APPENDIX A: PROPOSED SITE PLAN

HWY 211 APARTMENTS

SEC. 08, T. 5 S., R. 1 W., W.M.
CITY OF WOODBURN
MARION COUNTY, OREGON
TAX LOT: 051W08A005200

SITE PLAN

1" = 40'0"

AREA:
416,894 SQ FT
9.57 ACRES

258 TOTAL APT UNITS

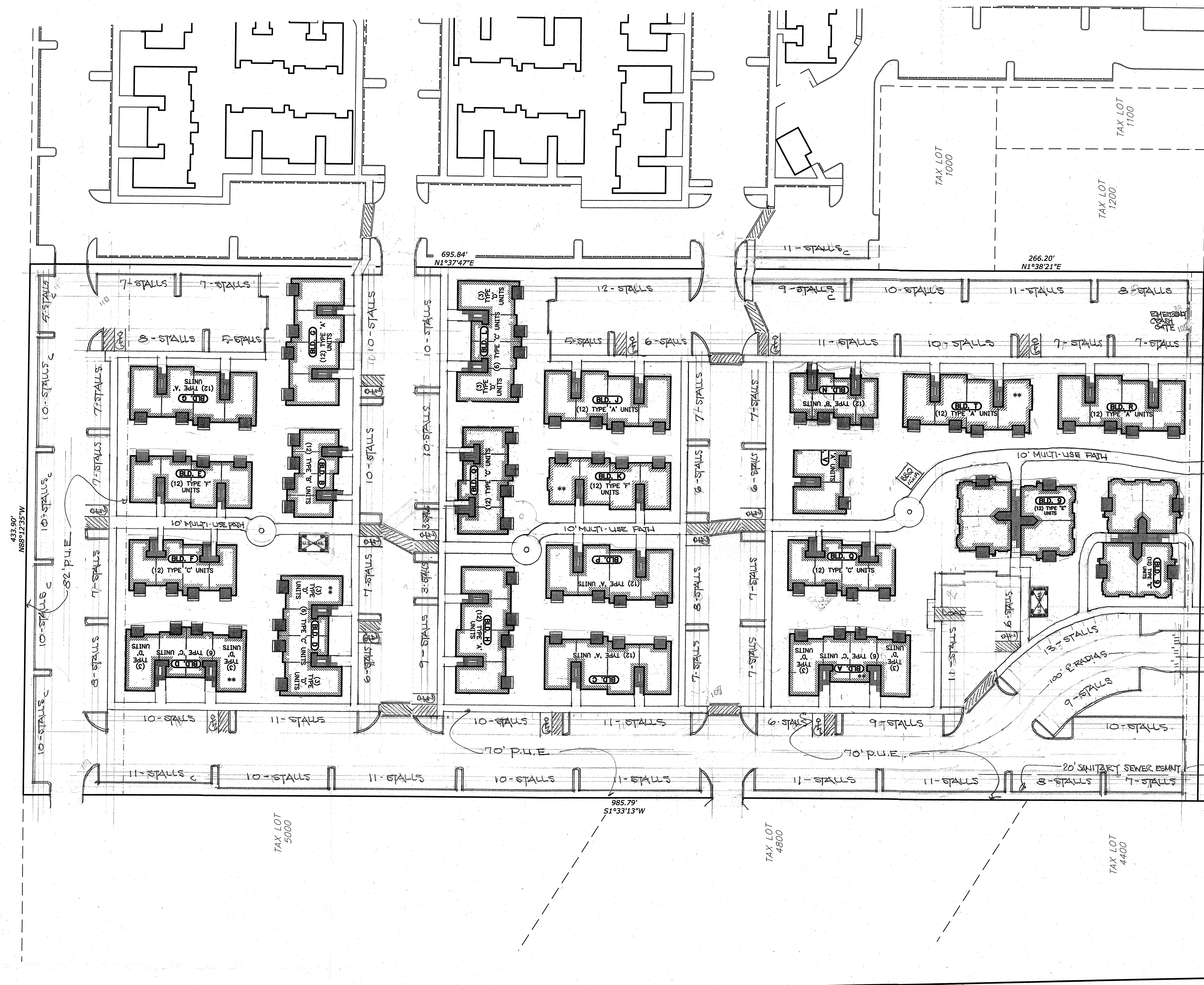
102	TYPE (A)	2 BED/ 2 BATH	(952 sqft)
24	TYPE (B)	STUDIO UNITS	(549sqft)
60	TYPE (C)	1 BED/ 1 BATH	(728 sqft)
24	TYPE (D)	3 BED/2 BATH	(1204sqft)
24	TYPE (E)	2 BED/2 BATH	(1179sqft)
24	TYPE (F)	2 BED/1 BATH	(844sqft)

517 TOTAL PARKING STALLS

435	STANDARD STALLS
65	COMPACT STALLS
16	HANDICAPPED STALLS
1	LOADING

SITE

2	US MAIL BOX AREAS
1	MULTI- USE PATH 10' wide
1	BBQ covered 15'x 15'



PROPOSED 258 Unit Apt Complex
Mollalla Rd Woodburn, OR

HWY 211 APARTMENTS

MULTI/TECH
ENGINEERING SERVICES, INC.
1155 13th ST. S.E. SALEM, OR. 97302
PH. (503) 363-9227 FAX (503) 364-1260
www.mtengineering.net office@mtengineering.net

NO CHANGES, MODIFICATIONS OR REPRODUCTIONS TO BE MADE TO THESE DRAWINGS WITHOUT WRITTEN AUTHORIZATION FROM THE DESIGN ENGINEER.

DIMENSIONS & NOTES TAKE PRECEDENCE OVER GRAPHICAL REPRESENTATION.

Design:	M.D.G.
Drawn:	T.N.S.
Checked:	J.C.B.
Date:	DEC 2021
Scale:	AS SHOWN

REVISED: 8-21-22

JOB # G21-088

APPENDIX B: TRAFFIC COUNTS

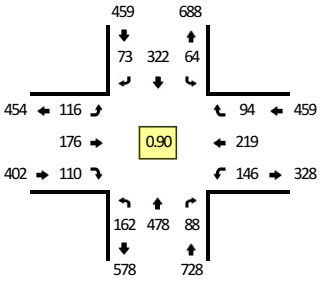
Type of peak hour being reported: Intersection Peak

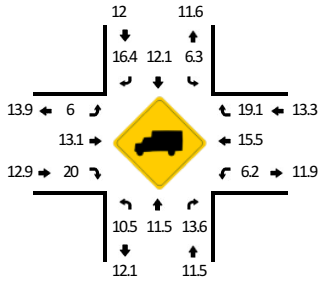
Method for determining peak hour: Total Entering Volume

LOCATION: OR-99E -- Molalla Rd
CITY/STATE: Marion, OR

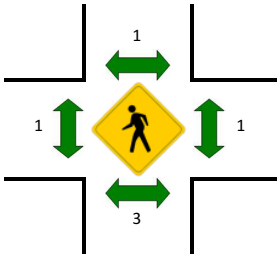
QC JOB #: 15064701
DATE: Thu, Sep 12 2019

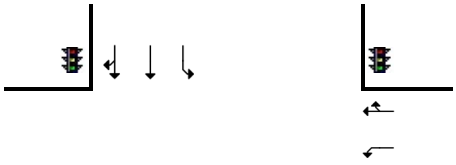
Peak-Hour: 7:10 AM -- 8:10 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

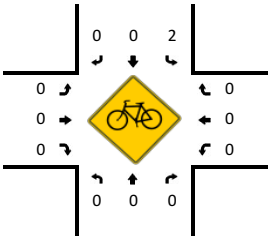


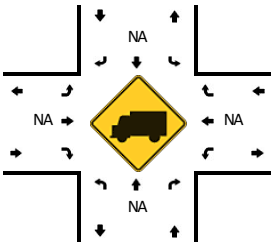


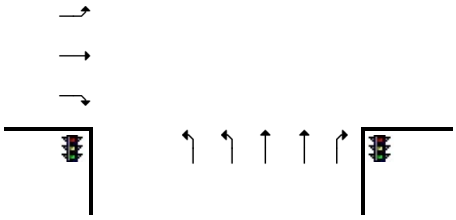
Quality Counts
DATA THAT DRIVES COMMUNITIES

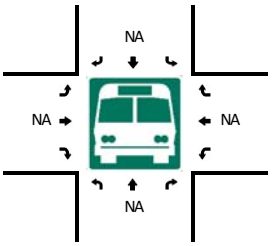












5-Min Count Period Beginning At	OR-99E (Northbound)				OR-99E (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	8	32	7	0	3	9	5	0	9	13	2	0	2	10	9	0	109	
6:05 AM	2	49	6	0	1	13	3	0	6	14	1	0	2	10	7	0	114	
6:10 AM	4	44	9	0	2	11	1	0	10	16	1	0	2	11	2	0	113	
6:15 AM	4	49	6	0	3	19	4	0	10	13	1	0	9	10	6	0	134	
6:20 AM	5	48	9	0	2	17	5	0	6	17	5	0	6	14	6	0	140	
6:25 AM	5	38	9	0	5	11	4	0	8	25	5	0	7	12	5	0	134	
6:30 AM	5	37	9	0	6	17	7	0	9	16	4	0	5	12	8	0	135	
6:35 AM	5	53	10	0	2	20	5	0	8	9	2	0	6	19	6	0	145	
6:40 AM	6	69	10	0	3	29	8	0	7	29	7	0	5	18	10	0	201	
6:45 AM	6	41	8	0	6	24	6	0	15	18	3	0	9	10	7	0	153	
6:50 AM	13	55	7	0	3	22	3	0	19	11	3	0	5	14	10	0	165	
6:55 AM	9	34	10	0	6	15	4	0	12	19	8	0	15	13	7	0	152	1695
7:00 AM	8	53	10	0	5	33	8	0	11	10	5	0	11	11	4	0	169	1755
7:05 AM	9	40	10	0	6	20	5	0	5	19	12	0	5	9	3	0	143	1784
7:10 AM	12	39	8	0	8	27	11	0	7	8	8	0	12	20	3	0	163	1834
7:15 AM	7	36	13	0	4	21	7	0	7	14	6	0	19	21	16	0	171	1871
7:20 AM	10	47	5	0	8	24	2	0	13	15	1	0	10	17	9	0	161	1892
7:25 AM	20	45	10	0	4	23	9	0	10	14	4	0	15	17	14	0	185	1943
7:30 AM	11	40	9	0	2	20	7	0	9	12	11	0	7	20	6	0	154	1962
7:35 AM	18	37	7	0	6	29	7	0	13	11	9	0	14	17	5	0	173	1990
7:40 AM	12	41	8	0	3	27	3	0	11	10	5	0	13	17	6	0	156	1945
7:45 AM	18	53	8	0	8	29	7	0	7	19	15	0	13	24	6	0	207	1999
7:50 AM	14	38	8	0	2	31	10	0	12	24	11	0	15	19	6	0	190	2024
7:55 AM	16	30	3	0	9	30	1	0	11	18	19	0	7	17	8	0	169	2041
8:00 AM	14	37	4	0	6	39	4	0	6	13	7	0	11	22	6	0	169	2041
8:05 AM	10	35	5	0	4	22	5	0	10	18	14	0	10	8	9	0	150	2048
8:10 AM	13	27	5	0	4	28	5	0	4	8	5	0	11	14	3	0	127	2012
8:15 AM	8	32	5	0	5	18	6	0	12	11	18	0	6	12	4	0	137	1978
8:20 AM	19	28	10	0	4	27	11	0	7	17	5	0	6	13	10	0	157	1974
8:25 AM	12	33	7	1	3	18	11	0	6	16	5	0	6	13	3	0	134	1923
8:30 AM	6	27	6	0	2	28	10	0	11	11	10	0	8	18	8	0	145	1914
8:35 AM	21	23	6	0	9	25	4	0	6	17	11	0	15	11	9	0	157	1898
8:40 AM	10	25	6	0	8	18	10	0	10	18	14	0	8	12	8	0	147	1889
8:45 AM	13	33	8	0	5	24	4	0	8	12	16	0	8	11	8	0	150	1832
8:50 AM	13	30	4	0	8	17	8	0	7	5	11	0	12	13	9	0	137	1779
8:55 AM	9	26	11	0	10	20	11	0	10	15	8	0	6	9	2	0	137	1747

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	192	484	76	0	76	360	72	0	120	244	180	0	140	240	80	0	2264
Heavy Trucks	32	60	20		0	24	8		8	12	28		12	36	4		244
Pedestrians		8				0				4				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

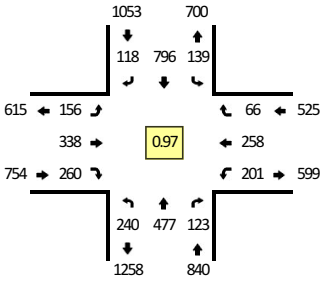
Type of peak hour being reported: Intersection Peak

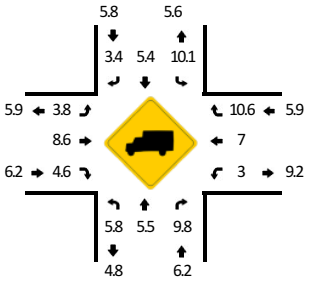
Method for determining peak hour: Total Entering Volume

LOCATION: OR-99E -- Molalla Rd
CITY/STATE: Marion, OR

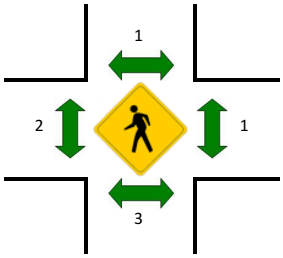
QC JOB #: 15064702
DATE: Thu, Sep 12 2019

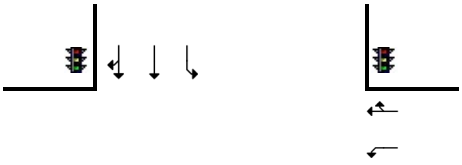
Peak-Hour: 4:25 PM -- 5:25 PM
Peak 15-Min: 4:55 PM -- 5:10 PM

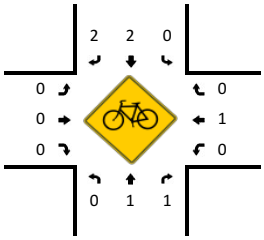


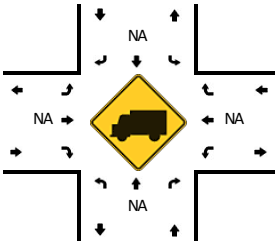


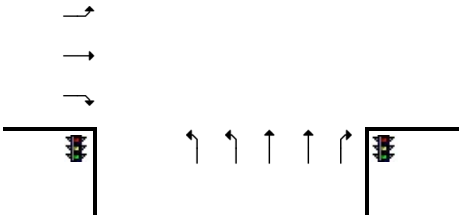
Quality Counts
DATA THAT DRIVES COMMUNITIES

