & Stop Fernanda Dr P.M. 13.9 В 46.5 Е 13.0 В 0.5 А 1.3 А

Table 9Projected Intersection Capacity Analysis



STUDY CONCLUSIONS

This signal warrant analysis was conducted to determine the need of and justification for the installation of a traffic signal at the intersection of Howland Boulevard and Fernanda Drive/Goldenhills Street in the City of Deltona, Volusia County. This analysis was performed to determine if a signal would become warranted due to the construction of Phase 3 of the Fernanda Place development, which is accessed via Fernanda Drive. The analysis was conducted utilizing existing hourly traffic counts obtained at each approach of the study intersection and hourly project trips based upon data provided by ITE.

The results of the analysis as documented herein revealed that the minimum volumes of the applicable warrants, Warrant 1 and Warrant 2, are satisfied for the Dual Lane Minor Approach scenario. The results of the intersection capacity analysis, however, indicated that the right-turning traffic on the westbound approach of the intersection enters the major street with minor conflict and should not be considered in the analysis. Therefore, the Single Lane Minor Approach scenario is more applicable to the study intersection. The results of the Signal Warrant Analysis revealed that the minimum volume thresholds are not satisfied for Warrant 1 (Condition A or B) or Warrant 2 for the Single Lane Minor Approach scenario. Additionally, the intersection capacity analysis indicated that the study intersection will operate satisfactorily in the A.M. and P.M. peak hours with the existing stop-control at the intersection. Therefore, a traffic signal is not recommended for installation at this location due to Phase 3 of the Fernanda Place development.



APPENDICES

APPENDIX A

Existing Intersection Approach Volumes

Prepared by National Data & Surveying Services VOLUME Howland Blvd & Goldenhills St & Fernanda Dr

Day: Date:	Tuesday 2/20/202	24												Pro	City: oject #	Deltona FL24_13	30074_0	01
		DAI	ILY TOT	TALS			NB 9,155	SB 8,542	EB 622	WB 840	Total 19,159			DAIL	Y TO	TALS		
				1	5-Minut	es Inter	val							Hour	lv Inte	ervals		
TIME	NB	SB	EB	WB	TOTAL	TIME	NB	SB	EB	WB	TOTAL	TIME	: I	NB	SB	EB	WB	TOTAL
0:00	16	7	0	0	23	12:00	111	118	7	9	245	00:00 01	1:00	45	22	0	2	69
0:15	13	3	0	0	16	12:15	134	104	9	7	254	01:00 02	2:00	33	16	1	1	51
0:30	6	7	0	1	14	12:30	98	106	5	18	227	02:00 03	3:00	25	24	1	5	55
0:45	10	5	0	1	16	12:45	121	97	6	5	229	03:00 04	4:00	20	43	5	7	75
1:00	7	1	0	0	8	13:00	127	103	7	5	242	04:00 05	5:00	26	117	1	20	164
1:15	9	4	0	0	13	13:15	103	91	11	6	211	05:00 06	6:00	86	331	20	39	476
1:30	11	5	1	0	17	13:30	116	128	11	8	263	06:00 07	/:00	150	6/8 1091	38	56	922
2:00	7	7	1	1	15	13:45	129	112	2	9	251	07:00 08	a.00	423 546	750	60 68	71	1/10
2.00	8	2	0	3	13	14.00	145	138	4	13	300	09.00 10	0.00	340	471	53	38	909
2:30	4	8	0	0	12	14:30	170	119	8	10	307	10:00 11	1:00	370	411	19	43	843
2:45	6	7	0	1	14	14:45	119	185	12	15	331	11:00 12	2:00	412	415	17	30	874
3:00	7	10	1	1	19	15:00	162	135	11	9	317	12:00 13	3:00	464	425	27	39	955
3:15	3	7	1	3	14	15:15	175	151	9	11	346	13:00 14	4:00	475	434	30	28	967
3:30	7	9	0	1	17	15:30	314	144	14	15	487	14:00 15	5:00	584	557	27	47	1215
3:45	3	17	3	2	25	15:45	232	132	8	13	385	15:00 16	6:00	883	562	42	48	1535
4:00	6	18	0	1	25	16:00	251	113	10	15	389	16:00 17	7:00	981	515	92	55	1643
4:15	8	23	0	3	34	16:15	249	146	44	9	448	17:00 18	8:00	1127	509	30	61	1727
4:30	8	29	0	9	46	16:30	247	148	23	19	437	18:00 19	9:00	911	409	31	46	1397
4:45	4	47	1	7	59	16:45	234	108	15	12	369	19:00 20	0:00	470	240	13	39	762
5:00	15	71	6	10	102	17:00	285	119	8	15	427	20:00 21	1:00	283	236	7	17	543
5:15	26	/0	4	8	108	17:15	258	123	5	15	401	21:00 22	2:00	220	152	6	16	394
5:30	22	102	3	10	137	17:30	294	139	2	18	453	22:00 23	3:00	186	92	5	3	286
5:45	23	00	/	11	129	17:45	290	128	15	13	440	23:00 00	0:00	00 CT	45		5	137
6:00	15	135	4	11	165	18:00	285	114	/	8	414			21		5		TOTAL
6:15	35	168	6	13	222	18:15	229	98	13	11	351			NB	5B	EB	WB	TOTAL
6:30	49	185	11	18	263	18:30	207	102	6	16	331	Peak P	Period	00:00	to	12:00	100	7500
6:45	51	190	1/	14	2/2	18:45	190	95	5	14	301	Vo	olume	2483	4368 7.1E	311	436	7598
7:00	72	250	19	27	348 /12	19:00	150	59	0	14	251	Peak Book Vo	Hour	7.45	1122	7:15	124	1040
7:15	112	200	22	40	413	19.15	90	53	1	6	167	Peak Hour F	actor	0 007	0 0 2 0	0.030	0 775	0.960
7:45	140	299	23	20	481	19:45	103	48	- 2	9	162	reaktiouri	actor	0.507	0.555	0.550	0.775	0.500
8:00	162	272	24	22	480	20:00	80	56	3	5	144	Peak P	Period	12:00	to	00:00		
8:15	154	195	15	9	373	20:15	70	76	0	2	148	Vo	olume	6672	4174	311	404	11561
8:30	132	165	14	18	329	20:30	65	54	3	4	126	Peak	Hour	17:00	14:45	16:00	16:30	17:00
8:45	98	127	15	22	262	20:45	68	50	1	6	125	Peak Vo	olume	1127	615	92	61	1727
9:00	110	143	26	15	294	21:00	58	34	3	5	100	Peak Hour F	actor	0.958	0.831	0.523	0.803	0.953
9:15	80	114	10	6	210	21:15	48	45	2	3	98							
9:30	91	115	15	6	227	21:30	55	35	0	3	93	Peak P	Period	07:00	to	09:00		
9:45	66	99	2	11	178	21:45	59	38	1	5	103	Vo	olume	969	1840	156	195	3160
10:00	105	100	6	10	221	22:00	64	35	2	1	102	Peak	Hour	7:45	7:15	7:15	7:00	7:15
10:15	74	115	8	13	210	22:15	42	24	1	0	67	Peak Vo	olume	588	1123	93	124	1848
10:30	93	113	2	12	220	22:30	43	20	2	1	66	Peak Hour F	actor	0.907	0.939	0.930	0.775	0.960
10:45	98	83	3	8	192	22:45	3/	13	0	1	51		hand a	46.00		40.00		-
11:00	101	80 106	9	87	204	23:00	31 21	10	1	1	48	Peak P	reriod	16:00	t0	122	116	2270
11:15	0/ 121	100	2	/ 0	202	23:15	16	0	1	1 2	55 27	Vo	Hour	2108 17:00	1024	16:00	16.30	3370 17:00
11:45	103	115	3	9	241	23:45	20	3 8	0	∠ 1	29	Peak Vo	olume	1127	521	92	61	1727
TOTALS	2483	4368	311	436	7598	TOTALS	6672	4174	311	404	11561	Peak Hour F	actor	0.958	0.880	0.523	0.803	0.953
SPLIT %	33%	57%	4%	6%	40%	SPLIT %	58%	36%	3%	3%	60%	Cakinouri		5.550	5.000	0.525	0.005	0.555
1200			./.	0,0					•,•	•/•								



