

# TRAFFIC DIVERSION STUDY

## MARS WAY TOWN OF JUNO BEACH, FLORIDA

### Prepared for:

Town of Juno Beach  
340 Ocean Drive  
Juno Beach, Florida 33408

Job No. 19-004.8

Date: February 6, 2023

**Bryan  
Kelley** Digitally signed  
by Bryan Kelley  
Date:  
2023.02.24  
08:29:22 -05'00'

Bryan G. Kelley, P.E.  
FL Reg. No. 74006

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## 1.0 INTRODUCTION

Simmons & White, Inc. at the request of the Town of Juno Beach conducted a traffic calming study on Mars Way in February, 2020. The traffic study concluded that both speeding and cut through traffic was occurring on Mars Way. After an evaluation of several traffic calming alternatives, the recommendation made to the Town was to install speed humps or speed tables on Mars Way. The Town Council ultimately decided against the speed humps/tables due to the majority of residents on Mars Way not desiring the speed humps/tables primarily due to noise concerns. Instead, the Town Council chose the option to install striping improvements and “No Through Truck” signage to help reduce speeding and cut through traffic. Additionally, the Town Council commissioned a traffic study to be conducted to determine if the FDOT would permit a closure of the median on Mars Way at US-1. The purpose of this study is to provide a traffic analysis of the surrounding area and the traffic impact if the median modification were to be constructed.

## 2.0 DATA COLLECTION

The study area for the traffic analysis consisted of US-1 from Donald Ross Road to the north and to Olympus Drive to the south. Figure 1 attached to this report depicts the study area. Mars Way currently consists of a convenient cut-through option for vehicles traveling from west of Donald Ross Road or north of US-1 to Ocean Drive/A1A within the Town of Juno Beach. With the potential elimination of the southbound left turn movement on US-1 at Mars Way, the majority of diverted traffic will utilize Donald Ross Road or Olympus Drive to travel to Ocean Drive. The elimination of the westbound left turn movement on Mars Way at Ocean Drive will cause residents of Mars Way to make a right turn on US-1 and then a U-turn at Park Street to travel south.

Turning movement counts were collected from 7:00-9:00 A.M. and from 4:00-6:00 P.M. on January 23, 2023 and January 24, 2023 at the following locations:

- US-1 at Park Street
- US-1 at Mars Way
- US-1 at U-turn location just south of Mars Way
- US-1 at Olympus Drive

Additionally, turning movement counts at US-1 at Donald Ross Road obtained from the Palm Beach County Traffic Division and collected on April 12, 2022 were utilized in the traffic study.

The impact of a median closure on US-1 at Mars Way would result in several turning movement diversions at the above stated intersections. The traffic diversions may be summarized as follows:

1. US-1 at Donald Ross Road
  - Additional eastbound throughs
  - Reduced eastbound right turns
2. US-1 at Park Street
  - Additional northbound U-turns
  - Reduced southbound throughs
3. US-1 at Mars Way
  - Elimination of southbound left turns
  - Elimination of westbound left turns
  - Additional southbound throughs
  - Additional northbound right turns
4. US-1 at U-Turn median opening south of Mars Way
  - Additional southbound U-turns
  - Additional southbound throughs
5. US-1 at Olympus Drive
  - Additional southbound left turns

### **3.0 TRAFFIC ANALYSIS**

The existing traffic counts at each of the study intersections along with the diverted traffic volumes are attached to this report. Synchro 10 software with Highway Capacity Manual (HCM) methodologies were utilized for the traffic operational analysis. Note HCM 6<sup>th</sup> Edition was utilized for the unsignalized intersections and HCM 2000 was utilized for the signalized intersection of Donald Ross Road at US-1. HCM 6<sup>th</sup> Edition was not used for this signalized intersection since it operates under split phasing which HCM 6<sup>th</sup> Edition does not support. The existing signal timing from Palm Beach County was also obtained and utilized. The results of the analysis under the existing conditions and the build conditions (with closure of US-1 at Mars Way center median opening) are attached to the report and may be summarized as follows:

**Table 1**  
**Existing Conditions Operational Analysis**

Intersection	Peak Hour	Delay (sec/veh)	LOS	95 <sup>th</sup> Percentile Queue* (ft)	Turn Lane Length (ft)
Donald Ross Road at US-1	AM	32.3	C	N/A	N/A
	PM	39.0	D	N/A	
US-1 at Park Street (Northbound Left Turn)	AM	10.8	A	25	160 ft + 160 ft taper
	PM	9.9	A	25	
US-1 at Mars Way (Southbound Left Turn)	AM	9.8	A	25	150 ft + 150 ft taper
	PM	11.8	B	25	
US-1 at U-Turn S. of Mars Way (Southbound Left Turn)	AM	9.6	A	25	100 ft + 160 ft taper
	PM	11.2	B	25	
US-1 at Olympus Drive (Southbound Left Turn)	AM	9.3	A	25	130 ft + 80 ft taper
	PM	11.5	B	25	

\*95<sup>th</sup> percentile queue rounded up to the nearest 25 feet.

**Table 2**  
**Build Conditions (Closure of US-1 at Mars Way Center Median) Operational Analysis**

Intersection	Peak Hour	Delay (sec/veh)	LOS	95 <sup>th</sup> Percentile Queue* (ft)	Turn Lane Length (ft)
Donald Ross Road at US-1	AM	32.4	C	N/A	N/A
	PM	39.1	D	N/A	
US-1 at Park Street (Northbound Left Turn)	AM	10.8	A	25	160 ft + 160 ft taper
	PM	9.8	A	25	
US-1 at Mars Way (Southbound Left Turn)	AM	N/A			
	PM	N/A			
US-1 at U-Turn S. of Mars Way (Southbound Left Turn)	AM	9.7	A	25	100 ft + 160 ft taper
	PM	11.4	B	25	
US-1 at Olympus Drive (Southbound Left Turn)	AM	9.4	A	25	130 ft + 80 ft taper
	PM	11.7	B	25	

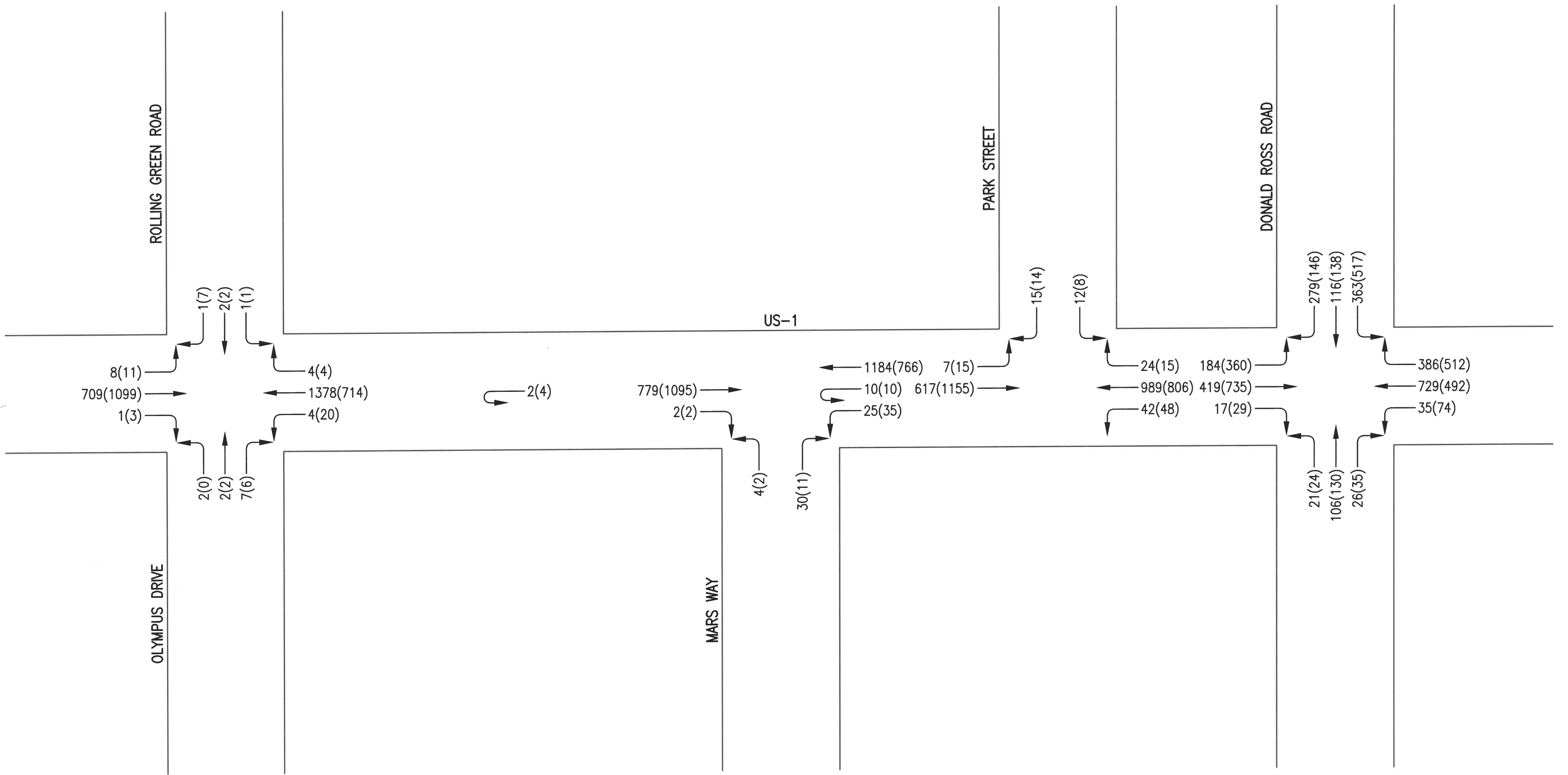
\*95<sup>th</sup> percentile queue rounded up to the nearest 25 feet.

As shown above, there is currently minimal vehicular delay and queueing at each of the subject left turn lanes. The redistribution of traffic from Mars Way will only have a minimal impact to each of the study intersections and will not result in any detrimental impact. Additionally, each of the existing left turn lanes has sufficient storage to accommodate the increase in traffic. However, it should be noted that the existing turn lanes do not meet current FDOT standards in regards to turn lane length design. Current FDOT standards would require a minimum of 160

feet in full storage plus an additional 50-foot taper. This is based on a 45 mph roadway with a 95<sup>th</sup> percentile queue of 25 feet.

#### **4.0 CONCLUSION**

The purpose of this traffic study was to determine the traffic impacts if the center median on US-1 at Mars Way was closed preventing southbound left turns and westbound left turns. The data collection along with the corresponding traffic operational analysis demonstrated that redistribution of traffic would have minimal impacts to the surrounding roadway network and no reduction in Level of Service or queue spillover would occur at the impacted intersections. It should be noted that while the center median modification is feasible from a traffic operations perspective, additional factors are worth considering. The center median modification would come at a significant cost and additional turn lane modifications could be required by the FDOT to bring up to current standards. Further, the additional cut through traffic on Olympus Drive could revert speeding issues on Mars Way to Olympus Drive.

