



## FUTURE TRANSPORTATION SYSTEM CONDITIONS

DATE: January 23, 2024

TO: Project Management Team

FROM: Anthony Gamallo, AICP | DKS Associates  
Travis Larson, PE | DKS Associates  
John Bosket, PE | DKS Associates

SUBJECT: Monmouth Transportation System Plan  
Memorandum #3: Future Transportation System Conditions

Project #24328-000

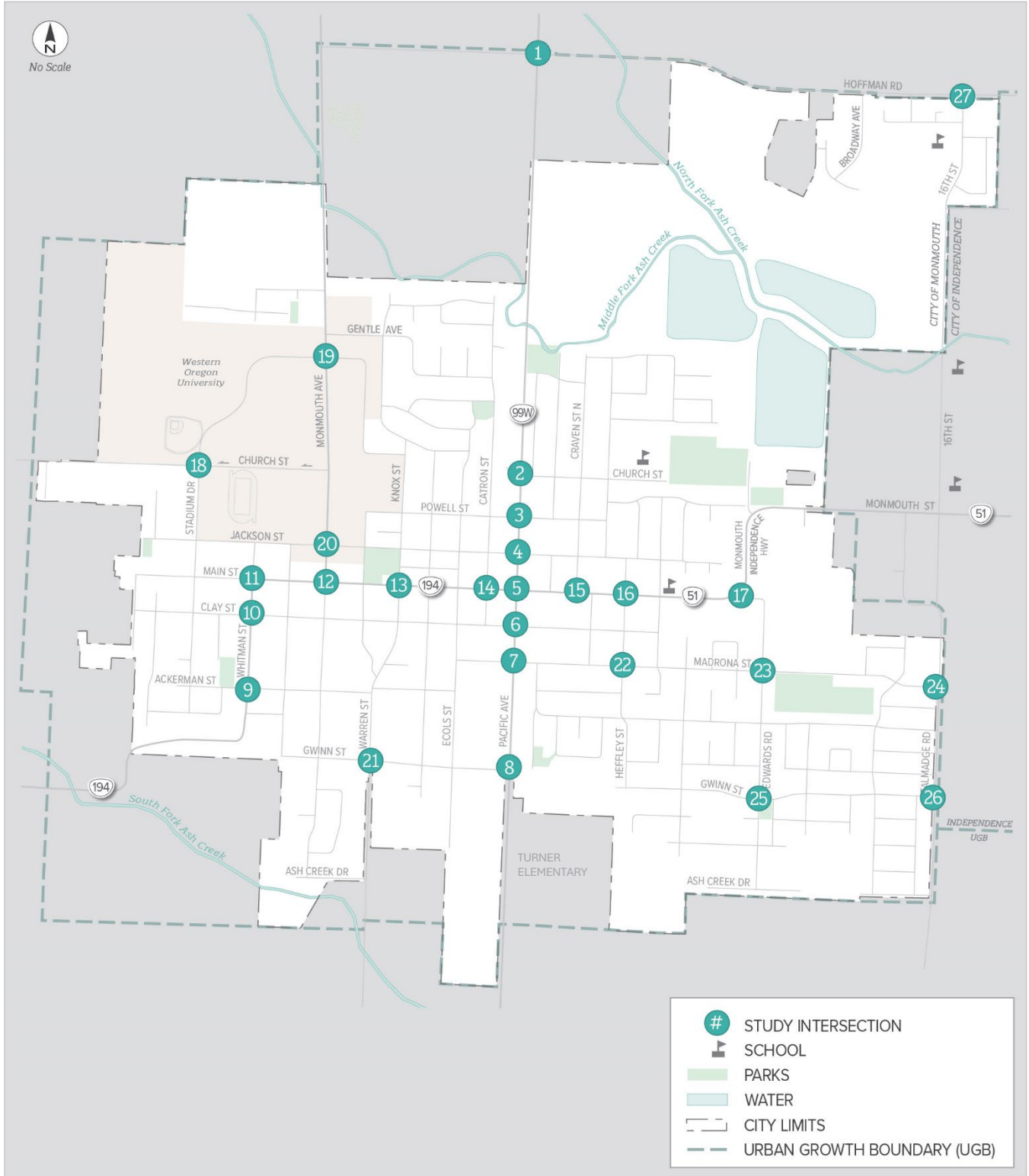
### INTRODUCTION

This memorandum provides a summary of the baseline Future 2045 transportation conditions for the City of Monmouth with a focus on the future vehicular intersection operations. This baseline scenario assumes no new improvements are made to the transportation system. Conditions related to safety, connectivity, pedestrian/bicycle specifics, and other similar considerations were presented in Memo #2: Existing Transportation System Conditions.

### STUDY INTERSECTIONS

The study area includes the entirety of the Monmouth Urban Growth Boundary (UGB), with twenty-seven study intersections identified for operational evaluation. Figure 1 provides an overview of the city and shows the location of the below study intersections.

1. OR 99W/Hoffman Road
2. OR 99W/Church Street
3. OR 99W/Powell Street
4. OR 99W/Jackson Street
5. OR 99W/Main Street
6. OR 99W/Clay Street
7. OR 99W/Madrona Street
8. OR 99W/Gwinn Street
9. Whitman Street/Ackerman Street
10. Whitman Street/Clay Street
11. Whitman Street/Main Street
12. Monmouth Avenue/Main Street
13. Knox Street/Main Street
14. Catron Street/Main Street
15. Craven Street North/Main Street
16. Heffley Street/Main Street
17. Edwards Road/Monmouth Independence Highway
18. Stadium Drive/Church Street
19. Monmouth Avenue/Stadium Drive
20. Monmouth Avenue/Jackson Street
21. Warren Street/Gwinn Street
22. Heffley Street/Madrona Street
23. Edwards Road/Madrona Street
24. Talmadge Road/Madrona Street
25. Edwards Road/Gwinn Street
26. Talmadge Road/Gwinn Street
27. 16<sup>th</sup> Street/Hoffman Road



**FIGURE 1: STUDY AREA**

## FUTURE TRAFFIC VOLUMES & TRAVEL DEMAND

This section provides documentation of growth trends in the city and resultant forecast future traffic volumes. 2045 was determined to be the appropriate horizon year for the TSP and associated operational analysis.

### TRAVEL DEMAND & GROWTH RATES

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The project team consulted statewide and regional estimates for population and traffic volume to determine appropriate traffic volume growth rates for anticipated 2045 horizon year traffic volumes in Monmouth.

#### POPULATION TRENDS

The Portland State University Population Research Center (PSU PRC) conducts population estimates and forecasts for cities and counties throughout Oregon.<sup>1</sup> As discussed in the Existing Transportation System Conditions memorandum, the historical population growth rate for the City of Monmouth has averaged around 2.18% per year, based on the 2000, 2010, and 2020 censuses, with the certified 2020 census noting a population of 11,110.<sup>2</sup> Looking at the 2045 population forecast of 16,527, an average annual growth rate (AAGR) of 1.95% between 2020 and 2045 is estimated for the city, which equates to approximately an additional average of 217 citizens added to the population of Monmouth per year over the 25-year period.

While there is typically a correlation between population growth and traffic volume growth, there are many other factors that influence how traffic volumes change over time, especially on streets and highways with regional traffic.

#### ODOT HIGHWAY GROWTH

The ODOT Future Highway Volume Table indicates minimal growth (0.5% average yearly linear growth or less) on much of OR 99W, OR 51, and OR 194 in Monmouth. However, the  $R^2$  value is low (under 0.50), which indicates relatively low confidence in the growth estimates. The only outlier for growth is the area surrounding the intersection of OR 99W and Main Street, for which a growth rate of 1.27% ( $R^2=0.73$ ) is shown just south of the intersection and a growth rate of 0.62% ( $R^2=0.50$ ) is shown just north of the intersection.

The ODOT Statewide Integrated Model (SWIM) provided much higher estimates for link volumes on certain segments of state highway. OR 99W north of Main Street had a growth rate of 1.1%, OR 99W south of Main Street had a growth rate of 0.9%, OR 51 east of OR 99W had a growth rate of 0.5%, and OR 194 west of OR 99W had a growth rate of 1.0%. No level of confidence was provided.

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<sup>1</sup> Portland State University (PSU) Population Research Center, <https://www.pdx.edu/population-research/population-forecasts>

<sup>2</sup> Table 4, 2022 Annual Report Tables, April 2023.

## **SELECTED GROWTH RATE**

The project team derived two different average yearly linear growth rates from the above sources, based on jurisdiction and context. A growth rate of 1.0% per year will be applied to all ODOT intersections, based on the ODOT sources described above. The growth rate represents a reasonable estimate for sources with lower levels of confidence but that still show minimal growth. While the population growth of the City is higher, the highways' regional influence is not expected to change significantly.

A growth rate of 1.5% per year will be applied to all non-ODOT intersections, to better align with City population growth estimates while still being based off ODOT highway estimates. On OR 194, the traffic volume shown entering and exiting the City of Monmouth via Whitman Street to the south is a small percentage of the traffic volume along the Main Street portion of OR 194, thereby showing that the volume along Main Street is predominately influenced by local traffic.

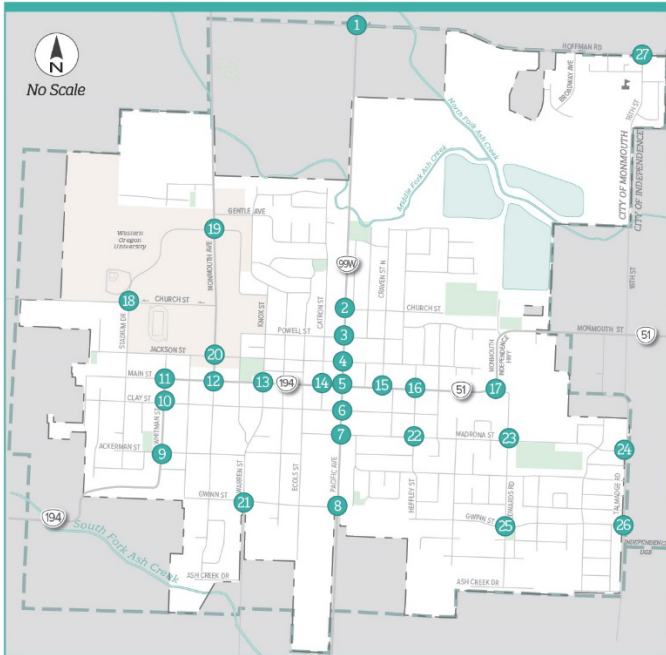
## **FUTURE TRAFFIC VOLUMES**

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Future traffic volumes were developed using the previously determined growth rates and the Existing 2023 volumes as established in the Existing Transportation System Conditions memorandum. Like for the existing conditions, volume estimates are provided for both the AM peak and PM peak periods to best represent commuter traffic within the City of Monmouth.

All vehicle movement volumes are rounded to the nearest five vehicles for each movement. All permitted public street intersection movements have a minimum value of five vehicles, and all permitted private access movements have a minimum value of one vehicle. Traffic volumes were not balanced between intersections due to the presence of driveways or other public street intersections between study intersections.

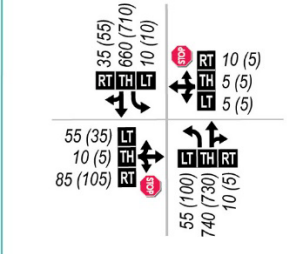
Figure 2 and Figure 3 show the Future 2045 traffic volumes.



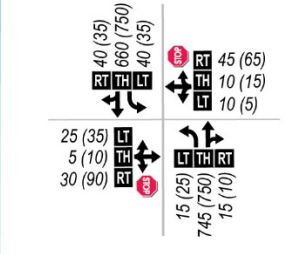
FUTURE 2045 PEAK HOUR TRAFFIC VOLUMES (cont. next page)

- # STUDY INTERSECTION (#1-14 this page)
- TRAFFIC SIGNAL
- STOP SIGN
- AM (PM) PEAK HOUR VOLUMES
- LANE CONFIGURATION
- VOLUME MOVEMENT  
Left • Thru • Right

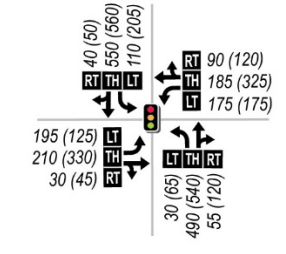
3 OR 99W @ Powell St.



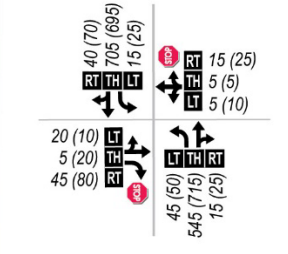
4 OR 99W @ Jackson St.



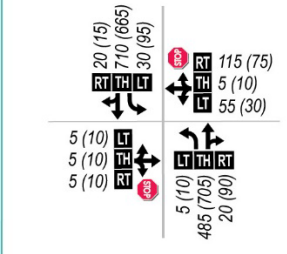
5 OR 99W @ Main St.



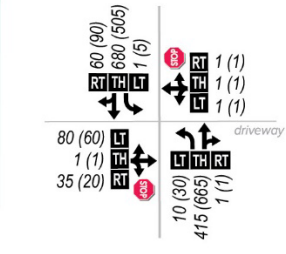
6 OR 99W @ Clay St.



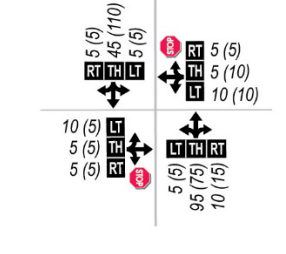
7 OR 99W @ Madrona St.



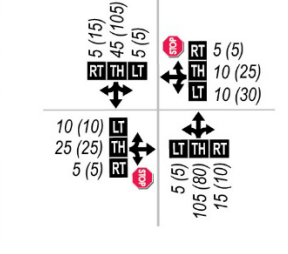
8 OR 99W @ Gwinn St.