National Data & Surveying Services Intersection Turning Movement Count

Location: Howland Blvd & Goldenhills St/Fernanda Dr

Location: City: Control:	Howland E Deltona 2-Way Sto	Blvd & Golde pp(EB/WB)	enhills St/Fe	ernanda Dr									Pro	oject ID: 2 Date: 2	24-130074- 2/20/2024	001	
NS/FW Streets		Howlar	nd Blvd			Howla	nd Blvd	Data -	Totals	oldenhills S	t/Fernanda	Dr	Gol	denhills St/	Fernanda ()r	
AM	0	NORTI 2	HBOUND 1	0	0	SOUTI 2	HBOUND 0	0	0	EAST 1	BOUND 0	0	0.5	WESTB 0.5	OUND 1	0	
6:00 AM	NL 0	NT 0	NR 0	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 9	WT 0	WR 1	WU 0	TOTAL 10
6:15 AM 6:30 AM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	10 15	0 0	4 3	0 0	14 18
6:45 AM 7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	9 16	0	5 11	0	14 27
7:15 AM 7:30 AM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	15 18	0 2	21 21	0 0	36 41
7:45 AM 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	15 14	0	5 7	0	20 21
8:15 AM 8:30 AM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	7 13	0 3	3 2	0 0	10 18
8:45 AM 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	14 11	2	5 4	0	21 16
9:15 AM 9:30 AM	0	0	0	0 0	0	0 0	0	0	0	0	0	0 0	2	0 1	3 1	0	5 7
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	8	0	3	0	11
TOTAL VOLUMES : APPROACH %'s :	NL 0	NT 0	NR 0	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 181 62.63%	WT 9 3.11%	WR 99 34.26%	WU 0 0.00%	TOTAL 289
PEAK HR : PEAK HR VOL :	0	07:00 AM	- 08:00 AM	0	0	0	0	0	0	0	0	0	64	2	58	0	TOTAL 124
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.889	0.250 0.75	0.690 6	0.000	0.756
		NORT	HBOUND			SOUTI	HBOUND			EAST	BOUND			WESTB	OUND		
NOON	0 NL	2 NT	1 NR	0 NU	0 SL	2 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0.5 WL	0.5 WT	1 WR	0 WU	TOTAL
10:00 AM 10:15 AM	0	0 0	0 0	0 0	0	0 0	0 0	0 0	0	0 0	0 0	0 0	777	1 0	2 6	0	10 13
10:30 AM 10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	4 5	0	8 3	0	12 8
11:00 AM 11:15 AM	0	0 0	0 0	0 0	0	0 0	0 0	0 0	0	0 0	0 0	0 0	5	0 0	3 1	0	8 6
11:30 AM 11:45 AM	0	0 0	0 0	0 0	0	0 0	0 0	0 0	0	0 0	0 0	0 0	4 4	0 0	6 2	0 0	10 6
12:00 PM 12:15 PM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	4 5	1	4 2	0 0	9 8
12:30 PM 12:45 PM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	9 4	0 0	8 2	0 0	17 6
1:00 PM 1:15 PM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	2 5	0 0	3 1	0 0	5 6
1:30 PM 1:45 PM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	6 6	0 0	2 3	0 0	8 9
TOTAL VOLUMES :	NL 0	NT 0	NR 0	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 82	WT 3	WR 56	WU 0	TOTAL 141
APPROACH %'s : PEAK HR :		10:00 AM	- 11:00 AM										58.16%	2.13%	39.72%	0.00%	TOTAL
PEAK HR VOL : PEAK HR FACTOR :	0.000	0.000	0.000	0 0.000	0 0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	23 0.821	1 0.250 0.82	19 0.594 27	0 0.000	43 0.827
514		NORTI	HBOUND			SOUTI	HBOUND			EAST	BOUND			WESTB	OUND		
PIM	0 NL	2 NT	1 NR	0 NU	0 SL	2 ST	0 SR	0 SU	0 EL	1 ET	0 ER	0 EU	0.5 WL	0.5 WT	1 WR	0 WU	TOTAL
2:00 PM 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	8	1	6 4	0	13
2:30 PM 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	10	0	15
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	10
3:30 PM 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	7	1	4	1	17
4:00 PM 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	1	4	0	9
4:30 PM 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	6 8	0	5	0	16 13
5:00 PM 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	11	1	9 5	0	17 16
5:30 PM 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	6 7	0	11 7	0	17 14
6:00 PM 6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	6 5	0	9 11
6:30 PM 6:45 PM	0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0	0 0	0 0	0 0	8 6	0 0	7 5	0 0	15 11
TOTAL VOLUMES :	NL 0	NT 0	NR 0	NU 0	SL 0	ST 0	SR 0	SU 0	EL 0	ET 0	ER 0	EU 0	WL 127	WT 8	WR 123	WU 1	TOTAL 259
APPROACH %'s : PEAK HR :		05:00 PM	- 06:00 PM										49.03%	3.09%	47.49%	0.39%	TOTAL
PEAK HR VOL : PEAK HR FACTOR :	0 0.000	0 0.000	0.000	0.000	0 0.000	0 0.000	0 0.000	0 0.000	0 0.000	0 0.000	0 0.000	0 0.000	31 0.705	1 0.250	32 0.727	0 0.000	64 0.941

