

# **Highway Factors Attachment 7**

Florida Traffic Signal Warrant Analysis

Williston, FL

### HWY16FH018

(16 pages)

## SIGNAL WARRANT ANALYSIS

#### Introduction

- The Signal Warrant Analysis Spreadsheets are a tool for assisting traffic engineers when evaluating the need for a traffic signal installation

- The filled spreadsheets can be used as part of the supporting documents for the signal warrant evaluation

Note: This templates are a useful resource, but it remains necessary to apply engineering judgment and to consider specific environmental, traffic, geometric, and operational conditions

Instructions	
Fill in "Orange" areas only	
Automated cells based on in Input Data in "orange" cells	
General Information	Fill in below the general information including:
	District, County (drop-down menu)
	City, Engineer, Date
	Major and Minor Street with corresponding number of lanes and speed limits
Enter Eight Hour Volumes	Any 8 hours of an average day. Major-street and minor-street volumes shall be for the same 8 hours; however, the 8 hours satisfied in Condition A shall <b>not</b> be required to be the same 8 hours satisfied in Condition B <b>for 80% columns only.</b> On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.
Enter Four Hour Volumes	Any 4 hours of an average day. 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, not required to be on the same approach during each of the 4 hours)
Enter Pedestrian Volumes (4-hr)	Pedestrians per hour crossing the major street (total of all crossings)
Enter Peak Hour Volumes	Vehicular: Any four consecutive 15-minute periods of an average day
	Pedestrian: Any four consecutive 15-minute periods of an average day representing the vehicles per hour on the major street (total of both approaches) and the corresponding pedestrians per hour crossing the major street (total of all crossings)

Input Data							
City:	Williston, FL						Form 750-020-01 TRAFFIC ENGINEERING
County:	34 – Levy	Engineer:	Ashley Poole				10/15
District:	Two	Date:	-				
District.	IWO	Date.	0000001 3, 2010				
Major Street:	US Alt 27 / SR 500	# Lanes:	2	Major Approach Speed:			
Minor Street:	NE 140th Court	# Lanes:	1	Minor Approach Speed:	35		
	Eight	Hour Volumes (Condition	ו A)		Eig	ht Hour Volumes (Condit	ion B)
		Major Street	Minor Street			Major Street	Minor Street
	Hours	(total of both approaches)			Hours	(total of both approaches)	
	7:00 - 8:00	459	59		7:00 - 8:00	459	59
	11:00 - 12:00	394	45		11:00 - 12:00	394	45
	13:00 - 14:00	441	36		13:00 - 14:00	441	36
	14:00 - 15:00	501	36		14:00 - 15:00	501	36
	15:00 - 16:00	539	36		15:00 - 16:00	539	36
	16:00 - 17:00	583	37		16:00 - 17:00	583	37
	17:00 - 18:00	568	47		17:00 - 18:00	568	47
	18:00 - 19:00	413	35		18:00 - 19:00	413	35
	Highes	t Four Hour Vehicular Vol	umes		Highe	est Four Hour Pedestrian	/olumes
		Major Street	Minor Street			Major Street	Pedestrian
	Hours	(total of both approaches)			Hours	(total of both approaches)	Crossings on Major Street
	7:00 - 8:00	459	59		12:00 - 13:00	405	2
	11:00 - 12:00	394	45		15:00 - 16:00	539	0
	16:00 - 17:00	583	37		16:00 - 17:00	583	0
	17:00 - 18:00	568	47		17:00 - 18:00	568	0
		Vehicular Peak Ho	our Volumes		1		
	Peak Hour	Major Street	Minor Street	Total Entering			
	r ouk riour	(total of both approaches)	(one direction only)	Volume			
	16:45 - 17:45	593	52	661			
	Ped	estrian Peak Hour Volum	es				
	Peak Hour	Major Street	Pedestrian Crossing Volumes				
		(total of both approaches)	on Major Street				
	12:00 - 13:00	405	2				