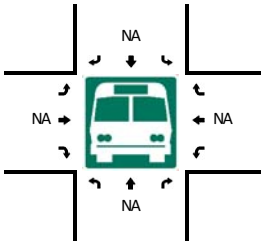












5-Min Count Period Beginning At	OR-99E (Northbound)				OR-99E (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	13	29	14	0	10	37	9	0	18	19	15	0	16	11	7	0	198	
3:05 PM	10	28	9	0	10	39	9	0	10	25	20	0	18	23	7	0	208	
3:10 PM	22	34	9	0	9	46	8	0	11	28	18	0	15	14	5	0	219	
3:15 PM	13	24	10	0	12	53	13	0	14	13	17	0	17	21	5	0	212	
3:20 PM	12	24	2	0	7	46	5	0	11	33	15	0	17	22	4	0	198	
3:25 PM	24	43	6	0	6	52	16	0	14	20	17	0	7	8	9	0	222	
3:30 PM	14	35	11	0	21	58	21	0	12	13	27	0	13	20	5	0	250	
3:35 PM	20	26	6	0	9	63	6	0	18	23	26	0	25	21	5	0	248	
3:40 PM	30	45	9	0	7	64	14	0	8	30	16	0	11	10	7	0	251	
3:45 PM	21	38	12	0	15	70	14	0	11	20	17	0	16	22	5	0	261	
3:50 PM	11	36	8	0	10	46	9	0	20	25	28	0	25	24	1	0	243	
3:55 PM	31	45	10	0	11	42	3	0	17	29	17	0	10	22	8	0	245	2755
4:00 PM	15	36	12	0	10	85	15	0	10	25	13	0	7	15	4	0	247	2804
4:05 PM	22	46	10	0	18	54	16	0	9	25	25	0	17	24	8	0	274	2870
4:10 PM	18	33	14	0	13	42	6	0	8	27	21	0	12	30	8	0	232	2883
4:15 PM	26	41	12	0	3	68	11	0	11	26	23	0	20	18	6	0	265	2936
4:20 PM	12	40	8	0	14	53	8	0	10	23	17	0	22	25	4	0	236	2974
4:25 PM	21	31	8	0	13	43	14	0	17	35	20	0	18	31	6	0	257	3009
4:30 PM	25	47	6	0	14	74	10	0	7	26	19	0	14	15	6	0	263	3022
4:35 PM	16	44	10	0	18	80	7	1	17	22	21	0	12	22	5	0	275	3049
4:40 PM	20	28	9	0	11	61	8	0	15	30	34	0	24	28	7	0	275	3073
4:45 PM	20	43	12	0	11	59	9	0	13	34	16	0	16	18	8	0	259	3071
4:50 PM	14	45	10	0	14	96	11	0	11	21	11	0	15	15	5	0	268	3096
4:55 PM	20	39	7	0	13	64	3	0	15	36	22	0	18	24	6	0	267	3118
5:00 PM	31	50	10	0	16	52	8	0	12	29	19	0	18	27	6	0	278	3149
5:05 PM	17	27	18	1	9	84	15	0	16	23	29	0	15	14	4	0	272	3147
5:10 PM	13	31	13	0	9	58	13	0	9	14	27	0	26	25	3	0	241	3156
5:15 PM	12	41	10	0	8	50	10	0	14	41	20	0	12	21	5	0	244	3135
5:20 PM	30	51	10	0	2	75	10	0	10	27	22	0	13	18	5	0	273	3172
5:25 PM	20	36	9	0	22	60	10	0	17	14	21	0	19	10	6	0	244	3159
5:30 PM	13	24	4	0	13	45	9	0	15	39	21	0	16	31	6	0	236	3132
5:35 PM	33	44	7	0	6	56	15	0	7	21	19	0	21	18	4	0	251	3108
5:40 PM	12	30	7	0	17	73	16	0	10	21	19	0	14	16	2	0	237	3070
5:45 PM	20	26	4	0	9	46	9	0	14	28	17	0	25	25	4	0	227	3038
5:50 PM	22	32	14	0	11	52	12	0	11	14	18	0	13	8	6	0	213	2983
5:55 PM	19	39	7	0	10	63	9	0	9	17	20	0	15	16	4	0	228	2944

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	272	464	140	4	152	800	104	0	172	352	280	0	204	260	64	0	3268
Heavy Trucks	24	36	4		8	16	0		0	24	16		8	4	8		148
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	1		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Cooley Rd -- Molalla Rd

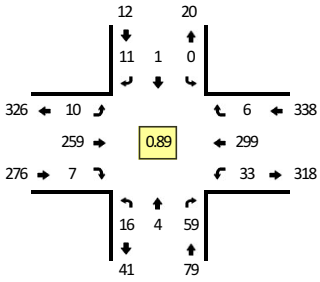
CITY/STATE: Marion, OR

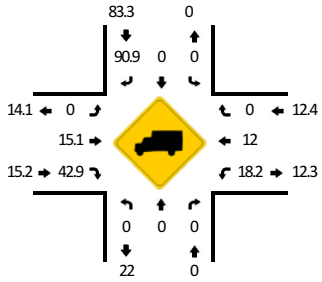
QC JOB #: 15064703

DATE: Thu, Sep 12 2019

Peak-Hour: 6:40 AM -- 7:40 AM

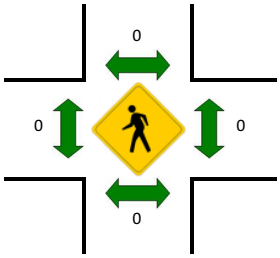
Peak 15-Min: 7:10 AM -- 7:25 AM

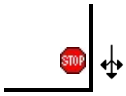


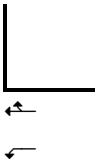


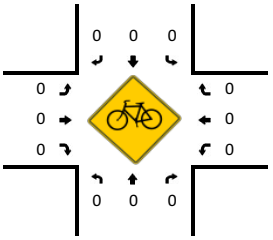
Quality Counts

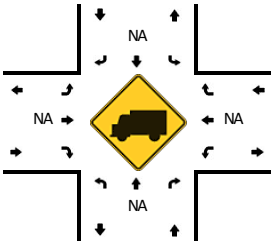
DATA THAT DRIVES COMMUNITIES

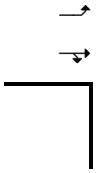


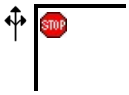


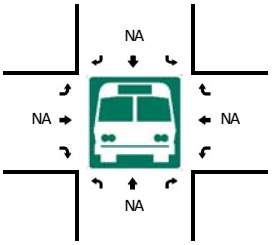












5-Min Count Period Beginning At	Cooley Rd (Northbound)				Cooley Rd (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	1	0	6	0	0	0	0	0	2	16	0	0	1	9	0	0	35	
6:05 AM	0	0	9	0	0	0	2	0	0	14	0	0	0	13	0	0	38	
6:10 AM	3	0	12	0	0	0	1	0	0	20	0	0	4	12	0	0	52	
6:15 AM	1	0	6	0	0	0	1	0	0	24	1	0	0	18	0	0	51	
6:20 AM	0	0	7	0	0	0	1	0	0	29	0	0	3	17	0	0	57	
6:25 AM	1	0	5	0	0	0	0	0	1	25	0	0	4	16	1	0	53	
6:30 AM	2	0	8	0	0	0	0	0	0	29	0	0	0	15	1	0	55	
6:35 AM	0	0	9	0	0	0	1	0	1	19	0	0	1	23	1	0	55	
6:40 AM	0	0	10	0	0	0	0	0	2	35	0	0	3	24	0	0	74	
6:45 AM	2	1	1	0	0	0	1	0	3	24	0	0	2	26	0	0	60	
6:50 AM	0	2	5	0	0	0	0	0	1	15	0	0	1	20	3	0	47	
6:55 AM	0	0	3	0	0	0	0	0	2	23	1	0	1	22	2	0	54	631
7:00 AM	2	0	6	0	0	0	0	0	1	16	1	0	2	17	1	0	46	642
7:05 AM	0	0	6	0	0	0	0	0	1	22	1	0	3	21	0	0	54	658
7:10 AM	0	1	5	0	0	0	1	0	0	23	1	0	2	30	0	0	63	669
7:15 AM	3	0	2	0	0	0	2	0	0	22	0	0	4	32	0	0	65	683
7:20 AM	1	0	5	0	0	0	4	0	0	22	0	0	6	32	0	0	70	696
7:25 AM	2	0	4	0	0	1	3	0	0	21	2	0	2	25	0	0	60	703
7:30 AM	0	0	9	0	0	0	0	0	0	16	1	0	5	22	0	0	53	701
7:35 AM	6	0	3	0	0	0	0	0	0	20	0	0	2	28	0	0	59	705
7:40 AM	0	0	3	0	0	0	0	0	1	15	0	0	1	29	0	0	49	680
7:45 AM	1	1	2	0	0	0	0	0	0	15	1	0	4	28	0	0	52	672
7:50 AM	2	0	4	0	0	0	1	0	0	17	2	0	1	25	0	0	52	677
7:55 AM	0	0	1	0	0	0	2	0	0	16	2	0	6	18	1	0	46	669
8:00 AM	1	0	1	0	0	0	0	0	1	15	1	0	0	17	0	0	36	659
8:05 AM	0	0	1	0	0	0	0	0	0	14	1	0	0	17	0	0	33	638
8:10 AM	0	0	2	0	0	0	0	0	0	12	2	0	4	14	0	0	34	609
8:15 AM	1	0	2	0	0	0	0	0	0	13	1	0	0	14	0	0	31	575
8:20 AM	1	0	0	0	0	0	0	0	0	16	3	0	5	14	0	0	39	544
8:25 AM	2	0	2	0	0	0	0	0	0	19	1	0	2	20	0	0	46	530
8:30 AM	2	0	2	0	0	0	0	0	0	13	1	0	2	19	0	0	39	516
8:35 AM	2	0	3	0	0	0	0	0	0	17	0	0	1	13	0	0	36	493
8:40 AM	3	0	0	0	0	0	1	0	0	17	0	0	3	9	0	0	33	477
8:45 AM	1	0	2	0	0	0	0	0	0	17	0	0	2	26	0	0	48	473
8:50 AM	0	0	2	0	0	0	2	0	0	11	1	0	2	12	0	0	30	451
8:55 AM	1	0	0	0	0	0	0	0	0	15	3	0	1	19	0	0	39	444

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	4	48	0	0	0	28	0	0	268	4	0	48	376	0	0	792
Heavy Trucks	0	0	0		0	0	28		0	36	0		4	44	0		112
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Cooley Rd -- Molalla Rd

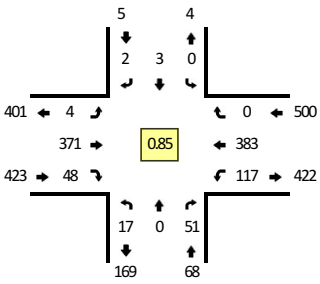
CITY/STATE: Marion, OR

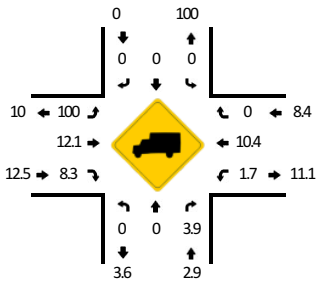
QC JOB #: 15064704

DATE: Thu, Sep 12 2019

Peak-Hour: 3:45 PM -- 4:45 PM

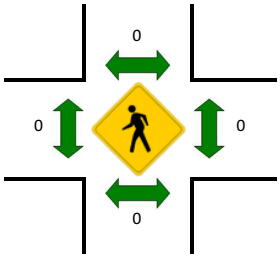
Peak 15-Min: 4:15 PM -- 4:30 PM

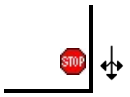


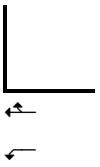


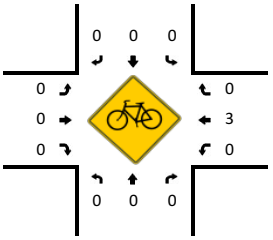
Quality Counts

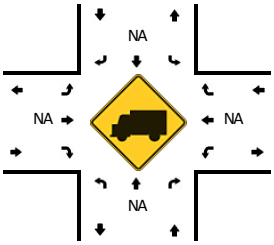
DATA THAT DRIVES COMMUNITIES

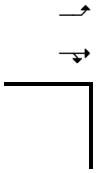


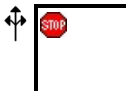


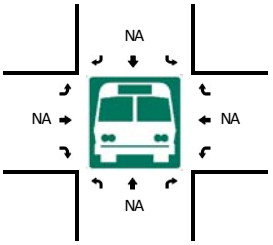












5-Min Count Period Beginning At	Cooley Rd (Northbound)				Cooley Rd (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	2	0	6	0	0	0	0	0	0	31	5	0	4	16	0	0	64	
3:05 PM	2	0	3	0	0	0	1	0	0	25	2	0	4	20	0	0	57	
3:10 PM	0	0	3	0	0	0	0	0	1	23	0	1	9	27	0	0	64	
3:15 PM	0	0	2	0	0	0	0	0	0	33	6	0	3	33	0	0	77	
3:20 PM	1	0	3	0	0	0	0	0	0	23	0	0	4	25	0	0	56	
3:25 PM	0	0	4	0	0	0	0	0	0	21	0	0	2	17	0	0	44	
3:30 PM	0	0	6	0	0	0	0	0	0	27	2	0	4	27	0	0	66	
3:35 PM	2	0	6	0	0	0	1	0	0	28	0	0	5	21	0	0	63	
3:40 PM	0	0	2	0	0	0	0	0	1	40	0	0	8	28	0	0	79	
3:45 PM	0	0	4	0	0	0	0	0	0	32	5	0	6	30	0	0	77	
3:50 PM	1	0	5	0	0	0	0	0	0	23	4	0	8	34	0	0	75	
3:55 PM	1	0	4	0	0	1	0	0	1	29	4	0	9	33	0	0	82	804
4:00 PM	1	0	5	0	0	0	0	0	1	35	2	0	8	23	0	0	75	815
4:05 PM	0	0	7	0	0	0	0	0	0	32	2	0	8	27	0	0	76	834
4:10 PM	3	0	7	0	0	0	0	0	0	28	1	0	9	32	0	0	80	850
4:15 PM	1	0	6	1	0	2	2	0	0	36	3	0	23	48	0	0	122	895
4:20 PM	1	0	1	0	0	0	0	0	0	36	7	0	8	37	0	0	90	929
4:25 PM	2	0	3	0	0	0	0	0	0	32	4	0	10	31	0	0	82	967
4:30 PM	2	0	3	0	0	0	0	0	1	32	5	0	6	23	0	0	72	973
4:35 PM	2	0	5	0	0	0	0	0	0	28	3	0	11	36	0	0	85	995
4:40 PM	2	0	1	0	0	0	0	0	1	28	8	0	11	29	0	0	80	996
4:45 PM	0	0	3	0	0	0	0	0	0	37	3	0	9	23	0	0	75	994
4:50 PM	1	0	8	0	0	0	0	0	1	25	4	0	10	14	0	1	64	983
4:55 PM	0	0	4	0	0	0	0	0	1	32	5	0	5	23	0	0	70	971
5:00 PM	1	0	4	0	0	0	0	0	0	35	8	0	6	29	0	0	83	979
5:05 PM	2	0	8	0	1	0	1	0	0	39	7	0	6	27	0	0	91	994
5:10 PM	0	0	11	0	0	1	1	0	0	24	1	0	7	29	0	0	74	988
5:15 PM	0	0	3	0	0	0	1	0	2	36	1	0	9	26	0	0	78	944
5:20 PM	1	0	5	0	0	0	0	0	0	33	4	0	6	17	0	0	66	920
5:25 PM	1	0	2	0	0	0	0	0	0	21	6	0	6	25	0	0	61	899
5:30 PM	2	0	9	0	0	0	0	0	1	32	5	0	2	28	0	0	79	906
5:35 PM	1	0	6	0	0	2	2	0	0	30	1	0	7	19	0	0	68	889
5:40 PM	2	0	4	0	1	0	1	0	0	23	2	0	3	21	0	0	57	866
5:45 PM	0	0	2	0	0	0	0	0	1	33	0	0	5	31	0	0	72	863
5:50 PM	2	0	4	0	0	0	0	0	0	27	4	0	2	8	0	0	47	846
5:55 PM	4	0	4	0	0	2	1	0	0	13	7	0	6	40	0	0	77	853

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	16	0	40	4	0	8	8	0	0	416	56	0	164	464	0	0	1176
Heavy Trucks	0	0	0		0	0	0		0	68	4		0	60	0		132
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

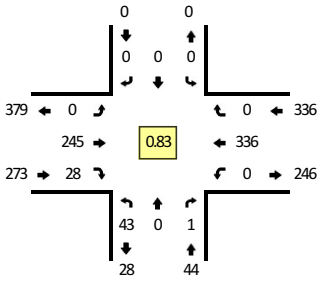
Type of peak hour being reported: Intersection Peak

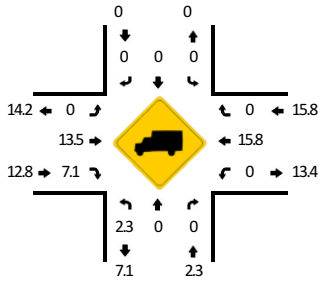
Method for determining peak hour: Total Entering Volume

LOCATION: June Way -- Molalla Rd
CITY/STATE: Marion, OR

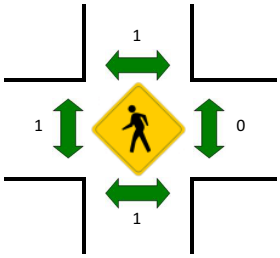
QC JOB #: 15064705
DATE: Thu, Sep 12 2019

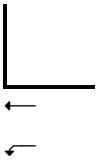
Peak-Hour: 7:05 AM -- 8:05 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

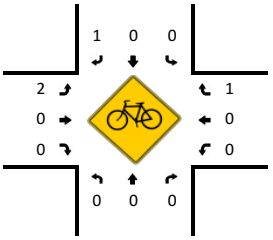


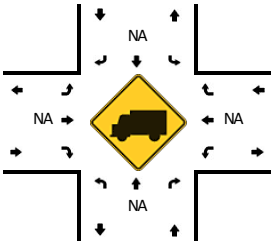


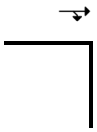
Quality Counts
DATA THAT DRIVES COMMUNITIES