Howland Blvd & Goldenhills St/Fernanda Dr

Peak Hour Turning Movement Count











National Data & Surveying Services

Site Code:	24-130074-001
Date:	02/20/2024
Weather:	Sunny
City:	Deltona
County:	Volusia
Count Times:	06:00 - 10:00
	10:00 - 14:00
	14:00 - 19:00
Control:	2-Way Stop(EB/WB)



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E/W Street: Goldenhills St/Fernanda Dr

APPENDIX B

ITE Trip Generation Data, Model Output, ITE Hourly Variation Rates

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units On a: Weekday

octing/cocation. Octional orban/oubarbar	Setting/Location:	General	Urban/Suburbar
--	-------------------	---------	----------------

Number of Studies:	174
Avg. Num. of Dwelling Units:	246
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Trip Gen Manual, 11th Edition

• Institute of Transportation Engineers



			Hourly Distrib	ution of Entering an	d Exiting Vehicle Tric	os by Land Use			
			So	ource: ITE Trip Generat	ion Manual , 11th Editi	on			
				'	,				
Land Use Code		210			210			210	
Land Use	Sing	e-Family Detached Ho	using	Sing	le-Family Detached Ho	using	Sing	le-Family Detached Ho	using
Setting	G	eneral Urban/Suburba	in		General Urban/Suburba	in	0	eneral Urban/Suburba	in
Time Period		Weekday			Saturday			Sunday	
# Data Sites		7			3			2	
	%	of 24-Hour Vehicle Tri	ps	%	of 24-Hour Vehicle Tri	ps	%	of 24-Hour Vehicle Tri	ps
Time	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
12:00 - 1:00 AM	0.3%	0.5%	0.2%	0.8%	0.6%	1.0%	0.6%	0.6%	0.6%
1:00 - 2:00 AM	0.2%	0.2%	0.1%	0.4%	0.6%	0.2%	0.6%	1.2%	0.0%
2:00 - 3:00 AM	0.2%	0.3%	0.1%	0.3%	0.4%	0.2%	0.0%	0.0%	0.0%
3:00 - 4:00 AM	0.2%	0.2%	0.2%	0.5%	0.4%	0.6%	0.3%	0.0%	0.6%
4:00 - 5:00 AM	0.6%	0.3%	0.8%	0.5%	0.6%	0.4%	0.0%	0.0%	0.0%
5:00 - 6:00 AM	1.2%	0.5%	2.0%	1.0%	0.8%	1.2%	1.8%	1.8%	1.8%
6:00 - 7:00 AM	3.7%	1.6%	5.8%	1.0%	0.4%	1.5%	1.5%	1.8%	1.2%
7:00 - 8:00 AM	6.5%	3.1%	10.0%	2.0%	0.8%	3.3%	1.8%	0.6%	3.0%
8:00 - 9:00 AM	6.2%	3.8%	8.5%	3.8%	2.5%	5.2%	4.7%	0.6%	9.0%
9:00 - 10:00 AM	4.6%	3.3%	5.8%	5.5%	5.0%	6.0%	4.7%	3.5%	6.0%
10:00 - 11:00 AM	4.9%	4.2%	5.6%	8.2%	6.2%	10.2%	11.5%	8.8%	14.4%
11:00 - 12:00 PM	5.3%	5.4%	5.1%	7.2%	8.7%	5.8%	7.7%	8.2%	7.2%
12:00 - 1:00 PM	5.7%	5.7%	5.7%	7.7%	7.3%	8.1%	9.2%	10.5%	7.8%
1:00 - 2:00 PM	6.1%	6.1%	6.0%	8.1%	7.1%	9.0%	9.8%	10.5%	9.0%
2:00 - 3:00 PM	6.6%	7.1%	6.1%	8.0%	8.7%	7.3%	5.9%	5.8%	6.0%
3:00 - 4:00 PM	7.5%	8.7%	6.2%	9.2%	9.8%	8.7%	4.4%	5.8%	3.0%
4:00 - 5:00 PM	8.9%	10.5%	7.4%	6.2%	6.9%	5.4%	8.3%	8.2%	8.4%
5:00 - 6:00 PM	8.7%	10.0%	7.3%	8.4%	9.6%	7.1%	9.8%	11.1%	8.4%
6:00 - 7:00 PM	7.2%	8.5%	5.9%	6.0%	7.3%	4.6%	6.2%	5.8%	6.6%
7:00 - 8:00 PM	5.1%	6.1%	4.2%	5.1%	4.8%	5.4%	5.3%	7.0%	3.6%
8:00 - 9:00 PM	4.6%	6.1%	3.1%	4.8%	6.0%	3.7%	4.1%	5.8%	2.4%
9:00 - 10:00 PM	3.3%	4.4%	2.3%	2.4%	2.7%	2.1%	0.3%	0.6%	0.0%
10:00 - 11:00 PM	1.6%	2.1%	1.0%	1.7%	1.5%	1.9%	1.5%	1.8%	1.2%
11:00 - 12:00 AM	1.0%	1.3%	0.6%	1.4%	1.5%	1.3%	0.0%	0.0%	0.0%

