



TRAFFIC IMPACT ANALYSIS

**Supermarket — Douglas Street & Tudor Road
Lee's Summit, Missouri**

**Prepared for:
Pickering Firm, Inc.
April 2026**

**Prepared by:
Traffic Engineering Consultants, Inc.**



Dane M Seiler

Digitally signed by Dane
M Seiler
DN: C=US,
E=dseiler@tecusa.com,
O=Traffic Engineering
Consultants, CN=Dane
M Seiler
Date: 2026.04.02
14:33:47-05'00'

Table of Contents

1.0	INTRODUCTION	3
2.0	BACKGROUND	3
	FIGURE 1.0 SITE LOCATION MAP	4
	FIGURE 2.0 SITE PLAN	5
3.0	BACKGROUND TRAFFIC	6
3.1	EXISTING TRAFFIC	6
3.2	FUTURE BACKGROUND TRAFFIC	6
	FIGURE 3.0 2025 EXISTING TRAFFIC	7
4.0	PHASE 1 - PROPOSED SITE TRIPS	8
	TABLE 1.0 PHASE 1 - PROJECTED SITE GENERATED TRIPS	8
4.1	DISTRIBUTION OF TRIPS	9
4.2	PHASE 1 - TOTAL TRAFFIC	9
	FIGURE 4.0 PHASE 1 - BACKGROUND TRAFFIC	10
	FIGURE 5.0 PHASE 1 - PROPOSED SITE TRAFFIC	11
	FIGURE 6.0 PHASE 1 - PROPOSED PASS BY TRAFFIC	12
	FIGURE 7.0 PHASE 1 - PROPOSED TOTAL TRAFFIC	13
5.0	PHASE 1 - CAPACITY ANALYSIS	14
5.1	METHODOLOGY	14
	TABLE 2.0 LEVEL-OF-SERVICE CRITERIA	15
5.2	PHASE 1 - SCENARIOS	15
	TABLE 3.0 PHASE 1 - INTERSECTION CAPACITY ANALYSIS RESULTS	16
5.2.1	2025 EXISTING TRAFFIC	18
5.2.2	2027 BACKGROUND TRAFFIC	18
5.2.3	PHASE 1 - 2027 TOTAL TRAFFIC	18
6.0	PHASE 2 - PROPOSED SITE TRIPS	19
	TABLE 4.0 PHASE 2 - PROJECTED SITE GENERATED TRIPS	19
6.1	PHASE 2 - DISTRIBUTION OF TRIPS	19
6.2	PHASE 2 - TOTAL TRAFFIC	20
	FIGURE 8.0 PHASE 2 - BACKGROUND TRAFFIC	21
	FIGURE 9.0 PHASE 2 - PROPOSED SITE TRAFFIC	22
	FIGURE 10.0 PHASE 2 - PROPOSED TOTAL TRAFFIC	23
7.0	PHASE 2 - CAPACITY ANALYSIS	24
7.1	METHODOLOGY	24



	TABLE 5.0 LEVEL-OF-SERVICE CRITERIA.....	25
7.2	PHASE 2 - SCENARIOS	25
	TABLE 6.0 PHASE 2 - INTERSECTION CAPACITY ANALYSIS RESULTS	26
7.2.1	2029 BACKGROUND TRAFFIC	28
7.2.2	PHASE 2 - 2029 TOTAL TRAFFIC.....	28
8.0	ALTERNATIVE TRANSPORTATION MODES.....	29
8.1	PEDESTRIAN & BIKING	29
8.2	TRANSIT.....	29
9.0	CONCLUSIONS AND RECOMMENDATIONS	30
9.1	VEHICULAR RECCOMENDATIONS	30
9.2	PEDESTRIAN & BIKING IMPROVEMENTS	31
10.0	APPENDIX A	32

1.0 INTRODUCTION

Traffic Engineering Consultants, Inc. (TEC) was retained to conduct a traffic impact analysis (TIA) for a proposed Supermarket, Gas Station, and retail development to be constructed in Lee's Summit, Missouri. The study was requested to determine the effects the development would have on the adjacent street system, to review the available access and to provide recommendations for improvements that may be necessary to accommodate the traffic expected to be generated by the development.

2.0 BACKGROUND

The site of the proposed development is located west of Douglas street south of Tudor Road as shown in **Figure 1**. The development will contain approximately 99,000 square foot Supermarket, 14 fueling positions Gas Station, 65,000 square feet of retail. Access to the development, as shown in **Figure 2**, is proposed via three full accesses and one partial access. The development is anticipated to be developed in two phases.

Douglas Street is a four-lane north/south regional high-activity link with a posted speed limit of 45 miles per hour (mph) and has an approximate average daily traffic (ADT) of 22,600 vehicles per day (vpd) within the limits of the project. The roadway is classified as a Major Arterial according to the Mid America Regional Council Functional Classification Map. The road currently does contain sidewalks on the east side and curb & gutter with no transit access or cycling facilities.

Tudor Road is a four-lane east/west local link with a posted speed limit of 35 miles per hour (mph) and has an approximate average daily traffic (ADT) of 6,600 vehicles per day (vpd) within the limits of the project. The roadway is classified as a Minor Arterial according to the Mid America Regional Council Functional Classification Map. The road currently does contain sidewalks on one side, a multiuse path on the south side, a landscaped median, and curb & gutter with no transit access.

Chipman Road is a four-lane east/west regional high-activity link with a posted speed limit of 45 miles per hour (mph) and has an approximate average daily traffic (ADT) of 12,800 vehicles per day (vpd) within the limits of the project. The roadway is classified as a Major Arterial according to the Mid America Regional Council Functional Classification Map. The road currently does contain sidewalks on one side, a multiuse path on the north side, a median, and curb & gutter with no transit access.



FIGURE 1.0 LOCATION MAP

Grocery Store & Gas Station - Douglas Street

Lee's Summit, Missouri

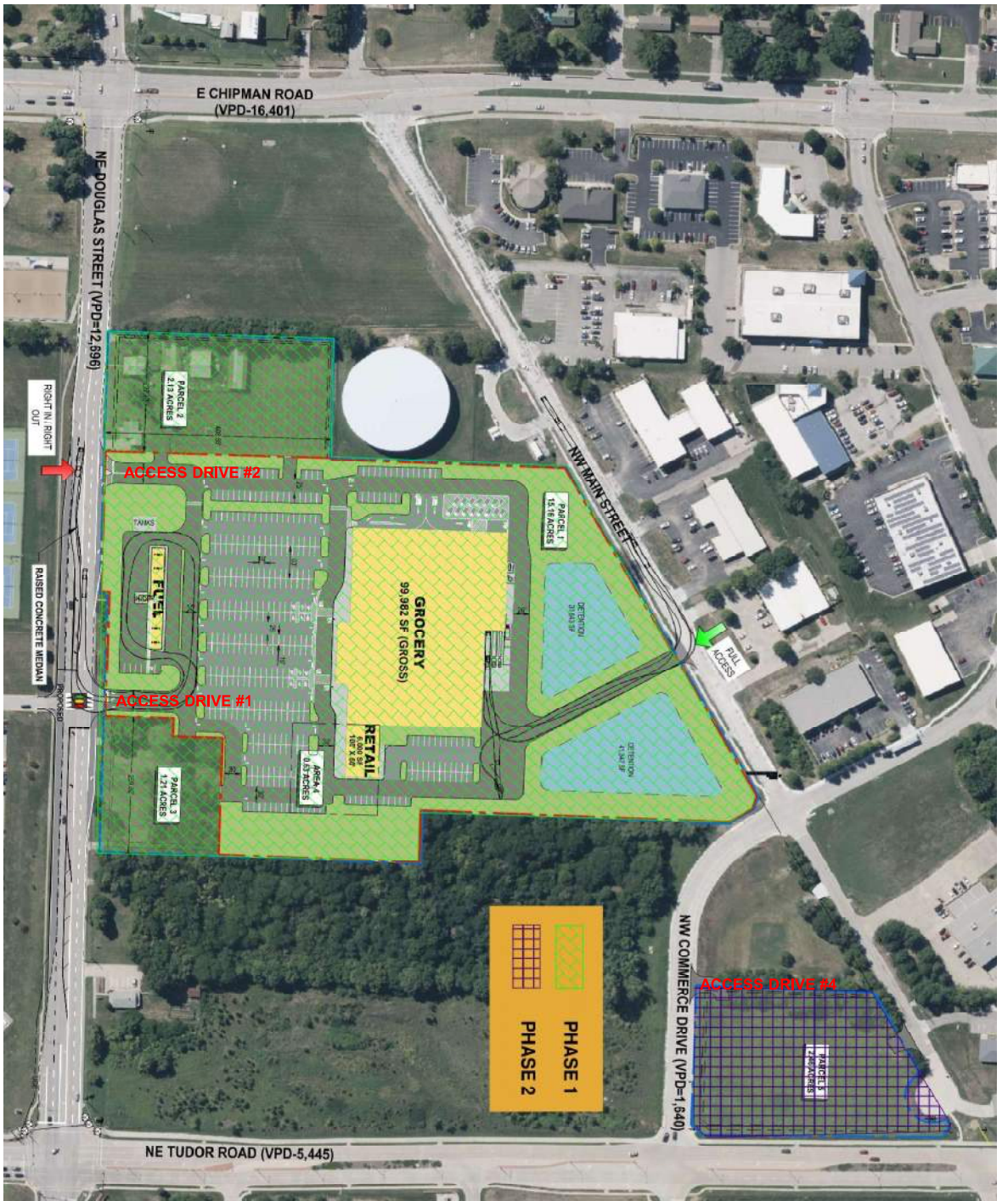


FIGURE 2.0 CONCEPTUAL SITE PLAN

Grocery Store & Gas Station - Douglas Street

Lee's Summit, Missouri

3.0 BACKGROUND TRAFFIC

3.1 EXISTING TRAFFIC

Existing traffic volume data was collected adjacent to the proposed development in November of 2025. AM and PM Peak hour turning movement volumes were collected at the intersections of Commerce Drive and Tudor Road, Douglas Street and Tudor Road, Douglas Street and High School Drive, Douglas Street and Chipman Road, Commerce Drive and Chipman Road. The collected data indicated the A.M. peak hour occurred from 7:00 to 8:00 and P.M. peak hour occurred from 4:15 to 5:15. Given the traffic characteristics in the area and the anticipated trip generation for the proposed development, the weekday peak periods would represent a “worst-case scenario” with regards to traffic impact on the surrounding roadway network. If traffic operations are acceptable during these weekday peak hours, it can be reasoned that conditions would be acceptable throughout the remainder of the day and week. The 2025 existing traffic is summarized in **Figure 3** and detailed printouts of all the traffic count data are included in the appendix.

3.2 FUTURE BACKGROUND TRAFFIC

The 2025 existing traffic was utilized to determine the background traffic for full build out. The development is projected to be completed in 2029 and 2027 was selected as the design period for Phase 1 full build out analysis and 2029 as the design period for Phase 2 full build out analysis. The background traffic was determined for each phase design year by applying an average annual growth rate of 2.0% to the 2025 existing traffic volumes. The full build 2027 projected background traffic is summarized in **Figure 4**. The full build 2029 projected background traffic is summarized in **Figure 8**.

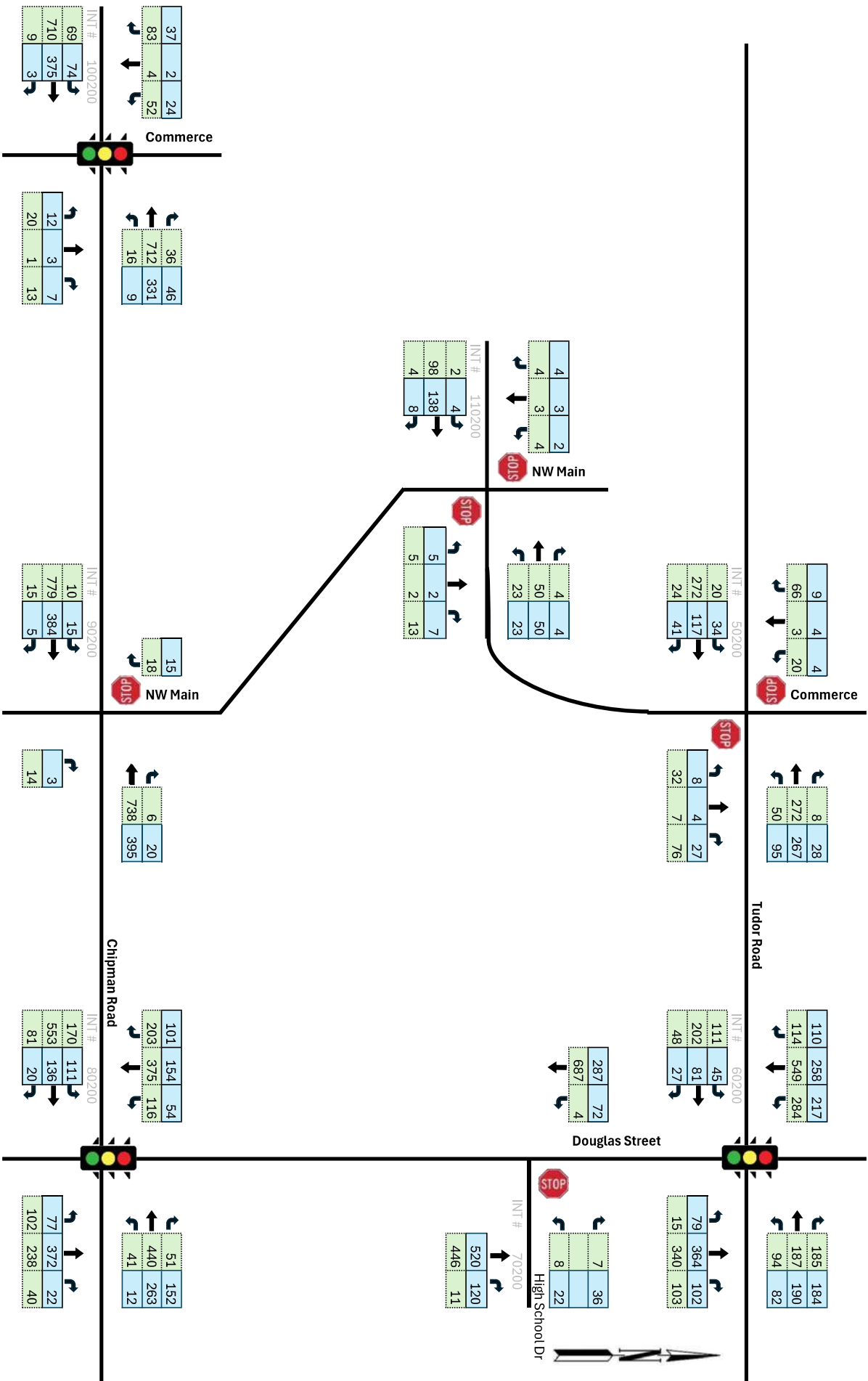


FIGURE 3.0 2025 Existing Traffic

Grocery Store & Gas Station - Douglas Street
Lee's Summit, Missouri



4.0 PHASE 1 - PROPOSED SITE TRIPS

To determine the effects a new development will have on an existing street system, new or additional traffic must be projected. The latest edition of the *Trip Generation Manual, 12th Edition*, published by the Institute of Transportation Engineers, was used to determine the amount of traffic the development is expected to generate. The report is a nationally accepted reference which provides trip rates for determining the traffic expected to be generated by different land use types.

Available information was utilized regarding the anticipated land use to determine the site generated traffic. The 850 – *Supermarket*, 822 – *Strip Retail Plaza* & 944 – *Gas Stations* category was selected to determine the trip generation of the proposed development. This site has 99,000 Square Foot Supermarket, 50,000 square feet Strip Retail Plaza, and 14 Vehicle Fueling Positions. The trip generation took into consideration both Internal capture, the sharing of trips between uses, and Pass By trips, the pulling of traffic from the existing traffic into the development. The resulting traffic volumes projected to be generated by the proposed development are indicated in **Table 1**.

TABLE 1.0 PHASE 1 - PROJECTED SITE GENERATED TRIPS

Building Type (Land Use)	ITE Land Use Code	Approximate Fueling Positions	Average Weekday Vehicle Trips			Average AM Peak Hour Directional Distribution		Average AM Peak Hour Directional Trips (vph)		Average PM Peak Hour Directional Distribution		Average PM Peak Hour Directional Trips (vph)	
			Per Day	Per Peak Hour of Adjacent Street Traffic									
				One Hour Between 7am & 9am	One Hour Between 4pm & 6pm								
				(vpd)	(vph)	(vph)	IN	OUT	IN	OUT	IN	OUT	IN
Full Build Out													
Trip Rate* Supermarket	850	(1 KSF GFA)	92.29	2.95	8.79	59%	41%	172	120	50%	50%	435	435
	99		9,137	292	870								
Trip Rate* Strip Retail Plaza 3.71 Acres /.25 FAR	822	(1 KSF GFA)	54.45	3.93	6.29	55%	45%	86	71	50%	50%	126	126
	40		2,178	157	252								
Trip Rate* Gas Station	944	(Fueling Positions)	172.01	11.32	14.23	50%	50%	68	68	50%	50%	86	86
	12		2,064	136	171								
Total Trips			13,379	585	1,293			327	258			647	647
Trip Rate Reductions													
Reduction Type			Reduction Amount (%)		AM Peak Hour				PM Peak Hour				
					Reduction		Total Development		Reduction		Total Development		
					IN	OUT	Volume		IN	OUT	Volume		
Internal Capture ⁵			10		33	26	IN	OUT	65	65	IN	OUT	
							294	233			582	582	
Reduction Type			Reduction Amount (%)		AM Peak Hour				PM Peak Hour				
					Reduction		Site Trips Added		Reduction		Site Trips Added		
						AM Peak Hour	PM Peak Hour	IN	OUT	To Roadway	IN	OUT	To Roadway
Pass-By Trips / Diverted Link** - 850 Supermarket				25%	25%	30	30			109	109		
Pass-By Trips / Diverted Link*** - 944 Gasoline/Service				60%	60%	40	41			51	51		
								224	162			422	422

* Trip Rates from "TRIP GENERATION MANUAL", 12th Ed., Institute of Transportation Engineers.

4.1 DISTRIBUTION OF TRIPS

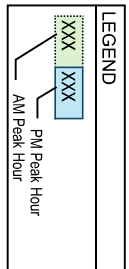
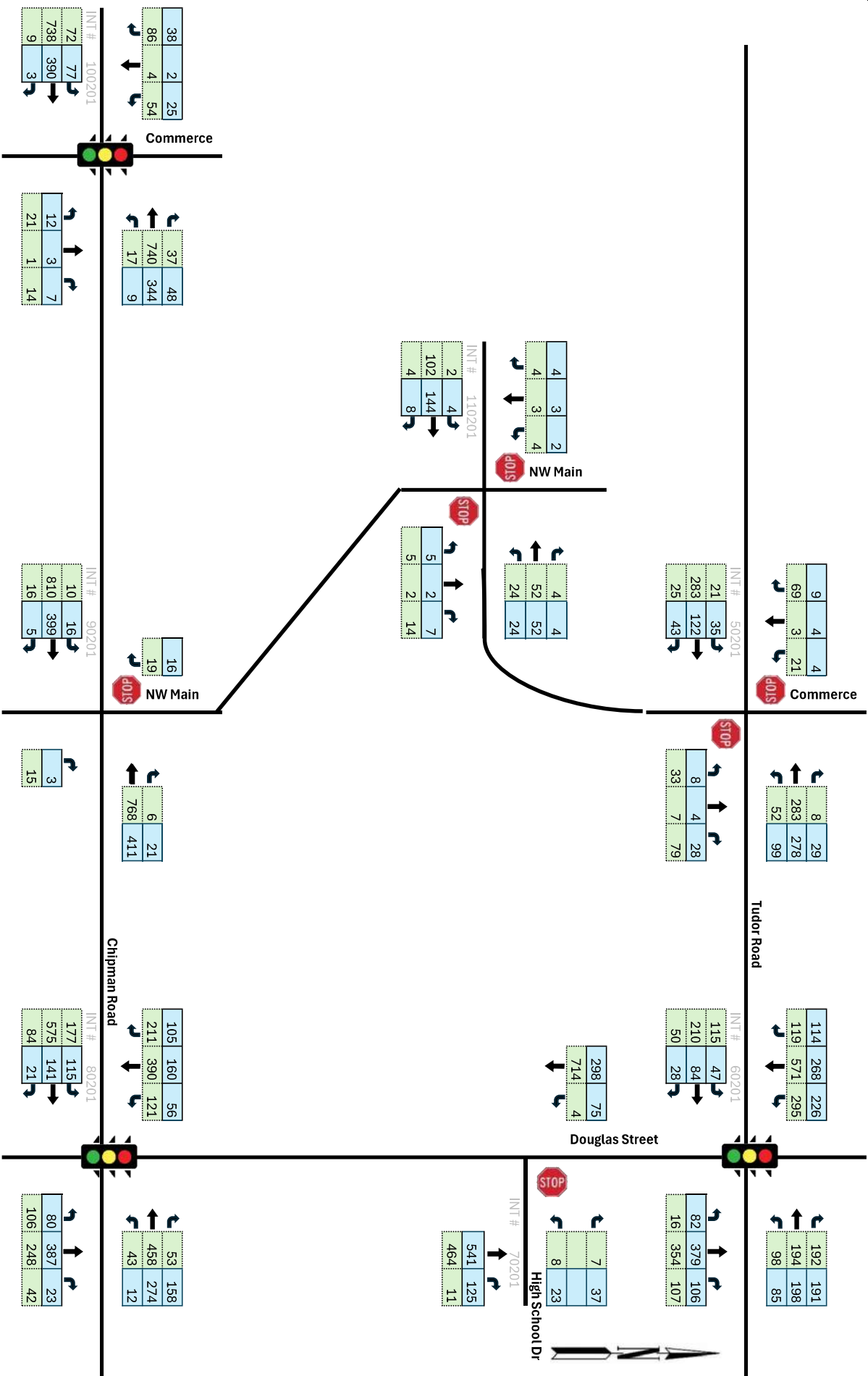
The traffic expected to be generated by the proposed development was then distributed among the points of access as well as the study intersection for the A.M. and P.M. peak hours. The distribution of the site generated traffic was based on anticipated usage of the site and traffic patterns in the area which were obtained from the traffic data that was collected for this study and is summarized in **Figure 5**. The directional distribution of the site generated traffic entering/exiting the proposed development is generally expected to be:

- 15% to/from Tudor Road west of Commerce Drive
- 10% to/from Tudor Road east of Douglas Street
- 20% to/from Douglas Street north of Tudor
- 20% to/from Douglas Street south of Chipman Road
- 20% to/from Chipman Road west of Commerce Drive
- 15% to/from Chipman Road east of Douglas Street

For more detailed direction distribution see **Figure 5**.

4.2 PHASE 1 - TOTAL TRAFFIC

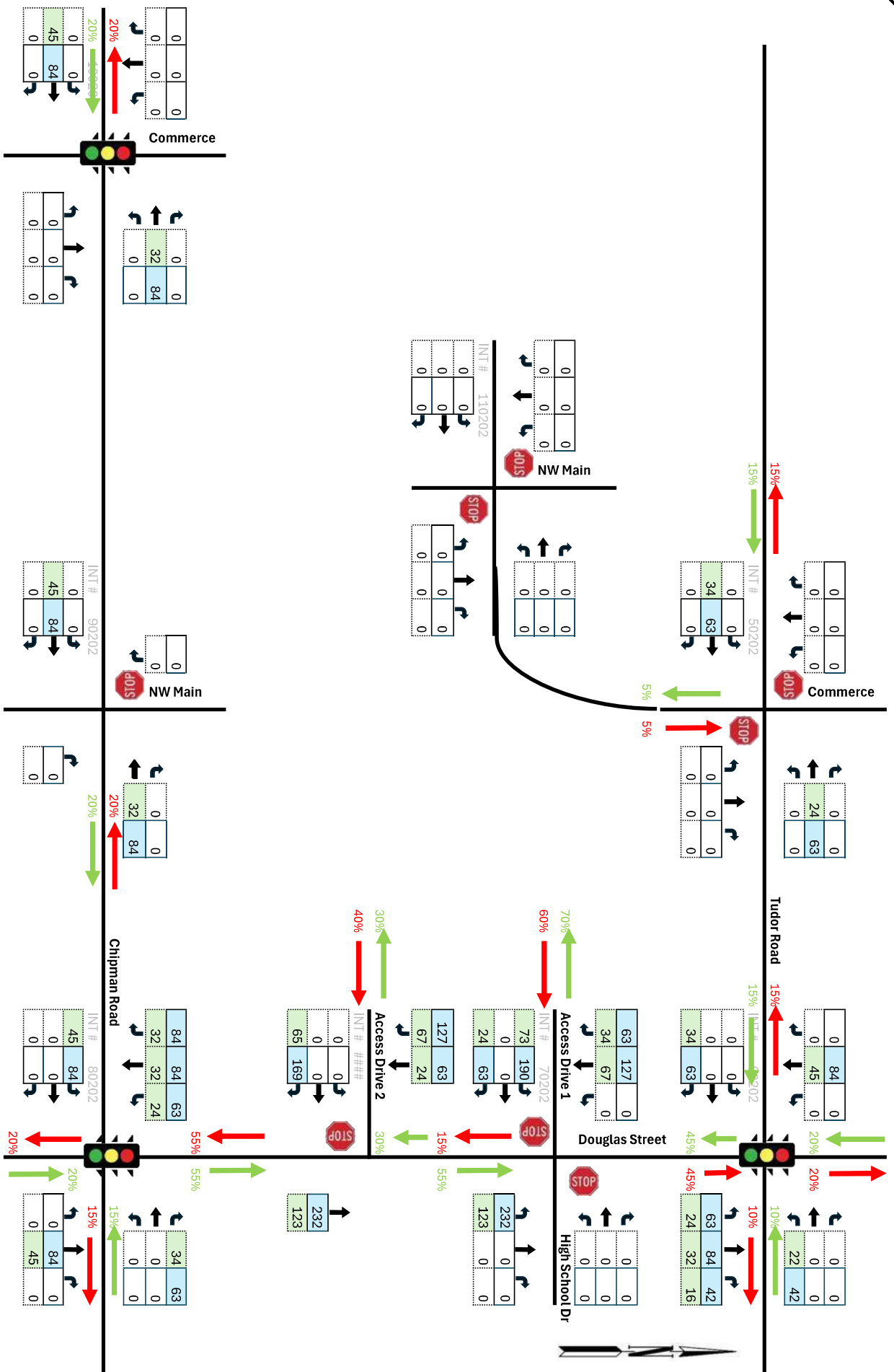
The site trips were then added to the future combined traffic for the 2027 design year. The 2027 phase 1 - total traffic (2027 future background traffic + future development trips + proposed site trips) for each access point as well as the adjacent study intersection is summarized in **Figure 6**.



2% Growth Rate
2 Number of Years

FIGURE 4.0 2027 Background Traffic

Grocery Store & Gas Station - Douglas Street
Lee's Summit, Missouri





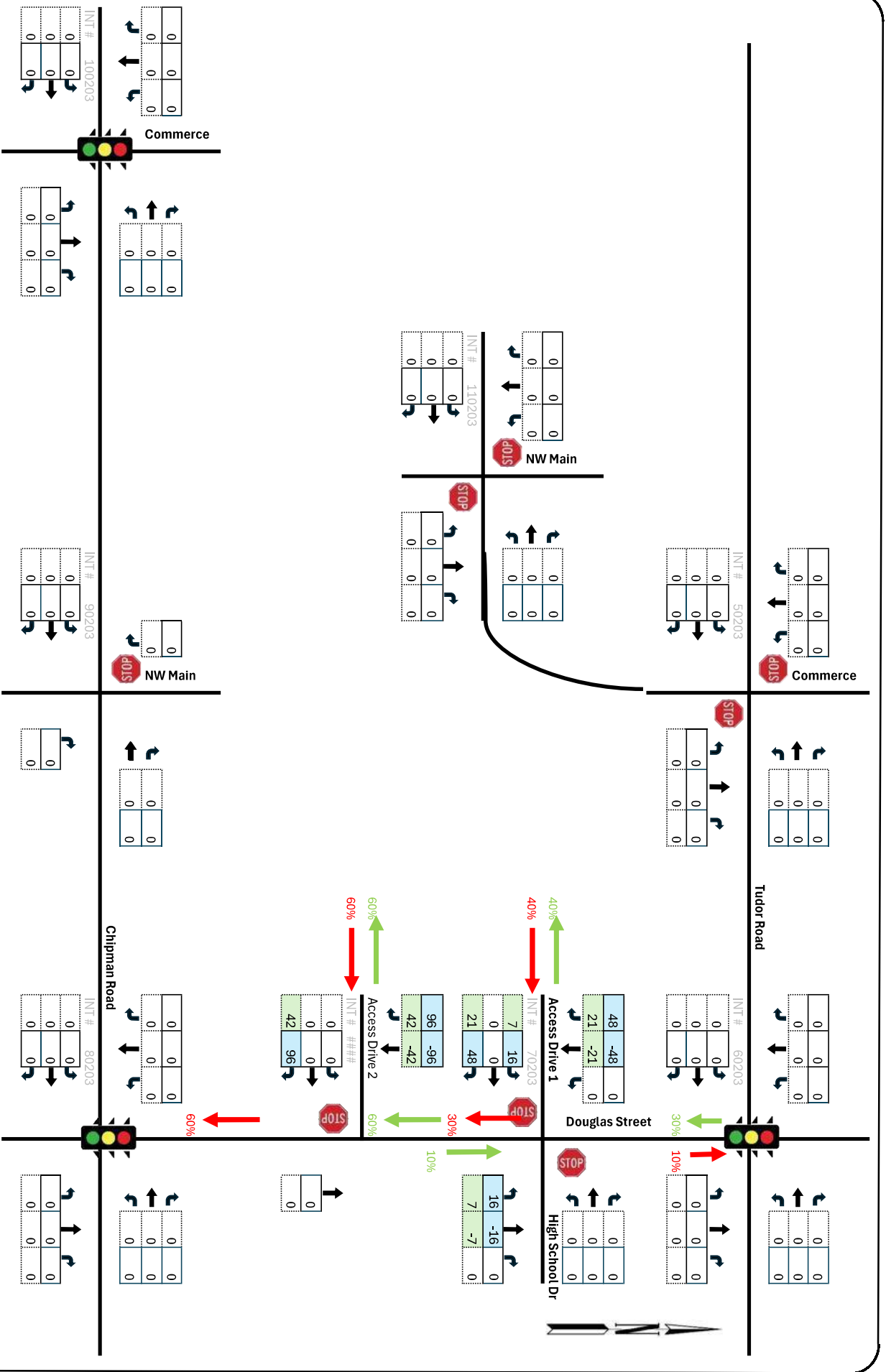
LEGEND	
XXX	AM Peak Hour
XXX	PM Peak Hour

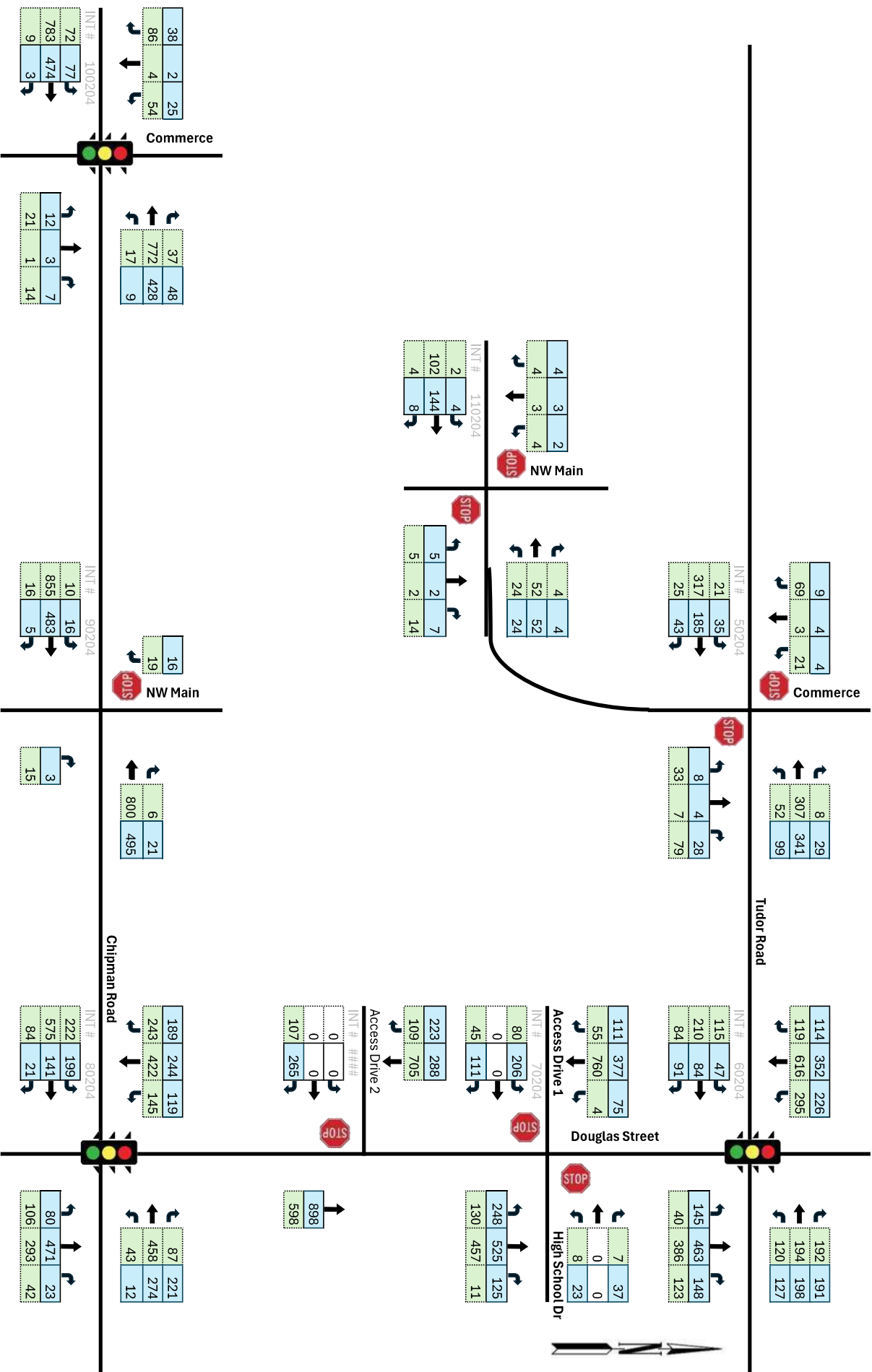
Peak Hour - Pass-by Site Generated Trips			
	IN (vph)	OUT (vph)	
AM Peak Hour	70	71	
PM Peak Hour	160	160	

FIGURE 6.0 Phase 1 - Proposed Pass By / Diverted |

Grocery Store & Gas Station - Douglas Street

Lee's Summit, Missouri





5.0 PHASE 1 - CAPACITY ANALYSIS

5.1 METHODOLOGY

The capacity analyses were conducted using *Synchro 12*, which is a software package for modeling and optimizing traffic signal timings at signalized intersections and analyzing unsignalized intersections in accordance with the methodology of the latest edition of the *Highway Capacity Manual, 7th Edition*. The *Highway Capacity Manual* is published by the Transportation Research Board of the National Research Council, Washington, D.C. The information has been widely accepted throughout the U.S. as a guide for defining and solving transportation challenges. The information is approved and distributed by the U.S. Department of Transportation, Federal Highway Administration.

The capacity analysis provides a measure of the amount of traffic that a given facility can accommodate. Traffic facilities generally operate poorly at or near capacity. The analysis is intended to estimate the maximum amount of traffic that can be accommodated by a facility while maintaining prescribed operational qualities. The definition of operational criteria is accomplished using levels-of-service. The concept of levels-of-service is defined as a qualitative measure and describes operational conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels-of-service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from "A" to "F", with level-of-service "A" representing the best operating conditions and level-of-service "F" the worst.

The average control delay for signalized intersections is estimated for each lane group and aggregated for each approach and for the intersection as a whole. The level-of-service for this type of traffic control is directly related to the control delay value. The criteria for stop controlled or unsignalized intersections have different threshold values than do those for signalized intersections. A higher level of control delay has been determined to be acceptable at a signalized intersection for the same level-of-service. The level-of-service criteria are summarized in **Table 2**.

TABLE 2.0 LEVEL-OF-SERVICE CRITERIA

Level-of-Service	Average Delay (seconds/vehicle)		Traffic Condition
	Unsignalized	Signalized	
A	≤ 10	≤ 10	Free Flow
B	> 10 - 15	> 10 - 20	Stable Flow (slight delays)
C	> 15 - 25	> 20 - 35	Stable Flow (acceptable delays)
D	> 25 - 35	> 35 - 55	Approaching Unstable Flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 35 - 50	> 55 - 80	Unstable Flow (intolerable delay)
F	> 50	> 80	Forced Flow (congested and queues fail to clear)

5.2 PHASE 1 - SCENARIOS

Capacity analyses were conducted for the A.M. and P.M. peak hours at each development driveway as well as the intersections of Commerce Drive / Sloan Road & Tudor Road, Douglas Street & Tudor Road, Douglas Street & High School Entrance, Douglas Street & Chipman Road, Main Street & Chipman Road, Commerce Drive & Chipman Road, and Main Street and Commerce Drive. The intersections were analyzed and reviewed under the existing traffic, 2029 background traffic, and 2029 total traffic. For purposes of this report, an overall intersection level-of-service “C” or better was considered an acceptable level-of-service as per Lee’s Summit Guidelines. The results of the capacity analyses conducted are summarized in **Table 3** and the raw data sheets have been included in the appendix.

