MEMORANDUM

TO:	Anna Dearman, AICP Walking & Biking Manager Nashville Department of Transportation & Multimodal Infrastructure (NDOT) 750 S 5th Street | Nashville, TN 37206
FROM:	Josh Green, KCI Technologies
DATE:	July 20, 2022
SUBJECT:	Lindsley Avenue Bikeway between 2nd Avenue South and Hermitage Avenue KCI Job Order No. 89210772.07

The Nashville Department of Transportation & Multimodal Infrastructure (NDOT) is proposing protected bike lanes within the existing pavement width along Lindsley Avenue in conjunction with a new development and scheduled repaving of the street. The purpose of this memo is to discuss the impacts of the proposed bikeway cross section on Lindsley Avenue between 2nd Avenue South and Hermitage Avenue. More specifically, the impacts to the existing on-street parking conditions along Lindsley Avenue, the existing laneage for the westbound approach of Lindsley Avenue at 2nd Avenue South, and the existing laneage for the westbound approach of the Interstate 40 off-ramp at 2nd Avenue South. Additional recommendations are made for the uncontrolled crossing locations at the project termini to connect adjacent multimodal facilities to Lindsley Avenue.

LINDSLEY AVENUE ON-STREET PARKING MODIFICATION

OVERVIEW

Based on the existing pavement width of approximately 42 feet, it is feasible to maintain on-street parking on one side of the street while maintaining two lanes of motor vehicle traffic with the addition of 5 feet minimum protected bike lanes in both directions. KCI Technologies collected existing parking count data and analyzed the data to determine the associated impact of the bikeway.

DATA COLLECTION

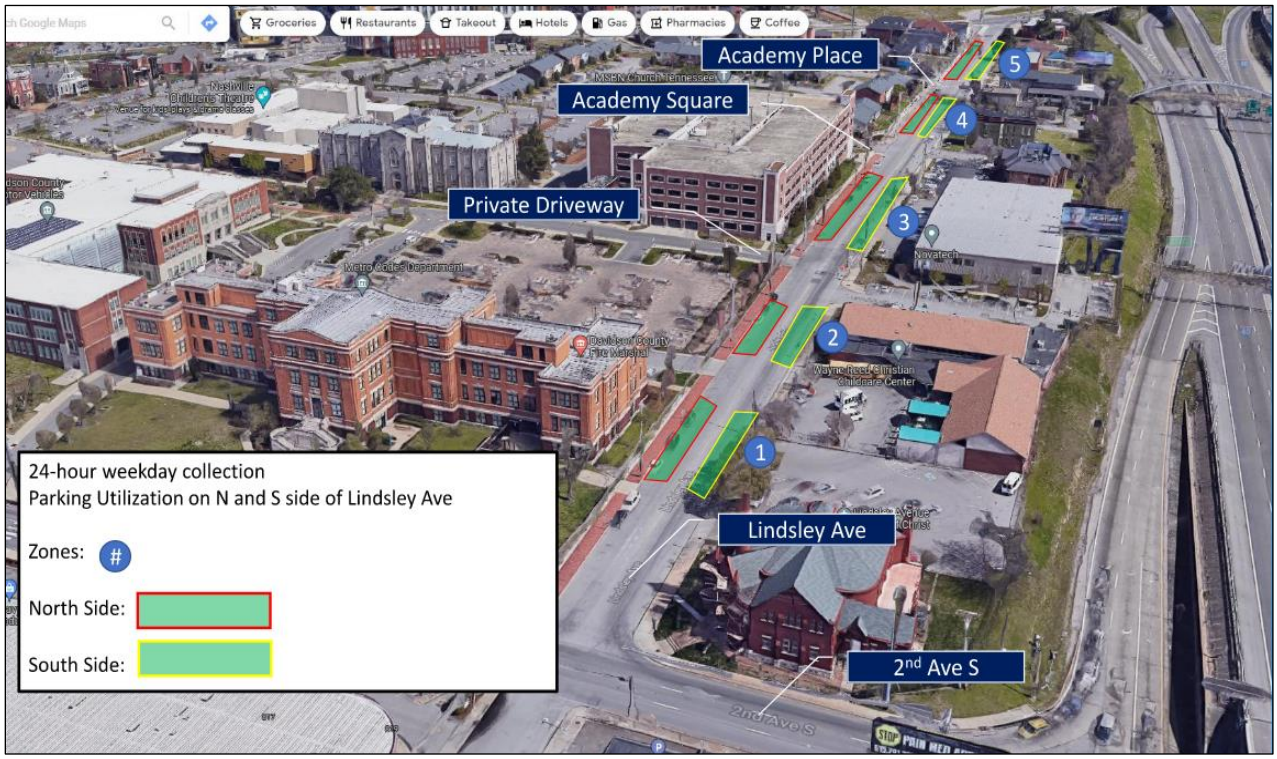
KCI collected 13-hour parking count data on a typical weekday in March 2022 while local schools were in session. Parking count data was collected in five zones along the north and south sides of Lindsley Avenue between 2nd Avenue South and Hermitage Avenue. The parking count data includes the total number of parking arrivals and departures for each zone along Lindsley Avenue

between 6:00 AM and 7:00 PM. A detailed summary of the parking count data collection can be found in Appendix A.

ANALYSIS

As mentioned, parking count data was collected in five zones along Lindsley Avenue. Figure 1 shows the zones along Lindsley Avenue in which the parking count data was collected. It should be noted that the existing parking along the street is not metered or managed by time-of-day restrictions. Existing signs are located between the parking count zones specifying prohibited locations for on street parking due to approaches to stop controlled intersections, minor street intersections, driveway locations, and the presence of pedestrian crosswalks.

FIGURE 1: LINDSLEY AVENUE PARKING COUNT ZONES



KCI consulted the *City of Memphis On-Street Parking Modification Guidelines*, which specify a process for on-street parking modification. As specified in these guidelines, any plan to modify on-street parking should be developed based on the evaluation of a street's parking utilization rate. NDOT agreed to this approach and the parking utilization rate for each zone along Lindsley Avenue as well as the entire segment of Lindsley Avenue was determined by analyzing the collected parking count data. Tables 1-5 show the capacity, demand, and utilization rate for each zone along Lindsley Avenue during the 13-hour period.

TABLE 1: ZONE 1 PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	3	4	133%
7:00-8:00 AM	3	3	100%
8:00-9:00 AM	3	3	100%
9:00-10:00 AM	3	6	200%
10:00-11:00 AM	3	4	133%
11:00-12:00 PM	3	4	133%
12:00-1:00 PM	3	4	133%
1:00-2:00 PM	3	3	100%
2:00-3:00 PM	3	3	100%
3:00-4:00 PM	3	0	0%
4:00-5:00 PM	3	0	0%
5:00-6:00 PM	3	0	0%
6:00-7:00 PM	3	0	0%
AVERAGE	--	--	**87%**

TABLE 2: ZONE 2 PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	2	5	250%
7:00-8:00 AM	2	3	150%
8:00-9:00 AM	2	5	250%
9:00-10:00 AM	2	5	250%
10:00-11:00 AM	2	3	150%
11:00-12:00 PM	2	4	200%
12:00-1:00 PM	2	4	200%
1:00-2:00 PM	2	4	200%
2:00-3:00 PM	2	3	150%
3:00-4:00 PM	2	3	150%
4:00-5:00 PM	2	0	0%
5:00-6:00 PM	2	0	0%
6:00-7:00 PM	2	0	0%
AVERAGE	--	--	**150%**

TABLE 3: ZONE 3 PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	14	0	0%
7:00-8:00 AM	14	0	0%
8:00-9:00 AM	14	2	14%
9:00-10:00 AM	14	2	14%
10:00-11:00 AM	14	2	14%
11:00-12:00 PM	14	1	7%
12:00-1:00 PM	14	0	0%
1:00-2:00 PM	14	3	21%
2:00-3:00 PM	14	2	14%
3:00-4:00 PM	14	1	7%
4:00-5:00 PM	14	1	7%
5:00-6:00 PM	14	0	0%
6:00-7:00 PM	14	0	0%
AVERAGE	--	--	**8%**

TABLE 4: ZONE 4 PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	22	4	18%
7:00-8:00 AM	22	2	9%
8:00-9:00 AM	22	7	32%
9:00-10:00 AM	22	16	73%
10:00-11:00 AM	22	7	32%
11:00-12:00 PM	22	7	32%
12:00-1:00 PM	22	6	27%
1:00-2:00 PM	22	6	27%
2:00-3:00 PM	22	5	23%
3:00-4:00 PM	22	3	14%
4:00-5:00 PM	22	5	23%
5:00-6:00 PM	22	8	36%
6:00-7:00 PM	22	5	23%
AVERAGE	--	--	**28%**

TABLE 5: ZONE 5 PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	30	11	37%
7:00-8:00 AM	30	13	43%
8:00-9:00 AM	30	10	33%
9:00-10:00 AM	30	10	33%
10:00-11:00 AM	30	12	40%
11:00-12:00 PM	30	15	50%
12:00-1:00 PM	30	12	40%
1:00-2:00 PM	30	11	37%
2:00-3:00 PM	30	13	43%
3:00-4:00 PM	30	8	27%
4:00-5:00 PM	30	12	40%
5:00-6:00 PM	30	10	33%
6:00-7:00 PM	30	9	30%
AVERAGE	--	--	**37%**

The capacity and demand from each zone for each hour was summed to determine the totals for the entire segment of Lindsley Avenue. Table 6 shows these totals and the calculated utilization rate for each hour. The average utilization rate for the entire Lindsley Avenue segment is also calculated.

TABLE 6: LINDSLEY AVENUE PARKING COUNT UTILIZATION

HOUR	CAPACITY (veh)	DEMAND (veh)	UTILIZATION
6:00-7:00 AM	71	24	34%
7:00-8:00 AM	71	21	30%
8:00-9:00 AM	71	27	38%
9:00-10:00 AM	71	39	55%
10:00-11:00 AM	71	28	39%
11:00-12:00 PM	71	31	44%
12:00-1:00 PM	71	26	37%
1:00-2:00 PM	71	27	38%
2:00-3:00 PM	71	26	37%
3:00-4:00 PM	71	15	21%
4:00-5:00 PM	71	18	25%
5:00-6:00 PM	71	18	25%
6:00-7:00 PM	71	14	20%
AVERAGE	--	--	**34%**

SUMMARY

The parking utilization rate for the entire segment of Lindsley Avenue between 2nd Avenue South and Hermitage Avenue was analyzed to determine the associated impact of the bikeway to the existing parking demand.

As referenced previously, the *City of Memphis On-Street Parking Modification Guidelines* specifies that modification from two-sided parking to one-sided parking should be considered when utilization is below 50% and the street segment is wide enough for parking on one side, vehicle lanes, and bicycle lanes. The segment of Lindsley Avenue along which the proposed bikeway is planned to be incorporated is approximately 42 feet in width. The parking utilization rate for the entire segment of Lindsley Avenue, as shown in Table 6, is 34%.

KCI proposes the following recommendations based on Lindsley Avenue's parking utilization rate and street width:

- Install bi-directional protected bike lanes, approximately 7 feet in width total, including a buffer space of 2 feet.
- Maintain designated on-street parking along the north side of Lindsley Avenue, approximately 8 feet in width.
- Maintain acceptable sight distance for turning motor vehicles at minor street intersections and driveways to improve visibility of cyclists and pedestrians.
- Remove designated on-street parking along the south side of Lindsley Avenue.