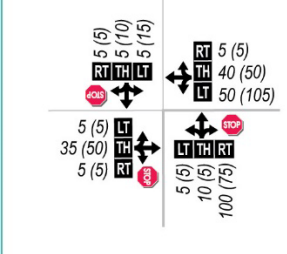
9 Whitman St. @ Ackerman St.



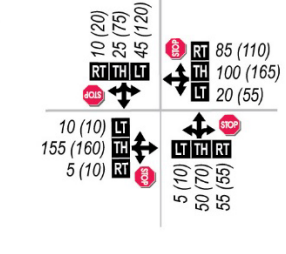
10 Whitman St. @ Clay St.



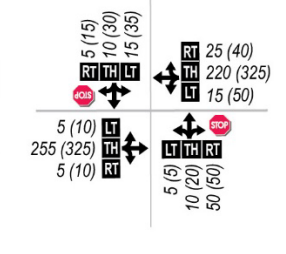
11 Whitman St. @ Main St.



12 Monmouth Ave. @ Main St.



13 Knox St. @ Main St.



14 Catron St. @ Main St.

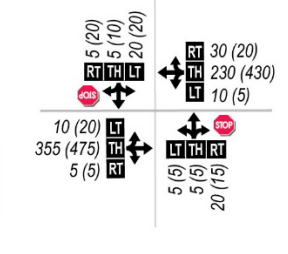


FIGURE 2: FUTURE AM AND PM PEAK HOUR VOLUMES (PART 1)

FUTURE 2045 PEAK HOUR TRAFFIC VOLUMES (cont. from previous page)

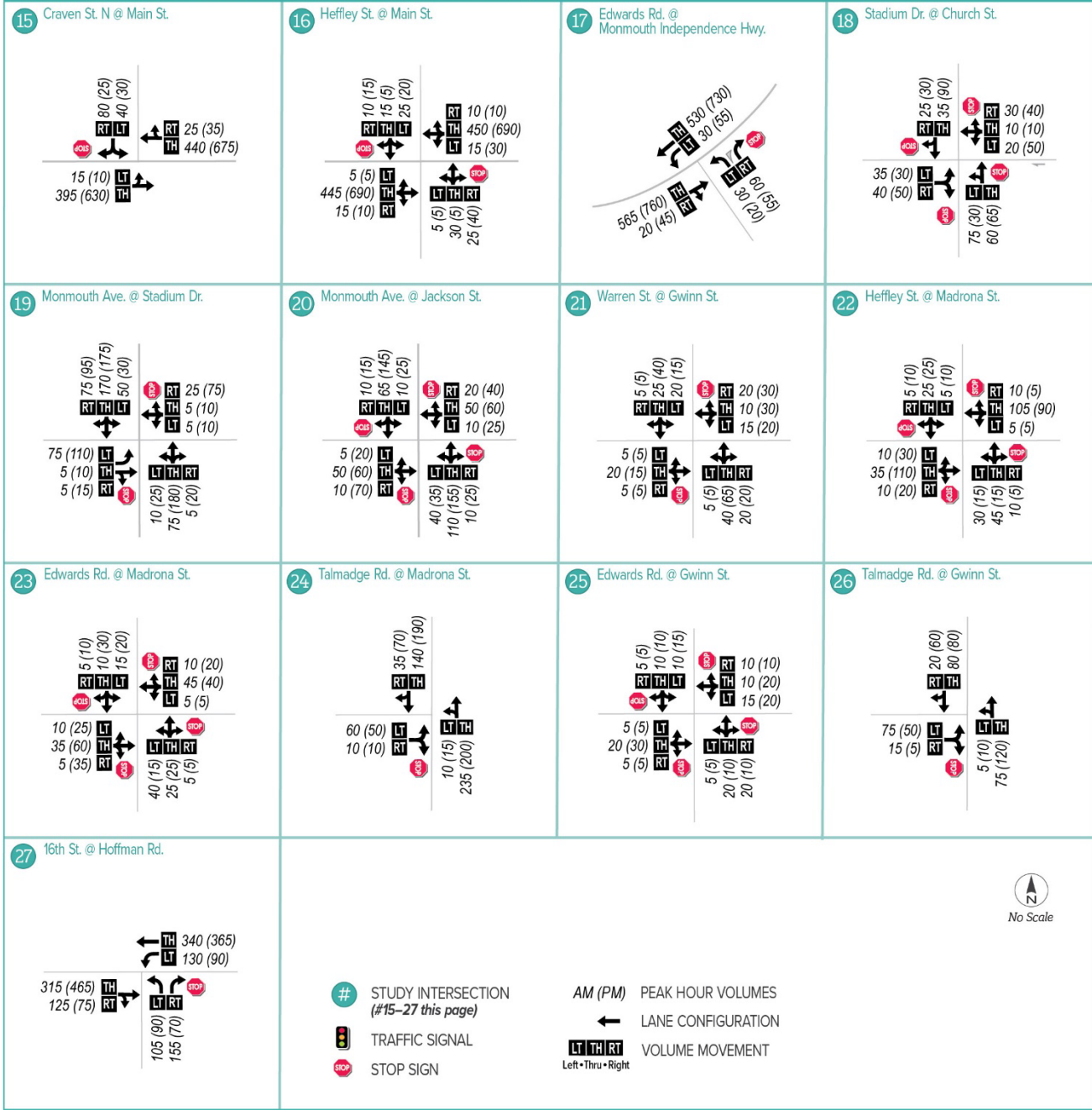


FIGURE 3: FUTURE AM AND PM PEAK HOUR VOLUMES (PART 2)

## FUTURE VEHICULAR INTERSECTION OPERATIONS

This section provides documentation of the Future 2045 vehicular intersection operations analysis at the study intersections, as well as a discussion on the results, assuming no improvements are made to the transportation system.

### FUTURE INTERSECTION OPERATIONS

Future traffic operations at the study intersections, for the weekday AM and PM peak hours, are based on the Highway Capacity Manual (HCM) 6<sup>th</sup> Edition methodology for signalized and unsignalized intersections.<sup>3</sup> Table 1 lists the calculated v/c ratio, delay, and LOS of each study intersection. Cells shaded red with bold text indicate intersections that are estimated to fail to meet mobility standards in the future scenario, while cells with yellow shading indicate intersections that will experience the heaviest congestion based on delay.

TABLE 1: FUTURE 2045 INTERSECTION OPERATIONS

INTERSECTION	MOBILITY STANDARD	AM PEAK HOUR			PM PEAK HOUR			
		V/C RATIO	DELAY (SECS)	LOS	V/C RATIO	DELAY (SECS)	LOS	
<b>TRAFFIC SIGNAL</b>								
1	OR 99W/ HOFFMAN RD	v/c ≤ 0.85	0.80	29.2	C	<b>0.88</b>	49.3	D
5	OR 99W/ MAIN ST	v/c ≤ 0.90	<b>0.91</b>	36.4	D	<b>1.11</b>	70.0	E
<b>STOP-CONTROL</b>								
2	OR 99W/ CHURCH ST	v/c ≤ 0.90	0.69 (WB)	65.4	A/F	0.47 (WB)	48.4	A/E
3	OR 99W/ POWELL ST	v/c ≤ 0.90	<b>&gt; 1.20 (EB)</b>	>120.0	A/F	<b>1.19 (EB)</b>	> 120.0	B/F
4	OR 99W/ JACKSON ST	v/c ≤ 0.90	0.61 (EB)	82.9	A/F	<b>&gt; 1.20 (EB)</b>	> 120.0	A/F
6	OR 99W/ CLAY ST	v/c ≤ 0.90	0.31 (EBL)	63.0	A/F	0.53 (EBL)	115.8	A/F
7	OR 99W/ MADRONA ST	v/c ≤ 0.90	0.88 (WB)	80.0	A/F	<b>0.99 (WB)</b>	>120.0	B/F
8	OR 99W/ GWINN ST	v/c ≤ 0.85	0.73 (EB)	67.1	A/F	0.62 (EB)	65.7	A/F
9	WHITMAN ST/ ACKERMAN ST	v/c ≤ 0.95	0.03 (WB)	10.1	A/B	0.04 (WB)	10.3	A/B
10	WHITMAN ST/ CLAY ST	v/c ≤ 0.95	0.06 (EB)	10.4	A/B	0.10 (WB)	11.0	A/B

<sup>3</sup> Highway Capacity Manual, 6<sup>th</sup> Edition, Transportation Research Board, 2016.

INTERSECTION	MOBILITY STANDARD	AM PEAK HOUR			PM PEAK HOUR		
		V/C RATIO	DELAY (SECS)	LOS	V/C RATIO	DELAY (SECS)	LOS
11 WHITMAN ST/ MAIN ST	v/c ≤ 0.95	0.14 (NB)	9.3	A/A	0.10 (NB)	9.4	A/A
12 MONMOUTH AVE/ MAIN ST	v/c ≤ 1.00	0.30 (WB)	9.2	A	0.53 (WB)	12.5	B
13 KNOX ST/ MAIN ST	v/c ≤ 1.00	0.12 (NB)	11.6	A/B	0.35 (SB)	27.4	A/D
14 CATRON ST/ MAIN ST	v/c ≤ 1.00	0.10 (SB)	16.3	A/C	0.19 (SB)	21.0	A/C
15 CRAVEN ST N/ MAIN ST	v/c ≤ 0.95	0.30 (SB)	17.1	A/C	0.34 (SB)	34.6	A/D
16 HEFFLEY ST/ MAIN ST	v/c ≤ 0.95	0.29 (SB)	31.3	A/D	0.44 (SB)	66.2	A/F
17 EDWARDS RD/ MONMOUTH INDEPENDENCE HIGHWAY	v/c ≤ 0.95	0.18 (NBL)	29.6	A/D	0.22 (NBL)	54.0	A/F
18 STADIUM DR/ CHURCH ST	LOS E	0.20 (NB)	8.0	A	0.17 (SB)	8.3	A
19 MONMOUTH AVE/ STADIUM DR	LOS E	0.20 (EBL)	15.1	A/C	0.43 (EBL)	25.8	A/D
20 MONMOUTH AVE/ JACKSON ST	LOS E	0.24 (NB)	8.4	A	0.37 (NB)	10.5	B
21 WARREN ST/ GWINN ST	v/c ≤ 0.85 LOS C	0.07 (WB)	9.7	A/A	0.12 (WB)	10.2	A/B
22 HEFFLEY ST/ MADRONA ST	LOS E	0.17 (WB)	8.0	A	0.22 (EB)	8.2	A
23 EDWARDS RD/ MADRONA ST	LOS E	0.10 (NB)	7.7	A	0.16 (EB)	7.9	A
24 TALMADGE RD/ MADRONA ST	v/c ≤ 0.85 LOS C	0.15 (EB)	12.8	A/B	0.14 (EB)	13.0	A/B
25 EDWARDS RD/ GWINN ST	LOS E	0.06 (NB)	7.2	A	0.07 (WB)	7.3	A
26 TALMADGE RD/ GWINN ST	v/c ≤ 0.85 LOS C	0.13 (EB)	10.2	A/B	0.08 (EB)	10.4	A/B
27 16 <sup>TH</sup> ST/ HOFFMAN RD	v/c ≤ 0.85 LOS C	0.60 (NBL)	46.6	<b>A/E</b>	0.48 (NBL)	38.5	<b>A/E</b>

**TRAFFIC SIGNAL:**

v/c = Total Intersection Volume-to-Capacity Ratio  
 Delay = Average Intersection Delay (secs)  
 LOS = Average Intersection Level of Service

**TWO-WAY STOP-CONTROL:**

v/c = Critical Lane Volume-to-Capacity Ratio  
 Delay = Critical Lane Approach Delay (secs)  
 LOS = Level of Service (Major/Minor Road)

**ALL-WAY STOP-CONTROL:**

v/c = Critical Lane Volume-to-Capacity Ratio  
 Delay = Average Intersection Delay (secs)  
 LOS = Average Intersection Level of Service

**Bold/Highlighted = Does not meet the mobility standard**

**Highlighted = Delay is high (LOS F), but the volume-to-capacity mobility standard is still met**



## DISCUSSION OF RESULTS & NEXT STEPS

As shown above and displayed in Figure 4 below, it is estimated that six of the study intersections will fail to meet their existing mobility standards in the Future 2045 horizon year. The majority of these intersections are located along OR 99W, as well as one non-ODOT intersection at 16<sup>th</sup> Street and Hoffman Road. There are also a few intersections that have high delays (LOS F), but still meet the applicable mobility standards.



**FIGURE 4: FUTURE 2045 INTERSECTION OPERATION DEFICIENCIES**

The five intersections on OR 99W expected to fail to meet their mobility standards include the intersecting streets of Hoffman Road, Powell Street, Jackson Street, Main Street, and Madrona Street. The OR 99W/Main Street intersection, in particular, poses challenges with being over capacity. The signalized intersection already has dedicated left turn lanes on all approaches, the surrounding area is very developed, and the intersection acts as a gateway traveling north-south and east-west through the city with no major alternative routes.



**FIGURE 5: OR 99W/MAIN STREET INTERSECTION (LOOKING NORTHEAST)**

The adjacent intersections at Powell Street and Jackson Street are anticipated to have the highest delay and capacity constraints in the future year. On OR 99W through Monmouth, there are five public street intersections spaced approximately 400 feet apart, stretching from Church Street to Madrona Street. Due to the close intersection spacing and relative parallel networks, there will likely be some level of volume balancing between intersections in the future as drivers adjust their routes to avoid congestion.

Local street connectivity in the surrounding neighborhoods contributes to the capacity constraints at the unsignalized intersections along OR 99W. For vehicles in the northwest neighborhood of the city, Powell Street provides the most direct access to OR 99W. Similarly, for vehicles in the southeast neighborhoods of the city, Madrona Street provides the most direct access. Within these neighborhoods and others, there are very few local streets providing continuous north-south or east-west connectivity, which results in all demand being funneled to just a few intersections.



