

GAP STUDY REVIEW MEMO

Date: January 4, 2021

Subject: Anclote Harbor Apartments Gap Study Review Comments

City of Tarpon Springs, Florida

American Project No: 5169367

American Consulting staff reviewed the Gap Study for the Anclote Harbor project and offer the following comments. Also see attached redlines.

1. In the Narrative section no background information is provided regarding US 19 or the project location. Provide the city and county where the project is located. What type of facility is US 19? What is the posted speed of US 19?
2. In Figure 2, Figure 3 and Figure 4 remove "southbound" from the legend. The ingress traffic technically travel westbound then northbound before making a U-turn southbound.
3. The study does not mention that the location of the offset left-turns are preliminary. Also, no narrative regarding storage length or how storage length will be determined for the offset left turns is provided.
4. Note: A five second gap at the posted speed limit of 55 mph equates to 323 feet gap. None of the field trial information regarding how a five second gap was determined to be sufficient was provided. Please provide information from a similar study completed for District 7 FDOT or an ITE/FDOT/FHWA manual reference stating that five seconds is an adequate gap duration for crossing three lanes of traffic. The FDOT MUTS indicates in Table 8-1 that 7.1 seconds should be used for a right turn from minor on a six lane facility.
5. Table 2,
 - a. Project traffic should be updated to represent the total number of vehicle trips exiting the project driveway (108 and 70).
 - b. Project traffic from southbound US 19 making the U-turn to the right turn lane into the project driveway is not discussed.
6. The data sheets refer to US 41, this should be US 19.

For any questions or concerns, please call Patricia at the City to coordinate a meeting if required with Consultant reviewer.

December 29, 2020

Ms. Patricia L. McNeese, AICP
Principal Planner
City of Tarpon Springs
324 East Pine Street
Tarpon Springs, Florida 34688

RE: **Anclote Harbor Apartments**
East of US 19 and North of E Live Oak Street
City of Tarpon Springs, Florida
Gap Study

Dear Ms. McNeese,

This gap study for the residential development of Anclote Harbor Apartments was conducted following the direction of the Florida Department of Transportation (FDOT) to require offset left-turn median openings adjacent to the project site for access to US 19.

Add location (city, county)
No background information for US 19 is provided. What type of roadway? What is the posted speed?

Narrative

This gap study was conducted to estimate the time duration and number of gaps available on US 19 at the proposed Anclote Harbor project site driveway. A gap is defined in the Florida Department of Transportation's (FDOT) *Manual on Uniform Traffic Studies* (MUTS) as "the time duration between the rear bumper and the front bumper of two consecutive vehicles" (**Figure 1**). For the purposes of this study an available gap was identified as a break in traffic across all three northbound or southbound lanes of US 19.

Figure 1: Example Gap from Data Collection



Based upon discussions with the Florida Department of Transportation (FDOT), an offset left-turn median opening will be required for the project to improve the safety of the ingress and egress movements to the proposed project. **Figure 2** below shows the ingress and egress movements associated with an offset left-turn median opening.

Figure 2: Proposed Offset Left-Turn Median Opening

Aren't the locations of the U-turns preliminary at this time? Storage length for the U-turns is not provided.

