Kimley»Horn

February 26, 2020

Mr. Steven Cohoon
Sumter County Public Works
3019 E Anderson Ave
Bushnell, FL 33513

RE: ***Morse Boulevard at N Timber Trail – Signal Warrant Analysis***
Kimley-Horn Project No. 142109097

Dear Mr. Cohoon:

Sumter County has requested that Kimley-Horn prepare a signal warrant analysis of the intersection of Morse Boulevard at N Timber Trail based on the three vehicular traffic volume warrants within the Manual on Uniform Traffic Control Devices (MUTCD). The evaluation was performed considering the existing intersection geometry (T-intersection) and the future intersection geometry when the Villages of Southern Oaks connection is made on the east side of Morse Boulevard. Below is a summary of the evaluation:

- Signal Warrant 1 is **not satisfied** for the existing or projected future condition
- Signal Warrant 2 is **not satisfied** for the existing or projected future condition
- Signal Warrant 3 is **not satisfied** for the existing or projected future condition

The observed traffic volumes, future traffic projections, and warrant analysis are summarized in more detail in the following sections of this report.

EXISTING CONDITIONS

Morse Boulevard is considered the major street and has a posted speed limit of 45 mph. Morse Boulevard has two travel lanes in the northbound and southbound directions, with an exclusive northbound left-turn lane and southbound right-turn lane to N Timber Trail. There is also a southbound left-turn lane that is currently utilized for u-turns and will be the location of a future connection to The Villages of Southern Oaks.

N Timber Trail is stop-controlled and has a single eastbound approach lane at Morse Boulevard. There is a gate for exiting traffic located just west of the intersection.

An eight-hour turning movement count was taken at the intersection between the hours of 10:00 AM and 6:00 PM on Tuesday January 28, 2020. The traffic counts were taken during peak season; therefore, peak season adjustment factors were not applied to the existing traffic counts.

EXISTING SIGNAL WARRANT ANALYSES

The three vehicular volume signal warrants from the MUTCD were evaluated at the intersection for existing traffic conditions.

- Signal Warrant 1 evaluates eight hours of vehicular volumes and is intended for locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal (Condition A) or where the traffic volume on the major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street (Condition B).
- Signal Warrant 2 evaluates four hours of vehicular volumes and is intended for application at locations where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.
- Signal Warrant 3 evaluates the highest individual hour of approach volumes for the side street at the intersection and is intended for application at locations where traffic conditions are such that for a minimum of one hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street.

Morse Boulevard was considered the major street approach with two through lanes in each direction. Since the posted speed limit on Morse Boulevard at the subject intersection is 45 miles per hour, the 70 percent thresholds from the signal warrant tables and graphs were utilized for the analyses.

N Timber Trail was considered the minor street approach. N Timber Trail has a single shared through/left-turn/right-turn lane; therefore, a single-lane approach was assumed for the minor street.

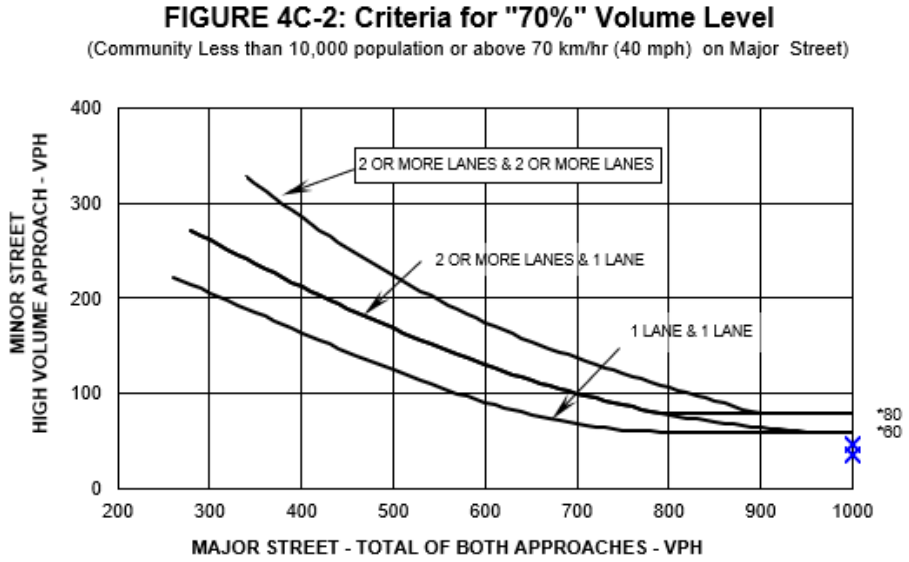
A reduction in minor street right-turn volumes was applied based on Pagones Theorem. Pagones Theorem advises that only 80 percent of right-turn volumes be included in the minor street approach volume based on the shared lane geometry and right-turn volumes. A table summary of Pagones Theorem reductions is provided as an attachment.

Signal Warrant 1

The eight hours of traffic volumes were compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The required minor street approach volume is 105 vehicles per hour for Condition A and 53 vehicles per hour for Condition B. The minor street approach volume does not meet the criteria for any of the eight hours of recorded traffic volumes. The Signal Warrant spreadsheet is provided as an attachment.

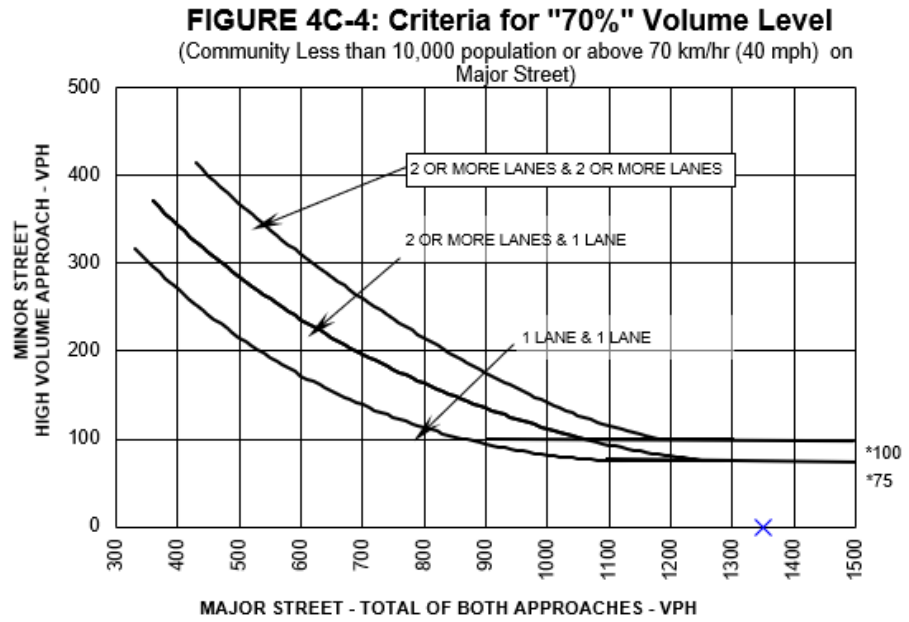
Signal Warrant 2

The highest four hours of side street approach traffic volumes were compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The minor street approach volume after applying the Pagones reduction was plotted on the Y axis and the major street volume was plotted on the X axis. All plotted points were below the warrant volume threshold line representing 2 or more major street lanes and 1 minor street lane. Therefore, Signal Warrant 2 is not met for the existing observed traffic volumes for the highest four hours of side street traffic. The graph is provided below and the Signal Warrant spreadsheet is provided as an attachment.



Signal Warrant 3

The highest hour of side street traffic volumes was compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The minor street approach volume after applying the Pagones reduction was plotted on the Y axis and the major street volume was plotted on the X axis. The plotted point was below the warrant volume threshold line representing 2 or more major street lanes and 1 minor street lane. Therefore, Signal Warrant 3 is not met for the existing observed traffic volumes for the highest hour of side street traffic. The graph is provided below and the Signal Warrant spreadsheet is provided as an attachment.



FUTURE SIGNAL WARRANT ANALYSES

The three vehicular volume signal warrants from the MUTCD were evaluated at the intersection for future traffic conditions with the eastern connection for The Villages of Southern Oaks.

The intersection currently exists as a T-intersection, with N Timber Trail making up the west leg. A new connection for The Villages of Southern Oaks (VOSO) will be added to the east leg of the intersection, making it a full four-leg intersection. Peak hour traffic volumes for the eastern VOSO connection were previously developed for the VOSO development based on the anticipated amount of residential development being served by the connection and trip generation characteristics from the Residential Origin-Destination Study (2005). An hourly distribution of traffic as obtained from a similar existing roadway within The Villages was applied to the projected peak hour traffic volumes to estimate the hourly approach volumes for the peak hours under evaluation (10AM to 6PM). The traffic volume development for the intersection is provided as an attachment.

The approach volumes on the VOSO connection are anticipated to be greater than those on N Timber Trail. For the future conditions analysis, the VOSO approach volumes were utilized for the minor street approach. The anticipated geometry for the VOSO connection will include an exclusive left-turn lane and shared through/right-turn lane; therefore, a 2-lane approach was considered. Pagones Theorem advises that only 40 percent of right-turn volumes be included in the minor street approach volume based on the shared lane geometry and right-turn volumes. A table summary of Pagones Theorem reductions is provided as an attachment.

Morse Boulevard was considered the major street approach with two through lanes in each direction. Since the posted speed limit on Morse Boulevard at the subject intersection is 45 miles per hour, the 70 percent thresholds from the signal warrant tables and graphs were utilized for the analyses.