APPENDIX C

FDOT Signal Warrant Summary Worksheets

			TRA	State	of Flori SIGN	da Dej JAL	partmen WAR	t of Trans	sportation	ARY		Form 7 TRAFFIC ENG Oc	SINEER
City: County: District:		79	Delton – Volu Five	a Isia				E	Engineer: Date:		SS March 1, 20	24	
Major Street: Minor Street:			H	lowland E Fernanda	Blvd Dr			L	anes: 2 anes: 2	Majo Mino	or Approach or Approach	Speed: Speed:	45 30
JTCD Electror	nic Refe	rence to	Chapte	er 4: <u>htt</u>	o://muto	d.fhwa	a.dot.gov	<u>//pdfs/20</u>	<u>09r1r2/part4.</u>	<u>pdf</u>			
lume Level C	<u>Criteria</u>							_					
1. Is the po	sted spe	ed or 85	th-perc	centile of r	najor st	reet >	40 mph	?			√ Yes	No	
2. Is the inte	ersectioi	n in a bui	lt-up ai	rea of an i	solated	comm	nunity wi	th a pop	ulation < 10,0	000?	Yes	I No	
"70%" volun	ne level	may be u	used if	Question	1 or 2 a	above	is answe	ered "Yes	s" 🔽 МА	AY	✓ 70%	100%	
ARRANT 1	- EIGH	IT-HOU	R VEI	HICULA	r vol	UME							
	Warran	t 1 is sat	isfied if	f Conditior	n A <u>or</u>	Condit	tion B is	"100%" s	atisfied for e	ight hours	. 🗌 Yes	✓ No	
	Wa	rrant 1 is	also s	atisfied if I	both Co	onditio	n A <u>and</u>	Conditio	on B are "80%	6" satisfied			
(snould only	be appli	iea after	an ade	equate tria inconveni	ai ot oth ience to	er alte traffic	ernatives c has fail	that cou ed to sol	ia cause less ve the traffic	aeiay and problems)	Yes	I No	
	Warra	nt 1 is sa	atisfied	if Conditio	on A <u>or</u>	Cona	dition B is	s "70%" s	atisfied for e	ight hours	. 🗸 Yes	No	
Condition A	A - Minir	<u>num Vel</u>	nicular	<u>Volume</u>							_	_	
										Applicable	e:Yes	No	
Condition A	is intend	ded for a	nnlicati	ion at loca	tions w				100%	6 Satisfied	 Yes 	√ No	
			opiicali	011 41 1004	lions w	nere a	a large vo	olume of	1007	o Gationica			
intersecting signal	traffic is	the princ	cipal re	ason to co	onsider	nere a install	a large vo ling a tra	olume of ffic contro	ol 80%	6 Satisfied	I: Yes	✓ No	
intersecting signal.	traffic is	the princ	cipal re	ason to co	onsider	nere a install	a large vo ling a tra	olume of ffic contro	ol 80% 70%	6 Satisfied6 Satisfied	l: Yes	✓ No ✓ No	
intersecting signal. Number of traffic or	traffic is Lanes n each a	for movi	ing	Vehicles stree	per hou t (total	ur on i of bothes	a large vo ling a tra major- th	olume of ffic contro Vehicle street	es per hour of (one directi	6 Satisfied 6 Satisfied on minor- ion only)	I: Yes	✓ No	
intersecting signal. Number of traffic or Major	traffic is Lanes n each a	for movi approact	ing	Vehicles stree ap 100% ^a	per hou t (total pproact	ur on i of bothes)	major- th	Vehicle street	ol 80% 70% es per hour o (one directi	6 Satisfied 6 Satisfied on minor- on only) 70% ^c	: Yes	✓ No	
intersecting signal. Number of traffic or Major	traffic is	for movi approact Minor		Vehicles stree a 100%ª	per hou t (total pproact 80%	ur on r of both both	major- th	Vehicle street 100% ^e	es per hour of (one direction)	6 Satisfied 6 Satisfied on minor- on only) 70% ^c 105	I: Yes	✓ No	
intersecting signal. Number of traffic or Major 1 2 or more	traffic is	for movi approact Minor 1	ing l	Vehicles stree ap 100% ^a 500 600	per hou t (total pproact 80% 400 480	ur on i of bothes)	major- th 70% ^c 350 420	Vehicle street 100% ^a 150	1007 pl 809 709 es per hour of (one direction) 1 80% ^b 120 120	6 Satisfied 6 Satisfied 6 Satisfied 70 minor- 70 minor- 70% ^c 105 105	: Yes	✓ No ✓ No	
intersecting signal. Number of traffic or Major 1 2 or more 2 or more	F Lanes n each a	for movi approact Minor 1 1 2 or more		Vehicles stree ap 100% ^a 500 600	per hou t (total pproact 80% 400 480	ur on i of bothes)	a large vo ling a tra major- th 70% [°] 350 420 420	Vehicle street 100% ^e 150 200	1007 80% 70% 25 per hour of (one direction) 120 120 160	6 Satisfied 6 Satisfied on minor- on only) 70%° 105 105 140	I: Yes	✓ No	
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intersecting signal. Number of traffic or 1 2 or more 2 or more 1 ^a Basic Minim ^b Used for cor ° May be used <i>Record 8 high</i>	traffic is	for movi approact Minor 1 2 or more 2 or more y volume of Condit the major-st s and the	ing a b c ing a a c corresp	Vehicles stree ap 100% ^a 500 600 600 500 and B after eed exceed	per hou t (total pproach 80% 400 480 480 480 480 480 480 480 480 480	te trial of horin	major- th 70% ^c 350 420 350 of other m an isolat minor-stre	Vehicle street 100% ⁸ 150 200 200 emedial m et volume.	Note Note ol 80% 70% es per hour of (one direction) 120 120 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160 160	6 Satisfied 6 Satisfied 6 Satisfied 70%° 105 105 140 140 140 pulation of l	 Yes Yes Yes Yes Hess than 10,0 t. 	 ✓ No ✓ No ✓ 00 	
Intersecting signal.	traffic is	for movi approach Minor 1 2 or more of Conditioners s and the	ing h	Vehicles stree ap 100% ^a 500 600 500 and B after eed exceed bonding ma pht Highe	per hou t (total pproact 80% 400 480 480 480 480 480 480 480 480 480	te trial of here in the second	major- th 70% ^c 350 420 350 of other m an isolat	Vehicle street 100% ^e 150 200 200 emedial m ed comme	es per hour e (one direction) 80% 80% 120 120 120 160 160 160 160 160 160 160 16	 Satisfied Satisfied Satisfied Satisfied Satisfied Tomminor- on only) 70%^c 105 105 140 140 140 sulation of lettions Shee 	 Yes Yes Yes Yes Hess than 10,0 t. 	 ✓ No ✓ No ✓ 00 	
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intersecting signal.	traffic is	for movi approach Minor 1 1 2 or more 2 or more 2 or more 3 of Condit 1 e major-si s and the 1,520	ing ing ing ing ing ing ing ing	Vehicles stree ap 100% ^a 500 600 600 500 and B after eed exceed ponding ma pht Higher S 1,177	per hou t (total pproacl 80% 400 480 480 480 480 480 480 480 480 480	te trial of hes)	major- th 70% ^c 350 420 420 350 of other m an isolat minor-stre	Vehicle street 100% ^a 150 150 200 200 200 emedial m et volume t volume	es per hour of (one direction (one direction) 120 120 160 160 160 s in the Instruction (one direction) (one di	 Satisfied Satisfied Satisfied Satisfied Satisfied 107 105 105 140 140 140 Shee Shee olumes 	I: Yes I: Yes	 ✓ No ✓ No ✓ 00 	
intersecting signal.	E Lanes a Lanes a each a b each a b e b e c um hourl mbination d when th hest hour V V S S S S S S S S S S S S S	for movi approach Minor 1 1 2 or more of Conditioners s and the 1,520 1,520	ing ing ing ing in in in in in in in in in in in in in	Vehicles stree ap 100% ^a 500 600 500 600 500 and B after eed exceed bonding ma pht Highe: S 5 1,177 75	per hou t (total pproach 80% 400 480 480 480 480 480 480 480 480 480	ur on i of bot hes)	major- th 70% ^c 350 420 350 420 350 420 350 420 350 9 1,687 9 1,687	Vehicle street 100% [®] 150 200 200 200 200 200 200 200 200 200 2	es per hour of (one direction) 80% es per hour of (one direction) 120 120 160 160 160 160 160 160 160 teasures unity with a pop s in the Instruction Existing V	olumes	<pre></pre>	 ✓ No ✓ No ✓ 00 	