In summary, based on the analyses conducted, no further recommendations are presented for the Lindsley Avenue on-street parking modification.

LINDSLEY AVENUE AT 2ND AVENUE S WESTBOUND APPROACH MODIFICATION

OVERVIEW

The existing westbound approach of Lindsley Avenue at 2nd Avenue South is stop-controlled and contains one through lane and one right-turn lane with approximately 75 feet of storage. Potential impacts to the existing westbound approach of Lindsley Avenue at 2nd Avenue South, due to the proposed bikeway, include maintain the two-lane approach or condensing to a one-lane approach. KCI utilized existing turning moving count data and analyzed the two proposed scenarios to determine the associated impact of the bikeway.

ANALYSIS

To determine the operation of the Lindsley Avenue westbound approach for existing and modified scenarios, capacity analyses were performed for the AM and PM peak hours with existing counts and background counts. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, 6th Edition.

In order to account for the traffic growth prior to the completion of the proposed bikeway, background traffic volumes were established. For the purpose of this analysis, the proposed bikeway was assumed to be completed by the year 2024, which is a 2-year horizon. Historical daily traffic volumes were obtained from the three TDOT count stations located in the vicinity of the project site. From 2017-2019, the combined traffic at these three TDOT count stations has increased by an average of 1.33% per year. From 2018-2019, the combined traffic at these three TDOT count stations has increased by an average of 11.75% per year. The TDOT count station data is included in Appendix B.

A growth factor was applied to the existing peak hour traffic volumes to account for background growth for the future conditions. The existing peak hour traffic volumes at the intersection of 2nd Avenue South and Lindsley Avenue were increased by 6.0% per year for two years to account for anticipated background traffic growth within the project area.

The results of the capacity analyses for the existing and modified conditions of the Lindsley Avenue westbound approach are presented in Table 7 and Table 8. Capacity analyses worksheets are included in Appendix C.

TABLE 7. 2ND AVE S AND LINDSLEY AVE AM PEAK HOUR LEVELS OF SERVICE

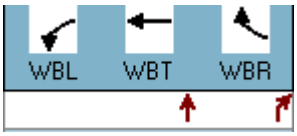
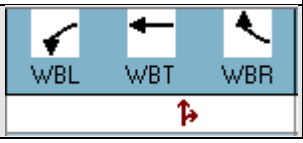
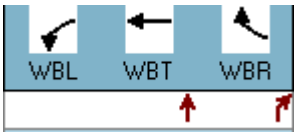
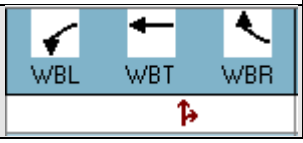
LINDSLEY WB APPROACH SCENARIO	SCENARIO LANEAGE	TURNING MOVEMENT	LEVEL OF SERVICE (Average Delay in sec/veh)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
Existing Two-Lane Approach		Westbound Through	F (175.4)	F (>300)
		Westbound Right-Turn	F (184.5)	F (>300)
Modified One-Lane Approach		Westbound Approach	F (>300)	F (>300)

TABLE 8. 2ND AVE S AND LINDSLEY AVE PM PEAK HOUR LEVELS OF SERVICE

LINDSLEY WB APPROACH SCENARIO	SCENARIO LANEAGE	TURNING MOVEMENT	LEVEL OF SERVICE (Average Delay in sec/veh)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
Existing Two-Lane Approach		Westbound Through	E (45.8)	F (68.2)
		Westbound Right-Turn	C (23.4)	D (29.7)
Modified One-Lane Approach		Westbound Approach	E (43.8)	F (82.2)

95th percentile queue lengths for the westbound approach of Lindsley Avenue at 2nd Avenue South were also analyzed under the existing and modified conditions. Table 9 and Table 10 indicate the results of the queue length analyses for the Lindsley Avenue westbound approach in the AM and PM peak hours.

TABLE 9. 2ND AVE AND LINDSLEY AVE AM 95TH PERCENTILE QUEUE LENGTH

LINDSLEY WB APPROACH SCENARIO	LANE	STORAGE (FEET)	95TH PERCENTILE QUEUE LENGTH (FEET)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
Existing Two-Lane Approach	Westbound Through	--	93	143
	Westbound Right-Turn	75	310	465
Modified One-Lane Approach	Westbound Through/Right-Turn	--	573	770

TABLE 10. 2ND AVE AND LINDSLEY AVE PM 95TH PERCENTILE QUEUE LENGTH

LINDSLEY WB APPROACH SCENARIO	LANE	STORAGE (FEET)	95TH PERCENTILE QUEUE LENGTH (FEET)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
Existing Two-Lane Approach	Westbound Through	--	25	40
	Westbound Right-Turn	75	35	53
Modified One-Lane Approach	Westbound Through/Right-Turn	--	85	143

In addition to the capacity analyses, KCI reviewed video footage of parking zone 1, shown in Figure 1, to determine the existing queue lengths of the westbound Lindsley Avenue approach. Parking zone 1 is approximately 125 feet east of the intersection of 2nd Avenue South and Lindsley Avenue. The queue lengths for the AM and PM peak hours were determined by watching the video footage to see how far the queue extended into parking zone 1. From the video review, it was determined

that for the AM peak hour, the maximum queue for the westbound approach was approximately 160 feet. For the PM peak hour, the maximum queue never extended into the video footage of parking zone 1.

SUMMARY

The capacity analyses results and video footage review for the westbound approach of Lindsley Avenue at 2nd Avenue South were analyzed to determine the associated impact of the bikeway to the existing westbound approach.

The capacity analyses indicate that the levels of service for a one-lane westbound approach in the AM and PM peak hours would remain the same as or slightly deteriorate from the existing two-lane approach scenario. The queue length results from the capacity analyses indicate that the queue lengths during the AM and PM peak hours would increase under a one-lane approach scenario. However, from the video footage review, it was determined that the actual existing queue lengths were less than the results from the capacity analyses.

From these results and other operational/safety factors, KCI recommends condensing the westbound Lindsley Avenue approach to a one-lane approach. The operational/safety factors involved in this recommendation are as follows:

- Lindsley Avenue is largely served by peak traffic in the AM peak hour – there is not a detrimental issue in the PM peak hour as there are alternative routes for motorists.
- If the existing dedicated right-turn lane remained, it would present multiple safety conflicts as it would be adjacent to a new bike lane and potentially a new pedestrian crosswalk.
- A one-lane approach would reduce conflict points as well as increase the visibility for bikes/pedestrians and turning motor vehicles at the intersection.
- The westbound bike lane approach should be designed to 'bend-in' to the intersection to reduce the likelihood of conflicts with right-turning motor vehicles.

In summary, based on the analyses conducted, no further recommendations are presented for the Lindsley Avenue westbound approach modification.

WESTBOUND INTERSTATE 40 OFF-RAMP APPROACH MODIFICATION AT 2ND AVENUE S

OVERVIEW

The existing westbound approach of the Interstate 40 off-ramp at 2nd Avenue South is signalized and contains one through lane with approximately 160 feet of storage, one through/right lane, and one right-turn lane. Although existing pedestrian curb ramps are provided, no crosswalk pavement markings are provided across the east leg of the intersection. Due to the speed of approaching motor vehicles, no right turn on red compliance was observed to be low. To improve pedestrian safety at the ramp approach and to slow motor vehicle speeds approaching the 2nd Avenue South and Lindsley Avenue intersection, located approximately 200 feet downstream, modification to the existing westbound approach of the Interstate 40 off-ramp at 2nd Avenue South include maintain the three-lane approach and reduce the turning radius, modifying the three-lane approach to two through lanes and one right-turn lane, condensing to a two-lane approach with one through/right lane and one right-turn lane, and condensing to a two-lane approach with one through lane and one right-turn lane. KCI utilized existing turning moving count data and analyzed the four proposed scenarios to determine the associated impact.

ANALYSIS

To determine the operation of the Interstate 40 off-ramp westbound approach for existing and modified scenarios, capacity analyses were performed for the AM and PM peak hours with existing counts and background counts. The capacity calculations were performed according to the methods outlined in the *Highway Capacity Manual*, 6th Edition.

In order to account for the traffic growth prior to the completion of the proposed bikeway, background traffic volumes were established. For the purpose of this analysis, the proposed bikeway was assumed to be completed by the year 2024, which is a 2-year horizon. Historical daily traffic volumes were obtained from one TDOT count station located in the vicinity of the project site. From 2017-2019, the traffic at this TDOT count station has increased by an average of 8.2% per year. The TDOT count station data is included in Appendix D.

A growth factor was applied to the existing peak hour traffic volumes to account for background growth for the future conditions. The existing peak hour traffic volumes at the intersection of 2nd Avenue South and Interstate 40 ramps were increased by 8.2% per year for two years to account for anticipated background traffic growth within the project area.

The results of the capacity analyses for the existing and modified conditions of the Interstate 40 off-ramp westbound approach are presented in Table 11 and Table 12. Capacity analyses worksheets are included in Appendix E.

TABLE 11. 2ND AVE S AND I-40 OFF-RAMP AM PEAK HOUR LEVELS OF SERVICE

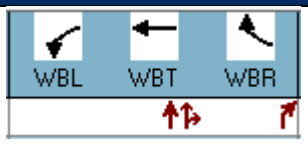
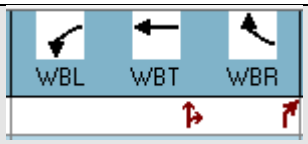
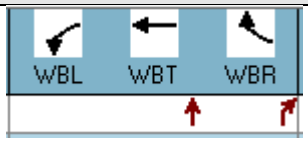
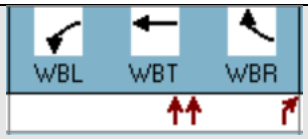
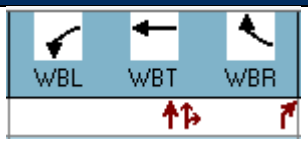
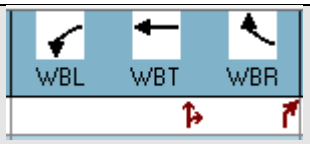
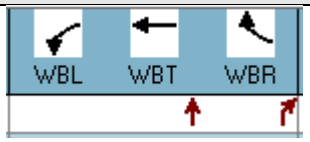
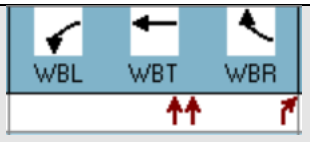
INTERSECTION	WB OFF-RAMP SCENARIO	SCENARIO LANEAGE	LEVEL OF SERVICE (Average Delay in sec/veh)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
2nd Ave S and I-40 Off-Ramp[1]	Existing Conditions		C (20.3)	C (22.8)
	Dual Right		C (24.0) **C (23.6)**	C (28.1) **C (27.7)**
	Thru and Right		C (25.5) **C (25.1)**	C (31.3) **C (30.6)**
	Two Thrus and One Right		C (25.2) **C (24.7)**	C (30.9) **C (30.2)**
	Note: 1 - HCM 2000 methods were used due to the incompatibility with NEMA phasing, which is not supported by HCM 6th Edition methods. "Right on Red" Scenario Results			

TABLE 12. 2ND AVE S AND I-40 OFF-RAMP
PM PEAK HOUR LEVELS OF SERVICE

INTERSECTION	WB OFF-RAMP SCENARIO	SCENARIO LANEAGE	LEVEL OF SERVICE (Average Delay in sec/veh)	
			EXISTING VOLUMES	BACKGROUND VOLUMES
2nd Ave S and I-40 Off-Ramp[1]	Existing Conditions		C (22.0)	C (23.1)
	Dual Right		C (25.6) **C (23.6)**	C (28.7) **C (26.5)**
	Thru and Right		C (25.6) **C (23.8)**	C (29.5) **C (26.9)**
	Two Thrus and One Right		C (25.0) **C (22.9)**	C (28.8) **C (26.0)**
	Note: 1 - HCM 2000 methods were used due to the incompatibility with NEMA phasing, which is not supported by HCM 6th Edition methods. "Right on Red" Scenario Results			

95th percentile queue lengths for the westbound approach of the Interstate 40 off-ramp at 2nd Avenue South were also analyzed under the existing and modified conditions. Table 13 and Table 14 indicate the results of the queue length analyses for the Lindsley Avenue westbound approach in the AM and PM peak hours.