**FIGURE 6: OR 99W/MADRONA STREET INTERSECTION (LOOKING WEST)**

The intersection of 16<sup>th</sup> Street and Hoffman Road, which is under the jurisdiction of Polk County, is also expected to exceed its mobility standard in the future. Polk County maintains a relatively low threshold for delay at their intersections, so while the calculated volume-to-capacity of the intersection is low, the calculated delay is still greater than the standard. If the City of Monmouth implements their own mobility standard for their city streets, the Polk County standards would still apply because (as documented in the Existing Transportation System Conditions memorandum) the County states that intersections within a UGB must meet both the County standards and the standards of the respective city, if applicable.

Future changes to mobility standards or street jurisdiction may impact the results of the intersections estimated to fail to meet the mobility standards.

Future memorandums will investigate intersection solutions, including performing traffic signal warrant analysis.

## POTENTIAL TRANSPORTATION NETWORK CHANGES

The Future 2045 operations analysis assumes no major changes to the transportation network over the next twenty years, with vehicle route choice and availability remaining the same. This means that drivers will predominately maintain their typical routes of travel and that no new major street connections will be built. This analysis is meant to show how the system would operate in the future if no improvements were made.

However, as documented in the Existing Transportation System Conditions memorandum, the City of Monmouth has significant buildable land to the north and south of the city, as well as the anticipated future connections to the City of Independence via extensions from Independence reaching Talmadge Road.



**FIGURE 7: TALMADGE ROAD/GWINN STREET INTERSECTION (LOOKING EAST)**

These two circumstances present significant changes to traffic patterns in Monmouth. If and when connections from Independence reach Monmouth, new east-west routes may divert traffic off of OR 51, decreasing volumes on the highway but increasing them on City of Monmouth Streets.

As Monmouth housing expands to the north and south, new or revised connections to the highway will be established, relieving some congestion at intersections like Powell Street or Madrona Street. The extension of Gwinn Street from Heffley Street to OR 99W will create a new route that would likely alleviate a portion of the congestion at Madrona Street.

These new street connections will be explored more in future memorandums.

## SUMMARY OF DEFICIENCIES & NEEDS

This section contains a summary of the future vehicular operating conditions for Monmouth's transportation system, highlighting any specific deficiencies.

### FUTURE TRAFFIC VOLUMES

- Future traffic volumes were developed using an average annual linear growth rate of 1.50% at ODOT intersections and 1.00% at non-ODOT intersections, as determined by assessing PSU population estimates, the ODOT Future Highway Volume Table, and the ODOT SWIM model.

### FUTURE VEHICULAR OPERATIONS

- Six study intersections are anticipated to fail to meet their applicable mobility standards in the 2045 horizon year.
  - OR 99W/Hoffman Road
  - OR 99W/Powell Street
  - OR 99W/Jackson Street
  - OR 99W/Main Street
  - OR 99W/Madrona Street
  - 16<sup>th</sup> Street/Hoffman Road

### ANTICIPATED CHANGES TO TRAFFIC PATTERNS

- Future operations analysis assumes no intersection improvements and no changes to traffic patterns, but two potential transportation network changes could create significant deviations from existing traffic patterns.
  - City growth along OR 99W on the north and south side of town
  - City of Independence expansion to Talmadge Road
- The effects of these potential network changes will be considered in future memorandums.

# APPENDIX

## CONTENTS

### APPENDIX A: HCM REPORTS

DRAFT























**APPENDIX A: HCM REPORTS**

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DRAFT

HCM 6th Signalized Intersection Summary  
1: OR 99W & Hoffman Rd























Monmouth TSP  
Future 2045 - AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	105	30	155	105	210	20	580	125	115	545	30
Future Volume (veh/h)	80	105	30	155	105	210	20	580	125	115	545	30
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	1723	1695	1627	1736	1736	1709	1750	1614	1723	1723	1614	1750
Adj Flow Rate, veh/h	89	117	21	172	117	145	22	644	76	128	606	16
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, %	2	4	9	1	1	3	0	10	2	2	10	0
Cap, veh/h	171	326	59	278	164	204	40	727	656	157	843	773
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.02	0.45	0.45	0.10	0.52	0.52
Sat Flow, veh/h	1029	1399	251	1161	705	874	1667	1614	1457	1641	1614	1480
Grp Volume(v), veh/h	89	0	138	172	0	262	22	644	76	128	606	16
Grp Sat Flow(s),veh/h/ln	1029	0	1650	1161	0	1579	1667	1614	1457	1641	1614	1480
Q Serve(g_s), s	6.6	0.0	5.7	11.9	0.0	12.4	1.1	29.8	2.5	6.2	23.4	0.4
Cycle Q Clear(g_c), s	19.0	0.0	5.7	17.6	0.0	12.4	1.1	29.8	2.5	6.2	23.4	0.4
Prop In Lane	1.00		0.15	1.00		0.55	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	171	0	384	278	0	368	40	727	656	157	843	773
V/C Ratio(X)	0.52	0.00	0.36	0.62	0.00	0.71	0.55	0.89	0.12	0.82	0.72	0.02
Avail Cap(c_a), veh/h	171	0	384	278	0	368	184	870	786	181	870	799
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	0.00	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	37.7	0.0	26.2	33.5	0.0	28.8	39.4	20.5	13.0	36.2	14.9	9.4
Incr Delay (d2), s/veh	2.2	0.0	0.4	3.7	0.0	6.0	8.4	10.2	0.1	20.6	3.1	0.0
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	1.9	0.0	2.2	3.5	0.0	5.2	0.5	12.3	0.8	3.3	8.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	0.0	26.6	37.3	0.0	34.7	47.8	30.7	13.1	56.8	18.0	9.4
LnGrp LOS	D	A	C	D	A	C	D	C	B	E	B	A
Approach Vol, veh/h		227			434			742			750	
Approach Delay, s/veh		31.8			35.7			29.4			24.4	
Approach LOS		C			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	48.6		25.0	13.8	42.8		25.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	44.0		19.0	9.0	44.0		19.0				
Max Q Clear Time (g_c+I1), s	3.1	25.4		19.6	8.2	31.8		21.0				
Green Ext Time (p_c), s	0.0	5.6		0.0	0.0	5.0		0.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				29.2								
HCM 6th LOS				C								
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												



HCM Signalized Intersection Capacity Analysis  
1: OR 99W & Hoffman Rd

Monmouth TSP  
Future 2045 - AM Peak

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	80	105	30	155	105	210	20	580	125	115	545	30	
Future Volume (vph)	80	105	30	155	105	210	20	580	125	115	545	30	
Ideal Flow (vphp)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	
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	0.97		1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1630	1610		1646	1539		1662	1591	1458	1630	1591	1454	
Flt Permitted	0.25	1.00		0.65	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	427	1610		1133	1539		1662	1591	1458	1630	1591	1454	
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)	89	117	33	172	117	233	22	644	139	128	606	33	
RTOR Reduction (vph)	0	11	0	0	79	0	0	0	57	0	0	15	
Lane Group Flow (vph)	89	139	0	172	271	0	22	644	82	128	606	18	
Confl. Peds. (#/hr)							2					2	
Heavy Vehicles (%)	2%	4%	9%	1%	1%	3%	0%	10%	2%	2%	10%	0%	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		8			4		1	6		5	2		
Permitted Phases	8			4					6			2	
Actuated Green, G (s)	19.2	19.2		19.2	19.2		2.8	41.8	41.8	8.7	47.7	47.7	
Effective Green, g (s)	19.2	19.2		19.2	19.2		2.8	41.8	41.8	8.7	47.7	47.7	
Actuated g/C Ratio	0.22	0.22		0.22	0.22		0.03	0.48	0.48	0.10	0.54	0.54	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.0	4.0	2.5	4.0	4.0	
Lane Grp Cap (vph)	93	352		248	336		53	758	694	161	865	790	
v/s Ratio Prot		0.09			0.18		0.01	c0.40		c0.08	c0.38		
v/s Ratio Perm	c0.21			0.15					0.06			0.01	
v/c Ratio	0.96	0.40		0.69	0.81		0.42	0.85	0.12	0.80	0.70	0.02	
Uniform Delay, d1	33.8	29.3		31.5	32.5		41.6	20.2	12.7	38.6	14.7	9.2	
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	78.4	0.5		7.5	12.9		3.8	9.2	0.1	22.5	2.8	0.0	
Delay (s)	112.3	29.8		39.0	45.4		45.4	29.4	12.8	61.1	17.5	9.3	
Level of Service	F	C		D	D		D	C	B	E	B	A	
Approach Delay (s)		60.5			43.3			26.9			24.4		
Approach LOS		E			D			C			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			33.2									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.88										
Actuated Cycle Length (s)			87.7									Sum of lost time (s)	18.0
Intersection Capacity Utilization			85.1%									ICU Level of Service	E
Analysis Period (min)			15										
c Critical Lane Group													

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	1	1	1	30	1	70	1	675	110	40	685	1
Future Vol, veh/h	1	1	1	30	1	70	1	675	110	40	685	1
Conflicting Peds, #/hr	0	0	0	0	0	0	6	0	0	0	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	2	0	8	0	0	9	0
Mvmt Flow	1	1	1	33	1	78	1	750	122	44	761	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1709	1730	768	1664	1669	811	768	0	0	872	0	0
Stage 1	856	856	-	813	813	-	-	-	-	-	-	-
Stage 2	853	874	-	851	856	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.22	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	73	89	405	78	97	379	855	-	-	782	-	-
Stage 1	355	377	-	375	395	-	-	-	-	-	-	-
Stage 2	357	370	-	358	377	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	53	80	403	71	87	379	850	-	-	782	-	-
Mov Cap-2 Maneuver	53	80	-	71	87	-	-	-	-	-	-	-
Stage 1	353	338	-	375	395	-	-	-	-	-	-	-
Stage 2	283	370	-	321	338	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	47	65.4	0	0.5
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	850	-	-	89	163	782	-	-
HCM Lane V/C Ratio	0.001	-	-	0.037	0.688	0.057	-	-
HCM Control Delay (s)	9.2	-	-	47	65.4	9.9	0	-
HCM Lane LOS	A	-	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	4	0.2	-	-

Intersection												
Int Delay, s/veh	26.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Vol, veh/h	55	10	85	5	5	10	55	740	10	10	660	35
Future Vol, veh/h	55	10	85	5	5	10	55	740	10	10	660	35
Conflicting Peds, #/hr	3	0	0	0	0	3	1	0	1	1	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	3	0	0	0	2	8	0	11	9	0
Mvmt Flow	61	11	94	6	6	11	61	822	11	11	733	39

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1737	1732	754	1778	1746	832	773	0	0	834	0	0
Stage 1	776	776	-	951	951	-	-	-	-	-	-	-
Stage 2	961	956	-	827	795	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.23	7.1	6.5	6.2	4.12	-	-	4.21	-	-
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	3.5	4	3.327	3.5	4	3.3	2.218	-	-	2.299	-	-
Pot Cap-1 Maneuver	69	89	407	65	87	372	842	-	-	762	-	-
Stage 1	393	410	-	315	341	-	-	-	-	-	-	-
Stage 2	311	339	-	369	402	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 59	81	407	42	79	371	841	-	-	761	-	-
Mov Cap-2 Maneuver	~ 59	81	-	42	79	-	-	-	-	-	-	-
Stage 1	364	404	-	292	316	-	-	-	-	-	-	-
Stage 2	274	314	-	272	396	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	290.3		53.4		0.7		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	841	-	-	119	96	761	-	-
HCM Lane V/C Ratio	0.073	-	-	1.401	0.231	0.015	-	-
HCM Control Delay (s)	9.6	-	-	290.3	53.4	9.8	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	11.4	0.8	0	-	-

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

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	25	5	30	10	10	45	15	745	15	40	660	40
Future Vol, veh/h	25	5	30	10	10	45	15	745	15	40	660	40
Conflicting Peds, #/hr	0	0	1	1	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	4	0	14	3	8	8	0	0	9	3
Mvmt Flow	27	5	32	11	11	48	16	801	16	43	710	43

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1690	1668	734	1678	1681	809	754	0	0	817	0	0
Stage 1	819	819	-	841	841	-	-	-	-	-	-	-
Stage 2	871	849	-	837	840	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.24	7.1	6.64	6.23	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.336	3.5	4.126	3.327	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	75	97	417	76	89	379	830	-	-	820	-	-
Stage 1	372	392	-	362	364	-	-	-	-	-	-	-
Stage 2	349	380	-	364	364	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	56	90	416	63	83	379	829	-	-	820	-	-
Mov Cap-2 Maneuver	56	90	-	63	83	-	-	-	-	-	-	-
Stage 1	365	371	-	355	357	-	-	-	-	-	-	-
Stage 2	290	373	-	313	345	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	82.9		42.7		0.2		0.5	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	829	-	-	105	163	820	-	-
HCM Lane V/C Ratio	0.019	-	-	0.614	0.429	0.052	-	-
HCM Control Delay (s)	9.4	-	-	82.9	42.7	9.6	-	-
HCM Lane LOS	A	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3	1.9	0.2	-	-