TABLE 3.0 PHASE 1 - INTERSECTION CAPACITY ANALYSIS RESULTS

Intersection	Traffic Control	Overall / Approach	AM Peak Hour					
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			2025 Existing Traffic		2027 Background Traffic		2027 Total Traffic	
Commerce Dr / Sloan & Tudor Road	TWSC	OVR	✓ 3.8	A	✓ 3.9	A	✓ 3.8	A
		EB	✓ 0.5	A	✓ 0.5	A	✓ 0.5	A
		WB	✓ 1.2	A	✓ 1.2	A	✓ 1.2	A
		NB	✓ 13.5	B	✓ 14.0	B	✓ 14.8	B
		SB	✓ 12.1	B	✓ 12.4	B	✓ 13.0	B
Douglas St & Tudor Road	SIGNAL	OVR	✓ 23.4	C	✓ 22.1	C	✓ 21.9	C
		EB	✗ 43.9	D	✗ 49.9	D	✗ 51.0	D
		WB	✗ 53.8	D	✗ 55.2	E	✗ 54.0	D
		NB	✓ 0.7	A	✓ 1.5	A	✓ 1.9	A
		SB	✓ 11.7	B	✓ 9.4	A	✓ 10.6	B
Douglas St & High School Entrance / Access Drive 1	TWSC	OVR	✓ 0.2	A	✓ 0.2	A	✓ 12.3	B
		EB					✗ 126.8	F
		WB	✓ 14.3	B	✓ 14.7	B	✗ 25.2	D
		NB	✓ 0.0	A	✓ 0.0	A	✓ 2.5	A
		SB	✓ 0.1	A	✓ 0.1	A	✓ 0.1	A
Douglas St & Access Drive 2	TWSC	OVR					✓ 1.0	A
		EB					✓ 13.4	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A
Douglas St & Chipman Road	SIGNAL	OVR	✓ 31.1	C	✓ 31.7	C	✓ 34.7	C
		EB	✓ 24.9	C	✓ 25.5	C	✓ 31.5	C
		WB	✗ 41.0	D	✗ 41.7	D	✗ 44.7	D
		NB	✓ 24.5	C	✓ 24.7	C	✓ 25.4	C
		SB	✓ 34.3	C	✓ 34.9	C	✗ 36.2	D
NW Main St & Chipman Road	TWSC	OVR	✓ 0.3	A	✓ 0.2	A	✓ 0.2	A
		EB	✓ 0.1	A	✓ 0.1	A	✓ 0.1	A
		WB	✓ 0.0	A	✓ 0.0	A	✓ 0.0	A
		SB	✓ 9.3	A	✓ 9.3	A	✓ 9.4	A
Commerce Drive & Chipman Road	SIGNAL	OVR	✓ 13.4	B	✓ 13.5	B	✓ 13.5	B
		EB	✓ 18.8	B	✓ 19.0	B	✓ 19.1	B
		WB	✓ 2.7	A	✓ 2.8	A	✓ 2.8	A
		NB	✓ 32.6	C	✓ 32.7	C	✓ 32.7	C
		SB	✗ 36.7	D	✗ 36.9	D	✗ 36.9	D
NW Main St & Commerce Drive	TWSC	OVR	✓ 2.3	A	✓ 2.3	A	✓ 2.3	A
		EB	✓ 0.1	A	✓ 0.1	A	✓ 0.1	A
		WB	✓ 2.2	A	✓ 2.2	A	✓ 2.2	A
		NB	✓ 9.4	A	✓ 9.4	A	✓ 9.4	A
		SB	✓ 9.7	A	✓ 9.7	A	✓ 9.7	A
Douglas St & High School Entrance / Access Drive 1	PRO SIGNAL	OVR					✓ 5.7	A
		EB					✗ 55.0	D
		WB					✗ 51.9	D
		NB					✓ 0.5	A
		SB					✓ 0.5	A

			PM Peak Hour					
			2025 Existing Traffic		2027 Background Traffic		2027 Total Traffic	
Commerce Dr / Sloan & Tudor Road	TWSC	OVR	✓ 2.6	A	✓ 2.6	A	✓ 2.3	A
		EB	✓ 1.4	A	✓ 1.4	A	✓ 1.1	A
		WB	✓ 1.9	A	✓ 1.9	A	✓ 1.7	A
		NB	✓ 11.4	B	✓ 11.5	B	✓ 12.6	B
		SB	✓ 13.0	B	✓ 13.3	B	✓ 14.8	B
Douglas St & Tudor Road	SIGNAL	OVR	✓ 21.9	C	✓ 22.1	C	✓ 21.9	C
		EB	✗ 46.3	D	✗ 45.9	D	✗ 51.0	D
		WB	✗ 54.8	D	✗ 55.2	E	✗ 54.1	D
		NB	✓ 1.4	A	✓ 1.5	A	✓ 1.9	A
		SB	✓ 9.1	A	✓ 9.4	A	✓ 10.6	B
Douglas St & High School Entrance / Access Drive 1	TWSC	OVR	✓ 1.7	A	✓ 1.7	A	✓ 10.4	B
		EB					✗ 47.6	D
		WB	✓ 16.0	C	✓ 16.8	C	✗ 40.5	D
		NB	✓ 0.0	A	✓ 0.0	A	✓ 1.0	A
		SB	✓ 2.4	A	✓ 2.4	A	✓ 0.4	A
Douglas St & Access Drive 2	TWSC	OVR					✓ 2.3	A
		EB					✓ 13.9	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A
Douglas St & Chipman Road	SIGNAL	OVR	✓ 27.1	C	✓ 28.2	C	✓ 34.9	C
		EB	✓ 29.5	C	✓ 29.4	C	✗ 43.5	D
		WB	✓ 32.4	C	✓ 32.8	C	✗ 52.6	D
		NB	✓ 25.4	C	✓ 25.6	C	✓ 26.8	C
		SB	✓ 20.2	C	✓ 24.9	C	✓ 30.5	C
NW Main St & Chipman Road	TWSC	OVR	✓ 0.3	A	✓ 0.3	A	✓ 0.3	A
		EB	✓ 0.3	A	✓ 0.3	A	✓ 0.3	A
		WB	✓ 0.0	A	✓ 0.0	A	✓ 0.0	A
		SB	✓ 9.7	A	✓ 9.8	A	✓ 9.3	A
Commerce Drive & Chipman Road	SIGNAL	OVR	✓ 14.1	B	✓ 14.2	B	✓ 13.1	B
		EB	✓ 20.8	C	✓ 20.8	C	✓ 19.8	B
		WB	✓ 2.2	A	✓ 2.2	A	✓ 2.0	A
		NB	✓ 32.2	C	✓ 32.2	C	✓ 32.2	C
		SB	✓ 33.5	C	✓ 33.6	C	✓ 33.6	C
NW Main St & Commerce Drive	TWSC	OVR	✓ 1.7	A	✓ 1.7	A	✓ 1.7	A
		EB	✓ 0.2	A	✓ 0.2	A	✓ 0.2	A
		WB	✓ 2.3	A	✓ 2.3	A	✓ 2.3	A
		NB	✓ 9.9	A	✓ 10.0	B	✓ 10.0	B
		SB	✓ 9.8	A	✓ 9.8	A	✓ 9.8	A
Douglas St & High School Entrance / Access Drive 1	PRO SIGNAL	OVR					✓ 10.4	B
		EB					✗ 47.6	D
		WB					✗ 40.5	D
		NB					✓ 1.0	A
		SB					✓ 0.4	A

	Signal	Unsignalized
LEVEL OF SERVICE A - C	✓	✓
LEVEL OF SERVICE D - E	✗	✗
LEVEL OF SERVICE F	✗	✗

5.2.1 2025 EXISTING TRAFFIC

The analyses conducted under the 2025 existing traffic indicated that the overall intersections operate at an acceptable level-of-service "C" or better during the a.m. and p.m. peak hours.

5.2.2 2027 BACKGROUND TRAFFIC

The analyses conducted under the 2027 background traffic indicated that the overall intersections operate at an acceptable level-of-service "C" or better during the a.m. and p.m. peak hours.

5.2.3 PHASE 1 - 2027 TOTAL TRAFFIC

The analyses conducted under the 2027 phase 1 total traffic indicated that the overall intersections operate at an acceptable level-of-service "C" or better during the a.m. and p.m. peak hours. The intersection of Douglas Street and High School Entrance / Access Drive 1 did have level of service F for the side street during the a.m. and p.m. peak hours. A signal was modeled for the intersection during the peak hours and found that a signal would meet the level of service requirements. The results for a signal at that intersection were included in **Table 3**.

6.0 PHASE 2 - PROPOSED SITE TRIPS

To determine the effects a new development will have on an existing street system, new or additional traffic must be projected. The latest edition of the *Trip Generation Manual, 12th Edition*, published by the Institute of Transportation Engineers, was used to determine the amount of traffic the development is expected to generate. The report is a nationally accepted reference which provides trip rates for determining the traffic expected to be generated by different land use types.

Available information was utilized regarding the anticipated land use to determine the site generated traffic. The 850 – *Supermarket*, 822 – *Strip Retail Plaza* & 944 – *Gas Stations* category was selected to determine the trip generation of the proposed development. This site has 99,000 Square Foot Supermarket, 50,000 square feet Strip Retail Plaza, and 14 Vehicle Fueling Positions. The trip generation took into consideration both Internal capture, the sharing of trips between uses, and Pass By trips, the pulling of traffic from the existing traffic into the development. The resulting traffic volumes projected to be generated by the proposed development are indicated in **Table 4**.

TABLE 4.0 PHASE 2 - PROJECTED SITE GENERATED TRIPS

Building Type (Land Use)	ITE Land Use Code	Approximate Fuelling Positions	Average Weekday Vehicle Trips			Average AM Peak Hour Directional Distribution		Average AM Peak Hour Directional Trips (vph)		Average PM Peak Hour Directional Distribution		Average PM Peak Hour Directional Trips (vph)	
			Per Day	Per Peak Hour of Adjacent Street Traffic									
				One Hour Between 7am & 9am	One Hour Between 4pm & 6pm								
				(vpd)	(vph)	(vph)	IN	OUT	IN	OUT	IN	OUT	IN
Trip Rate*	822	(1 KSF GFA)	54.45	3.93	6.29	55%	45%	61	50	50%	50%	88	88
Strip Retail Plaza													
2.61 Acres / .25 FAR		28	1,525	110	176								
Total Trips			1,525	110	176			61	50			88	88

6.1 PHASE 2 - DISTRIBUTION OF TRIPS

The traffic expected to be generated by the proposed development was then distributed among the points of access as well as the study intersection for the A.M. and P.M. peak hours. The distribution of the site generated traffic was based on anticipated usage of the site and traffic patterns in the area which were obtained from the traffic data that was collected for this study and is summarized in **Figure 9**. The directional distribution of the site generated traffic entering/exiting the proposed development is generally expected to be:

- 20% to/from Tudor Road west of Commerce Drive
- 20% to/from Tudor Road east of Douglas Street
- 30% / 20% to/from Douglas Street north of Tudor
- 10% / 20% to/from Douglas Street south of Chipman Road
- 10% / 15% to/from Chipman Road west of Commerce Drive
- 20% to/from Chipman Road east of Douglas Street

For more detailed direction distribution see **Figure 9**.

6.2 PHASE 2 - TOTAL TRAFFIC

The site trips were then added to the future combined traffic for the 2029 design year. The 2029 phase 2 - total traffic (2029 future background traffic + phase 1 development trips + phase 2 development trips) for each access point as well as the adjacent study intersection is summarized in **Figure 10**.

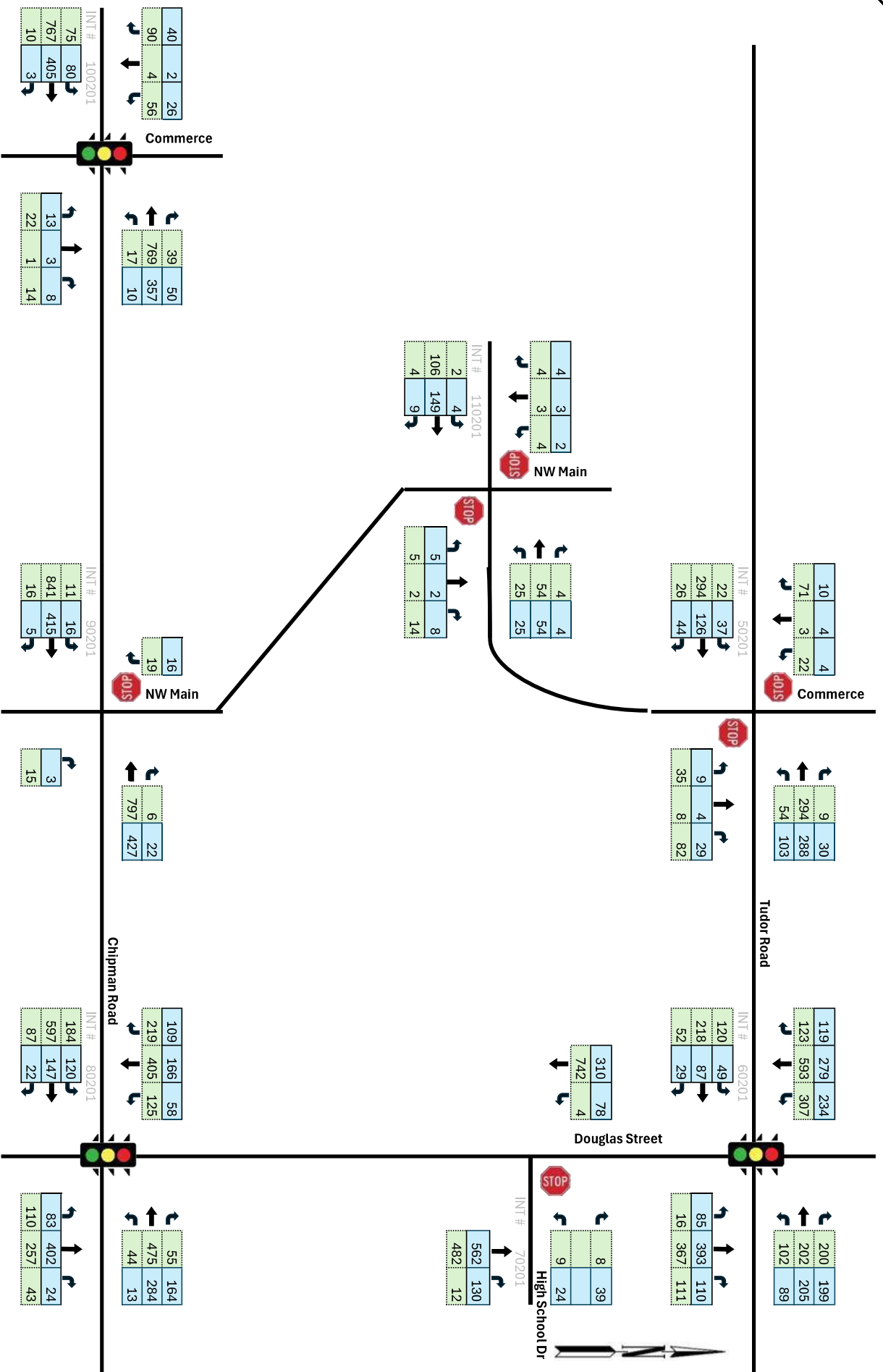
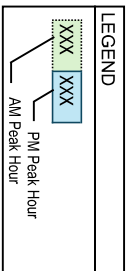
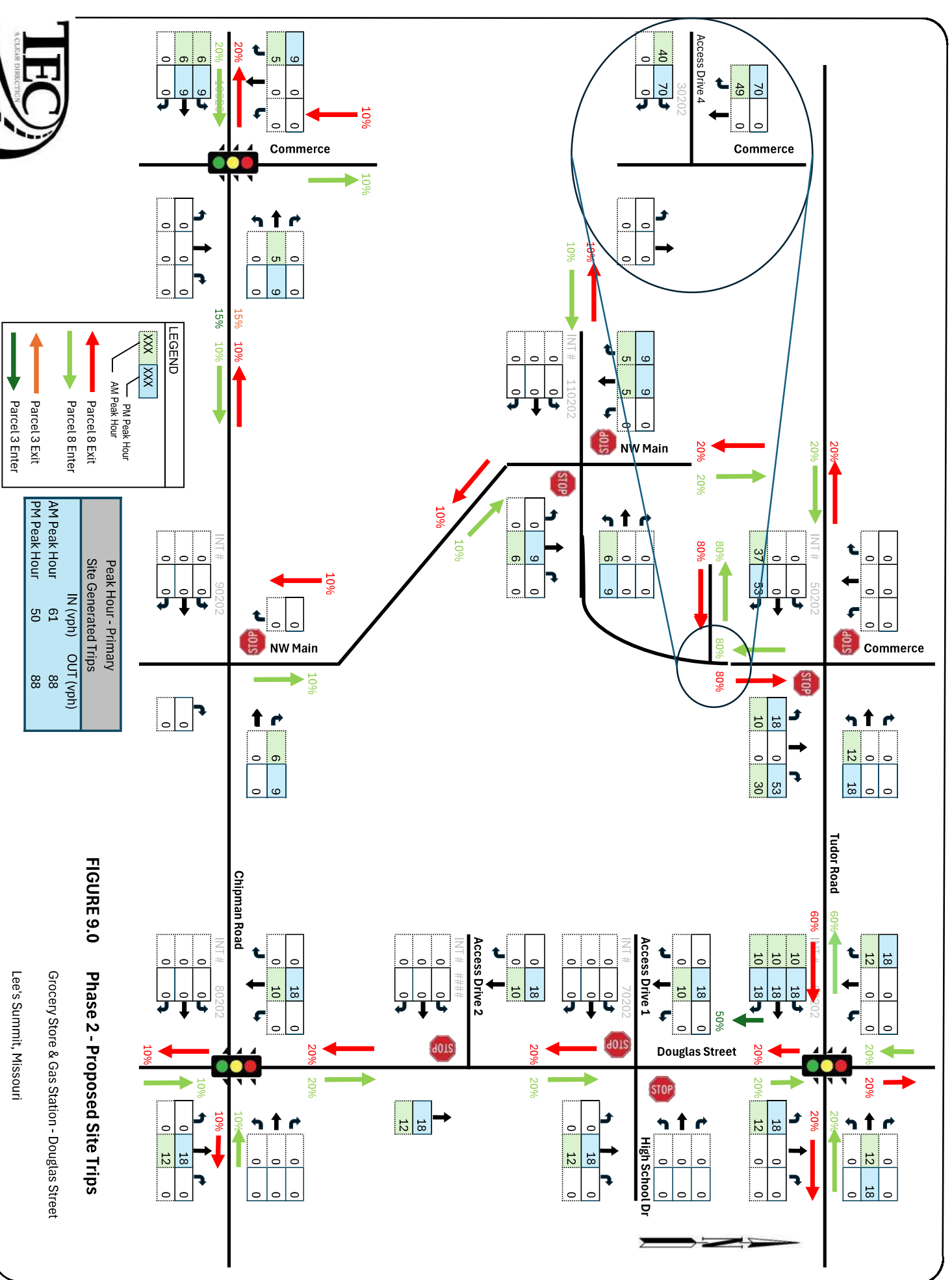


FIGURE 8.0 2029 Background Traffic

Grocery Store & Gas Station - Douglas Street

Lee's Summit, Missouri



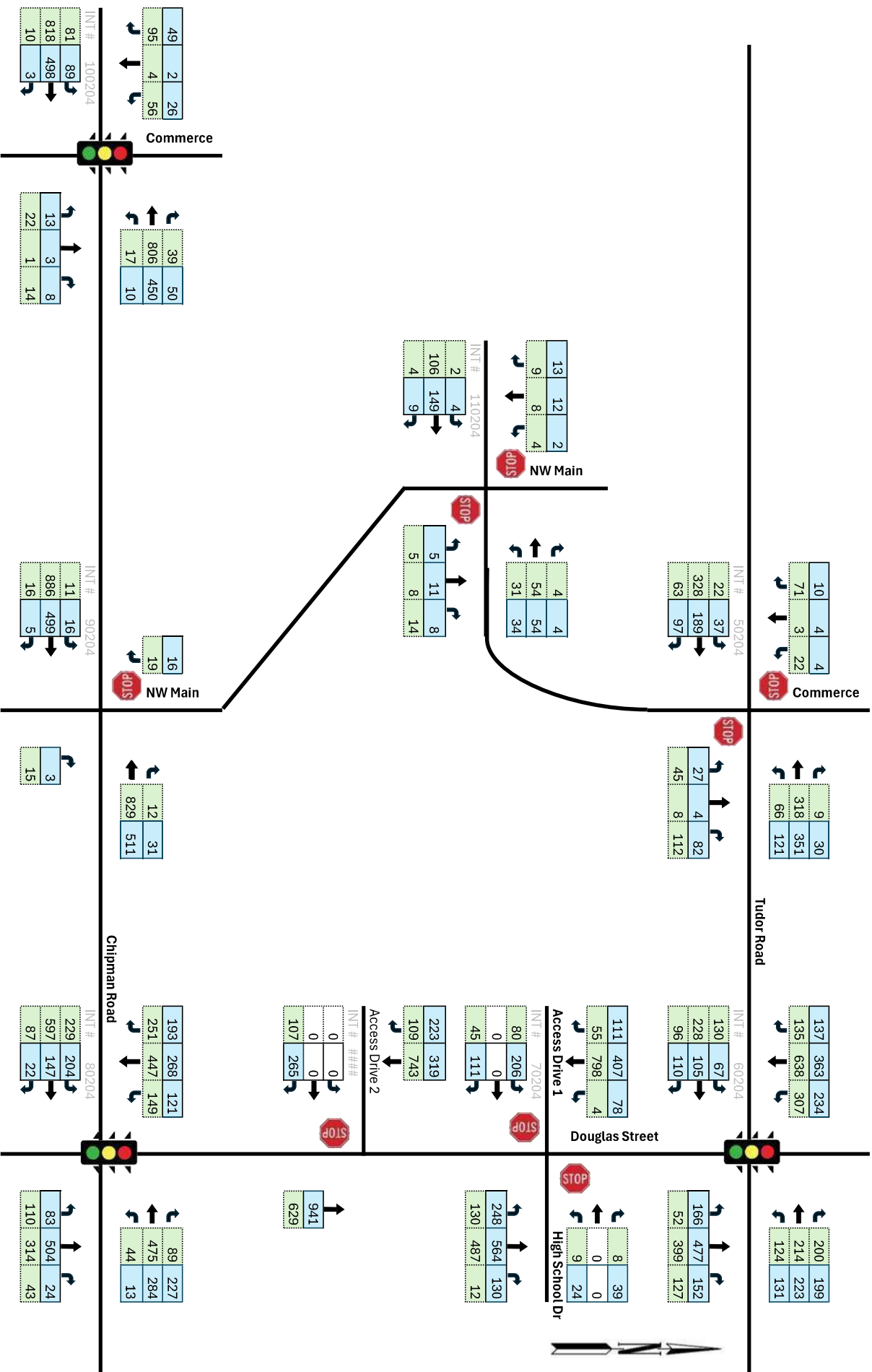


FIGURE 10.0 Phase 2 - Total Traffic

Grocery Store & Gas Station - Douglas Street

Lee's Summit, Missouri



7.0 PHASE 2 - CAPACITY ANALYSIS

7.1 METHODOLOGY

The capacity analyses were conducted using *Synchro 12*, which is a software package for modeling and optimizing traffic signal timings at signalized intersections and analyzing unsignalized intersections in accordance with the methodology of the latest edition of the *Highway Capacity Manual, 7th Edition*. The *Highway Capacity Manual* is published by the Transportation Research Board of the National Research Council, Washington, D.C. The information has been widely accepted throughout the U.S. as a guide for defining and solving transportation challenges. The information is approved and distributed by the U.S. Department of Transportation, Federal Highway Administration.

The capacity analysis provides a measure of the amount of traffic that a given facility can accommodate. Traffic facilities generally operate poorly at or near capacity. The analysis is intended to estimate the maximum amount of traffic that can be accommodated by a facility while maintaining prescribed operational qualities. The definition of operational criteria is accomplished using levels-of-service. The concept of levels-of-service is defined as a qualitative measure and describes operational conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Six levels-of-service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from "A" to "F", with level-of-service "A" representing the best operating conditions and level-of-service "F" the worst.

The average control delay for signalized intersections is estimated for each lane group and aggregated for each approach and for the intersection as a whole. The level-of-service for this type of traffic control is directly related to the control delay value. The criteria for stop controlled or unsignalized intersections have different threshold values than do those for signalized intersections. A higher level of control delay has been determined to be acceptable at a signalized intersection for the same level-of-service. The level-of-service criteria are summarized in **Table 5**.

TABLE 5.0 LEVEL-OF-SERVICE CRITERIA

Level-of-Service	Average Delay (seconds/vehicle)		Traffic Condition
	Unsignalized	Signalized	
A	≤ 10	≤ 10	Free Flow
B	> 10 - 15	> 10 - 20	Stable Flow (slight delays)
C	> 15 - 25	> 20 - 35	Stable Flow (acceptable delays)
D	> 25 - 35	> 35 - 55	Approaching Unstable Flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 35 - 50	> 55 - 80	Unstable Flow (intolerable delay)
F	> 50	> 80	Forced Flow (congested and queues fail to clear)

7.2 PHASE 2 - SCENARIOS

Capacity analyses were conducted for the A.M. and P.M. peak hours at each development driveway as well as the intersections of Commerce Drive / Sloan Road & Tudor Road, Douglas Street & Tudor Road, Douglas Street & High School Entrance, Douglas Street & Chipman Road, Main Street & Chipman Road, Commerce Drive & Chipman Road, and Main Street and Commerce Drive. The intersections were analyzed and reviewed under the existing traffic, 2029 background traffic, and 2029 total traffic. For purposes of this report, an overall intersection level-of-service “C” or better was considered an acceptable level-of-service as per Lee’s Summit Guidelines. The results of the capacity analyses conducted are summarized in **Table 6** and the raw data sheets have been included in the appendix.

TABLE 6.0 PHASE 2 - INTERSECTION CAPACITY ANALYSIS RESULTS

Intersection	Traffic Control	Overall / Approach	AM Peak Hour					
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
			2025 Existing Traffic		2029 Background Traffic		2029 Total Traffic	
Commerce Dr / Sloan & Tudor Road	TWSC	OVR	✓ 3.8	A	✓ 4.0	A	✓ 4.7	A
		EB	✓ 0.5	A	✓ 0.5	A	✓ 0.4	A
		WB	✓ 1.2	A	✓ 1.2	A	✓ 1.4	A
		NB	✓ 13.5	B	✓ 14.6	B	✓ 17.9	C
		SB	✓ 12.1	B	✓ 12.8	B	✓ 14.0	B
Douglas St & Tudor Road	SIGNAL	OVR	✓ 23.4	C	✓ 24.0	C	✓ 25.1	C
		EB	✗ 43.9	D	✗ 43.1	D	✗ 44.2	D
		WB	✗ 53.8	D	✗ 54.5	D	✗ 54.7	D
		NB	✓ 0.7	A	✓ 0.8	A	✓ 2.0	A
		SB	✓ 11.7	B	✓ 12.9	B	✓ 14.6	B
Douglas St & High School Entrance / Access Drive 1	PRO SIGNAL	OVR					✓ 5.5	A
		EB					✗ 55.1	E
		WB					✗ 51.9	D
		NB					✓ 0.5	A
		SB					✓ 0.5	A
Douglas St & Access Drive 2	TWSC	OVR					✓ 1.0	A
		EB					✓ 13.7	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A
Douglas St & Chipman Road	SIGNAL	OVR	✓ 31.1	C	✓ 32.3	C	✓ 30.9	C
		EB	✓ 24.9	C	✓ 26.2	C	✓ 25.4	C
		WB	✗ 41.0	D	✗ 42.4	D	✗ 42.7	D
		NB	✓ 24.5	C	✓ 24.9	C	✓ 27.8	C
		SB	✓ 34.3	C	✗ 35.6	D	✓ 29.9	C
NW Main St & Chipman Road	TWSC	OVR	✓ 0.3	A	✓ 0.2	A	✓ 0.2	A
		EB	✓ 0.1	A	✓ 0.1	A	✓ 0.1	A
		WB	✓ 0.0	A	✓ 0.0	A	✓ 0.0	A
		SB	✓ 9.3	A	✓ 11.6	B	✓ 11.8	B
Commerce Drive & Chipman Road	SIGNAL	OVR	✓ 13.4	B	✓ 13.7	B	✓ 13.9	B
		EB	✓ 18.8	B	✓ 19.2	B	✓ 19.6	B
		WB	✓ 2.7	A	✓ 2.8	A	✓ 2.9	A
		NB	✓ 32.6	C	✓ 32.7	C	✓ 32.8	C
		SB	✗ 36.7	D	✗ 37.2	D	✗ 37.4	D
NW Main St & Commerce Drive	TWSC	OVR	✓ 2.3	A	✓ 2.2	A	✓ 2.9	A
		EB	✓ 0.1	A	✓ 0.1	A	✓ 0.1	A
		WB	✓ 2.2	A	✓ 2.3	A	✓ 2.6	A
		NB	✓ 9.4	A	✓ 9.4	A	✓ 9.9	A
		SB	✓ 9.7	A	✓ 9.8	A	✓ 9.9	A
Commerce Drive & Access Drive 4	TWSC	OVR					✓ 1.4	A
		EB					✓ 10.2	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A

			PM Peak Hour					
			2025 Existing Traffic		2029 Background Traffic		2029 Total Traffic	
Commerce Dr / Sloan & Tudor Road	TWSC	OVR	✓ 2.6	A	✓ 2.7	A	✓ 3.4	A
		EB	✓ 1.4	A	✓ 1.4	A	✓ 0.9	A
		WB	✓ 1.9	A	✓ 1.9	A	✓ 2.0	A
		NB	✓ 11.4	B	✓ 11.8	B	✓ 14.9	B
		SB	✓ 13.0	B	✓ 13.4	B	✓ 16.1	C
Douglas St & Tudor Road	SIGNAL	OVR	✓ 21.9	C	✓ 22.3	C	✓ 22.9	C
		EB	✗ 46.3	D	✗ 45.6	D	✗ 48.2	D
		WB	✗ 54.8	D	✗ 55.5	E	✗ 54.2	D
		NB	✓ 1.4	A	✓ 1.5	A	✓ 2.4	A
		SB	✓ 9.1	A	✓ 9.7	A	✓ 11.9	B
Douglas St & High School Entrance / Access Drive 1	PRO SIGNAL	OVR					✓ 9.8	A
		EB					✗ 47.8	D
		WB					✗ 41.4	D
		NB					✓ 0.9	A
		SB					✓ 0.4	A
Douglas St & Access Drive 2	TWSC	OVR					✓ 2.1	A
		EB					✓ 13.7	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A
Douglas St & Chipman Road	SIGNAL	OVR	✓ 27.1	C	✓ 29.4	C	✓ 32.6	C
		EB	✓ 29.5	C	✓ 29.3	C	✗ 35.0	C
		WB	✓ 32.4	C	✓ 33.3	C	✓ 33.5	C
		NB	✓ 25.4	C	✓ 25.8	C	✗ 37.4	D
		SB	✓ 20.2	C	✓ 29.7	C	✓ 25.1	C
NW Main St & Chipman Road	TWSC	OVR	✓ 0.3	A	✓ 0.3	A	✓ 0.4	A
		EB	✓ 0.3	A	✓ 0.3	A	✓ 0.3	A
		WB	✓ 0.0	A	✓ 0.0	A	✓ 0.0	A
		SB	✓ 9.7	A	✓ 9.9	A	✓ 10.3	B
Commerce Drive & Chipman Road	SIGNAL	OVR	✓ 14.1	B	✓ 14.2	B	✓ 13.7	B
		EB	✓ 20.8	C	✓ 20.9	C	✓ 20.4	C
		WB	✓ 2.2	A	✓ 2.3	A	✓ 2.2	A
		NB	✓ 32.2	C	✓ 32.2	C	✓ 32.2	C
		SB	✓ 33.5	C	✓ 33.7	C	✓ 34.0	C
NW Main St & Commerce Drive	TWSC	OVR	✓ 1.7	A	✓ 1.7	A	✓ 2.7	A
		EB	✓ 0.2	A	✓ 0.2	A	✓ 0.2	A
		WB	✓ 2.3	A	✓ 2.3	A	✓ 2.8	A
		NB	✓ 9.9	A	✓ 10.0	B	✓ 10.7	B
		SB	✓ 9.8	A	✓ 9.9	A	✓ 10.1	B
Commerce Drive & Access Drive 4	TWSC	OVR					✓ 2.2	A
		EB					✓ 10.4	B
		NB					✓ 0.0	A
		SB					✓ 0.0	A

	Signal	Unsignalized
LEVEL OF SERVICE A - C	✓	✓
LEVEL OF SERVICE D - E	✗	✗
LEVEL OF SERVICE F	●	◆

7.2.1 2029 BACKGROUND TRAFFIC

The analyses conducted under the 2029 background traffic indicated that the overall intersections operate at an acceptable level-of-service "C" or better during the a.m. and p.m. peak hours.

7.2.2 PHASE 2 - 2029 TOTAL TRAFFIC

The analyses conducted under the 2029 phase 2 total traffic indicated that the overall intersections operate at an acceptable level-of-service "C" or better during the a.m. and p.m. peak hours. A signal was modeled for the intersection of Douglas Street and High School Entrance / Access Drive 1 during the peak hours since it was found that a signal would meet the level of service requirements. The results for a signal at that intersection were included in **Table 6**.

8.0 ALTERNATIVE TRANSPORTATION MODES

8.1 PEDESTRIAN & BIKING

Bike and pedestrian accommodations were reviewed in the vicinity of the proposed development. All new driveways with planned sidewalks will be constructed to meet ADA and accommodate connectivity. In reviewing the Lee's Summit Comprehensive Plan indicates the need for trails along Tudor Road and Chipman Road. Those trails currently exist within the vicinity of the development. Sidewalks should be installed along Douglas Street within the development to allow for increased pedestrian activity and meet city code. In addition, a new signal at Douglas Street and the High School Entrance / Access Drive 1 should include crosswalks to allow for pedestrian connectivity.

8.2 TRANSIT

There are currently no fixed route transit services within the vicinity of the development.

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 VEHICULAR RECCOMENDATIONS

TEC was requested to conduct a traffic impact study on a proposed supermarket, retail and gas station development in Lee's Summit, Missouri. Existing traffic volume data was collected adjacent to the proposed development. The development was analyzed as full build out in 2029. The proposed development traffic was then determined and added to the background design traffic for conducting reviews and analyses.

A traffic signal warrant analysis was completed for the intersection of Douglas Street and High School Entrance / Access Drive 1 in accordance with the criteria outlined in the MUTCD. Turning-movement counts, pedestrian activity, and speed data were evaluated against the applicable warrants. For this development the Eight-Hour was most applicable.

Based on these findings, installation of a traffic signal is warranted in the 2027 build condition and is expected to enhance both safety and operations at the intersection. Alternative traffic control options—such as all-way stop control and minor geometric improvements—were reviewed but are not anticipated to provide the same level of safety and operational benefit as a properly timed and coordinated traffic signal.

Improvements are needed at the intersection of Douglas Street and High School Entrance / Access Drive 1 in order to handle the anticipated traffic demands.

1. Signalization to meet the capacity needs (see Signal Warrants in Appendix)
2. Addition of Northbound and Southbound left turn lane as required by the city of Lee's Summit
3. With Signalization, installation of a crosswalk for pedestrian connectivity.

In addition to these improvements, access restrictions shall be installed at Access Drive 2 in order to restrict traffic movements to right in and right out only.

Several intersections operate at approach Level of Service D under existing conditions, and the addition of development traffic generally maintains that same approach Level of Service D threshold under proposed conditions. In some cases, delay increases while the approach remains at Level of Service D. In

a limited number of instances, certain approaches at signalized intersections exceed the Level of Service D threshold and operate at Level of Service E by less than one second. These occurrences are at signalized intersections where timing is intentionally weighted to prioritize major roadway traffic and maintain efficient progression along the mainline corridor. While signal timing could be adjusted to meet the approach Level of Service threshold, it is typical practice for side street approaches to experience somewhat greater delay in order to optimize overall traffic flow on the primary roadway.

It should also be noted that in no instance did the overall intersection Level of Service fall below Level of Service C, and where adjustments were needed, signal timing modifications were able to bring operations back within the applicable threshold.

Sight Distance at Proposed Entrances and Roadway Intersections – Careful consideration should be given to sight distance obstructions when planning any future development, aesthetics enhancements, such as berms, fencing, or landscaping. To ensure that these improvements do not obstruct the view of entering and exiting traffic at the developments access with public roads. It is generally recommended that all improvements higher than 3.0 feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway. Conditions may vary and will need to be reviewed by the site engineer on a case-by-case basis.

Based on these findings, installation of a traffic signal is warranted in the 2027 build condition and is expected to enhance both safety and operations at the intersection. A signal is close to being warranted today based upon existing traffic. Alternative traffic control options—such as all-way stop control and minor geometric improvements—were reviewed but are not anticipated to provide the same level of safety and operational benefit as a properly timed and coordinated traffic signal. A roundabout could be considered in lieu of a traffic signal.

9.2 PEDESTRIAN & BIKING IMPROVEMENTS

Bike and pedestrian accommodations were reviewed in the vicinity of the proposed development. All new driveways with planned sidewalks will be constructed to meet ADA and accommodate connectivity. New sidewalk shall be installed along Douglas Street to meet city code, and with a new signal at Douglas Street and High School Entrance / Access Drive 1, crosswalks should be install to accommodate pedestrian connectivity.

10.0 APPENDIX A

Supermarket — Douglas Street & Tudor Road Lee's Summit, Missouri

Existing

Existing Traffic Counts

AM Existing Synchro

PM Existing Synchro

Phase 1 - 2027

AM Peak Calculations

AM Background Traffic Synchro

AM Total Traffic Synchro

AM Total Traffic Synchro w/ Signal

PM Peak Calculations

PM Background Traffic Synchro

PM Total Traffic Synchro

PM Total Traffic Synchro w/ Signal

Prepared by:

Traffic Engineering Consultants, Inc.

Phase 2 - 2029

AM Peak Calculations

AM Background Traffic Synchro

AM Total Traffic Synchro w/ Signal

PM Peak Calculations

PM Background Traffic Synchro

PM Total Traffic Synchro w/ Signal

Prepared by:

Traffic Engineering Consultants, Inc.



EXISTING INFORMATION

Supermarket — Douglas Street & Tudor Road

Lee's Summit, Missouri

Existing

Existing Traffic Counts

AM Existing Synchro

PM Existing Synchro

Prepared by:

Traffic Engineering Consultants, Inc.