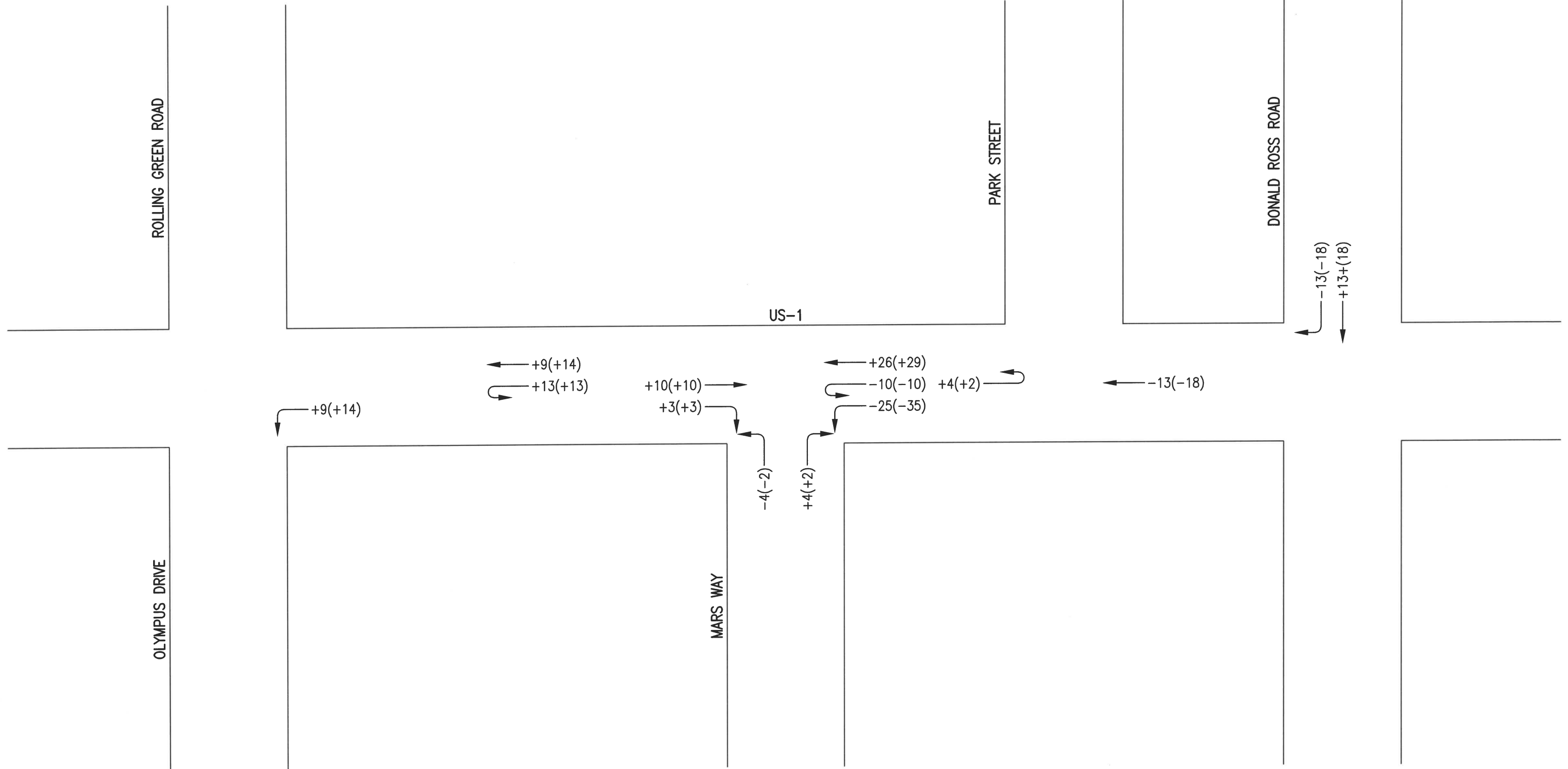


**EXISTING TRAFFIC VOLUMES**

**LEGEND**

- 14 A.M. PEAK HOUR TURNING MOVEMENT
- (18) P.M. PEAK HOUR TURNING MOVEMENT

**MARS WAY**



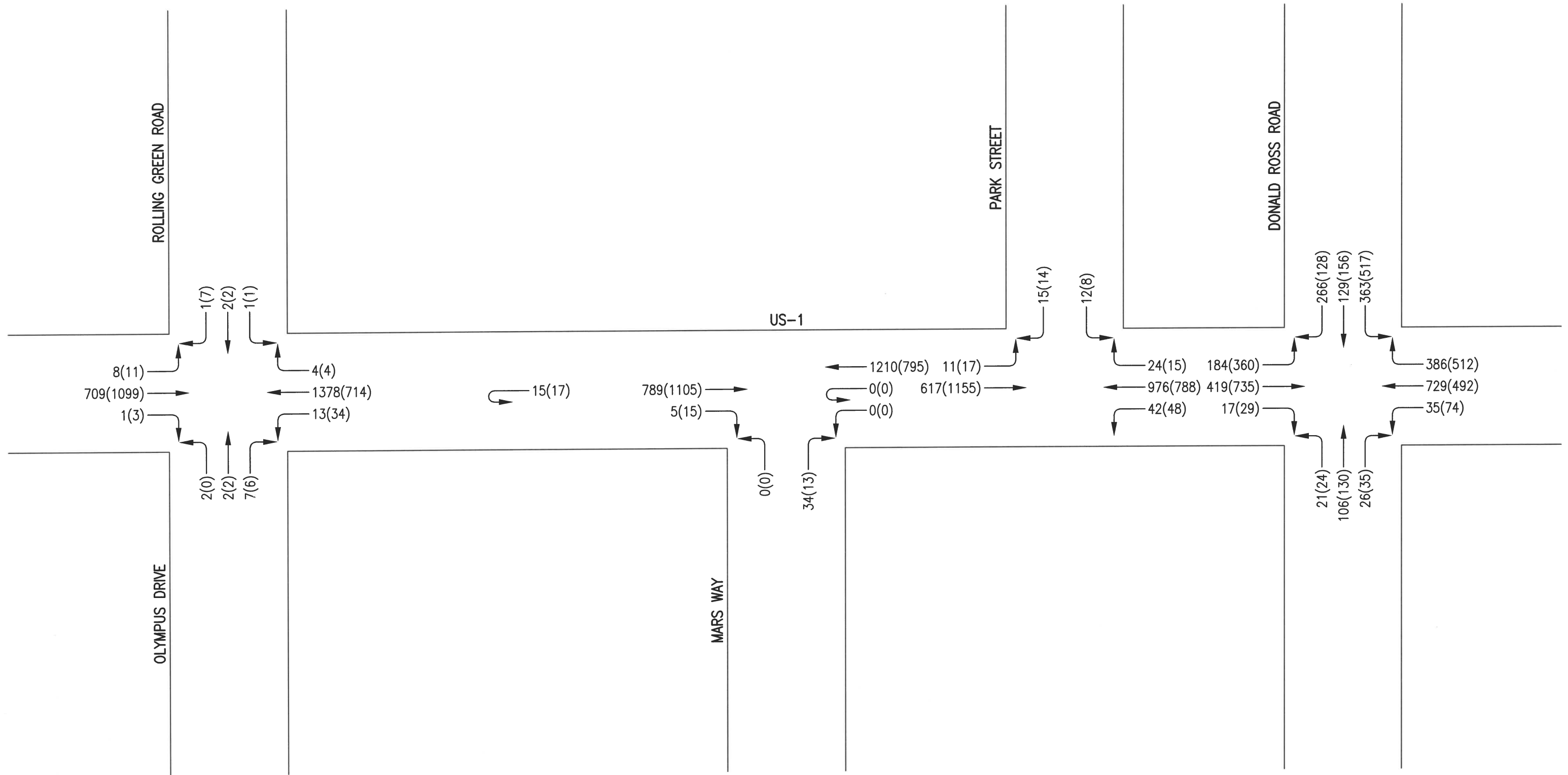
**DIVERTED TRIPS WITH MARS WAY MEDIAN CLOSURE**

**LEGEND**

- 14 A.M. PEAK HOUR TURNING MOVEMENT
- (18) P.M. PEAK HOUR TURNING MOVEMENT

**MARS WAY**





**TOTAL TRAFFIC VOLUMES WITH MARS WAY MEDIAN CLOSURE**

**LEGEND**

- 14 A.M. PEAK HOUR TURNING MOVEMENT
- (18) P.M. PEAK HOUR TURNING MOVEMENT

**MARS WAY**

# **APPENDIX A**

## **TRAFFIC COUNTS**

Manual Traffic Count - All Traffic  
US1 and Park St  
Juno Beach, FL

File Name : US1-PARK  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 1

Groups Printed- All Traffic

Start Time	US1 NB				US1 SB				Park St EB			Driveway WB			Int. Total
	Left	Thru	Right	UTurn	Left	Thru	Right	UTurn	Left	Thru	Right	Left	Thru	Right	
07:00 AM	1	111	1	0	0	146	0	4	0	0	2	0	0	0	265
07:15 AM	0	108	0	1	0	160	0	3	2	0	2	1	0	0	277
07:30 AM	3	142	0	0	0	218	3	11	2	0	3	0	0	0	382
07:45 AM	1	162	0	0	0	230	3	9	3	0	2	0	0	0	410
Total	5	523	1	1	0	754	6	27	7	0	9	1	0	0	1334
08:00 AM	0	155	0	0	3	294	4	8	2	0	3	0	0	0	469
08:15 AM	2	156	0	0	0	247	16	12	3	0	3	0	0	0	439
08:30 AM	4	144	0	0	0	218	1	10	4	0	7	0	0	0	388
08:45 AM	12	163	0	1	0	219	1	7	3	0	2	0	0	0	408
Total	18	618	0	1	3	978	22	37	12	0	15	0	0	0	1704
*** BREAK ***															
04:00 PM	2	264	0	0	0	196	14	7	3	0	1	0	0	0	487
04:15 PM	1	276	0	1	0	220	5	15	1	0	2	0	0	1	522
04:30 PM	2	284	0	1	0	192	3	11	4	0	0	0	0	1	498
04:45 PM	2	288	0	1	0	205	3	8	0	0	3	0	0	0	510
Total	7	1112	0	3	0	813	25	41	8	0	6	0	0	2	2017
05:00 PM	6	307	0	1	0	189	4	14	3	0	9	0	0	0	533
05:15 PM	4	275	0	0	0	202	3	10	4	0	1	0	0	0	499
05:30 PM	4	321	0	0	0	154	10	7	5	0	2	0	0	0	503
05:45 PM	6	223	0	2	0	160	3	8	7	1	6	0	0	0	416
Total	20	1126	0	3	0	705	20	39	19	1	18	0	0	0	1951
Grand Total	50	3379	1	8	3	3250	73	144	46	1	48	1	0	2	7006
Apprch %	1.5	98.3	0	0.2	0.1	93.7	2.1	4.1	48.4	1.1	50.5	33.3	0	66.7	
Total %	0.7	48.2	0	0.1	0	46.4	1	2.1	0.7	0	0.7	0	0	0	

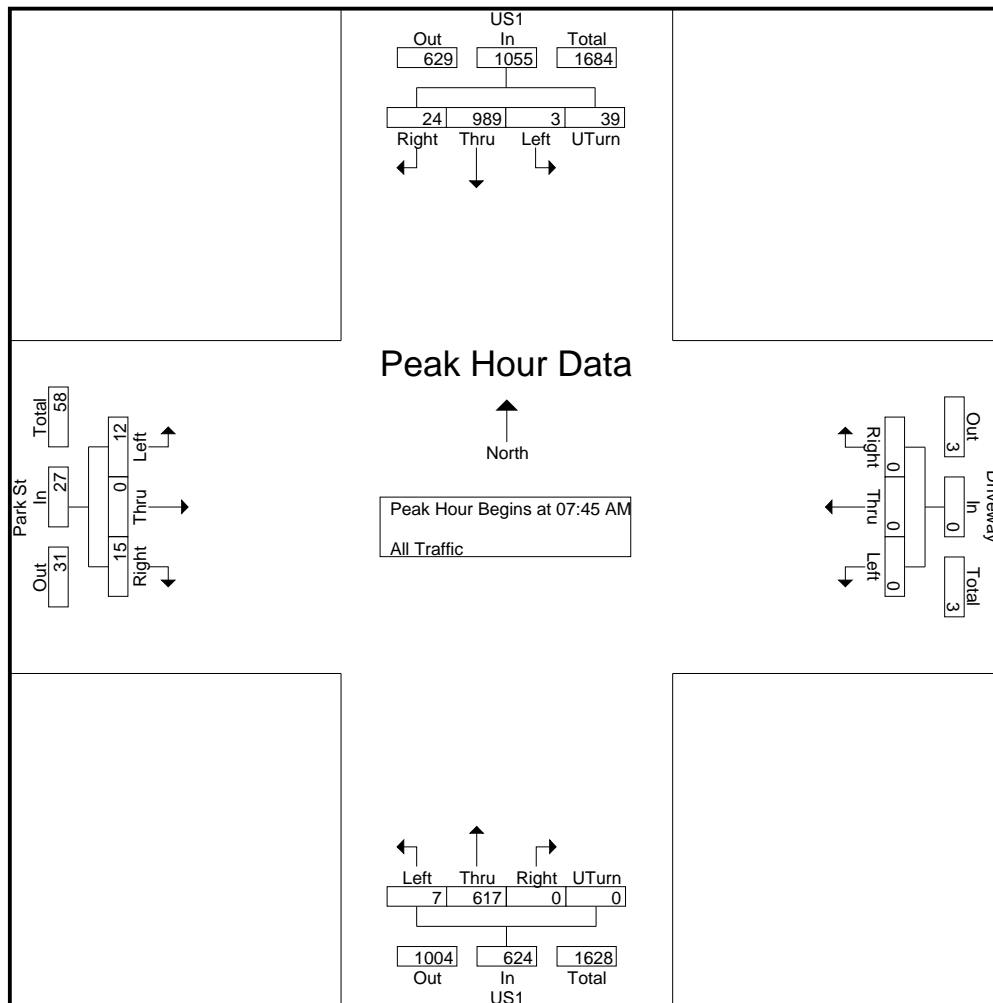
Manual Traffic Count - All Traffic  
US1 and Park St  
Juno Beach, FL

File Name : US1-PARK  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 2

Start Time	US1 NB					US1 SB					Park St EB				Driveway WB				Int. Total
	Left	Thru	Right	UTurn	App. Total	Left	Thru	Right	UTurn	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:45 AM	1	162	0	0	163	0	230	3	9	242	3	0	2	5	0	0	0	0	410
08:00 AM	0	155	0	0	155	3	294	4	8	309	2	0	3	5	0	0	0	0	469
08:15 AM	2	156	0	0	158	0	247	16	12	275	3	0	3	6	0	0	0	0	439
08:30 AM	4	144	0	0	148	0	218	1	10	229	4	0	7	11	0	0	0	0	388
Total Volume	7	617	0	0	624	3	989	24	39	1055	12	0	15	27	0	0	0	0	1706
% App. Total	1.1	98.9	0	0		0.3	93.7	2.3	3.7		44.4	0	55.6		0	0	0		
PHF	.438	.952	.000	.000	.957	.250	.841	.375	.813	.854	.750	.000	.536	.614	.000	.000	.000	.000	.909