			TRA			•			nsportation	ARY		Form 7 TRAFFIC ENG	750-020-01 INEERING 10/15
City: County: District:			lliston, 4 – Lev Two						Engineer: Date:		Ashley Poo ctober 3, 20		
Major Street: Minor Street:				Alt 27 / Sl E 140th C					Lanes: 2 Lanes: 1		r Approach r Approach		65 35
IUTCD Electro	nic Refe	rence to	Chapte	er 4: <u>http</u>	<u>)://mutc</u>	d.fhwa	.dot.gov	<u>//pdfs/2</u>	009r1r2/part4	.pdf			
<u>'olume Level C</u> 1. Is the po 2. Is the inte	sted spe								/h)? pulation < 10,	000?	✓ Yes ☐ Yes	☐ No ✓ No	
"70%" volun	ne level	<b>may</b> be ւ	used if	Question	1 <b>or</b> 2 a	above i	s answe	ered "Ye	es"		✓ 70%	100%	
(should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems). Condition A - Minimum Vehicular Volume Condition A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. Yes ✓ No No Number of Lange for moving Vehicles per hour on major- Number of Lange for moving Vehicles per hour on major-													
Number of Lanes for moving traffic on each approach         Vehicles per hour on major- street (total of both approaches)         Vehicles per hour on major- street (one direction only)													
Major		Minor		100% <sup>a</sup>	80%	b	70% <sup>c</sup>	100%	6 <sup>a</sup> 80% <sup>b</sup>	70% <sup>c</sup>			
1		1		500	400	)	350	150	120	105			
2 or more	е	1		600	480		420	150		105			
2 or more		2 or more		600 500	480		420 350	200 200		140 140			
	um hourl nbination d when th	y volume of Condit e major-si	ions A a treet spe corresp	and B after eed exceed	adequa ls 40 mp <i>ior-stree</i>	te trial c oh or in <u>t and m</u>	of other r an isolat	emedial ed comr		pulation of le		00	
Street	7:00 - 8:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00					
Major	459	394	441	501	539	583	568	413	Existing V	olumes			
Minor	59	45	36	36	36	37	47	35	-Aloting V	51411100			
L									l				

### 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.

	nes for moving ch approach	stree	per hour o t (total of t oproaches	ooth	Vehicles per hour on minor- street (one direction only)				
Major	Minor	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>		
1	1	750	600	525	75	60	53		
2 or more	1	900	720	630	75	60	53		
2 or more	2 or more	900	720	630	100	80	70		
1	2 or more	750	600	525	100	80	70		

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

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

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

		Eiç	ght High	lest Hou	Irs			
Street	7:00 - 8:00	11:00 - 12:00	13:00 - 14:00	14:00 - 15:00	15:00 - 16:00	16:00 - 17:00	17:00 - 18:00	18:00 - 19:00
Major	459	394	441	501	539	583	568	413
Minor	59	45	36	36	36	37	47	35

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 10/15

🗸 Yes No Yes 🔽 No 🔽 No Yes 80% Satisfied:

Yes

🗸 No

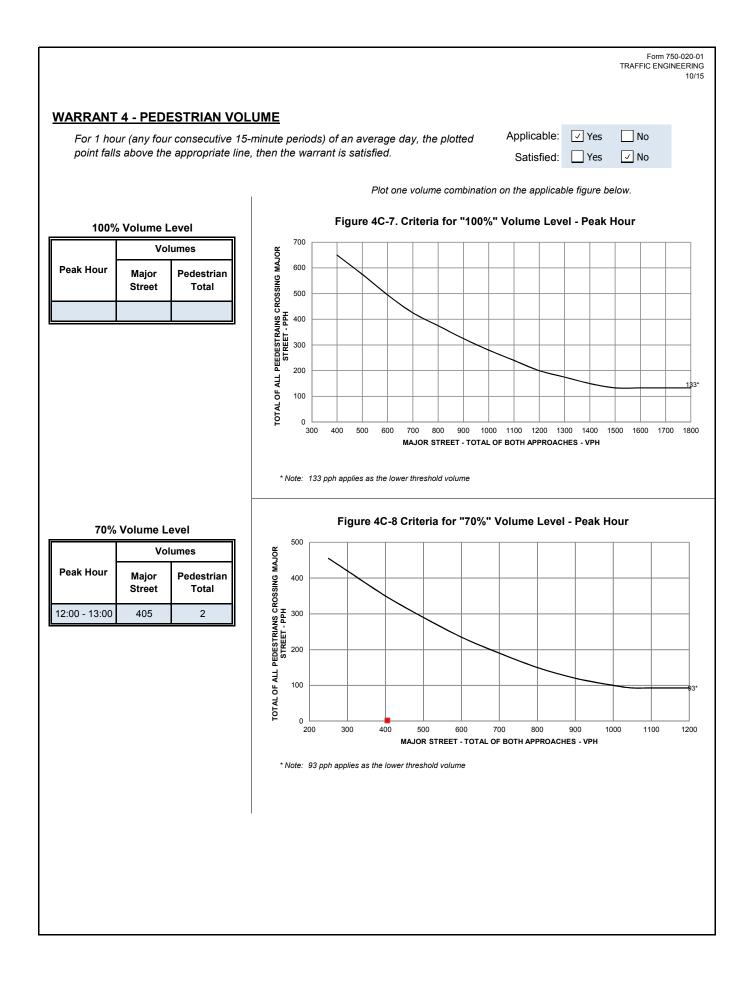
Applicable: 100% Satisfied:

70% Satisfied:

		TRA	State of Flor					ov.			rm 750-020-01 ENGINEERING 10/15
C Cour Distr	-	Willistor 34 – Le Two	n, FL evy			Engine Da	er:	A	shley P tober 3,		
Major Stre Minor Stre	eet: eet:	US N	S Alt 27 / SR 500 NE 140th Court			Lanes: Lanes:	2	Minor		ch Speed: ch Speed:	
2. Is the	I Criteria posted spe intersectio	eed or 85th-pe n in a built-up	ercentile of major area of an isolat if Question 1 <b>or</b>	ed communi	mph (70 l ity with a	km/h)? populatio	,		Y	′es □ No ′es ☑ No ′es □ No	
lf all four		above the app	EHICULAR VC	n the warrar Plot four v	olume con	fied. nbinations o	on the app	•	ire below.	∕es ✓ No	
Four Highest Hours           7:00 - 8:00           11:00 - 12:00           16:00 - 17:00           17:00 - 18:00	Volu Major Street 459 394 583 568	Minor           Street           59           45           37           47	MINOR STREET 400 300 100 100 100		-	2 OR MORE L	ANES & 2 OR M	IORE LANES &			*115
70%	Volume Le	vel	400	MA. applies as the low pplies as the lowe FIGI (Community L	er threshold er threshold vo URE 4C-2	- TOTAL OF volume for a r olume thresho 2: Criteria	ninor street a old for a mino <b>a for "70</b> 9	OACHES - Warpproach with r street appro	n two or mol bach with ol me Leve	re lanes and ne lane.	  400
Four Highest Hours	Major Street	Minor Street	PROACH - VPH		T	2 OR MORE LAN	IES & 2 OR MOI				_
7:00 - 8:00 11:00 - 12:00 16:00 - 17:00 17:00 - 18:00	459 394 583 568	59 45 37 47	300 200 WINOR STREET HIGH VOLUME APPROACH 100 0		•	•	•	1 LANE 8			*80 *60
			* Note: 80 vph ap	200 300 M.	er threshold ve		inor street ap	proach with	two or more	e lanes and	000