EXISTING INFORMATION



(303) 216-2439
www.alltrafficdata.net

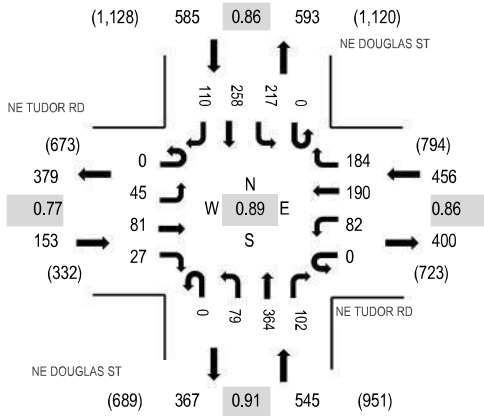
Location: 1 NE DOUGLAS ST & NE TUDOR RD AM

Date: Thursday, December 4, 2025

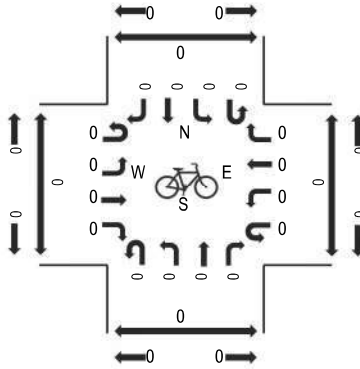
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

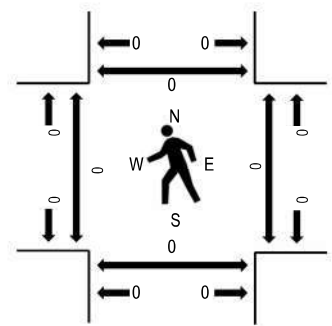
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NE TUDOR RD Eastbound				NE TUDOR RD Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	10	24	9	0	14	44	56	0	10	80	38	0	68	72	17	442	1,739	0	0	0	0
7:15 AM	0	13	21	8	0	29	45	58	0	17	99	26	0	72	68	30	486	1,650	0	0	0	0
7:30 AM	0	10	18	6	0	18	57	23	0	25	89	12	0	27	55	34	374	1,527	0	0	0	0
7:45 AM	0	12	18	4	0	21	44	47	0	27	96	26	0	50	63	29	437	1,505	0	0	0	0
8:00 AM	0	12	14	2	0	15	44	32	0	9	80	23	0	37	53	32	353	1,466	0	0	0	0
8:15 AM	0	25	19	4	0	12	37	39	0	7	75	15	0	40	62	28	363		0	0	0	0
8:30 AM	0	18	22	5	0	11	34	38	0	8	74	14	0	39	62	27	352		0	0	0	0
8:45 AM	0	20	35	3	0	15	28	33	0	6	81	14	0	51	78	34	398		0	0	0	0
Count Total	0	120	171	41	0	135	333	326	0	109	674	168	0	384	513	231	3,205		0	0	0	0
Peak Hour	0	45	81	27	0	82	190	184	0	79	364	102	0	217	258	110	1,739		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

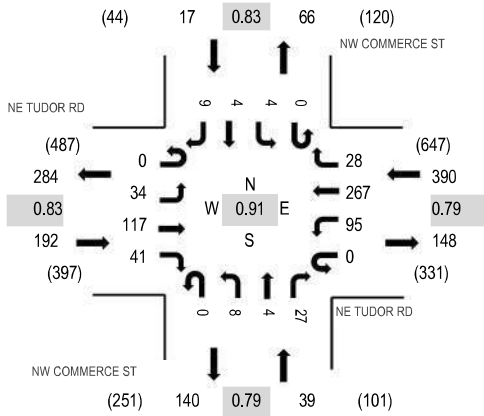
Location: 2 NW COMMERCE ST & NE TUDOR RD AM

Date: Thursday, December 4, 2025

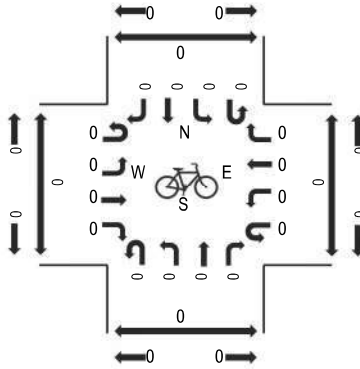
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

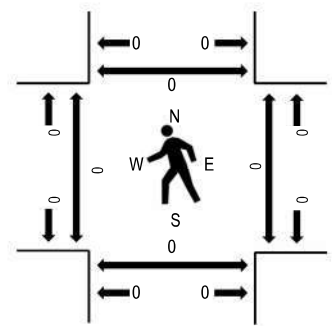
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NE TUDOR RD Eastbound				NE TUDOR RD Westbound				NW COMMERCE ST Northbound				NW COMMERCE ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	4	43	9	0	14	44	4	0	3	0	4	0	0	1	1	127	619	0	0	0	0
7:15 AM	0	4	39	5	0	24	60	4	0	2	2	6	0	2	2	0	150	638	0	0	0	0
7:30 AM	0	1	22	6	0	22	90	11	0	3	0	9	0	0	2	1	167	629	0	0	0	0
7:45 AM	0	17	27	18	0	22	75	5	0	3	1	5	0	0	0	2	175	589	0	0	0	0
8:00 AM	0	12	29	12	0	27	42	8	0	0	1	7	0	2	0	6	146	570	0	0	0	0
8:15 AM	0	9	35	8	0	15	42	4	0	4	3	11	0	2	2	6	141		0	0	0	0
8:30 AM	0	9	24	5	0	21	40	3	0	4	1	12	0	1	1	6	127		0	0	0	0
8:45 AM	0	13	36	10	0	24	42	4	0	8	0	12	0	3	1	3	156		0	0	0	0
Count Total	0	69	255	73	0	169	435	43	0	27	8	66	0	10	9	25	1,189		0	0	0	0
Peak Hour	0	34	117	41	0	95	267	28	0	8	4	27	0	4	4	9	638		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

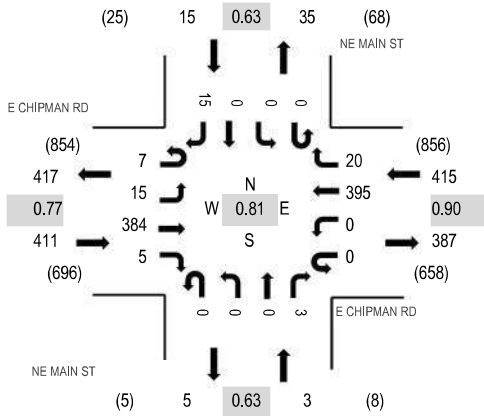
Location: 3 NE MAIN ST & E CHIPMAN RD AM

Date: Thursday, December 4, 2025

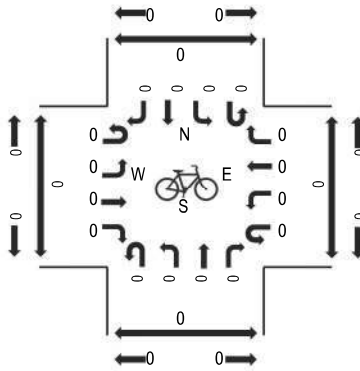
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

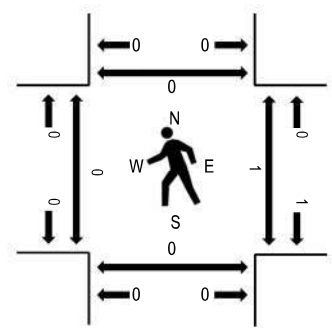
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E CHIPMAN RD Eastbound				E CHIPMAN RD Westbound				NE MAIN ST Northbound				NE MAIN ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	1	0	54	0	0	0	84	2	0	0	0	2	0	0	0	0	143	741	0	0	1	0
7:15 AM	1	3	66	0	0	0	119	3	0	0	0	1	0	0	0	4	197	779	0	0	0	0
7:30 AM	0	3	65	0	0	0	107	4	0	0	0	1	0	0	0	3	183	785	0	0	0	0
7:45 AM	4	7	81	0	0	0	111	11	0	0	0	1	0	0	0	3	218	802	0	0	0	1
8:00 AM	2	1	85	3	0	0	80	5	0	0	0	2	0	0	0	3	181	844	0	0	0	0
8:15 AM	2	3	83	1	0	0	106	5	0	0	0	0	0	0	0	3	203		0	1	0	0
8:30 AM	3	4	89	1	0	0	94	3	0	0	0	0	0	0	0	6	200		0	0	0	0
8:45 AM	0	7	127	0	0	0	115	7	0	0	0	1	0	0	0	3	260		0	0	0	0
Count Total	13	28	650	5	0	0	816	40	0	0	0	8	0	0	0	25	1,585		0	1	1	1
Peak Hour	7	15	384	5	0	0	395	20	0	0	0	3	0	0	0	15	844		0	1	0	0



(303) 216-2439
www.alltrafficdata.net

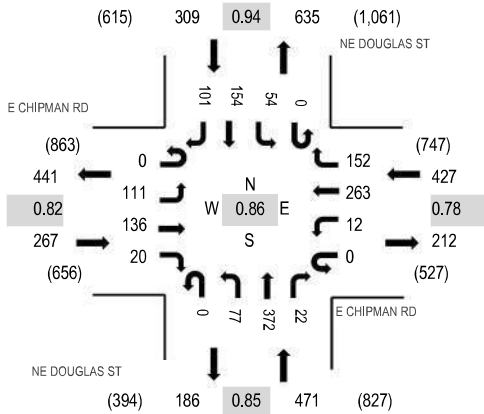
Location: 4 NE DOUGLAS ST & E CHIPMAN RD AM

Date: Thursday, December 4, 2025

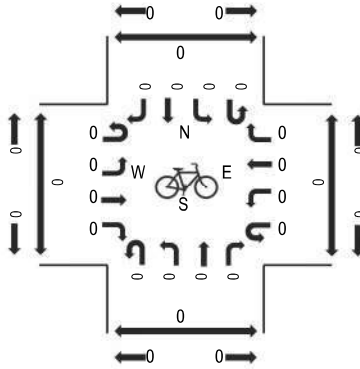
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

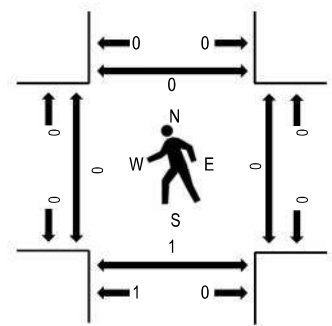
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E CHIPMAN RD Eastbound				E CHIPMAN RD Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	21	28	5	0	2	56	55	0	15	79	2	0	11	37	18	329	1,474	0	0	1	0
7:15 AM	0	34	30	5	0	2	73	62	0	18	110	10	0	14	40	29	427	1,465	0	0	0	0
7:30 AM	0	25	34	6	0	4	57	14	0	22	89	7	0	12	34	32	336	1,379	0	0	0	0
7:45 AM	0	31	44	4	0	4	77	21	0	22	94	3	0	17	43	22	382	1,377	0	0	0	0
8:00 AM	0	13	64	8	0	4	53	20	0	12	73	5	0	16	30	22	320	1,371	0	0	0	0
8:15 AM	0	27	46	11	0	6	62	10	0	18	74	8	0	11	36	32	341		0	0	0	0
8:30 AM	0	34	59	9	0	5	57	14	0	17	60	7	0	10	41	21	334		0	0	0	0
8:45 AM	0	33	73	12	0	7	69	13	0	19	55	8	0	8	39	40	376		0	0	0	0
Count Total	0	218	378	60	0	34	504	209	0	143	634	50	0	99	300	216	2,845		0	0	1	0
Peak Hour	0	111	136	20	0	12	263	152	0	77	372	22	0	54	154	101	1,474		0	0	1	0



(303) 216-2439
www.alltrafficdata.net

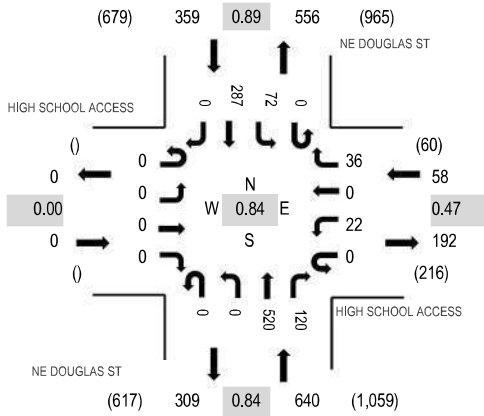
Location: 5 NE DOUGLAS ST & HIGH SCHOOL ACCESS AM

Date: Thursday, December 4, 2025

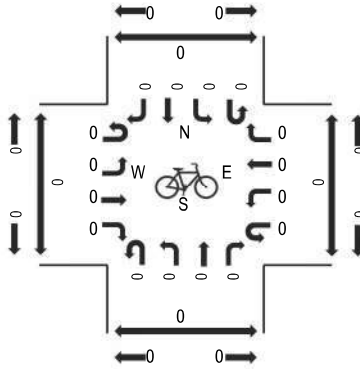
Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:15 AM - 07:30 AM

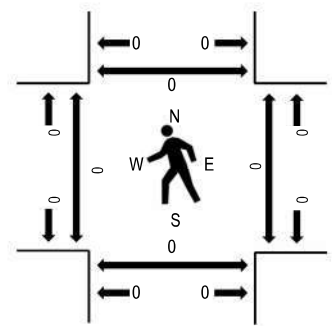
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HIGH SCHOOL ACCESS Eastbound				HIGH SCHOOL ACCESS Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	10	0	14	0	0	111	49	0	44	57	0	285	1,057	0	0	0	0
7:15 AM	0	0	0	0	0	10	0	21	0	0	128	62	0	24	71	0	316	951	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	131	3	0	2	78	0	215	821	0	0	0	0
7:45 AM	0	0	0	0	0	1	0	1	0	0	150	6	0	2	81	0	241	780	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	106	3	0	5	65	0	179	741	0	0	0	0
8:15 AM	0	0	0	0	0	1	0	0	0	0	105	1	0	3	76	0	186		0	1	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	97	2	0	1	74	0	174		0	0	0	0
8:45 AM	0	0	0	0	0	0	0	1	0	0	100	5	0	4	92	0	202		0	0	0	0
Count Total	0	0	0	0	0	23	0	37	0	0	928	131	0	85	594	0	1,798		0	1	0	0
Peak Hour	0	0	0	0	0	22	0	36	0	0	520	120	0	72	287	0	1,057		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

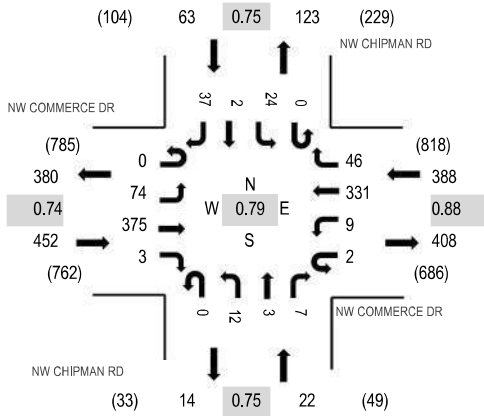
Location: 6 NW CHIPMAN RD & NW COMMERCE DR AM

Date: Thursday, December 4, 2025

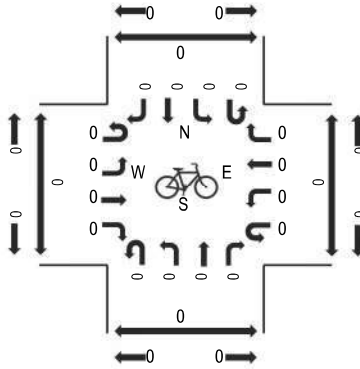
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

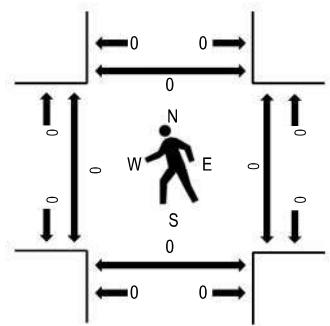
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NW COMMERCE DR Eastbound				NW COMMERCE DR Westbound				NW CHIPMAN RD Northbound				NW CHIPMAN RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	7	52	0	0	2	72	8	0	4	0	2	0	1	2	5	155	808	0	0	1	0
7:15 AM	0	13	62	2	0	3	107	13	0	5	2	2	0	6	0	6	221	855	0	0	0	0
7:30 AM	0	10	55	0	0	4	93	10	0	4	1	1	0	6	1	6	191	838	0	0	0	0
7:45 AM	0	25	83	1	0	4	98	16	0	1	1	4	0	4	0	4	241	875	0	0	0	0
8:00 AM	0	12	84	1	1	1	72	13	0	3	0	3	0	3	1	8	202	925	0	0	0	0
8:15 AM	0	19	72	0	1	1	77	13	0	2	1	1	0	8	1	8	204		0	0	0	0
8:30 AM	0	18	94	0	0	4	78	6	0	5	0	2	0	10	0	11	228		0	0	0	0
8:45 AM	0	25	125	2	0	3	104	14	0	2	2	1	0	3	0	10	291		0	0	0	0
Count Total	0	129	627	6	2	22	701	93	0	26	7	16	0	41	5	58	1,733		0	0	1	0
Peak Hour	0	74	375	3	2	9	331	46	0	12	3	7	0	24	2	37	925		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

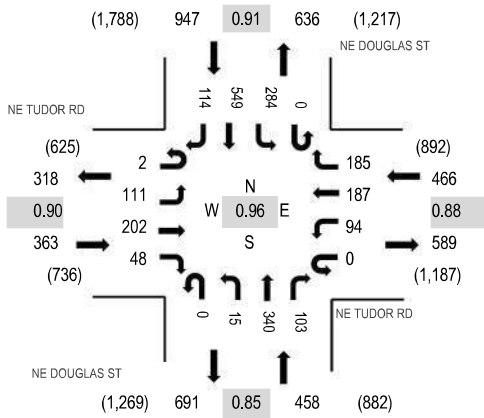
Location: 1 NE DOUGLAS ST & NE TUDOR RD PM

Date: Thursday, December 4, 2025

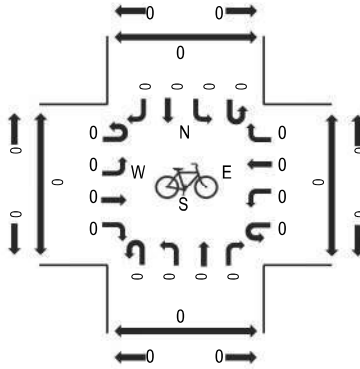
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

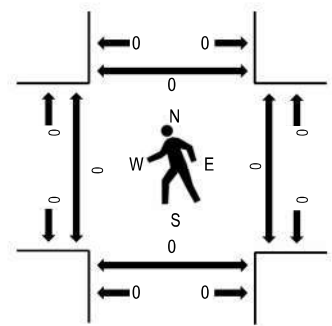
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NE TUDOR RD Eastbound				NE TUDOR RD Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	1	33	56	10	0	29	50	46	0	12	86	22	0	55	138	19	557	2,207	1	0	2	0
4:15 PM	1	26	51	11	0	25	50	45	0	3	83	19	0	69	153	24	560	2,234	0	0	0	0
4:30 PM	1	32	51	16	0	23	32	35	0	1	70	22	0	69	162	30	544	2,208	0	0	0	0
4:45 PM	0	29	46	9	0	17	57	49	0	6	88	31	0	71	108	35	546	2,181	0	0	0	0
5:00 PM	0	24	54	12	0	29	48	56	0	5	99	31	0	75	126	25	584	2,091	0	0	0	0
5:15 PM	0	38	60	7	0	28	43	33	0	1	63	16	0	91	121	33	534		0	0	0	0
5:30 PM	0	28	53	6	0	22	47	40	0	5	81	32	0	70	103	30	517		0	0	0	0
5:45 PM	0	25	51	5	0	20	37	31	0	4	77	25	0	67	89	25	456		0	0	0	0
Count Total	3	235	422	76	0	193	364	335	0	37	647	198	0	567	1,000	221	4,298		1	0	2	0
Peak Hour	2	111	202	48	0	94	187	185	0	15	340	103	0	284	549	114	2,234		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

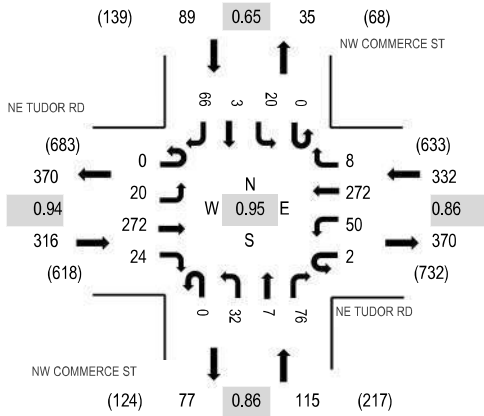
Location: 2 NW COMMERCE ST & NE TUDOR RD PM

Date: Thursday, December 4, 2025

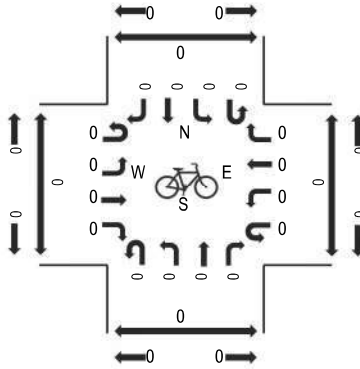
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

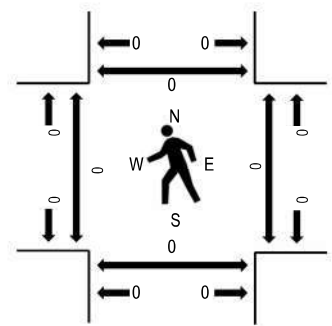
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NE TUDOR RD Eastbound				NE TUDOR RD Westbound				NW COMMERCE ST Northbound				NW COMMERCE ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	7	75	4	1	8	68	6	0	8	0	24	0	1	2	4	208	826	0	0	1	0
4:15 PM	0	4	69	5	0	10	66	3	0	3	1	16	0	3	1	8	189	837	0	0	0	0
4:30 PM	0	4	76	3	0	9	64	0	0	6	4	12	0	6	0	20	204	852	0	0	0	0
4:45 PM	0	7	64	7	1	29	66	2	0	11	0	24	0	4	0	10	225	849	0	0	0	0
5:00 PM	0	4	59	8	1	7	76	4	0	5	2	19	0	8	1	25	219	781	0	0	0	0
5:15 PM	0	5	73	6	0	5	66	2	0	10	1	21	0	2	2	11	204		0	0	0	0
5:30 PM	0	5	69	1	1	8	66	1	0	7	1	19	0	3	0	20	201		0	0	0	0
5:45 PM	0	4	58	1	0	7	55	1	0	3	0	20	0	3	0	5	157		0	0	0	0
Count Total	0	40	543	35	4	83	527	19	0	53	9	155	0	30	6	103	1,607		0	0	1	0
Peak Hour	0	20	272	24	2	50	272	8	0	32	7	76	0	20	3	66	852		0	0	0	0



(303) 216-2439
www.alltrafficdata.net

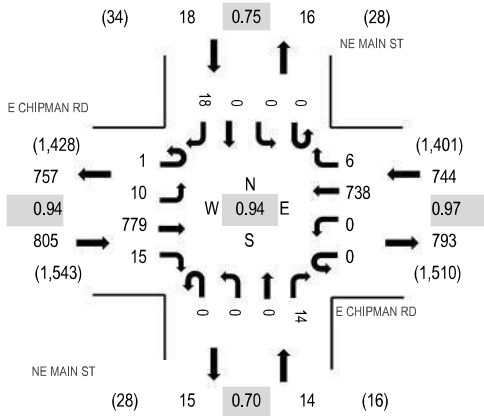
Location: 3 NE MAIN ST & E CHIPMAN RD PM

Date: Thursday, December 4, 2025

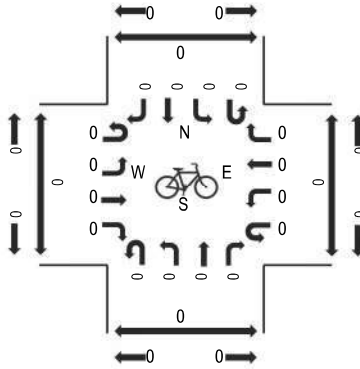
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

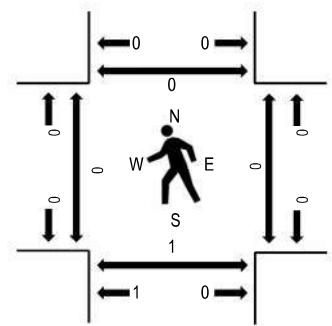
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E CHIPMAN RD Eastbound				E CHIPMAN RD Westbound				NE MAIN ST Northbound				NE MAIN ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	2	196	4	0	0	181	2	0	0	0	0	0	0	0	4	389	1,579	0	0	0	0
4:15 PM	0	2	199	4	0	0	185	2	0	0	0	4	0	0	0	1	397	1,581	0	0	0	0
4:30 PM	0	2	179	5	0	0	180	0	0	0	0	5	0	0	0	2	373	1,530	0	0	0	0
4:45 PM	1	3	212	0	0	0	191	1	0	0	0	4	0	0	0	8	420	1,533	0	0	1	0
5:00 PM	0	3	189	6	0	0	182	3	0	0	0	1	0	0	0	7	391	1,415	0	0	0	0
5:15 PM	0	2	161	4	0	0	169	2	0	0	0	2	0	0	0	6	346		0	0	0	0
5:30 PM	1	2	194	2	0	0	172	2	0	0	0	0	0	0	0	3	376		0	0	0	0
5:45 PM	3	0	164	3	0	0	129	0	0	0	0	0	0	0	0	3	302		0	0	0	0
Count Total	5	16	1,494	28	0	0	1,389	12	0	0	0	16	0	0	0	34	2,994		0	0	1	0
Peak Hour	1	10	779	15	0	0	738	6	0	0	0	14	0	0	0	18	1,581		0	0	1	0



(303) 216-2439
www.alltrafficdata.net

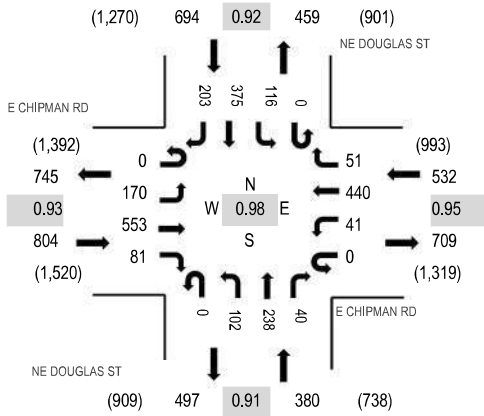
Location: 4 NE DOUGLAS ST & E CHIPMAN RD PM

Date: Thursday, December 4, 2025

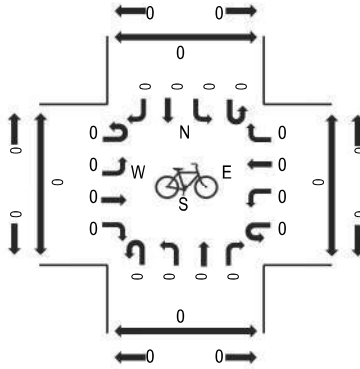
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:15 PM - 04:30 PM

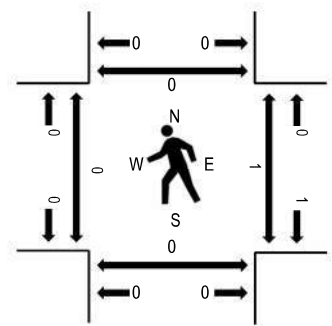
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	E CHIPMAN RD Eastbound				E CHIPMAN RD Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	35	131	26	0	7	115	18	0	21	70	5	0	45	81	45	599	2,399	0	1	0	0
4:15 PM	0	46	154	12	0	10	108	11	0	24	45	13	0	26	109	55	613	2,410	0	0	0	0
4:30 PM	0	31	124	22	0	15	104	10	0	25	54	11	0	36	97	57	586	2,314	0	0	0	0
4:45 PM	0	45	149	23	0	6	117	13	0	25	65	10	0	30	71	47	601	2,271	0	1	0	0
5:00 PM	0	48	126	24	0	10	111	17	0	28	74	6	0	24	98	44	610	2,122	0	0	0	0
5:15 PM	0	22	109	27	0	2	93	15	0	29	56	3	0	25	91	45	517		0	0	0	0
5:30 PM	0	41	124	34	0	2	98	13	0	29	60	9	0	28	62	43	543		0	0	0	0
5:45 PM	0	42	107	18	0	3	80	15	0	19	55	2	0	22	59	30	452		0	0	0	0
Count Total	0	310	1,024	186	0	55	826	112	0	200	479	59	0	236	668	366	4,521		0	2	0	0
Peak Hour	0	170	553	81	0	41	440	51	0	102	238	40	0	116	375	203	2,410		0	1	0	0



(303) 216-2439
www.alltrafficdata.net

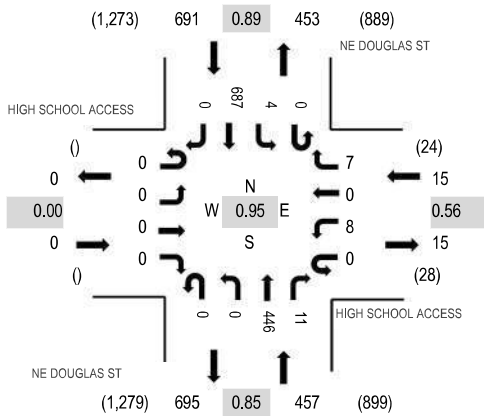
Location: 5 NE DOUGLAS ST & HIGH SCHOOL ACCESS PM

Date: Thursday, December 4, 2025

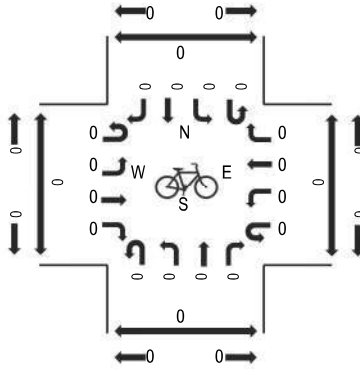
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

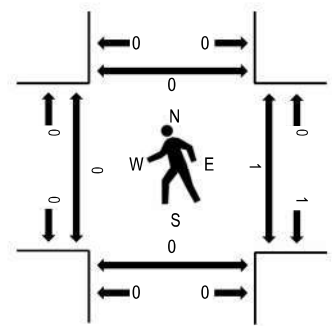
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HIGH SCHOOL ACCESS Eastbound				HIGH SCHOOL ACCESS Westbound				NE DOUGLAS ST Northbound				NE DOUGLAS ST Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	0	0	2	0	1	0	0	123	2	0	0	175	0	303	1,160	0	1	0	0
4:15 PM	0	0	0	0	0	4	0	4	0	0	103	1	0	2	186	0	300	1,163	0	0	0	0
4:30 PM	0	0	0	0	0	2	0	0	0	0	89	4	0	0	196	0	291	1,116	0	0	0	0
4:45 PM	0	0	0	0	0	2	0	3	0	0	121	1	0	1	138	0	266	1,078	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	133	5	0	1	167	0	306	1,036	0	1	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	87	5	0	1	159	0	253		0	0	0	0
5:30 PM	0	0	0	0	0	3	0	2	0	0	114	2	0	2	130	0	253		0	1	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	108	1	0	0	115	0	224		0	0	0	0
Count Total	0	0	0	0	0	13	0	11	0	0	878	21	0	7	1,266	0	2,196		0	3	0	0
Peak Hour	0	0	0	0	0	8	0	7	0	0	446	11	0	4	687	0	1,163		0	1	0	0



(303) 216-2439
www.alltrafficdata.net

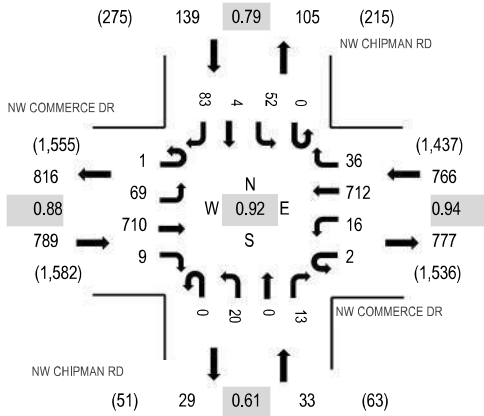
Location: 6 NW CHIPMAN RD & NW COMMERCE DR PM

Date: Thursday, December 4, 2025

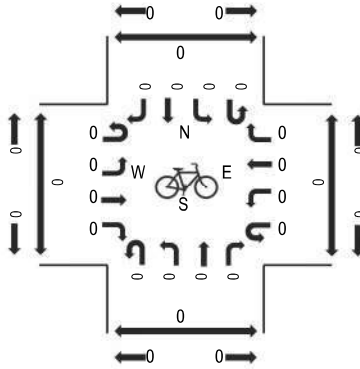
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

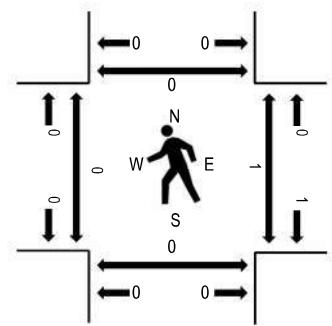
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	NW COMMERCE DR Eastbound				NW COMMERCE DR Westbound				NW CHIPMAN RD Northbound				NW CHIPMAN RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	9	190	4	0	3	168	8	0	5	0	3	0	12	1	30	433	1,713	0	0	0	0
4:15 PM	0	17	180	2	0	3	181	6	0	2	0	2	0	9	0	16	418	1,727	0	0	0	0
4:30 PM	1	8	159	3	1	1	169	8	0	3	0	2	0	15	3	21	394	1,708	0	0	0	0
4:45 PM	0	26	200	2	0	4	187	12	0	7	0	1	0	8	0	21	468	1,727	0	1	0	0
5:00 PM	0	18	171	2	1	8	175	10	0	8	0	8	0	20	1	25	447	1,644	0	0	0	0
5:15 PM	0	17	169	3	1	2	162	6	0	5	0	2	0	14	1	17	399		0	0	0	0
5:30 PM	1	16	179	1	2	2	165	10	0	6	0	2	0	10	2	17	413		0	0	0	0
5:45 PM	0	34	169	1	0	0	132	10	0	7	0	0	0	6	2	24	385		0	0	0	0
Count Total	2	145	1,417	18	5	23	1,339	70	0	43	0	20	0	94	10	171	3,357		0	1	0	0
Peak Hour	1	69	710	9	2	16	712	36	0	20	0	13	0	52	4	83	1,727		0	1	0	0

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	272	24	50	272	8	32	7	76	20	3	66
Future Vol, veh/h	20	272	24	50	272	8	32	7	76	20	3	66
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	296	26	54	296	9	35	8	83	22	3	72
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	304	0	0	322	0	0	610	765	161	599	770	148
Stage 1	-	-	-	-	-	-	352	352	-	404	404	-
Stage 2	-	-	-	-	-	-	258	413	-	195	365	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1253	-	-	1235	-	-	378	332	856	385	330	872
Stage 1	-	-	-	-	-	-	638	630	-	594	597	-
Stage 2	-	-	-	-	-	-	724	592	-	788	622	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1253	-	-	1235	-	-	323	312	856	319	310	872
Mov Cap-2 Maneuver	-	-	-	-	-	-	323	312	-	319	310	-
Stage 1	-	-	-	-	-	-	627	619	-	568	571	-
Stage 2	-	-	-	-	-	-	632	566	-	691	611	-
Approach	EB		WB			NB			SB			
HCM Ctrl Dly, s/v	0.5		1.22			13.53			12.13			
HCM LOS						B			B			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	547	1253	-	-	1235	-	-	601				
HCM Lane V/C Ratio	0.229	0.017	-	-	0.044	-	-	0.161				
HCM Ctrl Dly (s/v)	13.5	7.9	-	-	8	-	-	12.1				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.6				

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	779	738	6	0	18
Future Vol, veh/h	10	779	738	6	0	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	847	802	7	0	20
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	809	0	-	0	-	404
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	813	-	-	-	0	596
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	813	-	-	-	-	596
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB	SB			
HCM Ctrl Dly, s/v	0.12	0	11.25			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	813	-	-	-	596	
HCM Lane V/C Ratio	0.013	-	-	-	0.033	
HCM Ctrl Dly (s/v)	9.5	-	-	-	11.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	98	4	23	50	4	5	2	13	4	3	4
Future Vol, veh/h	2	98	4	23	50	4	5	2	13	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	107	4	25	54	4	5	2	14	4	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	111	0	0	219	222	109	218	222	57
Stage 1	-	-	-	-	-	-	113	113	-	107	107	-
Stage 2	-	-	-	-	-	-	106	109	-	112	115	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1545	-	-	1479	-	-	737	677	945	738	677	1010
Stage 1	-	-	-	-	-	-	892	802	-	899	807	-
Stage 2	-	-	-	-	-	-	900	805	-	893	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1545	-	-	1479	-	-	717	664	945	711	664	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	717	664	-	711	664	-
Stage 1	-	-	-	-	-	-	891	801	-	883	793	-
Stage 2	-	-	-	-	-	-	876	791	-	876	799	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.14			2.23			9.39			9.69		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	842	34	-	-	530	-	-	780				
HCM Lane V/C Ratio	0.026	0.001	-	-	0.017	-	-	0.015				
HCM Ctrl Dly (s/v)	9.4	7.3	0	-	7.5	0	-	9.7				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection

Int Delay, s/veh 0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	7	446	11	4	687
Future Vol, veh/h	8	7	446	11	4	687
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	8	485	12	4	747

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	873	248	0
Stage 1	491	-	-
Stage 2	382	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	290	752	-
Stage 1	581	-	-
Stage 2	659	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	288	752	-
Mov Cap-2 Maneuver	288	-	-
Stage 1	581	-	-
Stage 2	656	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	14.27	0	0.09
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	404	21
HCM Lane V/C Ratio	-	-	0.04	0.004
HCM Ctrl Dly (s/v)	-	-	14.3	8.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	136	20	12	263	152	77	372	22	54	154	101
Future Volume (veh/h)	111	136	20	12	263	152	77	372	22	54	154	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	121	148	22	13	286	165	84	404	24	59	167	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	149	1217	178	26	1144	510	506	1335	79	421	720	610
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Prop Arrive On Green	0.17	0.78	0.78	0.01	0.32	0.32	0.04	0.39	0.39	0.05	0.51	0.51
Unsig. Movement Delay												
Ln Grp Delay, s/veh	58.9	8.5	8.5	72.6	30.5	32.5	21.0	26.3	26.3	21.1	20.2	19.7
Ln Grp LOS	E	A	A	E	C	C	C	C	C	C	C	B
Approach Vol, veh/h	291			464			512			336		
Approach Delay, s/veh	29.5			32.4			25.4			20.2		
Approach LOS	C			C			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	9.3	52.0	6.8	51.9	10.1	51.2	15.1	43.6				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	4.8				
Max Q Clear (g_c+I1), s	4.4	11.8	2.9	3.4	5.4	7.9	9.9	11.5				
Green Ext Time (g_e), s	0.0	2.7	0.0	1.0	0.0	1.4	0.2	2.0				
Prob of Phs Call (p_c)	0.86	1.00	0.35	1.00	0.94	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.01	0.00	1.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3409			3111			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	202			455			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

030 EX - PM PEAK 4:00 pm 12/01/2025 Baseline

Synchro 12 Report
Page 1

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	59	0	13	0	84	0	121	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	2.4	0.0	0.9	0.0	3.4	0.0	7.9	0.0
Cycle Q Clear Time (g_c), s	2.4	0.0	0.9	0.0	3.4	0.0	7.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	960	0	0	0	1102	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.2	0.0	0.0	0.0	46.2	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	37.2	0.0	0.0	0.0	40.3	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.6	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	421	0	26	0	506	0	149	0
V/C Ratio (X)	0.14	0.00	0.50	0.00	0.17	0.00	0.81	0.00
Avail Cap (c_a), veh/h	446	0	134	0	534	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	20.9	0.0	58.7	0.0	20.8	0.0	49.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	13.9	0.0	0.2	0.0	9.9	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.1	0.0	72.6	0.0	21.0	0.0	58.9	0.0
1st-Term Q (Q1), veh/ln	1.0	0.0	0.4	0.0	1.4	0.0	3.2	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.0	0.0	0.5	0.0	1.4	0.0	3.7	0.0
%ile Storage Ratio (RQ%)	0.02	0.00	0.06	0.00	0.11	0.00	0.27	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	210	0	83	0	167	0	286
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	9.8	0.0	1.4	0.0	5.9	0.0	7.1
Cycle Q Clear Time (g_c), s	0.0	9.8	0.0	1.4	0.0	5.9	0.0	7.1
Lane Grp Cap (c), veh/h	0	696	0	695	0	720	0	1144
V/C Ratio (X)	0.00	0.30	0.00	0.12	0.00	0.23	0.00	0.25
Avail Cap (c_a), veh/h	0	696	0	695	0	720	0	1144
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.2	0.0	8.1	0.0	19.4	0.0	30.0
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.4	0.0	0.8	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.3	0.0	8.5	0.0	20.2	0.0	30.5
1st-Term Q (Q1), veh/ln	0.0	4.1	0.0	0.5	0.0	2.5	0.0	3.1

HCM 7th Signalized Intersection Capacity Analysis 3: Douglas Street & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.4	0.0	0.6	0.0	2.7	0.0	3.1
%ile Storage Ratio (RQ%)	0.00	0.32	0.00	0.03	0.00	0.06	0.00	0.04
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	218	0	87	0	110	0	165
Grp Sat Flow (s), veh/h/ln	0	1834	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	9.8	0.0	1.4	0.0	4.5	0.0	9.5
Cycle Q Clear Time (g_c), s	0.0	9.8	0.0	1.4	0.0	4.5	0.0	9.5
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.11	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	718	0	700	0	610	0	510
V/C Ratio (X)	0.00	0.30	0.00	0.12	0.00	0.18	0.00	0.32
Avail Cap (c_a), veh/h	0	718	0	700	0	610	0	510
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.2	0.0	8.1	0.0	19.1	0.0	30.8
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.4	0.0	0.6	0.0	1.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.3	0.0	8.5	0.0	19.7	0.0	32.5
1st-Term Q (Q1), veh/ln	0.0	4.3	0.0	0.5	0.0	1.6	0.0	3.6
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.5	0.0	0.6	0.0	1.7	0.0	3.9
%ile Storage Ratio (RQ%)	0.00	0.34	0.00	0.03	0.00	0.24	0.00	0.49
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	27.1
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	81	27	82	190	184	79	364	102	217	258	110
Future Volume (veh/h)	45	81	27	82	190	184	79	364	102	217	258	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	88	29	89	207	200	86	396	111	236	280	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	149	460	205	298	271	242	696	2104	939	716	1526	638
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.03	0.13	0.13	0.06	0.15	0.15	0.08	1.00	1.00	0.07	0.62	0.62
Unsig. Movement Delay												
Ln Grp Delay, s/veh	45.1	46.8	46.6	42.2	54.7	60.6	8.3	0.2	0.3	7.6	9.9	10.0
Ln Grp LOS	D	D	D	D	D	E	A	A	A	A	A	A
Approach Vol, veh/h	166				496				593		636	
Approach Delay, s/veh	46.3				54.8				1.4		9.1	
Approach LOS	D				D				A		A	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	13.1	75.6	11.3	20.0	9.2	79.5	8.5	22.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	7.9	2.0	7.1	4.7	4.3	8.0	4.8	16.7				
Green Ext Time (g_e), s	0.7	3.1	0.1	0.6	0.0	2.7	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.95	1.00	0.94	1.00	0.80	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.37				
Left-Turn Movement Data												
Assigned Mvmt	1	3	5	7								
Mvmt Sat Flow, veh/h	1781	1781	1781	1781								
Through Movement Data												
Assigned Mvmt	2	4	6	8								
Mvmt Sat Flow, veh/h	3554	3554	2443	1777								
Right-Turn Movement Data												
Assigned Mvmt	12	14	16	18								
Mvmt Sat Flow, veh/h	1585	1585	1021	1585								
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

030 EX - PM PEAK 4:00 pm 12/01/2025 Baseline

Synchro 12 Report
Page 4

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	236	0	89	0	86	0	49	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.9	0.0	5.1	0.0	2.3	0.0	2.8	0.0
Cycle Q Clear Time (g_c), s	5.9	0.0	5.1	0.0	2.3	0.0	2.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	892	0	1275	0	985	0	978	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	72.5	0.0	15.8	0.0	71.1	0.0	15.5	0.0
Perm LT Serve Time (g_u), s	71.1	0.0	12.9	0.0	69.0	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.5	0.0	0.2	0.0	0.2	0.0	0.6	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	716	0	298	0	696	0	149	0
V/C Ratio (X)	0.33	0.00	0.30	0.00	0.12	0.00	0.33	0.00
Avail Cap (c_a), veh/h	1056	0	353	0	722	0	320	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	7.3	0.0	41.6	0.0	8.2	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.0	0.1	0.0	1.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	7.6	0.0	42.2	0.0	8.3	0.0	45.1	0.0
1st-Term Q (Q1), veh/ln	2.1	0.0	2.3	0.0	0.8	0.0	1.3	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.2	0.0	2.3	0.0	0.8	0.0	1.3	0.0
%ile Storage Ratio (RQ%)	0.16	0.00	0.39	0.00	0.14	0.00	0.20	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	396	0	88	0	202	0	207
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	2.7	0.0	5.8	0.0	13.4
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.7	0.0	5.8	0.0	13.4
Lane Grp Cap (c), veh/h	0	2104	0	460	0	1110	0	271
V/C Ratio (X)	0.00	0.19	0.00	0.19	0.00	0.18	0.00	0.76
Avail Cap (c_a), veh/h	0	2104	0	903	0	1110	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	46.6	0.0	9.5	0.0	48.8
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.0	0.4	0.0	5.9
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.2	0.0	46.8	0.0	9.9	0.0	54.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.2	0.0	2.2	0.0	5.9