TABLE 13. 2ND AVE S AND I-40 OFF-RAMP AM 95TH PERCENTILE QUEUE LENGTH

INTERSECTION	WB OFF-RAMP SCENARIO	LANE	STORAGE (FEET)	95TH PERCENTILE QUEUE LENGTH (FEET)	
				EXISTING VOLUMES	BACKGROUND VOLUMES
2nd Ave S and I-40 Off-Ramp	Existing Conditions	Westbound Through	665	225	259
		Westbound Right-Turn		242	279
	Dual Right	Westbound Through/Right	665	380 **366**	462 **453**
		Westbound Right-Turn		352 **336**	#454 **414**
	Thru and Right	Westbound Through	665	247 **247**	293 **293**
		Westbound Right-Turn		#486 **#466**	#620 **#603**
	Two Thrus and One Right	Westbound Through	665	115 **115**	134 **134**
		Westbound Right-Turn		#486 **#466**	#620 **#603**
	#: 95th percentile volume exceeds capacity, queue may be longer. "Right on Red" Scenario Results				

TABLE 14. 2ND AVE S AND I-40 OFF-RAMP PM 95TH PERCENTILE QUEUE LENGTH

INTERSECTION	WB OFF-RAMP SCENARIO	LANE	STORAGE (FEET)	95TH PERCENTILE QUEUE LENGTH (FEET)	
				EXISTING VOLUMES	BACKGROUND VOLUMES
2nd Ave S and I-40 Off-Ramp	Existing Conditions	Westbound Through	665	233	270
		Westbound Right-Turn		250	287
	Dual Right	Westbound Through/Right	665	393 **385**	#501 **#476**
		Westbound Right-Turn		360 **246**	#461 **351**
	Thru and Right	Westbound Through	665	284 **284**	336 **336**
		Westbound Right-Turn		#458 **317**	#581 **#478**
	Two Thrus and One Right	Westbound Through	665	133 **133**	154 **154**
		Westbound Right-Turn		#458 **317**	#581 **#478**
	#: 95th percentile volume exceeds capacity, queue may be longer. "Right on Red" Scenario Results				

SUMMARY

The levels of service and the 95th percentile queue lengths for the westbound approach of the Interstate 40 off-ramp at 2nd Avenue South were analyzed to determine the associated impact to the existing approach.

The capacity analyses indicate that the levels of service for the modified scenarios in the AM and PM peak hours would remain the same as or slightly deteriorate from the existing approach scenario. The queue length results from the capacity analyses indicate that the queue lengths during the AM and PM peak hours would increase under the modified approach scenarios, in some instances increasing to the mainline interstate travel lanes.

From these results and other operational/safety factors, KCI recommends keeping the existing westbound Interstate 40 off-ramp approach as is. KCI also recommends the following improvements as alternatives to modifying the existing approach:

- Reduce curb radii in the northeast corner of the intersection to slow turning traffic movements and reduce pedestrian crossing distances. As a temporary measure, the curb radius can be reduced with a painted edgeline and contrasting surface treatment in the extra space created by the reduction of curb radii.
- Install dynamic right-turn on red restriction signs for the westbound approach to improve motorist compliance at the intersection.

In summary, based on the analyses conducted, no further recommendations are presented for the Interstate 40 off-ramp westbound approach modification.

CONTROLLED PEDESTRIAN/BICYCLE CROSSING OPTIONS FOR LINDSLEY AVENUE AT 2ND AVENUE S AND HERMITAGE AVENUE

OVERVIEW

The Lindsley Avenue project termini intersects two multilane roadways with high speeds and long pedestrian/bicycle crossing movements at 2nd Avenue South and Hermitage Avenue. No traffic control is provided for either intersecting street. The Lindsley Avenue and 2nd Avenue South intersection is located approximately 200 feet from the adjacent westbound Interstate 40 off-ramp signalized intersection and contains three one-way travel lanes of approximately 36 feet in width. The closet adjacent pedestrian crossing opportunity is located approximately 350 feet to the north at the uncontrolled 2nd Avenue South and Ash Street intersection. The Lindsley Avenue and Hermitage Avenue intersection is located approximately 1,150 feet from the adjacent Middleton Street signalized intersection and contains three alternating direction travel lanes of approximately 36 feet in width. The closest adjacent pedestrian crossing opportunity is located at the signalized Middleton Street intersection.

ALTERNATIVES TO CONSIDER

As growth in the area accelerates, the need to provide a safe pedestrian/bicycle crossing at each intersection is critical for connecting the proposed Lindsley Avenue bikeway to adjacent facilities such as 3rd Avenue South and Division Street to the west and the Rolling Mill Hill Greenway to the east. KCI recommends the following alternatives to consider at each intersection:

<u>Lindsley Avenue and 2nd Avenue South</u>

- Install an overhead Pedestrian Hybrid Beacon (PHB) for the northbound 2nd Avenue South approach. Additional pedestrian push button poles or bicycle friendly detection devices (where feasible) should also be installed in each corner of the intersection. Operation of the PHB should be designed as follows:
    - Upon actuation by the nonmotorized user, the yellow change interval at the upstream signalized intersection of 2nd Avenue South and the westbound Interstate 40 off-ramp should be timed to coincide with the flashing yellow indications of the PHB.
    - This allows vehicular traffic to clear the crossing while the red indication of the PHB is displayed.
    - The proposed dynamic right-turn on red restriction signs for the westbound Interstate 40 off-ramp should be activated during the red indication of the PHB.
    - A nonmotorized user would receive a walk signal while an LED warning light embedded sign (R10-15) will be displayed for the Lindsley Avenue westbound right turns and eastbound left turns.
    - This signal timing strategy could reduce conflicts, improve PHB compliance for motorists, and provide nonmotorized users a natural gap in traffic to cross 2nd Avenue

South.

- In addition to crosswalk pavement markings at the intersection, various gateway treatments could be considered such as in-ground warning lights, LED warning light embedded signs, rumble strip pavement markings, or lane line hardening devices approaching the crossing location.

** It should be noted that specific details will be determined during detailed design.*

Lindsley Avenue and Hermitage Avenue

- The Rolling Mill Hill Greenway terminates at Middleton Street. Sufficient existing right of way may allow for the widening of the existing sidewalk on the east side of Middleton Street and on the north side of Hermitage Avenue to provide a minimum shared use path of 8 feet in width to connect to the Lindsley Avenue intersection.
- Additionally, improvements to this intersection may coincide with changes to parcels located on the north side of Hermitage Avenue. An application submitted in April 2022 indicate that Metro intends to acquire the State of Tennessee owned property at 88 Hermitage Avenue which is adjacent to an MDHA owned property on the east side of Middleton Street. Further modifications may include eliminating the Anthes Drive leg of the intersection or providing a median refuge island in conjunction with crossing improvements.
- A PHB or other active warning devices such as overhead rectangular rapid flashing beacons (RRFBs) should be considered if a conventional traffic signal is not warranted with any new development on the north side of the intersection.

** It should be noted that specific details will be determined during detailed design.*

APPENDICES

APPENDIX A
PARKING COUNT DATA

APPENDIX B
LINDSLEY AVENUE TDOT COUNT DATA

APPENDIX C
LINDSLEY AVENUE WESTBOUND CAPACITY ANALYSES

APPENDIX D
I-40 OFF-RAMP TDOT COUNT DATA

APPENDIX E
I-40 OFF-RAMP WESTBOUND CAPACITY ANALYSES

APPENDIX A
PARKING COUNT DATA

	ZONE 1 (NORTH)			ZONE 1 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
6:00-6:15am	0	0	3	0	0	0
6:15-6:30am	1	1	4	0	0	0
6:30-6:45am	0	0	3	0	0	0
6:45-7:00am	0	0	3	0	0	0
7:00-7:15am	0	0	3	0	0	0
7:15-7:30am	0	0	3	0	0	0
7:30-7:45am	0	0	3	0	0	0
7:45-8:00am	0	0	3	0	0	0
8:00-8:15am	0	0	3	0	0	0
8:15-8:30am	0	0	3	0	0	0
8:30-8:45am	0	0	3	0	0	0
8:45-9:00am	0	0	3	0	0	0
9:00-9:15am	1	1	4	0	0	0
9:15-9:30am	0	0	3	1	1	1
9:30-9:45am	0	0	3	0	0	0
9:45-10:00am	1	0	4	0	0	0
10:00-10:15am	0	1	4	0	0	0
10:15-10:30am	0	0	3	0	0	0
10:30-10:45am	0	0	3	0	0	0
10:45-11:00am	0	0	3	0	0	0
11:00-11:15am	0	0	3	0	0	0
11:15-11:30am	0	0	3	0	0	0
11:30-11:45am	1	0	4	0	0	0
11:45-12:00pm	0	1	4	0	0	0
12:00-12:15pm	0	0	3	0	0	0
12:15-12:30pm	1	0	4	0	0	0
12:30-12:45pm	0	1	4	0	0	0
12:45-1:00pm	0	0	3	0	0	0
1:00-1:15pm	0	0	3	0	0	0
1:15-1:30pm	0	1	3	0	0	0
1:30-1:45pm	0	0	2	0	0	0
1:45-2:00pm	0	0	2	0	0	0
2:00-2:15pm	0	0	2	0	0	0
2:15-2:30pm	1	1	3	0	0	0
2:30-2:45pm	0	1	2	0	0	0
2:45-3:00pm	0	1	1	0	0	0
3:00-3:15pm	0	0	0	0	0	0
3:15-3:30pm	0	0	0	0	0	0
3:30-3:45pm	0	0	0	0	0	0
3:45-4:00pm	0	0	0	0	0	0

	ZONE 1 (NORTH)			ZONE 1 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
4:00-4:15pm	0	0	0	0	0	0
4:15-4:30pm	0	0	0	0	0	0
4:30-4:45pm	0	0	0	0	0	0
4:45-5:00pm	0	0	0	0	0	0
5:00-5:15pm	0	0	0	0	0	0
5:15-5:30pm	0	0	0	0	0	0
5:30-5:45pm	0	0	0	0	0	0
5:45-6:00pm	0	0	0	0	0	0
6:00-6:15pm	0	0	0	0	0	0
6:15-6:30pm	0	0	0	0	0	0
6:30-6:45pm	0	0	0	0	0	0
6:45-7:00pm	0	0	0	0	0	0
TOTAL	6	9	52	1	1	1