TRA	State of Florid	•	•		RY	TRAFFIC EI	NGINI
City: Willisto County: 34 – L District: Tw	n, FL evy			Engineer: Date:	Asl	hley Poole ober 3, 2016	
	S Alt 27 / SR 500 NE 140th Court	)		_anes: 2 _anes: 1	-	pproach Speed: pproach Speed:	
MUTCD Electronic Reference to Chapt		/mutcd.fhwa.do			-		
Volume Level Criteria 1. Is the posted speed or 85th-pe 2. Is the intersection in a built-up "70%" volume level may be used	area of an isolate	d community v	with a pop	oulation < 10,0	000?	<ul> <li>✓ Yes</li> <li>No</li> <li>Yes</li> <li>✓ No</li> <li>✓ 70%</li> <li>100</li> </ul>	%
WARRANT 3 - PEAK HOUR If all three criteria are fulfilled <u>or</u> t then the warrant is satisfied. Unusual condition justifying use of warrant:	he plotted point li	Plot volum	e combinat	e line, ion on the appl. <b>Criteria for '</b>	-		
Record hour when criteria are fulfilled and the corresponding delay or volume in boxes provided.         Peak Hour 100% Volume         Time       Major Vol.       Minor Vol.         Peak Hour 70% Volume         Time       Major Vol.       Minor Vol.         Time         Major Vol.       Minor Vol.         Time       Major Vol.       Minor Vol.	- 000 HIGH VOLUME APPROACH - VPH 000 000 000 000 000 000 000 000 000 0				OR MORE LANES & 1	LANE	*
Instrument       16:45 - 17:45     593     52       Criteria       1. Delay on Minor Approach       *(vehicle-hours)       Approach Lanes     1     2       Delay Criteria*     4.0     5.0       Delay*     0.1       Fulfilled?:     Yes     No	100 vph a	MAJOR applies as the lower applies as the lower FIGUR	STREET - TO threshold volu threshold volu E 4C-4: C	TAL OF BOTH APP ume for a minor stra ume threshold for a <b>Criteria for "7</b> population or abov	eet approach with a minor street appro	two or more lanes and bach with one lane.	1800
2. Volume on Minor Approach         One-Direction *(vehicles per hour)         Approach Lanes       1         Volume Criteria*       100         Volume*       52         Fulfilled?:       Yes         Xolume *(vehicles per hour)         No       of Approaches         Xo       4	MINOR STREET MINOR STREET 100 000 000 000 000 000 000 000 000 00			2 OR MORE I	ANES & 1 LANE		
No. of Approaches     3     4       Volume Criteria*     650     800       Volume*     661       Fulfilled?:     Yes     No	300 * Note: 100 vph a		TREET - TOTA		eet approach with i	two or more lanes and	1300

		TRA	State of I		•			•		ARY				orm 750-020-0 ENGINEERING 10/15
Ci	ity:	Williston,	FL				E	Engine	er:		Ashle	ey Poo	le	
Coun	ity:	34 – Lev									Octobe			
Distri	ict:	Тwo												
Major Stre			Alt 27 / SR 5				La	anes:	2	-			Speed:	65
Minor Stre	et:	N	E 140th Cour	rt			La	anes:	1	Mir	nor App	broach	Speed:	35
MUTCD Electr	ronic Refe	rence to Chapte	r 4: <u>http://r</u>	nutcd.ft	<u>hwa.do</u>	t.gov/p	dfs/200	<u>)9r1r2/</u>	part4.	<u>pdf</u>				
Volume Level												_		_
		eed or 85th-perc	-								Ŀ	✓ Yes	No	
2. Is the i	intersectio	n in a built-up ar	ea of an isola	ated cor	mmunii	ty with a	a popu	lation	< 10,0	000?	L	Yes	_∕_ No	
"70%" vol	lume level	may be used if	Question 1 <b>o</b> i	r 2 abov	ve is aı	nswere	d "Yes"	'			7	70%	100	%
WARRANT	4 - PEDE	ESTRIAN VOI	UME											
	-	ours of an avera		olotted p	ooints l	ie abov	e the			Applicabl	e:	🗸 Yes	No	
appropria	te line, the	en the warrant is	satisfied.							Satisfie	d:	Yes	🗸 No	
					Plot fo	our volur	ne comi	bination	ns on th	ne applicab	le figure	e below	<i>.</i>	
					Figu	re 4C-5	5. Crite	ria for	"100	%" Volum	e Leve	əl		
100%	Volume L		5	500										
Four Highest	Vol	umes	SSING											
Hours	Major Street	Pedestrian Total		400										
	oneer	Total	T - PP	300	_							_		
			DEST	200										
			L PEE											
				100	_								1	07
			TOTAL OF ALL PEEDESTRAINS CROSSING MAJOR STRET - PPH ALOR STRET - PPH	0										
			10	300	400		00 70 R STREET			00 1000 TH APPROAC			1300 140	10
			* Note:	107 pph aµ	pplies as	the lower	hreshold	volume						
709/	Volumo I.	aval			Figu	ure 4C-	6 Crite	eria foi	r "70%	6" Volum	e Leve	I		
10%	Volume Lo Vol	lumes	9 <u>2</u>	400										
Four Highest Hours	Major	Pedestrian	ROSS	300										
	Street	Total	ANS C		+									
12:00 - 13:00	405	2	TOTAL OF ALL PEDESTRIANS CROSSING MAJOR STREET - PPH	200		$\rightarrow$								
15:00 - 16:00	539		L PED					$\rightarrow$	$\square$					
16:00 - 17:00	583			100							_			75*
17:00 - 18:00	568		)TAL (											75*
			10	0 200	300	400		500	600	700	800	900	0 100	0
						MAJO	R STREET	T - TOTAL	OF BOT	TH APPROAC	HES - VPI	4		
			* Note:	75 pph app	plies as th	ne lower th	reshold v	olume						