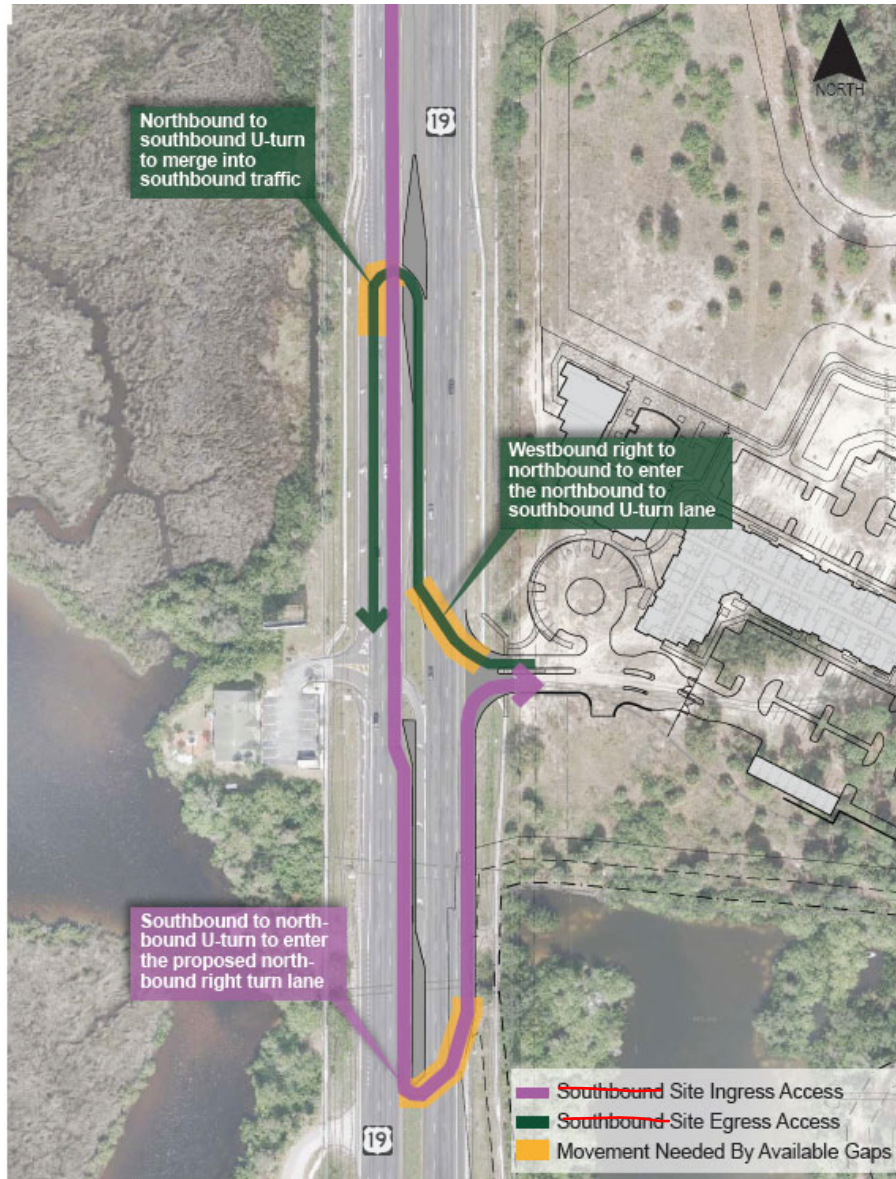


Figure 3 and Figure 4 identify the anticipated project traffic from the proposed project in the AM and PM peak hour periods, respectively, and the number of project trips that will need to utilize the available gaps.

Figure 3: AM Peak Hour Project Trips (7AM to 8AM)