HCM 6th Signalized Intersection Summary  
5: OR 99W & Main St

Monmouth TSP  
Future 2045 - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	210	30	175	185	90	30	490	55	110	550	40
Future Volume (veh/h)	195	210	30	175	185	90	30	490	55	110	550	40
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		0.98	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	1723	1695	1627	1695	1668	1709	1641	1600	1627	1709	1614	1750
Adj Flow Rate, veh/h	205	221	26	184	195	75	32	516	54	116	579	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	4	9	4	6	3	8	11	9	3	10	0
Cap, veh/h	319	309	36	338	228	88	180	562	59	227	636	44
Arrive On Green	0.12	0.21	0.21	0.11	0.20	0.20	0.03	0.40	0.40	0.06	0.43	0.43
Sat Flow, veh/h	1641	1487	175	1615	1144	440	1563	1420	149	1628	1492	103
Grp Volume(v), veh/h	205	0	247	184	0	270	32	0	570	116	0	619
Grp Sat Flow(s),veh/h/ln	1641	0	1662	1615	0	1584	1563	0	1569	1628	0	1595
Q Serve(g_s), s	8.1	0.0	11.5	7.4	0.0	13.7	1.0	0.0	28.6	3.5	0.0	30.2
Cycle Q Clear(g_c), s	8.1	0.0	11.5	7.4	0.0	13.7	1.0	0.0	28.6	3.5	0.0	30.2
Prop In Lane	1.00		0.11	1.00		0.28	1.00		0.09	1.00		0.06
Lane Grp Cap(c), veh/h	319	0	345	338	0	315	180	0	621	227	0	680
V/C Ratio(X)	0.64	0.00	0.72	0.54	0.00	0.86	0.18	0.00	0.92	0.51	0.00	0.91
Avail Cap(c_a), veh/h	329	0	410	362	0	391	329	0	661	332	0	680
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.4	0.0	30.6	23.1	0.0	32.1	18.7	0.0	23.8	18.9	0.0	22.3
Incr Delay (d2), s/veh	3.0	0.0	3.4	0.6	0.0	12.4	0.3	0.0	18.4	1.3	0.0	17.1
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	3.3	0.0	4.8	2.8	0.0	6.2	0.4	0.0	13.1	1.3	0.0	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.4	0.0	34.0	23.7	0.0	44.5	19.1	0.0	42.2	20.2	0.0	39.4
LnGrp LOS	C	A	C	C	A	D	B	A	D	C	A	D
Approach Vol, veh/h		452			454			602			735	
Approach Delay, s/veh		30.6			36.1			41.0			36.4	
Approach LOS		C			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.1	40.4	14.5	21.0	9.7	37.9	13.8	21.7				
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5				
Max Green Setting (Gmax), s	10.5	35.0	10.5	20.5	10.5	35.0	10.5	20.5				
Max Q Clear Time (g_c+I1), s	3.0	32.2	10.1	15.7	5.5	30.6	9.4	13.5				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.5	0.1	2.2	0.0	0.5				

Intersection Summary

HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

# HCM Signalized Intersection Capacity Analysis

## 5: OR 99W & Main St

Monmouth TSP  
Future 2045 - AM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	210	30	175	185	90	30	490	55	110	550	40
Future Volume (vph)	195	210	30	175	185	90	30	490	55	110	550	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.95		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1629	1635		1596	1572		1539	1551		1614	1582	
Flt Permitted	0.28	1.00		0.37	1.00		0.22	1.00		0.18	1.00	
Satd. Flow (perm)	481	1635		620	1572		349	1551		314	1582	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	205	221	32	184	195	95	32	516	58	116	579	42
RTOR Reduction (vph)	0	6	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	205	247	0	184	271	0	32	570	0	116	619	0
Confl. Peds. (#/hr)	2		4	4		2	1		1	1		1
Confl. Bikes (#/hr)									4			
Heavy Vehicles (%)	2%	4%	9%	4%	6%	3%	8%	11%	9%	3%	10%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	28.2	18.3		27.8	18.1		40.1	36.4		46.7	39.7	
Effective Green, g (s)	28.2	18.3		27.8	18.1		40.1	36.4		46.7	39.7	
Actuated g/C Ratio	0.31	0.20		0.31	0.20		0.45	0.40		0.52	0.44	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)	277	332		297	316		204	627		264	698	
v/s Ratio Prot	c0.08	0.15		0.07	c0.17		0.01	0.37		c0.03	c0.39	
v/s Ratio Perm	0.15			0.12			0.06			0.19		
v/c Ratio	0.74	0.75		0.62	0.86		0.16	0.91		0.44	0.89	
Uniform Delay, d1	24.9	33.6		24.6	34.7		16.0	25.2		14.8	23.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.9	7.7		2.7	19.2		0.3	17.9		0.9	13.9	
Delay (s)	33.8	41.3		27.3	53.9		16.3	43.1		15.6	36.9	
Level of Service	C	D		C	D		B	D		B	D	
Approach Delay (s)		38.0			43.5			41.7			33.6	
Approach LOS		D			D			D			C	

### Intersection Summary

HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↖	↗		↖	↗	
Traffic Vol, veh/h	20	5	45	5	5	15	45	545	15	15	705	40
Future Vol, veh/h	20	5	45	5	5	15	45	545	15	15	705	40
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	3	3	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	120	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	6	0	11	25	0	0	0	12	27	8	8	15
Mvmt Flow	22	5	48	5	5	16	48	586	16	16	758	43

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1514	1514	781	1531	1527	597	802	0	0	605	0	0
Stage 1	813	813	-	693	693	-	-	-	-	-	-	-
Stage 2	701	701	-	838	834	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.31	7.35	6.5	6.2	4.1	-	-	4.18	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.35	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.399	3.725	4	3.3	2.2	-	-	2.272	-	-
Pot Cap-1 Maneuver	96	121	381	85	119	507	830	-	-	944	-	-
Stage 1	367	395	-	399	448	-	-	-	-	-	-	-
Stage 2	423	444	-	330	386	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	84	112	381	67	110	506	829	-	-	941	-	-
Mov Cap-2 Maneuver	84	112	-	67	110	-	-	-	-	-	-	-
Stage 1	345	388	-	375	421	-	-	-	-	-	-	-
Stage 2	381	417	-	279	379	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	32.7		30.6		0.7		0.2	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	829	-	-	88	381	167	941	-	-
HCM Lane V/C Ratio	0.058	-	-	0.305	0.127	0.161	0.017	-	-
HCM Control Delay (s)	9.6	-	-	63	15.8	30.6	8.9	-	-
HCM Lane LOS	A	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.1	0.4	0.6	0.1	-	-

Intersection												
Int Delay, s/veh	10.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	5	5	5	55	5	115	5	485	20	30	710	20
Future Vol, veh/h	5	5	5	55	5	115	5	485	20	30	710	20
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	0	0	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	5	0	6	0	12	7	5	8	29
Mvmt Flow	6	6	6	61	6	128	6	539	22	33	789	22

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1498	1442	803	1434	1442	550	814	0	0	561	0	0
Stage 1	869	869	-	562	562	-	-	-	-	-	-	-
Stage 2	629	573	-	872	880	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.5	6.26	4.1	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4	3.354	2.2	-	-	2.245	-	-
Pot Cap-1 Maneuver	102	134	387	110	134	527	822	-	-	995	-	-
Stage 1	349	372	-	506	513	-	-	-	-	-	-	-
Stage 2	474	507	-	341	368	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	72	128	386	102	128	527	820	-	-	995	-	-
Mov Cap-2 Maneuver	72	128	-	102	128	-	-	-	-	-	-	-
Stage 1	346	359	-	502	509	-	-	-	-	-	-	-
Stage 2	353	503	-	320	355	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	38.8		80		0.1		0.3	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	820	-	-	123	220	995	-	-
HCM Lane V/C Ratio	0.007	-	-	0.136	0.884	0.034	-	-
HCM Control Delay (s)	9.4	-	-	38.8	80	8.7	-	-
HCM Lane LOS	A	-	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	7.1	0.1	-	-



Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	80	1	35	1	1	1	10	415	1	1	680	60
Future Vol, veh/h	80	1	35	1	1	1	10	415	1	1	680	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0	11	14	0	0	7	10
Mvmt Flow	89	1	39	1	1	1	11	461	1	1	756	67

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1277	1276	790	1296	1309	462	823	0	0	462	0	0
Stage 1	792	792	-	484	484	-	-	-	-	-	-	-
Stage 2	485	484	-	812	825	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.21	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.299	-	-	2.2	-	-
Pot Cap-1 Maneuver	145	168	393	140	161	604	769	-	-	1110	-	-
Stage 1	385	404	-	568	555	-	-	-	-	-	-	-
Stage 2	567	555	-	376	390	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	142	165	393	124	159	604	769	-	-	1110	-	-
Mov Cap-2 Maneuver	142	165	-	124	159	-	-	-	-	-	-	-
Stage 1	380	404	-	560	547	-	-	-	-	-	-	-
Stage 2	557	547	-	338	390	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	67.1		24.6		0.2		0	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	769	-	-	176	187	1110	-	-
HCM Lane V/C Ratio	0.014	-	-	0.732	0.018	0.001	-	-
HCM Control Delay (s)	9.8	-	-	67.1	24.6	8.2	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0.1	0	-	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	5	5	10	5	5	5	95	10	5	45	5
Future Vol, veh/h	10	5	5	10	5	5	5	95	10	5	45	5
Conflicting Peds, #/hr	1	0	2	2	0	1	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	22	20	0	0	0	0	50	6	25
Mvmt Flow	11	6	6	11	6	6	6	108	11	6	51	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	199	200	56	203	198	118	57	0	0	122	0	0
Stage 1	66	66	-	129	129	-	-	-	-	-	-	-
Stage 2	133	134	-	74	69	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.32	6.7	6.2	4.1	-	-	4.6	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.32	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.32	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.698	4.18	3.3	2.2	-	-	2.65	-	-
Pot Cap-1 Maneuver	764	699	1016	714	667	939	1560	-	-	1215	-	-
Stage 1	950	844	-	829	756	-	-	-	-	-	-	-
Stage 2	875	789	-	888	803	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	749	691	1014	698	659	935	1560	-	-	1212	-	-
Mov Cap-2 Maneuver	749	691	-	698	659	-	-	-	-	-	-	-
Stage 1	946	840	-	823	751	-	-	-	-	-	-	-
Stage 2	859	783	-	871	799	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	9.7		10.1		0.3		0.7	
HCM LOS	A		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	784	734	1212	-	-
HCM Lane V/C Ratio	0.004	-	-	0.029	0.031	0.005	-	-
HCM Control Delay (s)	7.3	0	-	9.7	10.1	8	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	25	5	10	10	5	5	105	15	5	45	5
Future Vol, veh/h	10	25	5	10	10	5	5	105	15	5	45	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	6	0	12	0	0	0	0	0	0	9	0
Mvmt Flow	11	28	6	11	11	6	6	119	17	6	51	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	216	215	54	224	210	131	57	0	0	137	0	0
Stage 1	66	66	-	141	141	-	-	-	-	-	-	-
Stage 2	150	149	-	83	69	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.56	6.2	7.22	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.56	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.56	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.054	3.3	3.608	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	745	676	1019	711	691	924	1560	-	-	1459	-	-
Stage 1	950	832	-	839	784	-	-	-	-	-	-	-
Stage 2	857	766	-	901	841	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	725	670	1019	679	685	921	1560	-	-	1458	-	-
Mov Cap-2 Maneuver	725	670	-	679	685	-	-	-	-	-	-	-
Stage 1	946	829	-	835	780	-	-	-	-	-	-	-
Stage 2	834	762	-	862	838	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.4		10.2		0.3		0.7	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	714	719	1458	-	-
HCM Lane V/C Ratio	0.004	-	-	0.064	0.04	0.004	-	-
HCM Control Delay (s)	7.3	0	-	10.4	10.2	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	35	5	50	40	5	5	10	100	5	5	5
Future Vol, veh/h	5	35	5	50	40	5	5	10	100	5	5	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	15	0	0	0	0	0	0	33	0
Mvmt Flow	6	40	6	57	45	6	6	11	114	6	6	6

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	51	0	0	46	0	0	223	220	43	280	220	48
Stage 1	-	-	-	-	-	-	55	55	-	162	162	-
Stage 2	-	-	-	-	-	-	168	165	-	118	58	-
Critical Hdwy	4.1	-	-	4.25	-	-	7.1	6.5	6.2	7.1	6.83	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.83	-
Follow-up Hdwy	2.2	-	-	2.335	-	-	3.5	4	3.3	3.5	4.297	3.3
Pot Cap-1 Maneuver	1568	-	-	1482	-	-	737	682	1033	676	628	1027
Stage 1	-	-	-	-	-	-	962	853	-	845	709	-
Stage 2	-	-	-	-	-	-	839	766	-	891	789	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1568	-	-	1482	-	-	703	652	1033	574	600	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	703	652	-	574	600	-
Stage 1	-	-	-	-	-	-	958	850	-	842	681	-
Stage 2	-	-	-	-	-	-	794	735	-	779	786	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	4	9.3	10.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	964	1568	-	-	1482	-	-	685
HCM Lane V/C Ratio	0.136	0.004	-	-	0.038	-	-	0.025
HCM Control Delay (s)	9.3	7.3	0	-	7.5	0	-	10.4
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.1

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	155	5	20	100	85	5	50	55	45	25	10
Future Vol, veh/h	10	155	5	20	100	85	5	50	55	45	25	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	2	0	7	8	6	0	5	0	3	10	0
Mvmt Flow	11	176	6	23	114	97	6	57	63	51	28	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.3	9.5	8.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	6%	10%	56%
Vol Thru, %	45%	91%	49%	31%
Vol Right, %	50%	3%	41%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	170	205	80
LT Vol	5	10	20	45
Through Vol	50	155	100	25
RT Vol	55	5	85	10
Lane Flow Rate	125	193	233	91
Geometry Grp	1	1	1	1
Degree of Util (X)	0.164	0.252	0.294	0.13
Departure Headway (Hd)	4.712	4.691	4.547	5.13
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	756	761	787	695
Service Time	2.773	2.744	2.598	3.196
HCM Lane V/C Ratio	0.165	0.254	0.296	0.131
HCM Control Delay	8.7	9.3	9.5	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	1	1.2	0.4

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	5	255	5	15	220	25	5	10	50	15	10	5
Future Vol, veh/h	5	255	5	15	220	25	5	10	50	15	10	5
Conflicting Peds, #/hr	6	0	3	3	0	6	2	0	1	1	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	2	0	9	6	0	0	0	3	10	0	0
Mvmt Flow	6	283	6	17	244	28	6	11	56	17	11	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	278	0	0	292	0	0	604	613	290	631	602	266
Stage 1	-	-	-	-	-	-	301	301	-	298	298	-
Stage 2	-	-	-	-	-	-	303	312	-	333	304	-
Critical Hdwy	4.1	-	-	4.19	-	-	7.1	6.5	6.23	7.2	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.2	5.5	-
Follow-up Hdwy	2.2	-	-	2.281	-	-	3.5	4	3.327	3.59	4	3.3
Pot Cap-1 Maneuver	1296	-	-	1231	-	-	413	410	747	382	416	778
Stage 1	-	-	-	-	-	-	712	669	-	694	671	-
Stage 2	-	-	-	-	-	-	711	661	-	664	667	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1289	-	-	1227	-	-	393	397	744	338	403	772
Mov Cap-2 Maneuver	-	-	-	-	-	-	393	397	-	338	403	-
Stage 1	-	-	-	-	-	-	706	663	-	686	656	-
Stage 2	-	-	-	-	-	-	682	646	-	600	661	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.5			11.6			14.9		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	618	1289	-	-	1227	-	-	396
HCM Lane V/C Ratio	0.117	0.004	-	-	0.014	-	-	0.084
HCM Control Delay (s)	11.6	7.8	0	-	8	0	-	14.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.3