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.2	0.0	2.3	0.0	6.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.03	0.00	0.09	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	111	0	29	0	198	0	200
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1687	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	1.9	0.0	6.0	0.0	14.7
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	1.9	0.0	6.0	0.0	14.7
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.61	0.00	1.00
Lane Grp Cap (c), veh/h	0	939	0	205	0	1053	0	242
V/C Ratio (X)	0.00	0.12	0.00	0.14	0.00	0.19	0.00	0.83
Avail Cap (c_a), veh/h	0	939	0	403	0	1053	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	46.3	0.0	9.6	0.0	49.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.4	0.0	11.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	46.6	0.0	10.0	0.0	60.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.8	0.0	2.2	0.0	5.8
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.8
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.8	0.0	2.3	0.0	6.6
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.14	0.00	0.08	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	21.9
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	34	117	41	95	267	28	8	4	27	4	4	9
Future Vol, veh/h	34	117	41	95	267	28	8	4	27	4	4	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	37	127	45	103	290	30	9	4	29	4	4	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	321	0	0	172	0	0	577	751	86	636	742	145
Stage 1	-	-	-	-	-	-	223	223	-	497	497	-
Stage 2	-	-	-	-	-	-	354	527	-	140	246	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1236	-	-	1403	-	-	400	338	956	362	342	876
Stage 1	-	-	-	-	-	-	759	718	-	524	543	-
Stage 2	-	-	-	-	-	-	636	526	-	849	702	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1403	-	-	351	304	956	311	307	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	351	304	-	311	307	-
Stage 1	-	-	-	-	-	-	736	696	-	485	503	-
Stage 2	-	-	-	-	-	-	578	488	-	793	681	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.42	1.89	11.37	12.96
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	607	1236	-	-	1403	-	-	470
HCM Lane V/C Ratio	0.07	0.03	-	-	0.074	-	-	0.039
HCM Ctrl Dly (s/v)	11.4	8	-	-	7.8	-	-	13
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.2	-	-	0.1

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	375	3	9	331	46	12	3	7	24	2	37
Future Volume (veh/h)	74	375	3	9	331	46	12	3	7	24	2	37
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	408	3	10	360	50	13	3	8	26	2	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	103	2142	16	21	1715	236	259	66	139	185	30	248
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.02	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	67.7	11.6	11.6	73.9	0.5	0.5	32.2	0.0	0.0	33.5	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h	491				420		24				68	
Approach Delay, s/veh	20.8				2.2		32.2				33.5	
Approach LOS	C				A		C				C	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		5.9	76.1	38.0		11.4	70.6				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.4		3.8	5.2	5.5		3.8	5.3				
Max Q Clear (g_c+I1), s	3.2		2.7	8.2	5.7		7.3	2.0				
Green Ext Time (g_e), s	0.1		0.0	2.7	0.3		0.1	2.7				
Prob of Phs Call (p_c)	1.00		0.28	1.00	1.00		0.93	1.00				
Prob of Max Out (p_x)	0.00		0.00	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	773		1781	523		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	239		3616	108		3137						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	506		27	902		432						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

030 EX - PM PEAK 4:00 pm 12/01/2025 Baseline

Synchro 12 Report
Page 8

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	24	10	0	0	68	80	0
Grp Sat Flow (s), veh/h/ln	0	1518	1781	0	0	1534	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.5	5.3	0.0
Cycle Q Clear Time (g_c), s	0.0	1.2	0.7	0.0	0.0	3.7	5.3	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1386	0	0	0	1426	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1835	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	29.3	0.0	0.0	0.0	31.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.2	0.0	0.0	0.0	3.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.38	1.00	0.00
Lane Grp Cap (c), veh/h	0	464	21	0	0	463	103	0
V/C Ratio (X)	0.00	0.05	0.48	0.00	0.00	0.15	0.78	0.00
Avail Cap (c_a), veh/h	0	464	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.2	0.0	0.0	32.9	55.8	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.7	0.0	0.0	0.7	12.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.9	0.0	0.0	33.5	67.7	0.0
1st-Term Q (Q1), veh/ln	0.0	0.5	0.3	0.0	0.0	1.5	2.4	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.5	0.4	0.0	0.0	1.6	2.7	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.11	0.00	0.00	0.17	0.77	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	200	0	0	0	203
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1053	0	0	0	971
V/C Ratio (X)	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.21
Avail Cap (c_a), veh/h	0	0	0	1053	0	0	0	971
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	211	0	0	0	207
Grp Sat Flow (s), veh/h/ln	0	0	0	1866	0	0	0	1793
Q Serve Time (g_s), s	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.33	0.00	0.01	0.00	0.59	0.00	0.24
Lane Grp Cap (c), veh/h	0	0	0	1105	0	0	0	980
V/C Ratio (X)	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.21
Avail Cap (c_a), veh/h	0	0	0	1105	0	0	0	980
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.6	0.0	0.0	0.0	0.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	14.1
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	384	395	20	0	15
Future Vol, veh/h	15	384	395	20	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	417	429	22	0	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	451	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	1106	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1106	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.31	0	9.73
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1106	-	-	-	778
HCM Lane V/C Ratio	0.015	-	-	-	0.021
HCM Ctrl Dly (s/v)	8.3	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	138	8	23	50	4	5	2	7	2	3	4
Future Vol, veh/h	4	138	8	23	50	4	5	2	7	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	150	9	25	54	4	5	2	8	2	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	59	0	0	159	0	0	269	272	154	266	274	57
Stage 1	-	-	-	-	-	-	163	163	-	107	107	-
Stage 2	-	-	-	-	-	-	106	109	-	160	167	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1545	-	-	1421	-	-	684	635	892	686	633	1010
Stage 1	-	-	-	-	-	-	839	763	-	899	807	-
Stage 2	-	-	-	-	-	-	900	805	-	842	760	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1545	-	-	1421	-	-	663	621	892	664	620	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	663	621	-	664	620	-
Stage 1	-	-	-	-	-	-	836	761	-	883	792	-
Stage 2	-	-	-	-	-	-	876	791	-	830	758	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.2			2.26			9.89			9.79		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	752	47	-	-	530	-	-	762				
HCM Lane V/C Ratio	0.02	0.003	-	-	0.018	-	-	0.013				
HCM Ctrl Dly (s/v)	9.9	7.3	0	-	7.6	0	-	9.8				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection

Int Delay, s/veh 1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	36	520	120	72	287
Future Vol, veh/h	22	36	520	120	72	287
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	39	565	130	78	312

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	943	348	0
Stage 1	630	-	-
Stage 2	313	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	261	648	-
Stage 1	493	-	-
Stage 2	715	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	236	648	-
Mov Cap-2 Maneuver	236	-	-
Stage 1	493	-	-
Stage 2	647	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	16	0	2.36
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	390	722
HCM Lane V/C Ratio	-	-	0.162	0.087
HCM Ctrl Dly (s/v)	-	-	16	9.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.3



2027 INFORMATION

**Supermarket — Douglas Street & Tudor Road
Lee's Summit, Missouri**

2027 Phase 1

AM Peak Calculations

AM Background Traffic Synchro

AM Total Traffic Synchro

AM Total Traffic Synchro w/ Signal

PM Peak Calculations

PM Background Traffic Synchro

PM Total Traffic Synchro

PM Total Traffic Synchro w/ Signal

Prepared by:

Traffic Engineering Consultants, Inc.

[illegible][illegible][illegible][illegible]

[illegible]

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	575	84	43	458	53	106	248	42	121	390	211
Future Volume (veh/h)	177	575	84	43	458	53	106	248	42	121	390	211
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	192	625	91	47	498	58	115	270	46	132	424	229
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	219	1113	162	61	955	426	304	1192	200	502	725	614
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Prop Arrive On Green	0.25	0.72	0.72	0.03	0.27	0.27	0.05	0.39	0.39	0.03	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	60.5	16.2	16.2	76.2	39.3	34.0	23.5	25.1	25.2	21.3	39.4	34.2
Ln Grp LOS	E	B	B	E	D	C	C	C	C	C	D	C
Approach Vol, veh/h	908			603			431			785		
Approach Delay, s/veh	25.5			41.7			24.7			34.9		
Approach LOS	C			D			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	52.0	9.1	47.9	11.5	51.5	19.7	37.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	5.1				
Max Q Clear (g_c+I1), s	7.4	9.2	5.1	13.5	6.6	25.7	14.4	16.3				
Green Ext Time (g_e), s	0.0	2.0	0.0	4.8	0.0	3.4	0.3	2.3				
Prob of Phs Call (p_c)	0.99	1.00	0.79	1.00	0.98	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.93	0.00	1.00	0.00	0.05	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3043		3113		1870		3554				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		512		453		1585		1585				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	132	0	47	0	115	0	192	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.4	0.0	3.1	0.0	4.6	0.0	12.4	0.0
Cycle Q Clear Time (g_c), s	5.4	0.0	3.1	0.0	4.6	0.0	12.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	1064	0	0	0	779	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.5	0.0	0.0	0.0	46.5	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	39.8	0.0	0.0	0.0	22.8	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	1.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	502	0	61	0	304	0	219	0
V/C Ratio (X)	0.26	0.00	0.78	0.00	0.38	0.00	0.88	0.00
Avail Cap (c_a), veh/h	502	0	134	0	312	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	21.1	0.0	57.5	0.0	22.8	0.0	44.4	0.0
Incr Delay (d2), s/veh	0.3	0.0	18.7	0.0	0.8	0.0	16.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.3	0.0	76.2	0.0	23.5	0.0	60.5	0.0
1st-Term Q (Q1), veh/ln	2.3	0.0	1.4	0.0	1.9	0.0	4.8	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.3	0.0	0.1	0.0	1.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.3	0.0	1.7	0.0	2.0	0.0	5.8	0.0
%ile Storage Ratio (RQ%)	0.06	0.00	0.22	0.00	0.15	0.00	0.43	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	156	0	356	0	424	0	498
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	7.0	0.0	11.4	0.0	23.7	0.0	14.3
Cycle Q Clear Time (g_c), s	0.0	7.0	0.0	11.4	0.0	23.7	0.0	14.3
Lane Grp Cap (c), veh/h	0	696	0	635	0	725	0	955
V/C Ratio (X)	0.00	0.22	0.00	0.56	0.00	0.58	0.00	0.52
Avail Cap (c_a), veh/h	0	696	0	635	0	725	0	955
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.3	0.0	12.6	0.0	36.0	0.0	37.3
Incr Delay (d2), s/veh	0.0	0.7	0.0	3.6	0.0	3.4	0.0	2.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.1	0.0	16.2	0.0	39.4	0.0	39.3
1st-Term Q (Q1), veh/ln	0.0	3.0	0.0	3.2	0.0	11.4	0.0	6.2

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.6	0.0	0.7	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.1	0.0	3.8	0.0	12.1	0.0	6.5
%ile Storage Ratio (RQ%)	0.00	0.23	0.00	0.21	0.00	0.29	0.00	0.09
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	160	0	360	0	229	0	58
Grp Sat Flow (s), veh/h/ln	0	1778	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	7.2	0.0	11.5	0.0	14.2	0.0	3.3
Cycle Q Clear Time (g_c), s	0.0	7.2	0.0	11.5	0.0	14.2	0.0	3.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.29	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	696	0	640	0	614	0	426
V/C Ratio (X)	0.00	0.23	0.00	0.56	0.00	0.37	0.00	0.14
Avail Cap (c_a), veh/h	0	696	0	640	0	614	0	426
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.4	0.0	12.6	0.0	32.5	0.0	33.3
Incr Delay (d2), s/veh	0.0	0.8	0.0	3.6	0.0	1.7	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.2	0.0	16.2	0.0	34.2	0.0	34.0
1st-Term Q (Q1), veh/ln	0.0	3.1	0.0	3.2	0.0	5.8	0.0	1.3
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.6	0.0	0.3	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.2	0.0	3.9	0.0	6.1	0.0	1.4
%ile Storage Ratio (RQ%)	0.00	0.24	0.00	0.21	0.00	0.85	0.00	0.17
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	31.7
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	210	50	98	194	192	16	354	107	295	571	119
Future Volume (veh/h)	115	210	50	98	194	192	16	354	107	295	571	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	228	54	107	211	209	17	385	116	321	621	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	222	596	266	297	281	250	442	1822	813	707	1756	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.17	0.17	0.06	0.16	0.16	0.04	1.00	1.00	0.10	0.60	0.60
Unsig. Movement Delay												
Ln Grp Delay, s/veh	41.4	44.8	43.4	39.4	54.0	61.6	13.2	0.3	0.4	10.3	13.1	13.2
Ln Grp LOS	D	D	D	D	D	E	B	A	A	B	B	B
Approach Vol, veh/h	407				527				518		1071	
Approach Delay, s/veh	43.6				54.0				0.7		12.3	
Approach LOS	D				D				A		B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	17.1	66.0	12.3	24.6	6.7	76.4	13.5	23.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	5.0	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	11.7	2.0	8.0	8.8	2.5	15.0	9.0	17.3				
Green Ext Time (g_e), s	0.9	3.1	0.1	1.5	0.0	5.5	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.97	1.00	0.43	1.00	0.98	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	0.76	0.00	0.07	0.46				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3554			3554			2930			1777		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	1585			1585			608			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	321	0	107	0	17	0	125	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	9.7	0.0	6.0	0.0	0.5	0.0	7.0	0.0
Cycle Q Clear Time (g_c), s	9.7	0.0	6.0	0.0	0.5	0.0	7.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	897	0	1097	0	712	0	967	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	63.5	0.0	19.0	0.0	61.5	0.0	19.0	0.0
Perm LT Serve Time (g_u), s	61.5	0.0	13.3	0.0	59.0	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	1.1	0.0	0.6	0.0	0.1	0.0	2.3	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	707	0	297	0	442	0	222	0
V/C Ratio (X)	0.45	0.00	0.36	0.00	0.04	0.00	0.56	0.00
Avail Cap (c_a), veh/h	988	0	337	0	506	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	9.8	0.0	38.7	0.0	13.1	0.0	39.1	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.0	0.0	0.0	2.2	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.3	0.0	39.4	0.0	13.2	0.0	41.4	0.0
1st-Term Q (Q1), veh/ln	3.6	0.0	2.6	0.0	0.2	0.0	3.0	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	3.7	0.0	2.7	0.0	0.2	0.0	3.2	0.0
%ile Storage Ratio (RQ%)	0.27	0.00	0.45	0.00	0.04	0.00	0.49	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	385	0	228	0	376	0	211
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	6.8	0.0	12.9	0.0	13.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.8	0.0	12.9	0.0	13.6
Lane Grp Cap (c), veh/h	0	1822	0	596	0	1065	0	281
V/C Ratio (X)	0.00	0.21	0.00	0.38	0.00	0.35	0.00	0.75
Avail Cap (c_a), veh/h	0	1822	0	903	0	1065	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	44.4	0.0	12.2	0.0	48.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.4	0.0	0.9	0.0	5.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	44.8	0.0	13.1	0.0	54.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.0	0.0	5.0	0.0	6.0

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.1	0.0	5.3	0.0	6.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.08	0.00	0.19	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	116	0	54	0	374	0	209
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1761	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	3.5	0.0	13.0	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.5	0.0	13.0	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.35	0.00	1.00
Lane Grp Cap (c), veh/h	0	813	0	266	0	1056	0	250
V/C Ratio (X)	0.00	0.14	0.00	0.20	0.00	0.35	0.00	0.83
Avail Cap (c_a), veh/h	0	813	0	403	0	1056	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	43.0	0.0	12.2	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.4	0.0	0.9	0.0	12.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	43.4	0.0	13.2	0.0	61.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.4	0.0	5.0	0.0	6.1
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.4	0.0	5.2	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.26	0.00	0.19	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	23.7
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	283	25	52	283	8	33	7	79	21	3	69
Future Vol, veh/h	21	283	25	52	283	8	33	7	79	21	3	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	308	27	57	308	9	36	8	86	23	3	75
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	316	0	0	335	0	0	635	796	167	624	801	154
Stage 1	-	-	-	-	-	-	367	367	-	421	421	-
Stage 2	-	-	-	-	-	-	268	429	-	203	380	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1241	-	-	1221	-	-	363	318	847	370	316	865
Stage 1	-	-	-	-	-	-	625	621	-	581	587	-
Stage 2	-	-	-	-	-	-	714	582	-	780	612	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1241	-	-	1221	-	-	307	298	847	304	296	865
Mov Cap-2 Maneuver	-	-	-	-	-	-	307	298	-	304	296	-
Stage 1	-	-	-	-	-	-	614	609	-	554	560	-
Stage 2	-	-	-	-	-	-	618	555	-	679	601	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.51			1.23			13.95			12.44		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	531	1241	-	-	1221	-	-	585				
HCM Lane V/C Ratio	0.244	0.018	-	-	0.046	-	-	0.173				
HCM Ctrl Dly (s/v)	14	8	-	-	8.1	-	-	12.4				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.6				

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	738	9	17	740	37	21	1	14	54	4	86
Future Volume (veh/h)	72	738	9	17	740	37	21	1	14	54	4	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	802	10	18	804	40	23	1	15	59	4	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	100	2104	26	33	1887	94	262	22	148	183	28	251
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.04	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	68.0	14.3	14.3	70.0	1.4	1.3	32.7	0.0	0.0	36.9	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			D		
Approach Vol, veh/h	890			862			39			156		
Approach Delay, s/veh	19.0			2.8			32.7			36.9		
Approach LOS	B			A			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		6.8	75.2	38.0		11.3	70.7				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.5		3.8	5.2	5.5		3.8	5.3				
Max Q Clear (g_c+I1), s	4.2		3.2	16.3	11.6		7.2	2.0				
Green Ext Time (g_e), s	0.2		0.0	6.1	0.8		0.1	6.5				
Prob of Phs Call (p_c)	1.00		0.45	1.00	1.00		0.93	1.00				
Prob of Max Out (p_x)	0.00		0.01	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	779		1781	516		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	79		3594	103		3445						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	537		45	913		171						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

12/11/2025

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	39	18	0	0	156	78	0
Grp Sat Flow (s), veh/h/ln	0	1395	1781	0	0	1531	1781	0
Q Serve Time (g_s), s	0.0	0.0	1.2	0.0	0.0	6.3	5.2	0.0
Cycle Q Clear Time (g_c), s	0.0	2.2	1.2	0.0	0.0	9.6	5.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1319	0	0	0	1419	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1299	0	0	0	1836	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	23.4	0.0	0.0	0.0	30.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0
Time to First Blk (g_f), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.59	1.00	0.00	0.00	0.38	1.00	0.00
Lane Grp Cap (c), veh/h	0	431	33	0	0	462	100	0
V/C Ratio (X)	0.00	0.09	0.54	0.00	0.00	0.34	0.78	0.00
Avail Cap (c_a), veh/h	0	431	141	0	0	462	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.3	57.2	0.0	0.0	34.9	55.9	0.0
Incr Delay (d2), s/veh	0.0	0.4	12.7	0.0	0.0	2.0	12.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.7	70.0	0.0	0.0	36.9	68.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.8	0.5	0.0	0.0	3.7	2.3	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.3	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.9	0.6	0.0	0.0	3.9	2.7	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.18	0.00	0.00	0.43	0.75	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	396	0	0	0	415
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1040	0	0	0	974
V/C Ratio (X)	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.43
Avail Cap (c_a), veh/h	0	0	0	1040	0	0	0	974
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.3	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.3	0.0	0.0	0.0	1.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	416	0	0	0	429
Grp Sat Flow (s), veh/h/ln	0	0	0	1862	0	0	0	1840
Q Serve Time (g_s), s	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	14.3	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.38	0.00	0.02	0.00	0.60	0.00	0.09
Lane Grp Cap (c), veh/h	0	0	0	1090	0	0	0	1008
V/C Ratio (X)	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.43
Avail Cap (c_a), veh/h	0	0	0	1090	0	0	0	1008
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.3	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.3	0.0	0.0	0.0	1.3
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.5
HCM 7th LOS	B

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	810	768	6	0	19
Future Vol, veh/h	10	810	768	6	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	880	835	7	0	21
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	841	0	-	0	-	421
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	790	-	-	-	0	581
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	790	-	-	-	-	581
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.12	0		11.42		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	790	-	-	-	581	
HCM Lane V/C Ratio	0.014	-	-	-	0.036	
HCM Ctrl Dly (s/v)	9.6	-	-	-	11.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection

Int Delay, s/veh 2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Future Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	111	4	26	57	4	5	2	15	4	3	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	115	0	0	228	230	113	227	230	59
Stage 1	-	-	-	-	-	-	117	117	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	116	120	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1474	-	-	728	669	940	728	669	1007
Stage 1	-	-	-	-	-	-	887	798	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	888	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1474	-	-	707	656	940	700	656	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	707	656	-	700	656	-
Stage 1	-	-	-	-	-	-	886	797	-	878	789	-
Stage 2	-	-	-	-	-	-	871	787	-	870	796	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.14	2.25	9.41	9.74
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	839	33	-	-	532	-	-	771
HCM Lane V/C Ratio	0.027	0.001	-	-	0.018	-	-	0.015
HCM Ctrl Dly (s/v)	9.4	7.3	0	-	7.5	0	-	9.7
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0

Intersection

Int Delay, s/veh 0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	7	464	11	4	714
Future Vol, veh/h	8	7	464	11	4	714
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	8	504	12	4	776

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	907	258	0
Stage 1	510	-	-
Stage 2	397	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	275	741	-
Stage 1	568	-	-
Stage 2	648	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	274	741	-
Mov Cap-2 Maneuver	274	-	-
Stage 1	568	-	-
Stage 2	645	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	14.69	0	0.09
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	388	20
HCM Lane V/C Ratio	-	-	0.042	0.004
HCM Ctrl Dly (s/v)	-	-	14.7	8.5
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	575	84	43	458	90	106	297	42	148	426	247
Future Volume (veh/h)	226	575	84	43	458	90	106	297	42	148	426	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	246	625	91	47	498	98	115	323	46	161	463	268
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	267	1113	162	61	859	383	278	1225	173	474	725	614
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Prop Arrive On Green	0.30	0.72	0.72	0.03	0.24	0.24	0.05	0.39	0.39	0.03	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	76.0	16.2	16.2	76.0	43.0	38.4	24.4	25.7	25.7	22.5	41.2	35.7
Ln Grp LOS	E	B	B	E	D	D	C	C	C	C	D	D
Approach Vol, veh/h	962			643			484			892		
Approach Delay, s/veh	31.5			44.7			25.4			36.2		
Approach LOS	C			D			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	52.0	9.1	47.9	11.5	51.5	23.0	34.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	12.0	35.0	7.0	46.0	18.0	29.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	5.0				
Max Q Clear (g_c+I1), s	8.0	10.5	5.1	13.5	6.6	28.4	18.0	16.8				
Green Ext Time (g_e), s	0.0	2.4	0.0	4.6	0.0	3.7	0.0	2.9				
Prob of Phs Call (p_c)	1.00	1.00	0.79	1.00	0.98	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.02	0.00	1.00	0.00	1.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3127			3113			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	441			453			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	161	0	47	0	115	0	246	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.0	0.0	3.1	0.0	4.6	0.0	16.0	0.0
Cycle Q Clear Time (g_c), s	6.0	0.0	3.1	0.0	4.6	0.0	16.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	1013	0	0	0	725	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.5	0.0	0.0	0.0	46.5	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	38.5	0.0	0.0	0.0	20.1	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	2.7	0.0	0.0	0.0	5.0	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	474	0	61	0	278	0	267	0
V/C Ratio (X)	0.34	0.00	0.77	0.00	0.41	0.00	0.92	0.00
Avail Cap (c_a), veh/h	474	0	178	0	286	0	267	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	22.0	0.0	57.5	0.0	23.4	0.0	41.3	0.0
Incr Delay (d2), s/veh	0.4	0.0	18.5	0.0	1.0	0.0	34.7	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	22.5	0.0	76.0	0.0	24.4	0.0	76.0	0.0
1st-Term Q (Q1), veh/ln	2.8	0.0	1.4	0.0	1.9	0.0	6.0	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.3	0.0	0.1	0.0	2.6	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.9	0.0	1.7	0.0	2.0	0.0	8.5	0.0
%ile Storage Ratio (RQ%)	0.12	0.00	0.22	0.00	0.15	0.00	0.64	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	182	0	356	0	463	0	498
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	8.3	0.0	11.4	0.0	26.4	0.0	14.8
Cycle Q Clear Time (g_c), s	0.0	8.3	0.0	11.4	0.0	26.4	0.0	14.8
Lane Grp Cap (c), veh/h	0	696	0	635	0	725	0	859
V/C Ratio (X)	0.00	0.26	0.00	0.56	0.00	0.64	0.00	0.58
Avail Cap (c_a), veh/h	0	696	0	635	0	725	0	859
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.7	0.0	12.6	0.0	37.0	0.0	40.1
Incr Delay (d2), s/veh	0.0	0.9	0.0	3.6	0.0	4.3	0.0	2.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.7	0.0	16.2	0.0	41.2	0.0	43.0
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	3.2	0.0	12.6	0.0	6.5

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	0.9	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.7	0.0	3.8	0.0	13.5	0.0	6.8
%ile Storage Ratio (RQ%)	0.00	0.28	0.00	0.21	0.00	0.55	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	187	0	360	0	268	0	98
Grp Sat Flow (s), veh/h/ln	0	1791	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	8.5	0.0	11.5	0.0	16.9	0.0	6.0
Cycle Q Clear Time (g_c), s	0.0	8.5	0.0	11.5	0.0	16.9	0.0	6.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.25	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	701	0	640	0	614	0	383
V/C Ratio (X)	0.00	0.27	0.00	0.56	0.00	0.44	0.00	0.26
Avail Cap (c_a), veh/h	0	701	0	640	0	614	0	383
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.8	0.0	12.6	0.0	33.5	0.0	36.8
Incr Delay (d2), s/veh	0.0	0.9	0.0	3.6	0.0	2.2	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.7	0.0	16.2	0.0	35.7	0.0	38.4
1st-Term Q (Q1), veh/ln	0.0	3.6	0.0	3.2	0.0	6.9	0.0	2.3
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	0.4	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.8	0.0	3.9	0.0	7.3	0.0	2.5
%ile Storage Ratio (RQ%)	0.00	0.28	0.00	0.21	0.00	1.02	0.00	0.32
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	34.7
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	210	87	123	194	192	43	390	125	295	620	119
Future Volume (veh/h)	115	210	87	123	194	192	43	390	125	295	620	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	228	95	134	211	209	47	424	136	321	674	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	222	549	245	302	281	250	432	1821	812	682	1739	332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.15	0.15	0.08	0.16	0.16	0.07	1.00	1.00	0.10	0.58	0.58
Unsig. Movement Delay												
Ln Grp Delay, s/veh	41.6	46.3	46.6	39.4	54.0	61.6	12.6	0.3	0.4	10.3	14.5	14.5
Ln Grp LOS	D	D	D	D	D	E	B	A	A	B	B	B
Approach Vol, veh/h	448				554				607		1124	
Approach Delay, s/veh	45.1				53.3				1.3		13.3	
Approach LOS	D				D				A		B	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	17.1	66.0	13.9	23.0	8.5	74.6	13.5	23.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	11.7	2.0	9.5	9.0	3.5	16.6	9.0	17.3				
Green Ext Time (g_e), s	0.9	3.4	0.0	1.7	0.0	6.0	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.99	1.00	0.79	1.00	0.98	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.07	0.46				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2		4		6		8					
Mvmt Sat Flow, veh/h	3554		3554		2976		1777					
Right-Turn Movement Data												
Assigned Mvmt	12		14		16		18					
Mvmt Sat Flow, veh/h	1585		1585		569		1585					
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	321	0	134	0	47	0	125	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	9.7	0.0	7.5	0.0	1.5	0.0	7.0	0.0
Cycle Q Clear Time (g_c), s	9.7	0.0	7.5	0.0	1.5	0.0	7.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	850	0	1057	0	678	0	967	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	63.5	0.0	18.5	0.0	61.5	0.0	18.5	0.0
Perm LT Serve Time (g_u), s	61.5	0.0	11.6	0.0	55.5	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	1.2	0.0	1.0	0.0	0.4	0.0	2.2	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	682	0	302	0	432	0	222	0
V/C Ratio (X)	0.47	0.00	0.44	0.00	0.11	0.00	0.56	0.00
Avail Cap (c_a), veh/h	963	0	318	0	470	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	9.8	0.0	38.4	0.0	12.5	0.0	39.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	1.0	0.0	0.1	0.0	2.2	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.3	0.0	39.4	0.0	12.6	0.0	41.6	0.0
1st-Term Q (Q1), veh/ln	3.6	0.0	3.3	0.0	0.6	0.0	3.1	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	3.7	0.0	3.4	0.0	0.6	0.0	3.2	0.0
%ile Storage Ratio (RQ%)	0.27	0.00	0.57	0.00	0.10	0.00	0.49	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	424	0	228	0	402	0	211
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	7.0	0.0	14.6	0.0	13.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.0	0.0	14.6	0.0	13.6
Lane Grp Cap (c), veh/h	0	1821	0	549	0	1038	0	281
V/C Ratio (X)	0.00	0.23	0.00	0.42	0.00	0.39	0.00	0.75
Avail Cap (c_a), veh/h	0	1821	0	903	0	1038	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.8	0.0	13.4	0.0	48.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.5	0.0	1.1	0.0	5.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	46.3	0.0	14.5	0.0	54.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.1	0.0	5.7	0.0	6.0

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.1	0.0	6.0	0.0	6.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.08	0.00	0.22	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	136	0	95	0	401	0	209
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1768	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	6.5	0.0	14.6	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.5	0.0	14.6	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.32	0.00	1.00
Lane Grp Cap (c), veh/h	0	812	0	245	0	1033	0	250
V/C Ratio (X)	0.00	0.17	0.00	0.39	0.00	0.39	0.00	0.83
Avail Cap (c_a), veh/h	0	812	0	403	0	1033	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.6	0.0	13.4	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	1.0	0.0	1.1	0.0	12.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	46.6	0.0	14.5	0.0	61.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.6	0.0	5.7	0.0	6.1
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.3	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	2.6	0.0	6.0	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.48	0.00	0.22	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	24.0
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	320	25	52	310	8	33	7	79	21	3	69
Future Vol, veh/h	21	320	25	52	310	8	33	7	79	21	3	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	348	27	57	337	9	36	8	86	23	3	75

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	346	0	0	375	0	0	690	866	188	673	871	168
Stage 1	-	-	-	-	-	-	407	407	-	450	450	-
Stage 2	-	-	-	-	-	-	283	459	-	223	421	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1210	-	-	1180	-	-	331	290	823	341	288	846
Stage 1	-	-	-	-	-	-	592	596	-	558	570	-
Stage 2	-	-	-	-	-	-	700	565	-	759	587	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1180	-	-	279	271	823	278	269	846
Mov Cap-2 Maneuver	-	-	-	-	-	-	279	271	-	278	269	-
Stage 1	-	-	-	-	-	-	581	584	-	531	543	-
Stage 2	-	-	-	-	-	-	604	538	-	658	576	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.46	1.15	14.82	12.97
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	495	1210	-	-	1180	-	-	552
HCM Lane V/C Ratio	0.261	0.019	-	-	0.048	-	-	0.183
HCM Ctrl Dly (s/v)	14.8	8	-	-	8.2	-	-	13
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0.2	-	-	0.7

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	787	9	17	776	37	21	1	14	54	4	86
Future Volume (veh/h)	72	787	9	17	776	37	21	1	14	54	4	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	855	10	18	843	40	23	1	15	59	4	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	100	2106	25	33	1892	90	262	22	148	183	28	251
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.04	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	68.0	14.7	14.7	70.0	1.5	1.4	32.7	0.0	0.0	36.9	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			D		
Approach Vol, veh/h	943			901			39			156		
Approach Delay, s/veh	19.1			2.8			32.7			36.9		
Approach LOS	B			A			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			3			6			7		
Case No	8.0			2.0			8.0			2.0		
Phs Duration (G+Y+Rc), s	38.0			6.8			75.2			38.0		
Change Period (Y+Rc), s	5.0			4.5			5.0			4.5		
Max Green (Gmax), s	33.0			9.5			63.0			33.0		
Max Allow Headway (MAH), s	5.5			3.8			5.2			5.5		
Max Q Clear (g_c+I1), s	4.2			3.2			17.5			11.6		
Green Ext Time (g_e), s	0.2			0.0			6.6			0.8		
Prob of Phs Call (p_c)	1.00			0.45			1.00			0.93		
Prob of Max Out (p_x)	0.00			0.01			0.00			0.00		
Left-Turn Movement Data												
Assigned Mvmt	5			3			1			7		
Mvmt Sat Flow, veh/h	779			1781			516			1781		
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	79			3598			103			3454		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	537			42			913			164		
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	39	18	0	0	156	78	0
Grp Sat Flow (s), veh/h/ln	0	1395	1781	0	0	1531	1781	0
Q Serve Time (g_s), s	0.0	0.0	1.2	0.0	0.0	6.3	5.2	0.0
Cycle Q Clear Time (g_c), s	0.0	2.2	1.2	0.0	0.0	9.6	5.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1319	0	0	0	1419	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1299	0	0	0	1836	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	23.4	0.0	0.0	0.0	30.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0
Time to First Blk (g_f), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.59	1.00	0.00	0.00	0.38	1.00	0.00
Lane Grp Cap (c), veh/h	0	431	33	0	0	462	100	0
V/C Ratio (X)	0.00	0.09	0.54	0.00	0.00	0.34	0.78	0.00
Avail Cap (c_a), veh/h	0	431	141	0	0	462	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.3	57.2	0.0	0.0	34.9	55.9	0.0
Incr Delay (d2), s/veh	0.0	0.4	12.7	0.0	0.0	2.0	12.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.7	70.0	0.0	0.0	36.9	68.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.8	0.5	0.0	0.0	3.7	2.3	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.3	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.9	0.6	0.0	0.0	3.9	2.7	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.18	0.00	0.00	0.43	0.75	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	422	0	0	0	434
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1040	0	0	0	974
V/C Ratio (X)	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1040	0	0	0	974
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.7	0.0	0.0	0.0	1.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	443	0	0	0	449
Grp Sat Flow (s), veh/h/ln	0	0	0	1863	0	0	0	1841
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.38	0.00	0.02	0.00	0.60	0.00	0.09
Lane Grp Cap (c), veh/h	0	0	0	1090	0	0	0	1009
V/C Ratio (X)	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1090	0	0	0	1009
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.7	0.0	0.0	0.0	1.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.5
HCM 7th LOS	B

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	859	804	6	0	19
Future Vol, veh/h	10	859	804	6	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	934	874	7	0	21
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	880	0	-	0	-	440
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	763	-	-	-	0	565
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	763	-	-	-	-	565
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.11	0		11.62		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	763	-	-	-	-	565
HCM Lane V/C Ratio	0.014	-	-	-	-	0.037
HCM Ctrl Dly (s/v)	9.8	-	-	-	-	11.6
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.1

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Future Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	111	4	26	57	4	5	2	15	4	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	115	0	0	228	230	113	227	230	59
Stage 1	-	-	-	-	-	-	117	117	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	116	120	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1474	-	-	728	669	940	728	669	1007
Stage 1	-	-	-	-	-	-	887	798	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	888	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1474	-	-	707	656	940	700	656	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	707	656	-	700	656	-
Stage 1	-	-	-	-	-	-	886	797	-	878	789	-
Stage 2	-	-	-	-	-	-	871	787	-	870	796	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.14			2.25			9.41			9.74		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	839	33	-	-	532	-	-	771				
HCM Lane V/C Ratio	0.027	0.001	-	-	0.018	-	-	0.015				
HCM Ctrl Dly (s/v)	9.4	7.3	0	-	7.5	0	-	9.7				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection												
Int Delay, s/veh	19.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	90	0	50	8	0	7	144	456	11	4	765	60
Future Vol, veh/h	90	0	50	8	0	7	144	456	11	4	765	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	0	54	9	0	8	157	496	12	4	832	65

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1434	1693	448	1239	1720	254	897	0	0	508	0	0
Stage 1	873	873	-	815	815	-	-	-	-	-	-	-
Stage 2	561	821	-	424	905	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 94	92	558	132	89	746	753	-	-	1053	-	-
Stage 1	311	366	-	338	389	-	-	-	-	-	-	-
Stage 2	480	387	-	578	353	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 74	73	558	94	70	746	753	-	-	1053	-	-
Mov Cap-2 Maneuver	~ 74	73	-	94	70	-	-	-	-	-	-	-
Stage 1	310	364	-	267	308	-	-	-	-	-	-	-
Stage 2	376	306	-	519	352	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	205.78	29.83	2.6	0.07
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	753	-	-	74	558	94	746	16	-	-
HCM Lane V/C Ratio	0.208	-	-	1.327	0.097	0.093	0.01	0.004	-	-
HCM Ctrl Dly (s/v)	11	-	-	\$ 313.4	12.1	47.3	9.9	8.4	0	-
HCM Lane LOS	B	-	-	F	B	E	A	A	A	-
HCM 95th %tile Q(veh)	0.8	-	-	7.7	0.3	0.3	0	0	-	-

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

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	119	0	611	704	120
Future Vol, veh/h	0	119	0	611	704	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	129	0	664	765	130
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	448	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	558	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	558	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	13.38	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 558		-	-		
HCM Lane V/C Ratio	- 0.232		-	-		
HCM Ctrl Dly (s/v)	- 13.4		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.9		-	-		

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	575	84	43	458	90	106	297	42	148	426	247
Future Volume (veh/h)	226	575	84	43	458	90	106	297	42	148	426	247
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	246	625	91	47	498	98	115	323	46	161	463	268
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	270	1113	162	61	852	380	357	1225	173	474	725	614
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Prop Arrive On Green	0.30	0.72	0.72	0.03	0.24	0.24	0.05	0.39	0.39	0.10	0.78	0.78
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.3	16.2	16.2	76.2	43.2	38.6	21.4	25.7	25.7	21.4	14.0	11.3
Ln Grp LOS	E	B	B	E	D	D	C	C	C	C	B	B
Approach Vol, veh/h	962			643			484			892		
Approach Delay, s/veh	29.0			44.9			24.7			14.5		
Approach LOS	C			D			C			B		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	52.0	9.1	47.9	11.5	51.5	23.2	33.8				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	5.0				
Max Q Clear (g_c+I1), s	8.0	10.5	5.1	13.5	6.6	15.2	17.9	16.9				
Green Ext Time (g_e), s	0.0	2.4	0.0	4.8	0.0	4.2	0.3	2.3				
Prob of Phs Call (p_c)	1.00	1.00	0.79	1.00	0.98	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.93	0.00	1.00	0.00	0.84	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3127			3113			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	441			453			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	161	0	47	0	115	0	246	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.0	0.0	3.1	0.0	4.6	0.0	15.9	0.0
Cycle Q Clear Time (g_c), s	6.0	0.0	3.1	0.0	4.6	0.0	15.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	1013	0	0	0	725	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.5	0.0	0.0	0.0	46.5	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	38.5	0.0	0.0	0.0	33.3	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	3.2	0.0	0.0	0.0	2.5	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	474	0	61	0	357	0	270	0
V/C Ratio (X)	0.34	0.00	0.78	0.00	0.32	0.00	0.91	0.00
Avail Cap (c_a), veh/h	474	0	134	0	365	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	20.9	0.0	57.5	0.0	20.9	0.0	41.0	0.0
Incr Delay (d2), s/veh	0.4	0.0	18.7	0.0	0.5	0.0	25.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.4	0.0	76.2	0.0	21.4	0.0	66.3	0.0
1st-Term Q (Q1), veh/ln	2.6	0.0	1.4	0.0	1.9	0.0	5.9	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.3	0.0	0.1	0.0	1.9	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.7	0.0	1.7	0.0	2.0	0.0	7.8	0.0
%ile Storage Ratio (RQ%)	0.11	0.00	0.22	0.00	0.15	0.00	0.58	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	182	0	356	0	463	0	498
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	8.3	0.0	11.4	0.0	13.2	0.0	14.9
Cycle Q Clear Time (g_c), s	0.0	8.3	0.0	11.4	0.0	13.2	0.0	14.9
Lane Grp Cap (c), veh/h	0	696	0	635	0	725	0	852
V/C Ratio (X)	0.00	0.26	0.00	0.56	0.00	0.64	0.00	0.58
Avail Cap (c_a), veh/h	0	696	0	635	0	725	0	852
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.7	0.0	12.6	0.0	9.7	0.0	40.3
Incr Delay (d2), s/veh	0.0	0.9	0.0	3.6	0.0	4.3	0.0	2.9
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.7	0.0	16.2	0.0	14.0	0.0	43.2
1st-Term Q (Q1), veh/ln	0.0	3.5	0.0	3.2	0.0	3.3	0.0	6.5