Signal Warrant 1

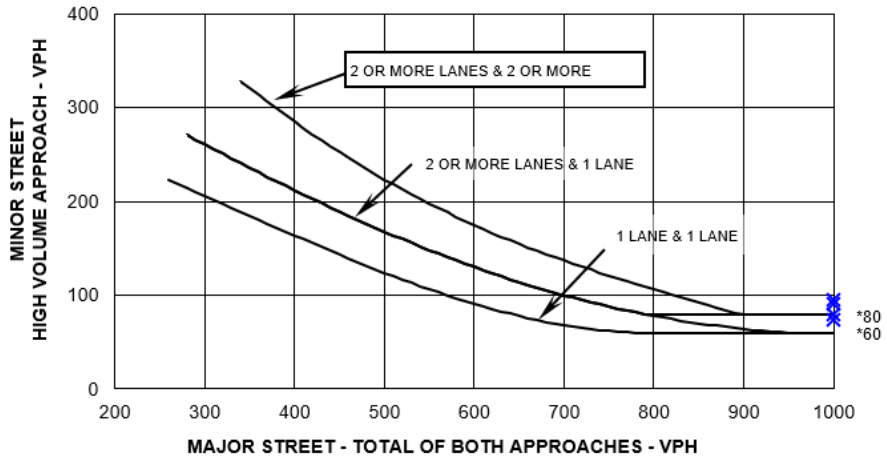
The eight hours of traffic volumes were compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The required minor street approach volume is 140 vehicles per hour for Condition A and 70 vehicles per hour for Condition B. The minor street approach volume only meets the Condition B criteria for five of the eight hours of recorded traffic volumes. Therefore, the volume warrants for Signal Warrant 1 are not met. The Signal Warrant spreadsheet is provided as an attachment.

Signal Warrant 2

The highest four hours of side street approach traffic volumes were compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The minor street approach volume after applying the Pagones reduction was plotted on the Y axis and the major street volume was plotted on the X axis. Only two of the four plotted points were above the warrant volume threshold line representing 2 or more major street lanes and 2 minor street lanes. Therefore, Signal Warrant 2 is not met for the projected traffic volumes. The graph is provided below and the Signal Warrant spreadsheet is provided as an attachment.

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)

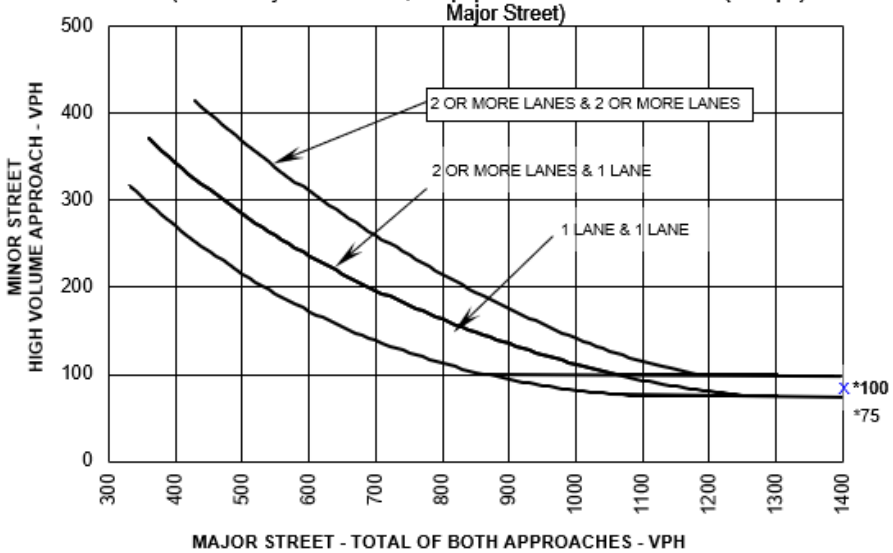


Signal Warrant 3

The highest hour of side street traffic volumes was compared to the traffic volume warrant criteria for the 70 percent volume thresholds. The minor street approach volume after applying the Pagones reduction was plotted on the Y axis and the major street volume was plotted on the X axis. The plotted point was below the warrant volume threshold line representing a minor street approach with 2 lanes. Therefore, Signal Warrant 3 is not met for the projected traffic volumes for the highest hour of side street traffic. The graph is provided below and the Signal Warrant spreadsheet is provided as an attachment.

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



CONCLUSION

Eight hours of existing traffic data at the intersection of Morse Boulevard at N Timber Trail were compared to the three traffic volume signal warrants from the MUTCD. A reduction in minor street right-turn volumes was applied based on Pagones Theorem. The existing observed traffic volumes do not satisfy the volume warrant criteria for Signal Warrant 1 (eight hours of vehicular volumes), Signal Warrant 2 (four hours of vehicular volumes), or Signal Warrant 3 (peak hour vehicular volumes).

A future connection to the VOSO development is planned for the east leg of the intersection. Projected traffic volumes with the VOSO connection were compared to the three traffic volume signal warrants from the MUTCD. The projected traffic volumes do not satisfy the volume warrant criteria for Signal Warrant 1, Signal Warrant 2, or Signal Warrant 3.

Please contact us if you have any questions or need additional information.

Sincerely,

KIMLEY-HORN

AMBER L. GARTNER, P.E
STATE OF FLORIDA,
PROFESSIONAL ENGINEER,
LICENSE NO. 72294
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY AMBER L. GARTNER, P.E. ON THE DATE INDICATED HERE.
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

Digitally signed by Amber L Gartner
Date: 2020.02.26 15:37:55-05'00'

Amber Lee Gartner, PE
Florida Professional Engineer Registration Number 72294
Registry 696

ALG/ds/aep

Attachments: Traffic Data and Volume Development
Pagones Theorem
Traffic Signal Warrant Worksheets – Existing Conditions
Traffic Signal Warrant Worksheets – Future Conditions

Cc: File

K:\OCA_Civil\142109097 - 2018 General On Call Support\Tasks\Morse Blvd at N Timber Trail SWA\doc\Lsc200226alg - Morse at N Timber Trail SWA.docx

ATTACHMENTS

Traffic Data and Volume Development

VEHICLE TURNING MOVEMENT COUNT

Project # 62911.04
MAJOR ROUTE: Warm Springs Ave/ CR 468
OBSERVER: VHB
WEATHER: CLEAR
NORTH APPROACH: Warm Springs Ave/ CR 468
SOUTH APPROACH: Warm Springs Ave/ CR 468

CITY: Wildwood
INTERSECTING ROUTE: N Timber Trail
DATE OF COUNT: Tuesday, January 28, 2020
ROAD CONDITION: GOOD
EAST APPROACH: N Timber Trail
WEST APPROACH: N Timber Trail
COUNT PERIODS:

COUNTY: Sumter
MILEPOST:

ALL VEHICLES / ALL MOVEMENTS

START	NORTHBOUND						SOUTHBOUND							EASTBOUND						WESTBOUND							GRAND
TIME	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	NS TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	U-TURN	LEFT	THRU	RIGHT	RTOR	TOTAL	EW TOTAL	TOTAL
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
10:00	1	0	138	0	0	139	0	0	157	5	0	162	301	0	10	0	3	0	13	0	0	0	0	0	0	13	314
10:15	0	1	168	0	0	169	0	0	153	9	0	162	331	0	9	0	4	0	13	0	0	0	0	0	0	13	344
10:30	1	0	144	0	0	145	0	0	160	5	0	165	310	0	6	0	3	0	9	0	0	0	0	0	0	9	319
10:45	1	0	190	0	0	191	0	0	159	11	0	170	361	0	12	0	2	0	14	0	0	0	0	0	0	14	375
Total	**3**	**1**	**640**	**0**	**0**	**644**	**0**	**0**	**629**	**30**	**0**	**659**	**1,303**	**0**	**37**	**0**	**12**	**0**	**49**	**0**	**0**	**0**	**0**	**0**	**0**	**49**	**1,352**
11:00	0	0	220	0	0	220	0	0	164	7	0	171	391	0	8	0	2	0	10	0	0	0	0	0	0	10	401
11:15	1	2	222	0	0	225	0	0	150	11	0	161	386	0	8	0	4	0	12	0	0	0	0	0	0	12	398
11:30	1	1	199	0	0	201	1	0	167	10	0	178	379	0	8	0	3	0	11	0	0	0	0	0	0	11	390
11:45	0	2	215	0	0	217	0	0	150	4	0	154	371	0	4	0	1	0	5	0	0	0	0	0	0	5	376
Total	**2**	**5**	**856**	**0**	**0**	**863**	**1**	**0**	**631**	**32**	**0**	**664**	**1,527**	**0**	**28**	**0**	**10**	**0**	**38**	**0**	**0**	**0**	**0**	**0**	**0**	**38**	**1,565**
12:00	1	0	218	0	0	219	0	0	184	14	0	198	417	0	3	0	0	0	3	0	0	0	0	0	0	3	420
12:15	1	0	199	0	0	200	0	0	198	10	0	208	408	0	6	0	3	0	9	0	0	0	0	0	0	9	417
12:30	0	1	210	0	0	211	0	0	161	5	0	166	377	0	11	0	3	0	14	0	0	0	0	0	0	14	391
12:45	0	1	175	0	0	176	0	0	168	10	0	178	354	1	9	0	1	0	11	0	0	0	0	0	0	11	365
Total	**2**	**2**	**802**	**0**	**0**	**806**	**0**	**0**	**711**	**39**	**0**	**750**	**1,556**	**1**	**29**	**0**	**7**	**0**	**37**	**0**	**0**	**0**	**0**	**0**	**0**	**37**	**1,593**
13:00	0	1	199	0	0	200	0	0	170	7	0	177	377	0	7	0	0	0	7	0	0	0	0	0	0	7	384
13:15	0	0	178	0	0	178	0	0	174	9	0	183	361	2	8	0	0	0	10	0	0	0	0	0	0	10	371
13:30	0	4	156	0	0	160	0	0	172	3	0	175	335	0	7	0	0	0	7	0	0	0	0	0	0	7	342
13:45	0	0	152	0	0	152	0	0	170	10	0	180	332	0	8	0	0	0	8	0	0	0	0	0	0	8	340
Total	**0**	**5**	**685**	**0**	**0**	**690**	**0**	**0**	**686**	**29**	**0**	**715**	**1,405**	**2**	**30**	**0**	**0**	**0**	**32**	**0**	**0**	**0**	**0**	**0**	**0**	**32**	**1,437**
14:00	0	2	168	0	0	170	0	0	150	7	0	157	327	0	11	0	1	0	12	0	0	0	0	0	0	12	339
14:15	0	0	184	0	0	184	1	0	154	6	0	161	345	0	8	0	1	0	9	0	0	0	0	0	0	9	354
14:30	0	0	177	0	0	177	1	0	176	9	0	186	363	1	7	0	2	0	10	0	0	0	0	0	0	10	373
14:45	2	0	174	0	0	176	0	0	179	7	0	186	362	0	5	0	0	0	5	0	0	0	0	0	0	5	367
Total	**2**	**2**	**703**	**0**	**0**	**707**	**2**	**0**	**659**	**29**	**0**	**690**	**1,397**	**1**	**31**	**0**	**4**	**0**	**36**	**0**	**0**	**0**	**0**	**0**	**0**	**36**	**1,433**
15:00	0	0	177	0	0	177	0	0	162	9	0	171	348	0	17	0	2	0	19	0	0	0	0	0	0	19	367
15:15	0	1	173	0	0	174	0	0	167	10	0	177	351	0	11	0	2	0	13	0	0	0	0	0	0	13	364
15:30	1	0	178	0	0	179	0	0	172	13	0	185	364	0	6	0	0	0	6	0	0	0	0	0	0	6	370
15:45	1	3	198	0	0	202	0	0	158	8	0	166	368	0	5	0	4	0	9	0	0	0	0	0	0	9	377
Total	**2**	**4**	**726**	**0**	**0**	**732**	**0**	**0**	**659**	**40**	**0**	**699**	**1,431**	**0**	**39**	**0**	**8**	**0**	**47**	**0**	**0**	**0**	**0**	**0**	**0**	**47**	**1,478**
16:00	1	1	193	0	0	195	0	0	174	10	0	184	379	0	6	0	3	0	9	0	0	0	0	0	0	9	388
16:15	0	1	172	0	0	173	0	0	220	4	0	224	397	0	3	0	1	0	4	0	0	0	0	0	0	4	401
16:30	1	1	200	0	0	202	0	0	164	11	0	175	377	0	7	0	1	0	8	0	0	0	0	0	0	8	385
16:45	0	6	169	0	0	175	0	0	161	5	0	166	341	0	6	0	1	0	7	0	0	0	0	0	0	7	348
Total	**2**	**9**	**734**	**0**	**0**	**745**	**0**	**0**	**719**	**30**	**0**	**749**	**1,494**	**0**	**22**	**0**	**6**	**0**	**28**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**1,522**
17:00	1	2	205	0	0	208	0	0	133	9	0	142	350	0	7	0	2	0	9	0	0	0	0	0	0	9	359
17:15	0	0	256	0	0	256	0	0	161	10	0	171	427	0	2	0	3	0	5	0	0	0	0	0	0	5	432
17:30	0	1	243	0	0	244	0	0	130	5	0	135	379	0	6	0	2	0	8	0	0	0	0	0	0	8	387
17:45	1	2	205	0	0	208	0	0	139	8	0	147	355	0	4	0	0	0	4	0	0	0	0	0	0	4	359
Total	**2**	**5**	**909**	**0**	**0**	**916**	**0**	**0**	**563**	**32**	**0**	**595**	**1,511**	**0**	**19**	**0**	**7**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**26**	**1,537**

VEHICLE TURNING MOVEMENT COUNT

SECTION: 62911.04
MAJOR ROUTE: Warm Springs Ave/ CR 468
OBSERVER: VHB
WEATHER: CLEAR
NORTH APPROACH: Warm Springs Ave/ CR 468
SOUTH APPROACH: Warm Springs Ave/ CR 468

CITY: Wildwood
INTERSECTING ROUTE: N Timber Trail
DATE OF COUNT: Tuesday, January 28, 2020
ROAD CONDITION: GOOD
EAST APPROACH: N Timber Trail
WEST APPROACH: N Timber Trail
COUNT PERIODS:

COUNTY: Sumter
MILEPOST:

HEAVY VEHICLES (TRUCKS + BUSES)

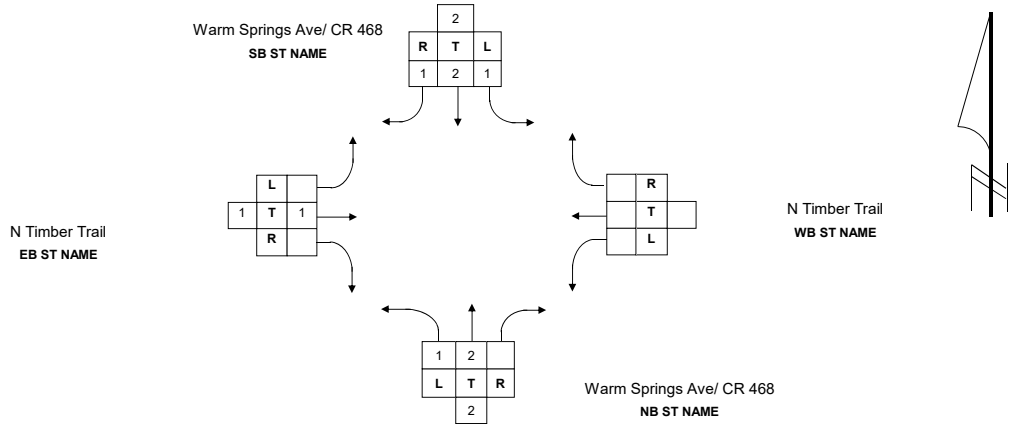
START	NORTHBOUND					SOUTHBOUND						EASTBOUND					WESTBOUND						GRAND
TIME	LEFT	THRU	RIGHT	RTOR	TOTAL	LEFT	THRU	RIGHT	RTOR	TOTAL	NS TOTAL	LEFT	THRU	RIGHT	RTOR	TOTAL	LEFT	THRU	RIGHT	RTOR	TOTAL	EW TOTAL	TOTAL
10:00	0	8	0	0	8	0	15	0	0	15	23	0	0	0	0	0	0	0	0	0	0	0	23
10:15	0	7	0	0	7	0	7	0	0	7	14	0	0	0	0	0	0	0	0	0	0	0	14
10:30	0	9	0	0	9	0	22	0	0	22	31	0	0	0	0	0	0	0	0	0	0	0	31
10:45	0	13	0	0	13	0	8	0	0	8	21	0	0	0	0	0	0	0	0	0	0	0	21
Total	**0**	**37**	**0**	**0**	**37**	**0**	**52**	**0**	**0**	**52**	**89**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**89**
11:00	0	9	0	0	9	0	15	0	0	15	24	0	0	0	0	0	0	0	0	0	0	0	24
11:15	0	12	0	0	12	0	11	0	0	11	23	0	0	0	0	0	0	0	0	0	0	0	23
11:30	0	15	0	0	15	0	10	0	0	10	25	0	0	0	0	0	0	0	0	0	0	0	25
11:45	0	20	0	0	20	0	12	0	0	12	32	0	0	0	0	0	0	0	0	0	0	0	32
Total	**0**	**56**	**0**	**0**	**56**	**0**	**48**	**0**	**0**	**48**	**104**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**104**
12:00	0	11	0	0	11	0	12	0	0	12	23	0	0	0	0	0	0	0	0	0	0	0	23
12:15	0	11	0	0	11	0	16	0	0	16	27	0	0	0	0	0	0	0	0	0	0	0	27
12:30	0	12	0	0	12	0	17	0	0	17	29	0	0	0	0	0	0	0	0	0	0	0	29
12:45	0	8	0	0	8	0	11	0	0	11	19	0	0	1	0	1	0	0	0	0	0	1	20
Total	**0**	**42**	**0**	**0**	**42**	**0**	**56**	**0**	**0**	**56**	**98**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**99**
13:00	0	19	0	0	19	0	9	0	0	9	28	0	0	0	0	0	0	0	0	0	0	0	28
13:15	0	6	0	0	6	0	19	0	0	19	25	0	0	0	0	0	0	0	0	0	0	0	25
13:30	0	7	0	0	7	0	12	0	0	12	19	0	0	0	0	0	0	0	0	0	0	0	19
13:45	0	13	0	0	13	0	6	1	0	7	20	0	0	0	0	0	0	0	0	0	0	0	20
Total	**0**	**45**	**0**	**0**	**45**	**0**	**46**	**1**	**0**	**47**	**92**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**92**
14:00	0	5	0	0	5	0	10	0	0	10	15	0	0	0	0	0	0	0	0	0	0	0	15
14:15	0	13	0	0	13	0	5	0	0	5	18	1	0	0	0	1	0	0	0	0	0	1	19
14:30	0	9	0	0	9	0	11	0	0	11	20	1	0	0	0	1	0	0	0	0	0	1	21
14:45	0	11	0	0	11	0	5	0	0	5	16	1	0	0	0	1	0	0	0	0	0	1	17
Total	**0**	**38**	**0**	**0**	**38**	**0**	**31**	**0**	**0**	**31**	**69**	**3**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**72**
15:00	0	23	0	0	23	0	11	0	0	11	34	0	0	1	0	1	0	0	0	0	0	1	35
15:15	0	8	0	0	8	0	17	0	0	17	25	1	0	0	0	1	0	0	0	0	0	1	26
15:30	0	21	0	0	21	0	13	0	0	13	34	1	0	0	0	1	0	0	0	0	0	1	35
15:45	0	19	0	0	19	0	16	0	0	16	35	0	0	0	0	0	0	0	0	0	0	0	35
Total	**0**	**71**	**0**	**0**	**71**	**0**	**57**	**0**	**0**	**57**	**128**	**2**	**0**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**3**	**131**
16:00	0	16	0	0	16	0	9	0	0	9	25	0	0	0	0	0	0	0	0	0	0	0	25
16:15	0	7	0	0	7	0	12	0	0	12	19	0	0	0	0	0	0	0	0	0	0	0	19
16:30	0	13	0	0	13	0	3	0	0	3	16	0	0	0	0	0	0	0	0	0	0	0	16
16:45	0	17	0	0	17	0	9	0	0	9	26	0	0	0	0	0	0	0	0	0	0	0	26
Total	**0**	**53**	**0**	**0**	**53**	**0**	**33**	**0**	**0**	**33**	**86**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**86**
17:00	0	6	0	0	6	0	3	0	0	3	9	0	0	0	0	0	0	0	0	0	0	0	9
17:15	0	6	0	0	6	0	2	0	0	2	8	0	0	0	0	0	0	0	0	0	0	0	8
17:30	0	6	0	0	6	0	2	0	0	2	8	0	0	0	0	0	0	0	0	0	0	0	8
17:45	0	8	0	0	8	0	1	0	0	1	9	0	0	0	0	0	0	0	0	0	0	0	9
Total	**0**	**26**	**0**	**0**	**26**	**0**	**8**	**0**	**0**	**8**	**34**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**34**