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	355	5	10	230	30	5	5	20	20	5	5
Future Vol, veh/h	10	355	5	10	230	30	5	5	20	20	5	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	4	0	17	8	0	0	0	6	0	0	0
Mvmt Flow	11	403	6	11	261	34	6	6	23	23	6	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	295	0	0	411	0	0	736	747	408	743	733	278
Stage 1	-	-	-	-	-	-	430	430	-	300	300	-
Stage 2	-	-	-	-	-	-	306	317	-	443	433	-
Critical Hdwy	4.1	-	-	4.27	-	-	7.1	6.5	6.26	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	2.2	-	-	2.353	-	-	3.5	4	3.354	3.5	4	3.3
Pot Cap-1 Maneuver	1278	-	-	1072	-	-	337	344	635	334	350	766
Stage 1	-	-	-	-	-	-	607	587	-	713	669	-
Stage 2	-	-	-	-	-	-	708	658	-	598	585	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1278	-	-	1070	-	-	324	335	634	312	341	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	324	335	-	312	341	-
Stage 1	-	-	-	-	-	-	599	579	-	705	661	-
Stage 2	-	-	-	-	-	-	688	650	-	565	577	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.3			13			16.3		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	485	1278	-	-	1070	-	-	352
HCM Lane V/C Ratio	0.07	0.009	-	-	0.011	-	-	0.097
HCM Control Delay (s)	13	7.8	0	-	8.4	0	-	16.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.3

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	15	395	440	25	40	80
Future Vol, veh/h	15	395	440	25	40	80
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	4	4	0	3	5
Mvmt Flow	16	425	473	27	43	86

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	502	0	-	0	946 489
Stage 1	-	-	-	-	489 -
Stage 2	-	-	-	-	457 -
Critical Hdwy	4.1	-	-	-	6.43 6.25
Critical Hdwy Stg 1	-	-	-	-	5.43 -
Critical Hdwy Stg 2	-	-	-	-	5.43 -
Follow-up Hdwy	2.2	-	-	-	3.527 3.345
Pot Cap-1 Maneuver	1073	-	-	-	289 573
Stage 1	-	-	-	-	614 -
Stage 2	-	-	-	-	636 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1071	-	-	-	282 572
Mov Cap-2 Maneuver	-	-	-	-	282 -
Stage 1	-	-	-	-	600 -
Stage 2	-	-	-	-	635 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1071	-	-	-	426
HCM Lane V/C Ratio	0.015	-	-	-	0.303
HCM Control Delay (s)	8.4	0	-	-	17.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	1.3



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	5	445	15	15	450	10	5	30	25	25	15	10
Future Vol, veh/h	5	445	15	15	450	10	5	30	25	25	15	10
Conflicting Peds, #/hr	1	0	1	1	0	1	12	0	0	0	0	12
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	3	30	8	3	0	0	0	0	5	0	25
Mvmt Flow	6	506	17	17	511	11	6	34	28	28	17	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	523	0	0	524	0	0	1105	1085	516	1110	1088	530
Stage 1	-	-	-	-	-	-	528	528	-	552	552	-
Stage 2	-	-	-	-	-	-	577	557	-	558	536	-
Critical Hdwy	4.1	-	-	4.18	-	-	7.1	6.5	6.2	7.15	6.5	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.15	5.5	-
Follow-up Hdwy	2.2	-	-	2.272	-	-	3.5	4	3.3	3.545	4	3.525
Pot Cap-1 Maneuver	1054	-	-	1013	-	-	190	218	563	184	218	506
Stage 1	-	-	-	-	-	-	538	531	-	513	518	-
Stage 2	-	-	-	-	-	-	506	515	-	509	527	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1053	-	-	1012	-	-	168	211	562	149	211	500
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	211	-	149	211	-
Stage 1	-	-	-	-	-	-	533	526	-	508	505	-
Stage 2	-	-	-	-	-	-	461	502	-	448	522	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.3			22.2			31.3		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	277	1053	-	-	1012	-	-	193
HCM Lane V/C Ratio	0.246	0.005	-	-	0.017	-	-	0.294
HCM Control Delay (s)	22.2	8.4	0	-	8.6	0	-	31.3
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	1.2

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	565	20	30	530	30	60
Future Vol, veh/h	565	20	30	530	30	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	7	0	5	0	4
Mvmt Flow	621	22	33	582	33	66

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	643	0	1280	632
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	648	-
Critical Hdwy	-	-	4.1	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	951	-	185	477
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	524	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	951	-	179	477
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	506	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	19.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	179	477	-	-	951	-
HCM Lane V/C Ratio	0.184	0.138	-	-	0.035	-
HCM Control Delay (s)	29.6	13.8	-	-	8.9	-
HCM Lane LOS	D	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	0.5	-	-	0.1	-

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	35	0	40	20	10	30	75	60	0	0	35	25
Future Vol, veh/h	35	0	40	20	10	30	75	60	0	0	35	25
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	5	0	0	4	11
Mvmt Flow	41	0	47	24	12	35	88	71	0	0	41	29
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.7	8.5	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	56%	47%	33%	0%
Vol Thru, %	44%	0%	17%	58%
Vol Right, %	0%	53%	50%	42%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	75	60	60
LT Vol	75	35	20	0
Through Vol	60	0	10	35
RT Vol	0	40	30	25
Lane Flow Rate	159	88	71	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0.196	0.105	0.084	0.083
Departure Headway (Hd)	4.453	4.275	4.287	4.245
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	812	841	838	846
Service Time	2.453	2.289	2.303	2.262
HCM Lane V/C Ratio	0.196	0.105	0.085	0.084
HCM Control Delay	8.5	7.8	7.7	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.4	0.3	0.3

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	5	5	5	5	25	10	75	5	50	170	75
Future Vol, veh/h	75	5	5	5	5	25	10	75	5	50	170	75
Conflicting Peds, #/hr	1	0	26	26	0	1	3	0	6	6	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	-
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, %	0	20	0	0	0	0	14	8	0	5	3	2
Mvmt Flow	88	6	6	6	6	29	12	88	6	59	200	88

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	499	489	273	515	530	98	291	0	0	100	0	0
Stage 1	365	365	-	121	121	-	-	-	-	-	-	-
Stage 2	134	124	-	394	409	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.7	6.2	7.1	6.5	6.2	4.24	-	-	4.15	-	-
Critical Hdwy Stg 1	6.1	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.7	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.18	3.3	3.5	4	3.3	2.326	-	-	2.245	-	-
Pot Cap-1 Maneuver	485	454	771	474	457	963	1205	-	-	1474	-	-
Stage 1	658	593	-	888	800	-	-	-	-	-	-	-
Stage 2	874	760	-	635	600	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	443	424	750	431	426	957	1202	-	-	1466	-	-
Mov Cap-2 Maneuver	443	424	-	431	426	-	-	-	-	-	-	-
Stage 1	649	563	-	873	786	-	-	-	-	-	-	-
Stage 2	831	747	-	579	569	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	14.7		10.4		0.9		1.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1202	-	-	443	542	708	1466	-	-
HCM Lane V/C Ratio	0.01	-	-	0.199	0.022	0.058	0.04	-	-
HCM Control Delay (s)	8	0	-	15.1	11.8	10.4	7.6	0	-
HCM Lane LOS	A	A	-	C	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0.2	0.1	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	50	10	10	50	20	40	110	10	10	65	10
Future Vol, veh/h	5	50	10	10	50	20	40	110	10	10	65	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	3	0	6	6	0	0	8	0
Mvmt Flow	6	59	12	12	59	24	47	129	12	12	76	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8.2	8.9	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	8%	12%	12%
Vol Thru, %	69%	77%	62%	76%
Vol Right, %	6%	15%	25%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	160	65	80	85
LT Vol	40	5	10	10
Through Vol	110	50	50	65
RT Vol	10	10	20	10
Lane Flow Rate	188	76	94	100
Geometry Grp	1	1	1	1
Degree of Util (X)	0.236	0.098	0.118	0.124
Departure Headway (Hd)	4.522	4.6	4.531	4.463
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	794	779	791	803
Service Time	2.547	2.628	2.559	2.489
HCM Lane V/C Ratio	0.237	0.098	0.119	0.125
HCM Control Delay	8.9	8.1	8.2	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	0.4	0.4

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	20	5	15	10	20	5	40	20	20	25	5
Future Vol, veh/h	5	20	5	15	10	20	5	40	20	20	25	5
Conflicting Peds, #/hr	0	0	1	1	0	0	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	8	0	25	0	14	7	0	11	25
Mvmt Flow	6	24	6	18	12	24	6	47	24	24	29	6

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	171	167	35	169	158	61	37	0	0	73	0	0
Stage 1	82	82	-	73	73	-	-	-	-	-	-	-
Stage 2	89	85	-	96	85	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.18	6.5	6.45	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.18	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.18	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.572	4	3.525	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	797	729	1044	781	738	943	1587	-	-	1540	-	-
Stage 1	931	831	-	922	838	-	-	-	-	-	-	-
Stage 2	923	828	-	896	828	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	754	712	1041	744	720	941	1584	-	-	1537	-	-
Mov Cap-2 Maneuver	754	712	-	744	720	-	-	-	-	-	-	-
Stage 1	925	816	-	916	833	-	-	-	-	-	-	-
Stage 2	884	823	-	851	813	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.7	0.6	3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1584	-	-	759	814	1537	-	-
HCM Lane V/C Ratio	0.004	-	-	0.047	0.065	0.015	-	-
HCM Control Delay (s)	7.3	0	-	10	9.7	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	35	10	5	105	10	30	45	10	5	25	5
Future Vol, veh/h	10	35	10	5	105	10	30	45	10	5	25	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	4	17	0	5	0	0	0	0	33	0	0
Mvmt Flow	12	41	12	6	124	12	35	53	12	6	29	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	8.1	8	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	35%	18%	4%	14%
Vol Thru, %	53%	64%	88%	71%
Vol Right, %	12%	18%	8%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	85	55	120	35
LT Vol	30	10	5	5
Through Vol	45	35	105	25
RT Vol	10	10	10	5
Lane Flow Rate	100	65	141	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0.123	0.078	0.167	0.057
Departure Headway (Hd)	4.41	4.313	4.263	4.977
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	815	833	844	721
Service Time	2.425	2.328	2.278	2.995
HCM Lane V/C Ratio	0.123	0.078	0.167	0.057
HCM Control Delay	8	7.7	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.3	0.6	0.2

**Intersection**

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	35	5	5	45	10	40	25	5	15	10	5
Future Vol, veh/h	10	35	5	5	45	10	40	25	5	15	10	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	40	0	3	0	10	5	0	10	0	25
Mvmt Flow	12	41	6	6	53	12	47	29	6	18	12	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.5	8	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	57%	20%	8%	50%
Vol Thru, %	36%	70%	75%	33%
Vol Right, %	7%	10%	17%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	50	60	30
LT Vol	40	10	5	15
Through Vol	25	35	45	10
RT Vol	5	5	10	5
Lane Flow Rate	82	59	71	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.1	0.068	0.08	0.043
Departure Headway (Hd)	4.393	4.138	4.065	4.358
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	807	852	868	810
Service Time	2.467	2.229	2.155	2.447
HCM Lane V/C Ratio	0.102	0.069	0.082	0.043
HCM Control Delay	8	7.5	7.5	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.3	0.1



Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	60	10	10	235	140	35
Future Vol, veh/h	60	10	10	235	140	35
Conflicting Peds, #/hr	0	2	11	0	0	11
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	11	0	1	2	0
Mvmt Flow	71	12	12	276	165	41

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	497	199	217	0	-	0
Stage 1	197	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Critical Hdwy	6.42	6.31	4.1	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.399	2.2	-	-	-
Pot Cap-1 Maneuver	532	820	1365	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	516	810	1351	-	-	-
Mov Cap-2 Maneuver	516	-	-	-	-	-
Stage 1	819	-	-	-	-	-
Stage 2	744	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1351	-	544	-	-
HCM Lane V/C Ratio	0.009	-	0.151	-	-
HCM Control Delay (s)	7.7	0	12.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	20	5	15	10	10	5	20	20	10	10	5
Future Vol, veh/h	5	20	5	15	10	10	5	20	20	10	10	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	10	0	0	0	15	0	0	33	0
Mvmt Flow	6	24	6	18	12	12	6	24	24	12	12	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.2	7.4	7.1	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	17%	43%	40%
Vol Thru, %	44%	67%	29%	40%
Vol Right, %	44%	17%	29%	20%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	30	35	25
LT Vol	5	5	15	10
Through Vol	20	20	10	10
RT Vol	20	5	10	5
Lane Flow Rate	53	35	41	29
Geometry Grp	1	1	1	1
Degree of Util (X)	0.056	0.039	0.048	0.033
Departure Headway (Hd)	3.81	4.007	4.153	4.033
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	935	890	859	883
Service Time	1.853	2.048	2.192	2.078
HCM Lane V/C Ratio	0.057	0.039	0.048	0.033
HCM Control Delay	7.1	7.2	7.4	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.1	0.2	0.1

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	75	15	5	75	80	20
Future Vol, veh/h	75	15	5	75	80	20
Conflicting Peds, #/hr	0	0	4	0	0	4
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	9	0	2	0	12
Mvmt Flow	87	17	6	87	93	23