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

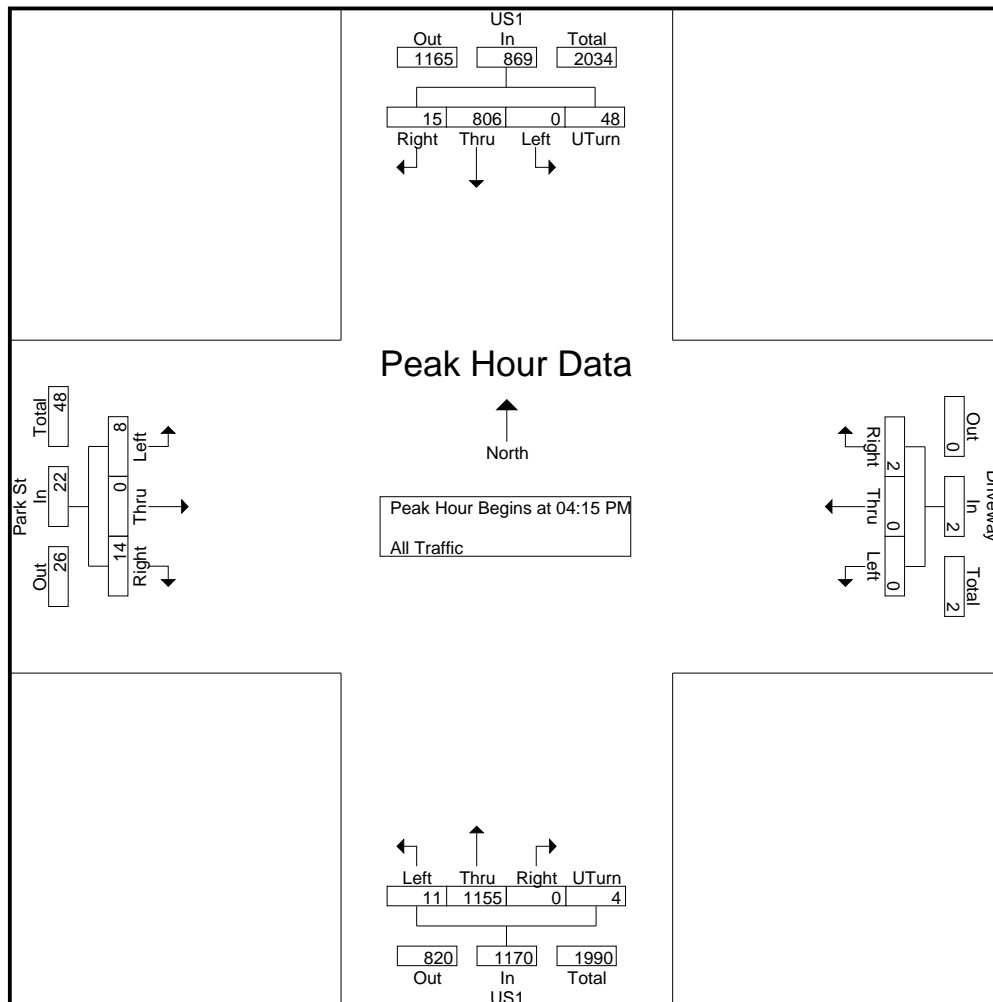
Peak Hour for Entire Intersection Begins at 07:45 AM



Manual Traffic Count - All Traffic  
US1 and Park St  
Juno Beach, FL

File Name : US1-PARK  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 3

Start Time	US1 NB					US1 SB					Park St EB				Driveway WB				Int. Total
	Left	Thru	Right	UTurn	App. Total	Left	Thru	Right	UTurn	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:15 PM																			
04:15 PM	1	276	0	1	278	0	220	5	15	240	1	0	2	3	0	0	1	1	522
04:30 PM	2	284	0	1	287	0	192	3	11	206	4	0	0	4	0	0	1	1	498
04:45 PM	2	288	0	1	291	0	205	3	8	216	0	0	3	3	0	0	0	0	510
05:00 PM	6	307	0	1	314	0	189	4	14	207	3	0	9	12	0	0	0	0	533
Total Volume	11	1155	0	4	1170	0	806	15	48	869	8	0	14	22	0	0	2	2	2063
% App. Total	0.9	98.7	0	0.3		0	92.8	1.7	5.5		36.4	0	63.6		0	0	100		
PHF	.458	.941	.000	1.0 0	.932	.000	.916	.750	.800	.905	.500	.000	.389	.458	.000	.000	.500	.500	.968



Manual Traffic Count - All Traffic  
US1 and Mars Way  
Juno Beach, FL

File Name : US1-MARS  
Site Code : SW2304  
Start Date : 1/24/2023  
Page No : 1

Groups Printed- All Traffic

Start Time	US1 NB		US1 SB			Mars Way WB		Int. Total
	Thru	Right	Left	Thru	UTurn	Left	Right	
07:00 AM	99	0	3	142	1	0	2	247
07:15 AM	128	1	3	197	4	0	4	337
07:30 AM	163	0	4	234	8	0	4	413
07:45 AM	182	0	4	315	8	1	8	518
Total	572	1	14	888	21	1	18	1515
08:00 AM	199	0	6	275	2	1	9	492
08:15 AM	153	0	8	339	5	2	9	516
08:30 AM	202	1	5	283	0	1	5	497
08:45 AM	225	1	6	287	3	0	7	529
Total	779	2	25	1184	10	4	30	2034

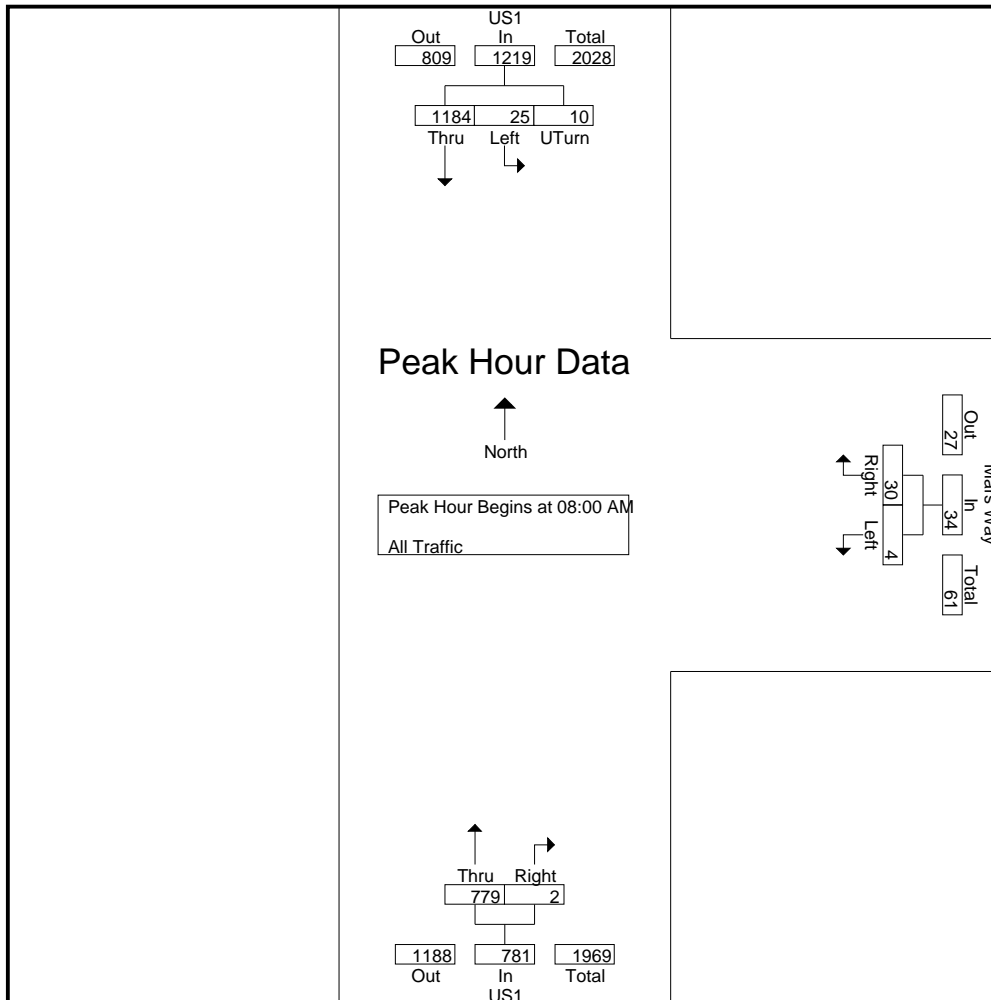
\*\*\* BREAK \*\*\*

04:00 PM	292	1	9	203	1	1	6	513
04:15 PM	277	2	5	184	3	0	5	476
04:30 PM	258	1	6	188	1	1	3	458
04:45 PM	238	1	12	207	5	0	5	468
Total	1065	5	32	782	10	2	19	1915
05:00 PM	271	0	7	181	1	1	1	462
05:15 PM	328	0	10	190	3	0	2	533
05:30 PM	262	0	7	170	3	1	3	446
05:45 PM	248	1	12	164	0	1	2	428
Total	1109	1	36	705	7	3	8	1869
Grand Total	3525	9	107	3559	48	10	75	7333
Apprch %	99.7	0.3	2.9	95.8	1.3	11.8	88.2	
Total %	48.1	0.1	1.5	48.5	0.7	0.1	1	

Manual Traffic Count - All Traffic  
US1 and Mars Way  
Juno Beach, FL

File Name : US1-MARS  
Site Code : SW2304  
Start Date : 1/24/2023  
Page No : 2

Start Time	US1 NB			US1 SB				Mars Way WB			Int. Total
	Thru	Right	App. Total	Left	Thru	UTurn	App. Total	Left	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 08:00 AM											
08:00 AM	199	0	199	6	275	2	283	1	9	10	492
08:15 AM	153	0	153	8	339	5	352	2	9	11	516
08:30 AM	202	1	203	5	283	0	288	1	5	6	497
08:45 AM	225	1	226	6	287	3	296	0	7	7	529
Total Volume	779	2	781	25	1184	10	1219	4	30	34	2034
% App. Total	99.7	0.3		2.1	97.1	0.8		11.8	88.2		
PHF	.866	.500	.864	.781	.873	.500	.866	.500	.833	.773	.961



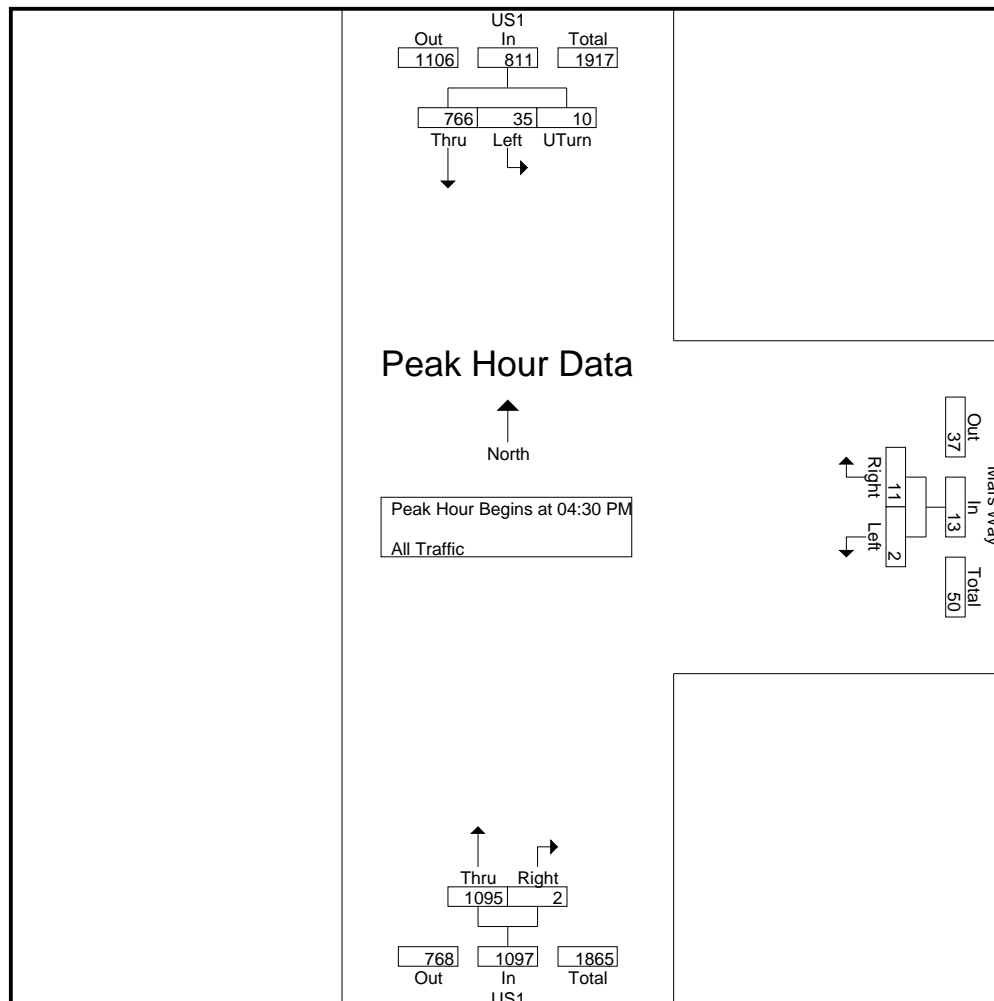
Manual Traffic Count - All Traffic  
US1 and Mars Way  
Juno Beach, FL