State of Florida Department of Transportation TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

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

Number of Lar traffic on ea	nes for moving ch approach	Vehicles stree ar	per hour o t (total of l oproaches	n major- ooth)	Vehicles street (o	per hour o one directi	on minor- on only)
Major	Minor	100% ^a	80% ^b	70% ^c	100% ^a	80% ^b	70% ^c
1	1	750	600	525	75	60	53
2 or more	1	900	720	630	75	60	53
2 or more	2 or more	900	720	630	100	80	70
1	2 or more	750	600	525	100	80	70

^a Basic Minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

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

		Eiç	ght High	est Hou	irs			
Street	.M.A.	7-8 A.M.	8-9 A.M.	2-3 P.M.	3-4 P.M.	4-5 P.M.	5-6 P.M.	.M.7 - 6-7
Major	836	1,520	1,325	1,177	1,489	1,549	1,687	1,363
Minor	90	199	114	75	77	92	98	74

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

Existing Volumes

Form 750-020-01 TRAFFIC ENGINEERING October 2020

No No

🔽 No

🗸 No

No No

Applicable: Yes 100% Satisfied: Yes

			State of I	-lorida	a Departm	nent of	Transp	ortatio	on				TR	Form AFFIC EN O	750-020 GINEER october 2
		TRA	FFIC SI	GN/	AL WA	ARRA	ANT	SU	MMA	ARY					
C Coun Distri	ity: hty: ict:	Deltor 79 – Vol Five	na usia				E	ngine Dat	er: te:		Ма	SS arch 1	, 2024		
Major Stre Minor Stre	eet: eet:		Howland Blv Fernanda D	rd r			La La	nes: nes:	2	_	Major Minor	Appro Appro	ach Sp ach Sp	beed: beed:	45 30
MUTCD Elect	ronic Refer	ence to Chap	ter 4: <u>ht</u>	<u>p://m</u>	utcd.fhwa	.dot.go\	//pdfs/2	2009r	1r2/pai	rt4.pdf					
Volume Leve 1. Is the 2. Is the "70%" vol	I Criteria posted spe intersection lume level	eed or 85th-pe n in a built-up may be used	ercentile of ma area of an iso if Question 1	ajor st blated or 2 a	treet > 40 I commun above is a	mph? ity with answere	a popu ed "Yes	ulatior "	n < 10, <mark>√ MA</mark>	000? .Y		 ✓ Ye Ye ✓ 70 	es [es [)% [_ No ✓ No <mark>_ 100%</mark>	0
WARRANT	2 - FOUF points lie a	R-HOUR VE above the app	HICULAR	VOL then t	UME the warrai Plot four v	nt is sat rolume c	isfied. ombinat	tions o	n the a	Applic Satis pplicab	able: sfied: ble figur	✓ Ye ✓ Ye re belov	es [es [<i>w.</i>	No No	
100%	Volume Le	evel			FIGU	RE 4C-'	1: Crit	eria f	or "10)0%" V	Volum	ne Lev	el		
Four Highest Hours	Volu Major Street	mes Minor Street	44 WINOK STREET * Note: 115 b 80 m	00 00 00 00 00 00 00 00 00 00 00 00 00	400 5 MA ies as the low FIG	00 600 JOR STRE er threshoi er threshoi	2 OF 0 700 EET - TOT Id volume Id volume	MORE L MORE L MORE L MORE L 80 AL OF for a m thresho	ANES & 2 C	DR MORE	LANES & 1 1 LANE & 1 00 11 HES - VF ach with t eet appro	LANE LANE LANE 00 12 PH two or mo pach with	200 13 core lanes one lane	00 140	*115 *80 00
70% \	/olume Le	vel		(400 г	(Community L	ess than 1	10,000 po	pulation	or above	e 70 km/l	hr. (40 m	iph) on M	Major Str	reet)	
Four	Volu	mes	НАЛ				2 OR M	ORE LAN	ES & 2 OR	MORE LA	NES				
Highest Hours	Major Street	Minor Street	TREET	300 -			$\overline{}$	2 OR	MORE LAN	IES & 1 LA	NE				
7-8 A.M.	1520	199		200 -	\rightarrow	\rightarrow	<	\geq	+				_		
8-9 A.M.	1325	114				7		\square	-	\rightarrow	1 LANE &	1 LANE			
4-5 P.M. 5-6 P.M.	1549 1687	92 98	HOH	100					+		\leq	\geq	\leq	=	80
			* Note: 80 ph	0 200 applie) 300 N s as the lowe	400 IAJOR STI r threshold) 5 REET - TO	00 DTAL O	600 F BOTH A	700 APPROA approac	CHES -	800 VPH vo or mor	900 re lanes a	1000 and)