	ZONE 2 (NORTH)			ZONE 2 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
6:00-6:15am	0	0	0	0	0	0
6:15-6:30am	2	2	2	0	0	0
6:30-6:45am	1	0	1	0	0	0
6:45-7:00am	2	0	3	0	0	0
7:00-7:15am	0	0	3	0	0	0
7:15-7:30am	0	0	3	0	0	0
7:30-7:45am	0	0	3	0	0	0
7:45-8:00am	0	0	3	0	0	0
8:00-8:15am	0	0	3	1	1	1
8:15-8:30am	0	0	3	0	0	0
8:30-8:45am	0	0	3	1	1	1
8:45-9:00am	0	0	3	0	0	0
9:00-9:15am	0	0	3	1	1	1
9:15-9:30am	0	0	3	1	1	1
9:30-9:45am	0	0	3	0	0	0
9:45-10:00am	0	0	3	0	0	0
10:00-10:15am	0	0	3	0	0	0
10:15-10:30am	0	0	3	0	0	0
10:30-10:45am	0	0	3	0	0	0
10:45-11:00am	0	0	3	0	0	0
11:00-11:15am	0	0	3	0	0	0
11:15-11:30am	0	0	3	1	0	1
11:30-11:45am	0	0	3	0	0	1
11:45-12:00pm	0	0	3	0	1	1
12:00-12:15pm	0	0	3	0	0	0
12:15-12:30pm	0	0	3	0	0	0
12:30-12:45pm	0	0	3	1	0	1
12:45-1:00pm	0	0	3	0	0	1
1:00-1:15pm	0	0	3	0	1	1
1:15-1:30pm	0	0	3	0	0	0
1:30-1:45pm	0	0	3	0	0	0
1:45-2:00pm	0	0	3	0	0	0
2:00-2:15pm	0	0	3	0	0	0
2:15-2:30pm	0	0	3	0	0	0
2:30-2:45pm	0	0	3	0	0	0
2:45-3:00pm	0	0	3	0	0	0
3:00-3:15pm	0	0	3	0	0	0
3:15-3:30pm	0	1	3	0	0	0
3:30-3:45pm	0	0	2	0	0	0
3:45-4:00pm	0	2	2	0	0	0

	ZONE 2 (NORTH)			ZONE 2 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
4:00-4:15pm	0	0	0	0	0	0
4:15-4:30pm	0	0	0	0	0	0
4:30-4:45pm	0	0	0	0	0	0
4:45-5:00pm	0	0	0	0	0	0
5:00-5:15pm	0	0	0	0	0	0
5:15-5:30pm	0	0	0	0	0	0
5:30-5:45pm	0	0	0	0	0	0
5:45-6:00pm	0	0	0	0	0	0
6:00-6:15pm	0	0	0	0	0	0
6:15-6:30pm	0	0	0	0	0	0
6:30-6:45pm	0	0	0	0	0	0
6:45-7:00pm	0	0	0	0	0	0
TOTAL	5	5	82	6	6	9

	ZONE 3 (NORTH)			ZONE 3 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
6:00-6:15am	0*	0*	0*	0*	0*	0*
6:15-6:30am	0*	0*	0*	0*	0*	0*
6:30-6:45am	0*	0*	0*	0*	0*	0*
6:45-7:00am	0	0	0	0	0	0
7:00-7:15am	0	0	0	0	0	0
7:15-7:30am	0	0	0	0	0	0
7:30-7:45am	0	0	0	0	0	0
7:45-8:00am	0	0	0	0	0	0
8:00-8:15am	1	1	1	0	0	0
8:15-8:30am	0	0	0	1	1	1
8:30-8:45am	0	0	0	0	0	0
8:45-9:00am	0	0	0	0	0	0
9:00-9:15am	0	0	0	2	1	2
9:15-9:30am	0	0	0	0	0	1
9:30-9:45am	0	0	0	0	0	1
9:45-10:00am	0	0	0	0	0	1
10:00-10:15am	1	0	1	0	0	1
10:15-10:30am	0	0	1	0	0	1
10:30-10:45am	0	0	1	0	1	1
10:45-11:00am	0	0	1	0	0	0
11:00-11:15am	0	0	1	0	0	0
11:15-11:30am	0	0	1	0	0	0
11:30-11:45am	0	0	1	0	0	0
11:45-12:00pm	0	1	1	0	0	0
12:00-12:15pm	0	0	0	0	0	0
12:15-12:30pm	0	0	0	0	0	0
12:30-12:45pm	0	0	0	0	0	0
12:45-1:00pm	0	0	0	0	0	0
1:00-1:15pm	1	0	1	0	0	0
1:15-1:30pm	0	0	1	0	0	0
1:30-1:45pm	0	0	1	1	1	1
1:45-2:00pm	0	0	1	1	0	1
2:00-2:15pm	0	0	1	0	1	1
2:15-2:30pm	0	0	1	0	0	0
2:30-2:45pm	0	0	1	0	0	0
2:45-3:00pm	0	0	1	0	0	0
3:00-3:15pm	0	0	1	0	0	0
3:15-3:30pm	0	0	1	0	0	0
3:30-3:45pm	0	1	1	0	0	0
3:45-4:00pm	0	0	0	0	0	0

	ZONE 3 (NORTH)			ZONE 3 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
4:00-4:15pm	0	0	0	0	0	0
4:15-4:30pm	1	0	1	0	0	0
4:30-4:45pm	0	0	1	0	0	0
4:45-5:00pm	0	1	1	0	0	0
5:00-5:15pm	0	0	0	0	0	0
5:15-5:30pm	0	0	0	0	0	0
5:30-5:45pm	0	0	0	0	0	0
5:45-6:00pm	0	0	0	0	0	0
6:00-6:15pm	0	0	0	0	0	0
6:15-6:30pm	0	0	0	0	0	0
6:30-6:45pm	0	0	0	0	0	0
6:45-7:00pm	0	0	0	0	0	0
TOTAL	4	4	23	5	5	12

*Dark lighting, hard to verify parking movements
Time period- construction taking place

	ZONE 4 (NORTH)			ZONE 4 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
6:00-6:15am	0	0	2	0	0	0
6:15-6:30am	1	1	3	0	0	0
6:30-6:45am	0	0	2	1	1	1
6:45-7:00am	0	0	2	0	0	0
7:00-7:15am	0	0	2	0	0	0
7:15-7:30am	0	0	2	0	0	0
7:30-7:45am	0	0	2	0	0	0
7:45-8:00am	0	0	2	0	0	0
8:00-8:15am	1	0	3	2	2	2
8:15-8:30am	0	0	3	0	0	0
8:30-8:45am	0	0	3	0	0	0
8:45-9:00am	2	1	5	0	0	0
9:00-9:15am	0	0	4	3	2	3
9:15-9:30am	1	1	5	1	1	2
9:30-9:45am	0	0	4	1	2	2
9:45-10:00am	3	2	7	3	1	3
10:00-10:15am	0	0	5	0	2	2
10:15-10:30am	0	0	5	0	0	0
10:30-10:45am	0	0	5	0	0	0
10:45-11:00am	0	0	5	0	0	0
11:00-11:15am	1	1	6	0	0	0
11:15-11:30am	0	0	5	0	0	0
11:30-11:45am	1	0	6	0	0	0
11:45-12:00pm	0	0	6	0	0	0
12:00-12:15pm	0	0	6	0	0	0
12:15-12:30pm	0	0	6	0	0	0
12:30-12:45pm	0	0	6	0	0	0
12:45-1:00pm	0	0	6	0	0	0
1:00-1:15pm	0	0	6	0	0	0
1:15-1:30pm	0	0	6	0	0	0
1:30-1:45pm	0	3	6	0	0	0
1:45-2:00pm	0	0	3	0	0	0
2:00-2:15pm	0	0	3	0	0	0
2:15-2:30pm	1	0	4	0	0	0
2:30-2:45pm	0	1	4	0	0	0
2:45-3:00pm	0	0	3	1	1	1
3:00-3:15pm	0	0	3	0	0	0
3:15-3:30pm	0	0	3	0	0	0
3:30-3:45pm	0	1	3	0	0	0
3:45-4:00pm	0	0	2	0	0	0

	ZONE 4 (NORTH)			ZONE 4 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
4:00-4:15pm	0	0	2	1	0	1
4:15-4:30pm	0	0	2	0	0	1
4:30-4:45pm	0	0	2	0	1	1
4:45-5:00pm	2	0	4	0	0	0
5:00-5:15pm	1	1	5	1	1	1
5:15-5:30pm	0	0	4	0	0	0
5:30-5:45pm	1	0	5	0	0	0
5:45-6:00pm	0	1	5	1	0	1
6:00-6:15pm	0	1	4	0	1	1
6:15-6:30pm	0	0	3	0	0	0
6:30-6:45pm	0	0	3	0	0	0
6:45-7:00pm	0	0	3	0	0	0
TOTAL	15	14	206	15	15	22
Time period- construction taking place						

	ZONE 5 (NORTH)			ZONE 5 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
6:00-6:15am	0	0	6	0	0	5
6:15-6:30am	0	0	6	0	0	5
6:30-6:45am	0	0	6	0	0	5
6:45-7:00am	0	0	6	0	0	5
7:00-7:15am	0	0	6	0	0	5
7:15-7:30am	0	1	6	0	1	5
7:30-7:45am	0	0	5	0	1	4
7:45-8:00am	2	0	7	0	0	3
8:00-8:15am	0	0	7	0	0	3
8:15-8:30am	0	1	7	0	0	3
8:30-8:45am	0	0	6	0	0	3
8:45-9:00am	0	1	6	0	0	3
9:00-9:15am	0	0	5	0	0	3
9:15-9:30am	0	0	5	0	0	3
9:30-9:45am	0	0	5	1	0	4
9:45-10:00am	1	0	6	0	0	4
10:00-10:15am	0	0	6	1	0	5
10:15-10:30am	0	0	6	0	0	5
10:30-10:45am	0	0	6	1	0	6
10:45-11:00am	0	0	6	0	0	6
11:00-11:15am	0	0	6	0	1	6
11:15-11:30am	0	0	6	0	1	5
11:30-11:45am	1	0	7	1	1	5
11:45-12:00pm	0	0	7	1	0	5
12:00-12:15pm	0	0	7	0	1	5
12:15-12:30pm	0	0	7	0	0	4
12:30-12:45pm	0	0	7	0	0	4
12:45-1:00pm	0	0	7	0	0	4
1:00-1:15pm	0	0	7	0	0	4
1:15-1:30pm	0	0	7	0	0	4
1:30-1:45pm	0	1	7	0	0	4
1:45-2:00pm	0	0	6	0	0	4
2:00-2:15pm	0	1	6	0	0	4
2:15-2:30pm	1	0	6	0	0	4
2:30-2:45pm	0	2	6	0	1	4
2:45-3:00pm	1	0	5	1	1	4
3:00-3:15pm	0	0	5	0	0	3
3:15-3:30pm	0	1	5	0	0	3
3:30-3:45pm	0	0	4	0	0	3
3:45-4:00pm	0	0	4	0	0	3