FLORIDA DEPARTMENT OF TRANSPORTATION

SUMMARY OF VEHICLE MOVEMENTS

SECTION:	62911.04	**CITY:**	Wildwood	**COUNTY:**	Sumter
MAJOR ROUTE:	Warm Springs Ave/ CR 468	**INTERSECTING ROUTE:**	N Timber Trail	**MILEPOST:**	
OBSERVER:	VHB	**DATE:**	1/28/2020		
WEATHER:	CLEAR	**ROAD CONDITION:**	GOOD		
REMARKS:					

FORM COMPLETED BY: **DATE:** 02/04/20



TIME	NORTHBOUND						SOUTHBOUND						TOTAL	EASTBOUND						WESTBOUND						TOTAL
BEGIN/END	**U**	**L**	**T**	**R**	**RTOR**	**TOT**	**U**	**L**	**T**	**R**	**RTOR**	**TOT**	**N/S**	**U**	**L**	**T**	**R**	**RTOR**	**TOT**	**U**	**L**	**T**	**R**	**RTOR**	**TOT**	**E/W**
10 - 11	3	1	640	0	0	**644**	0	0	629	30	0	**659**	**1,303**	0	37	0	12	0	**49**	0	0	0	0	0	**0**	**49**
11 - 12	2	5	856	0	0	**863**	1	0	631	32	0	**664**	**1,527**	0	28	0	10	0	**38**	0	0	0	0	0	**0**	**38**
12 - 13	2	2	802	0	0	**806**	0	0	711	39	0	**750**	**1,556**	1	29	0	7	0	**37**	0	0	0	0	0	**0**	**37**
13 - 14	0	5	685	0	0	**690**	0	0	686	29	0	**715**	**1,405**	2	30	0	0	0	**32**	0	0	0	0	0	**0**	**32**
14 - 15	2	2	703	0	0	**707**	2	0	659	29	0	**690**	**1,397**	1	31	0	4	0	**36**	0	0	0	0	0	**0**	**36**
15 - 16	2	4	726	0	0	**732**	0	0	659	40	0	**699**	**1,431**	0	39	0	8	0	**47**	0	0	0	0	0	**0**	**47**
16 - 17	2	9	734	0	0	**745**	0	0	719	30	0	**749**	**1,494**	0	22	0	6	0	**28**	0	0	0	0	0	**0**	**28**
17 - 18	2	5	909	0	0	**916**	0	0	563	32	0	**595**	**1,511**	0	19	0	7	0	**26**	0	0	0	0	0	**0**	**26**
TOTAL	15	33	6,055	0	0	**6,103**	3	0	5,257	261	0	**5,521**	**11,624**	4	235	0	54	0	**293**	0	0	0	0	0	**0**	**293**

Percentage	1.0%	0.5%	98.5%	0.0%	0.0%	100.0%	1.0%	0.0%	94.3%	4.7%	0.0%	100.0%	N/A	1.0%	80.0%	1.0%	18.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	N/A
Maximum	3	9	909	0	0	909	2	0	719	40	0	719	909	2	39	0	12	0	39	0	0	0	0	0	0	39
Minimum	0	1	640	0	0	0	0	0	563	29	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0
Total Heavy Veh	1		368	0	0	369	0		331	1	0	332	701	5		0	2	0	7	0		0	0	0	0	7
% Heavy Veh	2.1%		6.1%	#DIV/0!		6.0%	0.0%		6.3%	0.4%		6.0%	6.0%	2.1%		#DIV/0!	3.7%		2.4%	#DIV/0!		0.0%	#DIV/0!		#DIV/0!	2.4%

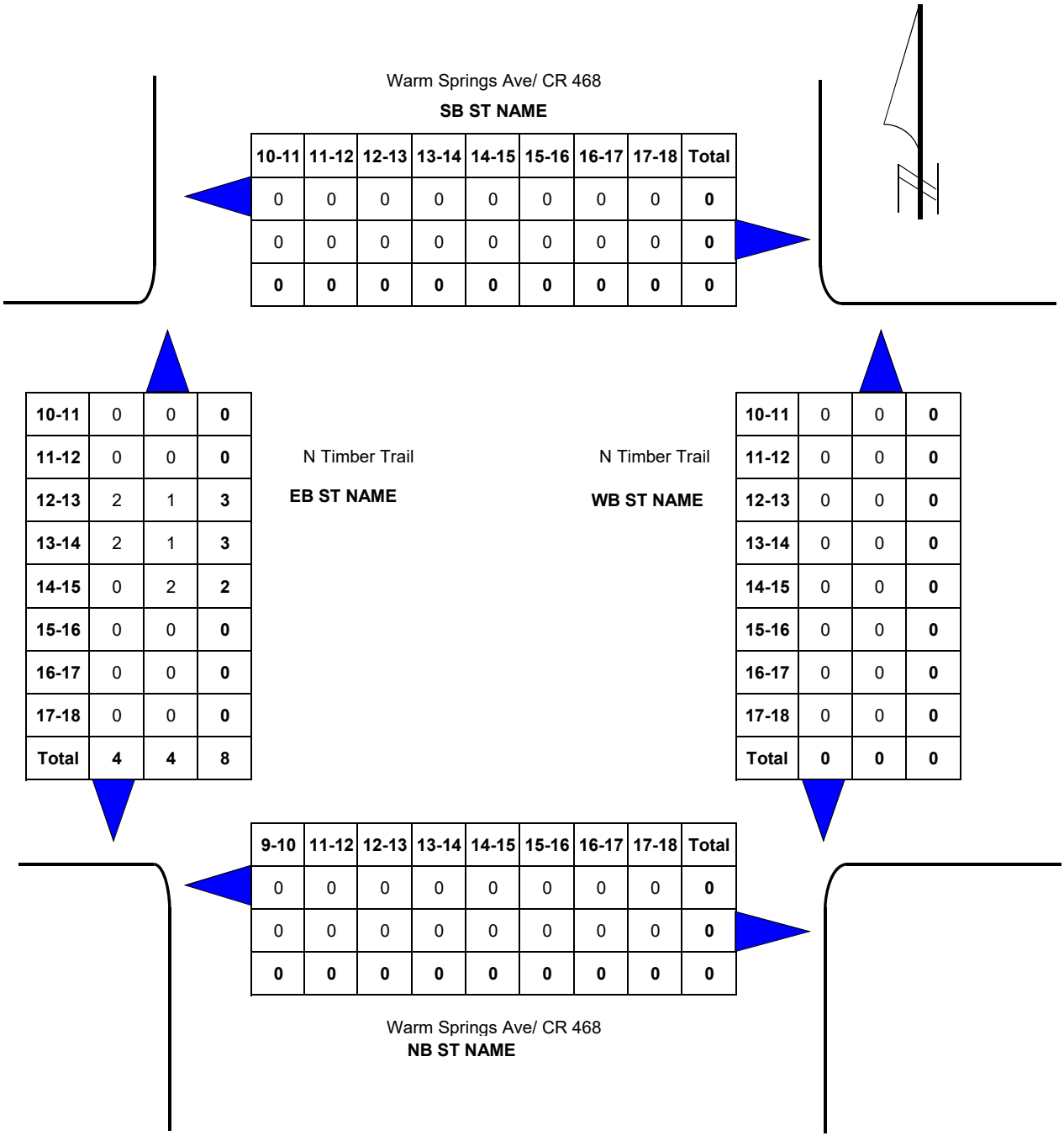
FLORIDA DEPARTMENT OF TRANSPORTATION

PEDESTRIAN MOVEMENT SUMMARY

SECTION	62911.04	**CITY**	Wildwood	**COUNTY**	Sumter
MAJOR ROUTE	Warm Springs Ave/ CR 468	**INTERSECTING ROUTE**	N Timber Trail		
OBSERVER	VHB	**DATE**	1/28/2020	**MILEPOST**	

REMARKS

FORM COMPLETED BY **DATE** 02/04/20



10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

10-11	0	0	**0**
11-12	0	0	**0**
12-13	2	1	**3**
13-14	2	1	**3**
14-15	0	2	**2**
15-16	0	0	**0**
16-17	0	0	**0**
17-18	0	0	**0**
Total	**4**	**4**	**8**