			TRA	State	of Flori SIGN	da Dep IAL	partmen WAR	t of Trans RANT	portation SUMM	ARY		TRAFFIC ENG Oc	SINEER
City: County: District:		79	Deltor – Vol Five	na usia				E	ngineer: Date:	-	SS March 1, 20	24	
Major Street: Minor Street:			ŀ	lowland B Fernanda	Blvd Dr			La La	anes: 2 anes: 1	Majo Mino	or Approach or Approach	Speed: Speed:	45 30
JTCD Electror	nic Refe	rence to	Chapt	er 4: <u>http</u>	o://muto	d.fhwa	a.dot.gov	//pdfs/200)9r1r2/part4.	<u>pdf</u>			
lume Level C	<u>riteria</u>	od or 85	th nor	contilo of n	naior et	root >	40 mph	2			Vec		
2 Is the inte	ersection	n in a bui	lt-up a	area of an i	solated		40 mpn nunity wi	r tha noni	ilation < 10 (002	✓ Tes		
2. 10 110 110	010000101		it up c		oolatoa	comm	iunity in						
"70%" volum	ne level	may be ι	used if	Question	1 or 2 a	above	is answe	ered "Yes	" <u> </u>	AY	✓ 70%	100%	
ARRANT 1	- EIGH	IT-HOU	R VE	HICULA	r vol	UME	_						
	Warran	t 1 is sat	isfied I	if Conditior	n A <u>or</u>	Condit	ion B is	"100%" s	atisfied for e	ight hours.	Yes	🗸 No	
(should only	Wa be appl	rrant 1 is ied after	also s an ad	satisfied if l lequate tria	both Co al of oth	onditior er alte	n A_ <u>and</u> rnatives	Condition that could	n B are "80% d cause less	6" satisfied delav and	/ Yes	√ No	
(inconveni	ience to	o traffic	has fail	ed to solv	e the traffic	problems).			
•	Warra	nt 1 is sa	atisfied	l if Conditio	on A <u>or</u>	Cond	lition B is	s "70%" s	atisfied for e	ight hours.	Yes	🗸 No	
Condition A	<u>A - Minir</u>	num Vel	nicula	<u>r Volume</u>						Annlicable	· 🗸 Yes	No	
									1000				
Condition A	is intend	ded fer e							100%	6 Satisfied	· res		
intersectina	traffic is	the princ	oplicat cipal re	tion at loca eason to co	tions w onsider	here a install	large vo ing a tra	olume of ffic contro	100% a/ 80%	6 Satisfied: 6 Satisfied:	: Yes	✓ No	
intersecting signal.	traffic is	the princ	oplicat cipal re	tion at loca eason to co	tions w onsider	here a installi	large vo ing a tra	olume of ffic contro	1009 b/ 809 709	6 Satisfied: 6 Satisfied: 6 Satisfied:	: Yes	✓ No ✓ No ✓ No	
intersecting signal. Number of traffic or	traffic is Lanes n each a	for movi	oplicat cipal re	tion at loca eason to co Vehicles stree ap	tions w onsider per hou t (total oproac	here a installi ur on r of bot hes)	large vo ing a tra major- th	olume of ffic contro Vehicle street	1009 809 709 s per hour o (one directi	6 Satisfied: 6 Satisfied: 6 Satisfied: 7 on minor- on only)	:Yes :Yes	✓ No ✓ No	
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intersecting signal. Number of traffic or Major	traffic is	for movi approact Minor	ing	tion at loca eason to co Vehicles stree ap 100%ª 500	tions w onsider per hou t (total oproac 80% 400	here a install ur on r of bot hes)	large vo ing a tra najor- th 70% ^c 350	Vehicle street 100% ^a	100% 80% 70% s per hour o (one directi 80% ^b 120	6 Satisfied: 6 Satisfied: 6 Satisfied: 70 minor- on only) 70% ^c 105	:Yes :Yes	y No y No y No	
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intersecting signal. Number of traffic or Major 1 2 or more 2 or more	traffic is	for movi approact Minor 1 2 or more	ng n	tion at loca eason to co Vehicles stree ap 100% ^a 500 600 600	tions w per hou t (total pproact 80% 400 480	here a install ur on r of bot hes)	large vo ing a tra major- th 70% ^c 350 420 420	Vehicle street 100% ^a 150 200	100% 80% 70% s per hour of (one directi 80% ^b 120 120 160	 Satisfied: Satisfied: Satisfied: Satisfied: on minor- on only 70%^c 105 105 140 	:Yes :Yes	y No y No y No	
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Intersecting signal.	traffic is	for movi approach Minor 1 2 or more 2 or more y volume of Condit	e e tions A	Vehicles (stree ap 100% ^a 500 600 600 500 and B after beed exceed	tions w per hou t (total pproact 80% 400 480 480 480 480 480 480 480 480 480	te trial of horin	large vo ing a tra major- th 70% ^c 350 420 350 of other m an isolat	Vehicle street 100% ^a 150 200 200 emedial meed commu	1009 809 709 s per hour o (one directi 80% ^b 120 120 160 160 160 easures unity with a poj	 Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Ton minor- on only) T0%^c 105 105 140 140 oulation of le 	: Yes : Yes : Yes	 ✓ No ✓ No ✓ No 	
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Intersecting signal.	traffic is	for movi approach Minor 1 2 or more 2 or more of Condit te major-si s and the	e e corres Eigen	Vehicles (stree ap 100% ^a 500 600 600 500 and B after beed exceed ponding ma, ght Highes	tions w per hou t (total pproact 80% 400 480 480 480 480 480 480 480 480 480	here a install ur on r of bot hes)	large vo ing a tra major- th 70% ^c 350 420 420 350 of other re an isolat hinor-stree	Vehicle street 100% ^a 150 200 200 emedial me ed commu	1009 809 709 s per hour of (one direction 120 120 160 160 160 easures nity with a pop s in the Instruction	6 Satisfied: 6 Satisfied: 6 Satisfied: 70 minor- on only) 70% ^c 105 105 140 140 140 140 sulation of le	: _ Yes : _ Yes : _ Yes	 ✓ No ✓ No ✓ No 	
Intersecting signal.	Example in the set hour the set	for movi approach Minor 1 2 or more 2 or more 3 of Condit be major-si 3 and the 3 of condit	ing s corres Eig Wid 7-	tion at loca eason to co Vehicles stree ap 100% ^a 500 600 500 600 500 and B after poed exceed ponding maj ght Highes	tions w per hou t (total pproact 400 480 400 480 480 480 480 480 480 480	te trial of both or in trial of tr	Iarge voc ing a tra major- th 70% ^c 350 420 420 350 0f other rr an isolat hinor-stree	Vehicle street 100% ^a 150 150 200 200 200 200 200	1009 809 709 s per hour o (one directi 80% ^b 120 120 160 160 easures inity with a pol s in the Instruc	 Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Tomminor- on only) T0%^c 105 105 140 140 140 sheet 	Yes Yes Yes Yes	 ✓ No ✓ No ✓ No 	
intersecting signal.	Lanes n each a n each	for movi approach Minor 1 2 or more 2 or more 2 or more 3 or condit be major-si s and the 5 4 6 5 6 6 6 1,325	oplications A treet spant correspondence of the spant corr	tion at loca eason to co Vehicles stree ap 100% ^a 500 600 600 600 500 600 600 600 500 and B after beed exceed ponding ma ght Highes S c c c 1,177	tions w per hou t (total pproact 400 480 480 480 480 480 480 480 480 480	te trial of here a install ur on r of bothes)	large voc ing a tra major- th 70% ^c 350 420 420 350 420 350 420 420 420 350	Vehicle street 100% ^a 150 150 200 200 200 200 200 200 200 200	1009 809 709 s per hour of (one direction 80% ^b 120 120 160 160 160 160 sin the Instruction s in the Instruction	 Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Tomminor- on only) 70%^c 105 105 140 140 140 Sheet olumes 	ess than 10,0	 ✓ No ✓ No ✓ No 	
Intersecting signal.	traffic is Lanes in each a each a each a each a each a a each a a a a a b a b a a a a a a a a a a a a a	for movi approach Minor 1 2 or more 2 or more 3 of Condit a polume a polume	ing cipal re ing cipal re ing corres corres Eig 940 30	tion at loca eason to co Vehicles stree ap 100% ^a 500 600 500 600 500 600 500 600 500 600 6	tions w per hou t (total pproact 80% 400 480 480 480 480 480 480 480 480 480	te trial of bothes)	large voc ing a tra major- th 70% ^c 350 420 420 350 420 350 420 420 350 420 420 350 420 420 350 420 420 420 420 420 350 420 420 420 420 420 350 420 420 420 420 420 420 350 420 420 420 420 420 420 420 420 420 42	Vehicle street 100% ^a 150 150 200 200 200 200 200 200 200 200 200 2	1009 809 709 s per hour of (one directi 80% ^b 120 120 160 160 easures inity with a pop s in the Instruct	 Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Satisfied: Tomminor- on only) T0%^c 105 105 105 140 140 140 sheet 	ess than 10,0	 ✓ No ✓ No ✓ No 	