File Name : US1-MARS  
Site Code : SW2304  
Start Date : 1/24/2023  
Page No : 3

Start Time	US1 NB			US1 SB				Mars Way WB			Int. Total
	Thru	Right	App. Total	Left	Thru	UTurn	App. Total	Left	Right	App. Total	
04:30 PM	258	1	259	6	188	1	195	1	3	4	458
04:45 PM	238	1	239	12	207	5	224	0	5	5	468
05:00 PM	271	0	271	7	181	1	189	1	1	2	462
05:15 PM	328	0	328	10	190	3	203	0	2	2	533
Total Volume	1095	2	1097	35	766	10	811	2	11	13	1921
% App. Total	99.8	0.2		4.3	94.5	1.2		15.4	84.6		
PHF	.835	.500	.836	.729	.925	.500	.905	.500	.550	.650	.901

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM





Start Date: 1/23/2023  
Start Time: 7:00:00 AM  
Site Code: SW2303  
Comment 1: Manual Traffic Count - All Traffic  
Comment 2: Midblock NB and SB Uturns  
Comment 3: Juno Beach, FL

	US1 NB	US1 SB
Start Time	UTurn	UTurn
7:00:00 AM	0	1
7:15:00 AM	0	0
7:30:00 AM	1	0
7:45:00 AM	0	1
8:00:00 AM	1	0
8:15:00 AM	0	0
8:30:00 AM	0	0
8:45:00 AM	0	0
4:00:00 PM	0	0
4:15:00 PM	0	1
4:30:00 PM	0	2
4:45:00 PM	0	0
5:00:00 PM	0	1
5:15:00 PM	0	0
5:30:00 PM	0	0
5:45:00 PM	0	0

# KMF Traffic Group, LLC

(772) 924-6993  
www.kmftraffic.net

Manual Traffic Count - All Traffic  
US1 and Olympus Dr  
Juno Beach, FL

File Name : US1-OLYMPUS  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 1

### Groups Printed- All Traffic

Start Time	US1 NB				US1 SB				Rolling Green Rd EB			Olympus Dr WB			Int. Total
	Right	Thru	Left	UTurn	Right	Thru	Left	UTurn	Right	Thru	Left	Right	Thru	Left	
07:00 AM	0	81	4	0	1	160	2	0	0	0	0	1	0	0	249
07:15 AM	0	121	3	0	2	214	2	0	1	0	0	2	0	0	345
07:30 AM	1	117	2	0	1	278	1	0	0	0	0	1	0	1	402
07:45 AM	1	113	4	1	0	232	2	0	0	1	1	2	0	0	357
Total	2	432	13	1	4	884	7	0	1	1	1	6	0	1	1353
08:00 AM	0	173	0	1	3	317	2	0	0	1	0	4	2	1	504
08:15 AM	0	208	1	0	1	354	0	0	1	0	0	0	0	1	566
08:30 AM	0	215	1	0	0	475	0	0	0	0	0	1	0	0	692
08:45 AM	1	168	5	2	1	175	0	0	0	0	0	1	1	0	354
Total	1	764	7	3	5	1321	2	0	1	1	0	6	3	2	2116
*** BREAK ***															
04:00 PM	0	296	3	2	0	169	5	0	3	0	0	2	0	0	480
04:15 PM	2	284	1	2	0	188	10	0	0	2	0	0	1	0	490
04:30 PM	1	251	1	0	3	187	1	0	2	0	1	3	0	0	450
04:45 PM	0	268	1	1	1	170	4	0	2	0	0	1	1	0	449
Total	3	1099	6	5	4	714	20	0	7	2	1	6	2	0	1869
05:00 PM	0	283	0	3	0	169	3	2	0	0	1	4	0	0	465
05:15 PM	0	253	1	4	0	200	1	0	2	0	0	4	0	0	465
05:30 PM	1	287	3	2	0	146	3	0	0	0	0	2	0	0	444
05:45 PM	1	238	1	1	0	143	3	0	1	0	0	1	0	0	389
Total	2	1061	5	10	0	658	10	2	3	0	1	11	0	0	1763
Grand Total	8	3356	31	19	13	3577	39	2	12	4	3	29	5	3	7101
Apprch %	0.2	98.3	0.9	0.6	0.4	98.5	1.1	0.1	63.2	21.1	15.8	78.4	13.5	8.1	
Total %	0.1	47.3	0.4	0.3	0.2	50.4	0.5	0	0.2	0.1	0	0.4	0.1	0	

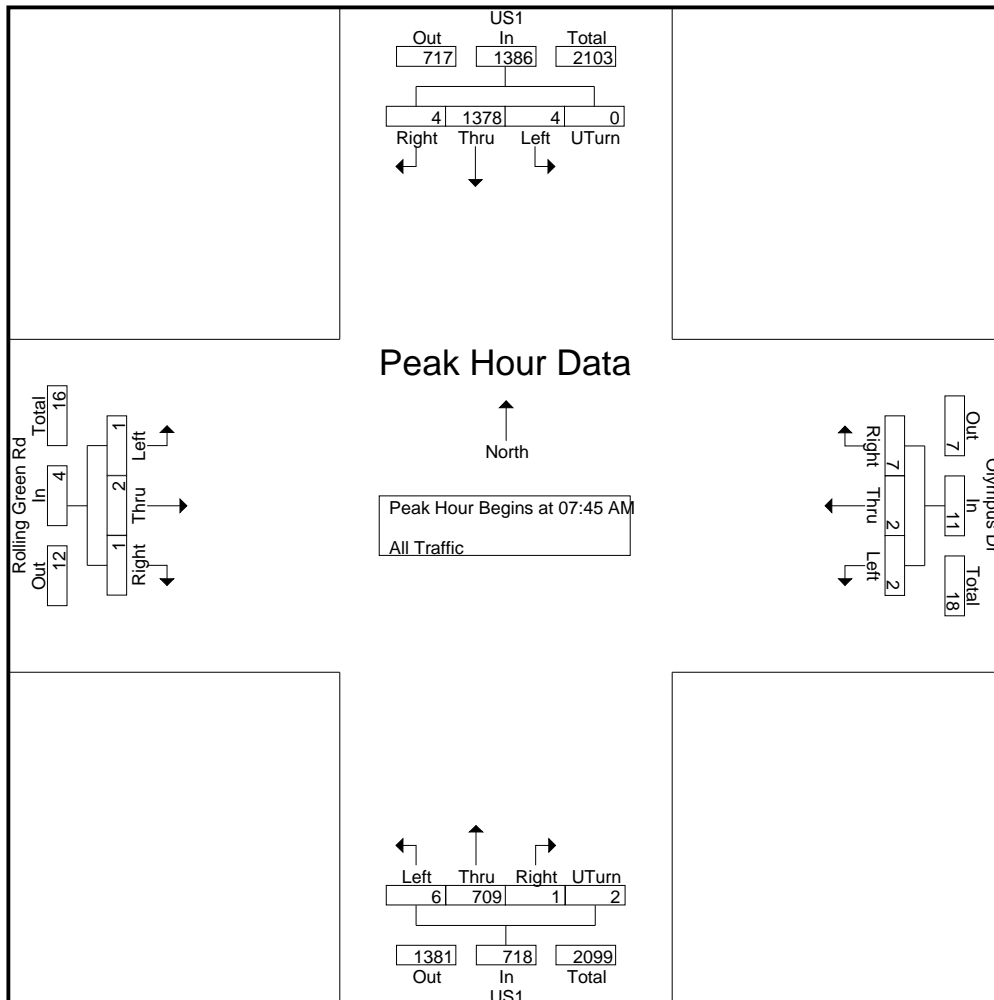
# KMF Traffic Group, LLC

(772) 924-6993  
www.kmftraffic.net

Manual Traffic Count - All Traffic  
US1 and Olympus Dr  
Juno Beach, FL

File Name : US1-OLYMPUS  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 2

Start Time	US1 NB					US1 SB					Rolling Green Rd EB				Olympus Dr WB				Int. Total
	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 07:45 AM																			
07:45 AM	1	113	4	1	119	0	232	2	0	234	0	1	1	2	2	0	0	2	357
08:00 AM	0	173	0	1	174	3	317	2	0	322	0	1	0	1	4	2	1	7	504
08:15 AM	0	208	1	0	209	1	354	0	0	355	1	0	0	1	0	0	1	1	566
08:30 AM	0	215	1	0	216	0	475	0	0	475	0	0	0	0	1	0	0	1	692
Total Volume	1	709	6	2	718	4	1378	4	0	1386	1	2	1	4	7	2	2	11	2119
% App. Total	0.1	98.7	0.8	0.3		0.3	99.4	0.3	0		25	50	25		63.6	18.2	18.2		
PHF	.250	.824	.375	.500	.831	.333	.725	.500	.000	.729	.250	.500	.250	.500	.438	.250	.500	.393	.766



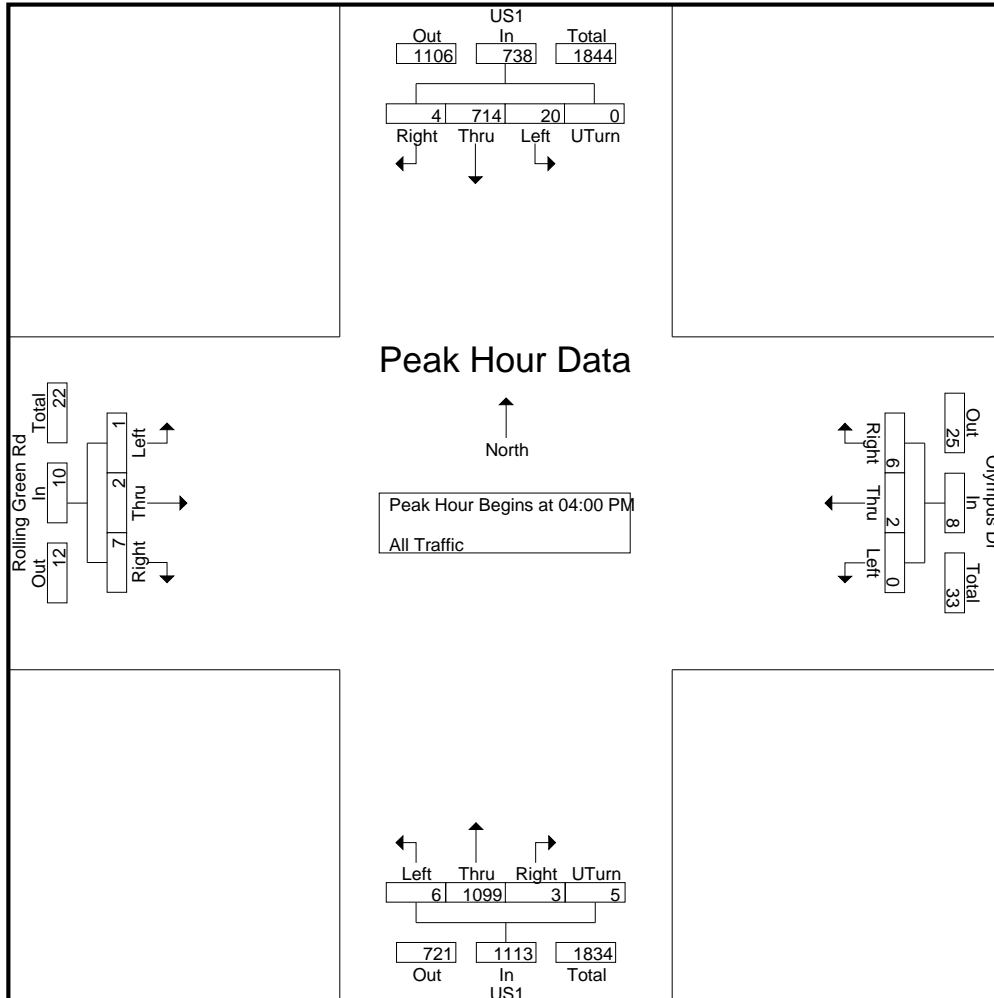
# KMF Traffic Group, LLC

(772) 924-6993  
www.kmftraffic.net

Manual Traffic Count - All Traffic  
US1 and Olympus Dr  
Juno Beach, FL

File Name : US1-0LYMPUS  
Site Code : SW2304  
Start Date : 1/23/2023  
Page No : 3

Start Time	US1 NB					US1 SB					Rolling Green Rd EB				Olympus Dr WB				Int. Total
	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	UTurn	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																			
Peak Hour for Entire Intersection Begins at 04:00 PM																			
04:00 PM	0	<b>296</b>	<b>3</b>	<b>2</b>	<b>301</b>	0	169	5	0	174	<b>3</b>	0	0	<b>3</b>	2	0	0	2	480
04:15 PM	<b>2</b>	284	1	2	289	0	<b>188</b>	<b>10</b>	0	<b>198</b>	0	<b>2</b>	0	2	0	<b>1</b>	0	1	<b>490</b>
04:30 PM	1	251	1	0	253	<b>3</b>	187	1	0	191	2	0	<b>1</b>	3	<b>3</b>	0	0	<b>3</b>	450
04:45 PM	0	268	1	1	270	1	170	4	0	175	2	0	0	2	1	1	0	2	449
Total Volume	3	1099	6	5	1113	4	714	20	0	738	7	2	1	10	6	2	0	8	1869
% App. Total	0.3	98.7	0.5	0.4		0.5	96.7	2.7	0		70	20	10		75	25	0		
PHF	.375	.928	.500	.625	.924	.333	.949	.500	.000	.932	.583	.250	.250	.833	.500	.500	.000	.667	.954