		Florida Department of T		MARY		Fe TRAFFIC	orm 750-0 ENGINEE
City:	Williston, FL		Engineer:		Ashley P		
County:	34 – Levy		Date:		October 3		
District:	Тwo						
Malan Otra at						ala Orana da	•
Major Street:	US Alt 27 / SR 500 NE 140th Court	)	Lanes: 2 Lanes: 1		ior Approa	ch Speed:	6 3
Minor Street:	NE 140th Court		Lanes: 1		юг Арргоа	ch Speed.	3
MUTCD Electronic F	Reference to Chapter 4: <u>http://</u>	mutcd.fhwa.dot.gov/pd	fs/2009r1r2/pa	rt4.pdf			
Record hours wl	<b>CHOOL CROSSING</b> here criteria are fulfilled and the boxes provided. The warrant is			Applicable: Satisfied:	Yes Yes	✓ No ✓ No	
		Criteria				Fulfil	led?
						Yes	No
There are a mini	imum of 20 students crossing the	e maior street during	Students:	Но	ur:		
1. the highest cross							
the highest closs							
	adequate gaps in the major stre on are using the established scho ame period.			Minutes:	Gaps:		
	fic signal along the major street i	s located more than 30	00 ft. (90 m) aw	ay, or the n			
3. signal is within 3	00 ft. (90 m) but the proposed tra				nent of		
					nent of		
3. signal is within 3					nent of		
3. signal is within 3					nent of		
3. signal is within 3					nent of		
3. signal is within 3					nent of		
3. signal is within 3					nent of		

· · · · · ·		State of Florida Depa TRAFFIC SIGNAL V	artment of Transportation VARRANT SUMMA	RY	For TRAFFIC E	m 750-0 NGINEE
Major Street:       US Alt 27 / SR 500       Lanes:       2       Major Approach Speed:       4         Minor Street:       NE 140th Court       Lanes:       1       Minor Approach Speed:       3         MUTCD Electronic Reference to Chapter 4:       http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf       Mutcase       4       4         WARRANT 6 - COORDINATED SIGNAL SYSTEM       Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.).       Applicable:       Yes       No         Criteria         Fulfilled?         On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       and the proposed       Image: Criteria are street that has traffic predominately in one direction, and the proposed				Ashley Pool October 3, 20	le )16	
Minor Street: NE 140th Court Lanes: 1 Minor Approach Speed: 3   MUTCD Electronic Reference to Chapter 4: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf   WARRANT 6 - COORDINATED SIGNAL SYSTEM Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.). Criteria Applicable: Yes I No Satisfied: Yes I No No 1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed						
Minor Street:       NE 140th Court       Lanes:       1       Minor Approach Speed:       3         MUTCD Electronic Reference to Chapter 4:       http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/part4.pdf         WARRANT 6 - COORDINATED SIGNAL SYSTEM       Applicable:       Yes       No         Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.).       Applicable:       Yes       No         Criteria         Fulfilled?         Yes       No         Satisfied:         Yes       No         Criteria         Fulfilled?         Yes       No         On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Colspan="3">Con a two-way street, adjacent signals do not provide the necessary degree of platooning.         On a two-way street, adjacent signals do not provide the necessary degree of platooning.       Image: Colspan="3">Mutrice of platooning.	Major Street:	US Alt 27 / SR 500	Lanes: 2	Major Approach	Speed:	6
WARRANT 6 - COORDINATED SIGNAL SYSTEM         Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.).       Applicable:       Yes       No         Satisfied:       Yes       No         Criteria       Fulfilled?         1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Comparison of the street of the street of the necessary degree of platooning, and the proposed						3
Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1,000 ft.). Criteria          Criteria       Fulfilled?         Yes       No         1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed       Image: Criteria are so far apart that they the proposed	MUTCD Electron	c Reference to Chapter 4: <u>http://mutcd.fhwa</u>	a.dot.gov/pdfs/2009r1r2/part4.	pdf		
Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if       Image: Satisfied:	WARRANT 6 -	COORDINATED SIGNAL SYSTEM			_	
signal spacing would be less than 300 m (1,000 ft.).          Criteria       Fulfilled?         1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Criteria in the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Criteria in the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Criteria in the adjacent signals are so far apart that they do not provide the necessary degree of platooning.         2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed       Image: Criteria in the proposed in the pr	Indicate if the	criteria are fulfilled in the boxes provided. The	e warrant is satisfied if Ap	plicable: Yes	✓ No	
Fulfilled?         Yes No         1. On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.       Image: Criteria	either criterio	n is fulfilled. This warrant should not be applie		Satisfied: Yes	🗸 No	
1.       On a one-way street or a street that has traffic predominately in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.         2.       On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed		Criteria				
apart that they do not provide the necessary degree of vehicle platooning.     On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed					Yes	No
2 On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed	1 On a one-way	street or a street that has traffic predominate	ly in one direction, the adjacen	t signals are so far		
2. On a two-way street, adjacent signals do not provide the necessary degree of platooning, and the proposed and adjacent signals will collectively provide a progressive operation.	apart that the	y do not provide the necessary degree of vehic	cle platooning.			
<sup>2.</sup> and adjacent signals will collectively provide a progressive operation.	on a two-way	street, adjacent signals do not provide the ne	cessary degree of platooning,	and the proposed		
	<sup>2</sup> . and adjacent	signals will collectively provide a progressive of	operation.			