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	0.9	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.7	0.0	3.8	0.0	4.1	0.0	6.8
%ile Storage Ratio (RQ%)	0.00	0.28	0.00	0.21	0.00	0.17	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	187	0	360	0	268	0	98
Grp Sat Flow (s), veh/h/ln	0	1791	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	8.5	0.0	11.5	0.0	6.9	0.0	6.0
Cycle Q Clear Time (g_c), s	0.0	8.5	0.0	11.5	0.0	6.9	0.0	6.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.25	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	701	0	640	0	614	0	380
V/C Ratio (X)	0.00	0.27	0.00	0.56	0.00	0.44	0.00	0.26
Avail Cap (c_a), veh/h	0	701	0	640	0	614	0	380
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.8	0.0	12.6	0.0	9.0	0.0	37.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	3.6	0.0	2.2	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.7	0.0	16.2	0.0	11.3	0.0	38.6
1st-Term Q (Q1), veh/ln	0.0	3.6	0.0	3.2	0.0	1.8	0.0	2.3
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	0.4	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.8	0.0	3.9	0.0	2.2	0.0	2.5
%ile Storage Ratio (RQ%)	0.00	0.28	0.00	0.21	0.00	0.31	0.00	0.32
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	27.4
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	210	87	123	194	192	43	390	125	295	620	119
Future Volume (veh/h)	115	210	87	123	194	192	43	390	125	295	620	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	228	95	134	211	209	47	424	136	321	674	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	222	549	245	302	281	250	432	1821	812	682	1739	332
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.15	0.15	0.08	0.16	0.16	0.07	1.00	1.00	0.10	0.58	0.58
Unsig. Movement Delay												
Ln Grp Delay, s/veh	41.6	46.3	46.6	39.4	54.0	61.6	12.6	0.3	0.4	10.3	14.5	14.5
Ln Grp LOS	D	D	D	D	D	E	B	A	A	B	B	B
Approach Vol, veh/h	448			554			607			1124		
Approach Delay, s/veh	45.1			53.3			1.3			13.3		
Approach LOS	D			D			A			B		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	17.1	66.0	13.9	23.0	8.5	74.6	13.5	23.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	11.7	2.0	9.5	9.0	3.5	16.6	9.0	17.3				
Green Ext Time (g_e), s	0.9	3.4	0.0	1.7	0.0	6.0	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.99	1.00	0.79	1.00	0.98	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.07	0.46				
Left-Turn Movement Data												
Assigned Mvmt	1	3	5	7								
Mvmt Sat Flow, veh/h	1781	1781	1781	1781								
Through Movement Data												
Assigned Mvmt	2	4	6	8								
Mvmt Sat Flow, veh/h	3554	3554	2976	1777								
Right-Turn Movement Data												
Assigned Mvmt	12	14	16	18								
Mvmt Sat Flow, veh/h	1585	1585	569	1585								
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	321	0	134	0	47	0	125	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	9.7	0.0	7.5	0.0	1.5	0.0	7.0	0.0
Cycle Q Clear Time (g_c), s	9.7	0.0	7.5	0.0	1.5	0.0	7.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	850	0	1057	0	678	0	967	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	63.5	0.0	18.5	0.0	61.5	0.0	18.5	0.0
Perm LT Serve Time (g_u), s	61.5	0.0	11.6	0.0	55.5	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	1.2	0.0	1.0	0.0	0.4	0.0	2.2	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	682	0	302	0	432	0	222	0
V/C Ratio (X)	0.47	0.00	0.44	0.00	0.11	0.00	0.56	0.00
Avail Cap (c_a), veh/h	963	0	318	0	470	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.98	0.00	1.00	0.00
Uniform Delay (d1), s/veh	9.8	0.0	38.4	0.0	12.5	0.0	39.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	1.0	0.0	0.1	0.0	2.2	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.3	0.0	39.4	0.0	12.6	0.0	41.6	0.0
1st-Term Q (Q1), veh/ln	3.6	0.0	3.3	0.0	0.6	0.0	3.1	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	3.7	0.0	3.4	0.0	0.6	0.0	3.2	0.0
%ile Storage Ratio (RQ%)	0.27	0.00	0.57	0.00	0.10	0.00	0.49	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	424	0	228	0	402	0	211
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	7.0	0.0	14.6	0.0	13.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.0	0.0	14.6	0.0	13.6
Lane Grp Cap (c), veh/h	0	1821	0	549	0	1038	0	281
V/C Ratio (X)	0.00	0.23	0.00	0.42	0.00	0.39	0.00	0.75
Avail Cap (c_a), veh/h	0	1821	0	903	0	1038	0	378
Upstream Filter (I)	0.00	0.98	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.8	0.0	13.4	0.0	48.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.5	0.0	1.1	0.0	5.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	46.3	0.0	14.5	0.0	54.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.1	0.0	5.7	0.0	6.0

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.1	0.0	6.0	0.0	6.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.08	0.00	0.22	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	136	0	95	0	401	0	209
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1768	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	6.5	0.0	14.6	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.5	0.0	14.6	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.32	0.00	1.00
Lane Grp Cap (c), veh/h	0	812	0	245	0	1033	0	250
V/C Ratio (X)	0.00	0.17	0.00	0.39	0.00	0.39	0.00	0.83
Avail Cap (c_a), veh/h	0	812	0	403	0	1033	0	337
Upstream Filter (I)	0.00	0.98	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.6	0.0	13.4	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	1.0	0.0	1.1	0.0	12.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	46.6	0.0	14.5	0.0	61.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.6	0.0	5.7	0.0	6.1
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.3	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	2.6	0.0	6.0	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.48	0.00	0.22	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	24.0
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	320	25	52	310	8	33	7	79	21	3	69
Future Vol, veh/h	21	320	25	52	310	8	33	7	79	21	3	69
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	348	27	57	337	9	36	8	86	23	3	75

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	346	0	0	375	0	0	690	866	188	673	871	168
Stage 1	-	-	-	-	-	-	407	407	-	450	450	-
Stage 2	-	-	-	-	-	-	283	459	-	223	421	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1210	-	-	1180	-	-	331	290	823	341	288	846
Stage 1	-	-	-	-	-	-	592	596	-	558	570	-
Stage 2	-	-	-	-	-	-	700	565	-	759	587	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1180	-	-	279	271	823	278	269	846
Mov Cap-2 Maneuver	-	-	-	-	-	-	279	271	-	278	269	-
Stage 1	-	-	-	-	-	-	581	584	-	531	543	-
Stage 2	-	-	-	-	-	-	604	538	-	658	576	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.46			1.15			14.82			12.97		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	495	1210	-	-	1180	-	-	552
HCM Lane V/C Ratio	0.261	0.019	-	-	0.048	-	-	0.183
HCM Ctrl Dly (s/v)	14.8	8	-	-	8.2	-	-	13
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0.2	-	-	0.7

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	787	9	17	776	37	21	1	14	54	4	86
Future Volume (veh/h)	72	787	9	17	776	37	21	1	14	54	4	86
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	855	10	18	843	40	23	1	15	59	4	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	100	2106	25	33	1892	90	262	22	148	183	28	251
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.04	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	68.0	14.7	14.7	70.0	1.5	1.4	32.7	0.0	0.0	36.9	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			D		
Approach Vol, veh/h	943			901			39			156		
Approach Delay, s/veh	19.1			2.8			32.7			36.9		
Approach LOS	B			A			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			3	4	6		7	8			
Case No	8.0			2.0	4.0	8.0		2.0	4.0			
Phs Duration (G+Y+Rc), s	38.0			6.8	75.2	38.0		11.3	70.7			
Change Period (Y+Rc), s	5.0			4.5	5.0	5.0		4.5	5.0			
Max Green (Gmax), s	33.0			9.5	63.0	33.0		18.5	54.0			
Max Allow Headway (MAH), s	5.5			3.8	5.2	5.5		3.8	5.3			
Max Q Clear (g_c+I1), s	4.2			3.2	17.5	11.6		7.2	2.0			
Green Ext Time (g_e), s	0.2			0.0	6.6	0.8		0.1	6.9			
Prob of Phs Call (p_c)	1.00			0.45	1.00	1.00		0.93	1.00			
Prob of Max Out (p_x)	0.00			0.01	0.00	0.00		0.00	0.00			
Left-Turn Movement Data												
Assigned Mvmt	5			3	1		7					
Mvmt Sat Flow, veh/h	779			1781	516		1781					
Through Movement Data												
Assigned Mvmt	2			4		6		8				
Mvmt Sat Flow, veh/h	79			3598		103		3454				
Right-Turn Movement Data												
Assigned Mvmt	12			14		16		18				
Mvmt Sat Flow, veh/h	537			42		913		164				
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	39	18	0	0	156	78	0
Grp Sat Flow (s), veh/h/ln	0	1395	1781	0	0	1531	1781	0
Q Serve Time (g_s), s	0.0	0.0	1.2	0.0	0.0	6.3	5.2	0.0
Cycle Q Clear Time (g_c), s	0.0	2.2	1.2	0.0	0.0	9.6	5.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1319	0	0	0	1419	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1299	0	0	0	1836	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	23.4	0.0	0.0	0.0	30.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0
Time to First Blk (g_f), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.4	0.0	0.0	0.0	3.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.59	1.00	0.00	0.00	0.38	1.00	0.00
Lane Grp Cap (c), veh/h	0	431	33	0	0	462	100	0
V/C Ratio (X)	0.00	0.09	0.54	0.00	0.00	0.34	0.78	0.00
Avail Cap (c_a), veh/h	0	431	141	0	0	462	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.3	57.2	0.0	0.0	34.9	55.9	0.0
Incr Delay (d2), s/veh	0.0	0.4	12.7	0.0	0.0	2.0	12.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.7	70.0	0.0	0.0	36.9	68.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.8	0.5	0.0	0.0	3.7	2.3	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.3	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.9	0.6	0.0	0.0	3.9	2.7	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.18	0.00	0.00	0.43	0.75	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	422	0	0	0	434
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1040	0	0	0	974
V/C Ratio (X)	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1040	0	0	0	974
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.7	0.0	0.0	0.0	1.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	443	0	0	0	449
Grp Sat Flow (s), veh/h/ln	0	0	0	1863	0	0	0	1841
Q Serve Time (g_s), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.5	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.38	0.00	0.02	0.00	0.60	0.00	0.09
Lane Grp Cap (c), veh/h	0	0	0	1090	0	0	0	1009
V/C Ratio (X)	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1090	0	0	0	1009
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.5	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.7	0.0	0.0	0.0	1.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.5
HCM 7th LOS	B

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	859	804	6	0	19
Future Vol, veh/h	10	859	804	6	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	934	874	7	0	21
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	880	0	-	0	-	440
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	763	-	-	-	0	565
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	763	-	-	-	-	565
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.11	0		11.62		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	763	-	-	-	-	565
HCM Lane V/C Ratio	0.014	-	-	-	-	0.037
HCM Ctrl Dly (s/v)	9.8	-	-	-	-	11.6
HCM Lane LOS	A	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.1

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Future Vol, veh/h	2	102	4	24	52	4	5	2	14	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	111	4	26	57	4	5	2	15	4	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	115	0	0	228	230	113	227	230	59
Stage 1	-	-	-	-	-	-	117	117	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	116	120	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1474	-	-	728	669	940	728	669	1007
Stage 1	-	-	-	-	-	-	887	798	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	888	797	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1474	-	-	707	656	940	700	656	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	707	656	-	700	656	-
Stage 1	-	-	-	-	-	-	886	797	-	878	789	-
Stage 2	-	-	-	-	-	-	871	787	-	870	796	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.14			2.25			9.41			9.74		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	839	33	-	-	532	-	-	771				
HCM Lane V/C Ratio	0.027	0.001	-	-	0.018	-	-	0.015				
HCM Ctrl Dly (s/v)	9.4	7.3	0	-	7.5	0	-	9.7				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	0	50	8	0	7	144	456	11	4	765	60
Future Volume (veh/h)	90	0	50	8	0	7	144	456	11	4	765	60
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	98	0	54	9	0	8	157	496	12	4	832	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	182	0	145	140	0	145	572	2926	71	796	2826	221
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Prop Arrive On Green	0.09	0.00	0.09	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	56.2	0.0	52.8	53.6	0.0	49.9	1.2	0.3	0.2	0.0	0.4	0.5
Ln Grp LOS	E		D	D		D	A	A	A	A	A	A
Approach Vol, veh/h		152			17			665			901	
Approach Delay, s/veh		55.0			51.9			0.5			0.5	
Approach LOS		E			D			A			A	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		2			4		6		8			
Case No		6.0			6.0		6.0		6.0			
Phs Duration (G+Y+Rc), s		104.0			16.0		104.0		16.0			
Change Period (Y+Rc), s		5.0			5.0		5.0		5.0			
Max Green (Gmax), s		92.0			18.0		92.0		18.0			
Max Allow Headway (MAH), s		5.7			4.4		5.3		4.7			
Max Q Clear (g _c +I1), s		2.0			10.8		2.0		6.6			
Green Ext Time (g _e), s		5.5			0.3		7.2		0.0			
Prob of Phs Call (p _c)		1.00			1.00		1.00		1.00			
Prob of Max Out (p _x)		0.00			0.12		0.00		0.00			
Left-Turn Movement Data												
Assigned Mvmt		5			7		1		3			
Mvmt Sat Flow, veh/h		621			1407		891		1350			
Through Movement Data												
Assigned Mvmt		2			4		6		8			
Mvmt Sat Flow, veh/h		3546			0		3425		0			
Right-Turn Movement Data												
Assigned Mvmt		12			14		16		18			
Mvmt Sat Flow, veh/h		86			1585		268		1585			
Left Lane Group Data												
Assigned Mvmt		0	5	0	7	0	1	0	3			

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

Lane Assignment		L		L		L		L
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	157	0	98	0	4	0	9
Grp Sat Flow (s), veh/h/ln	0	621	0	1407	0	891	0	1350
Q Serve Time (g_s), s	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.8
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.8	0.0	0.0	0.0	4.6
Perm LT Sat Flow (s_l), veh/h/ln	0	621	0	1407	0	891	0	1350
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	99.0	0.0	11.0	0.0	99.0	0.0	11.0
Perm LT Serve Time (g_u), s	0.0	99.0	0.0	10.4	0.0	99.0	0.0	7.1
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.8
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	572	0	182	0	796	0	140
V/C Ratio (X)	0.00	0.27	0.00	0.54	0.00	0.01	0.00	0.06
Avail Cap (c_a), veh/h	0	572	0	265	0	796	0	219
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.92	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	53.8	0.0	0.0	0.0	53.4
Incr Delay (d2), s/veh	0.0	1.2	0.0	2.4	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	1.2	0.0	56.2	0.0	0.0	0.0	53.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.3
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	3.0	0.0	0.0	0.0	0.3
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.47	0.00	0.00	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	248	0	0	0	454	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1870	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1466	0	0	0	1543	0	0
V/C Ratio (X)	0.00	0.17	0.00	0.00	0.00	0.29	0.00	0.00
Avail Cap (c_a), veh/h	0	1466	0	0	0	1543	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.92	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		T+R		T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	260	0	54	0	443	0	8
Grp Sat Flow (s), veh/h/ln	0	1855	0	1585	0	1822	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.8	0.0	0.0	0.0	0.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.05	0.00	1.00	0.00	0.15	0.00	1.00
Lane Grp Cap (c), veh/h	0	1530	0	145	0	1503	0	145
V/C Ratio (X)	0.00	0.17	0.00	0.37	0.00	0.29	0.00	0.06
Avail Cap (c_a), veh/h	0	1530	0	238	0	1503	0	238
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.92	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	51.3	0.0	0.0	0.0	49.8
Incr Delay (d2), s/veh	0.0	0.2	0.0	1.6	0.0	0.5	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.2	0.0	52.8	0.0	0.5	0.0	49.9
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.6	0.0	0.2	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.25	0.00	0.01	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	5.7
HCM 7th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	
Traffic Vol, veh/h	0	119	0	611	704	120
Future Vol, veh/h	0	119	0	611	704	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	129	0	664	765	130
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	448	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	558	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	558	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	13.38	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 558		-	-		
HCM Lane V/C Ratio	- 0.232		-	-		
HCM Ctrl Dly (s/v)	- 13.4		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.9		-	-		

PHASE 1 - PM PEAK HOUR CALCULATIONS

[illegible][illegible][illegible]

EXISTING TRAFFIC		BACKGROUND TRAFFIC		SITE TRAFFIC		PASS BY TRAFFIC		TOTAL TRAFFIC	
ADT PROJECT 9% 300 625 104 54		ADT PROJECT 9% 321 660 150 56		ADT PROJECT 9% 231 231 84 84 63		ADT PROJECT 9% 0 0 0 0 0		ADT PROJECT 9% 400 891 199 54 119	
On-ramp Road 708 441 267 113 136 20 7462		On-ramp Road 736 459 214 115 12 141 6 178		On-ramp Road 63 34 63 34 0 63 1397		On-ramp Road 0 0 0 0 0 0 0 0		On-ramp Road 575 139 186 141 21 255 10 64	
Douglas Drive 77 222 25 198 471 7 7 990 637		Douglas Drive 60 387 25 193 489 7 7 990 633		Douglas Drive 0 84 0 84 84 1397 348		Douglas Drive 0 0 0 0 0 0 0 0 0		Douglas Drive 80 471 20 277 574 0 0 9 950 833	

The figure displays six maps of a road network, each representing a different traffic type. The maps are arranged in a 3x2 grid. Each map includes a legend, a table of counts for each road segment, and a map showing the road layout with colored segments indicating the traffic type distribution.

Legend:

- Kaiser Traffic:** Blue
- Background Traffic:** Orange
- Site Traffic:** Purple
- Passby Traffic:** Yellow
- Total Traffic:** Green

Map 1: Kaiser Traffic

ADT PROJECT	9%
15	35
25	0
0	0

Map 2: Background Traffic

ADT PROJECT	9%
18	37
28	0
0	0

Map 3: Site Traffic

ADT PROJECT	9%
0	0
0	0
0	0

Map 4: Passby Traffic

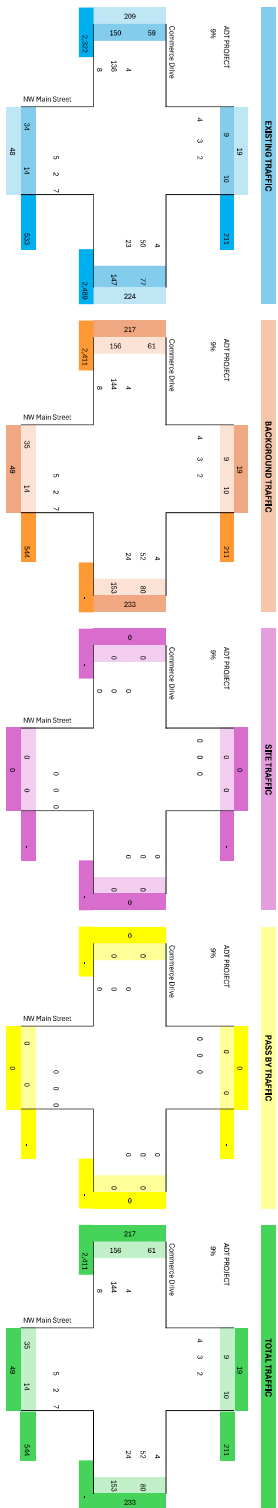
ADT PROJECT	9%
0	0
0	0
0	0

Map 5: Total Traffic

ADT PROJECT	9%
18	37
15	0
0	0

ESTIMOTRAFFIC		BACKGROUND TRAFFIC		SITE TRAFFIC		PASS TRAFFIC		TOTAL TRAFFIC	
ADT PROJECT 9% 188 63 123 2,067		ADT PROJECT 9% 183 65 128 2,144		ADT PROJECT 9% 0 0 0 0		ADT PROJECT 9% 0 0 0 0		ADT PROJECT 9% 288 65 128 2,144	
CHURN ROAD 432 388 452 3,544		CHURN ROAD 446 334 406 3,608		CHURN ROAD 0 0 0 0		CHURN ROAD 0 0 0 0		CHURN ROAD 478 438 554 4,214	
NW Commerce Rd 12 3 7 407		NW Commerce Rd 12 3 7 407		NW Commerce Rd 0 0 0 0		NW Commerce Rd 0 0 0 0		NW Commerce Rd 12 3 7 407	

[illegible]

[illegible]

Warrant 1, Eight-Hour Vehicular Volume (MUTCD Section 4C.02) - MoDOT EPG 902.3.2

EXISTING TRAFFIC

N/S Street
E/W Street

Douglas Street
High School Drive

WARRANT RESULT: SIGNAL NOT WARRANTED

Condition A — Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2+	1	600	480	420	336	150	120	105	84
2+	2+	600	480	420	336	200	160	140	112
1	2+	500	400	350	280	200	160	140	112

Condition B — Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2+	1	900	720	630	504	75	60	53	42
2+	2+	900	720	630	504	100	80	70	56
1	2+	750	600	525	420	100	80	70	56

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street								

1	1	NB/SB	PM PEAK 1424	8TH HR 1280	EB	PM PEAK 318	8TH HR 286		
Condition A	VOLUME	STAND.	MET		VOLUME	STAND.	MET	WARRANT	
100%	1280	500	YES		286	150	YES	YES	
80%	1280	400	YES		286	120	YES	YES	
70%	1280	350	YES		286	105	YES	YES	
56%	1280	280	YES		286	84	YES	YES	
Condition B									
100%	1280	750	YES		286	75	YES	YES	
80%	1280	600	YES		286	60	YES	YES	
70%	1280	525	YES		286	53	YES	YES	
56%	1280	420	YES		286	42	YES	YES	

Source MODOT Traffic Volume Map

Count Time	NB	SB	Traffic Volume	% of 24 Hr
1	39	42	81	0.35%
2	20	23	43	0.19%
3	20	15	35	0.15%
4	29	15	44	0.19%
5	69	27	96	0.42%
6	235	81	316	1.38%
7	520	230	750	3.27%
8	696	664	1360	5.92%
9	559	718	1277	5.56%
10	637	745	1382	6.02%
11	686	810	1496	6.52%
12	696	918	1614	7.03%
13	716	987	1703	7.42%
14	725	1002	1727	7.52%
15	843	1060	1903	8.29%
16	716	1064	1780	7.75%
17	735	1060	1795	7.82%
18	657	925	1582	6.89%
19	627	745	1372	5.98%
20	392	503	895	3.90%
21	294	361	655	2.85%
22	235	299	534	2.33%
23	167	200	367	1.60%
24	69	81	150	0.65%
TOTAL	10382	12575	22957	

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	115	141	21	12	274	158	80	387	23	56	160	105
Future Volume (veh/h)	115	141	21	12	274	158	80	387	23	56	160	105
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	125	153	23	13	298	172	87	421	25	61	174	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	153	1214	179	26	1135	506	488	1335	79	413	719	609
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.17	0.78	0.78	0.01	0.32	0.32	0.04	0.39	0.39	0.04	0.38	0.38
Unsig. Movement Delay												
Ln Grp Delay, s/veh	58.7	8.5	8.5	72.6	30.9	33.0	21.1	26.5	26.5	21.4	25.9	25.2
Ln Grp LOS	E	A	A	E	C	C	C	C	C	C	C	C
Approach Vol, veh/h	301			483			533			349		
Approach Delay, s/veh	29.4			32.8			25.6			24.9		
Approach LOS	C			C			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	9.3	52.0	6.8	51.9	10.2	51.1	15.3	43.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	4.8				
Max Q Clear (g_c+I1), s	4.5	12.3	2.9	3.5	5.5	9.6	10.1	11.9				
Green Ext Time (g_e), s	0.0	2.9	0.0	1.0	0.0	1.4	0.2	2.1				
Prob of Phs Call (p_c)	0.87	1.00	0.35	1.00	0.94	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.01	0.00	1.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3409			3106			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	202			459			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	61	0	13	0	87	0	125	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	2.5	0.0	0.9	0.0	3.5	0.0	8.1	0.0
Cycle Q Clear Time (g_c), s	2.5	0.0	0.9	0.0	3.5	0.0	8.1	0.0
Perm LT Sat Flow (s_l), veh/h/ln	944	0	0	0	1091	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.1	0.0	0.0	0.0	46.1	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	36.7	0.0	0.0	0.0	38.5	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.7	0.0	0.0	0.0	0.7	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	413	0	26	0	488	0	153	0
V/C Ratio (X)	0.15	0.00	0.50	0.00	0.18	0.00	0.82	0.00
Avail Cap (c_a), veh/h	438	0	134	0	514	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	21.3	0.0	58.7	0.0	20.9	0.0	48.7	0.0
Incr Delay (d2), s/veh	0.2	0.0	13.9	0.0	0.2	0.0	10.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.4	0.0	72.6	0.0	21.1	0.0	58.7	0.0
1st-Term Q (Q1), veh/ln	1.0	0.0	0.4	0.0	1.5	0.0	3.3	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.1	0.0	0.5	0.0	1.5	0.0	3.8	0.0
%ile Storage Ratio (RQ%)	0.02	0.00	0.06	0.00	0.11	0.00	0.28	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	219	0	86	0	174	0	298
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	10.3	0.0	1.4	0.0	7.6	0.0	7.5
Cycle Q Clear Time (g_c), s	0.0	10.3	0.0	1.4	0.0	7.6	0.0	7.5
Lane Grp Cap (c), veh/h	0	696	0	694	0	719	0	1135
V/C Ratio (X)	0.00	0.31	0.00	0.12	0.00	0.24	0.00	0.26
Avail Cap (c_a), veh/h	0	696	0	694	0	719	0	1135
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.3	0.0	8.1	0.0	25.1	0.0	30.3
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.4	0.0	0.8	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.5	0.0	8.5	0.0	25.9	0.0	30.9
1st-Term Q (Q1), veh/ln	0.0	4.3	0.0	0.5	0.0	3.4	0.0	3.2

HCM 7th Signalized Intersection Capacity Analysis 3: Douglas Street & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.6	0.0	0.6	0.0	3.5	0.0	3.3
%ile Storage Ratio (RQ%)	0.00	0.34	0.00	0.03	0.00	0.08	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	227	0	90	0	114	0	172
Grp Sat Flow (s), veh/h/ln	0	1834	0	1788	0	1585	0	1585
Q Serve Time (g_s), s	0.0	10.3	0.0	1.5	0.0	5.7	0.0	9.9
Cycle Q Clear Time (g_c), s	0.0	10.3	0.0	1.5	0.0	5.7	0.0	9.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.11	0.00	0.26	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	718	0	699	0	609	0	506
V/C Ratio (X)	0.00	0.32	0.00	0.13	0.00	0.19	0.00	0.34
Avail Cap (c_a), veh/h	0	718	0	699	0	609	0	506
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.3	0.0	8.1	0.0	24.5	0.0	31.2
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.4	0.0	0.7	0.0	1.8
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.5	0.0	8.5	0.0	25.2	0.0	33.0
1st-Term Q (Q1), veh/ln	0.0	4.5	0.0	0.6	0.0	2.2	0.0	3.8
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.7	0.0	0.6	0.0	2.3	0.0	4.1
%ile Storage Ratio (RQ%)	0.00	0.35	0.00	0.04	0.00	0.32	0.00	0.52
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	28.2
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	84	28	85	198	191	82	379	106	226	268	114
Future Volume (veh/h)	47	84	28	85	198	191	82	379	106	226	268	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	91	30	92	215	208	89	412	115	246	291	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	150	474	211	304	280	250	680	2074	925	705	1514	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.03	0.13	0.13	0.06	0.16	0.16	0.08	1.00	1.00	0.07	0.62	0.62
Unsig. Movement Delay												
Ln Grp Delay, s/veh	44.8	46.4	46.2	41.6	55.0	61.4	8.7	0.2	0.3	7.8	10.3	10.3
Ln Grp LOS	D	D	D	D	D	E	A	A	A	A	B	B
Approach Vol, veh/h	172			515			616			661		
Approach Delay, s/veh	45.9			55.2			1.5			9.4		
Approach LOS	D			E			A			A		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	13.5	74.5	11.5	20.5	9.2	78.8	8.6	23.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	8.3	2.0	7.3	4.7	4.4	8.3	4.9	17.3				
Green Ext Time (g_e), s	0.7	3.3	0.1	0.6	0.0	2.8	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.95	1.00	0.95	1.00	0.82	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.45				
Left-Turn Movement Data												
Assigned Mvmt	1	3	5	7								
Mvmt Sat Flow, veh/h	1781	1781	1781	1781								
Through Movement Data												
Assigned Mvmt	2	4	6	8								
Mvmt Sat Flow, veh/h	3554	3554	2446	1777								
Right-Turn Movement Data												
Assigned Mvmt	12	14	16	18								
Mvmt Sat Flow, veh/h	1585	1585	1018	1585								
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	246	0	92	0	89	0	51	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.3	0.0	5.3	0.0	2.4	0.0	2.9	0.0
Cycle Q Clear Time (g_c), s	6.3	0.0	5.3	0.0	2.4	0.0	2.9	0.0
Perm LT Sat Flow (s_l), veh/h/ln	876	0	1270	0	971	0	964	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	71.8	0.0	16.4	0.0	70.0	0.0	16.0	0.0
Perm LT Serve Time (g_u), s	70.0	0.0	13.3	0.0	67.9	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.7	0.0	0.2	0.0	0.2	0.0	0.7	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	705	0	304	0	680	0	150	0
V/C Ratio (X)	0.35	0.00	0.30	0.00	0.13	0.00	0.34	0.00
Avail Cap (c_a), veh/h	1039	0	356	0	706	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	7.5	0.0	41.1	0.0	8.6	0.0	43.5	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.0	0.1	0.0	1.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	7.8	0.0	41.6	0.0	8.7	0.0	44.8	0.0
1st-Term Q (Q1), veh/ln	2.3	0.0	2.3	0.0	0.9	0.0	1.3	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.3	0.0	2.4	0.0	0.9	0.0	1.4	0.0
%ile Storage Ratio (RQ%)	0.17	0.00	0.40	0.00	0.15	0.00	0.21	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	412	0	91	0	209	0	215
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	2.7	0.0	6.1	0.0	13.9
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.7	0.0	6.1	0.0	13.9
Lane Grp Cap (c), veh/h	0	2074	0	474	0	1100	0	280
V/C Ratio (X)	0.00	0.20	0.00	0.19	0.00	0.19	0.00	0.77
Avail Cap (c_a), veh/h	0	2074	0	903	0	1100	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	46.2	0.0	9.9	0.0	48.5
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.0	0.4	0.0	6.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.2	0.0	46.4	0.0	10.3	0.0	55.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.2	0.0	2.3	0.0	6.2

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.2	0.0	2.5	0.0	6.7
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.03	0.00	0.09	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	115	0	30	0	206	0	208
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1687	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	2.0	0.0	6.3	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.0	0.0	6.3	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.60	0.00	1.00
Lane Grp Cap (c), veh/h	0	925	0	211	0	1044	0	250
V/C Ratio (X)	0.00	0.12	0.00	0.14	0.00	0.20	0.00	0.83
Avail Cap (c_a), veh/h	0	925	0	403	0	1044	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.9	0.0	9.9	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.4	0.0	12.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	46.2	0.0	10.3	0.0	61.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.8	0.0	2.3	0.0	6.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.8	0.0	2.4	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.15	0.00	0.09	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	22.1
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	122	43	99	278	29	8	4	28	4	4	9
Future Vol, veh/h	35	122	43	99	278	29	8	4	28	4	4	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	133	47	108	302	32	9	4	30	4	4	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	334	0	0	179	0	0	601	781	90	662	773	151
Stage 1	-	-	-	-	-	-	232	232	-	517	517	-
Stage 2	-	-	-	-	-	-	368	549	-	145	255	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1222	-	-	1394	-	-	384	325	950	347	328	868
Stage 1	-	-	-	-	-	-	750	711	-	509	532	-
Stage 2	-	-	-	-	-	-	624	515	-	843	695	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1222	-	-	1394	-	-	335	290	950	296	294	868
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	290	-	296	294	-
Stage 1	-	-	-	-	-	-	727	689	-	470	491	-
Stage 2	-	-	-	-	-	-	564	475	-	786	673	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	1.41			1.9			11.51			13.27		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	596	1222	-	-	1394	-	-	454				
HCM Lane V/C Ratio	0.073	0.031	-	-	0.077	-	-	0.041				
HCM Ctrl Dly (s/v)	11.5	8	-	-	7.8	-	-	13.3				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	0.2	0.1	-	-	0.3	-	-	0.1				

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	390	3	9	344	48	12	3	7	25	2	38
Future Volume (veh/h)	77	390	3	9	344	48	12	3	7	25	2	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	424	3	10	374	52	13	3	8	27	2	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	107	2143	15	21	1706	235	259	66	139	187	29	247
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.02	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	67.3	11.7	11.7	73.9	0.5	0.5	32.2	0.0	0.0	33.6	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h		511			436			24			70	
Approach Delay, s/veh		20.8			2.2			32.2			33.6	
Approach LOS		C			A			C			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		2	3	4			6	7	8			
Case No		8.0	2.0	4.0			8.0	2.0	4.0			
Phs Duration (G+Y+Rc), s		38.0	5.9	76.1			38.0	11.7	70.3			
Change Period (Y+Rc), s		5.0	4.5	5.0			5.0	4.5	5.0			
Max Green (Gmax), s		33.0	9.5	63.0			33.0	18.5	54.0			
Max Allow Headway (MAH), s		5.4	3.8	5.2			5.4	3.8	5.3			
Max Q Clear (g _c +I1), s		3.2	2.7	8.5			5.8	7.6	2.0			
Green Ext Time (g _e), s		0.1	0.0	2.8			0.3	0.1	2.8			
Prob of Phs Call (p _c)		1.00	0.28	1.00			1.00	0.94	1.00			
Prob of Max Out (p _x)		0.00	0.00	0.00			0.00	0.00	0.00			
Left-Turn Movement Data												
Assigned Mvmt		5	3				1	7				
Mvmt Sat Flow, veh/h		774	1781				528	1781				
Through Movement Data												
Assigned Mvmt		2		4			6		8			
Mvmt Sat Flow, veh/h		239		3617			107		3136			
Right-Turn Movement Data												
Assigned Mvmt			12		14			16		18		
Mvmt Sat Flow, veh/h			506		26			898		433		
Left Lane Group Data												
Assigned Mvmt		0	5	3	0	0	1	7	0			

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

12/11/2025

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	24	10	0	0	70	84	0
Grp Sat Flow (s), veh/h/ln	0	1519	1781	0	0	1533	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.6	5.6	0.0
Cycle Q Clear Time (g_c), s	0.0	1.2	0.7	0.0	0.0	3.8	5.6	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1385	0	0	0	1426	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1835	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	29.2	0.0	0.0	0.0	31.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.2	0.0	0.0	0.0	3.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.39	1.00	0.00
Lane Grp Cap (c), veh/h	0	464	21	0	0	463	107	0
V/C Ratio (X)	0.00	0.05	0.48	0.00	0.00	0.15	0.78	0.00
Avail Cap (c_a), veh/h	0	464	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.2	0.0	0.0	32.9	55.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.7	0.0	0.0	0.7	11.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.9	0.0	0.0	33.6	67.3	0.0
1st-Term Q (Q1), veh/ln	0.0	0.5	0.3	0.0	0.0	1.6	2.5	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.5	0.4	0.0	0.0	1.6	2.9	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.11	0.00	0.00	0.18	0.81	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	208	0	0	0	211
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1053	0	0	0	966
V/C Ratio (X)	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.22
Avail Cap (c_a), veh/h	0	0	0	1053	0	0	0	966
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	219	0	0	0	215
Grp Sat Flow (s), veh/h/ln	0	0	0	1866	0	0	0	1792
Q Serve Time (g_s), s	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.33	0.00	0.01	0.00	0.59	0.00	0.24
Lane Grp Cap (c), veh/h	0	0	0	1105	0	0	0	975
V/C Ratio (X)	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.22
Avail Cap (c_a), veh/h	0	0	0	1105	0	0	0	975
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.3	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	14.2
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	399	411	21	0	16
Future Vol, veh/h	16	399	411	21	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	434	447	23	0	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	470	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	1088	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1088	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.32	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1088	-	-	-	767
HCM Lane V/C Ratio	0.016	-	-	-	0.023
HCM Ctrl Dly (s/v)	8.4	-	-	-	9.8
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Future Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	157	9	26	57	4	5	2	8	2	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	165	0	0	280	283	161	277	285	59
Stage 1	-	-	-	-	-	-	170	170	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	166	174	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1413	-	-	672	626	884	675	624	1007
Stage 1	-	-	-	-	-	-	832	758	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	836	755	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1413	-	-	651	612	884	652	611	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	651	612	-	652	611	-
Stage 1	-	-	-	-	-	-	830	756	-	877	788	-
Stage 2	-	-	-	-	-	-	870	787	-	824	753	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.19			2.28			9.95			9.84		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	742	46	-	-	532	-	-	753				
HCM Lane V/C Ratio	0.021	0.003	-	-	0.018	-	-	0.013				
HCM Ctrl Dly (s/v)	10	7.3	0	-	7.6	0	-	9.8				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection

Int Delay, s/veh 1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	23	37	541	125	75	298
Future Vol, veh/h	23	37	541	125	75	298
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	40	588	136	82	324

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	981	362	0
Stage 1	656	-	-
Stage 2	325	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	247	635	-
Stage 1	478	-	-
Stage 2	705	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	221	635	-
Mov Cap-2 Maneuver	221	-	-
Stage 1	478	-	-
Stage 2	632	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	16.8	0	2.44
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	370	724
HCM Lane V/C Ratio	-	-	0.176	0.093
HCM Ctrl Dly (s/v)	-	-	16.8	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.6	0.3

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	141	21	12	274	226	80	478	23	124	251	196
Future Volume (veh/h)	206	141	21	12	274	226	80	478	23	124	251	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	153	23	13	298	246	87	520	25	135	273	213
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	251	1171	173	26	891	398	392	1352	65	393	745	631
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Prop Arrive On Green	0.24	0.63	0.63	0.01	0.25	0.25	0.04	0.39	0.39	0.03	0.27	0.27
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.1	14.7	14.7	72.6	37.8	46.9	21.3	27.7	27.7	21.9	33.1	32.7
Ln Grp LOS	E	B	B	E	D	D	C	C	C	C	C	C
Approach Vol, veh/h	400			557			632			621		
Approach Delay, s/veh	43.5			42.6			26.8			30.5		
Approach LOS	D			D			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	52.0	6.8	50.2	10.2	52.8	21.9	35.1				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.7	3.8	4.7				
Max Q Clear (g_c+I1), s	7.4	15.0	2.9	4.4	5.5	16.2	16.6	18.5				
Green Ext Time (g_e), s	0.0	3.6	0.0	1.0	0.0	2.4	0.3	1.5				
Prob of Phs Call (p_c)	0.99	1.00	0.35	1.00	0.94	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.01	0.00	1.00	0.00	0.31	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3452			3106			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	166			459			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	135	0	13	0	87	0	224	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.4	0.0	0.9	0.0	3.5	0.0	14.6	0.0
Cycle Q Clear Time (g_c), s	5.4	0.0	0.9	0.0	3.5	0.0	14.6	0.0
Perm LT Sat Flow (s_l), veh/h/ln	862	0	0	0	910	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	47.0	0.0	0.0	0.0	47.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	34.0	0.0	0.0	0.0	33.6	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	2.5	0.0	0.0	0.0	1.4	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	393	0	26	0	392	0	251	0
V/C Ratio (X)	0.34	0.00	0.50	0.00	0.22	0.00	0.89	0.00
Avail Cap (c_a), veh/h	393	0	134	0	418	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	21.4	0.0	58.7	0.0	21.0	0.0	45.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	13.9	0.0	0.3	0.0	21.1	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.9	0.0	72.6	0.0	21.3	0.0	66.1	0.0
1st-Term Q (Q1), veh/ln	2.3	0.0	0.4	0.0	1.5	0.0	5.9	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	1.5	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.4	0.0	0.5	0.0	1.5	0.0	7.3	0.0
%ile Storage Ratio (RQ%)	0.10	0.00	0.06	0.00	0.11	0.00	0.55	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	267	0	86	0	273	0	298
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	12.9	0.0	2.4	0.0	14.2	0.0	8.2
Cycle Q Clear Time (g_c), s	0.0	12.9	0.0	2.4	0.0	14.2	0.0	8.2
Lane Grp Cap (c), veh/h	0	696	0	670	0	745	0	891
V/C Ratio (X)	0.00	0.38	0.00	0.13	0.00	0.37	0.00	0.33
Avail Cap (c_a), veh/h	0	696	0	670	0	745	0	891
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	26.1	0.0	14.3	0.0	31.7	0.0	36.8
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.4	0.0	1.4	0.0	1.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	27.7	0.0	14.7	0.0	33.1	0.0	37.8
1st-Term Q (Q1), veh/ln	0.0	5.5	0.0	0.9	0.0	6.8	0.0	3.6