SIGNAL ID	E-W STREET	N-S STREET	DATE	TIME	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
8907	Donald Ross Rd	Parkside Dr	12/13/2021	5:00 PM	4	344	121	73	0	150	63	251	0	314	1777	212	10	34	1390	101	4844
8907	Donald Ross Rd	Parkside Dr	2/3/2020	7:30 AM	2	172	43	48	2	127	37	345	0	245	1849	208	3	14	818	90	4003
8907	Donald Ross Rd	Parkside Dr	2/3/2020	12:00 PM	3	142	83	71	0	126	44	135	2	134	995	83	11	33	844	89	2795
8907	Donald Ross Rd	Parkside Dr	2/3/2020	5:00 PM	0	253	119	68	1	127	73	395	13	310	1199	156	2	27	1659	122	4524
8930	Donald Ross Rd	Prosperity Farms Rd/P	3/24/2022	7:30 AM	0	136	52	135	0	164	73	20	3	23	1323	178	3	116	771	40	3037
8930	Donald Ross Rd	Prosperity Farms Rd/P	3/24/2022	12:15 PM	0	140	70	159	0	64	44	29	5	27	772	173	2	160	822	61	2528
8930	Donald Ross Rd	Prosperity Farms Rd/P	3/24/2022	4:45 PM	0	168	101	166	0	81	49	20	2	38	846	194	0	141	1196	95	3097
8930	Donald Ross Rd	Prosperity Farms Rd/P	2/11/2020	7:30 AM	0	130	47	125	0	172	78	35	0	24	1342	129	0	115	737	64	2998
8930	Donald Ross Rd	Prosperity Farms Rd/P	2/11/2020	12:15 PM	0	146	72	199	0	71	47	23	3	29	811	145	7	161	825	142	2681
8930	Donald Ross Rd	Prosperity Farms Rd/P	2/11/2020	4:45 PM	0	190	108	187	0	58	60	27	6	33	857	165	3	190	1440	125	3449
8930	Donald Ross Rd	Prosperity Farms Rd/P	1/14/2019	7:30 AM	0	121	44	148	0	173	52	29	6	19	1296	171	1	125	762	45	2992
8930	Donald Ross Rd	Prosperity Farms Rd/P	1/14/2019	12:15 PM	0	150	60	197	0	68	54	30	4	18	823	134	2	171	787	76	2574
8930	Donald Ross Rd	Prosperity Farms Rd/P	1/14/2019	4:45 PM	0	211	96	206	0	78	48	20	3	27	842	167	1	167	1295	140	3301
8950	Donald Ross Rd	US-1	4/12/2022	7:45 AM	0	184	419	17	17	28	729	386	1	363	116	279	0	21	106	26	2692
8950	Donald Ross Rd	US-1	4/12/2022	12:15 PM	3	256	494	29	34	81	546	483	9	456	161	205	0	20	100	44	2921
8950	Donald Ross Rd	US-1	4/12/2022	4:45 PM	1	359	735	29	17	57	492	512	7	510	138	146	0	24	130	35	3192
8950	Donald Ross Rd	US-1	2/20/2020	7:45 AM	1	229	431	11	12	28	851	529	3	411	101	356	0	18	94	20	3095
8950	Donald Ross Rd	US-1	2/20/2020	12:15 PM	6	255	668	25	49	67	591	558	16	571	208	284	0	47	111	40	3496
8950	Donald Ross Rd	US-1	2/20/2020	4:45 PM	3	354	935	17	59	56	667	739	17	588	190	275	0	27	162	26	4115
20405	Dyer Bl	Military Tr	4/16/2019	7:30 AM	1	46	1685	5	0	0	1080	179	0	203	1	43	0	0	0	0	3243
20405	Dyer Bl	Military Tr	4/16/2019	12:15 PM	5	49	965	6	2	0	913	182	0	141	0	56	0	1	2	4	2326
20405	Dyer Bl	Military Tr	4/16/2019	4:30 PM	6	43	1331	4	0	0	1722	261	0	208	0	82	0	3	0	8	3668
53290	E Atlantic Ave	A1A/Ocean Ave	1/30/2019	8:15 AM	0	75	133	0	0	0	352	89	0	56	0	87	0	0	0	0	792
53290	E Atlantic Ave	A1A/Ocean Ave	1/30/2019	12:00 PM	0	103	191	0	0	0	212	105	0	136	0	193	0	0	0	0	940
53290	E Atlantic Ave	A1A/Ocean Ave	1/30/2019	4:00 PM	0	139	297	0	0	0	248	101	0	125	0	146	0	0	0	0	1056
53255	E Atlantic Ave	US-1 NB (NE 6th Ave)	1/30/2019	7:45 AM	0	53	579	73	0	0	0	0	0	98	261	0	0	0	189	78	1331
53255	E Atlantic Ave	US-1 NB (NE 6th Ave)	1/30/2019	12:00 PM	0	104	803	115	0	0	0	0	0	53	424	0	0	0	298	178	1975
53255	E Atlantic Ave	US-1 NB (NE 6th Ave)	1/30/2019	4:30 PM	0	66	1072	60	0	0	0	0	0	73	288	0	0	0	329	209	2097
53250	E Atlantic Ave	US-1 SB (NE 5th Ave)	1/30/2019	7:45 AM	0	0	0	0	0	75	795	25	0	0	281	38	0	58	166	0	1438
53250	E Atlantic Ave	US-1 SB (NE 5th Ave)	1/30/2019	12:00 PM	0	0	0	0	0	102	682	80	0	0	365	41	0	60	238	0	1568
53250	E Atlantic Ave	US-1 SB (NE 5th Ave)	1/30/2019	4:30 PM	0	0	0	0	0	104	920	79	0	0	274	46	0	80	305	0	1808
28199	Elmhurst Rd	Haverhill Rd	5/3/2022	7:30 AM	0	16	659	296	0	105	567	23	0	35	28	30	0	129	6	106	2000
28199	Elmhurst Rd	Haverhill Rd	5/3/2022	12:00 PM	0	17	485	126	0	62	514	29	0	18	9	16	0	122	7	165	1570
28199	Elmhurst Rd	Haverhill Rd	5/3/2022	5:00 PM	0	40	669	266	0	114	1072	50	0	37	21	17	2	274	23	231	2816
28199	Elmhurst Rd	Haverhill Rd	5/1/2019	7:30 AM	0	26	705	233	0	78	496	14	0	24	28	44	0	117	1	73	1839
28199	Elmhurst Rd	Haverhill Rd	5/1/2019	5:00 PM	0	54	681	162	0	85	889	41	0	25	38	29	0	245	39	164	2452

# **APPENDIX B**

## **EXISTING CONDITIONS – SYNCHRO** **PRINTOUTS**

Lanes, Volumes, Timings  
3: Donald Ross Road & US-1

01/31/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	116	279	21	106	26	184	419	17	35	729	386
Future Volume (vph)	363	116	279	21	106	26	184	419	17	35	729	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>			0.850		0.971			0.994				0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1809	0	1770	3518	0	1770	3539	1583
Fl <sub>t</sub> Permitted	0.950			0.950			0.210			0.481		
Satd. Flow (perm)	3433	1863	1583	1770	1809	0	391	3518	0	896	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			303		8			4				374
Link Speed (mph)		30			30			30				30
Link Distance (ft)		637			666			706				389
Travel Time (s)		14.5			15.1			16.0				8.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	395	126	303	23	115	28	200	455	18	38	792	420
Shared Lane Traffic (%)												
Lane Group Flow (vph)	395	126	303	23	143	0	200	473	0	38	792	420
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Detector Phase	3	3	1	4	4		1	6		5	2	3
Switch Phase												
Minimum Initial (s)	6.0	6.0	4.0	6.0	6.0		4.0	20.0		4.0	20.0	6.0
Minimum Split (s)	25.0	25.0	25.0	13.0	13.0		25.0	27.0		12.0	27.0	25.0
Total Split (s)	30.0	30.0	27.0	25.0	25.0		27.0	57.0		15.0	45.0	30.0
Total Split (%)	23.6%	23.6%	21.3%	19.7%	19.7%		21.3%	44.9%		11.8%	35.4%	23.6%
Maximum Green (s)	23.0	23.0	20.0	18.0	18.0		20.0	50.0		8.0	38.0	23.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	21.0	21.0	34.4	14.3	14.3		70.1	59.4		57.0	50.3	78.3
Actuated g/C Ratio	0.17	0.17	0.27	0.11	0.11		0.55	0.47		0.45	0.40	0.62
v/c Ratio	0.70	0.41	0.47	0.12	0.68		0.55	0.29		0.08	0.57	0.38
Control Delay	56.7	51.1	4.2	50.2	66.9		21.5	23.1		16.3	33.8	3.2

Lanes, Volumes, Timings  
 3: Donald Ross Road & US-1

01/31/2023

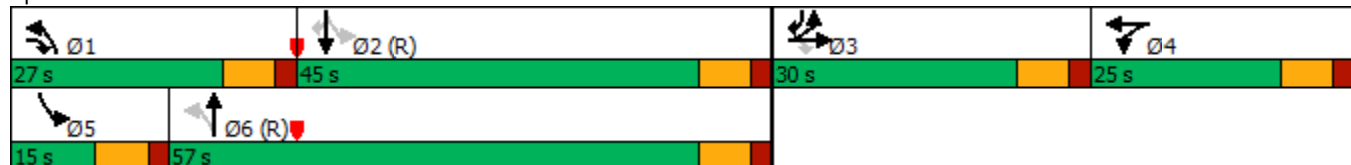


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	56.7	51.1	4.2	50.2	66.9		21.5	23.1		16.3	33.8	3.2
LOS	E	D	A	D	E		C	C		B	C	A
Approach Delay		36.5			64.6			22.6			23.0	
Approach LOS		D			E			C			C	

Intersection Summary

Area Type: Other  
 Cycle Length: 127  
 Actuated Cycle Length: 127  
 Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green  
 Natural Cycle: 90  
 Control Type: Actuated-Coordinated  
 Maximum v/c Ratio: 0.70  
 Intersection Signal Delay: 29.1  
 Intersection LOS: C  
 Intersection Capacity Utilization 71.2%  
 ICU Level of Service C  
 Analysis Period (min) 15

Splits and Phases: 3: Donald Ross Road & US-1





# HCM Signalized Intersection Capacity Analysis

## 3: Donald Ross Road & US-1

01/31/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↗		↖	↑↗		↖	↑↑	↖
Traffic Volume (vph)	363	116	279	21	106	26	184	419	17	35	729	386
Future Volume (vph)	363	116	279	21	106	26	184	419	17	35	729	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1808		1770	3519		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.21	1.00		0.48	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1808		391	3519		896	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	395	126	303	23	115	28	200	455	18	38	792	420
RTOR Reduction (vph)	0	0	221	0	7	0	0	2	0	0	0	164
Lane Group Flow (vph)	395	126	82	23	136	0	200	471	0	38	792	256
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Actuated Green, G (s)	21.0	21.0	34.4	14.3	14.3		70.7	58.1		55.9	50.3	71.3
Effective Green, g (s)	21.0	21.0	34.4	14.3	14.3		70.7	58.1		55.9	50.3	71.3
Actuated g/C Ratio	0.17	0.17	0.27	0.11	0.11		0.56	0.46		0.44	0.40	0.56
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	567	308	428	199	203		363	1609		432	1401	975
v/s Ratio Prot	c0.12	0.07	0.02	0.01	c0.08		c0.06	0.13		0.00	0.22	0.04
v/s Ratio Perm			0.03				c0.25			0.03		0.12
v/c Ratio	0.70	0.41	0.19	0.12	0.67		0.55	0.29		0.09	0.57	0.26
Uniform Delay, d1	50.0	47.4	35.6	50.7	54.1		17.1	21.6		20.3	29.8	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	0.9	0.2	0.3	8.1		1.8	0.5		0.1	1.7	0.1
Delay (s)	53.7	48.3	35.8	50.9	62.2		18.9	22.0		20.4	31.5	14.5
Level of Service	D	D	D	D	E		B	C		C	C	B
Approach Delay (s)		46.3			60.6			21.1			25.4	
Approach LOS		D			E			C			C	


















### Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: US-1 & Park Street

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	15	0	0	0	7	617	0	42	989	24
Future Volume (vph)	12	0	15	0	0	0	7	617	0	42	989	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.926										0.996
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	0	0	1770	3539	0	1770	3525	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	0	0	1770	3539	0	1770	3525	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			418			540			706	
Travel Time (s)		11.5			9.5			12.3			16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	0	16	0	0	0	8	671	0	46	1075	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	0	0	8	671	0	46	1101	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	44.8%					ICU Level of Service A						
Analysis Period (min)	15											