10-11	0	0	**0**
11-12	0	0	**0**
12-13	0	0	**0**
13-14	0	0	**0**
14-15	0	0	**0**
15-16	0	0	**0**
16-17	0	0	**0**
17-18	0	0	**0**
Total	**0**	**0**	**0**

9-10	11-12	12-13	13-14	14-15	15-16	16-17	17-18	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

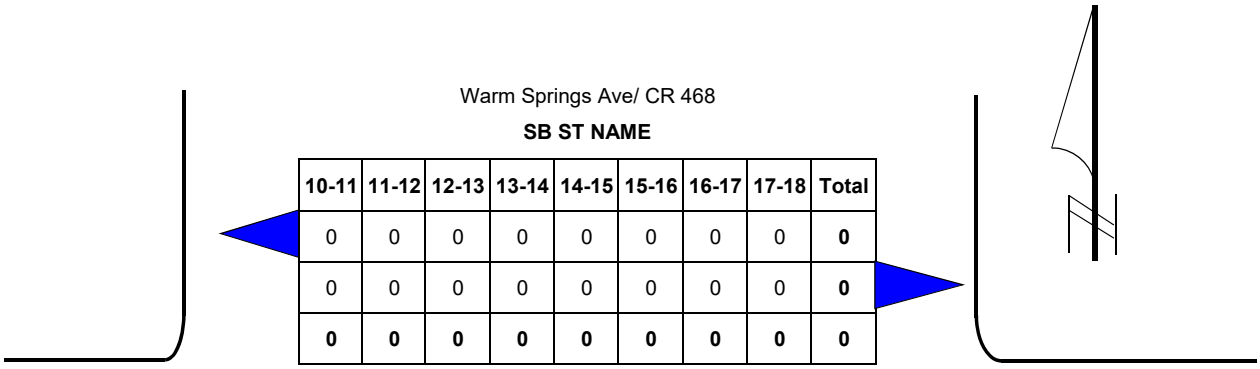
FLORIDA DEPARTMENT OF TRANSPORTATION

BICYCLE MOVEMENT SUMMARY

SECTION	62911.04	**CITY**	Wildwood	**COUNTY**	Sumter
MAJOR ROUTE	Warm Springs Ave/CR 468	**INTERSECTING ROUTE**	N Timber Trail		
OBSERVER	VHB	**DATE**	1/28/2020	**MILEPOST**	

REMARKS

FORM COMPLETED BY **DATE** 02/04/20



Warm Springs Ave/ CR 468

SB ST NAME

10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

10-11	0	0	**0**
11-12	0	0	**0**
12-13	0	0	**0**
13-14	0	0	**0**
14-15	0	0	**0**
15-16	0	0	**0**
16-17	0	0	**0**
17-18	0	0	**0**
Total	**0**	**0**	**0**

N Timber Trail

EB ST NAME

N Timber Trail

WB ST NAME

10-11	0	0	**0**
11-12	0	0	**0**
12-13	0	0	**0**
13-14	0	0	**0**
14-15	0	0	**0**
15-16	0	0	**0**
16-17	0	0	**0**
17-18	0	0	**0**
Total	**0**	**0**	**0**

9-10	11-12	12-13	13-14	14-15	15-16	16-17	17-18	Total
0	0	0	0	0	0	0	0	**0**
0	0	0	0	0	0	0	0	**0**
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Warm Springs Ave/ CR 468

NB ST NAME

ALL TRAFFIC SOLUTIONS

Extended Speed Summary Report

Generated by Travis Sears from Sumter County Sheriffs Office on Feb 17, 2020 at 10:44:20 AM

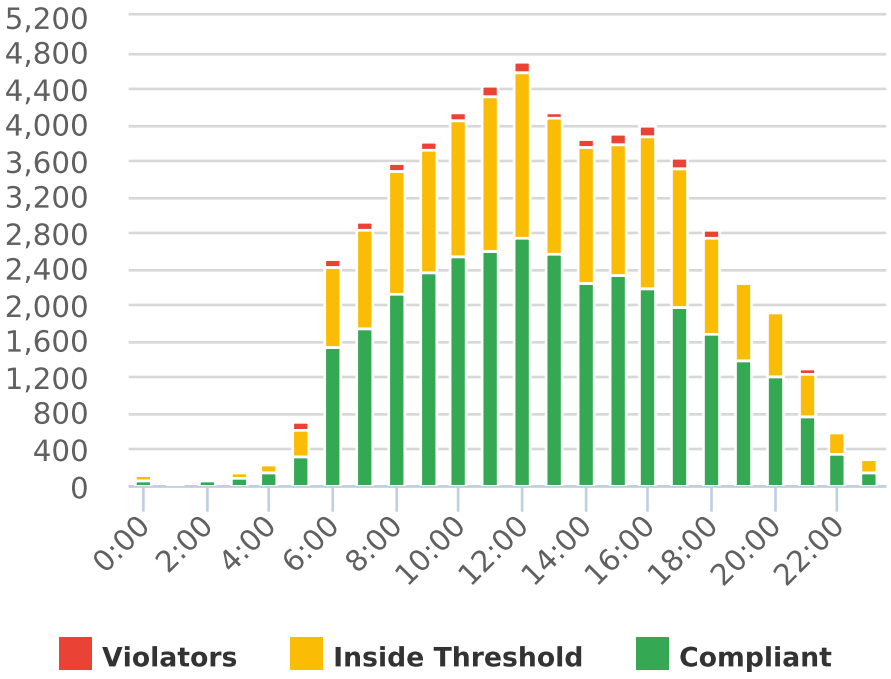
Time of Day: 0:00 to 23:59
Dates: 1/28/2020 to 2/7/2020

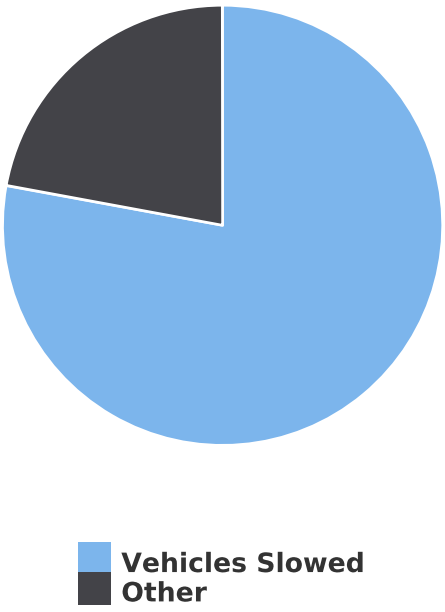
Site: Morse Blvd / Sandlewood Drive, SB

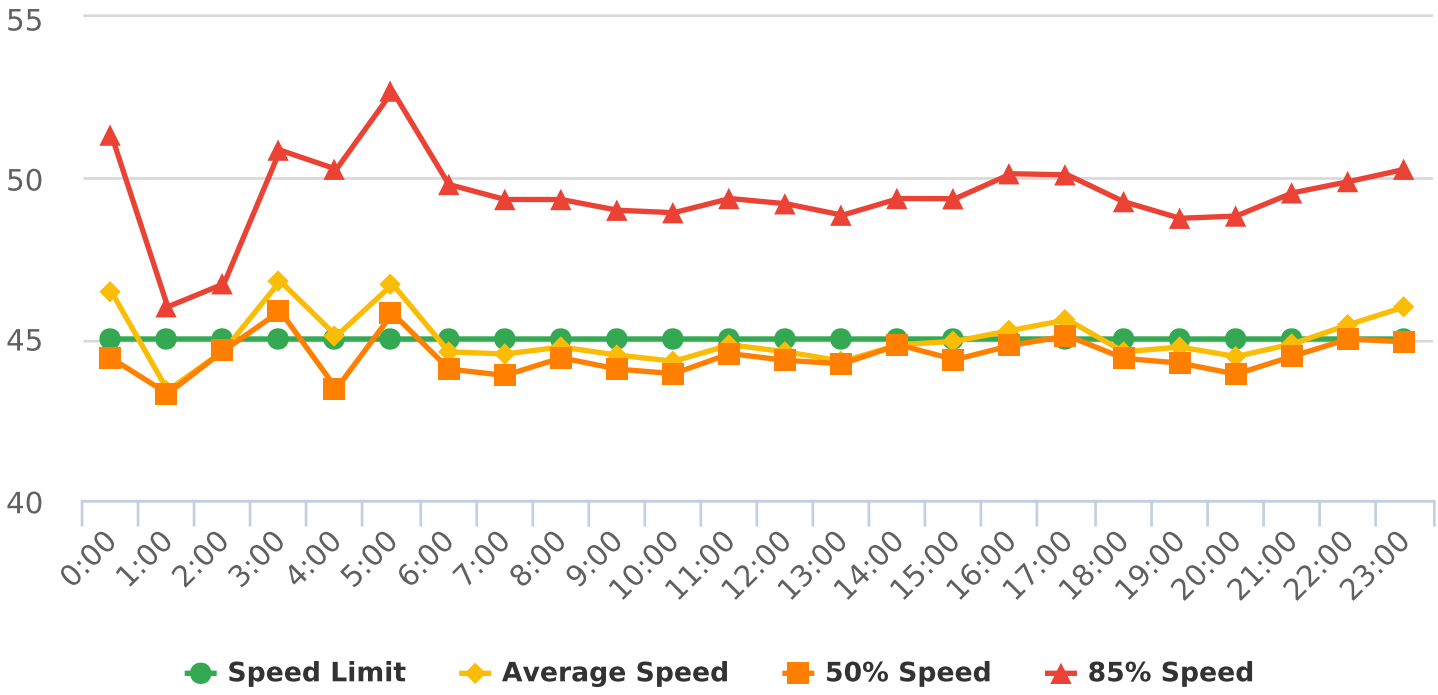
Overall Summary

Total Days of Data: 11
Speed Limit: 45
Average Speed: 45.01
50th Percentile Speed: 44.45
85th Percentile Speed: 49.47
Pace Speed Range: 40-50