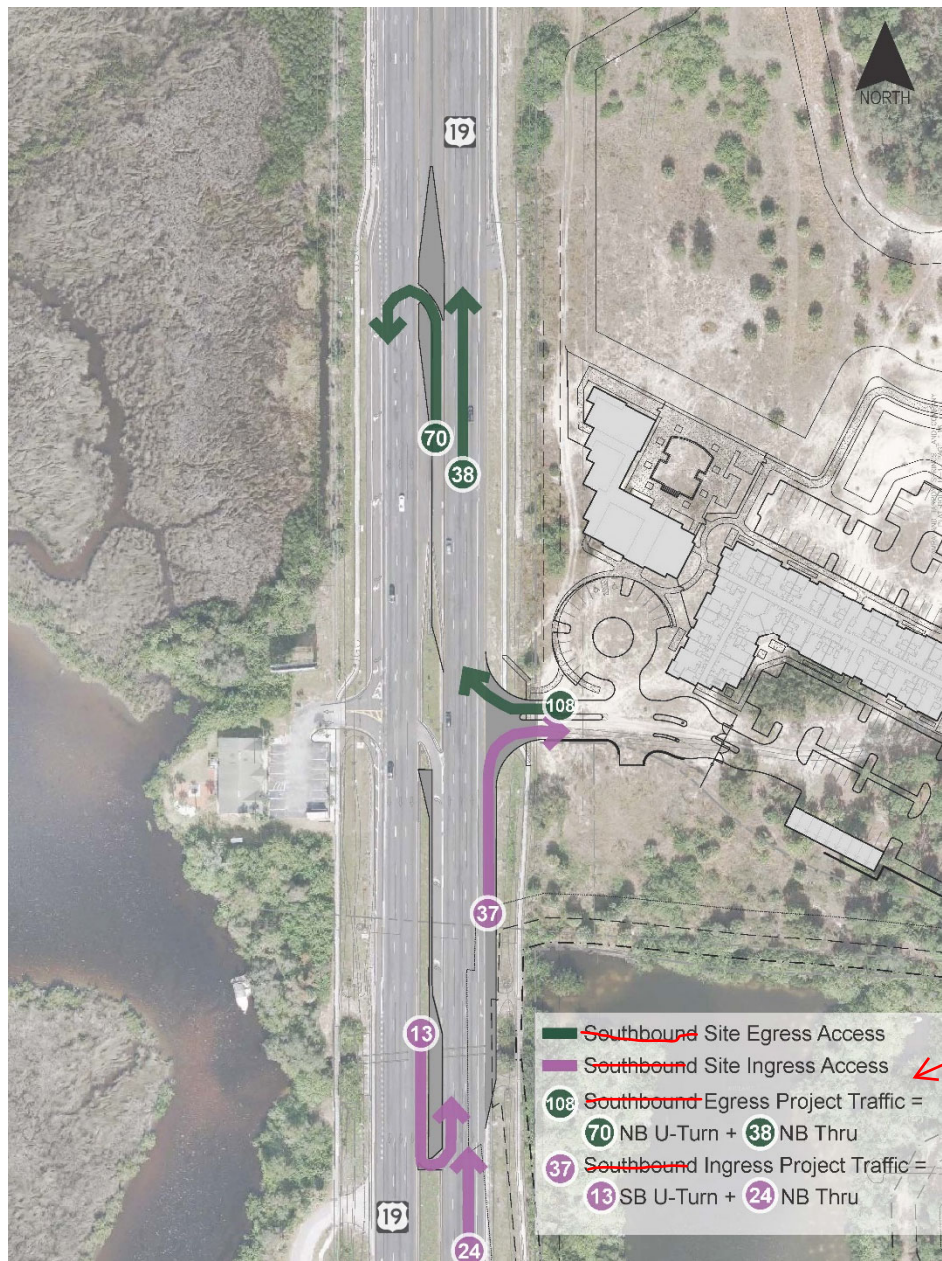
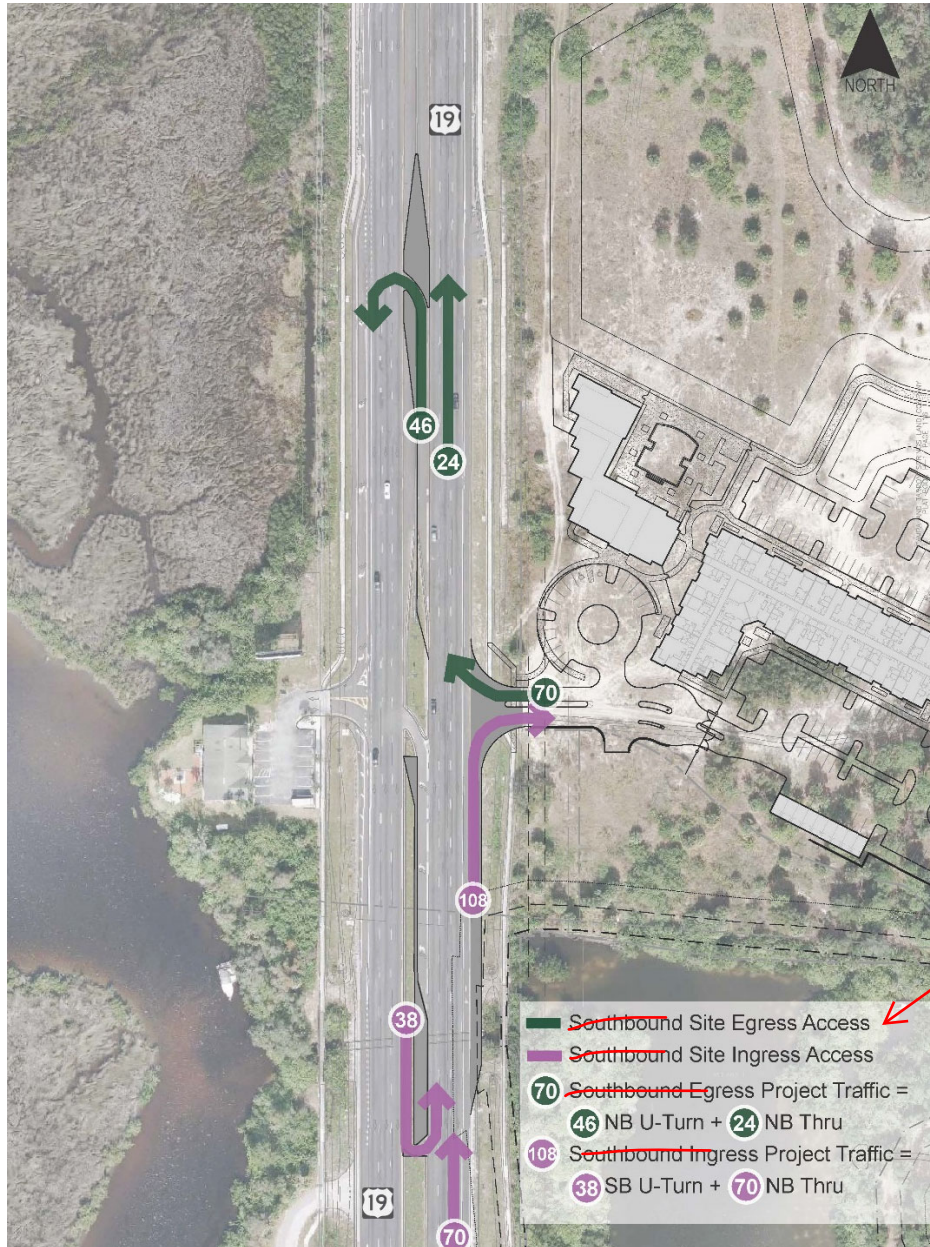


Figure 4: PM Peak Hour Project Trips (4PM to 5PM)



Remove "Southbound" and just label traffic egress or ingress

Data Collection

Data collection for the gap study was conducted on Thursday, October 1, 2020 during the AM (7 AM to 9 AM) and PM (4 PM to 6 PM) peak-hours at the proposed Anclote Harbor project site driveway. Based upon field trials along US 19 at the proposed project driveway location, a 5 second gap was determined to be needed to conduct the westbound right-turn maneuver to cross the three northbound lanes and enter the northbound to southbound u-turn lane, as well as to conduct the southbound to northbound u-turn to enter the proposed northbound right-turn lane. A 5 second gap was also determined to be sufficient to perform the northbound to southbound u-turn maneuver to enter the southbound US 19 through movement. The gaps identified in the data collection were a result of the northbound and southbound traffic being stopped at the adjacent traffic signals of Beckett Way (to the north) and Spruce Street (to the south).