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	208	109	120	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.4	6.29	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.381	2.2	-	-	-
Pot Cap-1 Maneuver	785	926	1480	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	776	922	1474	-	-	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	926	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1474	-	797	-	-
HCM Lane V/C Ratio	0.004	-	0.131	-	-
HCM Control Delay (s)	7.5	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection						
Int Delay, s/veh	6.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	315	125	130	340	105	155
Future Vol, veh/h	315	125	130	340	105	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	4	1	3	3	1	8
Mvmt Flow	358	142	148	386	119	176

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	500	0	1111 429
Stage 1	-	-	-	-	429 -
Stage 2	-	-	-	-	682 -
Critical Hdwy	-	-	4.13	-	6.41 6.28
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	-	-	2.227	-	3.509 3.372
Pot Cap-1 Maneuver	-	-	1059	-	232 613
Stage 1	-	-	-	-	659 -
Stage 2	-	-	-	-	504 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1059	-	200 613
Mov Cap-2 Maneuver	-	-	-	-	200 -
Stage 1	-	-	-	-	659 -
Stage 2	-	-	-	-	433 -

Approach	EB	WB	NB
HCM Control Delay, s	0	2.5	26.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	200	613	-	-	1059	-
HCM Lane V/C Ratio	0.597	0.287	-	-	0.139	-
HCM Control Delay (s)	46.6	13.2	-	-	8.9	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	3.3	1.2	-	-	0.5	-

<b>ID</b>	<b>Software/Method</b>	<b>Intersection</b>	<b>Control Type</b>	<b>LOS</b>	<b>Delay</b>	<b>V/C Ratio</b>
1	Synchro HCM 6th Signal	OR 99W & Hoffman Rd	Signal	C	29.2	0.80
5	Synchro HCM 6th Signal	OR 99W & Main St	Signal	D	36.4	0.91

HCM 6th Signalized Intersection Summary  
1: OR 99W & Hoffman Rd

Monmouth TSP  
Future 2045 - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	170	35	95	115	125	15	670	105	215	655	70
Future Volume (veh/h)	70	170	35	95	115	125	15	670	105	215	655	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1750	1736	1695	1695	1736	1750	1750	1682	1723	1736	1682	1682
Adj Flow Rate, veh/h	76	185	29	103	125	86	16	728	56	234	712	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	1	4	4	1	0	0	5	2	1	5	5
Cap, veh/h	194	319	50	195	210	144	31	790	686	172	934	791
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.02	0.47	0.47	0.10	0.56	0.56
Sat Flow, veh/h	1095	1459	229	1058	958	659	1667	1682	1460	1654	1682	1425
Grp Volume(v), veh/h	76	0	214	103	0	211	16	728	56	234	712	43
Grp Sat Flow(s),veh/h/ln	1095	0	1688	1058	0	1618	1667	1682	1460	1654	1682	1425
Q Serve(g_s), s	5.8	0.0	9.8	8.4	0.0	10.2	0.8	35.1	1.8	9.0	28.3	1.2
Cycle Q Clear(g_c), s	16.0	0.0	9.8	18.2	0.0	10.2	0.8	35.1	1.8	9.0	28.3	1.2
Prop In Lane	1.00		0.14	1.00		0.41	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	194	0	370	195	0	354	31	790	686	172	934	791
V/C Ratio(X)	0.39	0.00	0.58	0.53	0.00	0.60	0.52	0.92	0.08	1.36	0.76	0.05
Avail Cap(c_a), veh/h	194	0	370	195	0	354	173	853	740	172	934	791
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	0.00	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	37.6	0.0	30.3	38.5	0.0	30.4	42.2	21.5	12.7	38.9	14.9	8.9
Incr Delay (d2), s/veh	0.9	0.0	1.9	2.2	0.0	2.4	9.8	14.9	0.1	196.7	4.0	0.0
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	1.6	0.0	4.1	2.2	0.0	4.1	0.4	16.0	0.6	12.9	10.7	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	0.0	32.3	40.6	0.0	32.8	52.0	36.4	12.8	235.6	18.9	8.9
LnGrp LOS	D	A	C	D	A	C	D	D	B	F	B	A
Approach Vol, veh/h		290			314			800				989
Approach Delay, s/veh		33.9			35.4			35.1				69.7
Approach LOS		C			D			D				E
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	54.2		25.0	15.0	46.8		25.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	9.0	44.0		19.0	9.0	44.0		19.0				
Max Q Clear Time (g_c+I1), s	2.8	30.3		20.2	11.0	37.1		18.0				
Green Ext Time (p_c), s	0.0	5.8		0.0	0.0	3.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	49.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM Signalized Intersection Capacity Analysis  
1: OR 99W & Hoffman Rd

Monmouth TSP  
Future 2045 - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	170	35	95	115	125	15	670	105	215	655	70
Future Volume (vph)	70	170	35	95	115	125	15	670	105	215	655	70
Ideal Flow (vphp)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	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	0.97		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1672		1599	1606		1662	1667	1458	1646	1667	1417
Flt Permitted	0.35	1.00		0.45	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	615	1672		753	1606		1662	1667	1458	1646	1667	1417
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	185	38	103	125	136	16	728	114	234	712	76
RTOR Reduction (vph)	0	8	0	0	46	0	0	0	53	0	0	30
Lane Group Flow (vph)	76	215	0	103	215	0	16	728	61	234	712	46
Confl. Bikes (#/hr)			4									
Heavy Vehicles (%)	0%	1%	4%	4%	1%	0%	0%	5%	2%	1%	5%	5%
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4					6			2
Actuated Green, G (s)	14.8	14.8		14.8	14.8		1.4	44.2	44.2	9.2	52.0	52.0
Effective Green, g (s)	14.8	14.8		14.8	14.8		1.4	44.2	44.2	9.2	52.0	52.0
Actuated g/C Ratio	0.17	0.17		0.17	0.17		0.02	0.51	0.51	0.11	0.60	0.60
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.0	4.0	2.5	4.0	4.0
Lane Grp Cap (vph)	105	287		129	275		26	854	747	175	1005	854
v/s Ratio Prot		0.13			0.13		0.01	c0.44		c0.14	0.43	
v/s Ratio Perm	0.12			c0.14					0.04			0.03
v/c Ratio	0.72	0.75		0.80	0.78		0.62	0.85	0.08	1.34	0.71	0.05
Uniform Delay, d1	33.8	33.9		34.3	34.2		42.1	18.2	10.7	38.5	11.8	7.0
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	20.5	9.7		27.4	13.1		31.7	8.5	0.1	185.1	2.5	0.0
Delay (s)	54.3	43.6		61.6	47.3		73.8	26.7	10.7	223.6	14.3	7.0
Level of Service	D	D		E	D		E	C	B	F	B	A
Approach Delay (s)		46.3			51.3			25.5			61.7	
Approach LOS		D			D			C			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			46.2				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			86.2			Sum of lost time (s)				18.0		
Intersection Capacity Utilization			91.1%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	1	1	1	20	1	45	1	735	25	35	745	1
Future Vol, veh/h	1	1	1	20	1	45	1	735	25	35	745	1
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	14	0	0	0	7	0	4	5	0
Mvmt Flow	1	1	1	22	1	48	1	790	27	38	801	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1717	1706	811	1685	1693	804	811	0	0	817	0	0
Stage 1	887	887	-	806	806	-	-	-	-	-	-	-
Stage 2	830	819	-	879	887	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	72	92	383	70	94	386	824	-	-	802	-	-
Stage 1	341	365	-	359	398	-	-	-	-	-	-	-
Stage 2	367	392	-	326	365	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	58	83	380	65	85	386	817	-	-	802	-	-
Mov Cap-2 Maneuver	58	83	-	65	85	-	-	-	-	-	-	-
Stage 1	338	331	-	359	398	-	-	-	-	-	-	-
Stage 2	320	392	-	296	331	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	44.7		48.4		0		0.4	
HCM LOS	E		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	817	-	-	94	151	802	-	-
HCM Lane V/C Ratio	0.001	-	-	0.034	0.47	0.047	-	-
HCM Control Delay (s)	9.4	-	-	44.7	48.4	9.7	0	-
HCM Lane LOS	A	-	-	E	E	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	2.2	0.1	-	-



Intersection												
Int Delay, s/veh	18.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	35	5	105	5	5	5	100	730	5	10	710	55
Future Vol, veh/h	35	5	105	5	5	5	100	730	5	10	710	55
Conflicting Peds, #/hr	0	0	2	2	0	0	5	0	4	4	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	2	0	0	0	0	5	0	12	4	4
Mvmt Flow	38	5	114	5	5	5	109	793	5	11	772	60

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1848	1849	809	1904	1877	800	837	0	0	802	0	0
Stage 1	829	829	-	1018	1018	-	-	-	-	-	-	-
Stage 2	1019	1020	-	886	859	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.1	-	-	4.22	-	-
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	3.5	4	3.318	3.5	4	3.3	2.2	-	-	2.308	-	-
Pot Cap-1 Maneuver	58	75	380	53	72	388	806	-	-	779	-	-
Stage 1	368	388	-	289	317	-	-	-	-	-	-	-
Stage 2	288	317	-	342	376	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	47	63	377	30	61	387	802	-	-	776	-	-
Mov Cap-2 Maneuver	47	63	-	30	61	-	-	-	-	-	-	-
Stage 1	316	381	-	249	273	-	-	-	-	-	-	-
Stage 2	240	273	-	231	369	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	204.6		91.7		1.2		0.1	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	802	-	-	132	57	776	-	-
HCM Lane V/C Ratio	0.136	-	-	1.194	0.286	0.014	-	-
HCM Control Delay (s)	10.2	-	-	204.6	91.7	9.7	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	9.5	1	0	-	-

Intersection												
Int Delay, s/veh	20.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	35	10	90	5	15	65	25	750	10	35	750	35
Future Vol, veh/h	35	10	90	5	15	65	25	750	10	35	750	35
Conflicting Peds, #/hr	1	0	2	2	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	17	0	0	0	0	0	5	11	0	5	4
Mvmt Flow	37	11	95	5	16	68	26	789	11	37	789	37

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1778	1742	816	1786	1755	798	832	0	0	802	0	0
Stage 1	888	888	-	849	849	-	-	-	-	-	-	-
Stage 2	890	854	-	937	906	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.67	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.67	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.67	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.153	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	65	80	380	64	86	389	809	-	-	830	-	-
Stage 1	341	342	-	358	380	-	-	-	-	-	-	-
Stage 2	340	355	-	320	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	43	73	377	40	79	388	804	-	-	828	-	-
Mov Cap-2 Maneuver	43	73	-	40	79	-	-	-	-	-	-	-
Stage 1	328	325	-	346	367	-	-	-	-	-	-	-
Stage 2	259	343	-	221	340	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	241.1		44.9		0.3		0.4	
HCM LOS	F		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	804	-	-	113	176	828	-	-
HCM Lane V/C Ratio	0.033	-	-	1.258	0.508	0.044	-	-
HCM Control Delay (s)	9.6	-	-	241.1	44.9	9.6	-	-
HCM Lane LOS	A	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	9.3	2.5	0.1	-	-

HCM 6th Signalized Intersection Summary  
5: OR 99W & Main St

Monmouth TSP  
Future 2045 - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	330	45	175	325	120	65	540	120	205	560	50
Future Volume (veh/h)	125	330	45	175	325	120	65	540	120	205	560	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.98	1.00		0.99	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	1736	1709	1750	1736	1709	1750	1695	1654	1723	1723	1682	1750
Adj Flow Rate, veh/h	128	337	41	179	332	108	66	551	114	209	571	48
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	3	0	1	3	0	4	7	2	2	5	0
Cap, veh/h	206	329	40	248	302	98	218	501	104	240	661	56
Arrive On Green	0.08	0.22	0.22	0.10	0.25	0.25	0.04	0.38	0.38	0.10	0.43	0.43
Sat Flow, veh/h	1654	1486	181	1654	1228	399	1615	1328	275	1641	1529	129
Grp Volume(v), veh/h	128	0	378	179	0	440	66	0	665	209	0	619
Grp Sat Flow(s),veh/h/ln	1654	0	1667	1654	0	1627	1615	0	1603	1641	0	1658
Q Serve(g_s), s	5.5	0.0	20.5	7.6	0.0	22.8	2.3	0.0	35.0	7.2	0.0	31.4
Cycle Q Clear(g_c), s	5.5	0.0	20.5	7.6	0.0	22.8	2.3	0.0	35.0	7.2	0.0	31.4
Prop In Lane	1.00		0.11	1.00		0.25	1.00		0.17	1.00		0.08
Lane Grp Cap(c), veh/h	206	0	369	248	0	400	218	0	605	240	0	717
V/C Ratio(X)	0.62	0.00	1.03	0.72	0.00	1.10	0.30	0.00	1.10	0.87	0.00	0.86
Avail Cap(c_a), veh/h	265	0	369	265	0	400	329	0	605	263	0	717
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.0	0.0	36.1	26.0	0.0	35.0	20.3	0.0	28.9	22.2	0.0	23.8
Incr Delay (d2), s/veh	1.1	0.0	53.6	7.2	0.0	74.3	0.6	0.0	66.6	23.4	0.0	11.4
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	2.2	0.0	13.6	3.4	0.0	17.1	0.9	0.0	24.0	4.0	0.0	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.1	0.0	89.7	33.2	0.0	109.3	20.8	0.0	95.4	45.7	0.0	35.2
LnGrp LOS	C	A	F	C	A	F	C	A	F	D	A	D
Approach Vol, veh/h		506			619			731				828
Approach Delay, s/veh		74.2			87.3			88.7				37.9
Approach LOS		E			F			F				D
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	45.1	11.7	27.3	13.7	40.0	14.0	25.0				
Change Period (Y+Rc), s	4.5	5.0	4.5	4.5	4.5	5.0	4.5	4.5				
Max Green Setting (Gmax), s	10.5	35.0	10.5	20.5	10.5	35.0	10.5	20.5				
Max Q Clear Time (g_c+I1), s	4.3	33.4	7.5	24.8	9.2	37.0	9.6	22.5				
Green Ext Time (p_c), s	0.0	1.0	0.0	0.0	0.1	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay	70.0
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