HCM 6th TWSC  
6: US-1 & Park Street

01/31/2023

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕		↕	↕	
Traffic Vol, veh/h	12	0	15	0	0	0	7	617	0	42	989	24
Future Vol, veh/h	12	0	15	0	0	0	7	617	0	42	989	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	16	0	0	0	8	671	0	46	1075	26












Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1532	1867	551				1101	0	0	671	0	0
Stage 1	1180	1180	-				-	-	-	-	-	-
Stage 2	352	687	-				-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94				4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32				2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	107	72	478				630	-	-	915	-	-
Stage 1	254	262	-				-	-	-	-	-	-
Stage 2	683	446	-				-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	100	0	478				630	-	-	915	-	-
Mov Cap-2 Maneuver	100	0	-				-	-	-	-	-	-
Stage 1	238	0	-				-	-	-	-	-	-
Stage 2	683	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.2	0.1	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	630	-	-	178	915	-	-
HCM Lane V/C Ratio	0.012	-	-	0.165	0.05	-	-
HCM Control Delay (s)	10.8	-	-	29.2	9.1	-	-
HCM Lane LOS	B	-	-	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	-	-

Lanes, Volumes, Timings  
9: Mars Way & US-1

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	4	30	779	2	35	1184
Future Volume (vph)	4	30	779	2	35	1184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Fr <sub>t</sub>	0.880			0.850		
Fl <sub>t</sub> Protected	0.995				0.950	
Satd. Flow (prot)	1631	0	3539	1583	1770	3539
Fl <sub>t</sub> Permitted	0.995				0.950	
Satd. Flow (perm)	1631	0	3539	1583	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	520		600			540
Travel Time (s)	11.8		13.6			12.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	33	847	2	38	1287
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	847	2	38	1287
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	42.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	4	30	779	2	35	1184
Future Vol, veh/h	4	30	779	2	35	1184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	33	847	2	38	1287













Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1567	424	0	0	849	0
Stage 1	847	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	102	579	-	-	785	-
Stage 1	381	-	-	-	-	-
Stage 2	443	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	97	579	-	-	785	-
Mov Cap-2 Maneuver	97	-	-	-	-	-
Stage 1	363	-	-	-	-	-
Stage 2	443	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	365	785
HCM Lane V/C Ratio	-	-	0.101	0.048
HCM Control Delay (s)	-	-	16	9.8
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2

Lanes, Volumes, Timings  
11: US-1 & U-Turn

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	0	781	0	2	1186
Future Volume (vph)	0	0	781	0	2	1186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
<b>Fr</b>						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	0	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	0	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	346		575			600
Travel Time (s)	7.9		13.1			13.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	849	0	2	1289
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	849	0	2	1289
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	36.1%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↖	↕
Traffic Vol, veh/h	0	0	781	0	2	1186
Future Vol, veh/h	0	0	781	0	2	1186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	849	0	2	1289




















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	425	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	578	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	578	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	-	-	785
HCM Lane V/C Ratio	-	-	0.003
HCM Control Delay (s)	-	0	9.6
HCM Lane LOS	-	A	A
HCM 95th %tile Q(veh)	-	-	0

Lanes, Volumes, Timings  
13: Olympus Drive & US-1

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	1	2	2	7	8	709	1	4	1378	4
Future Volume (vph)	1	2	1	2	2	7	8	709	1	4	1378	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>		0.966			0.910							0.850
Fl <sub>t</sub> Protected		0.988			0.992		0.950			0.950		
Satd. Flow (prot)	0	1778	0	0	1682	0	1770	3539	0	1770	3539	1583
Fl <sub>t</sub> Permitted		0.988			0.992		0.950			0.950		
Satd. Flow (perm)	0	1778	0	0	1682	0	1770	3539	0	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			446			254			575	
Travel Time (s)		4.3			10.1			5.8			13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2	1	2	2	8	9	771	1	4	1498	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	12	0	9	772	0	4	1498	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	48.1%					ICU Level of Service A						
Analysis Period (min)	15											



Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	1	2	1	2	2	7	8	709	1	4	1378	4
Future Vol, veh/h	1	2	1	2	2	7	8	709	1	4	1378	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	1	2	2	8	9	771	1	4	1498	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1911	2296	749	1548	2300	386	1502	0	0	772	0	0
Stage 1	1506	1506	-	790	790	-	-	-	-	-	-	-
Stage 2	405	790	-	758	1510	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	41	38	354	78	38	612	442	-	-	839	-	-
Stage 1	127	182	-	350	400	-	-	-	-	-	-	-
Stage 2	593	400	-	365	181	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	38	37	354	73	37	612	442	-	-	839	-	-
Mov Cap-2 Maneuver	38	37	-	73	37	-	-	-	-	-	-	-
Stage 1	124	181	-	343	392	-	-	-	-	-	-	-
Stage 2	571	392	-	358	180	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	87.3		38.9		0.1		0	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	442	-	-	48	118	839	-	-
HCM Lane V/C Ratio	0.02	-	-	0.091	0.101	0.005	-	-
HCM Control Delay (s)	13.3	-	-	87.3	38.9	9.3	-	-
HCM Lane LOS	B	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	0	-	-

Lanes, Volumes, Timings  
3: Donald Ross Road & US-1

01/31/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	517	138	146	24	130	35	360	735	29	74	492	512
Future Volume (vph)	517	138	146	24	130	35	360	735	29	74	492	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>			0.850		0.968			0.994				0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1803	0	1770	3518	0	1770	3539	1583
Fl <sub>t</sub> Permitted	0.950			0.950			0.283			0.320		
Satd. Flow (perm)	3433	1863	1583	1770	1803	0	527	3518	0	596	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			159		8			3				231
Link Speed (mph)		30			30			30				30
Link Distance (ft)		637			666			706				389
Travel Time (s)		14.5			15.1			16.0				8.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	150	159	26	141	38	391	799	32	80	535	557
Shared Lane Traffic (%)												
Lane Group Flow (vph)	562	150	159	26	179	0	391	831	0	80	535	557
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Detector Phase	3	3	1	4	4		1	6		5	2	3
Switch Phase												
Minimum Initial (s)	6.0	6.0	4.0	6.0	6.0		4.0	20.0		4.0	20.0	6.0
Minimum Split (s)	25.0	25.0	25.0	13.0	13.0		25.0	27.0		12.0	27.0	25.0
Total Split (s)	35.0	35.0	35.0	25.0	25.0		35.0	60.0		15.0	40.0	35.0
Total Split (%)	25.9%	25.9%	25.9%	18.5%	18.5%		25.9%	44.4%		11.1%	29.6%	25.9%
Maximum Green (s)	28.0	28.0	28.0	18.0	18.0		28.0	53.0		8.0	33.0	28.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	74.1
Actuated g/C Ratio	0.20	0.20	0.38	0.12	0.12		0.52	0.41		0.35	0.30	0.55
v/c Ratio	0.81	0.40	0.23	0.12	0.80		0.79	0.57		0.29	0.51	0.57
Control Delay	61.8	50.2	2.6	53.3	79.5		33.2	32.7		22.8	43.3	14.6

Lanes, Volumes, Timings  
 3: Donald Ross Road & US-1

01/31/2023

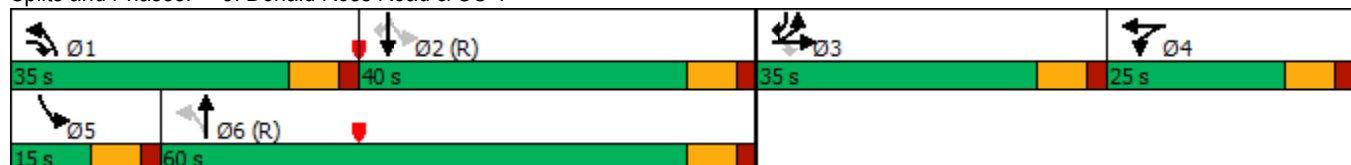


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	61.8	50.2	2.6	53.3	79.5		33.2	32.7		22.8	43.3	14.6
LOS	E	D	A	D	E		C	C		C	D	B
Approach Delay		49.0			76.2			32.9			28.2	
Approach LOS		D			E			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	135
Actuated Cycle Length:	135
Offset:	0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	37.9
Intersection LOS:	D
Intersection Capacity Utilization	83.7%
ICU Level of Service	E
Analysis Period (min)	15

Splits and Phases: 3: Donald Ross Road & US-1



# HCM Signalized Intersection Capacity Analysis

## 3: Donald Ross Road & US-1

01/31/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	517	138	146	24	130	35	360	735	29	74	492	512
Future Volume (vph)	517	138	146	24	130	35	360	735	29	74	492	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1803		1770	3519		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.28	1.00		0.32	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1803		526	3519		595	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	150	159	26	141	38	391	799	32	80	535	557
RTOR Reduction (vph)	0	0	99	0	7	0	0	2	0	0	0	116
Lane Group Flow (vph)	562	150	60	26	172	0	391	829	0	80	535	441
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Actuated Green, G (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	67.1
Effective Green, g (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	67.1
Actuated g/C Ratio	0.20	0.20	0.38	0.12	0.12		0.52	0.41		0.35	0.30	0.50
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	691	375	595	213	217		492	1459		274	1045	868
v/s Ratio Prot	c0.16	0.08	0.02	0.01	c0.10		c0.14	0.24		0.02	0.15	0.10
v/s Ratio Perm			0.02				c0.28			0.09		0.18
v/c Ratio	0.81	0.40	0.10	0.12	0.79		0.79	0.57		0.29	0.51	0.51
Uniform Delay, d1	51.5	46.8	27.3	53.0	57.7		21.9	30.2		29.8	39.5	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.3	0.7	0.1	0.3	17.7		8.6	1.6		0.6	1.8	0.5
Delay (s)	58.7	47.5	27.4	53.2	75.4		30.6	31.9		30.4	41.3	23.3
Level of Service	E	D	C	D	E		C	C		C	D	C
Approach Delay (s)		51.1			72.6			31.4			32.0	
Approach LOS		D			E			C			C	


















### Intersection Summary

HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lanes, Volumes, Timings  
6: US-1 & Park Street

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	14	0	0	0	15	1155	0	48	806	15
Future Volume (vph)	8	0	14	0	0	0	15	1155	0	48	806	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.916										0.997
Flt Protected		0.982					0.950			0.950		
Satd. Flow (prot)	0	1676	0	0	0	0	1770	3539	0	1770	3529	0
Flt Permitted		0.982					0.950			0.950		
Satd. Flow (perm)	0	1676	0	0	0	0	1770	3539	0	1770	3529	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			418			540			706	
Travel Time (s)		11.5			9.5			12.3			16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	15	0	0	0	16	1255	0	52	876	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	0	0	16	1255	0	52	892	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	48.6%						ICU Level of Service A					
Analysis Period (min)	15											

HCM 6th TWSC  
6: US-1 & Park Street

01/31/2023

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕		↕	↕	
Traffic Vol, veh/h	8	0	14	0	0	0	15	1155	0	48	806	15
Future Vol, veh/h	8	0	14	0	0	0	15	1155	0	48	806	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	15	0	0	0	16	1255	0	52	876	16












Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1648	2275	446				892	0	0	1255	0	0
Stage 1	988	988	-				-	-	-	-	-	-
Stage 2	660	1287	-				-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94				4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32				2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	90	40	560				756	-	-	550	-	-
Stage 1	321	323	-				-	-	-	-	-	-
Stage 2	476	233	-				-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	80	0	560				756	-	-	550	-	-
Mov Cap-2 Maneuver	80	0	-				-	-	-	-	-	-
Stage 1	284	0	-				-	-	-	-	-	-
Stage 2	476	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.6	0.1	0.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	756	-	-	176	550	-	-
HCM Lane V/C Ratio	0.022	-	-	0.136	0.095	-	-
HCM Control Delay (s)	9.9	-	-	28.6	12.2	-	-
HCM Lane LOS	A	-	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.3	-	-

Lanes, Volumes, Timings  
9: Mars Way & US-1

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	2	11	1095	2	45	766
Future Volume (vph)	2	11	1095	2	45	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Fr <sub>t</sub>	0.884			0.850		
Fl <sub>t</sub> Protected	0.993				0.950	
Satd. Flow (prot)	1635	0	3539	1583	1770	3539
Fl <sub>t</sub> Permitted	0.993				0.950	
Satd. Flow (perm)	1635	0	3539	1583	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	520		600			540
Travel Time (s)	11.8		13.6			12.3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	12	1190	2	49	833
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	1190	2	49	833
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	46.9%		ICU Level of Service A			
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑	↗	↘	↑↑
Traffic Vol, veh/h	2	11	1095	2	45	766
Future Vol, veh/h	2	11	1095	2	45	766
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	12	1190	2	49	833

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1705	595	0	0	1192
Stage 1	1190	-	-	-	-
Stage 2	515	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	82	447	-	-	581
Stage 1	251	-	-	-	-
Stage 2	565	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	75	447	-	-	581
Mov Cap-2 Maneuver	75	-	-	-	-
Stage 1	230	-	-	-	-
Stage 2	565	-	-	-	-