	ZONE 5 (NORTH)			ZONE 5 (SOUTH)		
Time Period	Arrivals	Departures	Cumulative Parked Cars	Arrivals	Departures	Cumulative Parked Cars
4:00-4:15pm	0	0	4	0	0	3
4:15-4:30pm	0	0	4	0	0	3
4:30-4:45pm	0	0	4	2	2	5
4:45-5:00pm	3	2	7	0	0	3
5:00-5:15pm	1	1	6	1	0	4
5:15-5:30pm	0	0	5	0	0	4
5:30-5:45pm	0	0	5	0	0	4
5:45-6:00pm	0	1	5	0	0	4
6:00-6:15pm	0	3	4	0	1	4
6:15-6:30pm	0	0	1	0	0	3
6:30-6:45pm	0	0	1	0	0	3
6:45-7:00pm	0	0	1	1	1	4
TOTAL	10	15	288	10	12	211

APPENDIX B
LINDSLEY AVENUE TDOT COUNT DATA

LINDSLEY AVENUE TDOT AADT DATA

Station	420	46R	157
Route	5th Ave S	I-40 WB Ramp	Lafayette St
Location	Northwest of the Intersection of 2nd Ave S and Lindsley Ave	East of the intersection of 2nd Ave S and I-40 WB Ramps	West of the intersection of 2nd Ave S and Lindsley Ave
County	Davidson	Davidson	Davidson
2019	2,421	10,880	14,229
2018	1,439	9,870	13,327
2017	1,984	9,293	15,533
2016	1,964	8,260	13,794
2015	1,945	9,697	13,774
2014	1,897	8,296	13,235
2013	929	8,778	10,267
2012	1,356	8,484	11,613
2011	1,451	7,561	12,329
2010	1,541	6,853	14,334
2009	1,664	6,892	13,965
2008	2,222	9,115	14,068
2007	2,157	7,976	12,905

APPENDIX C
LINDSLEY AVENUE WESTBOUND CAPACITY ANALYSES

Intersection	
Int Delay, s/veh	21.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	18	0	0	47	216	30	1585	339	0	0	0
Future Vol, veh/h	6	18	0	0	47	216	30	1585	339	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	75	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	1065	472	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	20	0	0	51	235	33	1723	368	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	781	2157	-	-	1973	1046	0	0	0
Stage 1	0	0	-	-	1973	-	-	-	-
Stage 2	781	2157	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	343	47	0	0	62	~ 193	-	-	-
Stage 1	-	-	0	0	106	-	-	-	-
Stage 2	321	86	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	47	-	-	62	~ 193	-	-	-
Mov Cap-2 Maneuver	-	47	-	-	62	-	-	-	-
Stage 1	-	-	-	-	106	-	-	-	-
Stage 2	-	86	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		182.9	
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2
Capacity (veh/h)	-	-	-	-	62	193
HCM Lane V/C Ratio	-	-	-	-	0.824	1.216
HCM Control Delay (s)	-	-	-	-	175.4	184.5
HCM Lane LOS	-	-	-	-	F	F
HCM 95th %tile Q(veh)	-	-	-	-	3.7	12.4

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

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	96	0	0	29	90	26	1257	169	0	0	0
Future Vol, veh/h	6	96	0	0	29	90	26	1257	169	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	75	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	0	65472
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	104	0	0	32	98	28	1366	184	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	618	1606	-	-	1514	775	0	0	0
Stage 1	0	0	-	-	1514	-	-	-	-
Stage 2	618	1606	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	425	~ 104	0	0	119	292	-	-	-
Stage 1	-	-	0	0	181	-	-	-	-
Stage 2	404	163	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	225	~ 104	-	-	119	292	-	-	-
Mov Cap-2 Maneuver	225	~ 104	-	-	119	-	-	-	-
Stage 1	-	-	-	-	181	-	-	-	-
Stage 2	222	163	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	172.3	28.9	
HCM LOS	F	D	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2
Capacity (veh/h)	-	-	-	107	119	292
HCM Lane V/C Ratio	-	-	-	1.036	0.265	0.335
HCM Control Delay (s)	-	-	-	172.3	45.8	23.4
HCM Lane LOS	-	-	-	F	E	C
HCM 95th %tile Q(veh)	-	-	-	6.7	1	1.4

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

Intersection	
Int Delay, s/veh	64

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	18	0	0	47	216	30	1585	339	0	0	0
Future Vol, veh/h	6	18	0	0	47	216	30	1585	339	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	108	106	5472
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	20	0	0	51	235	33	1723	368	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	781	2157	-	-	1973	1046	0	0	0
Stage 1	0	0	-	-	1973	-	-	-	-
Stage 2	781	2157	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	343	47	0	0	62	~ 193	-	-	-
Stage 1	-	-	0	0	106	-	-	-	-
Stage 2	321	86	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	47	-	-	62	~ 193	-	-	-
Mov Cap-2 Maneuver	-	47	-	-	62	-	-	-	-
Stage 1	-	-	-	-	106	-	-	-	-
Stage 2	-	86	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		$ 545.5	
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	-	140
HCM Lane V/C Ratio	-	-	-	-	2.042
HCM Control Delay (s)	-	-	-	-	$ 545.5
HCM Lane LOS	-	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	-	22.9

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

Intersection	
Int Delay, s/veh	13.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	96	0	0	29	90	26	1257	169	0	0	0
Future Vol, veh/h	6	96	0	0	29	90	26	1257	169	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	108	106	5472
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	104	0	0	32	98	28	1366	184	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	618	1606	-	-	1514	775	0	0	0
Stage 1	0	0	-	-	1514	-	-	-	-
Stage 2	618	1606	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	425	~ 104	0	0	119	292	-	-	-
Stage 1	-	-	0	0	181	-	-	-	-
Stage 2	404	163	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	225	~ 104	-	-	119	292	-	-	-
Mov Cap-2 Maneuver	225	~ 104	-	-	119	-	-	-	-
Stage 1	-	-	-	-	181	-	-	-	-
Stage 2	222	163	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	172.3	43.8	
HCM LOS	F	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	107	216
HCM Lane V/C Ratio	-	-	-	1.036	0.599
HCM Control Delay (s)	-	-	-	172.3	43.8
HCM Lane LOS	-	-	-	F	E
HCM 95th %tile Q(veh)	-	-	-	6.7	3.4

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

Intersection	
Int Delay, s/veh	45

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	20	0	0	53	243	34	1781	381	0	0	0
Future Vol, veh/h	7	20	0	0	53	243	34	1781	381	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	75	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	108	106	54
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	22	0	0	58	264	37	1936	414	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	877	2424	-	-	2217	1175	0	0	0
Stage 1	0	0	-	-	2217	-	-	-	-
Stage 2	877	2424	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	302	32	0	0	~ 43	~ 158	-	-	-
Stage 1	-	-	0	0	80	-	-	-	-
Stage 2	280	62	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	32	-	-	~ 43	~ 158	-	-	-
Mov Cap-2 Maneuver	-	32	-	-	~ 43	-	-	-	-
Stage 1	-	-	-	-	80	-	-	-	-
Stage 2	-	62	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		$ 383.1	
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2
Capacity (veh/h)	-	-	-	-	43	158
HCM Lane V/C Ratio	-	-	-	-	1.34	1.672
HCM Control Delay (s)	-	-	-	-	$ 402.5	$ 378.9
HCM Lane LOS	-	-	-	-	F	F
HCM 95th %tile Q(veh)	-	-	-	-	5.7	18.6

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

Intersection	
Int Delay, s/veh	27

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	108	0	0	33	101	29	1412	190	0	0	0
Future Vol, veh/h	7	108	0	0	33	101	29	1412	190	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	75	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	108	106	5472	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	117	0	0	36	110	32	1535	207	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	696	1806	-	-	1703	871	0	0	0
Stage 1	0	0	-	-	1703	-	-	-	-
Stage 2	696	1806	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	384	~ 78	0	0	91	253	-	-	-
Stage 1	-	-	0	0	146	-	-	-	-
Stage 2	362	129	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	151	~ 78	-	-	91	253	-	-	-
Mov Cap-2 Maneuver	151	~ 78	-	-	91	-	-	-	-
Stage 1	-	-	-	-	146	-	-	-	-
Stage 2	155	129	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	$ 394.9	39.2	
HCM LOS	F	E	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2
Capacity (veh/h)	-	-	-	80	91	253
HCM Lane V/C Ratio	-	-	-	1.562	0.394	0.434
HCM Control Delay (s)	-	-	-	$ 394.9	68.2	29.7
HCM Lane LOS	-	-	-	F	F	D
HCM 95th %tile Q(veh)	-	-	-	10.2	1.6	2.1

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

Intersection	
Int Delay, s/veh	116.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	20	0	0	53	243	34	1781	381	0	0	0
Future Vol, veh/h	7	20	0	0	53	243	34	1781	381	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	1081	1065	472	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	22	0	0	58	264	37	1936	414	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	877	2424	-	-	2217	1175	0	0	0
Stage 1	0	0	-	-	2217	-	-	-	-
Stage 2	877	2424	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	302	32	0	0	~ 43	~ 158	-	-	-
Stage 1	-	-	0	0	80	-	-	-	-
Stage 2	280	62	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	-	32	-	-	~ 43	~ 158	-	-	-
Mov Cap-2 Maneuver	-	32	-	-	~ 43	-	-	-	-
Stage 1	-	-	-	-	80	-	-	-	-
Stage 2	-	62	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s		$ 989.6	
HCM LOS	-	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	-	107
HCM Lane V/C Ratio	-	-	-	-	3.007
HCM Control Delay (s)	-	-	-	-	$ 989.6
HCM Lane LOS	-	-	-	-	F
HCM 95th %tile Q(veh)	-	-	-	-	30.8

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

Intersection	
Int Delay, s/veh	30

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	108	0	0	33	101	29	1412	190	0	0	0
Future Vol, veh/h	7	108	0	0	33	101	29	1412	190	0	0	0
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	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	108	1065	472	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	117	0	0	36	110	32	1535	207	0	0	0

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	696	1806	-	-	1703	871	0	0	0
Stage 1	0	0	-	-	1703	-	-	-	-
Stage 2	696	1806	-	-	0	-	-	-	-
Critical Hdwy	6.44	6.54	-	-	6.54	7.14	5.34	-	-
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-
Critical Hdwy Stg 2	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.82	4.02	-	-	4.02	3.92	3.12	-	-
Pot Cap-1 Maneuver	384	~ 78	0	0	91	253	-	-	-
Stage 1	-	-	0	0	146	-	-	-	-
Stage 2	362	129	0	0	-	-	-	-	-
Platoon blocked, %								-	-
Mov Cap-1 Maneuver	151	~ 78	-	-	91	253	-	-	-
Mov Cap-2 Maneuver	151	~ 78	-	-	91	-	-	-	-
Stage 1	-	-	-	-	146	-	-	-	-
Stage 2	155	129	-	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	$ 394.9	82.2	
HCM LOS	F	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1
Capacity (veh/h)	-	-	-	80	176
HCM Lane V/C Ratio	-	-	-	1.562	0.828
HCM Control Delay (s)	-	-	-	$ 394.9	82.2
HCM Lane LOS	-	-	-	F	F
HCM 95th %tile Q(veh)	-	-	-	10.2	5.7

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

APPENDIX D
I-40 RAMP TDOT COUNT DATA

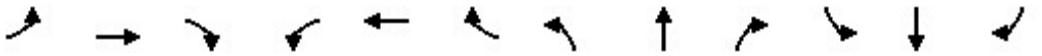
I-40 RAMP TDOT AADT DATA

Station	46R
Route	I-40 WB Ramp
Location	East of the intersection of 2nd Ave S and I-40 WB Ramps
County	Davidson
2019	10,880
2018	9,870
2017	9,293
2016	8,260
2015	9,697
2014	8,296
2013	8,778
2012	8,484
2011	7,561
2010	6,853
2009	6,892
2008	9,115
2007	7,976