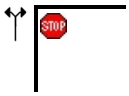


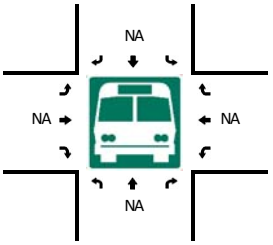












5-Min Count Period Beginning At	June Way (Northbound)				June Way (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:00 AM	2	0	0	0	0	0	0	0	0	17	1	0	0	11	0	0	31	
6:05 AM	3	0	0	0	0	0	0	0	0	17	2	0	0	15	0	0	37	
6:10 AM	0	0	0	0	0	0	0	0	0	17	1	0	0	16	0	0	34	
6:15 AM	4	0	1	0	0	0	0	0	0	24	0	0	0	19	0	0	48	
6:20 AM	3	0	0	0	0	0	0	0	0	29	1	0	0	19	0	0	52	
6:25 AM	1	0	0	0	0	0	0	0	0	32	0	0	0	16	0	0	49	
6:30 AM	6	0	1	0	0	0	0	0	0	22	2	0	0	19	0	0	50	
6:35 AM	1	0	1	0	0	0	0	0	0	21	1	0	0	23	0	0	47	
6:40 AM	3	0	1	0	0	0	0	0	0	35	0	0	0	25	0	0	64	
6:45 AM	1	0	1	0	0	0	0	0	0	27	0	0	0	24	0	0	53	
6:50 AM	0	0	0	0	0	0	0	0	0	14	1	0	0	23	0	0	38	
6:55 AM	3	0	0	0	0	0	0	0	0	30	2	0	0	24	0	0	59	562
7:00 AM	2	0	0	0	0	0	0	0	0	14	2	0	0	17	0	0	35	566
7:05 AM	0	0	0	0	0	0	0	0	0	25	2	0	0	17	0	0	44	573
7:10 AM	5	0	0	0	0	0	0	0	0	24	1	0	0	35	0	0	65	604
7:15 AM	5	0	0	0	0	0	0	0	0	23	0	0	0	37	0	0	65	621
7:20 AM	4	0	0	0	0	0	0	0	0	22	1	0	0	39	0	0	66	635
7:25 AM	4	0	0	0	0	0	0	0	0	21	1	0	0	26	0	0	52	638
7:30 AM	4	0	1	0	0	0	0	0	0	15	2	0	0	22	0	0	44	632
7:35 AM	2	0	0	0	0	0	0	0	0	21	2	0	0	37	0	0	62	647
7:40 AM	3	0	0	0	0	0	0	0	0	15	0	0	0	27	0	0	45	628
7:45 AM	2	0	0	0	0	0	0	0	0	16	5	0	0	30	0	0	53	628
7:50 AM	6	0	0	0	0	0	0	0	0	23	7	0	0	25	0	0	61	651
7:55 AM	3	0	0	0	0	0	0	0	0	21	4	0	0	22	0	0	50	642
8:00 AM	5	0	0	0	0	0	0	0	0	19	3	0	0	19	0	0	46	653
8:05 AM	3	0	0	0	0	0	0	0	0	12	2	0	0	16	0	0	33	642
8:10 AM	1	0	0	0	0	0	0	0	0	14	1	0	0	14	0	0	30	607
8:15 AM	0	0	0	0	0	0	0	0	0	14	2	0	0	16	0	0	32	574
8:20 AM	1	0	1	0	0	0	0	0	0	20	2	0	0	15	0	0	39	547
8:25 AM	0	0	0	0	0	0	0	0	0	20	1	0	0	20	0	0	41	536
8:30 AM	2	0	0	0	0	0	0	0	0	12	0	0	0	23	0	0	37	529
8:35 AM	1	0	0	0	0	0	0	0	0	21	1	0	0	15	0	0	38	505
8:40 AM	0	0	0	0	0	0	0	0	0	15	1	0	0	11	0	0	27	487
8:45 AM	3	0	0	0	0	0	0	0	0	16	2	0	0	28	0	0	49	483
8:50 AM	0	0	1	0	0	0	0	0	0	12	2	0	0	15	0	0	30	452
8:55 AM	4	0	0	0	0	0	0	0	0	18	9	0	0	20	0	0	51	453

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	56	0	0	0	0	0	0	0	0	276	8	0	0	444	0	0	784
Heavy Trucks	0	0	0		0	0	0		0	36	0		0	72	0		108
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

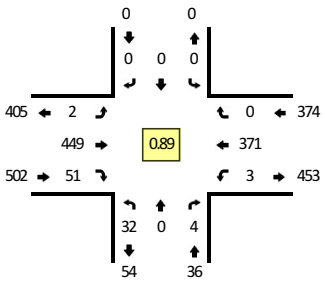
Type of peak hour being reported: Intersection Peak

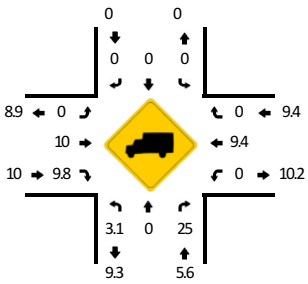
Method for determining peak hour: Total Entering Volume

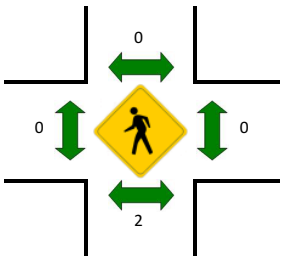
LOCATION: June Way -- Molalla Rd
CITY/STATE: Marion, OR

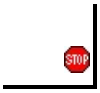
QC JOB #: 15064706
DATE: Thu, Sep 12 2019

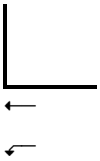
Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

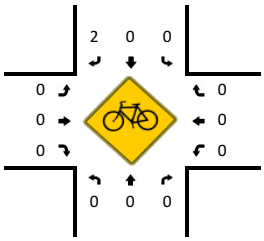


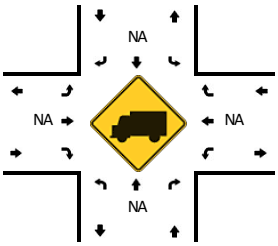


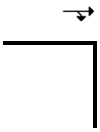


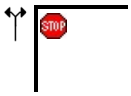


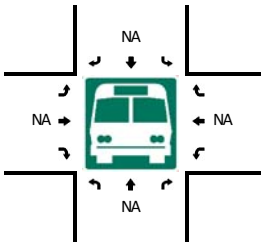












5-Min Count Period Beginning At	June Way (Northbound)				June Way (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	2	0	0	0	0	0	0	0	0	35	5	0	0	16	0	0	58	
3:05 PM	3	0	1	0	0	0	0	0	0	28	2	0	1	21	0	0	56	
3:10 PM	6	0	0	0	0	0	0	0	0	28	2	0	0	27	0	0	63	
3:15 PM	2	0	1	0	0	0	0	0	0	34	5	0	0	32	0	0	74	
3:20 PM	3	0	0	0	0	0	0	0	0	23	6	0	1	29	0	0	62	
3:25 PM	3	0	0	0	0	0	0	0	0	20	5	0	0	15	0	0	43	
3:30 PM	1	0	1	0	0	0	0	0	0	30	4	0	0	27	0	0	63	
3:35 PM	0	0	0	0	0	0	0	0	0	27	3	0	0	25	0	0	55	
3:40 PM	1	0	0	0	0	0	0	0	0	40	4	0	2	20	0	0	67	
3:45 PM	1	0	0	0	0	0	0	0	0	38	1	0	0	37	0	0	77	
3:50 PM	1	0	0	0	0	0	0	0	0	27	6	0	0	36	0	0	70	
3:55 PM	2	0	0	0	0	0	0	0	0	39	4	0	0	31	0	0	76	764
4:00 PM	6	0	0	0	0	0	0	0	0	32	4	0	0	26	0	0	68	774
4:05 PM	1	0	0	0	0	0	0	0	0	36	5	0	0	28	0	0	70	788
4:10 PM	1	0	1	0	0	0	0	0	0	31	7	1	1	33	0	0	75	800
4:15 PM	2	0	0	0	0	0	0	0	0	37	3	0	1	46	0	0	89	815
4:20 PM	1	0	0	0	0	0	0	0	0	44	2	1	0	37	0	0	85	838
4:25 PM	4	0	0	0	0	0	0	0	0	36	5	0	1	37	0	0	83	878
4:30 PM	1	0	1	0	0	0	0	0	0	39	1	0	0	22	0	0	64	879
4:35 PM	2	0	1	0	0	0	0	0	0	29	6	0	0	38	0	0	76	900
4:40 PM	1	0	0	0	0	0	0	0	0	37	4	0	0	32	0	0	74	907
4:45 PM	4	0	0	0	0	0	0	0	0	41	6	0	0	24	0	0	75	905
4:50 PM	6	0	0	0	0	0	0	0	0	29	5	0	0	14	0	0	54	889
4:55 PM	2	0	0	0	0	0	0	0	0	38	4	0	0	23	0	0	67	880
5:00 PM	7	0	1	0	0	0	0	0	0	44	5	0	0	37	0	0	94	906
5:05 PM	1	0	0	0	0	0	0	0	0	44	3	0	0	28	0	0	76	912
5:10 PM	0	0	0	0	0	0	0	0	0	26	5	0	0	29	0	0	60	897
5:15 PM	1	0	1	0	0	0	0	0	0	40	3	0	0	27	0	0	72	880
5:20 PM	2	0	0	0	0	0	0	0	0	35	4	0	0	20	0	0	61	856
5:25 PM	3	0	0	0	0	0	0	0	0	30	4	0	0	24	0	0	61	834
5:30 PM	2	0	0	0	0	0	0	0	0	36	6	0	0	34	0	0	78	848
5:35 PM	5	0	0	0	0	0	0	0	0	30	3	0	0	21	0	0	59	831
5:40 PM	3	0	0	0	0	0	0	0	0	25	2	0	0	23	0	0	53	810
5:45 PM	1	0	0	0	0	0	0	0	0	33	2	0	0	33	0	0	69	804
5:50 PM	3	0	0	0	0	0	0	0	0	33	5	0	0	10	0	0	51	801
5:55 PM	6	0	0	0	0	0	0	0	0	20	6	0	0	40	0	0	72	806

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	0	0	0	0	0	0	0	0	468	40	4	8	480	0	0	1028
Heavy Trucks	0	0	0		0	0	0		0	64	4		0	60	0		128
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 9/18/2019 2:50 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

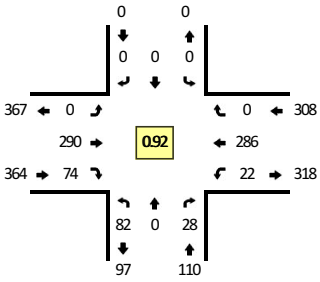
Type of peak hour being reported: Intersection Peak

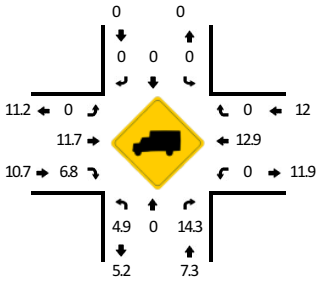
Method for determining peak hour: Total Entering Volume

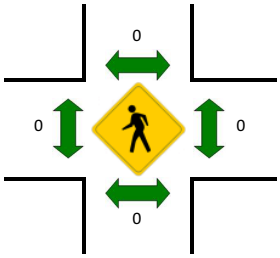
LOCATION: Safeway North Dwy -- Molalla Rd
CITY/STATE: Woodburn, OR

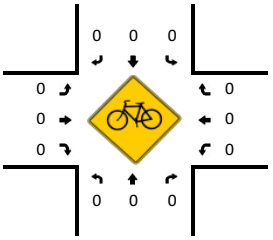
QC JOB #: 15363701
DATE: Tue, Feb 9 2021

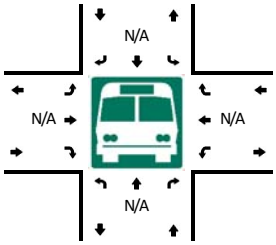
Peak-Hour: 6:45 AM -- 7:45 AM
Peak 15-Min: 7:10 AM -- 7:25 AM

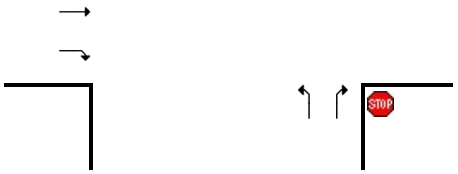


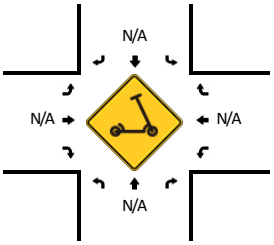












5-Min Count Period Beginning At	Safeway North Dwy (Northbound)				Safeway North Dwy (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
6:30 AM	6	0	2	0	0	0	0	0	0	10	6	0	5	24	0	0	53	
6:35 AM	5	0	3	0	0	0	0	0	0	22	3	0	0	18	0	0	51	
6:40 AM	2	0	3	0	0	0	0	0	0	20	5	0	3	23	0	0	56	
6:45 AM	4	0	3	0	0	0	0	0	0	25	6	0	2	30	0	0	70	
6:50 AM	3	0	1	1	0	0	0	0	0	28	8	0	0	30	0	0	71	
6:55 AM	7	0	3	0	0	0	0	0	0	22	5	0	2	28	0	0	67	
7:00 AM	5	0	1	0	0	0	0	0	0	26	4	0	2	19	0	0	57	
7:05 AM	9	0	2	0	0	0	0	0	0	28	9	0	2	21	0	0	71	
7:10 AM	7	0	3	0	0	0	0	0	0	24	7	0	0	25	0	0	66	
7:15 AM	7	0	5	0	0	0	0	0	0	36	4	0	2	17	0	0	71	
7:20 AM	7	0	3	0	0	0	0	0	0	30	3	0	3	30	0	0	76	
7:25 AM	7	0	3	0	0	0	0	0	0	20	5	0	3	20	0	0	58	767
7:30 AM	5	0	1	0	0	0	0	0	0	10	6	0	1	18	0	0	41	755
7:35 AM	6	0	3	0	0	0	0	0	0	18	8	0	4	30	0	0	69	773
7:40 AM	14	0	0	0	0	0	0	0	0	23	9	0	1	18	0	0	65	782
7:45 AM	4	0	4	0	0	0	0	0	0	10	12	0	2	26	0	0	58	770
7:50 AM	9	0	0	0	0	0	0	0	0	13	9	0	2	25	0	0	58	757
7:55 AM	7	0	0	0	0	0	0	0	0	15	6	0	2	19	0	0	49	739
8:00 AM	5	0	3	0	0	0	0	0	0	12	12	0	1	19	0	0	52	734
8:05 AM	11	0	2	0	0	0	0	0	0	14	6	0	2	16	0	0	51	714
8:10 AM	7	0	2	0	0	0	0	0	0	12	7	0	4	23	0	0	55	703
8:15 AM	7	0	1	0	0	0	0	0	0	10	7	0	1	25	0	0	51	683
8:20 AM	11	0	3	0	0	0	0	0	0	10	9	0	2	19	0	0	54	661
8:25 AM	10	0	2	0	0	0	0	0	0	13	9	0	3	24	0	0	61	664

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	84	0	44	0	0	0	0	0	0	360	56	0	20	288	0	0	852
Heavy Trucks	8	0	8		0	0	0		0	28	8		0	48	0		100
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/11/2021 1:27 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

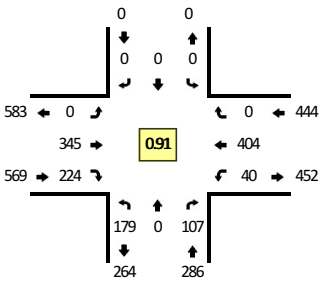
Type of peak hour being reported: Intersection Peak

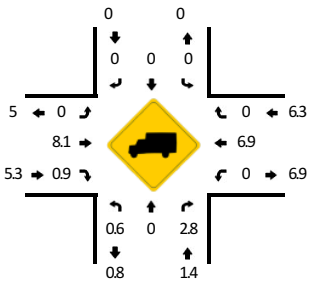
Method for determining peak hour: Total Entering Volume

LOCATION: Safeway North Dwy -- Molalla Rd
CITY/STATE: Woodburn, OR

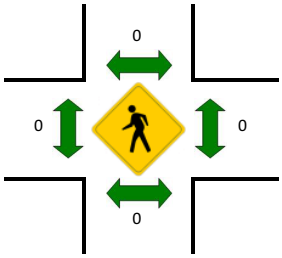
QC JOB #: 15363702
DATE: Tue, Feb 9 2021