		a Department of Transportation AL WARRANT SUMMA	Form 750-020-01 TRAFFIC ENGINEERING 10/15							
City:	Williston, FL	Engineer:	Ashley Poole							
County:	34 – Levy	Date:	October 3, 2016							
District:	Тwo									
Major Street:	US Alt 27 / SR 500	Lanes: 2	Major Approach Speed: 65							
Minor Street:	NE 140th Court	Lanes: 1	Minor Approach Speed: 35							
MUTCD Electro	onic Reference to Chapter 4: <u>http://mt</u>	utcd.fhwa.dot.gov/pdfs/2009r1r2/parte	4.pdf							
WARRANT 7	- CRASH EXPERIENCE									
Record hours where criteria are fulfilled, the corresponding volume, and other information Applicable: Ves No in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled. Satisfied: Yes Vo										

		Criteria	Hour								Volu	Met?		Fulfi	lled?	
		Cillena				пс	Jui				Major	Minor	Yes	No	Yes	No
	One of	Warrant 1, Condition A (80% satisfied)	No	No	No	No	No	No	No	No				Х		
		Warrant 1, Condition B (80% satisfied)	No	No	No	No	No	No	No	No				Х		
1.		Warrant 4, Pedestrian Volume at 80% of volume requirements: # ped/hr for four (4) hours or # ped/hr for one (1) hour.		lo	N	lo	N	0	N	lo				х		х
2.	Adequate trial of other remedial measure has failed 2. to reduce crash frequency.			asuro d:	e											х
3.	<ul><li>Five or more reported crashes, of types susceptible</li><li>to correction by signal, have occurred within a 12- month period.</li></ul>		Obs Cra Typ		ed	Angle, Left Turn, and Rear End			,	Number per 12 r		nes	4		х	

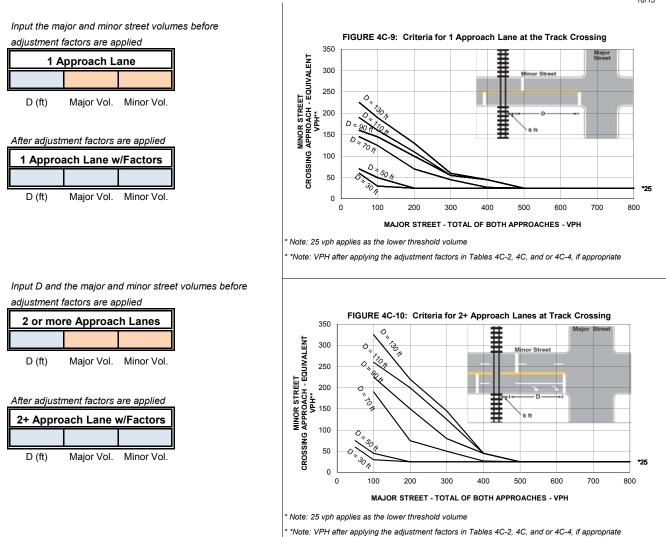
		Department of Transportation L WARRANT SUMN	IARY			orm 750-020-01 ENGINEERING 10/15
City:	Williston, FL	Engineer:		Ashley Poo		
County: District:	34 – Levy Two	Date:		October 3, 2	016	
Major Street:	US Alt 27 / SR 500	Lanes: 2	Ma	ajor Approach	Speed:	65
Minor Street:	NE 140th Court	Lanes: 1	Mi	nor Approach	Speed:	35
	nic Reference to Chapter 4: <u>http://mute</u>	cd.fhwa.dot.gov/pdfs/2009r1r2/p	art4.pdf			
information i	rs where criteria are fulfilled, and the corre n the boxes provided. The warrant is sati d if all intersecting routes have one or mo cs listed.	sfied if at least one of the criteria			Yes ☐ N Yes ☑ N	10 10
	0-141-			Met?	Fulfille	ed?