# HCM Signalized Intersection Capacity Analysis

## 5: OR 99W & Main St

Monmouth TSP  
Future 2045 - PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	330	45	175	325	120	65	540	120	205	560	50
Future Volume (vph)	125	330	45	175	325	120	65	540	120	205	560	50
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1644	1667		1645	1627		1598	1605		1630	1649	
Flt Permitted	0.20	1.00		0.19	1.00		0.20	1.00		0.10	1.00	
Satd. Flow (perm)	338	1667		321	1627		331	1605		170	1649	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	337	46	179	332	122	66	551	122	209	571	51
RTOR Reduction (vph)	0	5	0	0	14	0	0	8	0	0	3	0
Lane Group Flow (vph)	128	378	0	179	440	0	66	665	0	209	619	0
Confl. Peds. (#/hr)	10		7	7		10	4					4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	3%	0%	1%	3%	0%	4%	7%	2%	2%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	29.3	20.5		31.5	21.6		41.8	35.9		50.8	40.4	
Effective Green, g (s)	29.3	20.5		31.5	21.6		41.8	35.9		50.8	40.4	
Actuated g/C Ratio	0.31	0.22		0.33	0.23		0.44	0.38		0.53	0.42	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)	224	358		243	369		223	605		250	699	
v/s Ratio Prot	0.05	0.23		c0.08	c0.27		0.02	c0.41		c0.09	0.38	
v/s Ratio Perm	0.12			0.17			0.11			0.35		
v/c Ratio	0.57	1.05		0.74	1.19		0.30	1.10		0.84	0.89	
Uniform Delay, d1	26.3	37.4		25.6	36.8		17.8	29.7		23.6	25.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	62.6		9.6	110.4		0.5	66.6		20.5	13.8	
Delay (s)	28.5	100.0		35.2	147.2		18.3	96.3		44.1	39.1	
Level of Service	C	F		D	F		B	F		D	D	
Approach Delay (s)		82.1			115.5			89.3			40.3	
Approach LOS		F			F			F			D	

### Intersection Summary

HCM 2000 Control Delay	79.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	95.2	Sum of lost time (s)	18.5
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	
Traffic Vol, veh/h	10	20	80	10	5	25	50	715	25	25	695	70
Future Vol, veh/h	10	20	80	10	5	25	50	715	25	25	695	70
Conflicting Peds, #/hr	1	0	1	1	0	1	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	120	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	11	0	3	14	0	0	0	6	11	0	4	2
Mvmt Flow	11	22	88	11	5	27	55	786	27	27	764	77

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1789	1785	809	1823	1810	801	846	0	0	813	0	0
Stage 1	862	862	-	910	910	-	-	-	-	-	-	-
Stage 2	927	923	-	913	900	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.5	6.23	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.21	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4	3.327	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	60	82	379	55	80	388	800	-	-	823	-	-
Stage 1	337	375	-	313	356	-	-	-	-	-	-	-
Stage 2	310	351	-	312	360	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	48	73	377	30	72	388	796	-	-	823	-	-
Mov Cap-2 Maneuver	48	73	-	30	72	-	-	-	-	-	-	-
Stage 1	312	361	-	291	331	-	-	-	-	-	-	-
Stage 2	263	327	-	217	346	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	44.2		84.3		0.6		0.3	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	796	-	-	62	377	86	823	-	-
HCM Lane V/C Ratio	0.069	-	-	0.532	0.233	0.511	0.033	-	-
HCM Control Delay (s)	9.9	-	-	115.8	17.4	84.3	9.5	-	-
HCM Lane LOS	A	-	-	F	C	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.1	0.9	2.2	0.1	-	-

Intersection												
Int Delay, s/veh	11.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	10	10	10	30	10	75	10	705	90	95	665	15
Future Vol, veh/h	10	10	10	30	10	75	10	705	90	95	665	15
Conflicting Peds, #/hr	0	0	0	0	0	0	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	7	1	1	4	9
Mvmt Flow	11	11	11	32	11	81	11	758	97	102	715	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1807	1809	728	1767	1769	807	736	0	0	855	0	0
Stage 1	932	932	-	829	829	-	-	-	-	-	-	-
Stage 2	875	877	-	938	940	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.11	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.209	-	-
Pot Cap-1 Maneuver	62	80	427	66	84	385	879	-	-	789	-	-
Stage 1	322	348	-	368	388	-	-	-	-	-	-	-
Stage 2	347	369	-	320	345	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	39	68	425	51	72	385	875	-	-	789	-	-
Mov Cap-2 Maneuver	39	68	-	51	72	-	-	-	-	-	-	-
Stage 1	317	302	-	363	383	-	-	-	-	-	-	-
Stage 2	263	364	-	262	299	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	94.4		144.6		0.1		1.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	875	-	-	70	125	789	-	-
HCM Lane V/C Ratio	0.012	-	-	0.461	0.989	0.129	-	-
HCM Control Delay (s)	9.2	-	-	94.4	144.6	10.2	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	6.7	0.4	-	-

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	60	1	20	1	1	1	30	665	1	5	505	90
Future Vol, veh/h	60	1	20	1	1	1	30	665	1	5	505	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	4	7	0	0	6	1
Mvmt Flow	65	1	22	1	1	1	33	723	1	5	549	98

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1399	1398	598	1410	1447	724	647	0	0	724	0	0
Stage 1	608	608	-	790	790	-	-	-	-	-	-	-
Stage 2	791	790	-	620	657	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.14	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	119	142	506	117	133	429	929	-	-	888	-	-
Stage 1	486	489	-	386	404	-	-	-	-	-	-	-
Stage 2	386	404	-	479	465	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	114	136	506	108	127	429	929	-	-	888	-	-
Mov Cap-2 Maneuver	114	136	-	108	127	-	-	-	-	-	-	-
Stage 1	469	486	-	372	389	-	-	-	-	-	-	-
Stage 2	370	389	-	455	462	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	65.7		28.9		0.4		0.1			
HCM LOS	F		D							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	929	-	-	141	154	888	-	-
HCM Lane V/C Ratio	0.035	-	-	0.624	0.021	0.006	-	-
HCM Control Delay (s)	9	-	-	65.7	28.9	9.1	-	-
HCM Lane LOS	A	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.3	0.1	0	-	-

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	5	5	10	10	5	5	75	15	5	110	5
Future Vol, veh/h	5	5	5	10	10	5	5	75	15	5	110	5
Conflicting Peds, #/hr	7	0	1	1	0	7	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	0	0	0	0	5	8	20	2	33
Mvmt Flow	6	6	6	11	11	6	6	85	17	6	125	6

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	261	255	129	254	250	102	131	0	0	103	0	0
Stage 1	140	140	-	107	107	-	-	-	-	-	-	-
Stage 2	121	115	-	147	143	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.3	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.38	-	-
Pot Cap-1 Maneuver	696	652	926	703	656	959	1467	-	-	1384	-	-
Stage 1	868	785	-	903	811	-	-	-	-	-	-	-
Stage 2	888	804	-	860	782	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	674	645	925	688	649	952	1467	-	-	1383	-	-
Mov Cap-2 Maneuver	674	645	-	688	649	-	-	-	-	-	-	-
Stage 1	865	781	-	898	807	-	-	-	-	-	-	-
Stage 2	861	800	-	843	778	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	10.1		10.3		0.4		0.3			
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1467	-	-	729	710	1383	-	-
HCM Lane V/C Ratio	0.004	-	-	0.023	0.04	0.004	-	-
HCM Control Delay (s)	7.5	0	-	10.1	10.3	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-



Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	25	5	30	25	5	5	80	10	5	105	15
Future Vol, veh/h	10	25	5	30	25	5	5	80	10	5	105	15
Conflicting Peds, #/hr	1	0	1	1	0	1	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	5	0	0	0	5	0	0	4	0
Mvmt Flow	11	28	6	34	28	6	6	91	11	6	119	17

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	267	254	129	267	257	98	136	0	0	102	0	0
Stage 1	140	140	-	109	109	-	-	-	-	-	-	-
Stage 2	127	114	-	158	148	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	690	653	926	680	651	963	1461	-	-	1503	-	-
Stage 1	868	785	-	889	809	-	-	-	-	-	-	-
Stage 2	882	805	-	837	779	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	658	648	925	649	646	962	1461	-	-	1503	-	-
Mov Cap-2 Maneuver	658	648	-	649	646	-	-	-	-	-	-	-
Stage 1	865	782	-	885	806	-	-	-	-	-	-	-
Stage 2	842	802	-	798	776	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.7		11		0.4		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1461	-	-	676	666	1503	-	-
HCM Lane V/C Ratio	0.004	-	-	0.067	0.102	0.004	-	-
HCM Control Delay (s)	7.5	0	-	10.7	11	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	50	5	105	50	5	5	5	75	15	10	5
Future Vol, veh/h	5	50	5	105	50	5	5	5	75	15	10	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	1	1	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	4	0	0	0	0	3	0	12	0
Mvmt Flow	5	54	5	113	54	5	5	5	81	16	11	5

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	61	0	0	59	0	0	358	354	58	396	354	59
Stage 1	-	-	-	-	-	-	67	67	-	285	285	-
Stage 2	-	-	-	-	-	-	291	287	-	111	69	-
Critical Hdwy	4.1	-	-	4.14	-	-	7.1	6.5	6.23	7.1	6.62	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.62	-
Follow-up Hdwy	2.2	-	-	2.236	-	-	3.5	4	3.327	3.5	4.108	3.3
Pot Cap-1 Maneuver	1555	-	-	1532	-	-	601	574	1005	568	556	1012
Stage 1	-	-	-	-	-	-	948	843	-	727	658	-
Stage 2	-	-	-	-	-	-	721	678	-	899	818	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1552	-	-	1532	-	-	553	528	1004	486	511	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	553	528	-	486	511	-
Stage 1	-	-	-	-	-	-	945	840	-	723	607	-
Stage 2	-	-	-	-	-	-	651	625	-	818	816	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	4.9	9.4	12.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	912	1552	-	-	1532	-	-	542
HCM Lane V/C Ratio	0.1	0.003	-	-	0.074	-	-	0.06
HCM Control Delay (s)	9.4	7.3	0	-	7.5	0	-	12.1
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.2

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	160	10	55	165	110	10	70	55	120	75	20
Future Vol, veh/h	10	160	10	55	165	110	10	70	55	120	75	20
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
Heavy Vehicles, %	0	4	0	0	2	7	0	4	2	1	0	6
Mvmt Flow	11	178	11	61	183	122	11	78	61	133	83	22
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.2	14	10.5	12.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	6%	17%	56%
Vol Thru, %	52%	89%	50%	35%
Vol Right, %	41%	6%	33%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	135	180	330	215
LT Vol	10	10	55	120
Through Vol	70	160	165	75
RT Vol	55	10	110	20
Lane Flow Rate	150	200	367	239
Geometry Grp	1	1	1	1
Degree of Util (X)	0.236	0.311	0.529	0.383
Departure Headway (Hd)	5.653	5.595	5.198	5.768
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	632	640	689	621
Service Time	3.719	3.657	3.252	3.827
HCM Lane V/C Ratio	0.237	0.313	0.533	0.385
HCM Control Delay	10.5	11.2	14	12.4
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	0.9	1.3	3.1	1.8

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	325	10	50	325	40	5	20	50	35	30	15
Future Vol, veh/h	10	325	10	50	325	40	5	20	50	35	30	15
Conflicting Peds, #/hr	30	0	9	9	0	30	11	0	10	10	0	11
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	2	0	0	3	3	0	0	0	4	0	0
Mvmt Flow	11	349	11	54	349	43	5	22	54	38	32	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	422	0	0	369	0	0	900	916	374	934	900	412
Stage 1	-	-	-	-	-	-	386	386	-	509	509	-
Stage 2	-	-	-	-	-	-	514	530	-	425	391	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.14	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.14	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.14	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.536	4	3.3
Pot Cap-1 Maneuver	1148	-	-	1201	-	-	262	274	677	244	280	644
Stage 1	-	-	-	-	-	-	641	614	-	543	541	-
Stage 2	-	-	-	-	-	-	547	530	-	603	611	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1115	-	-	1191	-	-	214	246	665	191	251	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	214	246	-	191	251	-
Stage 1	-	-	-	-	-	-	628	601	-	521	495	-
Stage 2	-	-	-	-	-	-	464	485	-	523	598	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1	15.7	27.4
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	417	1115	-	-	1191	-	-	245
HCM Lane V/C Ratio	0.193	0.01	-	-	0.045	-	-	0.351
HCM Control Delay (s)	15.7	8.3	0	-	8.2	0	-	27.4
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	1.5

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	475	5	5	430	20	5	5	15	20	10	20
Future Vol, veh/h	20	475	5	5	430	20	5	5	15	20	10	20
Conflicting Peds, #/hr	10	0	10	10	0	10	4	0	1	1	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	0	2	0	0	3	0	0	0	0	0	0	0
Mvmt Flow	21	495	5	5	448	21	5	5	16	21	10	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	479	0	0	510	0	0	1038	1039	509	1030	1031	473
Stage 1	-	-	-	-	-	-	550	550	-	479	479	-
Stage 2	-	-	-	-	-	-	488	489	-	551	552	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1094	-	-	1065	-	-	211	232	568	214	235	595
Stage 1	-	-	-	-	-	-	523	519	-	571	558	-
Stage 2	-	-	-	-	-	-	565	553	-	522	518	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1084	-	-	1055	-	-	189	220	562	197	223	587
Mov Cap-2 Maneuver	-	-	-	-	-	-	189	220	-	197	223	-
Stage 1	-	-	-	-	-	-	504	500	-	550	549	-
Stage 2	-	-	-	-	-	-	529	544	-	488	499	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.1			16.9			21		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	1084	-	-	1055	-	-	277
HCM Lane V/C Ratio	0.079	0.019	-	-	0.005	-	-	0.188
HCM Control Delay (s)	16.9	8.4	0	-	8.4	0	-	21
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.7

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	10	630	675	35	30	25
Future Vol, veh/h	10	630	675	35	30	25
Conflicting Peds, #/hr	12	0	0	12	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	11	708	758	39	34	28