APPENDIX E
I-40 RAMP WESTBOUND CAPACITY ANALYSES

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	498	227	1915
v/c Ratio	0.66	0.66	0.56
Control Delay	44.7	49.5	12.1
Queue Delay	0.0	0.0	0.0
Total Delay	44.7	49.5	12.1
Queue Length 50th (ft)	194	178	251
Queue Length 95th (ft)	225	242	386
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1081	492	3390
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.46	0.46	0.56

Intersection Summary



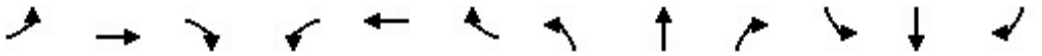
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.91	0.91		0.91				
Frt					0.93	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3167	1441		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3167	1441		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	12	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	498	227	0	1903	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					28.8	28.8		80.2				
Effective Green, g (s)					28.8	28.8		80.2				
Actuated g/C Ratio					0.24	0.24		0.67				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					760	345		3377				
v/s Ratio Prot					0.16	c0.16		c0.38				
v/s Ratio Perm												
v/c Ratio					0.66	0.66		0.56				
Uniform Delay, d1					41.1	41.2		10.6				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.3	5.0		0.7				
Delay (s)					43.4	46.1		11.3				
Level of Service					D	D		B				
Approach Delay (s)		0.0			44.2			11.3			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	456	207	1358
v/c Ratio	0.66	0.67	0.38
Control Delay	50.7	56.5	8.1
Queue Delay	0.0	0.0	0.0
Total Delay	50.7	56.5	8.1
Queue Length 50th (ft)	195	178	137
Queue Length 95th (ft)	233	250	209
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	958	432	3549
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.48	0.48	0.38

Intersection Summary



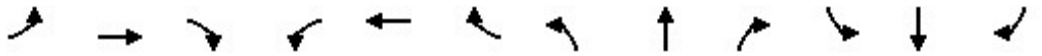
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.91	0.91		0.91				
Frt					0.94	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3193	1441		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3193	1441		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	456	207	0	1322	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					28.1	28.1		90.9				
Effective Green, g (s)					28.1	28.1		90.9				
Actuated g/C Ratio					0.22	0.22		0.70				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					690	311		3511				
v/s Ratio Prot					0.14	c0.14		c0.26				
v/s Ratio Perm												
v/c Ratio					0.66	0.67		0.38				
Uniform Delay, d1					46.6	46.6		8.0				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.6	5.8		0.3				
Delay (s)					49.2	52.5		8.3				
Level of Service					D	D		A				
Approach Delay (s)		0.0			50.2			8.3			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	382	343	1915
v/c Ratio	0.78	0.79	0.61
Control Delay	50.3	52.6	15.5
Queue Delay	0.0	0.0	0.0
Total Delay	50.3	52.6	15.5
Queue Length 50th (ft)	282	254	312
Queue Length 95th (ft)	380	352	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	580	513	3148
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.66	0.67	0.61

Intersection Summary



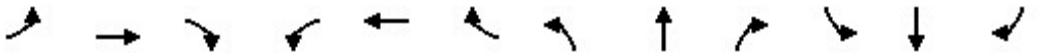
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.96	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1698	1504		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1698	1504		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	382	343	0	1902	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					34.6	34.6		74.4				
Effective Green, g (s)					34.6	34.6		74.4				
Actuated g/C Ratio					0.29	0.29		0.62				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					489	433		3133				
v/s Ratio Prot					0.22	c0.23		c0.38				
v/s Ratio Perm												
v/c Ratio					0.78	0.79		0.61				
Uniform Delay, d1					39.2	39.4		13.9				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					8.4	10.1		0.9				
Delay (s)					47.6	49.5		14.8				
Level of Service					D	D		B				
Approach Delay (s)		0.0			48.5			14.8			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	352	311	1358
v/c Ratio	0.79	0.80	0.41
Control Delay	58.2	60.5	10.3
Queue Delay	0.0	0.0	0.0
Total Delay	58.2	60.5	10.3
Queue Length 50th (ft)	287	254	170
Queue Length 95th (ft)	393	360	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	514	451	3342
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.68	0.69	0.41

Intersection Summary



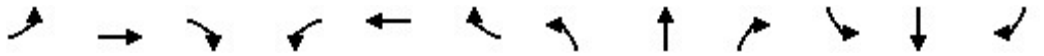
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.97	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1715	1504		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1715	1504		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	352	311	0	1316	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					33.6	33.6		85.4				
Effective Green, g (s)					33.6	33.6		85.4				
Actuated g/C Ratio					0.26	0.26		0.66				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					443	388		3299				
v/s Ratio Prot					0.21	c0.21		c0.26				
v/s Ratio Perm												
v/c Ratio					0.79	0.80		0.40				
Uniform Delay, d1					45.0	45.1		10.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					10.0	11.9		0.4				
Delay (s)					55.0	57.0		10.7				
Level of Service					D	E		B				
Approach Delay (s)		0.0			55.9			10.7			0.0	
Approach LOS		A			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	382	343	1915
v/c Ratio	0.78	0.78	0.60
Control Delay	48.7	49.9	15.0
Queue Delay	0.0	0.0	0.0
Total Delay	48.7	49.9	15.0
Queue Length 50th (ft)	272	242	305
Queue Length 95th (ft)	366	336	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	591	526	3180
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.65	0.65	0.60

Intersection Summary



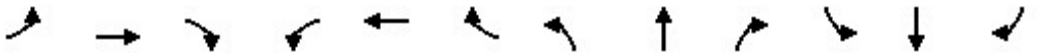
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.96	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1698	1504		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1698	1504		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	12	14	0	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	370	329	0	1902	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					33.8	33.8		75.2				
Effective Green, g (s)					33.8	33.8		75.2				
Actuated g/C Ratio					0.28	0.28		0.63				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					478	423		3167				
v/s Ratio Prot					0.22	c0.22		c0.38				
v/s Ratio Perm												
v/c Ratio					0.77	0.78		0.60				
Uniform Delay, d1					39.6	39.7		13.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					8.1	9.3		0.9				
Delay (s)					47.7	48.9		14.3				
Level of Service					D	D		B				
Approach Delay (s)		0.0			48.3			14.3			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	352	311	1358
v/c Ratio	0.79	0.66	0.40
Control Delay	56.9	31.7	10.1
Queue Delay	0.0	0.0	0.0
Total Delay	56.9	31.7	10.1
Queue Length 50th (ft)	281	148	167
Queue Length 95th (ft)	385	246	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	521	537	3360
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.68	0.58	0.40

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.97	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1715	1504		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1715	1504		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	92	0	41	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	345	219	0	1317	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					33.1	33.1		85.9				
Effective Green, g (s)					33.1	33.1		85.9				
Actuated g/C Ratio					0.25	0.25		0.66				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					436	382		3318				
v/s Ratio Prot					c0.20	0.15		c0.26				
v/s Ratio Perm												
v/c Ratio					0.79	0.57		0.40				
Uniform Delay, d1					45.2	42.3		10.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					9.9	2.5		0.4				
Delay (s)					55.1	44.8		10.5				
Level of Service					E	D		B				
Approach Delay (s)		0.0			50.3			10.5			0.0	
Approach LOS		A			D			B			A	

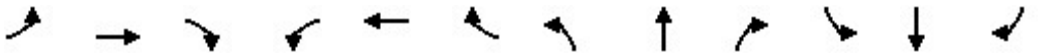
Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	446	1915
v/c Ratio	0.47	0.88	0.64
Control Delay	35.1	58.7	17.6
Queue Delay	0.0	0.0	0.0
Total Delay	35.1	58.7	17.6
Queue Length 50th (ft)	167	315	353
Queue Length 95th (ft)	247	#486	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	636	540	2994
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.44	0.83	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	446	0	1901	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					38.3	38.3		70.7				
Effective Green, g (s)					38.3	38.3		70.7				
Actuated g/C Ratio					0.32	0.32		0.59				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					594	505		2977				
v/s Ratio Prot					0.15	c0.28		c0.38				
v/s Ratio Perm												
v/c Ratio					0.47	0.88		0.64				
Uniform Delay, d1					32.7	38.7		16.2				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.8	17.0		1.1				
Delay (s)					33.5	55.7		17.3				
Level of Service					C	E		B				
Approach Delay (s)		0.0			47.2			17.3			0.0	
Approach LOS		A			D			B			A	

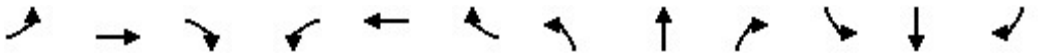
Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	384	1358
v/c Ratio	0.54	0.87	0.42
Control Delay	43.5	65.2	11.3
Queue Delay	0.0	0.0	0.0
Total Delay	43.5	65.2	11.3
Queue Length 50th (ft)	194	299	187
Queue Length 95th (ft)	284	#458	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	558	474	3244
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.50	0.81	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	384	0	1314	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.2	36.2		82.8				
Effective Green, g (s)					36.2	36.2		82.8				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					518	440		3198				
v/s Ratio Prot					0.15	c0.24		c0.26				
v/s Ratio Perm												
v/c Ratio					0.54	0.87		0.41				
Uniform Delay, d1					39.8	44.7		11.6				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					1.4	17.6		0.4				
Delay (s)					41.2	62.3		12.0				
Level of Service					D	E		B				
Approach Delay (s)		0.0			53.4			12.0			0.0	
Approach LOS		A			D			B			A	

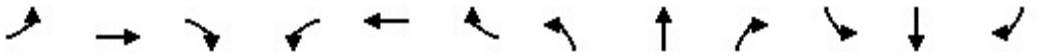
Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	446	1915
v/c Ratio	0.48	0.87	0.63
Control Delay	35.5	55.6	17.3
Queue Delay	0.0	0.0	0.0
Total Delay	35.5	55.6	17.3
Queue Length 50th (ft)	167	300	353
Queue Length 95th (ft)	247	#466	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	636	553	3016
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.44	0.81	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



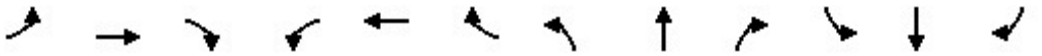
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	13	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	433	0	1901	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					37.7	37.7		71.3				
Effective Green, g (s)					37.7	37.7		71.3				
Actuated g/C Ratio					0.31	0.31		0.59				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					585	497		3002				
v/s Ratio Prot					0.15	c0.27		c0.38				
v/s Ratio Perm												
v/c Ratio					0.48	0.87		0.63				
Uniform Delay, d1					33.2	38.9		15.8				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.8	15.8		1.0				
Delay (s)					34.0	54.6		16.9				
Level of Service					C	D		B				
Approach Delay (s)		0.0			46.7			16.9			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	384	1358
v/c Ratio	0.64	0.82	0.39
Control Delay	50.5	45.9	9.3
Queue Delay	0.0	0.0	0.0
Total Delay	50.5	45.9	9.3
Queue Length 50th (ft)	210	214	156
Queue Length 95th (ft)	284	317	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	558	561	3455
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.50	0.68	0.39