	Criteria									i uni	meu :	
								Yes	No	Yes	No	
	Both of a. Total entering volume of at least 1,000 veh/hr during a the typical weekday peak hour.					Ente	ering Volume: 661			х		х
	<sup>1.</sup> criteria to the right are met.		. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.			1	2	3				^
		ing volume at least 1,000		11:00-12:00	12:00-13:00	15:00-1	6:0016:0	0-17:00	← Ho	our		х
	veh/hr for each of any 5 hrs of a non- normal business day (Sat. or Sun.)		619.00	567.00	636.00	647.0	00 5	54.00	←Volı	ume		Χ

	Characteristics of Major Routes	Met?		Fulfilled?		
		Yes	No	Yes	No	
	and of the street of highway system that serves as the philopal loadway	r Street:	Х			
1.	network for through traffic flow. Mino	r Street:		Х		
_		r Street:	Х			v
2.	. Rural or suburban highway outside of, entering, or traversing a city.	r Street:		Х		^
		r Street:	Х			
3.		r Street:		Х		

	•			TRAFFIC ENGINE
	TRAFFIC SIGNAL V	WARRANI SUI		
City:	Williston, FL	Engineer:		nley Poole
County:	34 – Levy	Date:	Octo	ber 3, 2016
District:	Тwo			
Major Street:	US Alt 27 / SR 500	Lanes:	2 Major A	pproach Speed: 65
Minor Street:	NE 140th Court	Lanes:		pproach Speed: 35
MUTCD Electronic Refer	rence to Chapter 4: <u>http://mutcd.fhwa</u>	a.dot.gov/pdfs/2009r1r2	/part4.pdf	
Approach Lane Criteria	=		_	
1. How many approa	ach lanes are there at the track crossing	g?		1 2 or
If there is 1 lane, use	Figure 4C-9 and if there are 2 or more	e, use Figure 4C-10.		Fig 4C-9 Fig 4C-1
WARRANT 9 - INTE	RSECTION NEAR A GRADE CR	OSSING		
	should be applied only after adequate of			
	alternative has failed to alleviate the sa	-	ed with the grade of Applicable:	crossing.
satisfied if both criter	ia are fulfilled in the boxes provided. Th ia are met.	ie warrant is	Satisfied:	Yes No
			Satistieu.	Fulfilled?
	Criteria			Yes No
1. A grade crossing exists	on an approach controlled by a STOP or Y	IELD sign and the center of	of the track nearest t	
	0 feet of the stop line or yield line on the ap			
	ic volume hour during which the rail uses the ombination of approach lanes over the track			plicable
-		just the minor-street approa	,	ctors from Tables
Enter D (feet)	s on Minor-Street Approach		Adjustment Fa	ctors from Tables
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks	s on Minor-Street Approach	Table 4C-3. Adjustme	Adjustment Fa	
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail	on Minor-Street Approach	Table 4C-3. Adjustme	Adjustment Fa	
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day	on Minor-Street Approach	Table 4C-3. Adjustme Occ	Adjustment Fa	
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1	es on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr	Adjustment Fa	entage of High-
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day	on Minor-Street Approach	Table 4C-3. Adjustme Occ	Adjustment Fa	entage of High-
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 2 3 to 5 6 to 8	as on Minor-Street Approach on Minor-Street Approach Factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4%	Adjustment Fa	Intage of High- Istment Factor
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	as on Minor-Street Approach on Minor-Street Approach Factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 2 3 to 5 6 to 8	as on Minor-Street Approach on Minor-Street Approach Factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33	Table 4C-3. Adjustme         Occ         % of High-Occupancy         Minor Street Appr         0%         2%         4%         6% or more         * A high-occupancy bus is	Adjustment Fa	Intage of High- Istment Factor