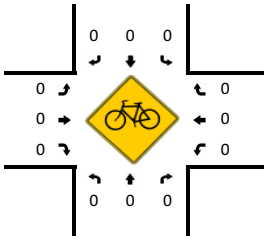
Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:15 PM -- 4:30 PM

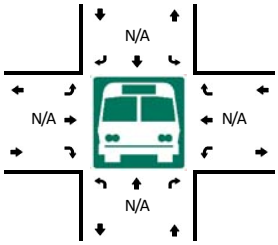


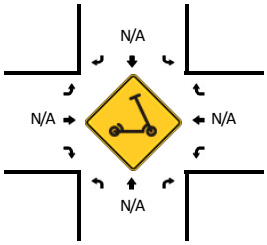


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	Safeway North Dwy (Northbound)				Safeway North Dwy (Southbound)				Molalla Rd (Eastbound)				Molalla Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:30 PM	14	0	6	0	0	0	0	0	0	29	20	0	0	31	0	0	100	
3:35 PM	19	0	8	0	0	0	0	0	0	31	16	0	0	30	0	0	104	
3:40 PM	13	0	8	0	0	0	0	0	0	23	20	0	3	29	0	0	96	
3:45 PM	9	0	10	0	0	0	0	0	0	35	16	0	3	40	0	0	113	
3:50 PM	22	0	4	0	0	0	0	0	0	23	16	0	3	23	0	0	91	
3:55 PM	16	0	8	0	0	0	0	0	0	30	25	0	3	30	0	0	112	
4:00 PM	22	0	2	0	0	0	0	0	0	27	9	0	2	10	0	0	72	
4:05 PM	19	0	6	0	0	0	0	0	0	19	10	0	0	33	0	0	87	
4:10 PM	7	0	5	0	0	0	0	0	0	27	23	0	6	34	0	0	102	
4:15 PM	12	0	9	0	0	0	0	0	0	26	26	0	3	32	0	0	108	
4:20 PM	14	0	11	0	0	0	0	0	0	40	15	0	6	47	0	0	133	
4:25 PM	12	0	11	0	0	0	0	0	0	34	15	0	4	39	0	0	115	1233
4:30 PM	13	0	8	0	0	0	0	0	0	30	15	0	1	35	0	0	102	1235
4:35 PM	22	0	10	0	0	0	0	0	0	27	23	0	4	32	0	0	118	1249
4:40 PM	11	0	14	0	0	0	0	0	0	29	14	0	5	28	0	0	101	1254
4:45 PM	8	0	6	0	0	0	0	0	0	22	21	0	4	46	0	0	107	1248
4:50 PM	18	0	6	0	0	0	0	0	0	21	19	0	2	33	0	0	99	1256
4:55 PM	24	0	11	0	0	0	0	0	0	22	15	0	2	30	0	0	104	1248
5:00 PM	21	0	4	0	0	0	0	0	0	35	15	0	0	21	0	0	96	1272
5:05 PM	17	0	12	0	0	0	0	0	0	32	23	0	3	27	0	0	114	1299
5:10 PM	17	0	10	0	0	0	0	0	0	30	19	0	2	24	0	0	102	1299
5:15 PM	17	0	3	0	0	0	0	0	0	33	18	0	5	29	0	0	105	1296
5:20 PM	13	0	7	0	0	0	0	0	0	23	11	0	5	30	0	0	89	1252
5:25 PM	17	0	9	0	0	0	0	0	0	20	12	0	3	18	0	0	79	1216

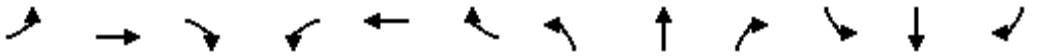
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	0	124	0	0	0	0	0	0	400	224	0	52	472	0	0	1424
Heavy Trucks	0	0	8		0	0	0		0	44	0		0	44	0		96
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/11/2021 1:27 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

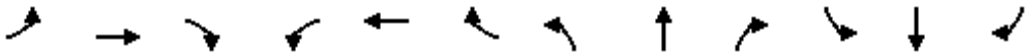
APPENDIX C:
SYNCHRO REPORTS – 2022 EXISTING AM + PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	195	128	155	242	97	204	540	102	73	355	80
Future Volume (vph)	122	195	128	155	242	97	204	540	102	73	355	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1471	1549	1298	1471	1477		2906	2995	1323	1484	2880	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1471	1549	1298	1471	1477		2906	2995	1323	1484	2880	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	136	217	142	172	269	108	227	600	113	81	394	89
RTOR Reduction (vph)	0	0	100	0	16	0	0	0	79	0	20	0
Lane Group Flow (vph)	136	217	42	172	361	0	227	600	34	81	463	0
Confl. Peds. (#/hr)	1		3	3		1	1		1	1		1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	11%	11%	11%	12%	12%	12%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	11.2	31.0	31.0	11.2	31.0		14.8	31.6	31.6	11.2	28.0	
Effective Green, g (s)	11.2	31.0	31.0	11.2	31.0		14.8	31.6	31.6	11.2	28.0	
Actuated g/C Ratio	0.11	0.30	0.30	0.11	0.30		0.14	0.30	0.30	0.11	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	156	457	383	156	436		409	901	398	158	768	
v/s Ratio Prot	0.09	0.14		c0.12	c0.24		c0.08	c0.20		0.05	0.16	
v/s Ratio Perm			0.03						0.03			
v/c Ratio	0.87	0.47	0.11	1.10	0.83		0.56	0.67	0.09	0.51	0.60	
Uniform Delay, d1	46.2	30.3	26.9	46.9	34.5		42.0	32.1	26.3	44.3	33.6	
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	37.6	0.9	0.2	102.2	12.5		1.6	3.9	0.4	2.8	3.5	
Delay (s)	83.8	31.3	27.1	149.1	47.0		43.7	36.0	26.8	47.1	37.1	
Level of Service	F	C	C	F	D		D	D	C	D	D	
Approach Delay (s)		44.5			79.0			36.7			38.6	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		

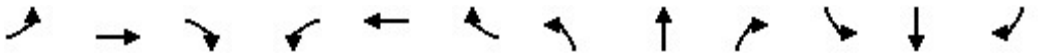
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	195	128	155	242	97	204	540	102	73	355	80
Future Volume (veh/h)	122	195	128	155	242	97	204	540	102	73	355	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1573	1573	1573	1573	1573	1573	1600	1600	1600	1586	1586	1586
Adj Flow Rate, veh/h	136	217	142	172	269	108	227	600	113	81	394	89
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	13	13	13	13	13	13	11	11	11	12	12	12
Cap, veh/h	93	442	373	93	300	120	155	1274	568	72	1014	227
Arrive On Green	0.06	0.28	0.28	0.06	0.28	0.28	0.05	0.42	0.42	0.05	0.41	0.41
Sat Flow, veh/h	1498	1573	1328	1498	1066	428	2956	3040	1355	1511	2447	547
Grp Volume(v), veh/h	136	217	142	172	0	377	227	600	113	81	241	242
Grp Sat Flow(s),veh/h/ln	1498	1573	1328	1498	0	1494	1478	1520	1355	1511	1507	1487
Q Serve(g_s), s	6.5	12.1	9.0	6.5	0.0	25.5	5.5	15.0	5.6	5.0	11.7	11.9
Cycle Q Clear(g_c), s	6.5	12.1	9.0	6.5	0.0	25.5	5.5	15.0	5.6	5.0	11.7	11.9
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	93	442	373	93	0	420	155	1274	568	72	624	616
V/C Ratio(X)	1.47	0.49	0.38	1.86	0.00	0.90	1.47	0.47	0.20	1.13	0.39	0.39
Avail Cap(c_a), veh/h	93	614	519	93	0	583	155	1274	568	72	624	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	31.5	30.4	49.3	0.0	36.3	49.8	22.1	19.3	50.0	21.4	21.5
Incr Delay (d2), s/veh	259.5	1.0	0.8	423.1	0.0	13.8	241.5	1.3	0.8	144.5	1.8	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	4.7	3.0	13.3	0.0	10.7	7.2	5.5	1.9	4.8	4.4	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	308.7	32.5	31.2	472.4	0.0	50.1	291.2	23.3	20.1	194.5	23.2	23.4
LnGrp LOS	F	C	C	F	A	D	F	C	C	F	C	C
Approach Vol, veh/h		495			549			940			564	
Approach Delay, s/veh		108.0			182.4			87.6			47.9	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	49.0	11.0	35.0	9.5	49.5	11.0	35.0
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.5	32.0	6.5	41.0	5.0	32.5	6.5	41.0
Max Q Clear Time (g_c+I1), s	7.5	13.9	8.5	27.5	7.0	17.0	8.5	14.1
Green Ext Time (p_c), s	0.0	5.7	0.0	1.3	0.0	8.4	0.0	0.4

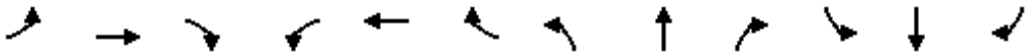
Intersection Summary	
HCM 6th Ctrl Delay	103.2
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	366	306	225	294	78	282	520	137	164	863	121
Future Volume (vph)	167	366	306	225	294	78	282	520	137	164	863	121
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1580		3014	3107	1372	1568	3073	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1580		3014	3107	1372	1568	3073	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	174	381	319	234	306	81	294	542	143	171	899	126
RTOR Reduction (vph)	0	0	177	0	8	0	0	0	104	0	9	0
Lane Group Flow (vph)	174	381	142	234	379	0	294	542	39	171	1016	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	15.6	33.8	33.8	19.5	37.7		15.8	34.0	34.0	17.7	35.9	
Effective Green, g (s)	15.6	33.8	33.8	19.5	37.7		15.8	34.0	34.0	17.7	35.9	
Actuated g/C Ratio	0.12	0.27	0.27	0.16	0.30		0.13	0.27	0.27	0.14	0.29	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	193	442	369	242	476		380	845	373	222	882	
v/s Ratio Prot	0.11	c0.23		c0.15	c0.24		0.10	0.17		c0.11	c0.33	
v/s Ratio Perm			0.10						0.03			
v/c Ratio	0.90	0.86	0.38	0.97	0.80		0.77	0.64	0.10	0.77	1.15	
Uniform Delay, d1	53.9	43.4	37.1	52.4	40.1		52.9	40.1	34.1	51.7	44.5	
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	38.4	16.1	0.8	48.1	9.2		9.5	3.7	0.6	15.1	81.6	
Delay (s)	92.4	59.5	37.9	100.5	49.3		62.3	43.8	34.7	66.8	126.1	
Level of Service	F	E	D	F	D		E	D	C	E	F	
Approach Delay (s)		58.1			68.6			48.1			117.6	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	76.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	366	306	225	294	78	282	520	137	164	863	121
Future Volume (veh/h)	167	366	306	225	294	78	282	520	137	164	863	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1654	1654	1654	1654	1654	1654	1654	1654	1654	1668	1668	1668
Adj Flow Rate, veh/h	174	381	319	234	306	81	294	542	143	171	899	126
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	6	6	6
Cap, veh/h	196	426	359	246	364	96	313	1076	479	133	904	127
Arrive On Green	0.12	0.26	0.26	0.16	0.29	0.29	0.10	0.34	0.34	0.08	0.32	0.32
Sat Flow, veh/h	1576	1654	1392	1576	1259	333	3057	3143	1400	1589	2790	391
Grp Volume(v), veh/h	174	381	319	234	0	387	294	542	143	171	511	514
Grp Sat Flow(s),veh/h/ln	1576	1654	1392	1576	0	1592	1528	1572	1400	1589	1585	1597
Q Serve(g_s), s	13.6	27.8	27.6	18.4	0.0	28.5	11.9	17.1	9.4	10.5	40.2	40.2
Cycle Q Clear(g_c), s	13.6	27.8	27.6	18.4	0.0	28.5	11.9	17.1	9.4	10.5	40.2	40.2
Prop In Lane	1.00		1.00	1.00		0.21	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	196	426	359	246	0	460	313	1076	479	133	514	517
V/C Ratio(X)	0.89	0.89	0.89	0.95	0.00	0.84	0.94	0.50	0.30	1.28	0.99	0.99
Avail Cap(c_a), veh/h	203	543	457	246	0	565	313	1076	479	133	514	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.8	44.8	44.7	52.3	0.0	41.7	55.7	32.7	30.1	57.2	42.1	42.1
Incr Delay (d2), s/veh	33.6	15.1	16.8	44.1	0.0	9.7	35.2	1.7	1.6	171.9	38.3	38.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	13.1	11.1	10.3	0.0	12.4	6.1	6.8	3.4	10.6	21.0	21.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.4	59.9	61.5	96.4	0.0	51.5	90.9	34.3	31.7	229.1	80.4	80.3
LnGrp LOS	F	E	E	F	A	D	F	C	C	F	F	F
Approach Vol, veh/h		874			621			979			1196	
Approach Delay, s/veh		65.9			68.4			50.9			101.6	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	46.0	20.1	41.6	15.0	48.3	24.0	37.7
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.8	31.7	16.1	44.4	10.5	34.0	19.5	41.0
Max Q Clear Time (g_c+I1), s	13.9	42.2	15.6	30.5	12.5	19.1	20.4	29.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	7.9	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	74.0
HCM 6th LOS	E

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	286	108	27	320	104	32
Future Vol, veh/h	286	108	27	320	104	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	11	11	14	14	7	7
Mvmt Flow	333	126	31	372	121	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	459	0	767	333
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	434	-
Critical Hdwy	-	-	4.24	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.326	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1042	-	363	697
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1042	-	349	697
Mov Cap-2 Maneuver	-	-	-	-	349	-
Stage 1	-	-	-	-	715	-
Stage 2	-	-	-	-	619	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	18.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	349	697	-	-	1042	-
HCM Lane V/C Ratio	0.347	0.053	-	-	0.03	-
HCM Control Delay (s)	20.7	10.5	-	-	8.6	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	18.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	412	268	47	477	214	128
Future Vol, veh/h	412	268	47	477	214	128
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	6	6	1	1
Mvmt Flow	453	295	52	524	235	141

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	748	0	1081	453
Stage 1	-	-	-	-	453	-
Stage 2	-	-	-	-	628	-
Critical Hdwy	-	-	4.16	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.254	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	843	-	242	609
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	534	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	843	-	~ 221	609
Mov Cap-2 Maneuver	-	-	-	-	~ 221	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	488	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	83.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	221	609	-	-	843	-
HCM Lane V/C Ratio	1.064	0.231	-	-	0.061	-
HCM Control Delay (s)	125.2	12.7	-	-	9.5	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	10.3	0.9	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	270	31	1	370	47	1
Future Vol, veh/h	270	31	1	370	47	1
Conflicting Peds, #/hr	0	1	1	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	13	13	16	16	2	2
Mvmt Flow	325	37	1	446	57	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	363	0	794	345
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	449	-
Critical Hdwy	-	-	4.26	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.344	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1122	-	357	698
Stage 1	-	-	-	-	717	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1121	-	356	697
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	642	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	360	-	-	1121	-
HCM Lane V/C Ratio	0.161	-	-	0.001	-
HCM Control Delay (s)	16.9	-	-	8.2	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	495	56	3	409	35	4
Future Vol, veh/h	495	56	3	409	35	4
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	10	10	9	9	6	6
Mvmt Flow	556	63	3	460	39	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	621	0	1056	590
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	466	-
Critical Hdwy	-	-	4.19	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.281	-	3.554	3.354
Pot Cap-1 Maneuver	-	-	927	-	245	500
Stage 1	-	-	-	-	546	-
Stage 2	-	-	-	-	623	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	925	-	244	499
Mov Cap-2 Maneuver	-	-	-	-	244	-
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	21.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	257	-	-	925	-
HCM Lane V/C Ratio	0.171	-	-	0.004	-
HCM Control Delay (s)	21.9	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	247	12	40	338	1	18	2	50	1	1	14
Future Vol, veh/h	3	247	12	40	338	1	18	2	50	1	1	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	12	12	12	0	0	0	93	93	93
Mvmt Flow	4	298	14	48	407	1	22	2	60	1	1	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	408	0	0	312	0	0	826	817	305	848	824	408
Stage 1	-	-	-	-	-	-	313	313	-	504	504	-
Stage 2	-	-	-	-	-	-	513	504	-	344	320	-
Critical Hdwy	4.24	-	-	4.22	-	-	7.1	6.5	6.2	8.03	7.43	7.13
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Follow-up Hdwy	2.326	-	-	2.308	-	-	3.5	4	3.3	4.337	4.837	4.137
Pot Cap-1 Maneuver	1089	-	-	1194	-	-	293	313	740	200	225	486
Stage 1	-	-	-	-	-	-	702	661	-	414	416	-
Stage 2	-	-	-	-	-	-	548	544	-	518	517	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1089	-	-	1194	-	-	272	299	740	176	215	486
Mov Cap-2 Maneuver	-	-	-	-	-	-	272	299	-	176	215	-
Stage 1	-	-	-	-	-	-	699	658	-	412	399	-
Stage 2	-	-	-	-	-	-	506	522	-	472	515	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	13.7	14.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	498	1089	-	-	1194	-	-	409
HCM Lane V/C Ratio	0.169	0.003	-	-	0.04	-	-	0.047
HCM Control Delay (s)	13.7	8.3	-	-	8.1	-	-	14.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.1