An example of a 5 second gap near the proposed project driveway is shown in **Figure 5**.

Figure 5: Example of 5 Second Gap (Looking Southbound)



Results

The data was reviewed for the number of gaps in both the northbound and southbound directions and summarized for the minimum five (5) second gaps and a minimum of ten (10) second gaps in duration. The number of gaps of ten (10) seconds or more identifies the ample amount of gaps which will allow for multiple vehicles to perform the specific maneuvers shown in **Figure 2**.

The number of gaps with a duration of at least five (5) seconds and at least ten (10) seconds during the AM and PM peak hours of data collection is provided in **Table 1**.

Table 1: Available Gap Summary

Time Period	Number of Gaps at Least 5 Seconds in Duration		Number of Gaps at Least 10 Seconds in Duration	
	Northbound	Southbound	Northbound	Southbound
7 AM to 8 AM	159	88	86	29
8 AM to 9 AM	166	118	77	48
4 PM to 5 PM	94	160	34	53
5 PM to 6 PM	91	150	29	55

A comparison of the project trips (i.e. required gaps) to the number of northbound available gaps is summarized in **Table 2** and in **Figure 6**. It should be noted that the gaps which significantly exceed ten seconds will allow multiple vehicles to perform the specific maneuvers. In the northbound direction, the longest gap duration observed was 86 seconds during the AM peak hours and 47 seconds during the PM peak hours.

Table 2: Northbound US 19 Gap Analysis

Northbound – US 19			
US 19 Peak Hour	Number of Gaps >= 5 Seconds	Project Traffic*	Number of Gaps >= 10 Seconds**
7 AM to 8 AM	159	70	86
4 PM to 5 PM	94	46	34

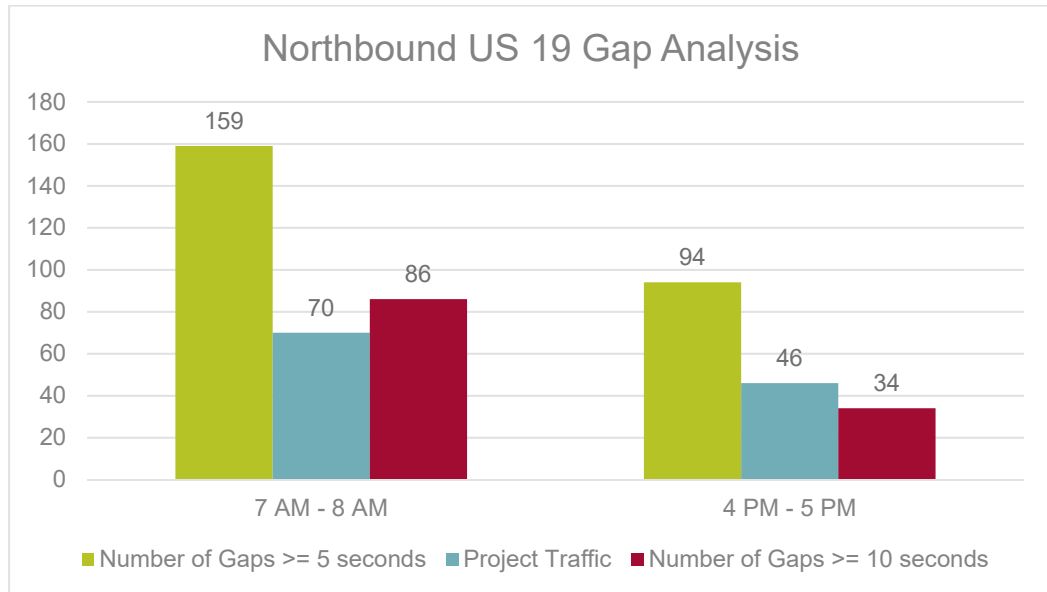
*Northbound U-Turn (Exiting Peak Hour Trips)

**Gap times range from 10 seconds to 86 seconds

Also need to show that the 13 vehicle trips from southbound US 19 to northbound into the project driveway have adequate number of gaps

Should this be 108 and 70? That is the number of vehicles making a northbound movement from the project driveway

Figure 6: Northbound US 19 Gap Analysis



A comparison of the project trips to the number of southbound gaps is summarized in **Table 3** and **Figure 7**. It should be noted that the gaps which significantly exceed ten seconds will allow multiple vehicles to make the u-turn movement into southbound traffic. In the southbound direction, the longest gap duration observed was 52 seconds during the AM peak hours and 74 seconds during the PM peak hours.