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	5.8	0.0	1.0	0.0	7.1	0.0	3.7
%ile Storage Ratio (RQ%)	0.00	0.43	0.00	0.06	0.00	0.29	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	90	0	213	0	246
Grp Sat Flow (s), veh/h/ln	0	1841	0	1788	0	1585	0	1585
Q Serve Time (g_s), s	0.0	13.0	0.0	2.4	0.0	13.0	0.0	16.5
Cycle Q Clear Time (g_c), s	0.0	13.0	0.0	2.4	0.0	13.0	0.0	16.5
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.00	0.26	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	721	0	674	0	631	0	398
V/C Ratio (X)	0.00	0.39	0.00	0.13	0.00	0.34	0.00	0.62
Avail Cap (c_a), veh/h	0	721	0	674	0	631	0	398
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	26.1	0.0	14.3	0.0	31.2	0.0	39.9
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.4	0.0	1.4	0.0	7.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	27.7	0.0	14.7	0.0	32.7	0.0	46.9
1st-Term Q (Q1), veh/ln	0.0	5.7	0.0	1.0	0.0	5.3	0.0	6.4
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.1	0.0	0.3	0.0	0.8
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.0	0.0	1.1	0.0	5.5	0.0	7.2
%ile Storage Ratio (RQ%)	0.00	0.45	0.00	0.06	0.00	0.78	0.00	0.92
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	34.9
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	84	96	130	198	191	150	470	151	226	359	114
Future Volume (veh/h)	47	84	96	130	198	191	150	470	151	226	359	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	91	104	141	215	208	163	511	164	246	390	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes				Yes				Yes			
Cap, veh/h	151	384	171	310	280	250	631	2064	921	641	1606	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.03	0.11	0.11	0.08	0.16	0.16	0.11	1.00	1.00	0.08	0.60	0.60
Unsig. Movement Delay												
Ln Grp Delay, s/veh	47.1	49.3	54.5	41.9	55.0	61.4	8.7	0.3	0.4	8.4	11.6	11.6
Ln Grp LOS	D	D	D	D	D	E	A	A	A	A	B	B
Approach Vol, veh/h	246				564				838			
Approach Delay, s/veh	51.0				54.1				1.9			
Approach LOS	D				D				A			
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	13.7	74.2	14.6	17.5	11.0	76.9	8.7	23.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.6	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	8.5	2.0	10.2	9.5	6.6	10.3	5.0	17.3				
Green Ext Time (g_e), s	0.7	4.3	0.0	0.8	0.0	3.5	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.99	1.00	1.00	1.00	0.82	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.45				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5			7					
Mvmt Sat Flow, veh/h	1781	1781		1781			1781					
Through Movement Data												
Assigned Mvmt	2		4			6		8				
Mvmt Sat Flow, veh/h	3554		3554			2661		1777				
Right-Turn Movement Data												
Assigned Mvmt	12		14			16		18				
Mvmt Sat Flow, veh/h	1585		1585			836		1585				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	246	0	141	0	163	0	51	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.5	0.0	8.2	0.0	4.6	0.0	3.0	0.0
Cycle Q Clear Time (g_c), s	6.5	0.0	8.2	0.0	4.6	0.0	3.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	764	0	1188	0	887	0	964	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	69.9	0.0	15.0	0.0	69.7	0.0	13.0	0.0
Perm LT Serve Time (g_u), s	69.7	0.0	10.2	0.0	64.2	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.1	0.0	0.6	0.0	1.2	0.0	0.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	641	0	310	0	631	0	151	0
V/C Ratio (X)	0.38	0.00	0.45	0.00	0.26	0.00	0.34	0.00
Avail Cap (c_a), veh/h	971	0	316	0	631	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	8.1	0.0	40.9	0.0	8.5	0.0	45.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.0	0.2	0.0	1.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	8.4	0.0	41.9	0.0	8.7	0.0	47.1	0.0
1st-Term Q (Q1), veh/ln	2.4	0.0	3.6	0.0	1.5	0.0	1.3	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.5	0.0	3.7	0.0	1.6	0.0	1.4	0.0
%ile Storage Ratio (RQ%)	0.18	0.00	0.62	0.00	0.27	0.00	0.22	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	511	0	91	0	259	0	215
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	2.8	0.0	8.1	0.0	13.9
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.8	0.0	8.1	0.0	13.9
Lane Grp Cap (c), veh/h	0	2064	0	384	0	1073	0	280
V/C Ratio (X)	0.00	0.25	0.00	0.24	0.00	0.24	0.00	0.77
Avail Cap (c_a), veh/h	0	2064	0	903	0	1073	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	49.0	0.0	11.0	0.0	48.5
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.5	0.0	6.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	49.3	0.0	11.6	0.0	55.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.3	0.0	3.1	0.0	6.2

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.3	0.0	3.3	0.0	6.7
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.03	0.00	0.12	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	164	0	104	0	255	0	208
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1720	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	7.5	0.0	8.3	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.5	0.0	8.3	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.49	0.00	1.00
Lane Grp Cap (c), veh/h	0	921	0	171	0	1038	0	250
V/C Ratio (X)	0.00	0.18	0.00	0.61	0.00	0.25	0.00	0.83
Avail Cap (c_a), veh/h	0	921	0	403	0	1038	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	51.1	0.0	11.1	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	3.4	0.0	0.6	0.0	12.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	54.5	0.0	11.6	0.0	61.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.0	0.0	3.1	0.0	6.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.2	0.0	0.2	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.1	0.0	3.3	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.57	0.00	0.12	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	21.9
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	190	43	99	346	29	8	4	28	4	4	9
Future Vol, veh/h	35	190	43	99	346	29	8	4	28	4	4	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	207	47	108	376	32	9	4	30	4	4	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	408	0	0	253	0	0	711	929	127	773	921	188
Stage 1	-	-	-	-	-	-	306	306	-	591	591	-
Stage 2	-	-	-	-	-	-	405	623	-	182	329	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1148	-	-	1309	-	-	320	266	900	289	269	822
Stage 1	-	-	-	-	-	-	679	660	-	460	493	-
Stage 2	-	-	-	-	-	-	593	477	-	803	645	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	1309	-	-	276	236	900	244	239	822
Mov Cap-2 Maneuver	-	-	-	-	-	-	276	236	-	244	239	-
Stage 1	-	-	-	-	-	-	656	638	-	422	452	-
Stage 2	-	-	-	-	-	-	533	437	-	745	623	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	1.08	1.67	12.57	14.81
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	519	1148	-	-	1309	-	-	385
HCM Lane V/C Ratio	0.084	0.033	-	-	0.082	-	-	0.048
HCM Ctrl Dly (s/v)	12.6	8.2	-	-	8	-	-	14.8
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.3	-	-	0.2

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	481	3	9	435	48	12	3	7	25	2	38
Future Volume (veh/h)	77	481	3	9	435	48	12	3	7	25	2	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	523	3	10	473	52	13	3	8	27	2	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	107	2146	12	21	1757	192	259	66	139	187	29	247
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.02	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	67.3	12.2	12.2	73.9	0.7	0.7	32.2	0.0	0.0	33.6	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h		610			535			24			70	
Approach Delay, s/veh		19.8			2.0			32.2			33.6	
Approach LOS		B			A			C			C	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		2	3	4			6	7	8			
Case No		8.0	2.0	4.0			8.0	2.0	4.0			
Phs Duration (G+Y+Rc), s		38.0	5.9	76.1			38.0	11.7	70.3			
Change Period (Y+Rc), s		5.0	4.5	5.0			5.0	4.5	5.0			
Max Green (Gmax), s		33.0	9.5	63.0			33.0	18.5	54.0			
Max Allow Headway (MAH), s		5.4	3.8	5.2			5.4	3.8	5.3			
Max Q Clear (g _c +I1), s		3.2	2.7	10.3			5.8	7.6	2.0			
Green Ext Time (g _e), s		0.1	0.0	3.5			0.3	0.1	3.6			
Prob of Phs Call (p _c)		1.00	0.28	1.00			1.00	0.94	1.00			
Prob of Max Out (p _x)		0.00	0.00	0.00			0.00	0.00	0.00			
Left-Turn Movement Data												
Assigned Mvmt		5	3				1	7				
Mvmt Sat Flow, veh/h		774	1781				528	1781				
Through Movement Data												
Assigned Mvmt		2		4			6		8			
Mvmt Sat Flow, veh/h		239		3623			107		3230			
Right-Turn Movement Data												
Assigned Mvmt			12		14			16		18		
Mvmt Sat Flow, veh/h			506		21			898		354		
Left Lane Group Data												
Assigned Mvmt		0	5	3	0	0	1	7	0			

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	24	10	0	0	70	84	0
Grp Sat Flow (s), veh/h/ln	0	1519	1781	0	0	1533	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.6	5.6	0.0
Cycle Q Clear Time (g_c), s	0.0	1.2	0.7	0.0	0.0	3.8	5.6	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1385	0	0	0	1426	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1835	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	29.2	0.0	0.0	0.0	31.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.2	0.0	0.0	0.0	3.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.39	1.00	0.00
Lane Grp Cap (c), veh/h	0	464	21	0	0	463	107	0
V/C Ratio (X)	0.00	0.05	0.48	0.00	0.00	0.15	0.78	0.00
Avail Cap (c_a), veh/h	0	464	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.2	0.0	0.0	32.9	55.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.7	0.0	0.0	0.7	11.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.9	0.0	0.0	33.6	67.3	0.0
1st-Term Q (Q1), veh/ln	0.0	0.5	0.3	0.0	0.0	1.6	2.5	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.5	0.4	0.0	0.0	1.6	2.9	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.11	0.00	0.00	0.18	0.81	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	256	0	0	0	259
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1053	0	0	0	966
V/C Ratio (X)	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.27
Avail Cap (c_a), veh/h	0	0	0	1053	0	0	0	966
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	270	0	0	0	266
Grp Sat Flow (s), veh/h/ln	0	0	0	1867	0	0	0	1807
Q Serve Time (g_s), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.33	0.00	0.01	0.00	0.59	0.00	0.20
Lane Grp Cap (c), veh/h	0	0	0	1106	0	0	0	983
V/C Ratio (X)	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.27
Avail Cap (c_a), veh/h	0	0	0	1106	0	0	0	983
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.1
HCM 7th LOS	B

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	490	502	21	0	16
Future Vol, veh/h	16	490	502	21	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	533	546	23	0	17
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	568	0	-	0	-	284
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1000	-	-	-	0	713
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1000	-	-	-	-	713
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.27	0		10.18		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1000	-	-	-	713	
HCM Lane V/C Ratio	0.017	-	-	-	0.024	
HCM Ctrl Dly (s/v)	8.7	-	-	-	10.2	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Future Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	157	9	26	57	4	5	2	8	2	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	165	0	0	280	283	161	277	285	59
Stage 1	-	-	-	-	-	-	170	170	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	166	174	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1413	-	-	672	626	884	675	624	1007
Stage 1	-	-	-	-	-	-	832	758	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	836	755	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1413	-	-	651	612	884	652	611	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	651	612	-	652	611	-
Stage 1	-	-	-	-	-	-	830	756	-	877	788	-
Stage 2	-	-	-	-	-	-	870	787	-	824	753	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.19			2.28			9.95			9.84		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	742	46	-	-	532	-	-	753				
HCM Lane V/C Ratio	0.021	0.003	-	-	0.018	-	-	0.013				
HCM Ctrl Dly (s/v)	10	7.3	0	-	7.6	0	-	9.8				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection												
Int Delay, s/veh	221.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	221	0	119	23	0	37	267	524	125	75	383	119
Future Vol, veh/h	221	0	119	23	0	37	267	524	125	75	383	119
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	240	0	129	25	0	40	290	570	136	82	416	129

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1509	1930	273	1589	1927	353	546	0	0	705	0	0
Stage 1	644	644	-	1218	1218	-	-	-	-	-	-	-
Stage 2	865	1286	-	371	709	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	~ 83	66	725	72	66	644	1020	-	-	889	-	-
Stage 1	428	466	-	191	251	-	-	-	-	-	-	-
Stage 2	315	233	-	621	436	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	~ 51	43	725	39	43	644	1020	-	-	889	-	-
Mov Cap-2 Maneuver	~ 51	43	-	39	43	-	-	-	-	-	-	-
Stage 1	389	423	-	137	180	-	-	-	-	-	-	-
Stage 2	~ 211	167	-	464	396	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	\$ 1207.81	84.28	2.89	1.64
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1020	-	-	51	725	39	644	351	-	-
HCM Lane V/C Ratio	0.285	-	-	4.756	0.178	0.648	0.062	0.092	-	-
HCM Ctrl Dly (s/v)	9.9	-	-	\$ 1852.2	11	202.2	11	9.5	0.6	-
HCM Lane LOS	A	-	-	F	B	F	B	A	A	-
HCM 95th %tile Q(veh)	1.2	-	-	27	0.6	2.3	0.2	0.3	-	-

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

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	283	0	916	288	237
Future Vol, veh/h	0	283	0	916	288	237
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	308	0	996	313	258
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	285	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	711	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	711	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	13.86	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 711		-	-		
HCM Lane V/C Ratio	- 0.432		-	-		
HCM Ctrl Dly (s/v)	- 13.9		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 2.2		-	-		

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	141	21	12	274	226	80	478	23	124	251	196
Future Volume (veh/h)	206	141	21	12	274	226	80	478	23	124	251	196
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	153	23	13	298	246	87	520	25	135	273	213
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	254	1378	204	26	1123	501	362	1122	54	326	615	521
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Prop Arrive On Green	0.24	0.74	0.74	0.01	0.32	0.32	0.05	0.32	0.32	0.08	0.55	0.55
Unsig. Movement Delay												
Ln Grp Delay, s/veh	54.8	9.1	9.2	72.6	31.2	36.6	25.7	34.8	34.8	26.8	22.9	22.7
Ln Grp LOS	D	A	A	E	C	D	C	C	C	C	C	C
Approach Vol, veh/h	400			557			632			621		
Approach Delay, s/veh	34.7			34.6			33.6			23.6		
Approach LOS	C			C			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	44.0	6.8	58.2	10.6	44.4	22.1	42.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	39.0	17.0	38.0	7.0	38.0	30.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.7	3.8	4.7				
Max Q Clear (g_c+I1), s	8.0	16.4	2.9	3.7	5.9	12.5	16.6	17.1				
Green Ext Time (g_e), s	0.0	3.3	0.0	1.0	0.0	2.4	0.5	1.8				
Prob of Phs Call (p_c)	0.99	1.00	0.35	1.00	0.94	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3452			3106			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	166			459			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	135	0	13	0	87	0	224	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.0	0.0	0.9	0.0	3.9	0.0	14.6	0.0
Cycle Q Clear Time (g_c), s	6.0	0.0	0.9	0.0	3.9	0.0	14.6	0.0
Perm LT Sat Flow (s_l), veh/h/ln	862	0	0	0	910	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	39.0	0.0	0.0	0.0	39.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	24.6	0.0	0.0	0.0	29.0	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	3.2	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	326	0	26	0	362	0	254	0
V/C Ratio (X)	0.41	0.00	0.50	0.00	0.24	0.00	0.88	0.00
Avail Cap (c_a), veh/h	326	0	252	0	384	0	445	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	25.9	0.0	58.7	0.0	25.4	0.0	44.8	0.0
Incr Delay (d2), s/veh	0.8	0.0	13.9	0.0	0.3	0.0	10.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	26.8	0.0	72.6	0.0	25.7	0.0	54.8	0.0
1st-Term Q (Q1), veh/ln	2.5	0.0	0.4	0.0	1.6	0.0	5.8	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.7	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.6	0.0	0.5	0.0	1.7	0.0	6.5	0.0
%ile Storage Ratio (RQ%)	0.11	0.00	0.06	0.00	0.13	0.00	0.49	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	267	0	86	0	273	0	298
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	14.3	0.0	1.6	0.0	10.5	0.0	7.5
Cycle Q Clear Time (g_c), s	0.0	14.3	0.0	1.6	0.0	10.5	0.0	7.5
Lane Grp Cap (c), veh/h	0	577	0	788	0	615	0	1123
V/C Ratio (X)	0.00	0.46	0.00	0.11	0.00	0.44	0.00	0.27
Avail Cap (c_a), veh/h	0	577	0	788	0	615	0	1123
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	32.2	0.0	8.9	0.0	20.5	0.0	30.6
Incr Delay (d2), s/veh	0.0	2.7	0.0	0.3	0.0	2.3	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	34.8	0.0	9.1	0.0	22.9	0.0	31.2
1st-Term Q (Q1), veh/ln	0.0	6.2	0.0	0.6	0.0	4.0	0.0	3.2

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.4	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.6	0.0	0.7	0.0	4.4	0.0	3.3
%ile Storage Ratio (RQ%)	0.00	0.49	0.00	0.04	0.00	0.18	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	278	0	90	0	213	0	246
Grp Sat Flow (s), veh/h/ln	0	1841	0	1788	0	1585	0	1585
Q Serve Time (g_s), s	0.0	14.4	0.0	1.7	0.0	9.4	0.0	15.1
Cycle Q Clear Time (g_c), s	0.0	14.4	0.0	1.7	0.0	9.4	0.0	15.1
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.00	0.26	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	598	0	793	0	521	0	501
V/C Ratio (X)	0.00	0.46	0.00	0.11	0.00	0.41	0.00	0.49
Avail Cap (c_a), veh/h	0	598	0	793	0	521	0	501
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	32.2	0.0	8.9	0.0	20.3	0.0	33.2
Incr Delay (d2), s/veh	0.0	2.6	0.0	0.3	0.0	2.4	0.0	3.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	34.8	0.0	9.2	0.0	22.7	0.0	36.6
1st-Term Q (Q1), veh/ln	0.0	6.4	0.0	0.7	0.0	3.1	0.0	5.8
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.1	0.0	0.3	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	6.8	0.0	0.7	0.0	3.4	0.0	6.3
%ile Storage Ratio (RQ%)	0.00	0.51	0.00	0.04	0.00	0.48	0.00	0.80
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	31.2
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	47	84	96	130	198	191	150	470	151	226	359	114
Future Volume (veh/h)	47	84	96	130	198	191	150	470	151	226	359	114
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	51	91	104	141	215	208	163	511	164	246	390	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	151	384	171	310	280	250	631	2064	921	641	1606	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.03	0.11	0.11	0.08	0.16	0.16	0.11	1.00	1.00	0.08	0.60	0.60
Unsig. Movement Delay												
Ln Grp Delay, s/veh	47.1	49.3	54.5	41.9	55.0	61.4	8.7	0.3	0.4	8.4	11.6	11.6
Ln Grp LOS	D	D	D	D	D	E	A	A	A	A	B	B
Approach Vol, veh/h		246			564			838			760	
Approach Delay, s/veh		51.0			54.1			1.9			10.6	
Approach LOS		D			D			A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		1	2	3	4	5	6	7	8			
Case No		1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0			
Phs Duration (G+Y+Rc), s		13.7	74.2	14.6	17.5	11.0	76.9	8.7	23.4			
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			
Max Green (Gmax), s		31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5			
Max Allow Headway (MAH), s		3.8	5.0	3.8	4.6	3.8	5.3	3.8	5.4			
Max Q Clear (g _c +I1), s		8.5	2.0	10.2	9.5	6.6	10.3	5.0	17.3			
Green Ext Time (g _e), s		0.7	4.3	0.0	0.8	0.0	3.5	0.1	1.6			
Prob of Phs Call (p _c)		1.00	1.00	0.99	1.00	1.00	1.00	0.82	1.00			
Prob of Max Out (p _x)		0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.45			
Left-Turn Movement Data												
Assigned Mvmt		1		3		5		7				
Mvmt Sat Flow, veh/h		1781		1781		1781		1781				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			3554		3554		2661		1777			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1585		1585		836		1585			
Left Lane Group Data												
Assigned Mvmt		1	0	3	0	5	0	7	0			

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	246	0	141	0	163	0	51	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.5	0.0	8.2	0.0	4.6	0.0	3.0	0.0
Cycle Q Clear Time (g_c), s	6.5	0.0	8.2	0.0	4.6	0.0	3.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	764	0	1188	0	887	0	964	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	69.9	0.0	15.0	0.0	69.7	0.0	13.0	0.0
Perm LT Serve Time (g_u), s	69.7	0.0	10.2	0.0	64.2	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.1	0.0	0.6	0.0	1.2	0.0	0.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	641	0	310	0	631	0	151	0
V/C Ratio (X)	0.38	0.00	0.45	0.00	0.26	0.00	0.34	0.00
Avail Cap (c_a), veh/h	971	0	316	0	631	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.91	0.00	1.00	0.00
Uniform Delay (d1), s/veh	8.1	0.0	40.9	0.0	8.5	0.0	45.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	1.0	0.0	0.2	0.0	1.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	8.4	0.0	41.9	0.0	8.7	0.0	47.1	0.0
1st-Term Q (Q1), veh/ln	2.4	0.0	3.6	0.0	1.5	0.0	1.3	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.5	0.0	3.7	0.0	1.6	0.0	1.4	0.0
%ile Storage Ratio (RQ%)	0.18	0.00	0.62	0.00	0.27	0.00	0.22	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	511	0	91	0	259	0	215
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	2.8	0.0	8.1	0.0	13.9
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.8	0.0	8.1	0.0	13.9
Lane Grp Cap (c), veh/h	0	2064	0	384	0	1073	0	280
V/C Ratio (X)	0.00	0.25	0.00	0.24	0.00	0.24	0.00	0.77
Avail Cap (c_a), veh/h	0	2064	0	903	0	1073	0	378
Upstream Filter (I)	0.00	0.91	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	49.0	0.0	11.0	0.0	48.5
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.5	0.0	6.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	49.3	0.0	11.6	0.0	55.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.3	0.0	3.1	0.0	6.2

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.3	0.0	3.3	0.0	6.7
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.03	0.00	0.12	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	164	0	104	0	255	0	208
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1720	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	7.5	0.0	8.3	0.0	15.3
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.5	0.0	8.3	0.0	15.3
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.49	0.00	1.00
Lane Grp Cap (c), veh/h	0	921	0	171	0	1038	0	250
V/C Ratio (X)	0.00	0.18	0.00	0.61	0.00	0.25	0.00	0.83
Avail Cap (c_a), veh/h	0	921	0	403	0	1038	0	337
Upstream Filter (I)	0.00	0.91	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	51.1	0.0	11.1	0.0	49.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	3.4	0.0	0.6	0.0	12.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	54.5	0.0	11.6	0.0	61.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.0	0.0	3.1	0.0	6.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.2	0.0	0.2	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.1	0.0	3.3	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.57	0.00	0.12	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	21.9
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	35	190	43	99	346	29	8	4	28	4	4	9
Future Vol, veh/h	35	190	43	99	346	29	8	4	28	4	4	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	207	47	108	376	32	9	4	30	4	4	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	408	0	0	253	0	0	711	929	127	773	921	188
Stage 1	-	-	-	-	-	-	306	306	-	591	591	-
Stage 2	-	-	-	-	-	-	405	623	-	182	329	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1148	-	-	1309	-	-	320	266	900	289	269	822
Stage 1	-	-	-	-	-	-	679	660	-	460	493	-
Stage 2	-	-	-	-	-	-	593	477	-	803	645	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1148	-	-	1309	-	-	276	236	900	244	239	822
Mov Cap-2 Maneuver	-	-	-	-	-	-	276	236	-	244	239	-
Stage 1	-	-	-	-	-	-	656	638	-	422	452	-
Stage 2	-	-	-	-	-	-	533	437	-	745	623	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	1.08			1.67			12.57			14.81		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	519	1148	-	-	1309	-	-	385
HCM Lane V/C Ratio	0.084	0.033	-	-	0.082	-	-	0.048
HCM Ctrl Dly (s/v)	12.6	8.2	-	-	8	-	-	14.8
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.3	-	-	0.2

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	481	3	9	435	48	12	3	7	25	2	38
Future Volume (veh/h)	77	481	3	9	435	48	12	3	7	25	2	38
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	523	3	10	473	52	13	3	8	27	2	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	107	2146	12	21	1757	192	259	66	139	187	29	247
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.02	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	67.3	12.2	12.2	73.9	0.7	0.7	32.2	0.0	0.0	33.6	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h	610			535			24			70		
Approach Delay, s/veh	19.8			2.0			32.2			33.6		
Approach LOS	B			A			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		5.9	76.1	38.0		11.7	70.3				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.4		3.8	5.2	5.4		3.8	5.3				
Max Q Clear (g_c+I1), s	3.2		2.7	10.3	5.8		7.6	2.0				
Green Ext Time (g_e), s	0.1		0.0	3.5	0.3		0.1	3.6				
Prob of Phs Call (p_c)	1.00		0.28	1.00	1.00		0.94	1.00				
Prob of Max Out (p_x)	0.00		0.00	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	774		1781	528		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	239		3623	107		3230						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	506		21	898		354						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	24	10	0	0	70	84	0
Grp Sat Flow (s), veh/h/ln	0	1519	1781	0	0	1533	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.6	5.6	0.0
Cycle Q Clear Time (g_c), s	0.0	1.2	0.7	0.0	0.0	3.8	5.6	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1385	0	0	0	1426	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1835	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	29.2	0.0	0.0	0.0	31.8	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.2	0.0	0.0	0.0	3.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.39	1.00	0.00
Lane Grp Cap (c), veh/h	0	464	21	0	0	463	107	0
V/C Ratio (X)	0.00	0.05	0.48	0.00	0.00	0.15	0.78	0.00
Avail Cap (c_a), veh/h	0	464	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.2	0.0	0.0	32.9	55.6	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.7	0.0	0.0	0.7	11.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.9	0.0	0.0	33.6	67.3	0.0
1st-Term Q (Q1), veh/ln	0.0	0.5	0.3	0.0	0.0	1.6	2.5	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.5	0.4	0.0	0.0	1.6	2.9	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.11	0.00	0.00	0.18	0.81	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	256	0	0	0	259
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1053	0	0	0	966
V/C Ratio (X)	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.27
Avail Cap (c_a), veh/h	0	0	0	1053	0	0	0	966
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.2	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	270	0	0	0	266
Grp Sat Flow (s), veh/h/ln	0	0	0	1867	0	0	0	1807
Q Serve Time (g_s), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.33	0.00	0.01	0.00	0.59	0.00	0.20
Lane Grp Cap (c), veh/h	0	0	0	1106	0	0	0	983
V/C Ratio (X)	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.27
Avail Cap (c_a), veh/h	0	0	0	1106	0	0	0	983
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.1
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	490	502	21	0	16
Future Vol, veh/h	16	490	502	21	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	533	546	23	0	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	568	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	1000	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1000	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.27	0	10.18
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1000	-	-	-	713
HCM Lane V/C Ratio	0.017	-	-	-	0.024
HCM Ctrl Dly (s/v)	8.7	-	-	-	10.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Future Vol, veh/h	4	144	8	24	52	4	5	2	7	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	157	9	26	57	4	5	2	8	2	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	165	0	0	280	283	161	277	285	59
Stage 1	-	-	-	-	-	-	170	170	-	111	111	-
Stage 2	-	-	-	-	-	-	110	113	-	166	174	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1542	-	-	1413	-	-	672	626	884	675	624	1007
Stage 1	-	-	-	-	-	-	832	758	-	894	804	-
Stage 2	-	-	-	-	-	-	895	802	-	836	755	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1542	-	-	1413	-	-	651	612	884	652	611	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-	651	612	-	652	611	-
Stage 1	-	-	-	-	-	-	830	756	-	877	788	-
Stage 2	-	-	-	-	-	-	870	787	-	824	753	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.19			2.28			9.95			9.84		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	742	46	-	-	532	-	-	753				
HCM Lane V/C Ratio	0.021	0.003	-	-	0.018	-	-	0.013				
HCM Ctrl Dly (s/v)	10	7.3	0	-	7.6	0	-	9.8				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	0	119	23	0	37	267	524	125	75	383	119
Future Volume (veh/h)	221	0	119	23	0	37	267	524	125	75	383	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	240	0	129	25	0	40	290	570	136	82	416	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	329	0	344	246	0	344	663	1992	474	579	1921	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Prop Arrive On Green	0.22	0.00	0.22	0.22	0.00	0.22	1.00	1.00	1.00	1.00	1.00	1.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	51.3	0.0	40.7	44.6	0.0	37.9	2.1	0.6	0.6	0.5	0.4	0.4
Ln Grp LOS	D		D	D		D	A	A	A	A	A	A
Approach Vol, veh/h	369			65			996			627		
Approach Delay, s/veh	47.6			40.5			1.0			0.4		
Approach LOS	D			D			A			A		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			4			6			8		
Case No	6.0			6.0			6.0			6.0		
Phs Duration (G+Y+Rc), s	88.9			31.1			88.9			31.1		
Change Period (Y+Rc), s	5.0			5.0			5.0			5.0		
Max Green (Gmax), s	75.0			35.0			75.0			35.0		
Max Allow Headway (MAH), s	5.3			4.4			5.4			5.0		
Max Q Clear (g_c+I1), s	2.0			25.0			2.0			12.4		
Green Ext Time (g_e), s	8.0			1.1			4.6			0.2		
Prob of Phs Call (p_c)	1.00			1.00			1.00			1.00		
Prob of Max Out (p_x)	0.00			0.09			0.00			0.00		
Left-Turn Movement Data												
Assigned Mvmt	5			7			1			3		
Mvmt Sat Flow, veh/h	862			1367			742			1261		
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	2848			0			2746			0		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	677			1585			843			1585		
Left Lane Group Data												
Assigned Mvmt	0	5	0	7	0	1	0	3				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

Lane Assignment		L		L		L		L
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	290	0	240	0	82	0	25
Grp Sat Flow (s), veh/h/ln	0	862	0	1367	0	742	0	1261
Q Serve Time (g_s), s	0.0	0.0	0.0	20.5	0.0	0.0	0.0	2.1
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	23.0	0.0	0.0	0.0	10.4
Perm LT Sat Flow (s_l), veh/h/ln	0	862	0	1367	0	742	0	1261
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	83.9	0.0	26.1	0.0	83.9	0.0	26.1
Perm LT Serve Time (g_u), s	0.0	83.9	0.0	23.6	0.0	83.9	0.0	17.7
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	20.5	0.0	0.0	0.0	2.1
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	663	0	329	0	579	0	246
V/C Ratio (X)	0.00	0.44	0.00	0.73	0.00	0.14	0.00	0.10
Avail Cap (c_a), veh/h	0	663	0	431	0	579	0	340
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.96	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	46.9	0.0	0.0	0.0	44.5
Incr Delay (d2), s/veh	0.0	2.1	0.0	4.3	0.0	0.5	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	2.1	0.0	51.3	0.0	0.5	0.0	44.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.7
2nd-Term Q (Q2), veh/ln	0.0	0.4	0.0	0.4	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.4	0.0	7.3	0.0	0.1	0.0	0.7
%ile Storage Ratio (RQ%)	0.00	0.10	0.00	1.15	0.00	0.02	0.00	0.08
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	355	0	0	0	282	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1870	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1243	0	0	0	1308	0	0
V/C Ratio (X)	0.00	0.29	0.00	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	1243	0	0	0	1308	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.96	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		T+R		T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	351	0	129	0	263	0	40
Grp Sat Flow (s), veh/h/ln	0	1748	0	1585	0	1719	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	2.4
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.3	0.0	0.0	0.0	2.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.39	0.00	1.00	0.00	0.49	0.00	1.00
Lane Grp Cap (c), veh/h	0	1223	0	344	0	1202	0	344
V/C Ratio (X)	0.00	0.29	0.00	0.37	0.00	0.22	0.00	0.12
Avail Cap (c_a), veh/h	0	1223	0	462	0	1202	0	462
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.96	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	40.0	0.0	0.0	0.0	37.7
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.7	0.0	0.4	0.0	0.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.6	0.0	40.7	0.0	0.4	0.0	37.9
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.3	0.0	0.0	0.0	1.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	3.3	0.0	0.1	0.0	1.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.52	0.00	0.00	0.00	0.11
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	10.4
HCM 7th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	283	0	916	288	237
Future Vol, veh/h	0	283	0	916	288	237
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	308	0	996	313	258

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 285	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 711	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 711	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	13.86	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 711	- -	- -
HCM Lane V/C Ratio	- 0.432	- -	- -
HCM Ctrl Dly (s/v)	- 13.9	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 2.2	- -	- -



2029 INFORMATION

**Supermarket — Douglas Street & Tudor Road
Lee's Summit, Missouri**

Phase 2 - 2029

AM Peak Calculations

AM Background Traffic Synchro

AM Total Traffic Synchro w/ Signal

PM Peak Calculations

PM Background Traffic Synchro

PM Total Traffic Synchro w/ Signal

Prepared by:

Traffic Engineering Consultants, Inc.

PHASE 2 - AM PEAK HOUR CALCULATION

[illegible]

[illegible][illegible][illegible][illegible]

[illegible][illegible]

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	597	87	44	475	55	110	257	43	125	405	219
Future Volume (veh/h)	184	597	87	44	475	55	110	257	43	125	405	219
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	649	95	48	516	60	120	279	47	136	440	238
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	227	1110	162	62	940	419	296	1194	199	496	721	611
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Prop Arrive On Green	0.25	0.71	0.71	0.03	0.26	0.26	0.06	0.39	0.39	0.03	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	61.5	16.7	16.7	75.8	40.3	34.5	24.0	25.2	25.3	21.5	40.4	34.7
Ln Grp LOS	E	B	B	E	D	C	C	C	C	C	D	C
Approach Vol, veh/h	944			624			446			814		
Approach Delay, s/veh	26.2			42.4			24.9			35.6		
Approach LOS	C			D			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	52.0	9.2	47.8	11.7	51.3	20.3	36.7				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	5.1				
Max Q Clear (g_c+I1), s	7.5	9.5	5.2	14.3	6.8	26.9	15.0	17.0				
Green Ext Time (g_e), s	0.0	2.1	0.0	5.0	0.0	3.5	0.3	2.3				
Prob of Phs Call (p_c)	0.99	1.00	0.80	1.00	0.98	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	1.00	0.00	1.00	0.00	0.08	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3049			3111			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	507			455			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	136	0	48	0	120	0	200	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	5.5	0.0	3.2	0.0	4.8	0.0	13.0	0.0
Cycle Q Clear Time (g_c), s	5.5	0.0	3.2	0.0	4.8	0.0	13.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	1054	0	0	0	762	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.3	0.0	0.0	0.0	46.3	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	39.5	0.0	0.0	0.0	21.4	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	1.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	496	0	62	0	296	0	227	0
V/C Ratio (X)	0.27	0.00	0.77	0.00	0.41	0.00	0.88	0.00
Avail Cap (c_a), veh/h	496	0	134	0	300	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	21.3	0.0	57.4	0.0	23.1	0.0	43.9	0.0
Incr Delay (d2), s/veh	0.3	0.0	18.3	0.0	0.9	0.0	17.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.5	0.0	75.8	0.0	24.0	0.0	61.5	0.0
1st-Term Q (Q1), veh/ln	2.4	0.0	1.4	0.0	2.0	0.0	5.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.3	0.0	0.1	0.0	1.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.4	0.0	1.8	0.0	2.1	0.0	6.1	0.0
%ile Storage Ratio (RQ%)	0.06	0.00	0.22	0.00	0.16	0.00	0.45	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	161	0	370	0	440	0	516
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	7.3	0.0	12.3	0.0	24.9	0.0	15.0
Cycle Q Clear Time (g_c), s	0.0	7.3	0.0	12.3	0.0	24.9	0.0	15.0
Lane Grp Cap (c), veh/h	0	696	0	634	0	721	0	940
V/C Ratio (X)	0.00	0.23	0.00	0.58	0.00	0.61	0.00	0.55
Avail Cap (c_a), veh/h	0	696	0	634	0	721	0	940
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.4	0.0	12.8	0.0	36.5	0.0	38.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	3.9	0.0	3.8	0.0	2.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.2	0.0	16.7	0.0	40.4	0.0	40.3
1st-Term Q (Q1), veh/ln	0.0	3.1	0.0	3.4	0.0	11.9	0.0	6.5

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.7	0.0	0.8	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.2	0.0	4.1	0.0	12.7	0.0	6.8
%ile Storage Ratio (RQ%)	0.00	0.24	0.00	0.22	0.00	0.30	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	165	0	374	0	238	0	60
Grp Sat Flow (s), veh/h/ln	0	1779	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	7.5	0.0	12.3	0.0	14.9	0.0	3.5
Cycle Q Clear Time (g_c), s	0.0	7.5	0.0	12.3	0.0	14.9	0.0	3.5
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.29	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	697	0	638	0	611	0	419
V/C Ratio (X)	0.00	0.24	0.00	0.59	0.00	0.39	0.00	0.14
Avail Cap (c_a), veh/h	0	697	0	638	0	611	0	419
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	24.5	0.0	12.8	0.0	32.8	0.0	33.7
Incr Delay (d2), s/veh	0.0	0.8	0.0	3.9	0.0	1.9	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	25.3	0.0	16.7	0.0	34.7	0.0	34.5
1st-Term Q (Q1), veh/ln	0.0	3.2	0.0	3.4	0.0	6.0	0.0	1.3
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.7	0.0	0.3	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	3.3	0.0	4.1	0.0	6.3	0.0	1.4
%ile Storage Ratio (RQ%)	0.00	0.25	0.00	0.22	0.00	0.89	0.00	0.18
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	32.3
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	218	52	102	202	200	16	367	111	307	593	123
Future Volume (veh/h)	120	218	52	102	202	200	16	367	111	307	593	123
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	237	57	111	220	217	17	399	121	334	645	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	225	615	274	302	289	258	423	1776	792	698	1736	360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.17	0.17	0.07	0.16	0.16	0.04	1.00	1.00	0.11	0.59	0.59
Unsig. Movement Delay												
Ln Grp Delay, s/veh	41.0	44.4	42.9	38.9	54.4	62.4	13.9	0.3	0.4	10.8	13.8	13.8
Ln Grp LOS	D	D	D	D	D	E	B	A	A	B	B	B
Approach Vol, veh/h	424			548			537			1113		
Approach Delay, s/veh	43.1			54.5			0.8			12.9		
Approach LOS	D			D			A			B		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	17.8	64.5	12.5	25.3	6.7	75.6	13.7	24.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	5.0	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	12.3	2.0	8.1	9.1	2.6	15.8	9.2	17.9				
Green Ext Time (g_e), s	1.0	3.2	0.1	1.6	0.0	5.8	0.2	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.98	1.00	0.43	1.00	0.99	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	0.78	0.00	0.09	0.55				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3554			3554			2930			1777		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	1585			1585			608			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	334	0	111	0	17	0	130	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	10.3	0.0	6.1	0.0	0.6	0.0	7.2	0.0
Cycle Q Clear Time (g_c), s	10.3	0.0	6.1	0.0	0.6	0.0	7.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	882	0	1085	0	693	0	952	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	62.0	0.0	19.5	0.0	60.0	0.0	19.5	0.0
Perm LT Serve Time (g_u), s	60.0	0.0	13.7	0.0	57.3	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	1.2	0.0	0.7	0.0	0.1	0.0	2.5	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	698	0	302	0	423	0	225	0
V/C Ratio (X)	0.48	0.00	0.37	0.00	0.04	0.00	0.58	0.00
Avail Cap (c_a), veh/h	968	0	339	0	487	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	10.3	0.0	38.2	0.0	13.9	0.0	38.7	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.7	0.0	0.0	0.0	2.3	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	10.8	0.0	38.9	0.0	13.9	0.0	41.0	0.0
1st-Term Q (Q1), veh/ln	3.9	0.0	2.7	0.0	0.2	0.0	3.1	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	4.0	0.0	2.8	0.0	0.2	0.0	3.3	0.0
%ile Storage Ratio (RQ%)	0.29	0.00	0.47	0.00	0.04	0.00	0.51	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	399	0	237	0	391	0	220
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	7.1	0.0	13.8	0.0	14.2
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.1	0.0	13.8	0.0	14.2
Lane Grp Cap (c), veh/h	0	1776	0	615	0	1053	0	289
V/C Ratio (X)	0.00	0.22	0.00	0.39	0.00	0.37	0.00	0.76
Avail Cap (c_a), veh/h	0	1776	0	903	0	1053	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	44.0	0.0	12.8	0.0	48.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.4	0.0	1.0	0.0	6.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	44.4	0.0	13.8	0.0	54.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.1	0.0	5.4	0.0	6.3

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.5
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.2	0.0	5.7	0.0	6.8
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.08	0.00	0.21	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	121	0	57	0	388	0	217
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1761	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	3.7	0.0	13.8	0.0	15.9
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.7	0.0	13.8	0.0	15.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.35	0.00	1.00
Lane Grp Cap (c), veh/h	0	792	0	274	0	1043	0	258
V/C Ratio (X)	0.00	0.15	0.00	0.21	0.00	0.37	0.00	0.84
Avail Cap (c_a), veh/h	0	792	0	403	0	1043	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	42.6	0.0	12.8	0.0	48.7
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.4	0.0	1.0	0.0	13.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	42.9	0.0	13.8	0.0	62.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	5.3	0.0	6.3
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.3	0.0	1.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.5	0.0	5.6	0.0	7.3
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.27	0.00	0.21	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	24.0
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	294	26	54	294	9	35	8	82	22	3	71
Future Vol, veh/h	22	294	26	54	294	9	35	8	82	22	3	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	320	28	59	320	10	38	9	89	24	3	77
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	329	0	0	348	0	0	660	828	174	649	833	160
Stage 1	-	-	-	-	-	-	382	382	-	437	437	-
Stage 2	-	-	-	-	-	-	279	447	-	212	396	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1227	-	-	1208	-	-	348	305	839	355	303	857
Stage 1	-	-	-	-	-	-	613	611	-	568	578	-
Stage 2	-	-	-	-	-	-	704	572	-	770	603	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1227	-	-	1208	-	-	292	284	839	287	283	857
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	284	-	287	283	-
Stage 1	-	-	-	-	-	-	601	599	-	541	550	-
Stage 2	-	-	-	-	-	-	606	544	-	665	591	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.51			1.23			14.63			12.81		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	509	1227	-	-	1208	-	-	565				
HCM Lane V/C Ratio	0.267	0.019	-	-	0.049	-	-	0.185				
HCM Ctrl Dly (s/v)	14.6	8	-	-	8.1	-	-	12.8				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1.1	0.1	-	-	0.2	-	-	0.7				