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	94	0	39	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	290	0	1319	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					30.6	30.6		88.4				
Effective Green, g (s)					30.6	30.6		88.4				
Actuated g/C Ratio					0.24	0.24		0.68				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					438	372		3414				
v/s Ratio Prot					0.15	c0.18		c0.26				
v/s Ratio Perm												
v/c Ratio					0.64	0.78		0.39				
Uniform Delay, d1					44.7	46.5		9.0				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					3.4	10.5		0.3				
Delay (s)					48.1	57.0		9.4				
Level of Service					D	E		A				
Approach Delay (s)		0.0			53.3			9.4			0.0	
Approach LOS		A			D			A			A	

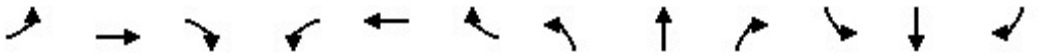
Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	446	1915
v/c Ratio	0.25	0.88	0.64
Control Delay	30.2	58.7	17.6
Queue Delay	0.0	0.0	0.0
Total Delay	30.2	58.7	17.6
Queue Length 50th (ft)	81	315	353
Queue Length 95th (ft)	115	#486	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1209	540	2994
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.83	0.64

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	446	0	1901	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					38.3	38.3		70.7				
Effective Green, g (s)					38.3	38.3		70.7				
Actuated g/C Ratio					0.32	0.32		0.59				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1129	505		2977				
v/s Ratio Prot					0.08	c0.28		c0.38				
v/s Ratio Perm												
v/c Ratio					0.25	0.88		0.64				
Uniform Delay, d1					30.2	38.7		16.2				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	17.0		1.1				
Delay (s)					30.4	55.7		17.3				
Level of Service					C	E		B				
Approach Delay (s)		0.0			45.9			17.3			0.0	
Approach LOS		A			D			B			A	

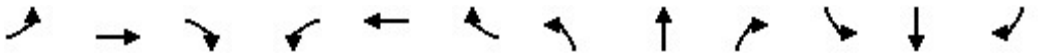
Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	384	1358
v/c Ratio	0.28	0.87	0.42
Control Delay	36.9	65.2	11.3
Queue Delay	0.0	0.0	0.0
Total Delay	36.9	65.2	11.3
Queue Length 50th (ft)	94	299	187
Queue Length 95th (ft)	133	#458	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1061	474	3244
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.81	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	384	0	1314	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.2	36.2		82.8				
Effective Green, g (s)					36.2	36.2		82.8				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					985	440		3198				
v/s Ratio Prot					0.08	c0.24		c0.26				
v/s Ratio Perm												
v/c Ratio					0.28	0.87		0.41				
Uniform Delay, d1					36.7	44.7		11.6				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	17.6		0.4				
Delay (s)					37.0	62.3		12.0				
Level of Service					D	E		B				
Approach Delay (s)		0.0			51.6			12.0			0.0	
Approach LOS		A			D			B			A	

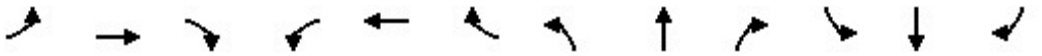
Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	446	1915
v/c Ratio	0.25	0.87	0.63
Control Delay	30.5	55.6	17.3
Queue Delay	0.0	0.0	0.0
Total Delay	30.5	55.6	17.3
Queue Length 50th (ft)	81	300	353
Queue Length 95th (ft)	115	#466	405
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1209	553	3016
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.81	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



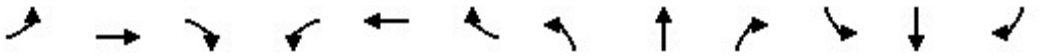
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Future Volume (vph)	0	0	0	0	257	410	218	1544	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5054				
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)	0	0	0	0	279	446	237	1678	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	13	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	433	0	1901	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					37.7	37.7		71.3				
Effective Green, g (s)					37.7	37.7		71.3				
Actuated g/C Ratio					0.31	0.31		0.59				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1111	497		3002				
v/s Ratio Prot					0.08	c0.27		c0.38				
v/s Ratio Perm												
v/c Ratio					0.25	0.87		0.63				
Uniform Delay, d1					30.6	38.9		15.8				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	15.8		1.0				
Delay (s)					30.8	54.6		16.9				
Level of Service					C	D		B				
Approach Delay (s)		0.0			45.4			16.9			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	279	384	1358
v/c Ratio	0.34	0.82	0.39
Control Delay	41.1	45.9	9.2
Queue Delay	0.0	0.0	0.0
Total Delay	41.1	45.9	9.2
Queue Length 50th (ft)	102	214	156
Queue Length 95th (ft)	133	317	219
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1061	561	3456
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.26	0.68	0.39

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Future Volume (vph)	0	0	0	0	257	353	314	936	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5022				
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)	0	0	0	0	279	384	341	1017	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	94	0	39	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	279	290	0	1319	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					30.6	30.6		88.4				
Effective Green, g (s)					30.6	30.6		88.4				
Actuated g/C Ratio					0.24	0.24		0.68				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					833	372		3414				
v/s Ratio Prot					0.08	c0.18		c0.26				
v/s Ratio Perm												
v/c Ratio					0.33	0.78		0.39				
Uniform Delay, d1					41.3	46.5		9.0				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.3	10.5		0.3				
Delay (s)					41.6	57.0		9.4				
Level of Service					D	E		A				
Approach Delay (s)		0.0			50.5			9.4			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	583	266	2242
v/c Ratio	0.68	0.68	0.69
Control Delay	42.8	47.8	16.2
Queue Delay	0.0	0.0	0.0
Total Delay	42.8	47.8	16.2
Queue Length 50th (ft)	222	203	376
Queue Length 95th (ft)	259	279	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1081	492	3238
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.54	0.54	0.69

Intersection Summary

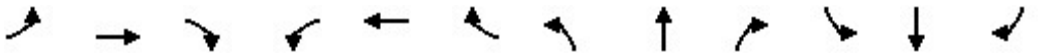
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.91	0.91		0.91				
Frt					0.93	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3167	1441		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3167	1441		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	583	266	0	2229	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					32.4	32.4		76.6				
Effective Green, g (s)					32.4	32.4		76.6				
Actuated g/C Ratio					0.27	0.27		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					855	389		3226				
v/s Ratio Prot					0.18	c0.18		c0.44				
v/s Ratio Perm												
v/c Ratio					0.68	0.68		0.69				
Uniform Delay, d1					39.2	39.2		14.0				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.4	5.3		1.2				
Delay (s)					41.6	44.5		15.3				
Level of Service					D	D		B				
Approach Delay (s)		0.0			42.5			15.3			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	69.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	534	242	1591
v/c Ratio	0.70	0.70	0.46
Control Delay	49.5	55.4	10.2
Queue Delay	0.0	0.0	0.0
Total Delay	49.5	55.4	10.2
Queue Length 50th (ft)	226	205	196
Queue Length 95th (ft)	270	287	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	958	432	3429
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.56	0.56	0.46

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.91	0.91		0.91				
Frt					0.94	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3193	1441		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3193	1441		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	39	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	534	242	0	1552	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					31.3	31.3		87.7				
Effective Green, g (s)					31.3	31.3		87.7				
Actuated g/C Ratio					0.24	0.24		0.67				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					768	346		3387				
v/s Ratio Prot					0.17	c0.17		c0.31				
v/s Ratio Perm												
v/c Ratio					0.70	0.70		0.46				
Uniform Delay, d1					45.0	45.1		10.0				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					3.0	6.5		0.4				
Delay (s)					48.0	51.6		10.4				
Level of Service					D	D		B				
Approach Delay (s)		0.0			49.1			10.4			0.0	
Approach LOS		A			D			B			A	

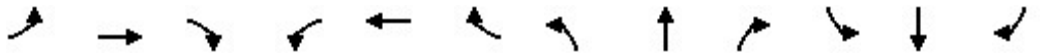
Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	447	402	2242
v/c Ratio	0.84	0.85	0.74
Control Delay	52.6	55.7	20.0
Queue Delay	0.0	0.0	0.0
Total Delay	52.6	55.7	20.0
Queue Length 50th (ft)	324	292	463
Queue Length 95th (ft)	462	#454	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	580	513	3015
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.77	0.78	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.96	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1698	1504		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1698	1504		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	447	402	0	2228	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					37.8	37.8		71.2				
Effective Green, g (s)					37.8	37.8		71.2				
Actuated g/C Ratio					0.31	0.31		0.59				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					534	473		2998				
v/s Ratio Prot					0.26	c0.27		c0.44				
v/s Ratio Perm												
v/c Ratio					0.84	0.85		0.74				
Uniform Delay, d1					38.2	38.4		17.7				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					11.4	13.9		1.7				
Delay (s)					49.7	52.3		19.5				
Level of Service					D	D		B				
Approach Delay (s)		0.0			50.9			19.5			0.0	
Approach LOS		A			D			B			A	

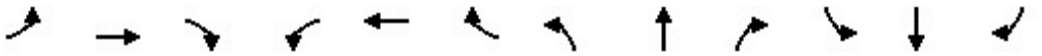
Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	412	364	1591
v/c Ratio	0.86	0.87	0.49
Control Delay	62.4	65.3	12.4
Queue Delay	0.0	0.0	0.0
Total Delay	62.4	65.3	12.4
Queue Length 50th (ft)	336	298	238
Queue Length 95th (ft)	#501	#461	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	514	451	3239
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.80	0.81	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



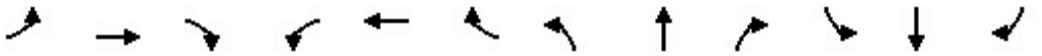
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.97	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1715	1504		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1715	1504		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	412	364	0	1547	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.3	36.3		82.7				
Effective Green, g (s)					36.3	36.3		82.7				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					478	419		3194				
v/s Ratio Prot					0.24	c0.24		c0.31				
v/s Ratio Perm												
v/c Ratio					0.86	0.87		0.48				
Uniform Delay, d1					44.5	44.6		12.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					15.2	17.6		0.5				
Delay (s)					59.7	62.2		13.0				
Level of Service					E	E		B				
Approach Delay (s)		0.0			60.8			13.0			0.0	
Approach LOS		A			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	447	402	2242
v/c Ratio	0.84	0.84	0.74
Control Delay	52.0	52.6	19.7
Queue Delay	0.0	0.0	0.0
Total Delay	52.0	52.6	19.7
Queue Length 50th (ft)	318	280	459
Queue Length 95th (ft)	453	414	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	586	525	3033
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.76	0.77	0.74

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.96	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1698	1504		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1698	1504		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	6	12	0	14	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	441	390	0	2228	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					37.3	37.3		71.7				
Effective Green, g (s)					37.3	37.3		71.7				
Actuated g/C Ratio					0.31	0.31		0.60				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					527	467		3019				
v/s Ratio Prot					c0.26	0.26		c0.44				
v/s Ratio Perm												
v/c Ratio					0.84	0.83		0.74				
Uniform Delay, d1					38.5	38.5		17.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					11.5	12.6		1.7				
Delay (s)					50.0	51.1		19.0				
Level of Service					D	D		B				
Approach Delay (s)		0.0			50.5			19.0			0.0	
Approach LOS		A			D			B			A	