Minimum Speed: 30
Maximum Speed: 84
Display Status: Dependent Messages
Average Volume per Day: 5117.8
Total Volume: 56296







ALL TRAFFIC SOLUTIONS

Extended Speed Summary Report

Generated by Travis Sears from Sumter County Sheriffs Office on Feb 17, 2020 at 10:44:20 AM

Time of Day: 0:00 to 23:59
Dates: 1/28/2020 to 2/7/2020

Site: Morse Blvd / Sandlewood Drive, SB

Hours	Sign Mode	Speed Limit	Total # Vehicles	Total # Violator	% Violator	Avg # Vehicles	Avg # Violator	Min Speed	Max Speed	Avg Speed	50% Speed	85% Speed	Sign Effectiveness
0:00	Dependent Messages	45	130	10	7.7 %	13.0	1.0	34	71	46.5	44.4	51.3	85.7 %
1:00	Dependent Messages	45	62	1	1.6 %	6.2	0.1	30	56	43.4	43.3	46.0	85.4 %
2:00	Dependent Messages	45	93	0	0.0 %	9.3	0.0	30	53	44.6	44.6	46.7	76.3 %
3:00	Dependent Messages	45	169	11	6.5 %	16.9	1.1	34	64	46.8	45.9	50.9	80.4 %
4:00	Dependent Messages	45	264	13	4.9 %	26.4	1.3	30	70	45.1	43.5	50.3	77.2 %
5:00	Dependent Messages	45	705	77	10.9 %	70.5	7.7	30	74	46.7	45.8	52.7	74.9 %
6:00	Dependent Messages	45	2521	91	3.6 %	252.1	9.1	30	70	44.6	44.1	49.8	76.6 %
7:00	Dependent Messages	45	2919	85	2.9 %	265.4	7.7	30	68	44.5	43.9	49.3	76.7 %
8:00	Dependent Messages	45	3566	75	2.1 %	324.2	6.8	30	69	44.8	44.4	49.3	75.8 %
9:00	Dependent Messages	45	3820	85	2.2 %	347.3	7.7	30	65	44.5	44.1	49.0	76.5 %
10:00	Dependent Messages	45	4137	103	2.5 %	376.1	9.4	30	78	44.3	43.9	48.9	72.5 %
11:00	Dependent Messages	45	4435	114	2.6 %	403.2	10.4	30	71	44.8	44.5	49.4	74.5 %
12:00	Dependent Messages	45	4687	104	2.2 %	426.1	9.5	30	69	44.6	44.3	49.2	74.6 %
13:00	Dependent Messages	45	4150	81	2.0 %	415.0	8.1	30	71	44.3	44.2	48.8	70.3 %
14:00	Dependent Messages	45	3827	86	2.2 %	382.7	8.6	30	65	44.8	44.8	49.4	74.5 %
15:00	Dependent Messages	45	3886	112	2.9 %	388.6	11.2	30	76	44.9	44.4	49.4	75.5 %
16:00	Dependent Messages	45	3983	110	2.8 %	398.3	11.0	30	75	45.3	44.8	50.1	78.7 %
17:00	Dependent Messages	45	3633	129	3.6 %	363.3	12.9	30	77	45.6	45.1	50.1	78.6 %
18:00	Dependent Messages	45	2833	79	2.8 %	283.3	7.9	30	67	44.6	44.4	49.3	81.0 %
19:00	Dependent Messages	45	2281	45	2.0 %	228.1	4.5	31	84	44.8	44.3	48.8	78.1 %
20:00	Dependent Messages	45	1959	37	1.9 %	195.9	3.7	31	71	44.5	43.9	48.8	82.2 %
21:00	Dependent Messages	45	1290	37	2.9 %	143.3	4.1	31	64	44.8	44.5	49.5	80.1 %
22:00	Dependent Messages	45	632	30	4.7 %	70.2	3.3	31	66	45.4	45.0	49.9	80.7 %
23:00	Dependent Messages	45	314	17	5.4 %	34.9	1.9	32	71	46.0	44.9	50.3	83.5 %
Total Vol/	Avg Speeds		56296	1532	3.5 %	5440.2	149.0	30	84	45.0	44.5	49.5	77.9 %
Total/Avg	w/o Feedback		0	0	0.0 %	0.0	0.0	0	0	0.0	0.0	0.0	0.0 %
Total/Avg	w/ Feedback		56296	1532	3.5 %	5440.2	149.0	30	84	45.0	44.5	49.5	77.9 %

Kimley»Horn

Morse Blvd at N Timber Trail
Hourly Traffic Volumes with Future VOSO Connection

			Morse Blvd			Morse Blvd			N Timber Trail			VOSO Future Connection		
			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND		
Start		End	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
10:00 AM	TO	10:15 AM	0	138	5	7	157	5	10	0	3	14	0	21
10:15 AM	TO	10:30 AM	1	168	5	7	153	9	9	0	4	15	0	23
10:30 AM	TO	10:45 AM	0	144	6	8	160	5	6	0	3	15	0	22
10:45 AM	TO	11:00 AM	0	190	6	9	159	11	12	0	2	13	0	19
11:00 AM	TO	11:15 AM	0	220	6	9	164	7	8	0	2	13	0	20
11:15 AM	TO	11:30 AM	2	222	8	11	150	11	8	0	4	10	0	16
11:30 AM	TO	11:45 AM	1	199	6	9	167	10	8	0	3	14	0	21
11:45 AM	TO	12:00 PM	2	215	7	11	150	4	4	0	1	12	0	18
12:00 PM	TO	12:15 PM	0	218	7	11	184	14	3	0	0	14	0	21
12:15 PM	TO	12:30 PM	0	199	7	10	198	10	6	0	3	16	0	24
12:30 PM	TO	12:45 PM	1	210	7	11	161	5	11	0	3	16	0	24
12:45 PM	TO	01:00 PM	1	175	6	9	168	10	9	0	1	13	0	20
01:00 PM	TO	01:15 PM	1	199	6	9	170	7	7	0	0	11	0	17
01:15 PM	TO	01:30 PM	0	178	7	10	174	9	8	0	0	12	0	18
01:30 PM	TO	01:45 PM	4	156	6	9	172	3	7	0	0	11	0	17
01:45 PM	TO	02:00 PM	0	152	7	11	170	10	8	0	0	12	0	19
02:00 PM	TO	02:15 PM	2	168	8	11	150	7	11	0	1	11	0	17
02:15 PM	TO	02:30 PM	0	184	6	9	154	6	8	0	1	11	0	16
02:30 PM	TO	02:45 PM	0	177	7	11	176	9	7	0	2	12	0	18
02:45 PM	TO	03:00 PM	0	174	7	11	179	7	5	0	0	11	0	17
03:00 PM	TO	03:15 PM	0	177	7	11	162	9	17	0	2	12	0	18
03:15 PM	TO	03:30 PM	1	173	7	11	167	10	11	0	2	10	0	16
03:30 PM	TO	03:45 PM	0	178	7	11	172	13	6	0	0	10	0	15
03:45 PM	TO	04:00 PM	3	198	8	12	158	8	5	0	4	9	0	13
04:00 PM	TO	04:15 PM	1	193	7	10	174	10	6	0	3	10	0	15
04:15 PM	TO	04:30 PM	1	172	7	11	220	4	3	0	1	9	0	14
04:30 PM	TO	04:45 PM	1	200	5	7	164	11	7	0	1	10	0	16
04:45 PM	TO	05:00 PM	6	169	5	8	161	5	6	0	1	8	0	13
05:00 PM	TO	05:15 PM	2	205	6	9	133	9	7	0	2	10	0	15
05:15 PM	TO	05:30 PM	0	256	6	9	161	10	2	0	3	8	0	12
05:30 PM	TO	05:45 PM	1	243	5	8	130	5	6	0	2	9	0	14
05:45 PM	TO	06:00 PM	2	205	7	10	139	8	4	0	0	8	0	12

Hourly Count Volumes

			Morse Blvd			Morse Blvd			N Timber Trail			VOSO Future Connection		
			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND		
Start Time		End Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
10:00 AM	TO	11:00 AM	1	640	22	31	629	30	37	0	12	57	0	85
11:00 AM	TO	12:00 PM	5	856	27	40	631	32	28	0	10	49	0	75
12:00 AM	TO	01:00 PM	2	802	27	41	711	39	29	0	7	59	0	89
01:00 PM	TO	02:00 PM	5	685	26	39	686	29	30	0	0	46	0	71
02:00 PM	TO	03:00 PM	2	703	28	42	659	29	31	0	4	45	0	68
03:00 PM	TO	04:00 PM	4	726	29	45	659	40	39	0	8	41	0	62
04:00 PM	TO	05:00 PM	9	734	24	36	719	30	22	0	6	37	0	58
05:00 PM	TO	06:00 PM	5	909	24	36	563	32	19	0	7	35	0	53

Pagones Theorem

Pagones Theorem			
Situation	**Approach configuration**	**Condition**	**Reduction of right turns**
1	Shared Left/ Through/Right	$R > 0.7A$ $0.7A \geq R > 0.35A$ $R \leq 0.35A$	Reduce R by 60 percent Reduce R by 40 percent Reduce R by 20 percent
2	Exclusive Left, Shared Through/ Right	$R > 3T$ $3T \geq R > T/3$ $R \leq T/3$	Reduce R by 60 percent Reduce R by 40 percent Reduce R by 20 percent
3	Any configuration with an exclusive right turn lane (usually ≥ 600 feet long)		Reduce R by 75 percent in all cases
4	Shared Left/Through and Shared Through/Right	$R > (T + L)$ $L > (T + R)$ $L = T = R$ (±10 vehicles) $L = T > 3R$ $R = T > 3L$ All other cases	Reduce R by 65 percent Use Situation 2 Reduce R by 40 percent Reduce R by 20 percent Reduce R by 50 percent Reduce R by 30 percent
5	Exclusive Left, Exclusive Through and Shared Through/Right	$R > T$ $T \geq R > T/2$ $T/2 \geq R > T/4$ $R \leq T/4$	Reduce R by 75 percent Reduce R by 50 percent Reduce R by 30 percent Reduce R by 15 percent

Where: L = number of left turning vehicles in approach;
T = number of through vehicles in approach;
R = number of right turning vehicles in approach; and
$A = (L + T + R)$.