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	767	10	17	769	39	22	1	14	56	4	90
Future Volume (veh/h)	75	767	10	17	769	39	22	1	14	56	4	90
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	834	11	18	836	42	24	1	15	61	4	98
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	105	2102	28	33	1877	94	263	21	142	181	28	253
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.04	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	67.5	14.6	14.5	70.0	1.5	1.4	32.7	0.0	0.0	37.2	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			D		
Approach Vol, veh/h	927			896			40			163		
Approach Delay, s/veh	19.2			2.8			32.7			37.2		
Approach LOS	B			A			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		6.8	75.2	38.0		11.6	70.4				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.5		3.8	5.2	5.5		3.8	5.3				
Max Q Clear (g_c+I1), s	4.3		3.2	17.1	12.1		7.4	2.0				
Green Ext Time (g_e), s	0.2		0.0	6.4	0.9		0.1	6.9				
Prob of Phs Call (p_c)	1.00		0.45	1.00	1.00		0.93	1.00				
Prob of Max Out (p_x)	0.00		0.01	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	783		1781	509		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	77		3591	102		3443						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	516		47	921		173						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

12/11/2025

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	40	18	0	0	163	82	0
Grp Sat Flow (s), veh/h/ln	0	1376	1781	0	0	1532	1781	0
Q Serve Time (g_s), s	0.0	0.0	1.2	0.0	0.0	6.7	5.4	0.0
Cycle Q Clear Time (g_c), s	0.0	2.3	1.2	0.0	0.0	10.1	5.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1313	0	0	0	1419	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1256	0	0	0	1836	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	22.9	0.0	0.0	0.0	30.7	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0
Time to First Blk (g_f), s	0.0	1.3	0.0	0.0	0.0	3.3	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.3	0.0	0.0	0.0	3.3	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.60	1.00	0.00	0.00	0.37	1.00	0.00
Lane Grp Cap (c), veh/h	0	427	33	0	0	463	105	0
V/C Ratio (X)	0.00	0.09	0.54	0.00	0.00	0.35	0.78	0.00
Avail Cap (c_a), veh/h	0	427	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.3	57.2	0.0	0.0	35.1	55.7	0.0
Incr Delay (d2), s/veh	0.0	0.4	12.7	0.0	0.0	2.1	11.8	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.7	70.0	0.0	0.0	37.2	67.5	0.0
1st-Term Q (Q1), veh/ln	0.0	0.9	0.5	0.0	0.0	3.9	2.4	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.1	0.0	0.0	0.3	0.3	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.9	0.6	0.0	0.0	4.1	2.8	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.18	0.00	0.00	0.45	0.79	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	413	0	0	0	431
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1040	0	0	0	969
V/C Ratio (X)	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1040	0	0	0	969
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.6	0.0	0.0	0.0	1.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	432	0	0	0	447
Grp Sat Flow (s), veh/h/ln	0	0	0	1862	0	0	0	1839
Q Serve Time (g_s), s	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.37	0.00	0.03	0.00	0.60	0.00	0.09
Lane Grp Cap (c), veh/h	0	0	0	1090	0	0	0	1003
V/C Ratio (X)	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.45
Avail Cap (c_a), veh/h	0	0	0	1090	0	0	0	1003
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.5	0.0	0.0	0.0	1.4
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.7
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	841	797	6	0	19
Future Vol, veh/h	11	841	797	6	0	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	914	866	7	0	21

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	873	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	769	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	769	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.13	0	11.58
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	769	-	-	-	568
HCM Lane V/C Ratio	0.016	-	-	-	0.036
HCM Ctrl Dly (s/v)	9.8	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	106	4	25	54	4	5	2	14	4	3	4
Future Vol, veh/h	2	106	4	25	54	4	5	2	14	4	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	115	4	27	59	4	5	2	15	4	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	120	0	0	236	239	117	236	239	61
Stage 1	-	-	-	-	-	-	122	122	-	115	115	-
Stage 2	-	-	-	-	-	-	115	117	-	121	124	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1540	-	-	1468	-	-	718	662	935	719	662	1004
Stage 1	-	-	-	-	-	-	882	795	-	890	800	-
Stage 2	-	-	-	-	-	-	890	798	-	884	793	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1540	-	-	1468	-	-	697	648	935	690	648	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-	697	648	-	690	648	-
Stage 1	-	-	-	-	-	-	881	794	-	872	785	-
Stage 2	-	-	-	-	-	-	866	783	-	866	792	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.13			2.26			9.45			9.79		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	832	32	-	-	535	-	-	764				
HCM Lane V/C Ratio	0.027	0.001	-	-	0.019	-	-	0.016				
HCM Ctrl Dly (s/v)	9.4	7.3	0	-	7.5	0	-	9.8				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	8	482	12	4	742
Future Vol, veh/h	9	8	482	12	4	742
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	9	524	13	4	807
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	942	268	0	0	537	0
Stage 1	530	-	-	-	-	-
Stage 2	412	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	261	730	-	-	1027	-
Stage 1	554	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	260	730	-	-	1027	-
Mov Cap-2 Maneuver	260	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Approach	WB	NB		SB		
HCM Ctrl Dly, s/v	15.16	0		0.09		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	373	19	-
HCM Lane V/C Ratio		-	-	0.05	0.004	-
HCM Ctrl Dly (s/v)		-	-	15.2	8.5	0
HCM Lane LOS		-	-	C	A	A
HCM 95th %tile Q(veh)		-	-	0.2	0	-

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	597	87	44	475	92	110	319	43	151	450	254
Future Volume (veh/h)	233	597	87	44	475	92	110	319	43	151	450	254
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	253	649	95	48	516	100	120	347	47	164	489	276
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	279	1188	174	62	925	413	268	1154	155	434	671	569
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Prop Arrive On Green	0.31	0.76	0.76	0.03	0.26	0.26	0.06	0.37	0.37	0.07	0.48	0.48
Unsig. Movement Delay												
Ln Grp Delay, s/veh	61.6	13.1	13.1	75.5	40.8	36.4	26.2	28.2	28.3	24.8	33.5	26.8
Ln Grp LOS	E	B	B	E	D	D	C	C	C	C	C	C
Approach Vol, veh/h	997				664				514		929	
Approach Delay, s/veh	25.4				42.7				27.8		29.9	
Approach LOS	C				D				C		C	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	11.0	49.0	9.2	50.8	11.9	48.1	23.8	36.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	44.0	12.0	38.0	7.0	43.0	25.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	5.1				
Max Q Clear (g_c+I1), s	8.0	11.5	5.2	12.2	7.1	27.1	18.4	17.1				
Green Ext Time (g_e), s	0.0	2.5	0.0	5.1	0.0	3.8	0.4	2.3				
Prob of Phs Call (p_c)	1.00	1.00	0.80	1.00	0.98	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.02	0.00	1.00	0.00	0.14	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3148			3111			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	423			455			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	164	0	48	0	120	0	253	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.0	0.0	3.2	0.0	5.1	0.0	16.4	0.0
Cycle Q Clear Time (g_c), s	6.0	0.0	3.2	0.0	5.1	0.0	16.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	990	0	0	0	702	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	43.1	0.0	0.0	0.0	43.1	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	34.5	0.0	0.0	0.0	17.9	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	4.1	0.0	0.0	0.0	5.2	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	434	0	62	0	268	0	279	0
V/C Ratio (X)	0.38	0.00	0.77	0.00	0.45	0.00	0.91	0.00
Avail Cap (c_a), veh/h	434	0	178	0	269	0	371	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	24.2	0.0	57.4	0.0	25.1	0.0	40.4	0.0
Incr Delay (d2), s/veh	0.5	0.0	18.1	0.0	1.2	0.0	21.2	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	24.8	0.0	75.5	0.0	26.2	0.0	61.6	0.0
1st-Term Q (Q1), veh/ln	0.6	0.0	1.4	0.0	2.1	0.0	6.1	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.3	0.0	0.1	0.0	1.6	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.6	0.0	1.8	0.0	2.2	0.0	7.7	0.0
%ile Storage Ratio (RQ%)	0.03	0.00	0.22	0.00	0.17	0.00	0.57	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	195	0	370	0	489	0	516
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	9.3	0.0	10.1	0.0	25.1	0.0	15.1
Cycle Q Clear Time (g_c), s	0.0	9.3	0.0	10.1	0.0	25.1	0.0	15.1
Lane Grp Cap (c), veh/h	0	652	0	678	0	671	0	925
V/C Ratio (X)	0.00	0.30	0.00	0.55	0.00	0.73	0.00	0.56
Avail Cap (c_a), veh/h	0	652	0	678	0	671	0	925
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	27.0	0.0	10.0	0.0	26.7	0.0	38.4
Incr Delay (d2), s/veh	0.0	1.2	0.0	3.1	0.0	6.8	0.0	2.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	28.2	0.0	13.1	0.0	33.5	0.0	40.8
1st-Term Q (Q1), veh/ln	0.0	4.0	0.0	2.7	0.0	10.2	0.0	6.6

HCM 7th Signalized Intersection Capacity Analysis 3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	1.3	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.2	0.0	3.3	0.0	11.5	0.0	6.9
%ile Storage Ratio (RQ%)	0.00	0.31	0.00	0.18	0.00	0.47	0.00	0.10
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	199	0	374	0	276	0	100
Grp Sat Flow (s), veh/h/ln	0	1794	0	1789	0	1585	0	1585
Q Serve Time (g_s), s	0.0	9.5	0.0	10.2	0.0	14.2	0.0	6.0
Cycle Q Clear Time (g_c), s	0.0	9.5	0.0	10.2	0.0	14.2	0.0	6.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.24	0.00	0.25	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	658	0	683	0	569	0	413
V/C Ratio (X)	0.00	0.30	0.00	0.55	0.00	0.49	0.00	0.24
Avail Cap (c_a), veh/h	0	658	0	683	0	569	0	413
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	27.1	0.0	10.0	0.0	23.8	0.0	35.0
Incr Delay (d2), s/veh	0.0	1.2	0.0	3.1	0.0	2.9	0.0	1.4
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	28.3	0.0	13.1	0.0	26.8	0.0	36.4
1st-Term Q (Q1), veh/ln	0.0	4.1	0.0	2.8	0.0	4.9	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.6	0.0	0.5	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.3	0.0	3.3	0.0	5.3	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.32	0.00	0.18	0.00	0.75	0.00	0.02
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	30.9
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (veh/h)	130	228	98	128	214	200	54	402	129	307	644	135
Future Volume (veh/h)	130	228	98	128	214	200	54	402	129	307	644	135
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A _{pbT})	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	141	248	107	139	233	217	59	437	140	334	700	147
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	235	587	262	308	290	259	405	1751	781	670	1663	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.08	0.17	0.17	0.08	0.16	0.16	0.07	0.99	0.99	0.11	0.57	0.57
Unsig. Movement Delay												
Ln Grp Delay, s/veh	40.8	45.4	45.9	38.5	57.4	62.2	13.7	0.8	0.9	11.2	16.0	16.0
Ln Grp LOS	D	D	D	D	E	E	B	A	A	B	B	B
Approach Vol, veh/h		496			589			636			1181	
Approach Delay, s/veh		44.2			54.7			2.0			14.6	
Approach LOS		D			D			A			B	
Timer:		1	2	3	4	5	6	7	8			
Assigned Phs		1	2	3	4	5	6	7	8			
Case No		1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0			
Phs Duration (G+Y+Rc), s		17.9	63.6	14.1	24.3	8.8	72.8	14.4	24.1			
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			
Max Green (Gmax), s		31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5			
Max Allow Headway (MAH), s		3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4			
Max Q Clear (g _c +I1), s		12.5	2.3	9.7	9.5	3.9	18.3	9.8	17.9			
Green Ext Time (g _e), s		1.0	3.6	0.0	1.9	0.0	6.4	0.2	1.6			
Prob of Phs Call (p _c)		1.00	1.00	0.99	1.00	0.86	1.00	0.99	1.00			
Prob of Max Out (p _x)		0.00	0.00	1.00	0.00	1.00	0.00	0.17	0.56			
Left-Turn Movement Data												
Assigned Mvmt		1		3		5		7				
Mvmt Sat Flow, veh/h		1781		1781		1781		1781				
Through Movement Data												
Assigned Mvmt			2		4		6		8			
Mvmt Sat Flow, veh/h			3554		3554		2923		1779			
Right-Turn Movement Data												
Assigned Mvmt			12		14		16		18			
Mvmt Sat Flow, veh/h			1585		1585		614		1584			
Left Lane Group Data												
Assigned Mvmt		1	0	3	0	5	0	7	0			

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	334	0	139	0	59	0	141	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	10.5	0.0	7.7	0.0	1.9	0.0	7.8	0.0
Cycle Q Clear Time (g_c), s	10.5	0.0	7.7	0.0	1.9	0.0	7.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	836	0	1026	0	650	0	940	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	61.1	0.0	19.6	0.0	59.1	0.0	19.6	0.0
Perm LT Serve Time (g_u), s	58.8	0.0	12.3	0.0	51.9	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	1.5	0.0	1.1	0.0	0.7	0.0	2.8	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	670	0	308	0	405	0	235	0
V/C Ratio (X)	0.50	0.00	0.45	0.00	0.15	0.00	0.60	0.00
Avail Cap (c_a), veh/h	938	0	321	0	438	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.98	0.00	1.00	0.00
Uniform Delay (d1), s/veh	10.6	0.0	37.5	0.0	13.5	0.0	38.4	0.0
Incr Delay (d2), s/veh	0.6	0.0	1.0	0.0	0.2	0.0	2.5	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	11.2	0.0	38.5	0.0	13.7	0.0	40.8	0.0
1st-Term Q (Q1), veh/ln	4.0	0.0	3.4	0.0	0.7	0.0	3.4	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	4.1	0.0	3.4	0.0	0.8	0.0	3.6	0.0
%ile Storage Ratio (RQ%)	0.30	0.00	0.58	0.00	0.13	0.00	0.55	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	437	0	248	0	425	0	233
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.3	0.0	7.5	0.0	16.3	0.0	15.1
Cycle Q Clear Time (g_c), s	0.0	0.3	0.0	7.5	0.0	16.3	0.0	15.1
Lane Grp Cap (c), veh/h	0	1751	0	587	0	1011	0	290
V/C Ratio (X)	0.00	0.25	0.00	0.42	0.00	0.42	0.00	0.80
Avail Cap (c_a), veh/h	0	1751	0	903	0	1011	0	378
Upstream Filter (I)	0.00	0.98	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.5	0.0	44.9	0.0	14.7	0.0	48.3
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.5	0.0	1.3	0.0	9.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.8	0.0	45.4	0.0	16.0	0.0	57.4
1st-Term Q (Q1), veh/ln	0.0	0.1	0.0	3.3	0.0	6.4	0.0	6.7

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.4	0.0	0.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	3.4	0.0	6.8	0.0	7.4
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.08	0.00	0.25	0.00	0.14
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	140	0	107	0	422	0	217
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1760	0	1585
Q Serve Time (g_s), s	0.0	0.2	0.0	7.3	0.0	16.3	0.0	15.9
Cycle Q Clear Time (g_c), s	0.0	0.2	0.0	7.3	0.0	16.3	0.0	15.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.35	0.00	1.00
Lane Grp Cap (c), veh/h	0	781	0	262	0	1001	0	259
V/C Ratio (X)	0.00	0.18	0.00	0.41	0.00	0.42	0.00	0.84
Avail Cap (c_a), veh/h	0	781	0	403	0	1001	0	337
Upstream Filter (I)	0.00	0.98	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.5	0.0	44.8	0.0	14.7	0.0	48.7
Incr Delay (d2), s/veh	0.0	0.5	0.0	1.0	0.0	1.3	0.0	13.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.9	0.0	45.9	0.0	16.0	0.0	62.2
1st-Term Q (Q1), veh/ln	0.0	0.1	0.0	2.9	0.0	6.4	0.0	6.3
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.4	0.0	1.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	2.9	0.0	6.7	0.0	7.3
%ile Storage Ratio (RQ%)	0.00	0.04	0.00	0.53	0.00	0.25	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	25.1
HCM 7th LOS	C

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	330	63	66	320	9	45	8	112	22	3	71
Future Vol, veh/h	22	330	63	66	320	9	45	8	112	22	3	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	359	68	72	348	10	49	9	122	24	3	77

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	358	0	0	427	0	0	760	942	214	723	966	174
Stage 1	-	-	-	-	-	-	441	441	-	491	491	-
Stage 2	-	-	-	-	-	-	319	501	-	232	475	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1198	-	-	1129	-	-	295	262	791	314	253	839
Stage 1	-	-	-	-	-	-	565	575	-	528	546	-
Stage 2	-	-	-	-	-	-	667	541	-	750	556	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1198	-	-	1129	-	-	243	240	791	236	232	839
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	240	-	236	232	-
Stage 1	-	-	-	-	-	-	554	564	-	494	512	-
Stage 2	-	-	-	-	-	-	563	506	-	613	544	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.43			1.4			17.83			14.02		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	458	1198	-	-	1129	-	-	503
HCM Lane V/C Ratio	0.392	0.02	-	-	0.064	-	-	0.207
HCM Ctrl Dly (s/v)	17.8	8.1	-	-	8.4	-	-	14
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.2	-	-	0.8

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	81	822	10	17	809	39	22	1	14	56	4	95
Future Volume (veh/h)	81	822	10	17	809	39	22	1	14	56	4	95
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	893	11	18	879	42	24	1	15	61	4	103
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	112	2104	26	33	1869	89	261	21	141	176	28	259
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.04	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.8	15.0	14.9	70.0	1.7	1.6	32.8	0.0	0.0	37.4	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			D		
Approach Vol, veh/h	992			939			40			168		
Approach Delay, s/veh	19.6			2.9			32.8			37.4		
Approach LOS	B			A			C			D		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		6.8	75.2	38.0		12.0	70.0				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.5		3.8	5.2	5.5		3.8	5.3				
Max Q Clear (g_c+I1), s	4.3		3.2	18.4	12.4		7.8	2.0				
Green Ext Time (g_e), s	0.2		0.0	7.0	0.9		0.1	7.4				
Prob of Phs Call (p_c)	1.00		0.45	1.00	1.00		0.95	1.00				
Prob of Max Out (p_x)	0.00		0.01	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	776		1781	492		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	77		3595	102		3453						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	512		44	941		165						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	40	18	0	0	168	88	0
Grp Sat Flow (s), veh/h/ln	0	1365	1781	0	0	1534	1781	0
Q Serve Time (g_s), s	0.0	0.0	1.2	0.0	0.0	6.9	5.8	0.0
Cycle Q Clear Time (g_c), s	0.0	2.3	1.2	0.0	0.0	10.4	5.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1307	0	0	0	1419	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1229	0	0	0	1837	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	22.6	0.0	0.0	0.0	30.7	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0
Time to First Blk (g_f), s	0.0	1.3	0.0	0.0	0.0	3.5	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.3	0.0	0.0	0.0	3.5	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.60	1.00	0.00	0.00	0.36	1.00	0.00
Lane Grp Cap (c), veh/h	0	423	33	0	0	463	112	0
V/C Ratio (X)	0.00	0.09	0.54	0.00	0.00	0.36	0.79	0.00
Avail Cap (c_a), veh/h	0	423	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.3	57.2	0.0	0.0	35.2	55.4	0.0
Incr Delay (d2), s/veh	0.0	0.4	12.7	0.0	0.0	2.2	11.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.8	70.0	0.0	0.0	37.4	66.8	0.0
1st-Term Q (Q1), veh/ln	0.0	0.9	0.5	0.0	0.0	4.0	2.6	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.1	0.0	0.0	0.3	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.9	0.6	0.0	0.0	4.3	3.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.11	0.18	0.00	0.00	0.47	0.84	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	441	0	0	0	452
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1040	0	0	0	962
V/C Ratio (X)	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.47
Avail Cap (c_a), veh/h	0	0	0	1040	0	0	0	962
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	15.0	0.0	0.0	0.0	1.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	463	0	0	0	469
Grp Sat Flow (s), veh/h/ln	0	0	0	1862	0	0	0	1841
Q Serve Time (g_s), s	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	16.4	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.37	0.00	0.02	0.00	0.61	0.00	0.09
Lane Grp Cap (c), veh/h	0	0	0	1090	0	0	0	996
V/C Ratio (X)	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.47
Avail Cap (c_a), veh/h	0	0	0	1090	0	0	0	996
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	13.7	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	14.9	0.0	0.0	0.0	1.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.4
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.9
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	890	832	12	5	19
Future Vol, veh/h	11	890	832	12	5	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	967	904	13	5	21

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	917	0	0 1418 459
Stage 1	-	-	- 911 -
Stage 2	-	-	- 508 -
Critical Hdwy	4.14	-	- 6.84 6.94
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	2.22	-	- 3.52 3.32
Pot Cap-1 Maneuver	739	-	- 128 549
Stage 1	-	-	- 353 -
Stage 2	-	-	- 569 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	739	-	- 126 549
Mov Cap-2 Maneuver	-	-	- 126 -
Stage 1	-	-	- 347 -
Stage 2	-	-	- 569 -

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.12	0	11.81
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	739	-	-	-	549
HCM Lane V/C Ratio	0.016	-	-	-	0.038
HCM Ctrl Dly (s/v)	9.9	-	-	-	11.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	106	4	31	54	4	5	8	14	4	8	9
Future Vol, veh/h	2	106	4	31	54	4	5	8	14	4	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	2	115	4	34	59	4	5	9	15	4	9	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	120	0	0	252	252	117	252	252	61
Stage 1	-	-	-	-	-	-	122	122	-	128	128	-
Stage 2	-	-	-	-	-	-	130	130	-	124	124	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1540	-	-	1468	-	-	701	651	935	701	651	1004
Stage 1	-	-	-	-	-	-	882	795	-	875	790	-
Stage 2	-	-	-	-	-	-	873	788	-	880	793	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1540	-	-	1468	-	-	668	635	935	663	635	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-	668	635	-	663	635	-
Stage 1	-	-	-	-	-	-	881	794	-	855	771	-
Stage 2	-	-	-	-	-	-	835	769	-	855	792	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.13			2.62			9.86			9.88		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	770	32	-	-	618	-	-	761				
HCM Lane V/C Ratio	0.038	0.001	-	-	0.023	-	-	0.03				
HCM Ctrl Dly (s/v)	9.9	7.3	0	-	7.5	0	-	9.9				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.1				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	0	48	9	0	8	145	486	12	4	807	58
Future Volume (veh/h)	88	0	48	9	0	8	145	486	12	4	807	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	96	0	52	10	0	9	158	528	13	4	877	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	180	0	144	141	0	144	552	2927	72	774	2848	205
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Prop Arrive On Green	0.09	0.00	0.09	0.09	0.00	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	56.3	0.0	52.8	53.6	0.0	50.1	1.3	0.3	0.3	0.0	0.5	0.5
Ln Grp LOS	E		D	D		D	A	A	A	A	A	A
Approach Vol, veh/h	148			19			699			944		
Approach Delay, s/veh	55.1			51.9			0.5			0.5		
Approach LOS	E			D			A			A		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			4			6			8		
Case No	6.0			6.0			6.0			6.0		
Phs Duration (G+Y+Rc), s	104.1			15.9			104.1			15.9		
Change Period (Y+Rc), s	5.0			5.0			5.0			5.0		
Max Green (Gmax), s	92.0			18.0			92.0			18.0		
Max Allow Headway (MAH), s	5.7			4.4			5.3			4.7		
Max Q Clear (g_c+I1), s	2.0			10.7			2.0			6.5		
Green Ext Time (g_e), s	5.9			0.3			7.8			0.0		
Prob of Phs Call (p_c)	1.00			1.00			1.00			1.00		
Prob of Max Out (p_x)	0.00			0.11			0.00			0.00		
Left-Turn Movement Data												
Assigned Mvmt	5			7			1			3		
Mvmt Sat Flow, veh/h	596			1406			865			1352		
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3544			0			3448			0		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	87			1585			248			1585		
Left Lane Group Data												
Assigned Mvmt	0	5	0	7	0	1	0	3				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

Lane Assignment		L		L		L		L
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	158	0	96	0	4	0	10
Grp Sat Flow (s), veh/h/ln	0	596	0	1406	0	865	0	1352
Q Serve Time (g_s), s	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.8
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.7	0.0	0.0	0.0	4.5
Perm LT Sat Flow (s_l), veh/h/ln	0	596	0	1406	0	865	0	1352
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	99.1	0.0	10.9	0.0	99.1	0.0	10.9
Perm LT Serve Time (g_u), s	0.0	99.1	0.0	10.3	0.0	99.1	0.0	7.2
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.8
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	552	0	180	0	774	0	141
V/C Ratio (X)	0.00	0.29	0.00	0.53	0.00	0.01	0.00	0.07
Avail Cap (c_a), veh/h	0	552	0	264	0	774	0	221
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.91	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	53.8	0.0	0.0	0.0	53.4
Incr Delay (d2), s/veh	0.0	1.3	0.0	2.4	0.0	0.0	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	1.3	0.0	56.3	0.0	0.0	0.0	53.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.3
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	3.0	0.0	0.0	0.0	0.3
%ile Storage Ratio (RQ%)	0.00	0.05	0.00	0.46	0.00	0.00	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	264	0	0	0	476	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1870	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1468	0	0	0	1545	0	0
V/C Ratio (X)	0.00	0.18	0.00	0.00	0.00	0.31	0.00	0.00
Avail Cap (c_a), veh/h	0	1468	0	0	0	1545	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.91	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		T+R		T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	277	0	52	0	464	0	9
Grp Sat Flow (s), veh/h/ln	0	1855	0	1585	0	1826	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.05	0.00	1.00	0.00	0.14	0.00	1.00
Lane Grp Cap (c), veh/h	0	1532	0	144	0	1508	0	144
V/C Ratio (X)	0.00	0.18	0.00	0.36	0.00	0.31	0.00	0.06
Avail Cap (c_a), veh/h	0	1532	0	238	0	1508	0	238
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.91	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	51.3	0.0	0.0	0.0	49.9
Incr Delay (d2), s/veh	0.0	0.3	0.0	1.5	0.0	0.5	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	52.8	0.0	0.5	0.0	50.1
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.2
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.5	0.0	0.2	0.0	0.3
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.24	0.00	0.01	0.00	0.03
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	5.5
HCM 7th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	116	0	638	742	122
Future Vol, veh/h	0	116	0	638	742	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	126	0	693	807	133
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	470	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	540	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	540	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	13.68	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 540		-	-		
HCM Lane V/C Ratio	- 0.233		-	-		
HCM Ctrl Dly (s/v)	- 13.7		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.9		-	-		

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	40	0	0	124	83	49
Future Vol, veh/h	40	0	0	124	83	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	0	0	135	90	53
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	252	117	143	0	-	0
Stage 1	117	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	737	935	1439	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	737	935	1439	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	10.19	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1439	-	737	-	-	
HCM Lane V/C Ratio	-	-	0.059	-	-	
HCM Ctrl Dly (s/v)	0	-	10.2	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

PHASE 2 PM PEAK HOUR CALCULATIONS

N/S Commerce Drive				PHASE 2 SITE TRIP				PHASE 1 VOLUME				TOTAL	
GR	2.0%	IN	0	IN	68	OUT	0	IN	68	OUT	0	IN	68
VMS	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220
MMWT	TRFC	x	TRFC	%	OUT	%	OUT	TL	%	OUT	%	OUT	TL
EEL	34	1.08	37	0	0	0	0	63	188	0	0	63	188
EER	117	1.08	126	0	0	0	0	97	121	0	0	97	121
WER	41	1.08	44	0	0	0	0	63	53	0	0	63	53
WEL	86	1.08	103	0	0	0	0	63	351	0	0	63	351
WER	287	1.08	288	0	0	0	0	63	301	0	0	63	301
WER	28	1.08	30	0	0	0	0	63	18	0	0	63	18
NEL	8	1.08	9	0	0	0	0	63	8	0	0	63	8
NEL	4	1.08	4	0	0	0	0	63	4	0	0	63	4
NEL	4	1.08	4	0	0	0	0	63	4	0	0	63	4
SER	4	1.08	4	0	0	0	0	63	4	0	0	63	4
SER	9	1.08	10	0	0	0	0	63	10	0	0	63	10

EXISTING TRAFFIC				BACKGROUND TRAFFIC				SITE TRAFFIC				PASS BY TRAFFIC				TOTAL TRAFFIC			
AUT PROJECT	63	17	86	18	71	89	0	0	0	0	0	0	0	0	0	18	71	89	0
Tutor Road	96	9	4	30	4	4	0	0	0	0	0	0	0	0	0	30	4	4	0
Commerce Drive	287	8	4	27	9	4	18	0	39	13	0	0	0	0	0	27	4	40	13
High School Drive	140	36	176	42	158	199	71	71	142	0	0	0	0	0	0	42	113	155	0
Tutor Road	140	36	176	42	158	199	71	71	142	0	0	0	0	0	0	42	113	155	0
Commerce Drive	140	36	176	42	158	199	71	71	142	0	0	0	0	0	0	42	113	155	0
High School Drive	140	36	176	42	158	199	71	71	142	0	0	0	0	0	0	42	113	155	0

N/S Douglas Street				PHASE 2 SITE TRIP				PHASE 1 VOLUME				TOTAL	
GR	2.0%	IN	0	IN	68	OUT	0	IN	68	OUT	0	IN	68
VMS	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220
MMWT	TRFC	x	TRFC	%	OUT	%	OUT	TL	%	OUT	%	OUT	TL
EEL	48	1.08	49	0	0	0	0	63	105	0	0	63	105
EER	81	1.08	87	0	0	0	0	63	110	0	0	63	110
WER	27	1.08	29	0	0	0	0	63	131	0	0	63	131
WEL	82	1.08	89	0	0	0	0	63	223	0	0	63	223
WER	100	1.08	205	0	0	0	0	63	198	0	0	63	198
NEL	79	1.08	169	0	0	0	0	63	156	0	0	63	156
NEL	4	1.08	4	0	0	0	0	63	157	0	0	63	157
NEL	4	1.08	4	0	0	0	0	63	157	0	0	63	157
SER	217	1.08	224	0	0	0	0	63	224	0	0	63	224
SER	258	1.08	279	0	0	0	0	63	258	0	0	63	258
SER	110	1.08	119	0	0	0	0	63	137	0	0	63	137

EXISTING TRAFFIC				BACKGROUND TRAFFIC				SITE TRAFFIC				PASS BY TRAFFIC				TOTAL TRAFFIC			
AUT PROJECT	1178	588	338	633	641	1614	0	0	0	0	0	0	0	0	0	633	641	1614	0
Tutor Road	120	29	217	120	29	204	0	0	0	0	0	0	0	0	0	120	29	204	0
Commerce Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
High School Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
Tutor Road	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
Commerce Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
High School Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0

N/S Douglas Street				PHASE 2 SITE TRIP				PHASE 1 VOLUME				TOTAL	
GR	2.0%	IN	0	IN	68	OUT	0	IN	68	OUT	0	IN	68
VMS	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220	CONV	8220
MMWT	TRFC	x	TRFC	%	OUT	%	OUT	TL	%	OUT	%	OUT	TL
EEL	0	1.08	0	0	0	0	0	63	0	0	0	63	0
EER	0	1.08	0	0	0	0	0	63	0	0	0	63	0
WER	22	1.08	24	0	0	0	0	63	24	0	0	63	24
WEL	0	1.08	0	0	0	0	0	63	0	0	0	63	0
WER	36	1.08	39	0	0	0	0	63	39	0	0	63	39
NEL	140	1.08	150	0	0	0	0	63	140	0	0	63	140
NEL	120	1.08	130	0	0	0	0	63	120	0	0	63	120
SER	72	1.08	79	0	0	0	0	63	79	0	0	63	79
SER	287	1.08	310	0	0	0	0	63	407	0	0	63	407
SER	140	1.08	0	0	0	0	0	63	140	0	0	63	140

EXISTING TRAFFIC				BACKGROUND TRAFFIC				SITE TRAFFIC				PASS BY TRAFFIC				TOTAL TRAFFIC			
AUT PROJECT	915	389	596	318	601	1614	0	0	0	0	0	0	0	0	0	318	601	1614	0
High School Drive	96	0	287	72	0	0	0	0	0	0	0	0	0	0	0	72	0	0	0
Commerce Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
High School Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
Tutor Road	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
Commerce Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0
High School Drive	140	36	176	42	158	199	0	0	0	0	0	0	0	0	0	42	113	155	0

EXISTING TRAFFIC		BACKGROUND TRAFFIC		SITE TRAFFIC		PASS BY TRAFFIC		TOTAL TRAFFIC	
ADT PROJECT 9% 101 154 54 644 209 635 10,488 Chrysler Road 708 441 789 111 138 20 Douglas Drive 77 372 22 195 473 7,989		ADT PROJECT 9% 100 166 58 229 229 11,327 Chrysler Road 916 476 4,630 120 147 22 Douglas Drive 80 462 24 203 509 7,989		ADT PROJECT 9% 0 110 0 36 36 400 Chrysler Road 0 0 0 0 0 0 Douglas Drive 0 38 0 30 36 400		ADT PROJECT 9% 64 64 0 231 231 5,187 Chrysler Road 64 64 0 0 0 0 Douglas Drive 0 64 0 64 64 1,897		ADT PROJECT 9% 100 268 121 837 820 390 16,488 Chrysler Road 264 264 20,967 13 282 Douglas Drive 83 804 24 303 911 10,488	

EXTENDING THEMATIC										BACKGROUND THEMATIC										SITE THEMATIC										PASS BY THEMATIC										TOTAL THEMATIC									
ADJ PRODUCT 9% 30 15 35 566										ADJ PRODUCT 9% 54 16 38 660										ADJ PRODUCT 9% 36 18 18 400										ADJ PRODUCT 9% 0 0 0 0										ADJ PRODUCT 9% 34 56 1,000									
Opposite Road 158 107 11 384 0 5 3,845										Opposite Road 20 425 238 618 974 1415 5 3,797										Opposite Road 9 0 0 0 0 0 0 91										Opposite Road 0 0 0 0 0 0 0 0										Opposite Road 125 4,901 1,005 16 200 5 1,005									
NW Main St 0 0 0 3 0 0 0 80										NW Main St 0 0 0 3 0 0 0 80										NW Main St 0 0 0 0 0 0 0 200										NW Main St 0 0 0 0 0 0 0 0										NW Main St 0 0 0 3 0 0 0 280									

EXISTING TRAFFIC		BACKGROUND TRAFFIC		SITE TRAFFIC		PASS BY TRAFFIC		TOTAL TRAFFIC	
186 63 123 2,407 9%		255 68 133 2,233 9%		18 9 9 208 9%		6 0 0 0 0		218 77 142 2,433 9%	
37 2 24		40 2 26		0 0 0		40 2 26		40 2 26	
46 386 704 351 375 465 8,405 3		52 417 989 352 388 459 9,919 3		0 0 0 0 0 0 0 0		52 417 989 352 388 459 9,919 3		52 417 989 352 388 459 9,919 3	
12 5 7		13 3 8		0 0 0		0 0 0		13 3 8	
14 22 483		15 24 433		0 0 0		0 0 0		15 24 433	
3 346		3,473		1,847		13,246		3 346	

[illegible]

EXISTING TRAFFIC		BACKGROUND TRAFFIC		SITE TRAFFIC		PASS BY TRAFFIC		TOTAL TRAFFIC	
ADT PROJECT 9% ADT PROJECT 9% ADT PROJECT 9% ADT PROJECT 9% ADT PROJECT 9%									
Connect Drive Connect Drive Connect Drive Connect Drive Connect Drive									
NW Main Street NW Main Street NW Main Street NW Main Street NW Main Street									
5 2 7 5 2 8 0 0 0 0 0 0 0 0 0									
48 52 297 794 2,000									
51 14 503 57 15 1791 18 9 506 0 0 0 0 0 0 27 13 311									

EXPERIMENTAL FACTOR										BACKGROUND FACTOR										SITE FACTOR										PASS BY FACTOR										TOTAL FACTOR									
ADT PROJECT 9% 173 140 29 1,886 0 140 0										ADT PROJECT 9% 138 151 42 2,144 0 151 0										ADT PROJECT 9% 140 70 70 1,596 70 0 0										ADT PROJECT 9% 0 0 0 0 0 0										ADT PROJECT 9% 233 221 112 3,798 70 151 0									
Access Drive 4 0 0 0 0 0 0 0										Access Drive 4 0 0 0 0 0 0 0										Access Drive 4 0 0 0 0 0 0										Access Drive 4 0 0 0 0 0 0										Access Drive 4 0 0 0 0 0 0									
Commerce Drive 0 39 0 140 29 1,886 173 0										Commerce Drive 0 42 0 151 42 2,144 138 0										Commerce Drive 0 0 0 0 0 0 0										Commerce Drive 0 0 0 0 0 0 0										Commerce Drive 0 42 0 151 42 2,144 233 0									

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	147	22	13	284	164	83	402	24	58	166	109
Future Volume (veh/h)	120	147	22	13	284	164	83	402	24	58	166	109
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	160	24	14	309	178	90	437	26	63	180	118
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	158	1210	179	28	1124	501	472	1335	79	406	717	608
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Prop Arrive On Green	0.18	0.78	0.78	0.02	0.32	0.32	0.04	0.39	0.39	0.02	0.26	0.26
Unsig. Movement Delay												
Ln Grp Delay, s/veh	58.5	8.6	8.7	72.2	31.3	33.6	21.2	26.7	26.7	21.8	31.7	30.8
Ln Grp LOS	E	A	A	E	C	C	C	C	C	C	C	C
Approach Vol, veh/h	314			501			553			361		
Approach Delay, s/veh	29.3			33.3			25.8			29.7		
Approach LOS	C			C			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	9.4	52.0	6.9	51.7	10.4	51.0	15.7	42.9				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	6.0	47.0	9.0	38.0	7.0	46.0	22.0	25.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.8	3.8	4.8				
Max Q Clear (g_c+I1), s	4.6	12.8	2.9	3.6	5.7	11.2	10.4	12.4				
Green Ext Time (g_e), s	0.0	3.0	0.0	1.1	0.0	1.5	0.2	2.1				
Prob of Phs Call (p_c)	0.88	1.00	0.37	1.00	0.95	1.00	1.00	1.00				
Prob of Max Out (p_x)	1.00	0.00	0.01	0.00	1.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3409			3106			1870			3554		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	202			458			1585			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	63	0	14	0	90	0	130	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	2.6	0.0	0.9	0.0	3.7	0.0	8.4	0.0
Cycle Q Clear Time (g_c), s	2.6	0.0	0.9	0.0	3.7	0.0	8.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	929	0	0	0	1081	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	46.0	0.0	0.0	0.0	46.0	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	36.2	0.0	0.0	0.0	36.8	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.7	0.0	0.0	0.0	0.8	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	406	0	28	0	472	0	158	0
V/C Ratio (X)	0.16	0.00	0.51	0.00	0.19	0.00	0.82	0.00
Avail Cap (c_a), veh/h	430	0	134	0	496	0	327	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	21.6	0.0	58.6	0.0	21.0	0.0	48.4	0.0
Incr Delay (d2), s/veh	0.2	0.0	13.6	0.0	0.2	0.0	10.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	21.8	0.0	72.2	0.0	21.2	0.0	58.5	0.0
1st-Term Q (Q1), veh/ln	1.1	0.0	0.4	0.0	1.5	0.0	3.5	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.0	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	1.1	0.0	0.5	0.0	1.6	0.0	3.9	0.0
%ile Storage Ratio (RQ%)	0.03	0.00	0.07	0.00	0.12	0.00	0.29	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	227	0	90	0	180	0	309
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	10.7	0.0	1.5	0.0	9.2	0.0	7.8
Cycle Q Clear Time (g_c), s	0.0	10.7	0.0	1.5	0.0	9.2	0.0	7.8
Lane Grp Cap (c), veh/h	0	696	0	692	0	717	0	1124
V/C Ratio (X)	0.00	0.33	0.00	0.13	0.00	0.25	0.00	0.27
Avail Cap (c_a), veh/h	0	696	0	692	0	717	0	1124
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.5	0.0	8.3	0.0	30.9	0.0	30.7
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.4	0.0	0.8	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.7	0.0	8.6	0.0	31.7	0.0	31.3
1st-Term Q (Q1), veh/ln	0.0	4.5	0.0	0.6	0.0	4.3	0.0	3.4

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.2	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.8	0.0	0.7	0.0	4.5	0.0	3.5
%ile Storage Ratio (RQ%)	0.00	0.36	0.00	0.04	0.00	0.11	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	236	0	94	0	118	0	178
Grp Sat Flow (s), veh/h/ln	0	1834	0	1788	0	1585	0	1585
Q Serve Time (g_s), s	0.0	10.8	0.0	1.6	0.0	7.0	0.0	10.4
Cycle Q Clear Time (g_c), s	0.0	10.8	0.0	1.6	0.0	7.0	0.0	10.4
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.11	0.00	0.26	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	718	0	696	0	608	0	501
V/C Ratio (X)	0.00	0.33	0.00	0.13	0.00	0.19	0.00	0.36
Avail Cap (c_a), veh/h	0	718	0	696	0	608	0	501
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	25.5	0.0	8.3	0.0	30.1	0.0	31.6
Incr Delay (d2), s/veh	0.0	1.2	0.0	0.4	0.0	0.7	0.0	2.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	26.7	0.0	8.7	0.0	30.8	0.0	33.6
1st-Term Q (Q1), veh/ln	0.0	4.7	0.0	0.6	0.0	2.8	0.0	4.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.3
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	4.9	0.0	0.7	0.0	2.9	0.0	4.3
%ile Storage Ratio (RQ%)	0.00	0.37	0.00	0.04	0.00	0.41	0.00	0.54
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	29.4
HCM 7th LOS	C