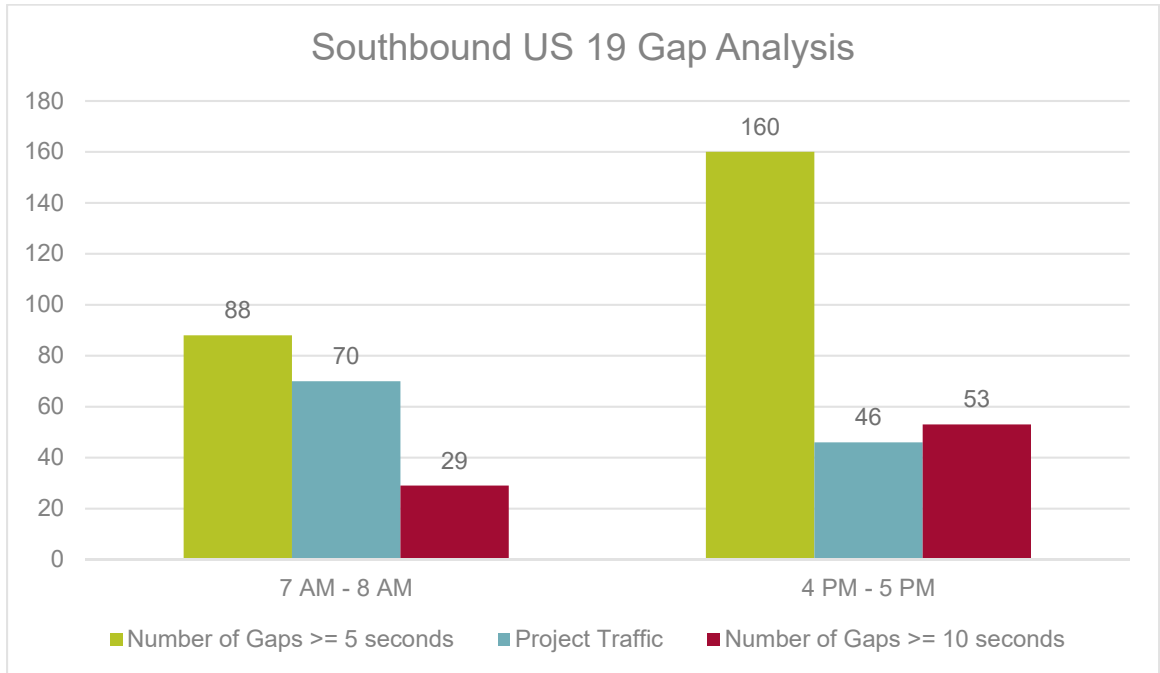
Table 3: Southbound US 19 Gap Analysis

Southbound – US 19			
US 19 Peak Hour	Number of Gaps >= 5 Seconds	Project Traffic*	Number of Gaps >= 10 Seconds**
7 AM to 8 AM	88	70	29
4 PM to 5 PM	160	46	53

*Northbound U-Turn (Exiting Peak Hour Trips)

**Gap times range from 10 seconds to 86 seconds

Figure 7: Southbound US 19 Gap Analysis




Conclusion

Based upon the gap study data collected and the projected number of project trips (i.e. required gaps needed), the gap study results indicate that there are anticipated to be a sufficient number of available gaps on US 19 adjacent to the proposed project to meet the demand of the project.

Please review this analysis and let us know if you have any questions.

Very truly yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Christopher Hatton, P.E.
Senior Vice-President