Traffic Signal Warrant Worksheets – Existing Conditions

SIGNAL WARRANT 1 - EXISTING CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood
County: Sumter
Engineer: Kimley-Horn
Date: Wednesday, February 26, 2020

Major Street: Morse Boulevard
Minor Street: N Timber Trail
Lanes: 2
Lanes: 1
Critical Approach Speed: 45

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					10:00 AM - 11:00 AM	11:00 AM - 12:00 PM	12:00 PM - 1:00 PM	1:00 PM - 2:00 PM	2:00 PM - 3:00 PM	3:00 PM - 4:00 PM	4:00 PM - 5:00 PM	5:00 PM - 6:00 PM
Approach Lanes	**1**		**2 or more**									
Volume Level	**100%**	**70%**	**100%**	**70%**								
Both Approaches on Major Street	500 (400)	350 (280)	600 (480)	**420 (336)**	**1,303 (1,303)**	**1,526 (1,526)**	**1,556 (1,556)**	**1,405 (1,405)**	**1,395 (1,395)**	**1,431 (1,431)**	**1,494 (1,494)**	**1,511 (1,511)**
Highest Approach on Minor Street	150 (120)	**105 (84)**	200 (160)	140 (112)	47 (47)	36 (36)	35 (35)	30 (30)	34 (34)	45 (45)	27 (27)	25 (25)

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ■ Yes ☐ No
Excessive Delay: ☐ Yes ■ No
100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					10:00 AM - 11:00 AM	11:00 AM - 12:00 PM	12:00 PM - 1:00 PM	1:00 PM - 2:00 PM	2:00 PM - 3:00 PM	3:00 PM - 4:00 PM	4:00 PM - 5:00 PM	5:00 PM - 6:00 PM
Approach Lanes	**1**		**2 or more**									
Volume Level	**100%**	**70%**	**100%**	**70%**								
Both Approaches on Major Street	750 (600)	525 (420)	900 (720)	**630 (504)**	**1,303 (1,303)**	**1,526 (1,526)**	**1,556 (1,556)**	**1,405 (1,405)**	**1,395 (1,395)**	**1,431 (1,431)**	**1,494 (1,494)**	**1,511 (1,511)**
Highest Approach on Minor Street	75 (60)	**53 (42)**	100 (80)	70 (56)	**47** (47)	36 (36)	35 (35)	30 (30)	34 (34)	**45** (45)	27 (27)	25 (25)

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Source: Revised from NCHRP Report 457

SIGNAL WARRANT 2 - EXISTING CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood
County: Sumter
Engineer: Kimley-Horn
Date: Wednesday, February 26, 2020

Major Street: Morse Boulevard — Lanes: 2 — Critical Approach Speed: 45
Minor Street: N Timber Trail — Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

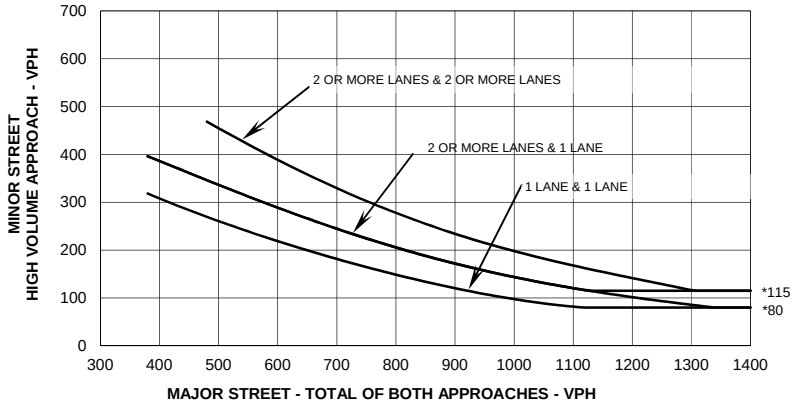
Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

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

Plot four volume combinations on the applicable figure below.

Four Highest Hours	Volumes	
	Major Street	Minor Street
10:00 AM - 11:00 AM	1,303	47
11:00 AM - 12:00 PM	1,526	36
12:00 PM - 1:00 PM	1,556	35
3:00 PM - 4:00 PM	1,431	45

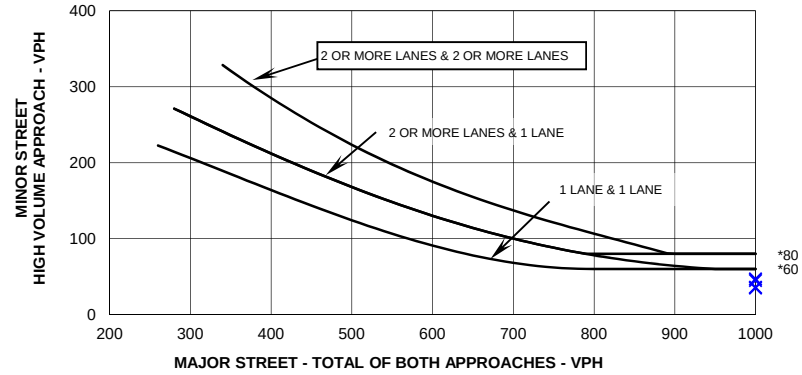
FIGURE 4C-1: Criteria for "100%" Volume Level



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

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



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

Source: Revised from NCHRP Report 457

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SIGNAL WARRANT 3 - EXISTING CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood
County: Sumter
Engineer: Kimley-Horn
Date: February 26, 2020

Major Street: Morse Boulevard — Lanes: 2 — Critical Approach Speed: 45
Minor Street: N Timber Trail — Lanes: 1

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 3 - PEAK HOUR

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

If all three criteria are fullfilled or the plotted point lies above the appropriate line, then the warrant is satisfed.

Unusual condition justifying use of warrant:

N/A

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

Peak Hour Volumes	
10:00 AM - 11:00 AM	
Major Street	1,303
Minor Street	47

Criteria

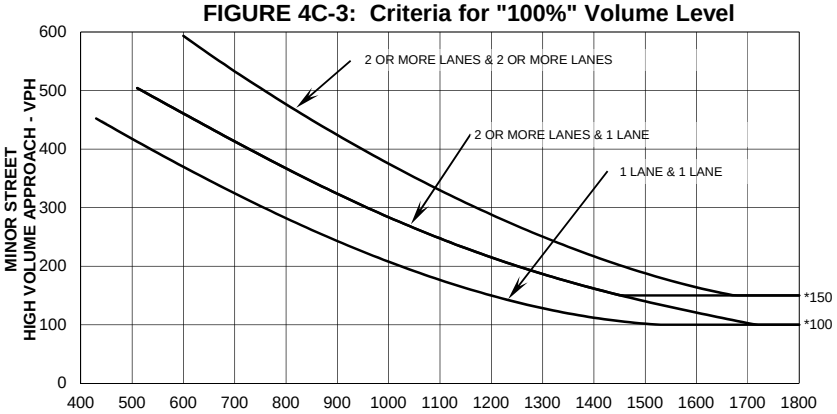
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?: ☐ Yes	☐ No	

2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	**1**	2
Volume Criteria*	**75**	100
Volume*	**47**	
Fulfilled?: ☐ Yes	■ No	

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	**3**	4
Volume Criteria*	**650**	800
Volume*	**1,350**	
Fulfilled?: ■ Yes	☐ No	

Plot volume combination on the applicable figure below.

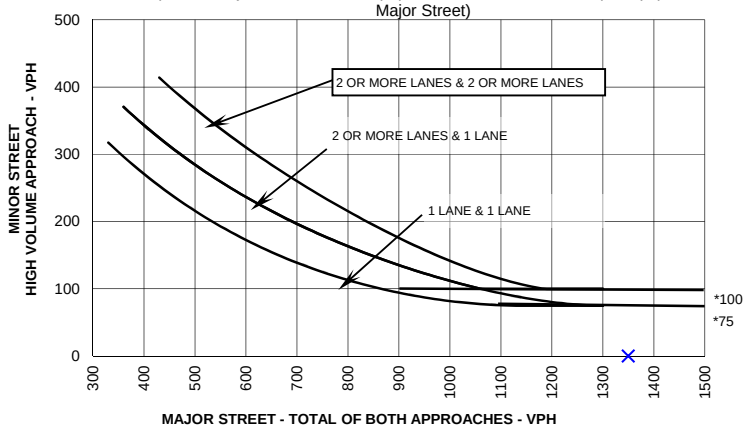
FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



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

Source: Revised from NCHRP Report 457

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Traffic Signal Warrant Worksheets – Future Conditions

SIGNAL WARRANT 1 - FUTURE VOSO CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood
County: Sumter
Engineer: Kimley-Horn
Date: Wednesday, February 26, 2020

Major Street: Morse Boulevard
Lanes: 2
Critical Approach Speed: 45
Minor Street: Future VOSO Connection
Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

Warrant 1 is satisfied if Condition A or Condition B is "100%" satisfied.
Warrant is also satisfied if both Condition A and Condition B are "80%" satisfied.