Approach	WB	NB	SB
HCM Control Delay, s	20	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	254	581
HCM Lane V/C Ratio	-	-	0.056	0.084
HCM Control Delay (s)	-	-	20	11.8
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.2	0.3



Lanes, Volumes, Timings  
11: US-1 & U-Turn

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	0	1097	0	4	764
Future Volume (vph)	0	0	1097	0	4	764
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
<b>Fr</b>						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	0	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	0	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	346		575			600
Travel Time (s)	7.9		13.1			13.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1192	0	4	830
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	1192	0	4	830
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	33.7%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↖	↕
Traffic Vol, veh/h	0	0	1097	0	4	764
Future Vol, veh/h	0	0	1097	0	4	764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1192	0	4	830




















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	596	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	447	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %			
Mov Cap-1 Maneuver	-	447	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	-	-	581
HCM Lane V/C Ratio	-	-	0.007
HCM Control Delay (s)	-	0	11.2
HCM Lane LOS	-	A	B
HCM 95th %tile Q(veh)	-	-	0

Lanes, Volumes, Timings  
13: Olympus Drive & US-1

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	7	0	2	6	11	1099	3	20	714	4
Future Volume (vph)	1	2	7	0	2	6	11	1099	3	20	714	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>		0.902			0.895							0.850
Fl <sub>t</sub> Protected		0.995					0.950			0.950		
Satd. Flow (prot)	0	1672	0	0	1667	0	1770	3539	0	1770	3539	1583
Fl <sub>t</sub> Permitted		0.995					0.950			0.950		
Satd. Flow (perm)	0	1672	0	0	1667	0	1770	3539	0	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			446			254			575	
Travel Time (s)		4.3			10.1			5.8			13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2	8	0	2	7	12	1195	3	22	776	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	9	0	12	1198	0	22	776	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	40.5%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	1	2	7	0	2	6	11	1099	3	20	714	4
Future Vol, veh/h	1	2	7	0	2	6	11	1099	3	20	714	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	8	0	2	7	12	1195	3	22	776	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1443	2042	388	1654	2045	599	780	0	0	1198	0	0
Stage 1	820	820	-	1221	1221	-	-	-	-	-	-	-
Stage 2	623	1222	-	433	824	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	93	56	611	65	55	445	833	-	-	578	-	-
Stage 1	335	387	-	191	251	-	-	-	-	-	-	-
Stage 2	440	250	-	571	385	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	85	53	611	60	52	445	833	-	-	578	-	-
Mov Cap-2 Maneuver	85	53	-	60	52	-	-	-	-	-	-	-
Stage 1	330	372	-	188	247	-	-	-	-	-	-	-
Stage 2	424	247	-	539	370	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	28.5		29.8		0.1		0.3	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	833	-	-	164	154	578	-	-
HCM Lane V/C Ratio	0.014	-	-	0.066	0.056	0.038	-	-
HCM Control Delay (s)	9.4	-	-	28.5	29.8	11.5	-	-
HCM Lane LOS	A	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0.1	-	-

## APPENDIX C

### BUILD CONDITIONS (CLOSURE OF CENTER MEDIAN ON US-1 AT MARS WAY – SYNCHRO PRINTOUTS

Lanes, Volumes, Timings  
3: Donald Ross Road & US-1

01/31/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	363	129	266	21	106	26	184	419	17	35	729	386
Future Volume (vph)	363	129	266	21	106	26	184	419	17	35	729	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>			0.850		0.971			0.994				0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1809	0	1770	3518	0	1770	3539	1583
Fl <sub>t</sub> Permitted	0.950			0.950			0.211			0.481		
Satd. Flow (perm)	3433	1863	1583	1770	1809	0	393	3518	0	896	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			289		8			4				374
Link Speed (mph)		30			30			30				30
Link Distance (ft)		637			666			706				389
Travel Time (s)		14.5			15.1			16.0				8.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	395	140	289	23	115	28	200	455	18	38	792	420
Shared Lane Traffic (%)												
Lane Group Flow (vph)	395	140	289	23	143	0	200	473	0	38	792	420
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Detector Phase	3	3	1	4	4		1	6		5	2	3
Switch Phase												
Minimum Initial (s)	6.0	6.0	4.0	6.0	6.0		4.0	20.0		4.0	20.0	6.0
Minimum Split (s)	25.0	25.0	25.0	13.0	13.0		25.0	27.0		12.0	27.0	25.0
Total Split (s)	30.0	30.0	27.0	25.0	25.0		27.0	57.0		15.0	45.0	30.0
Total Split (%)	23.6%	23.6%	21.3%	19.7%	19.7%		21.3%	44.9%		11.8%	35.4%	23.6%
Maximum Green (s)	23.0	23.0	20.0	18.0	18.0		20.0	50.0		8.0	38.0	23.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	21.0	21.0	34.2	14.3	14.3		70.1	59.4		57.2	50.5	78.5
Actuated g/C Ratio	0.17	0.17	0.27	0.11	0.11		0.55	0.47		0.45	0.40	0.62
v/c Ratio	0.70	0.45	0.45	0.12	0.68		0.56	0.29		0.08	0.56	0.37
Control Delay	56.7	52.3	4.2	50.2	66.9		21.5	23.1		16.2	33.6	3.1

Lanes, Volumes, Timings  
 3: Donald Ross Road & US-1

01/31/2023

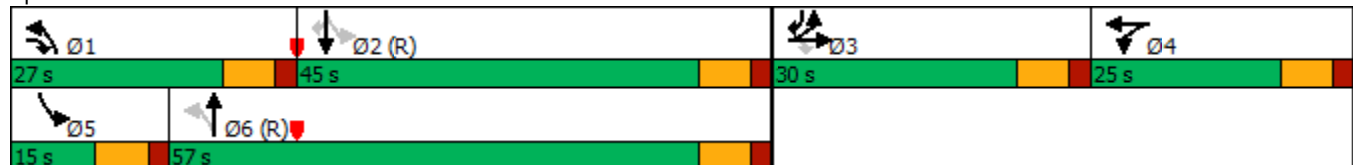


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	56.7	52.3	4.2	50.2	66.9		21.5	23.1		16.2	33.6	3.1
LOS	E	D	A	D	E		C	C		B	C	A
Approach Delay		37.5			64.6			22.7			22.8	
Approach LOS		D			E			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	127
Actuated Cycle Length:	127
Offset:	0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.70
Intersection Signal Delay:	29.3
Intersection LOS:	C
Intersection Capacity Utilization	71.2%
ICU Level of Service	C
Analysis Period (min)	15

Splits and Phases: 3: Donald Ross Road & US-1



# HCM Signalized Intersection Capacity Analysis

## 3: Donald Ross Road & US-1

01/31/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑	↖	↖	↗		↖	↖↗		↖	↖↗	↖
Traffic Volume (vph)	363	129	266	21	106	26	184	419	17	35	729	386
Future Volume (vph)	363	129	266	21	106	26	184	419	17	35	729	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1808		1770	3519		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.21	1.00		0.48	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1808		393	3519		896	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	395	140	289	23	115	28	200	455	18	38	792	420
RTOR Reduction (vph)	0	0	211	0	7	0	0	2	0	0	0	163
Lane Group Flow (vph)	395	140	78	23	136	0	200	471	0	38	792	257
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Actuated Green, G (s)	21.0	21.0	34.2	14.3	14.3		70.7	58.1		56.1	50.5	71.5
Effective Green, g (s)	21.0	21.0	34.2	14.3	14.3		70.7	58.1		56.1	50.5	71.5
Actuated g/C Ratio	0.17	0.17	0.27	0.11	0.11		0.56	0.46		0.44	0.40	0.56
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	567	308	426	199	203		361	1609		434	1407	978
v/s Ratio Prot	c0.12	0.08	0.02	0.01	c0.08		c0.06	0.13		0.00	0.22	0.04
v/s Ratio Perm			0.03				c0.25			0.03		0.12
v/c Ratio	0.70	0.45	0.18	0.12	0.67		0.55	0.29		0.09	0.56	0.26
Uniform Delay, d1	50.0	47.8	35.7	50.7	54.1		17.1	21.6		20.2	29.7	14.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	1.1	0.2	0.3	8.1		1.8	0.5		0.1	1.6	0.1
Delay (s)	53.7	48.9	35.9	50.9	62.2		18.9	22.0		20.3	31.3	14.4
Level of Service	D	D	D	D	E		B	C		C	C	B
Approach Delay (s)		46.6			60.6			21.1			25.3	
Approach LOS		D			E			C			C	

### Intersection Summary


















HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	127.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lanes, Volumes, Timings  
6: US-1 & Park Street

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	0	15	0	0	0	11	617	0	42	976	24
Future Volume (vph)	12	0	15	0	0	0	11	617	0	42	976	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.926									0.996	
Flt Protected		0.978					0.950			0.950		
Satd. Flow (prot)	0	1687	0	0	0	0	1770	3539	0	1770	3525	0
Flt Permitted		0.978					0.950			0.950		
Satd. Flow (perm)	0	1687	0	0	0	0	1770	3539	0	1770	3525	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			418			540			706	
Travel Time (s)		11.5			9.5			12.3			16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	0	16	0	0	0	12	671	0	46	1061	26
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	29	0	0	0	0	12	671	0	46	1087	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15			9	15		9	15	9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	44.4%						ICU Level of Service A					
Analysis Period (min)	15											

HCM 6th TWSC  
6: US-1 & Park Street

01/31/2023

Intersection												
Int Delay, s/veh	0.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕		↕	↕	
Traffic Vol, veh/h	12	0	15	0	0	0	11	617	0	42	976	24
Future Vol, veh/h	12	0	15	0	0	0	11	617	0	42	976	24
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	16	0	0	0	12	671	0	46	1061	26












Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1526	1861	544				1087	0	0	671	0	0
Stage 1	1166	1166	-				-	-	-	-	-	-
Stage 2	360	695	-				-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94				4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32				2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	108	72	483				638	-	-	915	-	-
Stage 1	259	266	-				-	-	-	-	-	-
Stage 2	677	442	-				-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	0	483				638	-	-	915	-	-
Mov Cap-2 Maneuver	101	0	-				-	-	-	-	-	-
Stage 1	241	0	-				-	-	-	-	-	-
Stage 2	677	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.9	0.2	0.4
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	638	-	-	180	915	-	-
HCM Lane V/C Ratio	0.019	-	-	0.163	0.05	-	-
HCM Control Delay (s)	10.8	-	-	28.9	9.1	-	-
HCM Lane LOS	B	-	-	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.2	-	-

Lanes, Volumes, Timings  
9: Mars Way & US-1

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	0	34	789	5	0	1210
Future Volume (vph)	0	34	789	5	0	1210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Fr <sub>t</sub>	0.865		0.850			
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	1611	0	3539	1583	1863	3539
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	1611	0	3539	1583	1863	3539
Link Speed (mph)	30		30		30	
Link Distance (ft)	520		600		540	
Travel Time (s)	11.8		13.6		12.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	37	858	5	0	1315
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	858	5	0	1315
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12		12	
Link Offset(ft)	0		0		0	
Crosswalk Width(ft)	16		16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free		Free	
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.4%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↙		↑↑	↗	↘	↑↑
Traffic Vol, veh/h	0	34	789	5	0	1210
Future Vol, veh/h	0	34	789	5	0	1210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	37	858	5	0	1315

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1516	429	0	0	863
Stage 1	858	-	-	-	-
Stage 2	658	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	110	574	-	-	775
Stage 1	376	-	-	-	-
Stage 2	477	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	110	574	-	-	775
Mov Cap-2 Maneuver	110	-	-	-	-
Stage 1	376	-	-	-	-
Stage 2	477	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	574	775
HCM Lane V/C Ratio	-	-	0.064	-
HCM Control Delay (s)	-	-	11.7	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Lanes, Volumes, Timings  
11: US-1 & U-Turn

01/31/2023



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↖	↕
Traffic Volume (vph)	0	0	781	0	15	1198
Future Volume (vph)	0	0	781	0	15	1198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
<b>Fr</b>						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	0	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	0	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	346		575			600
Travel Time (s)	7.9		13.1			13.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	849	0	16	1302
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	849	0	16	1302
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

**Intersection Summary**

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	36.4%
Analysis Period (min)	15
	ICU Level of Service A

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↖	↕
Traffic Vol, veh/h	0	0	781	0	15	1198
Future Vol, veh/h	0	0	781	0	15	1198
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	849	0	16	1302




















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	425	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	578	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	578	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	-	785	-
HCM Lane V/C Ratio	-	0.021	-
HCM Control Delay (s)	-	0	9.7
HCM Lane LOS	-	A	A
HCM 95th %tile Q(veh)	-	0.1	-