Kelly Fearon, P.E.
Traffic Engineer

Attachments: Data Collection

Copy To: Joel Provenzano, FDOT



Prepared by National Data & Surveying Services

Gap Study

Northbound

Location: US 41 & Legendary Tattoos Dwy
City: Tarpon Springs, FL

Day: Thursday
Date: 10/1/2020

TIME	DURATION (in seconds)										
7:00	3	3	6	8	5	13	16				
7:01	3	10	14	7	23						
7:02	5	39	11								
7:03	4	46									
7:04	3	4	4	4							
7:05	4	9	5	4	23	25					
7:06	27	9	18								
7:07	5	22	21								
7:08	6	3	4	3	3	18					
7:09	3	5	7	3	8	4	6	33			
7:10	27	86									
7:11											
7:12	3										
7:13	4	4	7	6	3	12					
7:14	3	11	4	6	40						
7:15	4	17	3	19	45						
7:16	5	6									
7:17	3	4	10	9	19						
7:18	4	20	3	9	41						
7:19	4	3	6	33							
7:20	3	4	4	5	3	4					
7:21	3	12	4	17							
7:22	13	12	74								
7:23	3	3	3								
7:24	3	7	27								
7:25	3	4	3	4	4	14					
7:26	9	5	16	6	12	16					
7:27	9	7	17	13	3						
7:28	10	6	36	3	3						
7:29	5	3									
7:30	11	23	3	7	40						
7:31	22	44									
7:32	22										
7:33	4	5	3	4	4	3	8				
7:34	4	11	3	4	5	6					
7:35	40	19									
7:36	5	4	9	3	27	3					
7:37	4	10	3	4	3	3					
7:38	3	4	4	7	3	3	3	5	3	11	
7:39	11	23	11	4	27						
7:40	5	4	3	10	5	14					
7:41	3	9	5	5	3	6	3				
7:42	3	3	7	4	13						
7:43	4	22	24	4	36						
7:44	4	3	21								
7:45	12	4	3								
7:46	3	4	3	3	5	6	6				
7:47	14	6	4	3	34						
7:48	17	12	9	3	6						
7:49	26	17	3	3							
7:50	5	4	9	3	3	5	11				
7:51	5	4	4	4	11	5	24				
7:52	22	3	3	4	3	3					
7:53	4	5	17	7	5	3	13	4			
7:54	3	5	18	3	3						
7:55	3	3	5	4	6	13					
7:56	16	12	27	5							
7:57	4	4	4	4	6	7	5	28			
7:58	3	3	6	7	3	3	3	8			
7:59	11	6	6								

Data was collected for gaps of at least 3 seconds in duration

8:00	35	52											
8:01	7	4	9	10									
8:02	13	8	6	4									
8:03	3	3	5	11	6	3							
8:04	4	22	5	6	31								
8:05	7	3	3	6	17								
8:06	29	6	5	5	3	6							
8:07	3	4	3	3	3	3	3	4					
8:08	8	5	5	3	25	13							
8:09	24	3	4	3	3	7							
8:10	23	10	5	4	3								
8:11	3	5	3	6	7	6							
8:12	3	4	14	4	9	22	3						
8:13	3	6	13	7	7	5	5	29					
8:14	4	36											
8:15	11	4	4	4									
8:16	3	3	10	8	5	7	26						
8:17	24	10	3	4									
8:18	3	5	4	5	24	21							
8:19	4	3	3										
8:20	3	3	5	3	5	4	6						
8:21	23	3	10	29									
8:22	7	5	29	18									
8:23	3	3	4	3									
8:24	3	3	5	9	4	4	4	11					
8:25	3	3	7	10	3	6	15						
8:26	5	3	5	32	4								
8:27	8	30											
8:28	4	4	4	4	7	5							
8:29	15	5	6	3	4	10	9	8					
8:30	6	12	5	23	3	3							
8:31	3	5	17	5	7	4							
8:32	3	3	3	3	5	4	3						
8:33	6	18	4	17	5	9							
8:34	26	5	15										
8:35	32	6	8	6									
8:36	5	3	4	17									
8:37	3	4	9	4	11	12							
8:38	43	17											
8:39	5	14	41										
8:40	10	4											
8:41	3	4	15	7	3	22							
8:42	3	12	18	4	4								
8:43	5	7	68										
8:44	6	3											
8:45	3	4	7	14									
8:46	4	5	14	5	3	3							
8:47	5	3	5	82									
8:48	4	3											
8:49	3	5	4	7	7	36							
8:50	4	19	8										
8:51	6	4	29	11									
8:52	7	29											
8:53	8	19											
8:54	5	13	17	3	4	12							
8:55	12	7	3	4	8	4	20						
8:56	47	3											
8:57	3	4	4	3									
8:58	4	3	4	3	3	15	3	8					
8:59	26	6	20										

Data was collected for gaps of at least 3 seconds in duration

16:00	3	4	4										
16:01	26	3	4	3									
16:02													
16:03	5	3	17	4									
16:04	7	3	11	5	18	5							
16:05	3	4											
16:06	3	5											
16:07	14												
16:08	3	4	5	4	5	3	9	3	15				
16:09	5	3											
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16:28	3	16	7										
16:29	4	20	9	3									
16:30	3	3	3	5	4	4	3						
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16:34	3	3	3	6	4								
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16:37	11	11	6	5	4	5	11						
16:38	12	3	3	7									
16:39	4												
16:40	3	3											
16:41	3	3	3	6	3	8	4	3	8	10			
16:42	13	3	3										
16:43	3	9											
16:44	3												
16:45	16	5	3	4	5	20							
16:46	12												
16:47	8	5	3	3	4	3	4						
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16:50	3	3	3	4	30	3	5	3					
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16:55	11	5											
16:56	3	3											
16:57	3	5	13										
16:58	5	5	7	40									
16:59	3	4	5	4	8	3	4						