State of Florida Department of Transportation TRAFFIC SIGNAL WARRANT SUMMARY

Condition B - Interruption of Continuous Traffic

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

Number of Lar traffic on ea	nes for moving ch approach	Vehicles stree ar	per hour o t (total of l oproaches	n major- ooth)	Vehicles per hour on minor- street (one direction only)					
Major	Minor	100% ^a	80% ^b	70% ^c	100% ^a	80% ^b	70% ^c			
1	1	750	600	525	75	60	53			
2 or more	1	900	720	630	75	60	53			
2 or more	2 or more	900	720	630	100	80	70			
1	2 or more	750	600	525	100	80	70			

^a Basic Minimum hourly volume

^b Used for combination of Conditions A and B after adequate trial of other remedial measures

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

Eight Highest Hours												
Street	7-8 A.M.	8-9 A.M.	1-2 P.M.	2-3 P.M.	3-4 P.M.	4-5 P.M.	.M.9-3	6-7 P.M.				
Major	1,520	1,325	940	1,177	1,489	1,549	1,687	1,363				
Minor	107	77	30	41	43	92	52	38				

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

Existing Volumes

Form 750-020-01 TRAFFIC ENGINEERING October 2020

No No

🔽 No

🗸 No

✓ No

Yes

Yes

Applicable:✓ Yes100% Satisfied:☐ Yes

80% Satisfied: 70% Satisfied:

			State of Flor	ida Departm	nent of Trans	sportatio	on			Foi TRAFFIC E	rm 750-02 NGINEEF October
		IRA	AFFIC SIGI	NAL WA	ARRAN	SU	MMAR	Y			
C Cour	ity: hty:	Deltor 79 – Vol	na usia	-		Enginee Dat	er: e:	М	SS arch 1, 3	2024	
Distr	ict:	Five	l.								
Major Stre	et:		Howland Blvd		L	anes:	2	Major Minor	Approa	ch Speed:	4
							<u> </u>		Appiou	on opecu.	
MUTCD Elect	ronic Refe	rence to Chap	ter 4: <u>http://</u>	mutcd.thwa	.dot.gov/pdfs	<u>s/2009r</u> 2	Ir2/part4.p	<u>odf</u>			
Volume Leve	l Criteria	ed or 85th-pe	rcentile of major	street > 10	mph?				V Yes		
2. Is the	intersection	n in a built-up	area of an isolat	ed commun	ity with a po	pulation	ı < 10.000	2	Yes	5 🔽 No	
						pulation				_	
"70%" vo	lume level	may be used	if Question 1 or	2 above is a	answered "Ye	es"	✓ MAY		√ 709	%100	%
WARRANT	2 - FOUF	R-HOUR VE	HICULAR VC	<u>LUME</u>					_		
If all four	r points lie a	above the app	propriate line, the	n the warra	nt is satisfied	1.	Арр	licable:	√ Yes	s 🗌 No	
				Plot four w	volume combir	nations o	Sa n the annlic	atisfied:		s 🗹 No	
				FIOLIOUIV		Ialions 0	n ine applic	able ligu	ie below.		
100%	Volume Le	evel	500	FIGU	RE 4C-1: C	riteria f	or "100%	" Volun	ne Leve	1	7
Four	Volu	imes	т		2	OR MORE L	ANES & 2 OR MO	RE LANES			
Highest Hours	Major	Minor	₽, 400 								_
nours	Street	Street			\searrow		2 OR MO	RE LANES &	1 LANE		_
			R STF				\times	1 LANE &	1 LANE		
						\square	\square	\sum			
			> Н <u>0</u> 100								*115
			т								*80
			30	0 400 5	00 600 7	700 80		1000 1	100 120 7 PH	0 1300 1	400
			* Note: 115 ph. a	pplies as the low	er threshold volu	me for a m	inor street app	roach with	two or more	e lanes and	
			80 mph a	pplies as the low	er threshold volu	me thresho	ld for a minor	street appr	oach with o	one lane.	
				FIG	URE 4C-2: (Criteria	for "70%	" Volur	ne Leve	el	
70% \	Volume Le	vel	400	(Community L	ess than 10,000	population	or above 70 k	m/hr. (40 n	nph) on Ma	ajor Street)	1
Four	Volu	imes	НАЛ		- 20	R MORE LAN	ES & 2 OR MORE	LANES			
Highest Hours	Major Street	Minor Street	SOACH -								
7-8 A.M.	1520	107	APPF		\searrow		MURE LANES & '				
3-4 P.M.	1489	43				\leftarrow	$\mathbf{\times}$	1 I ANE &	1 LANE		
4-5 P.M.	1549	92	× н9 100			\rightarrow			-		
5-6 P.M.	1687	52	Ī					+	\rightarrow	+	*80 *60
		·	C					700]
				200 300 N	400 IAJOR STREET -	500 • TOTAL O I	600 F BOTH APPR	OACHES -	800 • VPH	900 10	00
			* Note: 80 ph. ap	plies as the lowe	r threshold volum	ne for a min	or street appr	oach with t	wo or more	lanes and	

APPENDIX D

Intersection Capacity Analysis Worksheets

HCS Two-Way Stop-Control Report											
General Information		Site Information									
Analyst	SS	Intersection	Howland Blvd & Fernanda Dr								
Agency/Co.	TPD, Inc.	Jurisdiction	Deltona								
Date Performed	3/5/2024	East/West Street	Fernanda Dr/Goldenhills St								
Analysis Year	2025	North/South Street	Howland Blvd								
Time Analyzed	Projected AM	Peak Hour Factor	0.95								
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25								
Project Description	5427.2										
_anes											



Vehicle Volumes and Adjustments

Approach	Eastbound					Westbound			Northbound				Southbound				
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	1	0	1	2	1	0	1	2	0	
Configuration			LTR			LT		R		L	Т	R		L	Т	TR	
Volume (veh/h)		6	0	90		95	1	86	0	34	448	31	0	37	1098	12	
Percent Heavy Vehicles (%)		17	0	2		0	0	0	0	6			0	0			
Proportion Time Blocked																	
Percent Grade (%)	0				()											
Right Turn Channelized						N	о			N	0						
Median Type Storage				Left	Only				1								
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.84	6.50	6.94		7.50	6.50	6.90		4.22				4.10			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2			
Follow-Up Headway (sec)		3.67	4.00	3.32		3.50	4.00	3.30		2.26				2.20			
Delay, Queue Length, and	Leve	of Se	ervice														
Flow Rate, v (veh/h)			101			101		91		36				39			
Capacity, c (veh/h)			390			201		772		571				1071			
v/c Ratio			0.26			0.50		0.12		0.06				0.04			
95% Queue Length, Q ₉₅ (veh)			1.0			2.5		0.4		0.2				0.1			
Control Delay (s/veh)			17.4			39.8		10.3		11.7				8.5			
Level of Service (LOS)			С			E		В		В				А			
Approach Delay (s/veh)		17	7.4			25	5.9		0.8				0.3				
Approach LOS		(2			[)			A	4			A	4		

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HCS Two-Way Stop-Control Report										
General Information		Site Information								
Analyst	SS	Intersection	Howland Blvd & Fernanda Dr							
Agency/Co.	TPD, Inc.	Jurisdiction	Deltona							
Date Performed	3/5/2024	East/West Street	Fernanda Dr/Goldenhills St							
Analysis Year	2025	North/South Street	Howland Blvd							
Time Analyzed	Projected PM	Peak Hour Factor	0.96							
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25							
Project Description	5427.2									
anes										



Vehicle Volumes and Adjustments

Approach	Eastbound Westbound						North	bound		Southbound							
Movement	U	L	Т	R	U	L	Т	R	U	L	Т	R	U	L	Т	R	
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6	
Number of Lanes		0	1	0		0	1	1	0	1	2	1	0	1	2	0	
Configuration			LTR			LT		R		L	Т	R		L	Т	TR	
Volume (veh/h)		7	0	24		44	3	36	0	66	1016	91	0	60	473	8	
Percent Heavy Vehicles (%)		0	0	0		0	0	5	0	2			0	0			
Proportion Time Blocked																	
Percent Grade (%)	0				()											
Right Turn Channelized						N	о			N	lo						
Median Type Storage				Left	Only				1								
Critical and Follow-up Headways																	
Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1			
Critical Headway (sec)		7.50	6.50	6.90		7.50	6.50	7.00		4.14				4.10			
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2			
Follow-Up Headway (sec)		3.50	4.00	3.30		3.50	4.00	3.35		2.22				2.20			
Delay, Queue Length, and	Leve	of Se	ervice														
Flow Rate, v (veh/h)			32			49		38		69				63			
Capacity, c (veh/h)			439			134		486		1059				613			
v/c Ratio			0.07			0.37		0.08		0.06				0.10			
95% Queue Length, Q ₉₅ (veh)			0.2			1.5		0.2		0.2				0.3			
Control Delay (s/veh)			13.9			46.5		13.0		8.6				11.5			
Level of Service (LOS)			В			E		В		А				В			
Approach Delay (s/veh)		13	3.9		32.0			0.5				1.3					
Approach LOS		E	3			[>			/	4			ļ	4		

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