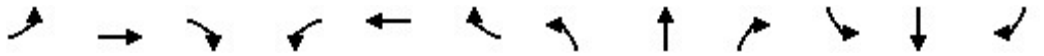
Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	412	364	1591
v/c Ratio	0.85	0.76	0.49
Control Delay	60.7	43.9	12.2
Queue Delay	0.0	0.0	0.0
Total Delay	60.7	43.9	12.2
Queue Length 50th (ft)	328	225	238
Queue Length 95th (ft)	#476	351	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	521	509	3251
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.79	0.72	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	0.95		0.91				
Frt					0.97	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1715	1504		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1715	1504		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	7	60	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	405	304	0	1547	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.0	36.0		83.0				
Effective Green, g (s)					36.0	36.0		83.0				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					474	416		3206				
v/s Ratio Prot					c0.24	0.20		c0.31				
v/s Ratio Perm												
v/c Ratio					0.85	0.73		0.48				
Uniform Delay, d1					44.5	42.6		12.3				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					14.4	6.9		0.5				
Delay (s)					58.9	49.5		12.8				
Level of Service					E	D		B				
Approach Delay (s)		0.0			54.5			12.8			0.0	
Approach LOS		A			D			B			A	

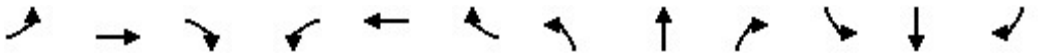
Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	522	2242
v/c Ratio	0.51	0.97	0.78
Control Delay	35.1	70.8	22.2
Queue Delay	0.0	0.0	0.0
Total Delay	35.1	70.8	22.2
Queue Length 50th (ft)	201	395	463
Queue Length 95th (ft)	293	#620	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	636	540	2879
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.51	0.97	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	522	0	2227	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					41.0	41.0		68.0				
Effective Green, g (s)					41.0	41.0		68.0				
Actuated g/C Ratio					0.34	0.34		0.57				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					636	540		2863				
v/s Ratio Prot					0.18	c0.33		c0.44				
v/s Ratio Perm												
v/c Ratio					0.51	0.97		0.78				
Uniform Delay, d1					31.5	38.8		20.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.9	30.2		2.2				
Delay (s)					32.5	69.1		22.3				
Level of Service					C	E		C				
Approach Delay (s)		0.0			55.0			22.3			0.0	
Approach LOS		A			D			C			A	

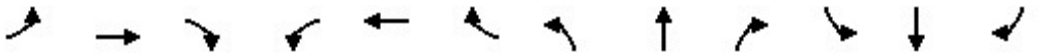
Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	449	1591
v/c Ratio	0.59	0.96	0.50
Control Delay	44.1	77.2	13.2
Queue Delay	0.0	0.0	0.0
Total Delay	44.1	77.2	13.2
Queue Length 50th (ft)	234	370	238
Queue Length 95th (ft)	336	#581	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	558	474	3153
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.59	0.95	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	46	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	449	0	1545	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					38.6	38.6		80.4				
Effective Green, g (s)					38.6	38.6		80.4				
Actuated g/C Ratio					0.30	0.30		0.62				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					553	470		3105				
v/s Ratio Prot					0.18	c0.28		c0.31				
v/s Ratio Perm												
v/c Ratio					0.59	0.96		0.50				
Uniform Delay, d1					39.0	44.9		13.7				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.0	30.3		0.6				
Delay (s)					41.0	75.2		14.2				
Level of Service					D	E		B				
Approach Delay (s)		0.0			60.8			14.2			0.0	
Approach LOS		A			E			B			A	

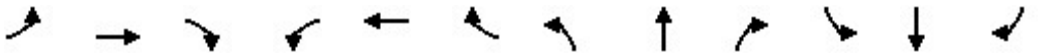
Intersection Summary			
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	522	2242
v/c Ratio	0.52	0.95	0.77
Control Delay	35.3	66.9	21.9
Queue Delay	0.0	0.0	0.0
Total Delay	35.3	66.9	21.9
Queue Length 50th (ft)	201	380	463
Queue Length 95th (ft)	293	#603	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	636	552	2897
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.51	0.95	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	12	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	510	0	2227	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					40.6	40.6		68.4				
Effective Green, g (s)					40.6	40.6		68.4				
Actuated g/C Ratio					0.34	0.34		0.57				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					630	535		2880				
v/s Ratio Prot					0.18	c0.32		c0.44				
v/s Ratio Perm												
v/c Ratio					0.52	0.95		0.77				
Uniform Delay, d1					31.9	38.8		19.8				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					1.0	27.6		2.1				
Delay (s)					32.8	66.4		21.9				
Level of Service					C	E		C				
Approach Delay (s)		0.0			53.5			21.9			0.0	
Approach LOS		A			D			C			A	

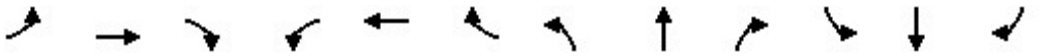
Intersection Summary			
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	449	1591
v/c Ratio	0.63	0.90	0.49
Control Delay	46.6	58.1	12.3
Queue Delay	0.0	0.0	0.0
Total Delay	46.6	58.1	12.3
Queue Length 50th (ft)	234	297	238
Queue Length 95th (ft)	336	#478	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	558	533	3245
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.59	0.84	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					1.00	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					1863	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					1863	1583		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	389	0	1547	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.2	36.2		82.8				
Effective Green, g (s)					36.2	36.2		82.8				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					518	440		3198				
v/s Ratio Prot					0.18	c0.25		c0.31				
v/s Ratio Perm												
v/c Ratio					0.63	0.88		0.48				
Uniform Delay, d1					41.1	44.9		12.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					2.8	19.1		0.5				
Delay (s)					43.9	63.9		12.9				
Level of Service					D	E		B				
Approach Delay (s)		0.0			55.5			12.9			0.0	
Approach LOS		A			E			B			A	

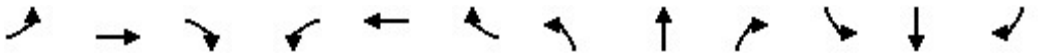
Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	522	2242
v/c Ratio	0.27	0.97	0.78
Control Delay	29.4	70.8	22.2
Queue Delay	0.0	0.0	0.0
Total Delay	29.4	70.8	22.2
Queue Length 50th (ft)	96	395	463
Queue Length 95th (ft)	134	#620	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1209	540	2879
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.27	0.97	0.78

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	522	0	2227	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					41.0	41.0		68.0				
Effective Green, g (s)					41.0	41.0		68.0				
Actuated g/C Ratio					0.34	0.34		0.57				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1209	540		2863				
v/s Ratio Prot					0.09	c0.33		c0.44				
v/s Ratio Perm												
v/c Ratio					0.27	0.97		0.78				
Uniform Delay, d1					28.7	38.8		20.1				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	30.2		2.2				
Delay (s)					28.8	69.1		22.3				
Level of Service					C	E		C				
Approach Delay (s)		0.0			53.6			22.3			0.0	
Approach LOS		A			D			C			A	

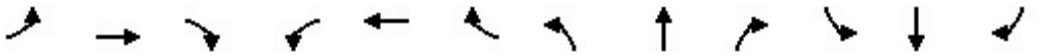
Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	449	1591
v/c Ratio	0.31	0.96	0.50
Control Delay	36.3	77.2	13.2
Queue Delay	0.0	0.0	0.0
Total Delay	36.3	77.2	13.2
Queue Length 50th (ft)	112	370	238
Queue Length 95th (ft)	154	#581	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1061	474	3153
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.31	0.95	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	46	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	449	0	1545	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					38.6	38.6		80.4				
Effective Green, g (s)					38.6	38.6		80.4				
Actuated g/C Ratio					0.30	0.30		0.62				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1050	470		3105				
v/s Ratio Prot					0.09	c0.28		c0.31				
v/s Ratio Perm												
v/c Ratio					0.31	0.96		0.50				
Uniform Delay, d1					35.4	44.9		13.7				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	30.3		0.6				
Delay (s)					35.6	75.2		14.2				
Level of Service					D	E		B				
Approach Delay (s)		0.0			58.5			14.2			0.0	
Approach LOS		A			E			B			A	

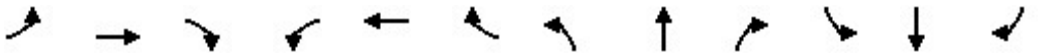
Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	522	2242
v/c Ratio	0.27	0.95	0.77
Control Delay	29.6	66.9	21.9
Queue Delay	0.0	0.0	0.0
Total Delay	29.6	66.9	21.9
Queue Length 50th (ft)	96	380	463
Queue Length 95th (ft)	134	#603	526
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1209	552	2897
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.27	0.95	0.77

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Future Volume (vph)	0	0	0	0	301	480	255	1808	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5054				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5054				
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)	0	0	0	0	327	522	277	1965	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	12	0	15	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	510	0	2227	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					40.6	40.6		68.4				
Effective Green, g (s)					40.6	40.6		68.4				
Actuated g/C Ratio					0.34	0.34		0.57				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					1197	535		2880				
v/s Ratio Prot					0.09	c0.32		c0.44				
v/s Ratio Perm												
v/c Ratio					0.27	0.95		0.77				
Uniform Delay, d1					28.9	38.8		19.8				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.2	27.6		2.1				
Delay (s)					29.1	66.4		21.9				
Level of Service					C	E		C				
Approach Delay (s)		0.0			52.0			21.9			0.0	
Approach LOS		A			D			C			A	

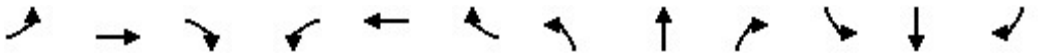
Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBT	WBR	NBT
Lane Group Flow (vph)	327	449	1591
v/c Ratio	0.33	0.90	0.49
Control Delay	37.7	58.1	12.3
Queue Delay	0.0	0.0	0.0
Total Delay	37.7	58.1	12.3
Queue Length 50th (ft)	112	297	238
Queue Length 95th (ft)	154	#478	275
Internal Link Dist (ft)	618		140
Turn Bay Length (ft)			
Base Capacity (vph)	1061	533	3245
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.31	0.84	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Future Volume (vph)	0	0	0	0	301	413	368	1096	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0	6.0		5.0				
Lane Util. Factor					0.95	1.00		0.91				
Frt					1.00	0.85		1.00				
Flt Protected					1.00	1.00		0.99				
Satd. Flow (prot)					3539	1583		5022				
Flt Permitted					1.00	1.00		0.99				
Satd. Flow (perm)					3539	1583		5022				
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)	0	0	0	0	327	449	400	1191	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	60	0	44	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	327	389	0	1547	0	0	0	0
Turn Type					NA	Prot	Split	NA				
Protected Phases					4	4	2	2				
Permitted Phases												
Actuated Green, G (s)					36.2	36.2		82.8				
Effective Green, g (s)					36.2	36.2		82.8				
Actuated g/C Ratio					0.28	0.28		0.64				
Clearance Time (s)					6.0	6.0		5.0				
Vehicle Extension (s)					4.0	4.0		4.0				
Lane Grp Cap (vph)					985	440		3198				
v/s Ratio Prot					0.09	c0.25		c0.31				
v/s Ratio Perm												
v/c Ratio					0.33	0.88		0.48				
Uniform Delay, d1					37.3	44.9		12.4				
Progression Factor					1.00	1.00		1.00				
Incremental Delay, d2					0.3	19.1		0.5				
Delay (s)					37.6	63.9		12.9				
Level of Service					D	E		B				
Approach Delay (s)		0.0			52.8			12.9			0.0	
Approach LOS		A			D			B			A	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group