Condition A - Minimum Vehicular Volume

100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					10:00 AM - 11:00 AM	11:00 AM - 12:00 PM	12:00 PM - 1:00 PM	1:00 PM - 2:00 PM	2:00 PM - 3:00 PM	3:00 PM - 4:00 PM	4:00 PM - 5:00 PM	5:00 PM - 6:00 PM
Approach Lanes	**1**		**2 or more**									
Volume Level	**100%**	**70%**	**100%**	**70%**								
Both Approaches on Major Street	500 (400)	350 (280)	600 (480)	**420 (336)**	**1,356 (1,356)**	**1,593 (1,593)**	**1,624 (1,624)**	**1,470 (1,470)**	**1,465 (1,465)**	**1,505 (1,505)**	**1,554 (1,554)**	**1,571 (1,571)**
Highest Approach on Minor Street	150 (120)	105 (84)	200 (160)	**140 (112)**	91 (91)	79 (79)	95 (95)	74 (74)	72 (72)	66 (66)	60 (60)	56 (56)

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition B - Interruption of Continuous Traffic

Condition B is intended for application where the traffic volume is so heavy that traffic on the minor street suffers excessive delay.

Applicable: ■ Yes ☐ No
Excessive Delay: ☐ Yes ■ No
100% Satisfied: ☐ Yes ■ No
80% Satisfied: ☐ Yes ■ No

(volumes in veh/hr)	Minimum Requirements (80% Shown in Brackets)				Eight Highest Hours							
					10:00 AM - 11:00 AM	11:00 AM - 12:00 PM	12:00 PM - 1:00 PM	1:00 PM - 2:00 PM	2:00 PM - 3:00 PM	3:00 PM - 4:00 PM	4:00 PM - 5:00 PM	5:00 PM - 6:00 PM
Approach Lanes	**1**		**2 or more**									
Volume Level	**100%**	**70%**	**100%**	**70%**								
Both Approaches on Major Street	750 (600)	525 (420)	900 (720)	**630 (504)**	**1,356 (1,356)**	**1,593 (1,593)**	**1,624 (1,624)**	**1,470 (1,470)**	**1,465 (1,465)**	**1,505 (1,505)**	**1,554 (1,554)**	**1,571 (1,571)**
Highest Approach on Minor Street	75 (60)	53 (42)	100 (80)	**70 (56)**	**91 (91)**	**79 (79)**	**95 (95)**	**74 (74)**	**72 (72)**	**66 (66)**	**60 (60)**	**56 (56)**

Record 8 highest hours and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours . Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Source: Revised from NCHRP Report 457

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SIGNAL WARRANT 2 - FUTURE VOSO CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood
County: Sumter
Engineer: Kimley-Horn
Date: Wednesday, February 26, 2020

Major Street: Morse Boulevard — Lanes: 2 — Critical Approach Speed: 45
Minor Street: Future VOSO Connection — Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 2 - FOUR-HOUR VEHICULAR VOLUME

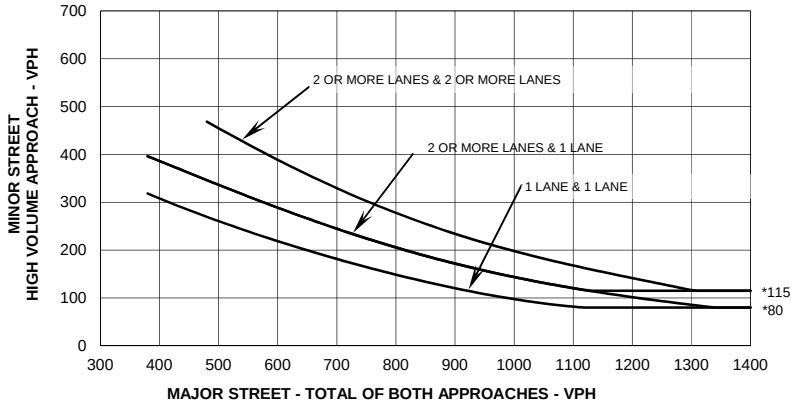
Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

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

Plot four volume combinations on the applicable figure below.

Four Highest Hours	Volumes	
	Major Street	Minor Street
10:00 AM - 11:00 AM	1,356	91
11:00 AM - 12:00 PM	1,593	79
12:00 PM - 1:00 PM	1,624	95
1:00 PM - 2:00 PM	1,470	74

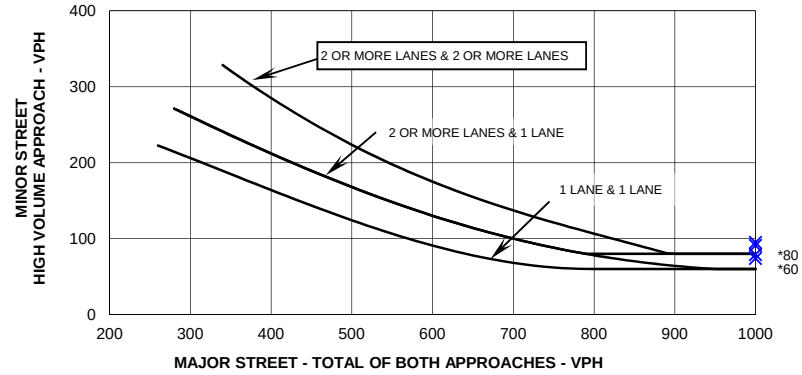
FIGURE 4C-1: Criteria for "100%" Volume Level



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

FIGURE 4C-2: Criteria for "70%" Volume Level

(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



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

Source: Revised from NCHRP Report 457

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SIGNAL WARRANT 3 - FUTURE VOSO CONDITIONS
TRAFFIC SIGNAL WARRANT SUMMARY

City: Wildwood | Engineer: Kimley-Horn
County: Sumter | Date: February 26, 2020

Major Street: Morse Boulevard | Lanes: 2 | Critical Approach Speed: 45
Minor Street: Future VOSO Connection | Lanes: 2

Volume Level Criteria

1. Is the critical speed of major street traffic > 70 km/h (40 mph) ? ■ Yes ☐ No
2. Is the intersection in a built-up area of isolated community of <10,000 population? ☐ Yes ■ No

If Question 1 or 2 above is answered "Yes", then use "70%" volume level ■ 70% ☐ 100%

WARRANT 3 - PEAK HOUR

Applicable: ■ Yes ☐ No
Satisfied: ☐ Yes ■ No

If all three criteria are fullfilled or the plotted point lies above the appropriate line, then the warrant is satisfed.

Unusual condition justifying use of warrant:

N/A

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

Peak Hour Volumes	
12:00 PM - 1:00 PM	
Major Street	1,624
Minor Street	95

Criteria

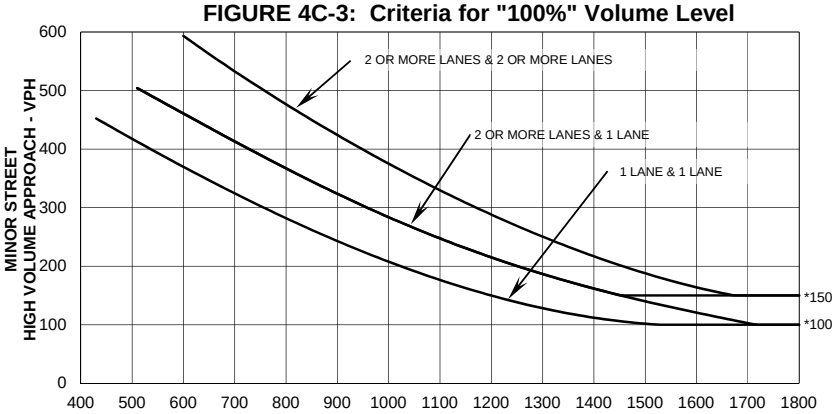
1. Delay on Minor Approach *(vehicle-hours)		
Approach Lanes	1	2
Delay Criteria*	4.0	5.0
Delay*		
Fulfilled?: ☐ Yes ☐ No		

2. Volume on Minor Approach *(vehicles per hour)		
Approach Lanes	1	**2**
Volume Criteria*	75	**100**
Volume*		**95**
Fulfilled?: ☐ Yes ■ No		

3. Total Entering Volume *(vehicles per hour)		
No. of Approaches	3	**4**
Volume Criteria*	650	**800**
Volume*		**1,755**
Fulfilled?: ■ Yes ☐ No		

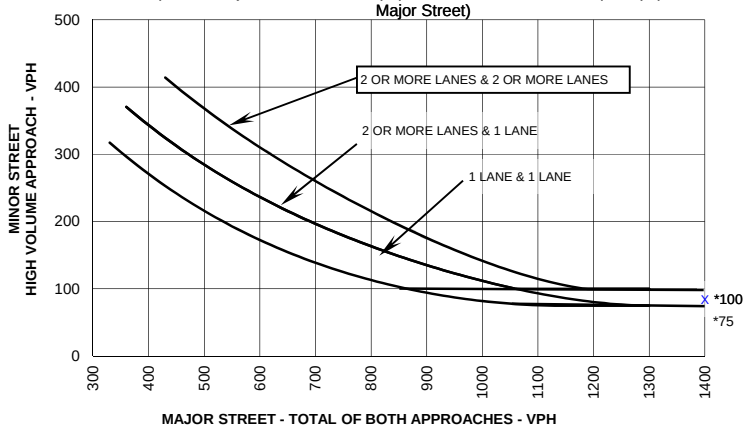
Plot volume combination on the applicable figure below.

FIGURE 4C-3: Criteria for "100%" Volume Level



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

FIGURE 4C-4: Criteria for "70%" Volume Level
(Community Less than 10,000 population or above 70 km/hr (40 mph) on Major Street)



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

Source: Revised from NCHRP Report 457

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