Data was collected for gaps of at least 3 seconds in duration

17:00	3											
17:01												
17:02	6	5	6	4	46							
17:03	7	3	3									
17:04	3	4	3									
17:05	5											
17:06	3	4	13	6	3	3	3	36				
17:07	3	3										
17:08	3											
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17:10	4	6	12	9	5	4						
17:11	6	4	21									
17:12	5	3	6									
17:13												
17:14	3	6	5	4	5	9	6					
17:15	7	5	3	3	6							
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17:18	3	5										
17:19	5	4	21	3								
17:20	18	13	3									
17:21	3	3										
17:22	3	17										
17:23	9	3	3	3	6	5	19	3				
17:24	4	5	3	3								
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17:27	5	8	11	5	5	4	9	11				
17:28	8	5										
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17:31	3	15	4	5	14	12						
17:32	3	5	5	4								
17:33	6	3										
17:34	3											
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17:36	4	7	3	3	6	13						
17:37	4	3										
17:38	3	3										
17:39	9	6	4	4	6							
17:40	3	4	28									
17:41	3	4	3	4								
17:42	5	5										
17:43	3	3	3	14								
17:44	7	3	5	4	8	6	6	4	3			
17:45	5	18	3	7								
17:46	3	3										
17:47	11											
17:48	19	47										
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17:53	3	3	16									
17:54	3	3										
17:55	3											
17:56	3	4	23	5	5	26						
17:57	3	8										
17:58	6	5	3	3								
17:59	3	3										

Data was collected for gaps of at least 3 seconds in duration

US 19

Prepared by National Data & Surveying Services

Gap Study

Southbound

Location: US 41 & Legendary Tattoos Dwy
City: Tarpon Springs, FL

Day: Thursday
Date: 10/1/2020

TIME	DURATION (in seconds)									
7:00	3	5	5							
7:01	3	3	3	33						
7:02	32									
7:03	4	3	7							
7:04	3	4	3	3	3					
7:05	6	18								
7:06	4	5	15	22						
7:07	4	6								
7:08	3	3	4							
7:09	4	4	9							
7:10	5	4	3	48						
7:11	20	10								
7:12										
7:13	3	4	4	3						
7:14	3	19	41							
7:15	5	4	3							
7:16	4									
7:17	5									
7:18	3	5	3	6	3	4	8	4	22	
7:19	10	3	3							
7:20										
7:21	4	4	3	4	4	5	3	5		
7:22	3	3	3	9						
7:23	7	19								
7:24	3	3								
7:25	9	4	3	4	3					
7:26	5	13	4	5	9					
7:27	3	17	16							
7:28	4	3	5							
7:29	7	3	4	3						
7:30	3	4	4	5	52					
7:31	3									
7:32	4									
7:33	3	3	4							
7:34	4	3	17							
7:35	9	14	7	3	4	4	5	4		
7:36	9	3								
7:37	3	3								
7:38	3	6								
7:39	6	5	5	40						
7:40	3	5								
7:41	3	3								
7:42	4	4	4	3						
7:43	9	3	8	4	8	26				
7:44	8	9								
7:45										
7:46	3	6	3	4						
7:47	8	5	10	7	6	5	11			
7:48	7	16	4	4	3					
7:49										
7:50	5	7	3	10						
7:51	6	5	4	13	7	4	40			
7:52	3									
7:53	3	3								
7:54	3	3	3	4	3	5	5	4		
7:55	5	3	3	4	8	8	4	3	6	
7:56	34	17								
7:57	3	4	4							
7:58	4	4	4	5	3	4	8			
7:59	3	3	8							

Data was collected for gaps of at least 3 seconds in duration

8:00	14	3	6	5	12	3	16													
8:01	3																			
8:02	3	4	5	5	4															
8:03	4	5	3	3																
8:04	3	4	4	3	3	4	5	4	11	7	5									
8:05	3	6	3	3	4	3														
8:06	3	5	3	3	3															
8:07	4	3	3	4	4															
8:08	9	3	9	7	17															
8:09	6	16	4																	
8:10	3	3																		
8:11	4	3	3	3	3	7														
8:12	7	5	5	7	3	3	4	9												
8:13	4	9	4	8	3															
8:14	5																			
8:15	3	4	4	5	6	11														
8:16	4	6	3	39																
8:17	4	7	27	4	5															
8:18	3																			
8:19	3	6	7																	
8:20	8	5	5	5	5	15														
8:21	23	4	21																	
8:22																				
8:23	11																			
8:24	3	3	3	3	3	3	5	15												
8:25	3	35	41																	
8:26	5	3																		
8:27	4	4																		
8:28	8	4																		
8:29	5	13	4	3	25	25														
8:30	8	7	5																	
8:31																				
8:32	4	5																		
8:33	3	10	26	20																
8:34	11	23	3																	
8:35	3																			
8:36																				
8:37	4	4	12	3	3	7	24													
8:38	19																			
8:39	3	3	4																	
8:40	7	3	7	3																
8:41	3	15	4	3	18	13														
8:42	3	22	7	10	25															
8:43	5																			
8:44	3	3	4	5																
8:45	3	5	3	3	3	3	22	5												
8:46	20	12	3	11																
8:47	3																			
8:48	3	4	6																	
8:49	5	5	12	42																
8:50	25	7	15																	
8:51	3	3																		
8:52	5	8	4	9	19															
8:53	7	7	5	7	3	6	4	4												
8:54	49	3																		
8:55	8	15	3	3																
8:56	3	3	6																	
8:57	8	7	7	3	3	3	3													
8:58	4	6	16	4	12	4	12													
8:59	3	4	11	3	4	5														