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	427	64	126	388	1	19	1	58	1	2	3
Future Vol, veh/h	4	427	64	126	388	1	19	1	58	1	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	11	11	11	7	7	7	0	0	0	0	0	0
Mvmt Flow	5	502	75	148	456	1	22	1	68	1	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	457	0	0	577	0	0	1306	1303	540	1337	1340	457
Stage 1	-	-	-	-	-	-	550	550	-	753	753	-
Stage 2	-	-	-	-	-	-	756	753	-	584	587	-
Critical Hdwy	4.21	-	-	4.17	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.299	-	-	2.263	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1058	-	-	972	-	-	138	162	546	132	154	608
Stage 1	-	-	-	-	-	-	523	519	-	405	420	-
Stage 2	-	-	-	-	-	-	403	420	-	501	500	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1058	-	-	972	-	-	119	137	546	101	130	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	119	137	-	101	130	-
Stage 1	-	-	-	-	-	-	520	516	-	403	356	-
Stage 2	-	-	-	-	-	-	337	356	-	435	498	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.3	23.4	23.8
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	286	1058	-	-	972	-	-	199
HCM Lane V/C Ratio	0.321	0.004	-	-	0.153	-	-	0.035
HCM Control Delay (s)	23.4	8.4	-	-	9.4	-	-	23.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.3	0	-	-	0.5	-	-	0.1

APPENDIX D:
METHODS AND ASSUMPTIONS MEMORANDUM

MEMORANDUM

DATE: **April 12, 2022**

TO: **Eric Lilequist/City of Woodburn; Dago Garcia/ City of Woodburn; Casey Knecht/ODOT Region 2**

FROM: **Tegan Enloe, PE/Enloe Consulting, LLC**

SUBJECT: **Woodburn Place Apartments Phase 2 TIA: Methods & Assumptions**

The applicant is proposing to build an apartment complex located on the north side of Molalla Road and across from June Way. The proposed development would build 258 apartment units. The complex would have direct access to Molalla Road. This memorandum outlines key analysis assumptions and methodology to be used in the traffic impact analysis for the proposed development.

Trip Generation

Trip generation values for the proposed development are provided below. These values will be added to the Background Traffic to develop Total Traffic volumes.

Table 1: Trip Generation

Land Use (ITE Codes)	Dwelling Units	Time Period	Trip Generation Rate	Peak Hour Trips		
				In	Out	Total
Multi-Family Mid-Rise Not Close to Rail Transit (LUC 221)	258	AM Peak	Equation	23	79	102
TOTAL AM PEAK HOUR				**23**	**79**	**102**
Multi-Family Mid-Rise Not Close to Rail Transit (LUC 221)	258	PM Peak	Equation	62	39	101
TOTAL PM PEAK HOUR				**62**	**39**	**101**

Trip Distribution

Trip distribution patterns are recommended based on previously approved studies in the area to provide for analysis consistency. The following distribution patterns are proposed:

- 25% north on 99E
- 25% south on 99E
- 35% west on Mt Hood Ave
- 7% east on Molalla Rd
- 5% south on Cooley Rd
- 3% south on June Way

Scenarios

The traffic analysis will be completed under the assumption that full build out will occur in 2024.

The following analysis scenarios are proposed for review:

- 2022 Existing Conditions, AM Peak Hour
- 2022 Existing Conditions, PM Peak Hour
- 2024 Background Traffic, AM Peak Hour
- 2024 Background Traffic, PM Peak Hour
- 2024 Total Traffic (Background + Site), AM Peak Hour
- 2024 Total Traffic (Background + Site), PM Peak Hour

A simulation-based queue length analysis will be provided for any intersections that exceed mobility standards.

Study Intersections

The following intersections are suggested for inclusion in the TIA study:

1. N Pacific Hwy (99E)/ Molalla Rd (OR 211)
2. Molalla Rd (OR 211)/ Safeway Driveway
3. Molalla Rd (OR 211)/ June Way/ Woodburn Place Apartments Phase 2 Site Access
4. Molalla Rd (OR 211)/ Woodburn Place Apartments Phase 1 Site Access
5. Molalla Rd (OR 211)/ Cooley Road

Analysis Volumes

The project study area is currently under construction and unable to be counted for the next several months. Counts at the proposed study intersections were collected in September 2019 and February 2021. These counts are less than three years old and are proposed for use in this study.

To establish the 30th HV values for the analysis, the seasonal adjustment factor is calculated using the ODOT Characteristic Table, which identifies ATR 24-001 (Woodburn) as a representative ATR for the study area. Table 1 shows the seasonal adjustment factor calculations. A seasonal adjustment factor of 1.06 is recommended for use for those collected in September and 1.18 for those collected in February.

Table 1: Seasonal Adjustment Factor Calculation

	2019	2018	2017	2016	2015	Average
Peak Month	117 (June)	~~109~~ (June)	~~117~~ (August)	111 (June)	113 (June)	113.7
Count Month (September)	~~109~~	106	109	106	~~105~~	107.0
Count Month (February)	~~89~~	96	95	~~98~~	97	96.0
Average Seasonal Adjustment Factor (September Counts): 1.06 **Average Seasonal Adjustment Factor (February Counts): 1.18**						
Note: strike through values represent the highest and lowest values and were excluded from the average.						

A growth rate for the study area is developed using ODOT's 2040 Future Volume Tables. Table 3 outlines the proposed Future Volume Table data points. An annual growth rate of 1.3% is proposed to be applied linearly to the existing volumes. This value is achieved by averaging the five available measurements in the study area.

Table 2: Future Volume Table

Site ID	Highway	Mile Point	Location	2019	2040	RSQ	21 Year Factor	Annual Rate
199	081 (OR99E)	31.65	North of Woodburn-Estacada Highway (OR211) and Hillsboro-Silverton Highway (OR214) [0.05 mile]	17,500	21,300	MODEL	1.22	1.0%
200	081 (OR99E)	31.80	South of Woodburn-Estacada Highway (OR211) [0.10 mile]	20,100	27,400	MODEL	1.36	1.7%
3235	140	39.24	West of Pacific Highway East (OR99E) [0.05 mile]	14,100	16,200	MODEL	1.15	0.7%
3236	140	39.37	East of Pacific Highway East (OR99E) [0.06 mile]	7,300	9,000	MODEL	1.23	1.1%
3446	161	0.15	East of Pacific Highway East (OR99E) and Hillsboro-Silverton Highway (OR214) [0.15 mile]	8,000	11,200	0.5248	1.40	1.9%
								Average Annual Rate: 1.3%

Planned Improvements

No capital improvement or other planned improvement projects are identified for inclusion in the background and total traffic analysis.

In Process Developments

The previously approved Woodburn Place Apartments Phase 1 development will be included as in-process trips.

APPENDIX E:
CRASH DATA REPORTS

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 161 ALL ROAD TYPES, MP 0.0 to 0.047 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2019														
REAR-END	0	1	0	1	0	2	0	0	1	0	1	0	0	0
YEAR 2019 TOTAL	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**
YEAR: 2018														
BACKING	0	1	0	1	0	1	0	0	1	0	1	1	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	0	0	1	0	0	1	0
YEAR 2018 TOTAL	**0**	**1**	**1**	**2**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**
YEAR: 2017														
REAR-END	0	2	2	4	0	2	0	1	2	4	0	1	3	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	0	1	0	0	0
YEAR 2017 TOTAL	**0**	**3**	**2**	**5**	**0**	**3**	**0**	**2**	**2**	**4**	**1**	**1**	**3**	**0**
YEAR: 2016														
NON-COLLISION	0	0	1	1	0	0	1	1	0	1	0	0	0	0
REAR-END	0	3	1	4	0	8	0	1	3	4	0	3	0	0
YEAR 2016 TOTAL	**0**	**3**	**2**	**5**	**0**	**8**	**1**	**2**	**3**	**5**	**0**	**3**	**0**	**0**
FINAL TOTAL	**0**	**8**	**5**	**13**	**0**	**14**	**1**	**4**	**7**	**10**	**3**	**5**	**4**	**0**

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 081 ALL ROAD TYPES, MP 31.653 to 31.747 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2020														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	0	0	1
REAR-END	0	4	0	4	0	5	1	3	1	3	1	2	1	0
YEAR 2020 TOTAL	**0**	**4**	**1**	**5**	**0**	**5**	**1**	**4**	**1**	**3**	**2**	**2**	**1**	**1**
YEAR: 2019														
ANGLE	0	0	1	1	0	0	0	1	0	0	1	1	0	0
REAR-END	0	1	1	2	0	2	0	2	0	2	0	0	2	0
SIDESWIPE - OVERTAKING	0	1	1	2	0	1	0	2	0	2	0	0	0	0
YEAR 2019 TOTAL	**0**	**2**	**3**	**5**	**0**	**3**	**0**	**5**	**0**	**4**	**1**	**1**	**2**	**0**
YEAR: 2018														
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	1	0	1	0	0	0	1
REAR-END	0	8	3	11	0	9	0	8	3	8	3	4	6	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	0	1	0
TURNING MOVEMENTS	0	3	0	3	0	8	0	2	1	1	2	3	0	0
YEAR 2018 TOTAL	**0**	**12**	**4**	**16**	**0**	**18**	**0**	**12**	**4**	**11**	**5**	**7**	**7**	**1**
YEAR: 2017														
BACKING	0	0	1	1	0	0	0	1	0	1	0	0	1	0
REAR-END	0	3	0	3	0	6	0	2	1	3	0	2	1	0
TURNING MOVEMENTS	0	2	1	3	0	2	0	2	1	1	2	3	0	0
YEAR 2017 TOTAL	**0**	**5**	**2**	**7**	**0**	**8**	**0**	**5**	**2**	**5**	**2**	**5**	**2**	**0**

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 081 ALL ROAD TYPES, MP 31.653 to 31.747 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2016														
ANGLE	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FIXED / OTHER OBJECT	0	0	2	2	0	0	1	1	1	1	1	1	0	2
REAR-END	0	1	2	3	0	1	1	2	1	2	1	3	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	0	0	0
YEAR 2016 TOTAL	**0**	**2**	**5**	**7**	**0**	**2**	**2**	**5**	**2**	**3**	**4**	**5**	**0**	**2**
FINAL TOTAL	**0**	**25**	**15**	**40**	**0**	**36**	**3**	**31**	**9**	**26**	**14**	**20**	**12**	**4**

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 140 ALL ROAD TYPES, MP 39.243 to 39.29 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2020														
REAR-END	0	2	1	3	0	3	0	2	1	1	2	2	1	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR 2020 TOTAL	**0**	**3**	**1**	**4**	**0**	**4**	**0**	**3**	**1**	**2**	**2**	**3**	**1**	**0**
YEAR: 2019														
REAR-END	0	2	0	2	0	2	0	1	1	2	0	1	1	0
YEAR 2019 TOTAL	**0**	**2**	**0**	**2**	**0**	**2**	**0**	**1**	**1**	**2**	**0**	**1**	**1**	**0**
YEAR: 2018														
REAR-END	0	2	1	3	0	6	1	2	1	3	0	3	0	0
YEAR 2018 TOTAL	**0**	**2**	**1**	**3**	**0**	**6**	**1**	**2**	**1**	**3**	**0**	**3**	**0**	**0**
YEAR: 2017														
REAR-END	0	2	1	3	0	3	2	2	1	3	0	2	1	0
YEAR 2017 TOTAL	**0**	**2**	**1**	**3**	**0**	**3**	**2**	**2**	**1**	**3**	**0**	**2**	**1**	**0**
YEAR: 2016														
FIXED / OTHER OBJECT	0	1	0	1	0	2	0	1	0	0	1	0	0	1
PEDESTRIAN	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	2	2	4	0	2	0	3	0	4	0	0	4	0
YEAR 2016 TOTAL	**0**	**4**	**2**	**6**	**0**	**5**	**0**	**5**	**0**	**5**	**1**	**1**	**4**	**1**
FINAL TOTAL	**0**	**13**	**5**	**18**	**0**	**20**	**3**	**13**	**4**	**15**	**3**	**10**	**7**	**1**

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 161 ALL ROAD TYPES, MP 0.183 to 0.277 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2019														
REAR-END	0	1	0	1	0	1	1	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR 2019 TOTAL	**0**	**2**	**0**	**2**	**0**	**3**	**1**	**2**	**0**	**2**	**0**	**2**	**0**	**0**
YEAR: 2016														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	0	0	0
YEAR 2016 TOTAL	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**
FINAL TOTAL	**0**	**3**	**0**	**3**	**0**	**4**	**1**	**3**	**0**	**3**	**0**	**2**	**0**	**0**

CITY OF WOODBURN, MARION COUNTY

JUNE WAY and Intersectional Crashes at JUNE WAY, City of Woodburn, Marion County, 01/01/2016 to 12/31/2020

1 - 2 of 2 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N V	I H L	C O R K	W	DATE / DAY / TIME / LAT	CLASS / DIST / FROM / LONG	CITY STREET / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR / OWNER / TYPE	QTY	MOVE / FROM / TO	P#	PRTC / TYPE	INJ / SVRTY	A G E	S E X	LICNS / RES	PED LOC	ERROR	ACT	EVENT	CAUSE
02582	N	N	N					07/10/2019	16	WOODBURN-ESTACADA H	INTER	3-LEG	N	N	CLR	S-STRGHT	01	NONE	0	STRGHT											29
NONE								WE		JUNE WAY	W		STOP SIGN	N	DRY	REAR		PRVTE		W -E									000		00
N								4P			06	0		N	DAY	INJ		SEMI TOW			01	DRVR	NONE	47	M	OR-Y		042	000		29
N								45 9 4.51	-122 49 35.68	016100100S00																OR>25					
																	02	NONE	0	STRGHT											
																		PRVTE		W -E									006		00
																		PSNGR CAR			01	DRVR	INJC	42	F	OR-Y		000	000		00
																										OR>25					
05057	N	N	N		N	N		12/16/2019	16	WOODBURN-ESTACADA H	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-L											010	02
CITY								MO		JUNE WAY	CN		STOP SIGN	N	DRY	TURN		PRVTE		SW-W									000		00
N								9A			04	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	21	F	OR-Y		028	000		02
N								45 9 4.49	-122 49 35.68	016100100S00																OR<25					
																	02	NONE	0	STRGHT											
																		PRVTE		W -E									000	010	00
																		PSNGR CAR			01	DRVR	INJC	50	F	OR-Y		000	000		00
																										OR<25					
																	02	NONE	0	STRGHT											
																		PRVTE		W -E									000	010	00
																		PSNGR CAR			02	PSNG	INJC	58	M			000	000		00

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Highway 161 ALL ROAD TYPES, MP 0.363 to 0.457 01/01/2016 to 12/31/2020, Both Add and Non-Add mileage

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
FINAL TOTAL														

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

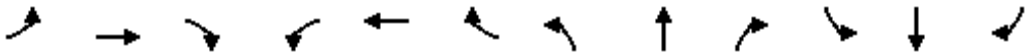
MARION COUNTY

COOLEY RD NE, MP -999.99 to 999.99, 01/01/2016 to 12/31/2020

1 - 1 of 1 Crash records shown.