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach actor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach actor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor-	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme	Adjustment Fa 1.00 0.50 Int Factor for Percecupancy Buses Buses* on Adju Buses* on Adju s defined as a bus o or-Trailer Trucks Int Factor	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme D less than 70 feet	Adjustment Fa 1.00 0.50 Int Factor for Perce cupancy Buses Buses* on Adju Buses* on Adju s defined as a bus o or-Trailer Trucks ont Factor D of 70 feet or m	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5%	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme D less than 70 feet 0.50	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5% 2.6% to 7.5%	Table 4C-3. Adjustme         Occ         % of High-Occupancy         Minor Street Appr         0%         2%         4%         6% or more         * A high-occupancy bus is         for Percentage of Tracto         Adjustme         D less than 70 feet         0.50         0.75	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach actor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5% 2.6% to 7.5% 7.6% to 12.5%	Table 4C-3. Adjustme Occ % of High-Occupancy Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme D less than 70 feet 0.50 0.75 1.00	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5% 2.6% to 7.5% 7.6% to 12.5% 12.6% to 17.5%	Table 4C-3. Adjustme Occ % of High-Occupancy I Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme D less than 70 feet 0.50 0.75 1.00 2.30	Adjustment Fa 1.00 0.50 The Factor for Percecupancy Buses Buses* on Adjustment Factor s defined as a bus of the factor D of 70 feet or m 0.50 0.75 1.00 1.15	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5% 2.6% to 7.5% 7.6% to 12.5% 12.6% to 17.5% 17.6% to 22.5%	Table 4C-3. Adjustme         Occ         % of High-Occupancy         Minor Street Appr         0%         2%         4%         6% or more         * A high-occupancy bus is         for Percentage of Tracto         Adjustme         D less than 70 feet         0.50         0.75         1.00         2.30         2.70	Adjustment Fa	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop
% of High Occupancy Buse Enter D (feet) % of Tractor-Trailer Trucks Table 4C-2. Adjustment F Rail Rail Traffic per Day 1 1 2 3 to 5 6 to 8 9 to 11	s on Minor-Street Approach on Minor-Street Approach factor for Daily Frequency of Traffic Adjustment Factor 0.67 0.91 1.00 1.18 1.25 1.33 Table 4C-4. Adjustment Factor % of Tractor-Trailer Trucks on Minor- Street Approach 0% to 2.5% 2.6% to 7.5% 7.6% to 12.5% 12.6% to 17.5%	Table 4C-3. Adjustme Occ % of High-Occupancy I Minor Street Appr 0% 2% 4% 6% or more * A high-occupancy bus is for Percentage of Tracto Adjustme D less than 70 feet 0.50 0.75 1.00 2.30	Adjustment Fa 1.00 0.50 The Factor for Percecupancy Buses Buses* on Adjustment Factor s defined as a bus of the factor D of 70 feet or m 0.50 0.75 1.00 1.15	entage of High- ustment Factor 1.00 1.09 1.19 1.32 iccupied by at least 20 peop

#### Form 750-020-01 TRAFFIC ENGINEERING 10/15



	TR	State of Florid	a Department of Tr		Form 750-020-C TRAFFIC ENGINEERIN 10/1
City: County: District:	Williston,	FL		Engineer: Date:	Ashley Poole October 3, 2016
Major Street: Minor Street: MUTCD Electr		Alt 27 / SR 500 E 140th Court pter 4: http://mute		Lanes: 2 Lanes: 1	Major Approach Speed: 65 Minor Approach Speed: 35
CONCLUSI	DNS				/ SR 500 at NE 140th Court.
WARRANTS	SATISFIED:	Warrant 1         Warrant 2         Warrant 3         Warrant 4         Warrant 5         Warrant 6         Warrant 7         Warrant 8         Warrant 9	Not Applicable         Not Applicable		