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	87	29	89	205	199	85	393	110	234	279	119
Future Volume (veh/h)	49	87	29	89	205	199	85	393	110	234	279	119
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	95	32	97	223	216	92	427	120	254	303	129
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	151	487	217	311	288	257	663	2042	911	693	1498	624
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.04	0.14	0.14	0.06	0.16	0.16	0.08	1.00	1.00	0.08	0.61	0.61
Unsig. Movement Delay												
Ln Grp Delay, s/veh	44.5	46.1	45.9	41.0	55.3	62.2	9.1	0.2	0.3	8.0	10.7	10.8
Ln Grp LOS	D	D	D	D	E	E	A	A	A	A	B	B
Approach Vol, veh/h	180				536				639		686	
Approach Delay, s/veh	45.6				55.5				1.5		9.7	
Approach LOS	D				E				A		A	
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	13.8	73.5	11.8	20.9	9.3	78.0	8.7	24.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	29.5	10.5	30.5	6.5	54.5	15.5	25.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.9	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	8.6	2.0	7.5	4.8	4.6	8.7	5.0	17.9				
Green Ext Time (g_e), s	0.7	3.4	0.1	0.6	0.0	2.9	0.1	1.6				
Prob of Phs Call (p_c)	1.00	1.00	0.96	1.00	0.95	1.00	0.83	1.00				
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.54				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3554			3554			2446			1777		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	1585			1585			1018			1585		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

12/11/2025

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	254	0	97	0	92	0	53	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.6	0.0	5.5	0.0	2.6	0.0	3.0	0.0
Cycle Q Clear Time (g_c), s	6.6	0.0	5.5	0.0	2.6	0.0	3.0	0.0
Perm LT Sat Flow (s_l), veh/h/ln	860	0	1264	0	956	0	950	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	71.0	0.0	17.0	0.0	69.0	0.0	16.4	0.0
Perm LT Serve Time (g_u), s	69.0	0.0	13.6	0.0	66.8	0.0	3.6	0.0
Perm LT Q Serve Time (g_ps), s	0.8	0.0	0.3	0.0	0.2	0.0	0.8	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	693	0	311	0	663	0	151	0
V/C Ratio (X)	0.37	0.00	0.31	0.00	0.14	0.00	0.35	0.00
Avail Cap (c_a), veh/h	1022	0	359	0	689	0	319	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	7.7	0.0	40.5	0.0	9.0	0.0	43.1	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.6	0.0	0.1	0.0	1.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	8.0	0.0	41.0	0.0	9.1	0.0	44.5	0.0
1st-Term Q (Q1), veh/ln	2.4	0.0	2.4	0.0	0.9	0.0	1.3	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.5	0.0	2.5	0.0	0.9	0.0	1.4	0.0
%ile Storage Ratio (RQ%)	0.18	0.00	0.42	0.00	0.16	0.00	0.22	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	427	0	95	0	218	0	223
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	2.8	0.0	6.5	0.0	14.4
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.8	0.0	6.5	0.0	14.4
Lane Grp Cap (c), veh/h	0	2042	0	487	0	1089	0	288
V/C Ratio (X)	0.00	0.21	0.00	0.20	0.00	0.20	0.00	0.77
Avail Cap (c_a), veh/h	0	2042	0	903	0	1089	0	378
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.9	0.0	10.3	0.0	48.1
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.2	0.0	0.4	0.0	7.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.2	0.0	46.1	0.0	10.7	0.0	55.3
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.3	0.0	2.5	0.0	6.4

HCM 7th Signalized Intersection Capacity Analysis 6: Douglas Street & Tudor Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.6
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.3	0.0	2.6	0.0	7.0
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.03	0.00	0.10	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	120	0	32	0	214	0	216
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1687	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	2.1	0.0	6.7	0.0	15.9
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	2.1	0.0	6.7	0.0	15.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.60	0.00	1.00
Lane Grp Cap (c), veh/h	0	911	0	217	0	1034	0	257
V/C Ratio (X)	0.00	0.13	0.00	0.15	0.00	0.21	0.00	0.84
Avail Cap (c_a), veh/h	0	911	0	403	0	1034	0	337
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	45.6	0.0	10.3	0.0	48.7
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.5	0.0	13.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	45.9	0.0	10.8	0.0	62.2
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.8	0.0	2.5	0.0	6.3
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.1	0.0	1.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	0.9	0.0	2.6	0.0	7.2
%ile Storage Ratio (RQ%)	0.00	0.02	0.00	0.16	0.00	0.10	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	22.3
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	126	44	103	288	30	9	4	29	4	4	10
Future Vol, veh/h	37	126	44	103	288	30	9	4	29	4	4	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	137	48	112	313	33	10	4	32	4	4	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	346	0	0	185	0	0	624	811	92	688	802	157
Stage 1	-	-	-	-	-	-	241	241	-	537	537	-
Stage 2	-	-	-	-	-	-	383	570	-	151	265	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1210	-	-	1387	-	-	370	312	947	333	316	861
Stage 1	-	-	-	-	-	-	741	705	-	496	521	-
Stage 2	-	-	-	-	-	-	612	504	-	836	688	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1210	-	-	1387	-	-	320	277	947	282	281	861
Mov Cap-2 Maneuver	-	-	-	-	-	-	320	277	-	282	281	-
Stage 1	-	-	-	-	-	-	716	681	-	456	479	-
Stage 2	-	-	-	-	-	-	550	463	-	776	665	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	1.44			1.91			11.81			13.38		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	574	1210	-	-	1387	-	-	449
HCM Lane V/C Ratio	0.08	0.033	-	-	0.081	-	-	0.044
HCM Ctrl Dly (s/v)	11.8	8.1	-	-	7.8	-	-	13.4
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.3	-	-	0.1

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

12/11/2025

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	405	3	10	357	50	13	3	8	26	2	40
Future Volume (veh/h)	80	405	3	10	357	50	13	3	8	26	2	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	440	3	11	388	54	14	3	9	28	2	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	111	2140	15	23	1699	235	257	62	145	186	29	248
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.06	0.59	0.59	0.03	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.9	11.8	11.8	73.0	0.5	0.6	32.2	0.0	0.0	33.7	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h	530			453			26			73		
Approach Delay, s/veh	20.9			2.3			32.2			33.7		
Approach LOS	C			A			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Case No	8.0		2.0	4.0	8.0		2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0		6.0	76.0	38.0		12.0	70.0				
Change Period (Y+Rc), s	5.0		4.5	5.0	5.0		4.5	5.0				
Max Green (Gmax), s	33.0		9.5	63.0	33.0		18.5	54.0				
Max Allow Headway (MAH), s	5.4		3.8	5.2	5.5		3.8	5.3				
Max Q Clear (g_c+I1), s	3.3		2.7	8.8	6.0		7.8	2.0				
Green Ext Time (g_e), s	0.1		0.0	2.9	0.4		0.1	2.9				
Prob of Phs Call (p_c)	1.00		0.31	1.00	1.00		0.94	1.00				
Prob of Max Out (p_x)	0.00		0.00	0.00	0.00		0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5		3	1		7						
Mvmt Sat Flow, veh/h	768		1781	525		1781						
Through Movement Data												
Assigned Mvmt	2		4	6		8						
Mvmt Sat Flow, veh/h	224		3618	105		3136						
Right-Turn Movement Data												
Assigned Mvmt	12		14	16		18						
Mvmt Sat Flow, veh/h	526		25	903		433						
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

12/11/2025

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	26	11	0	0	73	87	0
Grp Sat Flow (s), veh/h/ln	0	1518	1781	0	0	1533	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.8	5.8	0.0
Cycle Q Clear Time (g_c), s	0.0	1.3	0.7	0.0	0.0	4.0	5.8	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1383	0	0	0	1424	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1835	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	29.0	0.0	0.0	0.0	31.7	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.2	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.3	0.0	0.0	0.0	3.2	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.38	1.00	0.00
Lane Grp Cap (c), veh/h	0	464	23	0	0	463	111	0
V/C Ratio (X)	0.00	0.06	0.48	0.00	0.00	0.16	0.78	0.00
Avail Cap (c_a), veh/h	0	464	141	0	0	463	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.1	0.0	0.0	33.0	55.5	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.0	0.0	0.0	0.7	11.4	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.0	0.0	0.0	33.7	66.9	0.0
1st-Term Q (Q1), veh/ln	0.0	0.6	0.3	0.0	0.0	1.6	2.6	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.6	0.4	0.0	0.0	1.7	2.9	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.12	0.00	0.00	0.19	0.83	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	216	0	0	0	219
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1051	0	0	0	963
V/C Ratio (X)	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.23
Avail Cap (c_a), veh/h	0	0	0	1051	0	0	0	963
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.5
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

12/11/2025

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	227	0	0	0	223
Grp Sat Flow (s), veh/h/ln	0	0	0	1866	0	0	0	1792
Q Serve Time (g_s), s	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.35	0.00	0.01	0.00	0.59	0.00	0.24
Lane Grp Cap (c), veh/h	0	0	0	1103	0	0	0	971
V/C Ratio (X)	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.23
Avail Cap (c_a), veh/h	0	0	0	1103	0	0	0	971
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	2.9	0.0	0.0	0.0	0.1
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	14.2
HCM 7th LOS	B

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	415	427	22	0	16
Future Vol, veh/h	16	415	427	22	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	451	464	24	0	17
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	488	0	-	0	-	244
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	1071	-	-	-	0	757
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1071	-	-	-	-	757
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.31	0		9.87		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1071	-	-	-	757	
HCM Lane V/C Ratio	0.016	-	-	-	0.023	
HCM Ctrl Dly (s/v)	8.4	-	-	-	9.9	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	149	9	25	54	4	5	2	8	2	3	4
Future Vol, veh/h	4	149	9	25	54	4	5	2	8	2	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	162	10	27	59	4	5	2	9	2	3	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	172	0	0	290	293	167	287	296	61
Stage 1	-	-	-	-	-	-	176	176	-	115	115	-
Stage 2	-	-	-	-	-	-	115	117	-	172	180	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1540	-	-	1405	-	-	662	618	877	665	616	1004
Stage 1	-	-	-	-	-	-	826	754	-	890	800	-
Stage 2	-	-	-	-	-	-	890	798	-	830	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1540	-	-	1405	-	-	640	604	877	641	602	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-	640	604	-	641	602	-
Stage 1	-	-	-	-	-	-	824	751	-	872	784	-
Stage 2	-	-	-	-	-	-	865	782	-	817	748	-
Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.18			2.29			9.97			9.9		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	741	44	-	-	535	-	-	744				
HCM Lane V/C Ratio	0.022	0.003	-	-	0.019	-	-	0.013				
HCM Ctrl Dly (s/v)	10	7.3	0	-	7.6	0	-	9.9				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0				

Intersection

Int Delay, s/veh 1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	24	39	562	130	78	310
Future Vol, veh/h	24	39	562	130	78	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	42	611	141	85	337

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1020	376	0
Stage 1	682	-	-
Stage 2	338	-	-
Critical Hdwy	6.84	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	3.32	-
Pot Cap-1 Maneuver	233	621	-
Stage 1	464	-	-
Stage 2	694	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	207	621	-
Mov Cap-2 Maneuver	207	-	-
Stage 1	464	-	-
Stage 2	618	-	-

Approach	WB	NB	SB
HCM Ctrl Dly, s/v	17.64	0	2.51
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	353	724
HCM Lane V/C Ratio	-	-	0.194	0.099
HCM Ctrl Dly (s/v)	-	-	17.6	9.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.7	0.3

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	147	22	13	284	227	83	504	24	121	268	193
Future Volume (veh/h)	204	147	22	13	284	227	83	504	24	121	268	193
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	222	160	24	14	309	247	90	548	26	132	291	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	251	1405	207	28	1161	518	342	1028	49	319	592	502
HCM Platoon Ratio	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Prop Arrive On Green	0.24	0.76	0.76	0.02	0.33	0.33	0.05	0.30	0.30	0.11	0.53	0.53
Unsig. Movement Delay												
Ln Grp Delay, s/veh	56.9	8.5	8.5	72.2	30.3	35.3	27.8	39.0	38.9	26.9	25.0	24.1
Ln Grp LOS	E	A	A	E	C	D	C	D	D	C	C	C
Approach Vol, veh/h	406			570			664			633		
Approach Delay, s/veh	35.0			33.5			37.4			25.1		
Approach LOS	C			C			D			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	4.0	2.0	4.0	1.1	3.0	2.0	3.0				
Phs Duration (G+Y+Rc), s	13.1	40.7	6.9	59.3	10.9	43.0	21.9	44.2				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green (Gmax), s	13.0	31.0	5.0	51.0	6.0	38.0	28.0	28.0				
Max Allow Headway (MAH), s	3.8	5.3	3.8	5.3	3.8	4.7	3.8	4.7				
Max Q Clear (g_c+I1), s	8.1	17.9	2.9	3.7	6.2	13.9	16.4	16.9				
Green Ext Time (g_e), s	0.1	2.9	0.0	1.1	0.0	2.5	0.5	2.2				
Prob of Phs Call (p_c)	0.99	1.00	0.37	1.00	0.95	1.00	1.00	1.00				
Prob of Max Out (p_x)	0.36	0.00	1.00	0.00	1.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	1		3		5		7					
Mvmt Sat Flow, veh/h	1781		1781		1781		1781					
Through Movement Data												
Assigned Mvmt		2		4		6		8				
Mvmt Sat Flow, veh/h		3454		3106		1870		3554				
Right-Turn Movement Data												
Assigned Mvmt		12		14		16		18				
Mvmt Sat Flow, veh/h		164		458		1585		1585				
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Prot)		L (Pr/Pm)		L (Prot)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	132	0	14	0	90	0	222	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	6.1	0.0	0.9	0.0	4.2	0.0	14.4	0.0
Cycle Q Clear Time (g_c), s	6.1	0.0	0.9	0.0	4.2	0.0	14.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	839	0	0	0	897	0	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	35.7	0.0	0.0	0.0	35.7	0.0	0.0	0.0
Perm LT Serve Time (g_u), s	19.8	0.0	0.0	0.0	26.1	0.0	0.0	0.0
Perm LT Q Serve Time (g_ps), s	2.8	0.0	0.0	0.0	1.1	0.0	0.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	319	0	28	0	342	0	251	0
V/C Ratio (X)	0.41	0.00	0.51	0.00	0.26	0.00	0.88	0.00
Avail Cap (c_a), veh/h	391	0	74	0	344	0	416	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Uniform Delay (d1), s/veh	26.0	0.0	58.6	0.0	27.4	0.0	44.9	0.0
Incr Delay (d2), s/veh	0.9	0.0	13.6	0.0	0.4	0.0	12.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	26.9	0.0	72.2	0.0	27.8	0.0	56.9	0.0
1st-Term Q (Q1), veh/ln	2.5	0.0	0.4	0.0	1.8	0.0	5.8	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.8	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.5	0.0	0.5	0.0	1.8	0.0	6.6	0.0
%ile Storage Ratio (RQ%)	0.10	0.00	0.07	0.00	0.14	0.00	0.50	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	1	0	1	0	1	0	2
Grp Vol (v), veh/h	0	282	0	90	0	291	0	309
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1870	0	1777
Q Serve Time (g_s), s	0.0	15.9	0.0	1.6	0.0	11.9	0.0	7.7
Cycle Q Clear Time (g_c), s	0.0	15.9	0.0	1.6	0.0	11.9	0.0	7.7
Lane Grp Cap (c), veh/h	0	529	0	804	0	592	0	1161
V/C Ratio (X)	0.00	0.53	0.00	0.11	0.00	0.49	0.00	0.27
Avail Cap (c_a), veh/h	0	529	0	804	0	592	0	1161
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	35.2	0.0	8.2	0.0	22.1	0.0	29.8
Incr Delay (d2), s/veh	0.0	3.8	0.0	0.3	0.0	2.9	0.0	0.6
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	39.0	0.0	8.5	0.0	25.0	0.0	30.3
1st-Term Q (Q1), veh/ln	0.0	6.9	0.0	0.6	0.0	4.5	0.0	3.3

HCM 7th Signalized Intersection Capacity Analysis

3: Douglas Street & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.1	0.0	0.5	0.0	0.1
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	7.4	0.0	0.7	0.0	4.9	0.0	3.4
%ile Storage Ratio (RQ%)	0.00	0.55	0.00	0.04	0.00	0.20	0.00	0.05
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		R		R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	292	0	94	0	210	0	247
Grp Sat Flow (s), veh/h/ln	0	1841	0	1788	0	1585	0	1585
Q Serve Time (g_s), s	0.0	15.9	0.0	1.7	0.0	9.6	0.0	14.9
Cycle Q Clear Time (g_c), s	0.0	15.9	0.0	1.7	0.0	9.6	0.0	14.9
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.09	0.00	0.26	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	548	0	809	0	502	0	518
V/C Ratio (X)	0.00	0.53	0.00	0.12	0.00	0.42	0.00	0.48
Avail Cap (c_a), veh/h	0	548	0	809	0	502	0	518
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	35.2	0.0	8.3	0.0	21.6	0.0	32.2
Incr Delay (d2), s/veh	0.0	3.7	0.0	0.3	0.0	2.6	0.0	3.1
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	38.9	0.0	8.5	0.0	24.1	0.0	35.3
1st-Term Q (Q1), veh/ln	0.0	7.1	0.0	0.7	0.0	3.2	0.0	5.7
2nd-Term Q (Q2), veh/ln	0.0	0.6	0.0	0.1	0.0	0.4	0.0	0.4
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	7.7	0.0	0.7	0.0	3.5	0.0	6.2
%ile Storage Ratio (RQ%)	0.00	0.57	0.00	0.04	0.00	0.50	0.00	0.78
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	32.6
HCM 7th LOS	C

Notes

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

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	105	110	131	223	199	166	477	152	234	363	137
Future Volume (veh/h)	67	105	110	131	223	199	166	477	152	234	363	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	114	120	142	242	216	180	518	165	254	395	149
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	175	465	207	326	302	258	590	1968	878	626	1473	549
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Prop Arrive On Green	0.05	0.13	0.13	0.08	0.17	0.17	0.11	1.00	1.00	0.08	0.58	0.58
Unsig. Movement Delay												
Ln Grp Delay, s/veh	44.4	47.1	51.6	39.8	56.6	60.9	10.2	0.3	0.4	9.4	13.1	13.1
Ln Grp LOS	D	D	D	D	E	E	B	A	A	A	B	B
Approach Vol, veh/h	307			600			863			798		
Approach Delay, s/veh	48.2			54.2			2.4			11.9		
Approach LOS	D			D			A			B		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Case No	1.1	3.0	1.1	3.0	1.1	4.0	1.1	4.0				
Phs Duration (G+Y+Rc), s	14.3	70.9	14.5	20.2	11.0	74.3	10.3	24.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green (Gmax), s	31.5	27.5	12.5	30.5	6.5	52.5	16.5	26.5				
Max Allow Headway (MAH), s	3.8	5.0	3.8	4.6	3.8	5.3	3.8	5.4				
Max Q Clear (g_c+I1), s	9.1	2.0	10.0	10.5	7.6	11.4	6.2	18.2				
Green Ext Time (g_e), s	0.7	4.3	0.1	1.0	0.0	3.8	0.1	1.8				
Prob of Phs Call (p_c)	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.91	1.00			
Prob of Max Out (p_x)	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.46			
Left-Turn Movement Data												
Assigned Mvmt	1	3		5		7						
Mvmt Sat Flow, veh/h	1781	1781		1781		1781						
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	3554			3554			2533			1814		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	1585			1585			944			1553		
Left Lane Group Data												
Assigned Mvmt	1	0	3	0	5	0	7	0				

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

Lane Assignment	L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)		L (Pr/Pm)	
Lanes in Grp	1	0	1	0	1	0	1	0
Grp Vol (v), veh/h	254	0	142	0	180	0	73	0
Grp Sat Flow (s), veh/h/ln	1781	0	1781	0	1781	0	1781	0
Q Serve Time (g_s), s	7.1	0.0	8.0	0.0	5.6	0.0	4.2	0.0
Cycle Q Clear Time (g_c), s	7.1	0.0	8.0	0.0	5.6	0.0	4.2	0.0
Perm LT Sat Flow (s_l), veh/h/ln	758	0	1146	0	862	0	934	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	67.3	0.0	17.5	0.0	66.4	0.0	15.7	0.0
Perm LT Serve Time (g_u), s	66.4	0.0	12.2	0.0	60.4	0.0	3.8	0.0
Perm LT Q Serve Time (g_ps), s	0.4	0.0	0.7	0.0	1.5	0.0	1.0	0.0
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
Lane Grp Cap (c), veh/h	626	0	326	0	590	0	175	0
V/C Ratio (X)	0.41	0.00	0.44	0.00	0.30	0.00	0.42	0.00
Avail Cap (c_a), veh/h	947	0	363	0	590	0	334	0
Upstream Filter (I)	1.00	0.00	1.00	0.00	0.91	0.00	1.00	0.00
Uniform Delay (d1), s/veh	8.9	0.0	38.9	0.0	9.9	0.0	42.8	0.0
Incr Delay (d2), s/veh	0.4	0.0	0.9	0.0	0.3	0.0	1.6	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	9.4	0.0	39.8	0.0	10.2	0.0	44.4	0.0
1st-Term Q (Q1), veh/ln	2.7	0.0	3.5	0.0	1.9	0.0	1.9	0.0
2nd-Term Q (Q2), veh/ln	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
%ile Back of Q (50%), veh/ln	2.7	0.0	3.6	0.0	1.9	0.0	1.9	0.0
%ile Storage Ratio (RQ%)	0.20	0.00	0.61	0.00	0.33	0.00	0.30	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T		T		T		T	
Lanes in Grp	0	2	0	2	0	1	0	1
Grp Vol (v), veh/h	0	518	0	114	0	276	0	237
Grp Sat Flow (s), veh/h/ln	0	1777	0	1777	0	1777	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	3.5	0.0	9.2	0.0	15.4
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	3.5	0.0	9.2	0.0	15.4
Lane Grp Cap (c), veh/h	0	1968	0	465	0	1033	0	296
V/C Ratio (X)	0.00	0.26	0.00	0.25	0.00	0.27	0.00	0.80
Avail Cap (c_a), veh/h	0	1968	0	903	0	1033	0	392
Upstream Filter (I)	0.00	0.91	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	46.8	0.0	12.4	0.0	48.1
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.3	0.0	0.6	0.0	8.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.3	0.0	47.1	0.0	13.1	0.0	56.6
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	1.5	0.0	3.6	0.0	6.8

HCM 7th Signalized Intersection Capacity Analysis

6: Douglas Street & Tudor Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.7
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	1.6	0.0	3.8	0.0	7.5
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.04	0.00	0.14	0.00	0.14
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment		R		R		T+R		T+R
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	165	0	120	0	268	0	221
Grp Sat Flow (s), veh/h/ln	0	1585	0	1585	0	1700	0	1591
Q Serve Time (g_s), s	0.0	0.0	0.0	8.5	0.0	9.4	0.0	16.2
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.5	0.0	9.4	0.0	16.2
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	1.00	0.00	1.00	0.00	0.56	0.00	0.98
Lane Grp Cap (c), veh/h	0	878	0	207	0	989	0	265
V/C Ratio (X)	0.00	0.19	0.00	0.58	0.00	0.27	0.00	0.84
Avail Cap (c_a), veh/h	0	878	0	403	0	989	0	351
Upstream Filter (I)	0.00	0.91	0.00	1.00	0.00	1.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	49.0	0.0	12.5	0.0	48.4
Incr Delay (d2), s/veh	0.0	0.4	0.0	2.5	0.0	0.7	0.0	12.5
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.4	0.0	51.6	0.0	13.1	0.0	60.9
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.4	0.0	3.5	0.0	6.4
2nd-Term Q (Q2), veh/ln	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.9
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.1	0.0	3.5	0.0	3.7	0.0	7.3
%ile Storage Ratio (RQ%)	0.00	0.03	0.00	0.64	0.00	0.14	0.00	0.13
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	22.9
HCM 7th LOS	C

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	189	97	121	351	30	27	4	82	4	4	10
Future Vol, veh/h	37	189	97	121	351	30	27	4	82	4	4	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	-	120	-	150	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	205	105	132	382	33	29	4	89	4	4	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	414	0	0	311	0	0	795	1016	155	830	1036	191
Stage 1	-	-	-	-	-	-	339	339	-	645	645	-
Stage 2	-	-	-	-	-	-	456	677	-	185	391	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1141	-	-	1246	-	-	279	237	863	263	230	819
Stage 1	-	-	-	-	-	-	649	639	-	427	466	-
Stage 2	-	-	-	-	-	-	554	450	-	799	605	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1141	-	-	1246	-	-	233	204	863	199	199	819
Mov Cap-2 Maneuver	-	-	-	-	-	-	233	204	-	199	199	-
Stage 1	-	-	-	-	-	-	627	616	-	382	417	-
Stage 2	-	-	-	-	-	-	484	403	-	686	584	-

Approach	EB			WB			NB			SB		
HCM Ctrl Dly, s/v	0.95			1.98			14.79			16.11		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	490	1141	-	-	1246	-	-	343
HCM Lane V/C Ratio	0.251	0.035	-	-	0.106	-	-	0.057
HCM Ctrl Dly (s/v)	14.8	8.3	-	-	8.2	-	-	16.1
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1	0.1	-	-	0.4	-	-	0.2

HCM 7th Signalized Intersection Capacity Analysis

12: Olive St/Commerce Dr & Chipman Road

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	498	3	10	450	50	13	3	8	26	2	49
Future Volume (veh/h)	89	498	3	10	450	50	13	3	8	26	2	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	541	3	11	489	54	14	3	9	28	2	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	122	2143	12	23	1729	190	257	62	144	165	29	271
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Prop Arrive On Green	0.07	0.59	0.59	0.03	1.00	1.00	0.28	0.28	0.28	0.28	0.28	0.28
Unsig. Movement Delay												
Ln Grp Delay, s/veh	66.0	12.4	12.3	73.0	0.7	0.7	32.2	0.0	0.0	34.0	0.0	0.0
Ln Grp LOS	E	B	B	E	A	A	C			C		
Approach Vol, veh/h	641			554			26			83		
Approach Delay, s/veh	20.5			2.2			32.2			34.0		
Approach LOS	C			A			C			C		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			3	4	6	7	8				
Case No	8.0			2.0	4.0	8.0	2.0	4.0				
Phs Duration (G+Y+Rc), s	38.0			6.0	76.0	38.0	12.7	69.3				
Change Period (Y+Rc), s	5.0			4.5	5.0	5.0	4.5	5.0				
Max Green (Gmax), s	33.0			9.5	63.0	33.0	18.5	54.0				
Max Allow Headway (MAH), s	5.4			3.8	5.2	5.5	3.8	5.3				
Max Q Clear (g_c+I1), s	3.3			2.7	10.6	6.6	8.4	2.0				
Green Ext Time (g_e), s	0.1			0.0	3.7	0.4	0.1	3.7				
Prob of Phs Call (p_c)	1.00			0.31	1.00	1.00	0.96	1.00				
Prob of Max Out (p_x)	0.00			0.00	0.00	0.00	0.00	0.00				
Left-Turn Movement Data												
Assigned Mvmt	5			3		1	7					
Mvmt Sat Flow, veh/h	768			1781		453	1781					
Through Movement Data												
Assigned Mvmt	2			4		6	8					
Mvmt Sat Flow, veh/h	224			3623		104	3228					
Right-Turn Movement Data												
Assigned Mvmt	12			14		16	18					
Mvmt Sat Flow, veh/h	525			20		985	355					
Left Lane Group Data												
Assigned Mvmt	0	5	3	0	0	1	7	0				

HCM 7th Signalized Intersection Capacity Analysis
12: Olive St/Commerce Dr & Chipman Road

04/02/2026

Lane Assignment	L+T+R L (Prot)				L+T+R L (Prot)			
Lanes in Grp	0	1	1	0	0	1	1	0
Grp Vol (v), veh/h	0	26	11	0	0	83	97	0
Grp Sat Flow (s), veh/h/ln	0	1518	1781	0	0	1542	1781	0
Q Serve Time (g_s), s	0.0	0.0	0.7	0.0	0.0	0.7	6.4	0.0
Cycle Q Clear Time (g_c), s	0.0	1.3	0.7	0.0	0.0	4.6	6.4	0.0
Perm LT Sat Flow (s_l), veh/h/ln	0	1370	0	0	0	1424	0	0
Shared LT Sat Flow (s_sh), veh/h/ln	0	1821	0	0	0	1839	0	0
Perm LT Eff Green (g_p), s	0.0	33.0	0.0	0.0	0.0	33.0	0.0	0.0
Perm LT Serve Time (g_u), s	0.0	28.4	0.0	0.0	0.0	31.7	0.0	0.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
Time to First Blk (g_f), s	0.0	1.7	0.0	0.0	0.0	3.9	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	1.3	0.0	0.0	0.0	3.9	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	0.54	1.00	0.00	0.00	0.34	1.00	0.00
Lane Grp Cap (c), veh/h	0	463	23	0	0	464	122	0
V/C Ratio (X)	0.00	0.06	0.48	0.00	0.00	0.18	0.79	0.00
Avail Cap (c_a), veh/h	0	463	141	0	0	464	275	0
Upstream Filter (I)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
Uniform Delay (d1), s/veh	0.0	32.0	58.1	0.0	0.0	33.2	55.0	0.0
Incr Delay (d2), s/veh	0.0	0.2	15.0	0.0	0.0	0.8	10.9	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	32.2	73.0	0.0	0.0	34.0	66.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.6	0.3	0.0	0.0	1.9	2.9	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.1	0.0	0.0	0.1	0.4	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	1.00	0.00	0.00	1.00	1.00	0.00
%ile Back of Q (50%), veh/ln	0.0	0.6	0.4	0.0	0.0	2.0	3.3	0.0
%ile Storage Ratio (RQ%)	0.00	0.07	0.12	0.00	0.00	0.22	0.92	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment	T				T			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	265	0	0	0	268
Grp Sat Flow (s), veh/h/ln	0	0	0	1777	0	0	0	1777
Q Serve Time (g_s), s	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	0	0	1051	0	0	0	952
V/C Ratio (X)	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.28
Avail Cap (c_a), veh/h	0	0	0	1051	0	0	0	952
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis 12: Olive St/Commerce Dr & Chipman Road

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R				T+R			
Lanes in Grp	0	0	0	1	0	0	0	1
Grp Vol (v), veh/h	0	0	0	279	0	0	0	275
Grp Sat Flow (s), veh/h/ln	0	0	0	1867	0	0	0	1806
Q Serve Time (g_s), s	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	8.6	0.0	0.0	0.0	0.0
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.35	0.00	0.01	0.00	0.64	0.00	0.20
Lane Grp Cap (c), veh/h	0	0	0	1104	0	0	0	967
V/C Ratio (X)	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.28
Avail Cap (c_a), veh/h	0	0	0	1104	0	0	0	967
Upstream Filter (I)	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.7
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.7
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0
2nd-Term Q (Q2), veh/ln	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.2
%ile Storage Ratio (RQ%)	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.01
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	13.8
HCM 7th LOS	B

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	499	511	31	9	16
Future Vol, veh/h	16	499	511	31	9	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	542	555	34	10	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	589	0	878
Stage 1	-	-	572
Stage 2	-	-	306
Critical Hdwy	4.14	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.22	-	3.52
Pot Cap-1 Maneuver	982	-	287
Stage 1	-	-	528
Stage 2	-	-	720
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	982	-	282
Mov Cap-2 Maneuver	-	-	282
Stage 1	-	-	518
Stage 2	-	-	720

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.27	0	10.26
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	982	-	-	-	702
HCM Lane V/C Ratio	0.018	-	-	-	0.025
HCM Ctrl Dly (s/v)	8.7	-	-	-	10.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	149	9	34	54	4	5	11	8	2	12	13
Future Vol, veh/h	4	149	9	34	54	4	5	11	8	2	12	13
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	4	162	10	37	59	4	5	12	9	2	13	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	172	0	0	315	313	167	311	315	61
Stage 1	-	-	-	-	-	-	176	176	-	135	135	-
Stage 2	-	-	-	-	-	-	139	137	-	177	180	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1540	-	-	1405	-	-	638	603	877	641	601	1004
Stage 1	-	-	-	-	-	-	826	754	-	869	785	-
Stage 2	-	-	-	-	-	-	864	783	-	825	750	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1540	-	-	1405	-	-	597	584	877	603	582	1004
Mov Cap-2 Maneuver	-	-	-	-	-	-	597	584	-	603	582	-
Stage 1	-	-	-	-	-	-	824	751	-	845	763	-
Stage 2	-	-	-	-	-	-	814	762	-	801	748	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	0.18	2.82	10.67	10.12
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	661	44	-	-	656	-	-	732
HCM Lane V/C Ratio	0.039	0.003	-	-	0.026	-	-	0.04
HCM Ctrl Dly (s/v)	10.7	7.3	0	-	7.6	0	-	10.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.1

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	0	111	24	0	39	248	564	130	78	407	111
Future Volume (veh/h)	206	0	111	24	0	39	248	564	130	78	407	111
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q, veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj (A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Lanes Open During Work Zone												
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	0	121	26	0	42	270	613	141	85	442	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Opposing Right Turn Influence	Yes			Yes			Yes			Yes		
Cap, veh/h	313	0	328	240	0	328	661	2036	467	563	2010	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Prop Arrive On Green	0.21	0.00	0.21	0.21	0.00	0.21	1.00	1.00	1.00	1.00	1.00	1.00
Unsig. Movement Delay												
Ln Grp Delay, s/veh	51.1	0.0	41.5	45.3	0.0	38.9	1.9	0.6	0.6	0.5	0.4	0.4
Ln Grp LOS	D		D	D		D	A	A	A	A	A	A
Approach Vol, veh/h	345			68			1024			648		
Approach Delay, s/veh	47.8			41.4			0.9			0.4		
Approach LOS	D			D			A			A		
Timer:	1	2	3	4	5	6	7	8				
Assigned Phs	2			4			6			8		
Case No	6.0			6.0			6.0			6.0		
Phs Duration (G+Y+Rc), s	90.1			29.9			90.1			29.9		
Change Period (Y+Rc), s	5.0			5.0			5.0			5.0		
Max Green (Gmax), s	75.0			35.0			75.0			35.0		
Max Allow Headway (MAH), s	5.3			4.5			5.4			5.0		
Max Q Clear (g_c+I1), s	2.0			23.8			2.0			12.0		
Green Ext Time (g_e), s	8.5			1.1			4.9			0.2		
Prob of Phs Call (p_c)	1.00			1.00			1.00			1.00		
Prob of Max Out (p_x)	0.00			0.05			0.00			0.00		
Left-Turn Movement Data												
Assigned Mvmt	5			7			1			3		
Mvmt Sat Flow, veh/h	847			1365			710			1270		
Through Movement Data												
Assigned Mvmt	2			4			6			8		
Mvmt Sat Flow, veh/h	2870			0			2833			0		
Right-Turn Movement Data												
Assigned Mvmt	12			14			16			18		
Mvmt Sat Flow, veh/h	659			1585			769			1585		
Left Lane Group Data												
Assigned Mvmt	0	5	0	7	0	1	0	3				

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

Lane Assignment		L		L		L		L
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	270	0	224	0	85	0	26
Grp Sat Flow (s), veh/h/ln	0	847	0	1365	0	710	0	1270
Q Serve Time (g_s), s	0.0	0.0	0.0	19.2	0.0	0.0	0.0	2.2
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	21.8	0.0	0.0	0.0	10.0
Perm LT Sat Flow (s_l), veh/h/ln	0	847	0	1365	0	710	0	1270
Shared LT Sat Flow (s_sh), veh/h/ln	0	0	0	0	0	0	0	0
Perm LT Eff Green (g_p), s	0.0	85.1	0.0	24.9	0.0	85.1	0.0	24.9
Perm LT Serve Time (g_u), s	0.0	85.1	0.0	22.3	0.0	85.1	0.0	17.0
Perm LT Q Serve Time (g_ps), s	0.0	0.0	0.0	19.2	0.0	0.0	0.0	2.2
Time to First Blk (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serve Time pre Blk (g_fs), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop LT Inside Lane (P_L)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Lane Grp Cap (c), veh/h	0	661	0	313	0	563	0	240
V/C Ratio (X)	0.00	0.41	0.00	0.72	0.00	0.15	0.00	0.11
Avail Cap (c_a), veh/h	0	661	0	429	0	563	0	347
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.95	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	47.6	0.0	0.0	0.0	45.1
Incr Delay (d2), s/veh	0.0	1.9	0.0	3.5	0.0	0.5	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	1.9	0.0	51.1	0.0	0.5	0.0	45.3
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.7
2nd-Term Q (Q2), veh/ln	0.0	0.3	0.0	0.3	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.3	0.0	6.8	0.0	0.1	0.0	0.7
%ile Storage Ratio (RQ%)	0.00	0.09	0.00	1.07	0.00	0.02	0.00	0.08
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle Lane Group Data								
Assigned Mvmt	0	2	0	4	0	6	0	8
Lane Assignment		T				T		
Lanes in Grp	0	1	0	0	0	1	0	0
Grp Vol (v), veh/h	0	379	0	0	0	290	0	0
Grp Sat Flow (s), veh/h/ln	0	1777	0	0	0	1870	0	0
Q Serve Time (g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane Grp Cap (c), veh/h	0	1261	0	0	0	1327	0	0
V/C Ratio (X)	0.00	0.30	0.00	0.00	0.00	0.22	0.00	0.00
Avail Cap (c_a), veh/h	0	1261	0	0	0	1327	0	0
Upstream Filter (I)	0.00	1.00	0.00	0.00	0.00	0.95	0.00	0.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.6	0.0	0.0	0.0	0.4	0.0	0.0
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HCM 7th Signalized Intersection Capacity Analysis

20: Douglas Street & Access Drive 1

04/02/2026

2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Right Lane Group Data

Assigned Mvmt	0	12	0	14	0	16	0	18
Lane Assignment	T+R		T+R		T+R		T+R	
Lanes in Grp	0	1	0	1	0	1	0	1
Grp Vol (v), veh/h	0	375	0	121	0	273	0	42
Grp Sat Flow (s), veh/h/ln	0	1752	0	1585	0	1732	0	1585
Q Serve Time (g_s), s	0.0	0.0	0.0	7.9	0.0	0.0	0.0	2.6
Cycle Q Clear Time (g_c), s	0.0	0.0	0.0	7.9	0.0	0.0	0.0	2.6
Prot RT Sat Flow (s_R), veh/h/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prot RT Eff Green (g_R), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop RT Outside Lane (P_R)	0.00	0.38	0.00	1.00	0.00	0.44	0.00	1.00
Lane Grp Cap (c), veh/h	0	1243	0	328	0	1229	0	328
V/C Ratio (X)	0.00	0.30	0.00	0.37	0.00	0.22	0.00	0.13
Avail Cap (c_a), veh/h	0	1243	0	462	0	1229	0	462
Upstream Filter (I)	0.00	1.00	0.00	1.00	0.00	0.95	0.00	1.00
Uniform Delay (d1), s/veh	0.0	0.0	0.0	40.8	0.0	0.0	0.0	38.7
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.7	0.0	0.4	0.0	0.2
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	0.0	0.6	0.0	41.5	0.0	0.4	0.0	38.9
1st-Term Q (Q1), veh/ln	0.0	0.0	0.0	3.1	0.0	0.0	0.0	1.0
2nd-Term Q (Q2), veh/ln	0.0	0.2	0.0	0.1	0.0	0.1	0.0	0.0
3rd-Term Q (Q3), veh/ln	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back of Q Factor (f_B%)	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
%ile Back of Q (50%), veh/ln	0.0	0.2	0.0	3.1	0.0	0.1	0.0	1.0
%ile Storage Ratio (RQ%)	0.00	0.01	0.00	0.49	0.00	0.00	0.00	0.12
Initial Q (Qb), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Final (Residual) Q (Qe), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Delay (ds), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Q (Qs), veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sat Cap (cs), veh/h	0	0	0	0	0	0	0	0
Initial Q Clear Time (tc), h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary

HCM 7th Control Delay, s/veh	9.8
HCM 7th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	265	0	941	319	223
Future Vol, veh/h	0	265	0	941	319	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	288	0	1023	347	242
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	295	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.94	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.32	-	-	-	-
Pot Cap-1 Maneuver	0	702	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	702	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	13.65	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 702		-	-		
HCM Lane V/C Ratio	- 0.41		-	-		
HCM Ctrl Dly (s/v)	- 13.7		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 2		-	-		

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	0	0	42	151	70
Future Vol, veh/h	70	0	0	42	151	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	76	0	0	46	164	76

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	248	202	240	0	-	0
Stage 1	202	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	741	839	1326	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	741	839	1326	-	-	-
Mov Cap-2 Maneuver	741	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	977	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	10.42	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1326	-	741	-	-
HCM Lane V/C Ratio	-	-	0.103	-	-
HCM Ctrl Dly (s/v)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-