SER# / INVEST / RD DPT / UNLOC?	S P E D	A L C	D M R U G S	J N S	I H V	C O W R K	DATE / DAY / TIME / LAT	MILEPNT / DIST FROM / INTERSECT / LONG	COUNTY ROADS / FIRST STREET / SECOND STREET / LRS	RD CHAR / DIRECT / LOCTN	INT-TYPE (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH / COLL / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	A G E	S E X	LICNS RES	PED LOC	ERROR	ACT EVENT	CAUSE
03941	N	N	N				09/10/2016	0.38	COOLEY RD NE	STRGHT		N	N	CLR	S-1STOP	01	NONE 9	STRGHT										29
STATE							SA			UN	(NONE)	UNKNOWN	N	DRY	REAR		N/A	S -N									000	00
N							6A			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
N							45 8 58.15	-122 49 26.85			(02)													UNK				
																02	NONE 9	STOP										
																	N/A	S -N									011	00
																	PSNGR CAR		01	DRVR	NONE	00	Unk	UNK		000	000	00
																								UNK				

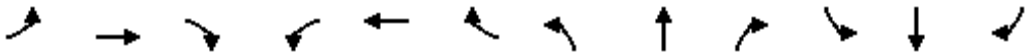
APPENDIX F:
SYNCHRO REPORTS – 2024 BACKGROUND AM + PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	207	131	174	268	114	209	554	110	80	365	82
Future Volume (vph)	125	207	131	174	268	114	209	554	110	80	365	82
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1471	1549	1298	1471	1474		2906	2995	1323	1484	2880	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1471	1549	1298	1471	1474		2906	2995	1323	1484	2880	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	230	146	193	298	127	232	616	122	89	406	91
RTOR Reduction (vph)	0	0	99	0	16	0	0	0	87	0	19	0
Lane Group Flow (vph)	139	230	47	193	409	0	232	616	35	89	478	0
Confl. Peds. (#/hr)	1		3	3		1	1		1	1		1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	11%	11%	11%	12%	12%	12%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	10.3	33.7	33.7	10.3	33.7		12.8	30.1	30.1	10.9	28.2	
Effective Green, g (s)	10.3	33.7	33.7	10.3	33.7		12.8	30.1	30.1	10.9	28.2	
Actuated g/C Ratio	0.10	0.32	0.32	0.10	0.32		0.12	0.29	0.29	0.10	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	144	497	416	144	473		354	858	379	154	773	
v/s Ratio Prot	0.09	0.15		c0.13	c0.28		c0.08	c0.21		0.06	0.17	
v/s Ratio Perm			0.04						0.03			
v/c Ratio	0.97	0.46	0.11	1.34	0.86		0.66	0.72	0.09	0.58	0.62	
Uniform Delay, d1	47.2	28.4	25.1	47.4	33.5		44.0	33.6	27.4	44.9	33.7	
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	63.9	0.8	0.1	192.3	15.4		4.3	5.1	0.5	5.2	3.7	
Delay (s)	111.1	29.2	25.3	239.7	48.9		48.3	38.8	27.9	50.0	37.4	
Level of Service	F	C	C	F	D		D	D	C	D	D	
Approach Delay (s)		50.2			108.5			39.7			39.3	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	57.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

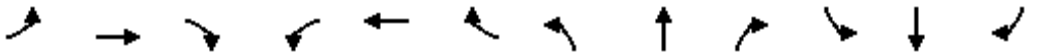
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	207	131	174	268	114	209	554	110	80	365	82
Future Volume (veh/h)	125	207	131	174	268	114	209	554	110	80	365	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1573	1573	1573	1573	1573	1573	1600	1600	1600	1586	1586	1586
Adj Flow Rate, veh/h	139	230	146	193	298	127	232	616	122	89	406	91
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	13	13	13	13	13	13	11	11	11	12	12	12
Cap, veh/h	93	488	413	93	325	138	155	1184	527	72	942	209
Arrive On Green	0.06	0.31	0.31	0.06	0.31	0.31	0.05	0.39	0.39	0.05	0.38	0.38
Sat Flow, veh/h	1498	1573	1329	1498	1045	445	2956	3040	1355	1511	2450	544
Grp Volume(v), veh/h	139	230	146	193	0	425	232	616	122	89	248	249
Grp Sat Flow(s),veh/h/ln	1498	1573	1329	1498	0	1491	1478	1520	1355	1511	1507	1488
Q Serve(g_s), s	6.5	12.4	8.9	6.5	0.0	28.9	5.5	16.3	6.3	5.0	12.7	13.0
Cycle Q Clear(g_c), s	6.5	12.4	8.9	6.5	0.0	28.9	5.5	16.3	6.3	5.0	12.7	13.0
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	93	488	413	93	0	463	155	1184	527	72	580	572
V/C Ratio(X)	1.50	0.47	0.35	2.08	0.00	0.92	1.50	0.52	0.23	1.24	0.43	0.43
Avail Cap(c_a), veh/h	93	614	519	93	0	582	155	1184	527	72	580	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	29.2	28.0	49.3	0.0	34.9	49.8	24.6	21.5	50.0	23.8	23.9
Incr Delay (d2), s/veh	272.7	0.9	0.6	521.6	0.0	17.6	255.0	1.6	1.0	182.9	2.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	4.8	2.9	15.9	0.0	12.5	7.5	6.0	2.2	5.5	4.9	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	321.9	30.1	28.6	570.9	0.0	52.5	304.8	26.2	22.5	232.9	26.1	26.3
LnGrp LOS	F	C	C	F	A	D	F	C	C	F	C	C
Approach Vol, veh/h		515			618			970			586	
Approach Delay, s/veh		108.4			214.4			92.4			57.6	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	45.9	11.0	38.1	9.5	46.4	11.0	38.1
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.5	32.0	6.5	41.0	5.0	32.5	6.5	41.0
Max Q Clear Time (g_c+I1), s	7.5	15.0	8.5	30.9	7.0	18.3	8.5	14.4
Green Ext Time (p_c), s	0.0	5.7	0.0	1.3	0.0	8.2	0.0	0.4

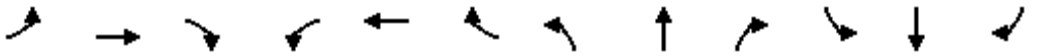
Intersection Summary	
HCM 6th Ctrl Delay	115.9
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	397	313	241	314	90	289	534	155	183	885	124
Future Volume (vph)	172	397	313	241	314	90	289	534	155	183	885	124
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1576		3014	3107	1372	1568	3074	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1576		3014	3107	1372	1568	3074	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	414	326	251	327	94	301	556	161	191	922	129
RTOR Reduction (vph)	0	0	168	0	9	0	0	0	117	0	9	0
Lane Group Flow (vph)	179	414	158	251	412	0	301	556	44	191	1042	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	15.8	35.8	35.8	19.5	39.5		15.3	34.0	34.0	15.7	34.4	
Effective Green, g (s)	15.8	35.8	35.8	19.5	39.5		15.3	34.0	34.0	15.7	34.4	
Actuated g/C Ratio	0.13	0.29	0.29	0.16	0.32		0.12	0.27	0.27	0.13	0.28	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	196	468	391	242	498		368	845	373	196	845	
v/s Ratio Prot	0.12	0.25		c0.16	c0.26		0.10	0.18		c0.12	c0.34	
v/s Ratio Perm			0.12						0.03			
v/c Ratio	0.91	0.88	0.40	1.04	0.83		0.82	0.66	0.12	0.97	1.23	
Uniform Delay, d1	53.9	42.6	36.0	52.8	39.6		53.5	40.3	34.2	54.5	45.3	
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	40.6	18.1	0.8	67.9	11.1		13.2	4.0	0.6	56.4	115.3	
Delay (s)	94.5	60.7	36.8	120.6	50.7		66.7	44.3	34.9	110.9	160.6	
Level of Service	F	E	D	F	D		E	D	C	F	F	
Approach Delay (s)		58.8			76.8			49.4			153.0	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	89.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	397	313	241	314	90	289	534	155	183	885	124
Future Volume (veh/h)	172	397	313	241	314	90	289	534	155	183	885	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1654	1654	1654	1654	1654	1654	1654	1654	1654	1668	1668	1668
Adj Flow Rate, veh/h	179	414	326	251	327	94	301	556	161	191	922	129
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	6	6	6
Cap, veh/h	201	454	382	246	373	107	313	1024	456	133	858	120
Arrive On Green	0.13	0.27	0.27	0.16	0.30	0.30	0.10	0.33	0.33	0.08	0.31	0.31
Sat Flow, veh/h	1576	1654	1393	1576	1234	355	3057	3143	1399	1589	2791	390
Grp Volume(v), veh/h	179	414	326	251	0	421	301	556	161	191	523	528
Grp Sat Flow(s),veh/h/ln	1576	1654	1393	1576	0	1588	1528	1572	1399	1589	1585	1597
Q Serve(g_s), s	14.0	30.3	27.7	19.5	0.0	31.4	12.3	18.1	11.0	10.5	38.4	38.4
Cycle Q Clear(g_c), s	14.0	30.3	27.7	19.5	0.0	31.4	12.3	18.1	11.0	10.5	38.4	38.4
Prop In Lane	1.00		1.00	1.00		0.22	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	201	454	382	246	0	480	313	1024	456	133	487	491
V/C Ratio(X)	0.89	0.91	0.85	1.02	0.00	0.88	0.96	0.54	0.35	1.43	1.07	1.07
Avail Cap(c_a), veh/h	203	543	457	246	0	564	313	1024	456	133	487	491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	43.9	43.0	52.8	0.0	41.4	55.9	34.5	32.1	57.2	43.3	43.3
Incr Delay (d2), s/veh	34.7	18.4	13.2	63.0	0.0	13.4	40.5	2.1	2.1	231.6	62.2	62.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	14.6	10.9	12.0	0.0	14.0	6.5	7.2	4.0	12.8	23.3	23.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.4	62.3	56.2	115.7	0.0	54.7	96.3	36.6	34.2	288.8	105.4	105.4
LnGrp LOS	F	E	E	F	A	D	F	D	C	F	F	F
Approach Vol, veh/h		919			672			1018			1242	
Approach Delay, s/veh		65.2			77.5			53.9			133.6	
Approach LOS		E			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	43.9	20.5	43.3	15.0	46.2	24.0	39.8
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.8	31.7	16.1	44.4	10.5	34.0	19.5	41.0
Max Q Clear Time (g_c+I1), s	14.3	40.4	16.0	33.4	12.5	20.1	21.5	32.3
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.0	7.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	86.4
HCM 6th LOS	F

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:10	5:10	5:10	5:10	5:10	5:10
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	742	771	706	646	696	712
Vehs Exited	527	555	401	391	388	451
Starting Vehs	329	329	285	311	301	310
Ending Vehs	544	545	590	566	609	566
Travel Distance (mi)	463	481	409	382	388	425
Travel Time (hr)	2307.0	2295.5	2257.5	2286.3	2228.7	2275.0
Total Delay (hr)	2291.2	2278.9	2243.4	2273.3	2215.4	2260.4
Total Stops	691	711	707	573	567	648
Fuel Used (gal)	526.7	523.9	514.9	520.5	508.2	518.8

Interval #0 Information Seeding

Start Time	4:00
End Time	4:10
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:10
End Time	4:25
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	615	649	569	509	558	579
Vehs Exited	453	489	357	333	361	400
Starting Vehs	329	329	285	311	301	310
Ending Vehs	491	489	497	487	498	489
Travel Distance (mi)	393	423	354	316	344	366
Travel Time (hr)	215.3	207.4	185.7	197.5	188.5	198.9
Total Delay (hr)	201.9	192.8	173.5	186.8	176.7	186.3
Total Stops	620	636	611	436	436	545
Fuel Used (gal)	57.2	56.0	49.4	51.3	50.2	52.8

Interval #2 Information Recording2

Start Time	4:25
End Time	5:10
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	127	122	137	137	138	130
Vehs Exited	74	66	44	58	27	52
Starting Vehs	491	489	497	487	498	489
Ending Vehs	544	545	590	566	609	566
Travel Distance (mi)	70	58	54	67	45	59
Travel Time (hr)	2091.8	2088.1	2071.8	2088.8	2040.3	2076.1
Total Delay (hr)	2089.3	2086.1	2069.9	2086.5	2038.8	2074.1
Total Stops	71	75	96	137	131	99
Fuel Used (gal)	469.5	467.8	465.4	469.2	458.0	466.0

Intersection: 1: OR 99E & Molalla Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	370	852	279	234	320	304	343	1570	1563	32	385	1812
Average Queue (ft)	347	837	34	227	304	304	343	1543	1534	30	385	1733
95th Queue (ft)	419	851	243	250	323	345	363	1647	1665	128	395	1994
Link Distance (ft)		834			273			1552	1552			1782
Upstream Blk Time (%)		98			99			94	75			84
Queuing Penalty (veh)		0			731			0	0			0
Storage Bay Dist (ft)	350		550	300		350	350			230	380	
Storage Blk Time (%)	79	20	0		99	20	80				100	
Queuing Penalty (veh)	557	97	0		238	53	213				442	

Intersection: 1: OR 99E & Molalla Rd

Movement	SB
Directions Served	TR
Maximum Queue (ft)	1797
Average Queue (ft)	1597
95th Queue (ft)	2091
Link Distance (ft)	1782
Upstream Blk Time (%)	65
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection	
Int Delay, s/veh	3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	110	28	378	107	33
Future Vol, veh/h	310	110	28	378	107	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	11	11	14	14	7	7
Mvmt Flow	360	128	33	440	124	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	866	360
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	506	-
Critical Hdwy	-	-	4.24	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.326	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	1016	-	317	673
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1016	-	303	673
Mov Cap-2 Maneuver	-	-	-	-	303	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	569	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	21.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	303	673	-	-	1016	-
HCM Lane V/C Ratio	0.411	0.057	-	-	0.032	-
HCM Control Delay (s)	24.9	10.7	-	-	8.7	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	1.9	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	30.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	275	48	521	220	131
Future Vol, veh/h	475	275	48	521	220	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	6	6	1	1
Mvmt Flow	522	302	53	573	242	144

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	824	0	1201	522
Stage 1	-	-	-	-	522	-
Stage 2	-	-	-	-	679	-
Critical Hdwy	-	-	4.16	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.254	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	789	-	~ 205	557
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	506	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	789	-	~ 185	557
Mov Cap-2 Maneuver	-	-	-	-	~ 185	-
Stage 1	-	-	-	-	597	-
Stage 2	-	-	-	-	456	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	143.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	185	557	-	-	789	-
HCM Lane V/C Ratio	1.307	0.258	-	-	0.067	-
HCM Control Delay (s)	220.8	13.7	-	-	9.9	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	13.7	1	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	294	32	2	429	49	2
Future Vol, veh/h	294	32	2	429	49	2
Conflicting Peds, #/hr	0	1	1	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	13	13	16	16	2	2
Mvmt Flow	354	39	2	517	59	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	394	0	897	375
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	-	-	4.26	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.344	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1092	-	310	671
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	595	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1091	-	309	670
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	593	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	316	-	-	1091	-
HCM Lane V/C Ratio	0.194	-	-	0.002	-
HCM Control Delay (s)	19.1	-	-	8.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	559	58	4	451	36	7
Future Vol, veh/h	559	58	4	451	36	7
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	10	10	9	9	6	6
Mvmt Flow	628	65	4	507	40	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	695	0	1178	663
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	-	-	4.19	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.281	-	3.554	3.354
Pot Cap-1 Maneuver	-	-	869	-	207	454
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	867	-	206	453
Mov Cap-2 Maneuver	-	-	-	-	206	-
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	589	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	25.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	226	-	-	867	-
HCM Lane V/C Ratio	0.214	-	-	0.005	-
HCM Control Delay (s)	25.2	-	-	9.2	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	277	380	2	7	51
Future Vol, veh/h	18	277	380	2	7	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	20	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	2	2
Mvmt Flow	20	301	413	2	8	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	415	0	-	0	755	414
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	4.23	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1087	-	-	-	376	638
Stage 1	-	-	-	-	667	-
Stage 2	-	-	-	-	720	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1087	-	-	-	369	638
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	720	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1087	-	-	-	614
HCM Lane V/C Ratio	0.018	-	-	-	0.103
HCM Control Delay (s)	8.4	-	-	-	11.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	507	420	7	5	33
Future Vol, veh/h	54	507	420	7	5	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	20	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	7	7	2	2
Mvmt Flow	59	551	457	8	5	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	465	0	-	0	1130	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	669	-
Critical Hdwy	4.2	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1056	-	-	-	225	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	509	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	1056	-	-	-	212	600
Mov Cap-2 Maneuver	-	-	-	-	347	-
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	509	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1056	-	-	-	547
HCM Lane V/C Ratio	0.056	-	-	-	0.076
HCM Control Delay (s)	8.6	-	-	-	12.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	257	15	41	348	1	19	2	51	1	1	15
Future Vol, veh/h	3	257	15	41	348	1	19	2	51	1	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	12	12	12	0	0	0	93	93	93
Mvmt Flow	4	310	18	49	419	1	23	2	61	1	1	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	420	0	0	328	0	0	854	845	319	877	854	420
Stage 1	-	-	-	-	-	-	327	327	-	518	518	-
Stage 2	-	-	-	-	-	-	527	518	-	359	336	-
Critical Hdwy	4.24	-	-	4.22	-	-	7.1	6.5	6.2	8.03	7.43	7.13
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Follow-up Hdwy	2.326	-	-	2.308	-	-	3.5	4	3.3	4.337	4.837	4.137
Pot Cap-1 Maneuver	1078	-	-	1177	-	-	281	302	726	190	215	477
Stage 1	-	-	-	-	-	-	690	651	-	406	410	-
Stage 2	-	-	-	-	-	-	538	536	-	507	508	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1078	-	-	1177	-	-	260	288	726	167	205	477
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	288	-	167	205	-
Stage 1	-	-	-	-	-	-	687	648	-	404	393	-
Stage 2	-	-	-	-	-	-	495	513	-	461	506	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	14.2	14.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	479	1078	-	-	1177	-	-	402
HCM Lane V/C Ratio	0.181	0.003	-	-	0.042	-	-	0.051
HCM Control Delay (s)	14.2	8.4	-	-	8.2	-	-	14.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	3.2