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	809	0	-	0	1520 790
Stage 1	-	-	-	-	790 -
Stage 2	-	-	-	-	730 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	825	-	-	-	132 393
Stage 1	-	-	-	-	451 -
Stage 2	-	-	-	-	481 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	816	-	-	-	126 389
Mov Cap-2 Maneuver	-	-	-	-	126 -
Stage 1	-	-	-	-	436 -
Stage 2	-	-	-	-	476 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	34.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	816	-	-	-	182
HCM Lane V/C Ratio	0.014	-	-	-	0.34
HCM Control Delay (s)	9.5	0	-	-	34.6
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	1.4

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	690	10	30	690	10	5	5	40	20	5	15
Future Vol, veh/h	5	690	10	30	690	10	5	5	40	20	5	15
Conflicting Peds, #/hr	10	0	3	3	0	10	4	0	0	0	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	22	0	1	0	0	0	3	0	0	38
Mvmt Flow	5	750	11	33	750	11	5	5	43	22	5	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	771	0	0	764	0	0	1605	1606	759	1622	1606	770
Stage 1	-	-	-	-	-	-	769	769	-	832	832	-
Stage 2	-	-	-	-	-	-	836	837	-	790	774	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.23	7.1	6.5	6.58
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	2.2	-	-	2.2	-	-	3.5	4	3.327	3.5	4	3.642
Pot Cap-1 Maneuver	853	-	-	858	-	-	86	106	405	83	106	348
Stage 1	-	-	-	-	-	-	397	413	-	366	387	-
Stage 2	-	-	-	-	-	-	364	385	-	386	411	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	845	-	-	856	-	-	73	97	404	66	97	343
Mov Cap-2 Maneuver	-	-	-	-	-	-	73	97	-	66	97	-
Stage 1	-	-	-	-	-	-	392	408	-	359	358	-
Stage 2	-	-	-	-	-	-	317	356	-	336	406	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.4			25.7			66.2		
HCM LOS							D			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	228	845	-	-	856	-	-	100
HCM Lane V/C Ratio	0.238	0.006	-	-	0.038	-	-	0.435
HCM Control Delay (s)	25.7	9.3	0	-	9.4	0	-	66.2
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.9	0	-	-	0.1	-	-	1.8

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶		↷	↶	↷	↷
Traffic Vol, veh/h	760	45	55	730	20	55
Future Vol, veh/h	760	45	55	730	20	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	0	2	2	0	2
Mvmt Flow	800	47	58	768	21	58

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	847	0	1708 824
Stage 1	-	-	-	-	824 -
Stage 2	-	-	-	-	884 -
Critical Hdwy	-	-	4.12	-	6.4 6.22
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	-	-	2.218	-	3.5 3.318
Pot Cap-1 Maneuver	-	-	790	-	101 373
Stage 1	-	-	-	-	434 -
Stage 2	-	-	-	-	407 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	790	-	94 373
Mov Cap-2 Maneuver	-	-	-	-	94 -
Stage 1	-	-	-	-	434 -
Stage 2	-	-	-	-	377 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	26.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	94	373	-	-	790	-
HCM Lane V/C Ratio	0.224	0.155	-	-	0.073	-
HCM Control Delay (s)	54	16.4	-	-	9.9	-
HCM Lane LOS	F	C	-	-	A	-
HCM 95th %tile Q(veh)	0.8	0.5	-	-	0.2	-



Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	0	50	50	10	40	30	65	0	0	90	30
Future Vol, veh/h	30	0	50	50	10	40	30	65	0	0	90	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	5	0	0	0	0	0	4	0	0	0	0	0
Mvmt Flow	35	0	59	59	12	47	35	76	0	0	106	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	8.2	8.5	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	38%	50%	0%
Vol Thru, %	68%	0%	10%	75%
Vol Right, %	0%	62%	40%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	80	100	120
LT Vol	30	30	50	0
Through Vol	65	0	10	90
RT Vol	0	50	40	30
Lane Flow Rate	112	94	118	141
Geometry Grp	1	1	1	1
Degree of Util (X)	0.145	0.115	0.145	0.171
Departure Headway (Hd)	4.669	4.404	4.45	4.362
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	769	814	806	823
Service Time	2.695	2.43	2.476	2.387
HCM Lane V/C Ratio	0.146	0.115	0.146	0.171
HCM Control Delay	8.5	8	8.2	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.4	0.5	0.6

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	10	15	10	10	75	25	180	20	30	175	95
Future Vol, veh/h	110	10	15	10	10	75	25	180	20	30	175	95
Conflicting Peds, #/hr	2	0	17	17	0	2	12	0	20	20	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	12	0	0	0	3	7	0	2	0
Mvmt Flow	129	12	18	12	12	88	29	212	24	35	206	112

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	678	658	291	666	702	246	330	0	0	256	0	0
Stage 1	344	344	-	302	302	-	-	-	-	-	-	-
Stage 2	334	314	-	364	400	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.22	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.22	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.608	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	369	387	753	360	365	798	1241	-	-	1321	-	-
Stage 1	676	640	-	686	668	-	-	-	-	-	-	-
Stage 2	684	660	-	635	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	300	353	732	316	333	781	1227	-	-	1296	-	-
Mov Cap-2 Maneuver	300	353	-	316	333	-	-	-	-	-	-	-
Stage 1	650	612	-	654	638	-	-	-	-	-	-	-
Stage 2	578	630	-	578	578	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Control Delay, s	23.3		12.3			0.9			0.8		
HCM LOS	C		B								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1227	-	-	300	512	602	1296	-	-
HCM Lane V/C Ratio	0.024	-	-	0.431	0.057	0.186	0.027	-	-
HCM Control Delay (s)	8	0	-	25.8	12.5	12.3	7.9	0	-
HCM Lane LOS	A	A	-	D	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.1	0.2	0.7	0.1	-	-

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	60	70	25	60	40	35	155	25	25	145	15
Future Vol, veh/h	20	60	70	25	60	40	35	155	25	25	145	15
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	2	3	12	4	0	0	3	0
Mvmt Flow	24	71	82	29	71	47	41	182	29	29	171	18
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.9	9.8	11.3	10.5
HCM LOS	A	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	13%	20%	14%
Vol Thru, %	72%	40%	48%	78%
Vol Right, %	12%	47%	32%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	215	150	125	185
LT Vol	35	20	25	25
Through Vol	155	60	60	145
RT Vol	25	70	40	15
Lane Flow Rate	253	176	147	218
Geometry Grp	1	1	1	1
Degree of Util (X)	0.369	0.252	0.216	0.31
Departure Headway (Hd)	5.257	5.132	5.277	5.13
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	685	701	681	701
Service Time	3.286	3.162	3.31	3.16
HCM Lane V/C Ratio	0.369	0.251	0.216	0.311
HCM Control Delay	11.3	9.9	9.8	10.5
HCM Lane LOS	B	A	A	B
HCM 95th-tile Q	1.7	1	0.8	1.3

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	15	5	20	30	30	5	65	20	15	40	5
Future Vol, veh/h	5	15	5	20	30	30	5	65	20	15	40	5
Conflicting Peds, #/hr	3	0	1	1	0	3	2	0	1	1	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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, %	0	0	0	0	0	0	0	8	15	9	0	0
Mvmt Flow	6	18	6	24	35	35	6	76	24	18	47	6

Major/Minor	Minor2		Minor1			Major1		Major2				
Conflicting Flow All	226	201	53	200	192	92	55	0	0	101	0	0
Stage 1	88	88	-	101	101	-	-	-	-	-	-	-
Stage 2	138	113	-	99	91	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.19	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.281	-	-
Pot Cap-1 Maneuver	734	699	1020	763	707	971	1563	-	-	1449	-	-
Stage 1	925	826	-	910	815	-	-	-	-	-	-	-
Stage 2	870	806	-	912	823	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	668	685	1017	732	693	967	1560	-	-	1448	-	-
Mov Cap-2 Maneuver	668	685	-	732	693	-	-	-	-	-	-	-
Stage 1	919	814	-	905	811	-	-	-	-	-	-	-
Stage 2	796	802	-	875	811	-	-	-	-	-	-	-

Approach	EB		WB			NB		SB		
HCM Control Delay, s	10.1		10.2			0.4		1.9		
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1560	-	-	729	787	1448	-	-
HCM Lane V/C Ratio	0.004	-	-	0.04	0.12	0.012	-	-
HCM Control Delay (s)	7.3	0	-	10.1	10.2	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0	-	-

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	30	110	20	5	90	5	15	15	5	10	25	10
Future Vol, veh/h	30	110	20	5	90	5	15	15	5	10	25	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	4	4	8	0	3	0	0	0	0	0	0	0
Mvmt Flow	34	125	23	6	102	6	17	17	6	11	28	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8	7.9	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	19%	5%	22%
Vol Thru, %	43%	69%	90%	56%
Vol Right, %	14%	12%	5%	22%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	35	160	100	45
LT Vol	15	30	5	10
Through Vol	15	110	90	25
RT Vol	5	20	5	10
Lane Flow Rate	40	182	114	51
Geometry Grp	1	1	1	1
Degree of Util (X)	0.051	0.211	0.135	0.064
Departure Headway (Hd)	4.616	4.174	4.282	4.513
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	779	845	841	797
Service Time	2.623	2.273	2.29	2.521
HCM Lane V/C Ratio	0.051	0.215	0.136	0.064
HCM Control Delay	7.9	8.4	8	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.8	0.5	0.2

**Intersection**

Intersection Delay, s/veh 7.9

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	60	35	5	40	20	15	25	5	20	30	10
Future Vol, veh/h	25	60	35	5	40	20	15	25	5	20	30	10
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	6	0	0	0	0	8	0	0	0	7	5	0
Mvmt Flow	29	69	40	6	46	23	17	29	6	23	34	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	7.6	7.8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	33%	21%	8%	33%
Vol Thru, %	56%	50%	62%	50%
Vol Right, %	11%	29%	31%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	120	65	60
LT Vol	15	25	5	20
Through Vol	25	60	40	30
RT Vol	5	35	20	10
Lane Flow Rate	52	138	75	69
Geometry Grp	1	1	1	1
Degree of Util (X)	0.064	0.162	0.086	0.086
Departure Headway (Hd)	4.445	4.236	4.155	4.51
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	808	852	865	797
Service Time	2.458	2.236	2.167	2.524
HCM Lane V/C Ratio	0.064	0.162	0.087	0.087
HCM Control Delay	7.8	8.1	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.6	0.3	0.3

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	50	10	15	200	190	70
Future Vol, veh/h	50	10	15	200	190	70
Conflicting Peds, #/hr	0	0	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	0	0	1	0	2
Mvmt Flow	59	12	18	235	224	82

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	541	270	311	0	0
Stage 1	270	-	-	-	-
Stage 2	271	-	-	-	-
Critical Hdwy	6.43	6.2	4.1	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.3	2.2	-	-
Pot Cap-1 Maneuver	500	774	1261	-	-
Stage 1	773	-	-	-	-
Stage 2	772	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	487	770	1255	-	-
Mov Cap-2 Maneuver	487	-	-	-	-
Stage 1	757	-	-	-	-
Stage 2	768	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1255	-	519	-	-
HCM Lane V/C Ratio	0.014	-	0.136	-	-
HCM Control Delay (s)	7.9	0	13	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	30	5	20	20	10	5	10	10	15	10	5
Future Vol, veh/h	5	30	5	20	20	10	5	10	10	15	10	5
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	6	0	0	0	0	0	0	0	0
Mvmt Flow	6	35	6	24	24	12	6	12	12	18	12	6
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	7.4	7.1	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	12%	40%	50%
Vol Thru, %	40%	75%	40%	33%
Vol Right, %	40%	12%	20%	17%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	40	50	30
LT Vol	5	5	20	15
Through Vol	10	30	20	10
RT Vol	10	5	10	5
Lane Flow Rate	29	47	59	35
Geometry Grp	1	1	1	1
Degree of Util (X)	0.032	0.052	0.067	0.04
Departure Headway (Hd)	3.909	4.006	4.109	4.105
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	908	890	869	866
Service Time	1.966	2.048	2.147	2.159
HCM Lane V/C Ratio	0.032	0.053	0.068	0.04
HCM Control Delay	7.1	7.3	7.4	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.2	0.1



Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	50	5	10	120	80	60
Future Vol, veh/h	50	5	10	120	80	60
Conflicting Peds, #/hr	0	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	0	2
Mvmt Flow	54	5	11	129	86	65

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	276	125	157	0	-	0
Stage 1	125	-	-	-	-	-
Stage 2	151	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	718	931	1435	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	704	926	1427	-	-	-
Mov Cap-2 Maneuver	704	-	-	-	-	-
Stage 1	893	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1427	-	720	-	-
HCM Lane V/C Ratio	0.008	-	0.082	-	-
HCM Control Delay (s)	7.5	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	↔
Traffic Vol, veh/h	465	75	90	365	90	70
Future Vol, veh/h	465	75	90	365	90	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	100	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	0	0	2	5	0
Mvmt Flow	500	81	97	392	97	75

Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	581	0	1127	541
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	586	-
Critical Hdwy	-	-	4.1	-	6.45	6.2
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.2	-	3.545	3.3
Pot Cap-1 Maneuver	-	-	1003	-	223	545
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1003	-	201	545
Mov Cap-2 Maneuver	-	-	-	-	201	-
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	497	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	27.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	201	545	-	-	1003	-
HCM Lane V/C Ratio	0.481	0.138	-	-	0.096	-
HCM Control Delay (s)	38.5	12.7	-	-	9	-
HCM Lane LOS	E	B	-	-	A	-
HCM 95th %tile Q(veh)	2.4	0.5	-	-	0.3	-

<b>ID</b>	<b>Software/Method</b>	<b>Intersection</b>	<b>Control Type</b>	<b>LOS</b>	<b>Delay</b>	<b>V/C Ratio</b>
1	Synchro HCM 6th Signal	OR 99W & Hoffman Rd	Signal	D	49.3	0.88
5	Synchro HCM 6th Signal	OR 99W & Main St	Signal	E	70.0	1.11