Lanes, Volumes, Timings  
13: Olympus Drive & US-1

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	1	2	2	7	8	709	1	13	1378	4
Future Volume (vph)	1	2	1	2	2	7	8	709	1	13	1378	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.966			0.910							0.850
Flt Protected		0.988			0.992		0.950			0.950		
Satd. Flow (prot)	0	1778	0	0	1682	0	1770	3539	0	1770	3539	1583
Flt Permitted		0.988			0.992		0.950			0.950		
Satd. Flow (perm)	0	1778	0	0	1682	0	1770	3539	0	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			446			254			575	
Travel Time (s)		4.3			10.1			5.8			13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2	1	2	2	8	9	771	1	14	1498	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	4	0	0	12	0	9	772	0	14	1498	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	48.1%						ICU Level of Service A					
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	1	2	1	2	2	7	8	709	1	13	1378	4
Future Vol, veh/h	1	2	1	2	2	7	8	709	1	13	1378	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	1	2	2	8	9	771	1	14	1498	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1931	2316	749	1568	2320	386	1502	0	0	772	0	0
Stage 1	1526	1526	-	790	790	-	-	-	-	-	-	-
Stage 2	405	790	-	778	1530	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	40	37	354	75	37	612	442	-	-	839	-	-
Stage 1	123	178	-	350	400	-	-	-	-	-	-	-
Stage 2	593	400	-	355	177	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	37	36	354	69	36	612	442	-	-	839	-	-
Mov Cap-2 Maneuver	37	36	-	69	36	-	-	-	-	-	-	-
Stage 1	121	175	-	343	392	-	-	-	-	-	-	-
Stage 2	571	392	-	344	174	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	89.3		39.9		0.1		0.1	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	442	-	-	47	115	839	-	-
HCM Lane V/C Ratio	0.02	-	-	0.093	0.104	0.017	-	-
HCM Control Delay (s)	13.3	-	-	89.3	39.9	9.4	-	-
HCM Lane LOS	B	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	0.1	-	-



Lanes, Volumes, Timings  
3: Donald Ross Road & US-1

01/31/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	517	156	128	24	130	35	360	735	29	74	492	512
Future Volume (vph)	517	156	128	24	130	35	360	735	29	74	492	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.968			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	1863	1583	1770	1803	0	1770	3518	0	1770	3539	1583
Flt Permitted	0.950			0.950			0.283			0.320		
Satd. Flow (perm)	3433	1863	1583	1770	1803	0	527	3518	0	596	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		8			3				231
Link Speed (mph)		30			30			30				30
Link Distance (ft)		637			666			706				389
Travel Time (s)		14.5			15.1			16.0				8.8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	170	139	26	141	38	391	799	32	80	535	557
Shared Lane Traffic (%)												
Lane Group Flow (vph)	562	170	139	26	179	0	391	831	0	80	535	557
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			12				12
Link Offset(ft)		0			0			0				0
Crosswalk Width(ft)		16			16			16				16
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Detector Phase	3	3	1	4	4		1	6		5	2	3
Switch Phase												
Minimum Initial (s)	6.0	6.0	4.0	6.0	6.0		4.0	20.0		4.0	20.0	6.0
Minimum Split (s)	25.0	25.0	25.0	13.0	13.0		25.0	27.0		12.0	27.0	25.0
Total Split (s)	35.0	35.0	35.0	25.0	25.0		35.0	60.0		15.0	40.0	35.0
Total Split (%)	25.9%	25.9%	25.9%	18.5%	18.5%		25.9%	44.4%		11.1%	29.6%	25.9%
Maximum Green (s)	28.0	28.0	28.0	18.0	18.0		28.0	53.0		8.0	33.0	28.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	74.1
Actuated g/C Ratio	0.20	0.20	0.38	0.12	0.12		0.52	0.41		0.35	0.30	0.55
v/c Ratio	0.81	0.45	0.20	0.12	0.80		0.79	0.57		0.29	0.51	0.57
Control Delay	61.8	51.5	2.7	53.3	79.5		33.2	32.7		22.8	43.3	14.6

Lanes, Volumes, Timings  
 3: Donald Ross Road & US-1

01/31/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	61.8	51.5	2.7	53.3	79.5		33.2	32.7		22.8	43.3	14.6
LOS	E	D	A	D	E		C	C		C	D	B
Approach Delay		50.4			76.2			32.9			28.2	
Approach LOS		D			E			C			C	

Intersection Summary

Area Type:	Other
Cycle Length:	135
Actuated Cycle Length:	135
Offset:	0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	90
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	38.3
Intersection LOS:	D
Intersection Capacity Utilization	83.7%
ICU Level of Service	E
Analysis Period (min)	15






























Splits and Phases: 3: Donald Ross Road & US-1



# HCM Signalized Intersection Capacity Analysis

## 3: Donald Ross Road & US-1


















01/31/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 				 		 	 	 
Traffic Volume (vph)	517	156	128	24	130	35	360	735	29	74	492	512
Future Volume (vph)	517	156	128	24	130	35	360	735	29	74	492	512
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	1863	1583	1770	1803		1770	3519		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.28	1.00		0.32	1.00	1.00
Satd. Flow (perm)	3433	1863	1583	1770	1803		526	3519		595	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	562	170	139	26	141	38	391	799	32	80	535	557
RTOR Reduction (vph)	0	0	87	0	7	0	0	2	0	0	0	116
Lane Group Flow (vph)	562	170	52	26	172	0	391	829	0	80	535	441
Turn Type	Split	NA	pm+ov	Split	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	3	3	1	4	4		1	6		5	2	3
Permitted Phases			3				6			2		2
Actuated Green, G (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	67.1
Effective Green, g (s)	27.2	27.2	50.8	16.3	16.3		70.5	56.0		47.4	39.9	67.1
Actuated g/C Ratio	0.20	0.20	0.38	0.12	0.12		0.52	0.41		0.35	0.30	0.50
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	691	375	595	213	217		492	1459		274	1045	868
v/s Ratio Prot	c0.16	0.09	0.02	0.01	c0.10		c0.14	0.24		0.02	0.15	0.10
v/s Ratio Perm			0.02				c0.28			0.09		0.18
v/c Ratio	0.81	0.45	0.09	0.12	0.79		0.79	0.57		0.29	0.51	0.51
Uniform Delay, d1	51.5	47.4	27.2	53.0	57.7		21.9	30.2		29.8	39.5	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.3	0.9	0.1	0.3	17.7		8.6	1.6		0.6	1.8	0.5
Delay (s)	58.7	48.2	27.2	53.2	75.4		30.6	31.9		30.4	41.3	23.3
Level of Service	E	D	C	D	E		C	C		C	D	C
Approach Delay (s)		51.7			72.6			31.4			32.0	
Approach LOS		D			E			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.1				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			135.0				Sum of lost time (s)			28.0		
Intersection Capacity Utilization			83.7%				ICU Level of Service			E		
Analysis Period (min)			15									

c Critical Lane Group

Lanes, Volumes, Timings  
6: US-1 & Park Street

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	14	0	0	0	17	1155	0	48	788	15
Future Volume (vph)	8	0	14	0	0	0	17	1155	0	48	788	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.916										0.997
Flt Protected		0.982					0.950			0.950		
Satd. Flow (prot)	0	1676	0	0	0	0	1770	3539	0	1770	3529	0
Flt Permitted		0.982					0.950			0.950		
Satd. Flow (perm)	0	1676	0	0	0	0	1770	3539	0	1770	3529	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		505			418			540			706	
Travel Time (s)		11.5			9.5			12.3			16.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	15	0	0	0	18	1255	0	52	857	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	24	0	0	0	0	18	1255	0	52	873	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	48.6%						ICU Level of Service A					
Analysis Period (min)	15											

HCM 6th TWSC  
6: US-1 & Park Street

01/31/2023

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↕	↕		↕	↕	
Traffic Vol, veh/h	8	0	14	0	0	0	17	1155	0	48	788	15
Future Vol, veh/h	8	0	14	0	0	0	17	1155	0	48	788	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	15	0	0	0	18	1255	0	52	857	16














Major/Minor	Minor2			Major1			Major2					
Conflicting Flow All	1633	2260	437				873	0	0	1255	0	0
Stage 1	969	969	-				-	-	-	-	-	-
Stage 2	664	1291	-				-	-	-	-	-	-
Critical Hdwy	6.84	6.54	6.94				4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	5.84	5.54	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	5.54	-				-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32				2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	92	40	567				768	-	-	550	-	-
Stage 1	329	330	-				-	-	-	-	-	-
Stage 2	474	232	-				-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	81	0	567				768	-	-	550	-	-
Mov Cap-2 Maneuver	81	0	-				-	-	-	-	-	-
Stage 1	291	0	-				-	-	-	-	-	-
Stage 2	474	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.3	0.1	0.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	SBL	SBT	SBR
Capacity (veh/h)	768	-	-	178	550	-	-
HCM Lane V/C Ratio	0.024	-	-	0.134	0.095	-	-
HCM Control Delay (s)	9.8	-	-	28.3	12.2	-	-
HCM Lane LOS	A	-	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.3	-	-

Lanes, Volumes, Timings  
9: Mars Way & US-1

01/31/2023

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (vph)	0	13	1105	5	0	795
Future Volume (vph)	0	13	1105	5	0	795
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Fr <sub>t</sub>	0.865		0.850			
Fl <sub>t</sub> Protected						
Satd. Flow (prot)	1611	0	3539	1583	1863	3539
Fl <sub>t</sub> Permitted						
Satd. Flow (perm)	1611	0	3539	1583	1863	3539
Link Speed (mph)	30		30			
Link Distance (ft)	520		600			
Travel Time (s)	11.8		13.6			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	14	1201	5	0	864
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	1201	5	0	864
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			
Link Offset(ft)	0		0			
Crosswalk Width(ft)	16		16			
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			
<b>Intersection Summary</b>						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	40.5%			ICU Level of Service A		
Analysis Period (min)	15					

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑	↗	↘	↑↑
Traffic Vol, veh/h	0	13	1105	5	0	795
Future Vol, veh/h	0	13	1105	5	0	795
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	1201	5	0	864

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1633	601	0	0	1206
Stage 1	1201	-	-	-	-
Stage 2	432	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	92	443	-	-	574
Stage 1	248	-	-	-	-
Stage 2	622	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	92	443	-	-	574
Mov Cap-2 Maneuver	92	-	-	-	-
Stage 1	248	-	-	-	-
Stage 2	622	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	443	574
HCM Lane V/C Ratio	-	-	0.032	-
HCM Control Delay (s)	-	-	13.4	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

# Lanes, Volumes, Timings

## 11: US-1 & U-Turn

01/31/2023



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↘	↕
Traffic Volume (vph)	0	0	1097	0	17	764
Future Volume (vph)	0	0	1097	0	17	764
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
<b>Fr</b>						
Flt Protected					0.950	
Satd. Flow (prot)	0	1863	3539	0	1770	3539
Flt Permitted					0.950	
Satd. Flow (perm)	0	1863	3539	0	1770	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	346		575			600
Travel Time (s)	7.9		13.1			13.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	1192	0	18	830
<b>Shared Lane Traffic (%)</b>						
Lane Group Flow (vph)	0	0	1192	0	18	830
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	0		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
<b>Two way Left Turn Lane</b>						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

### Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	33.7%
Analysis Period (min)	15
	ICU Level of Service A



Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗	↕		↖	↕
Traffic Vol, veh/h	0	0	1097	0	17	764
Future Vol, veh/h	0	0	1097	0	17	764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1192	0	18	830




















Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	596	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	447	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	-	447	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1	SBL	SBT
Capacity (veh/h)	-	-	581
HCM Lane V/C Ratio	-	-	0.032
HCM Control Delay (s)	-	0	11.4
HCM Lane LOS	-	A	B
HCM 95th %tile Q(veh)	-	-	0.1

Lanes, Volumes, Timings  
13: Olympus Drive & US-1

01/31/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	2	7	0	2	6	11	1099	3	34	714	4
Future Volume (vph)	1	2	7	0	2	6	11	1099	3	34	714	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>		0.902			0.895							0.850
Fl <sub>t</sub> Protected		0.995					0.950			0.950		
Satd. Flow (prot)	0	1672	0	0	1667	0	1770	3539	0	1770	3539	1583
Fl <sub>t</sub> Permitted		0.995					0.950			0.950		
Satd. Flow (perm)	0	1672	0	0	1667	0	1770	3539	0	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		187			446			254			575	
Travel Time (s)		4.3			10.1			5.8			13.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	2	8	0	2	7	12	1195	3	37	776	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	11	0	0	9	0	12	1198	0	37	776	4
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Free			Free	
<b>Intersection Summary</b>												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	40.5%					ICU Level of Service A						
Analysis Period (min)	15											

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	1	2	7	0	2	6	11	1099	3	34	714	4
Future Vol, veh/h	1	2	7	0	2	6	11	1099	3	34	714	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	0	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	8	0	2	7	12	1195	3	37	776	4

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1473	2072	388	1684	2075	599	780	0	0	1198	0	0
Stage 1	850	850	-	1221	1221	-	-	-	-	-	-	-
Stage 2	623	1222	-	463	854	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	88	53	611	61	53	445	833	-	-	578	-	-
Stage 1	322	375	-	191	251	-	-	-	-	-	-	-
Stage 2	440	250	-	548	373	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	79	49	611	55	49	445	833	-	-	578	-	-
Mov Cap-2 Maneuver	79	49	-	55	49	-	-	-	-	-	-	-
Stage 1	317	351	-	188	247	-	-	-	-	-	-	-
Stage 2	424	247	-	503	349	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	30.1		31		0.1		0.5	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	833	-	-	154	147	578	-	-
HCM Lane V/C Ratio	0.014	-	-	0.071	0.059	0.064	-	-
HCM Control Delay (s)	9.4	-	-	30.1	31	11.7	-	-
HCM Lane LOS	A	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0.2	-	-