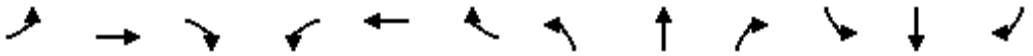
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	441	68	129	402	1	22	1	60	1	2	3
Future Vol, veh/h	5	441	68	129	402	1	22	1	60	1	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	11	11	11	7	7	7	0	0	0	0	0	0
Mvmt Flow	6	519	80	152	473	1	26	1	71	1	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	474	0	0	599	0	0	1352	1349	559	1385	1389	474
Stage 1	-	-	-	-	-	-	571	571	-	778	778	-
Stage 2	-	-	-	-	-	-	781	778	-	607	611	-
Critical Hdwy	4.21	-	-	4.17	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.299	-	-	2.263	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1043	-	-	954	-	-	128	152	532	122	144	595
Stage 1	-	-	-	-	-	-	509	508	-	392	410	-
Stage 2	-	-	-	-	-	-	391	410	-	487	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1043	-	-	954	-	-	110	127	532	92	120	595
Mov Cap-2 Maneuver	-	-	-	-	-	-	110	127	-	92	120	-
Stage 1	-	-	-	-	-	-	506	505	-	390	345	-
Stage 2	-	-	-	-	-	-	325	345	-	419	484	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.3	27.1	25.3
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	259	1043	-	-	954	-	-	184
HCM Lane V/C Ratio	0.377	0.006	-	-	0.159	-	-	0.038
HCM Control Delay (s)	27.1	8.5	-	-	9.5	-	-	25.3
HCM Lane LOS	D	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.7	0	-	-	0.6	-	-	0.1

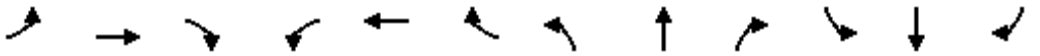
APPENDIX G:
SYNCHRO REPORTS – 2024 TOTAL AM + PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	215	131	194	296	134	209	554	116	86	365	82
Future Volume (vph)	125	215	131	194	296	134	209	554	116	86	365	82
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1471	1549	1298	1471	1470		2906	2995	1323	1484	2880	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1471	1549	1298	1471	1470		2906	2995	1323	1484	2880	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	239	146	216	329	149	232	616	129	96	406	91
RTOR Reduction (vph)	0	0	95	0	16	0	0	0	93	0	19	0
Lane Group Flow (vph)	139	239	51	216	462	0	232	616	36	96	478	0
Confl. Peds. (#/hr)	1		3	3		1	1		1	1		1
Heavy Vehicles (%)	13%	13%	13%	13%	13%	13%	11%	11%	11%	12%	12%	12%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	9.8	36.7	36.7	9.8	36.7		9.8	29.2	29.2	9.3	28.7	
Effective Green, g (s)	9.8	36.7	36.7	9.8	36.7		9.8	29.2	29.2	9.3	28.7	
Actuated g/C Ratio	0.09	0.35	0.35	0.09	0.35		0.09	0.28	0.28	0.09	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	137	541	453	137	513		271	832	367	131	787	
v/s Ratio Prot	0.09	0.15		c0.15	c0.31		c0.08	c0.21		0.06	0.17	
v/s Ratio Perm			0.04						0.03			
v/c Ratio	1.01	0.44	0.11	1.58	0.90		0.86	0.74	0.10	0.73	0.61	
Uniform Delay, d1	47.6	26.3	23.1	47.6	32.4		46.9	34.5	28.1	46.6	33.2	
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	80.8	0.7	0.1	291.5	19.1		22.3	5.9	0.5	18.9	3.5	
Delay (s)	128.4	27.0	23.3	339.1	51.5		69.2	40.3	28.7	65.6	36.7	
Level of Service	F	C	C	F	D		E	D	C	E	D	
Approach Delay (s)		52.8			141.0			45.7			41.4	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	69.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

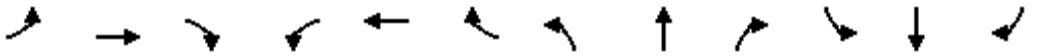
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	215	131	194	296	134	209	554	116	86	365	82
Future Volume (veh/h)	125	215	131	194	296	134	209	554	116	86	365	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1573	1573	1573	1573	1573	1573	1600	1600	1600	1586	1586	1586
Adj Flow Rate, veh/h	139	239	146	216	329	149	232	616	129	96	406	91
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	13	13	13	13	13	13	11	11	11	12	12	12
Cap, veh/h	93	539	455	93	351	159	155	1087	484	72	864	192
Arrive On Green	0.06	0.34	0.34	0.06	0.34	0.34	0.05	0.36	0.36	0.05	0.35	0.35
Sat Flow, veh/h	1498	1573	1329	1498	1024	464	2956	3040	1355	1511	2450	544
Grp Volume(v), veh/h	139	239	146	216	0	478	232	616	129	96	248	249
Grp Sat Flow(s),veh/h/ln	1498	1573	1329	1498	0	1488	1478	1520	1355	1511	1507	1488
Q Serve(g_s), s	6.5	12.4	8.5	6.5	0.0	32.7	5.5	17.1	7.1	5.0	13.4	13.6
Cycle Q Clear(g_c), s	6.5	12.4	8.5	6.5	0.0	32.7	5.5	17.1	7.1	5.0	13.4	13.6
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	93	539	455	93	0	509	155	1087	484	72	532	525
V/C Ratio(X)	1.50	0.44	0.32	2.33	0.00	0.94	1.50	0.57	0.27	1.33	0.47	0.47
Avail Cap(c_a), veh/h	93	614	519	93	0	581	155	1087	484	72	532	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	26.8	25.5	49.3	0.0	33.4	49.8	27.2	24.0	50.0	26.3	26.4
Incr Delay (d2), s/veh	272.7	0.7	0.5	630.7	0.0	22.1	255.0	2.1	1.3	219.1	2.9	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.4	4.7	2.7	18.7	0.0	14.6	7.5	6.4	2.4	6.3	5.2	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	321.9	27.5	26.0	679.9	0.0	55.5	304.8	29.3	25.3	269.1	29.3	29.5
LnGrp LOS	F	C	C	F	A	E	F	C	C	F	C	C
Approach Vol, veh/h		524			694			977			593	
Approach Delay, s/veh		105.2			249.9			94.2			68.2	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	42.5	11.0	41.5	9.5	43.0	11.0	41.5
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	5.5	32.0	6.5	41.0	5.0	32.5	6.5	41.0
Max Q Clear Time (g_c+I1), s	7.5	15.6	8.5	34.7	7.0	19.1	8.5	14.4
Green Ext Time (p_c), s	0.0	5.6	0.0	1.2	0.0	7.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	129.5
HCM 6th LOS	F



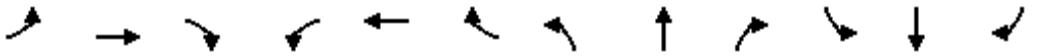
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1574		3014	3107	1372	1568	3074	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1574		3014	3107	1372	1568	3074	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	436	326	261	342	104	301	556	178	206	922	129
RTOR Reduction (vph)	0	0	164	0	9	0	0	0	130	0	9	0
Lane Group Flow (vph)	179	436	162	261	437	0	301	556	48	206	1042	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	15.8	37.0	37.0	19.5	40.7		14.9	34.0	34.0	14.5	33.6	
Effective Green, g (s)	15.8	37.0	37.0	19.5	40.7		14.9	34.0	34.0	14.5	33.6	
Actuated g/C Ratio	0.13	0.30	0.30	0.16	0.33		0.12	0.27	0.27	0.12	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	196	484	404	242	512		359	845	373	181	826	
v/s Ratio Prot	0.12	0.27		c0.17	c0.28		0.10	0.18		c0.13	c0.34	
v/s Ratio Perm			0.12						0.04			
v/c Ratio	0.91	0.90	0.40	1.08	0.85		0.84	0.66	0.13	1.14	1.26	
Uniform Delay, d1	53.9	42.2	35.1	52.8	39.4		53.9	40.3	34.3	55.2	45.7	
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	40.6	20.0	0.8	80.3	13.2		15.6	4.0	0.7	108.9	127.5	
Delay (s)	94.5	62.3	35.9	133.0	52.6		69.5	44.3	35.1	164.2	173.2	
Level of Service	F	E	D	F	D		E	D	D	F	F	
Approach Delay (s)		59.3			82.3			50.1			171.7	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	96.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Signalized Intersection Summary
1: OR 99E & Molalla Rd

06/30/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (veh/h)	172	419	313	251	328	100	289	534	171	198	885	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1654	1654	1654	1654	1654	1654	1654	1654	1654	1668	1668	1668
Adj Flow Rate, veh/h	179	436	326	261	342	104	301	556	178	206	922	129
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	6	6	6
Cap, veh/h	201	472	397	246	381	116	313	990	441	133	827	116
Arrive On Green	0.13	0.29	0.29	0.16	0.31	0.31	0.10	0.31	0.31	0.08	0.30	0.30
Sat Flow, veh/h	1576	1654	1393	1576	1216	370	3057	3143	1399	1589	2791	390
Grp Volume(v), veh/h	179	436	326	261	0	446	301	556	178	206	523	528
Grp Sat Flow(s),veh/h/ln	1576	1654	1393	1576	0	1585	1528	1572	1399	1589	1585	1597
Q Serve(g_s), s	14.0	32.0	27.3	19.5	0.0	33.6	12.3	18.4	12.5	10.5	37.1	37.1
Cycle Q Clear(g_c), s	14.0	32.0	27.3	19.5	0.0	33.6	12.3	18.4	12.5	10.5	37.1	37.1
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	201	472	397	246	0	497	313	990	441	133	470	473
V/C Ratio(X)	0.89	0.92	0.82	1.06	0.00	0.90	0.96	0.56	0.40	1.54	1.11	1.11
Avail Cap(c_a), veh/h	203	543	457	246	0	563	313	990	441	133	470	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	43.4	41.7	52.8	0.0	41.0	55.9	35.6	33.6	57.2	44.0	44.0
Incr Delay (d2), s/veh	34.7	20.6	10.6	74.7	0.0	16.2	40.5	2.3	2.7	278.3	76.5	76.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	15.7	10.5	12.8	0.0	15.2	6.5	7.4	4.6	14.5	24.4	24.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.4	63.9	52.2	127.4	0.0	57.2	96.3	38.0	36.4	335.6	120.5	120.5
LnGrp LOS	F	E	D	F	A	E	F	D	D	F	F	F
Approach Vol, veh/h		941			707			1035			1257	
Approach Delay, s/veh		64.5			83.1			54.7			155.7	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	42.6	20.5	44.7	15.0	44.9	24.0	41.1
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.8	31.7	16.1	44.4	10.5	34.0	19.5	41.0
Max Q Clear Time (g_c+I1), s	14.3	39.1	16.0	35.6	12.5	20.4	21.5	34.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	7.8	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	94.4
HCM 6th LOS	F

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:00	4:00	4:00	4:00	4:00	4:00
End Time	5:10	5:10	5:10	5:10	5:10	5:10
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	3	3	3	3	3	3
# of Recorded Intervals	2	2	2	2	2	2
Vehs Entered	738	670	669	662	740	694
Vehs Exited	475	364	355	370	498	413
Starting Vehs	298	331	274	311	333	306
Ending Vehs	561	637	588	603	575	592
Travel Distance (mi)	449	342	384	371	475	404
Travel Time (hr)	2275.0	2367.3	2301.4	2470.6	2308.6	2344.6
Total Delay (hr)	2259.6	2355.7	2288.3	2457.8	2292.3	2330.7
Total Stops	575	602	549	556	831	624
Fuel Used (gal)	520.3	537.8	525.6	561.9	529.0	534.9

Interval #0 Information Seeding

Start Time	4:00
End Time	4:10
Total Time (min)	10

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:10
End Time	4:25
Total Time (min)	15

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	574	554	500	486	563	534
Vehs Exited	430	325	293	270	401	343
Starting Vehs	298	331	274	311	333	306
Ending Vehs	442	560	481	527	495	497
Travel Distance (mi)	385	303	313	291	378	334
Travel Time (hr)	192.9	204.9	195.8	221.6	216.8	206.4
Total Delay (hr)	179.8	194.5	185.2	211.7	203.8	195.0
Total Stops	443	519	423	391	650	484
Fuel Used (gal)	51.9	52.7	50.8	56.0	57.0	53.7

Interval #2 Information Recording2

Start Time	4:25
End Time	5:10
Total Time (min)	45

Volumes adjusted by Growth Factors, Anti PHF.

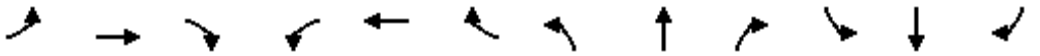
Run Number	1	2	3	4	5	Avg
Vehs Entered	164	116	169	176	177	160
Vehs Exited	45	39	62	100	97	68
Starting Vehs	442	560	481	527	495	497
Ending Vehs	561	637	588	603	575	592
Travel Distance (mi)	64	39	71	80	97	70
Travel Time (hr)	2082.0	2162.5	2105.6	2248.9	2091.9	2138.2
Total Delay (hr)	2079.8	2161.1	2103.1	2246.1	2088.5	2135.7
Total Stops	132	83	126	165	181	137
Fuel Used (gal)	468.4	485.0	474.7	505.9	472.1	481.2

Intersection: 1: OR 99E & Molalla Rd

Movement	EB	EB	EB	WB	WB	NB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	L	T	T	R	L	T
Maximum Queue (ft)	350	855	457	248	309	301	364	1577	1543	48	389	1820
Average Queue (ft)	291	834	46	234	295	299	364	1545	1176	47	389	1725
95th Queue (ft)	449	854	295	270	326	311	372	1611	2119	204	400	2007
Link Distance (ft)		834			273			1552	1552			1782
Upstream Blk Time (%)		98		0	99			95	39			86
Queuing Penalty (veh)		0		0	767			0	0			0
Storage Bay Dist (ft)	350		550	300		350	350			230	380	
Storage Blk Time (%)	50	53	0	0	99		100	0		19	100	
Queuing Penalty (veh)	360	258	0	0	249		267	0		52	442	

Intersection: 1: OR 99E & Molalla Rd

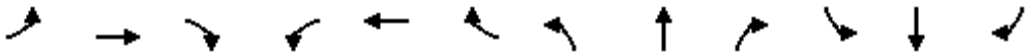
Movement	SB
Directions Served	TR
Maximum Queue (ft)	1798
Average Queue (ft)	1716
95th Queue (ft)	2028
Link Distance (ft)	1782
Upstream Blk Time (%)	84
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1574		3014	3107	1372	3043	3074	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1574		3014	3107	1372	3043	3074	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	436	326	261	342	104	301	556	178	206	922	129
RTOR Reduction (vph)	0	0	164	0	9	0	0	0	125	0	9	0
Lane Group Flow (vph)	179	436	162	261	437	0	301	556	53	206	1042	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	15.8	37.0	37.0	19.5	40.7		14.9	37.4	37.4	11.1	33.6	
Effective Green, g (s)	15.8	37.0	37.0	19.5	40.7		14.9	37.4	37.4	11.1	33.6	
Actuated g/C Ratio	0.13	0.30	0.30	0.16	0.33		0.12	0.30	0.30	0.09	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	196	484	404	242	512		359	929	410	270	826	
v/s Ratio Prot	0.12	0.27		c0.17	c0.28		c0.10	c0.18		0.07	c0.34	
v/s Ratio Perm			0.12						0.04			
v/c Ratio	0.91	0.90	0.40	1.08	0.85		0.84	0.60	0.13	0.76	1.26	
Uniform Delay, d1	53.9	42.2	35.1	52.8	39.4		53.9	37.4	31.9	55.7	45.7	
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	40.6	20.0	0.8	80.3	13.2		15.6	2.8	0.7	12.0	127.5	
Delay (s)	94.5	62.3	35.9	133.0	52.6		69.5	40.2	32.6	67.7	173.2	
Level of Service	F	E	D	F	D		E	D	C	E	F	
Approach Delay (s)		59.3			82.3			47.4			155.9	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	91.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