Data was collected for gaps of at least 3 seconds in duration

16:00	3	3	3	4	12	21													
16:01	8	10	11	5	5														
16:02	3	4	4																
16:03	4	5	5	3	8	5	5	3	3	5									
16:04	8	6	4	3	3	6	17												
16:05	10	7	23	5	7														
16:06	5	4	3																
16:07	3	7	3	3	6	6	5	17	5										
16:08	4	3	10	3	8	5													
16:09	3	8	3	8	4	31													
16:10	3	13	5																
16:11	8	10	4																
16:12	4	6	12	7	18														
16:13	5	4	3	11	4	3	4	10	14										
16:14	23																		
16:15	6	3	4	5	3														
16:16	9	6	7	6	3	4													
16:17	5	9	6	57															
16:18	5	4																	
16:19	4	8	3	8	12														
16:20	4	4	6	3	4	4	3												
16:21	3	18	5																
16:22	30	16	22																
16:23	10	12																	
16:24	7	10	5																
16:25	3	9	6	15															
16:26	36	13																	
16:27	8	4	9	3	7	6													
16:28	5	3	5	4	3	3	5												
16:29	4	4	5	5	3	5	4	5											
16:30	14	3	35																
16:31	3	7	4	3	3	4	4	3											
16:32	5	6	4	12	3														
16:33	6	3	3	5															
16:34	8	74																	
16:35	3	6																	
16:36	8	10	3	8	4	4	3												
16:37	4	8	4	5	3														
16:38	15	30																	
16:39	5	18	25	9															
16:40	4	5	5	6	3	4	3												
16:41	6	4	4	5	3	3	6												
16:42	3	9	20	10	26														
16:43	17	7	4																
16:44	3	5	3	4															
16:45	3	6	3	4	3														
16:46	8	4	6	3	3	3	3												
16:47	5	41																	
16:48	5	5	3	4	3														
16:49	3	3	7	3															
16:50	3	4	5	3	6	8													
16:51	5	17	30	4															
16:52	4	3	3	3	3	5	3	3	6	3	3	3	3	3	3	3	3	3	8
16:53	12	9																	
16:54	3	5	7	3	26														
16:55	3	33	18																
16:56	4	6	14																
16:57	3	4	6	5	9	9	7												
16:58	9	3	3	3	4	5	11	5											
16:59	70																		

Data was collected for gaps of at least 3 seconds in duration

17:00	8	3	3	15	5								
17:01													
17:02	5	3	3	8	3								
17:03	5	6	9	4	43								
17:04	4	3	3	3	3	3	3	3					
17:05	6	19	3	3									
17:06	3	4	3	3	3	3	5	4					
17:07	3	3	5	8	3	10	8	43					
17:08	9	4											
17:09	3	6	4	4									
17:10	4	3	6	5	9								
17:11	13	8	14										
17:12	31	3											
17:13	7	5	5	7	5								
17:14	4	3	8	3	6	6	4	3	3	3			
17:15	3	6	3	8	14	24							
17:16	3	4	6	4	8	6	33						
17:17	7												
17:18	3	7											
17:19	6	3	4	3	11	6	5	18					
17:20	4	6	3	46									
17:21	4	4	4										
17:22	4	3	3	4	4	3	4						
17:23	4	4	6	4	5	3	4	3	4	4	5		
17:24	21	61											
17:25													
17:26	5	3	3	5	4	11							
17:27	5	4	10	5	3	5							
17:28	4	12	4	5	16	17							
17:29	12	3	3	3									
17:30	4	4	3	9									
17:31	5	5	7	19	3	16							
17:32	6	8	3	5	4	10	4						
17:33	56												
17:34	3	5											
17:35	4	3	5	3	4	5	18	16					
17:36	3	3	6	8	28								
17:37	13	6	22										
17:38	13												
17:39	4	4	3	11	4	6	7	11					
17:40	18	9	6	16									
17:41	7	8	12	8	4	3							
17:42	3												
17:43	3	5	7	9	6	3	11	4					
17:44	4	5	3	4	4	4	17						
17:45	3	29	35										
17:46	3	11	3										
17:47	8	3	8	4	6	4	3	5					
17:48	12	3	3	4	3								
17:49	7	9	32	17									
17:50	3	9	6	3	5	3							
17:51	7	4	4	11	3	4	6	5	5	6			
17:52	3	3	9	4	8								
17:53	15	14	16										
17:54	26												
17:55	4	5	11	5									
17:56	3	8	5	11	4	8	3						
17:57	3	3	8	10	63								
17:58													
17:59	3	3	5	7	21								

Data was collected for gaps of at least 3 seconds in duration