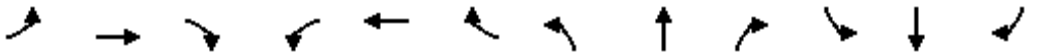
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (veh/h)	172	419	313	251	328	100	289	534	171	198	885	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1654	1654	1654	1654	1654	1654	1654	1654	1654	1668	1668	1668
Adj Flow Rate, veh/h	179	436	326	261	342	104	301	556	178	206	922	129
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	6	6	6
Cap, veh/h	201	472	397	246	381	116	313	996	444	252	827	116
Arrive On Green	0.13	0.29	0.29	0.16	0.31	0.31	0.10	0.32	0.32	0.08	0.30	0.30
Sat Flow, veh/h	1576	1654	1393	1576	1216	370	3057	3143	1399	3082	2791	390
Grp Volume(v), veh/h	179	436	326	261	0	446	301	556	178	206	523	528
Grp Sat Flow(s),veh/h/ln	1576	1654	1393	1576	0	1585	1528	1572	1399	1541	1585	1597
Q Serve(g_s), s	14.0	32.0	27.3	19.5	0.0	33.6	12.3	18.3	12.4	8.2	37.1	37.1
Cycle Q Clear(g_c), s	14.0	32.0	27.3	19.5	0.0	33.6	12.3	18.3	12.4	8.2	37.1	37.1
Prop In Lane	1.00		1.00	1.00		0.23	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	201	472	397	246	0	497	313	996	444	252	470	473
V/C Ratio(X)	0.89	0.92	0.82	1.06	0.00	0.90	0.96	0.56	0.40	0.82	1.11	1.11
Avail Cap(c_a), veh/h	203	543	457	246	0	563	313	996	444	259	470	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	43.4	41.7	52.8	0.0	41.0	55.9	35.4	33.4	56.5	44.0	44.0
Incr Delay (d2), s/veh	34.7	20.6	10.6	74.7	0.0	16.2	40.5	2.3	2.7	17.8	76.5	76.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	15.7	10.5	12.8	0.0	15.2	6.5	7.3	4.6	3.8	24.4	24.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	88.4	63.9	52.2	127.4	0.0	57.2	96.3	37.7	36.1	74.2	120.5	120.5
LnGrp LOS	F	E	D	F	A	E	F	D	D	E	F	F
Approach Vol, veh/h		941			707			1035			1257	
Approach Delay, s/veh		64.5			83.1			54.5			112.9	
Approach LOS		E			F			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	42.6	20.5	44.7	14.7	45.1	24.0	41.1
Change Period (Y+Rc), s	4.5	5.5	4.5	5.5	4.5	5.5	4.5	5.5
Max Green Setting (Gmax), s	12.8	31.7	16.1	44.4	10.5	34.0	19.5	41.0
Max Q Clear Time (g_c+I1), s	14.3	39.1	16.0	35.6	10.2	20.3	21.5	34.0
Green Ext Time (p_c), s	0.0	0.0	0.0	1.3	0.0	7.8	0.0	0.6

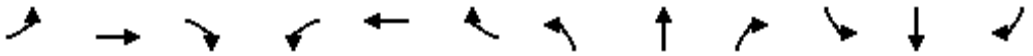
Intersection Summary	
HCM 6th Ctrl Delay	80.7
HCM 6th LOS	F



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1547	1304	3014	3107	1372	3043	3074	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1547	1304	3014	3107	1372	3043	3074	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	436	326	261	342	104	301	556	178	206	922	129
RTOR Reduction (vph)	0	0	164	0	1	63	0	0	125	0	9	0
Lane Group Flow (vph)	179	436	162	261	351	31	301	556	53	206	1042	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			
Actuated Green, G (s)	15.8	37.0	37.0	19.5	40.7	40.7	14.9	37.4	37.4	11.1	33.6	
Effective Green, g (s)	15.8	37.0	37.0	19.5	40.7	40.7	14.9	37.4	37.4	11.1	33.6	
Actuated g/C Ratio	0.13	0.30	0.30	0.16	0.33	0.33	0.12	0.30	0.30	0.09	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5	3.5	3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	196	484	404	242	503	424	359	929	410	270	826	
v/s Ratio Prot	0.12	c0.27		c0.17	c0.23		c0.10	c0.18		0.07	c0.34	
v/s Ratio Perm			0.12			0.02			0.04			
v/c Ratio	0.91	0.90	0.40	1.08	0.70	0.07	0.84	0.60	0.13	0.76	1.26	
Uniform Delay, d1	53.9	42.2	35.1	52.8	36.8	29.1	53.9	37.4	31.9	55.7	45.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	20.0	0.8	80.3	4.4	0.1	15.6	2.8	0.7	12.0	127.5	
Delay (s)	94.5	62.3	35.9	133.0	41.2	29.2	69.5	40.2	32.6	67.7	173.2	
Level of Service	F	E	D	F	D	C	E	D	C	E	F	
Approach Delay (s)		59.3			73.5			47.4			155.9	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	89.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Future Volume (vph)	172	419	313	251	328	100	289	534	171	198	885	124
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	4.0	4.5	5.5	5.5	4.5	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1554	1636	1366	1554	1547	1321	3014	3107	1372	1568	3074	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1554	1636	1366	1554	1547	1321	3014	3107	1372	1568	3074	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	179	436	326	261	342	104	301	556	178	206	922	129
RTOR Reduction (vph)	0	0	164	0	1	94	0	0	130	0	9	0
Lane Group Flow (vph)	179	436	162	261	351	0	301	556	48	206	1042	0
Confl. Peds. (#/hr)	1		6	6		1	2		1	1		2
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	6%	6%	6%
Turn Type	Prot	NA	Perm	Prot	NA	NA	Prot	NA	Perm	Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8						6			
Actuated Green, G (s)	15.8	37.0	37.0	19.5	40.7	0.0	14.9	34.0	34.0	14.5	33.6	
Effective Green, g (s)	15.8	37.0	37.0	19.5	40.7	0.0	14.9	34.0	34.0	14.5	33.6	
Actuated g/C Ratio	0.13	0.30	0.30	0.16	0.33	0.00	0.12	0.27	0.27	0.12	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5		4.5	5.5	5.5	4.5	5.5	
Vehicle Extension (s)	3.0	3.5	3.5	3.0	3.5		3.0	5.2	5.2	3.0	5.2	
Lane Grp Cap (vph)	196	484	404	242	503	0	359	845	373	181	826	
v/s Ratio Prot	0.12	c0.27		c0.17	c0.23		0.10	0.18		c0.13	c0.34	
v/s Ratio Perm			0.12						0.04			
v/c Ratio	0.91	0.90	0.40	1.08	0.70	0.00	0.84	0.66	0.13	1.14	1.26	
Uniform Delay, d1	53.9	42.2	35.1	52.8	36.8	62.5	53.9	40.3	34.3	55.2	45.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	40.6	20.0	0.8	80.3	4.4	0.0	15.6	4.0	0.7	108.9	127.5	
Delay (s)	94.5	62.3	35.9	133.0	41.2	62.5	69.5	44.3	35.1	164.2	173.2	
Level of Service	F	E	D	F	D	E	E	D	D	F	F	
Approach Delay (s)		59.3			77.9			50.1			171.7	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM 2000 Control Delay	96.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	330	110	28	446	107	33
Future Vol, veh/h	330	110	28	446	107	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	11	11	14	14	7	7
Mvmt Flow	384	128	33	519	124	38

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	512	0	969	384
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	585	-
Critical Hdwy	-	-	4.24	-	6.47	6.27
Critical Hdwy Stg 1	-	-	-	-	5.47	-
Critical Hdwy Stg 2	-	-	-	-	5.47	-
Follow-up Hdwy	-	-	2.326	-	3.563	3.363
Pot Cap-1 Maneuver	-	-	995	-	275	653
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	547	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	995	-	262	653
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	26
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	262	653	-	-	995	-
HCM Lane V/C Ratio	0.475	0.059	-	-	0.033	-
HCM Control Delay (s)	30.6	10.9	-	-	8.7	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	2.4	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	39.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	528	275	48	555	220	131
Future Vol, veh/h	528	275	48	555	220	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	5	5	6	6	1	1
Mvmt Flow	580	302	53	610	242	144

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	882	0	1296	580
Stage 1	-	-	-	-	580	-
Stage 2	-	-	-	-	716	-
Critical Hdwy	-	-	4.16	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.254	-	3.509	3.309
Pot Cap-1 Maneuver	-	-	750	-	~ 180	516
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	750	-	~ 161	516
Mov Cap-2 Maneuver	-	-	-	-	~ 161	-
Stage 1	-	-	-	-	562	-
Stage 2	-	-	-	-	434	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	198
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	161	516	-	-	750	-
HCM Lane V/C Ratio	1.502	0.279	-	-	0.07	-
HCM Control Delay (s)	$ 307.1	14.7	-	-	10.2	0
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	15.8	1.1	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	294	32	2	429	2	49	1	2	9	2	68
Future Vol, veh/h	20	294	32	2	429	2	49	1	2	9	2	68
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	20	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	83	83	83	83	92	83	92	83	92	92	92
Heavy Vehicles, %	2	13	13	16	16	2	2	2	2	2	2	2
Mvmt Flow	22	354	39	2	517	2	59	1	2	10	2	74

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	519	0	0	394	0	0	980	942	375	941	960	519
Stage 1	-	-	-	-	-	-	419	419	-	522	522	-
Stage 2	-	-	-	-	-	-	561	523	-	419	438	-
Critical Hdwy	4.12	-	-	4.26	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.344	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1047	-	-	1092	-	-	229	263	671	243	257	557
Stage 1	-	-	-	-	-	-	612	590	-	538	531	-
Stage 2	-	-	-	-	-	-	512	530	-	612	579	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1047	-	-	1091	-	-	193	255	670	236	249	556
Mov Cap-2 Maneuver	-	-	-	-	-	-	193	255	-	236	249	-
Stage 1	-	-	-	-	-	-	595	573	-	523	530	-
Stage 2	-	-	-	-	-	-	441	529	-	592	563	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0	31.2	14.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	199	1047	-	-	1091	-	-	469
HCM Lane V/C Ratio	0.314	0.021	-	-	0.002	-	-	0.183
HCM Control Delay (s)	31.2	8.5	0	-	8.3	-	-	14.4
HCM Lane LOS	D	A	A	-	A	-	-	B
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	-	0.7

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↰	↑			↕			↕	
Traffic Vol, veh/h	53	559	58	4	451	7	36	2	7	4	1	34
Future Vol, veh/h	53	559	58	4	451	7	36	2	7	4	1	34
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	20	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	89	89	89	89	92	89	92	89	92	92	92
Heavy Vehicles, %	2	10	10	9	9	2	6	2	6	2	2	2
Mvmt Flow	58	628	65	4	507	8	40	2	8	4	1	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	515	0	0	695	0	0	1317	1302	663	1301	1330	511
Stage 1	-	-	-	-	-	-	779	779	-	519	519	-
Stage 2	-	-	-	-	-	-	538	523	-	782	811	-
Critical Hdwy	4.12	-	-	4.19	-	-	7.16	6.52	6.26	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.281	-	-	3.554	4.018	3.354	3.518	4.018	3.318
Pot Cap-1 Maneuver	1051	-	-	869	-	-	132	161	454	138	155	563
Stage 1	-	-	-	-	-	-	383	406	-	540	533	-
Stage 2	-	-	-	-	-	-	520	530	-	387	393	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1051	-	-	867	-	-	114	145	453	124	140	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	145	-	124	140	-
Stage 1	-	-	-	-	-	-	347	368	-	491	530	-
Stage 2	-	-	-	-	-	-	483	527	-	344	356	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	49.3	15.3
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	130	1051	-	-	867	-	-	391
HCM Lane V/C Ratio	0.388	0.055	-	-	0.005	-	-	0.108
HCM Control Delay (s)	49.3	8.6	0	-	9.2	-	-	15.3
HCM Lane LOS	E	A	A	-	A	-	-	C
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	54	511	427	7	5	33
Future Vol, veh/h	54	511	427	7	5	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	20	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	7	7	2	2
Mvmt Flow	59	555	464	8	5	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	472	0	-	0	1141	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	673	-
Critical Hdwy	4.2	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1049	-	-	-	222	595
Stage 1	-	-	-	-	630	-
Stage 2	-	-	-	-	507	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1049	-	-	-	210	595
Mov Cap-2 Maneuver	-	-	-	-	345	-
Stage 1	-	-	-	-	595	-
Stage 2	-	-	-	-	507	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1049	-	-	-	543
HCM Lane V/C Ratio	0.056	-	-	-	0.076
HCM Control Delay (s)	8.6	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	286	382	2	7	51
Future Vol, veh/h	18	286	382	2	7	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	20	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	2	2
Mvmt Flow	20	311	415	2	8	55

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	417	0	-	0	767	416
Stage 1	-	-	-	-	416	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	4.23	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.317	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1085	-	-	-	370	637
Stage 1	-	-	-	-	666	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1085	-	-	-	363	637
Mov Cap-2 Maneuver	-	-	-	-	476	-
Stage 1	-	-	-	-	654	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1085	-	-	-	612
HCM Lane V/C Ratio	0.018	-	-	-	0.103
HCM Control Delay (s)	8.4	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	262	19	41	349	1	20	2	51	1	1	15
Future Vol, veh/h	3	262	19	41	349	1	20	2	51	1	1	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	12	12	12	0	0	0	93	93	93
Mvmt Flow	4	316	23	49	420	1	24	2	61	1	1	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	421	0	0	339	0	0	864	855	328	886	866	421
Stage 1	-	-	-	-	-	-	336	336	-	519	519	-
Stage 2	-	-	-	-	-	-	528	519	-	367	347	-
Critical Hdwy	4.24	-	-	4.22	-	-	7.1	6.5	6.2	8.03	7.43	7.13
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	7.03	6.43	-
Follow-up Hdwy	2.326	-	-	2.308	-	-	3.5	4	3.3	4.337	4.837	4.137
Pot Cap-1 Maneuver	1077	-	-	1166	-	-	277	298	718	187	211	477
Stage 1	-	-	-	-	-	-	682	645	-	405	409	-
Stage 2	-	-	-	-	-	-	538	536	-	502	501	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1077	-	-	1166	-	-	256	284	718	164	201	477
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	284	-	164	201	-
Stage 1	-	-	-	-	-	-	679	642	-	403	392	-
Stage 2	-	-	-	-	-	-	494	513	-	456	499	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.9	14.5	14.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	467	1077	-	-	1166	-	-	400
HCM Lane V/C Ratio	0.188	0.003	-	-	0.042	-	-	0.051
HCM Control Delay (s)	14.5	8.4	-	-	8.2	-	-	14.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	0.2

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	443	70	129	406	1	25	1	60	1	2	3
Future Vol, veh/h	5	443	70	129	406	1	25	1	60	1	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	20	-	-	500	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	11	11	11	7	7	7	0	0	0	0	0	0
Mvmt Flow	6	521	82	152	478	1	29	1	71	1	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	479	0	0	603	0	0	1360	1357	562	1393	1398	479
Stage 1	-	-	-	-	-	-	574	574	-	783	783	-
Stage 2	-	-	-	-	-	-	786	783	-	610	615	-
Critical Hdwy	4.21	-	-	4.17	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.299	-	-	2.263	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1038	-	-	951	-	-	127	150	530	120	142	591
Stage 1	-	-	-	-	-	-	507	506	-	390	407	-
Stage 2	-	-	-	-	-	-	388	407	-	485	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1038	-	-	951	-	-	109	125	530	90	119	591
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	125	-	90	119	-
Stage 1	-	-	-	-	-	-	504	503	-	388	342	-
Stage 2	-	-	-	-	-	-	322	342	-	417	482	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2.3	29.7	25.6
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	245	1038	-	-	951	-	-	182
HCM Lane V/C Ratio	0.413	0.006	-	-	0.16	-	-	0.039
HCM Control Delay (s)	29.7	8.5	-	-	9.5	-	-	25.6
HCM Lane LOS	D	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.9	0	-	-	0.6	-	-	0.1