

315 & 323 Mapleview Drive West

City of Barrie

Traffic Impact Study for Plaza REIT

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John Northcote, P.Eng.
Professional License #: 100124071



ENGINEERING

JD Northcote Engineering Inc.
86 Cumberland Street
Barrie, ON
705.725.4035
www.JDEngineering.ca

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Executive Summary

This report summarizes the traffic impact study prepared for the proposed development, municipally known as 315 & 323 Mapleview Drive West, located on the south side of Mapleview Drive West, midblock between Essa Road and Hollyholme Farm Road, City of Barrie [Barrie]. The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed development is anticipated to consist of a commercial plaza with three buildings; a total of 5,358 sq.m. (57,675 sq.ft.) of a retail area and a 185 sq.m. (1,996 sq.ft.) restaurant with a drive-through.

The proposed development is anticipated to include two access driveways onto Mapleview Drive West [West Access and East Access]. The West Access will be shared with the storage facility (currently under construction) located immediately west of the subject site and will operate as a right-in-right-out [RIRO] driveway. The East Access will operate as a full-movement driveway, aligned to optimize and facilitate safe movement for pedestrian, bicycle and vehicle traffic, while providing the required intersection spacing and consolidating access with a single driveway. The East Access is aligned with a potential future private road [MVD West Access] within the Mapleview & Essa Development, located north of the subject site. The East Access will be shared with the existing Lexus car dealership located immediately east of the subject site.

The scope of this analysis includes a review of the following intersections:

- Mapleview Drive West / Essa Road;
- Mapleview Drive West / Hollyholme Farm Road;
- Mapleview Drive West / Veteran's Drive;
- Mapleview Drive West / West Access; and
- Mapleview Drive West / East Access & MVD West Access.

Conclusions

1. The proposed development is expected to generate a total of 131 AM, 287 PM and 472 SAT peak hour primary trips and 40 AM, 113 PM and 152 SAT peak hour pass-by trips
2. Detailed turning movement traffic and pedestrian counts for the Mapleview Drive West / Essa Road, and Mapleview Drive West / Veteran's Drive intersections were obtained from the City. Detailed turning movement traffic and pedestrian counts for the Mapleview Drive West / Hollyholme Farm Road were obtained from a previous study completed by R.J. Burnside & Associates Limited.
3. An intersection operation analysis was completed at the study area intersections, using the existing (2023) and background (2026 and 2031) traffic volumes, with the adjacent development traffic and without the proposed development traffic. The following infrastructure improvements are recommended:

Mapleview Drive West / Veteran's Drive

Background (2026) Traffic Volumes

- Signal timing optimization during the PM peak hour and extend the cycle length.

Background (2031) Traffic Volumes

- Signal timing optimization during the SAT peak hour and extend the cycle length.

Mapleview Drive West / Essa Road:

Background (2031) Traffic Volumes

- Signal timing optimization during the PM peak hour while maintaining the existing cycle length.
4. An estimate of the amount of traffic that would be generated by the proposed development was prepared and assigned to the study area streets and intersections.
 5. An intersection operation analysis was completed under total (2026 and 2031) traffic volumes with the proposed development operational at the study area intersections. No additional geometric lane improvements or traffic signal improvements are recommended within the study area.
 6. The West Access will operate efficiently as a Right-In-Right-Out access, with one-way stop control for northbound movements. A single northbound and southbound lane at the West Access will provide the necessary capacity to service the proposed development.
 7. The East Access will operate efficiently as a signalized full-movement access. Two northbound lanes (northbound left and northbound through / right turn) and one southbound lane at the East Access will provide the necessary capacity to service the proposed development.
 8. The sight distance available east and west of the East Access at Mapleview Drive West meets the minimum stopping and intersection sight distance requirements.
 9. The sight distance available east and west of the West Access at Mapleview Drive West meets the minimum stopping and intersection sight distance requirements.
 10. A full-movement signalized East Access provides the following advantages
 - Consolidation of full-movement access onto Mapleview Drive West
 - Facilitate planned development density increases
 - Increased access for active transportation
 - Reduce travel distance for motorists
 - Optimal location for a full-movement access
 11. The developer is not constructing the proposed development for their own use, consequently, operational decisions are beyond their control; however, a list of transportation demand management techniques have been provided for consideration.
 12. The proposed parking supply for the subject site meets the parking requirements specified in the City Zoning By-law 2009-141.
 13. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

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1 Introduction

1.1 Background

Plaza REIT [The Client] is proposing to develop a property municipally known as 315 & 323 Maplevue Drive, located on the south side of Maplevue Drive West, midblock between Essa Road and Hollyholme Farm Road, City of Barrie [Barrie].

The proposed development is anticipated to consist of a commercial plaza with three buildings; a total of 5,358 sq.m. (57,675 sq.ft.) of a retail area and a 185 sq.m. (1,996 sq.ft.) restaurant with a drive-through.

The proposed development is anticipated to include two access driveways onto Maplevue Drive West [West Access and East Access]. The West Access will be shared with the storage facility (currently under construction) located immediately west of the subject site and will operate as a right-in-right-out [RIRO] driveway. The East Access will operate as a full-movement driveway, aligned with the future private road [MVD West Access] within the Maplevue & Essa Development, located north of the subject site. The East Access will be shared with the existing Lexus car dealership located immediately east of the subject site.

The Client has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic impact study in support of the proposed development.

1.2 Study Area

Figure 1 shows the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan by Cusimano Architects Inc. is provided in **Appendix A**.

The subject site is bound by Maplevue Drive West to the north, an existing Lexus car dealership to the east, existing industrial lands to the south and an existing self-storage facility to the west.

Based on our correspondence with the City, the following intersections will be analyzed as part of the study:

- Maplevue Drive West / Essa Road;
- Maplevue Drive West / Hollyholme Farm Road;
- Maplevue Drive West / Veteran's Drive;
- Maplevue Drive West / West Access; and
- Maplevue Drive West / East Access & MVD West Access.

Figure 1 – Proposed Site Location and Study Area



1.3 Study Scope and Objectives

The purpose of this study is to identify the potential impacts to traffic flow at the site access and on the surrounding roadway network. The study analysis includes the following tasks:

- Consult with the City to address any traffic-related issues or concerns they have with the proposed development;
- Determine existing traffic volumes and circulation patterns;
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Review the proposed parking supply; and
- Document findings and recommendations in a final report.

1.4 Analysis Periods

Traffic scenarios for the existing year (2023), the build-out year (2026), and 5-year post-build-out horizon year (2031) were selected for analysis of traffic operations in the study area. The weekday morning [AM], weekday afternoon [PM] and Saturday mid-day [SAT] peak hours have been selected as the analysis periods for this study.

2 Information Gathering

2.1 Street and Intersection Characteristics

Mapleview Drive West is a four-lane arterial road west of Essa Road and a seven-lane arterial road east of Essa Road. Mapleview Drive West has an urban cross-section and a sidewalk on both sides of the road within the study area. Mapleview Drive West has a multi-use path on the north side of the road, west of Essa Road within the study area. Mapleview Drive West has a posted speed limit of 60km/h and is under the jurisdiction of the City, within the study area.

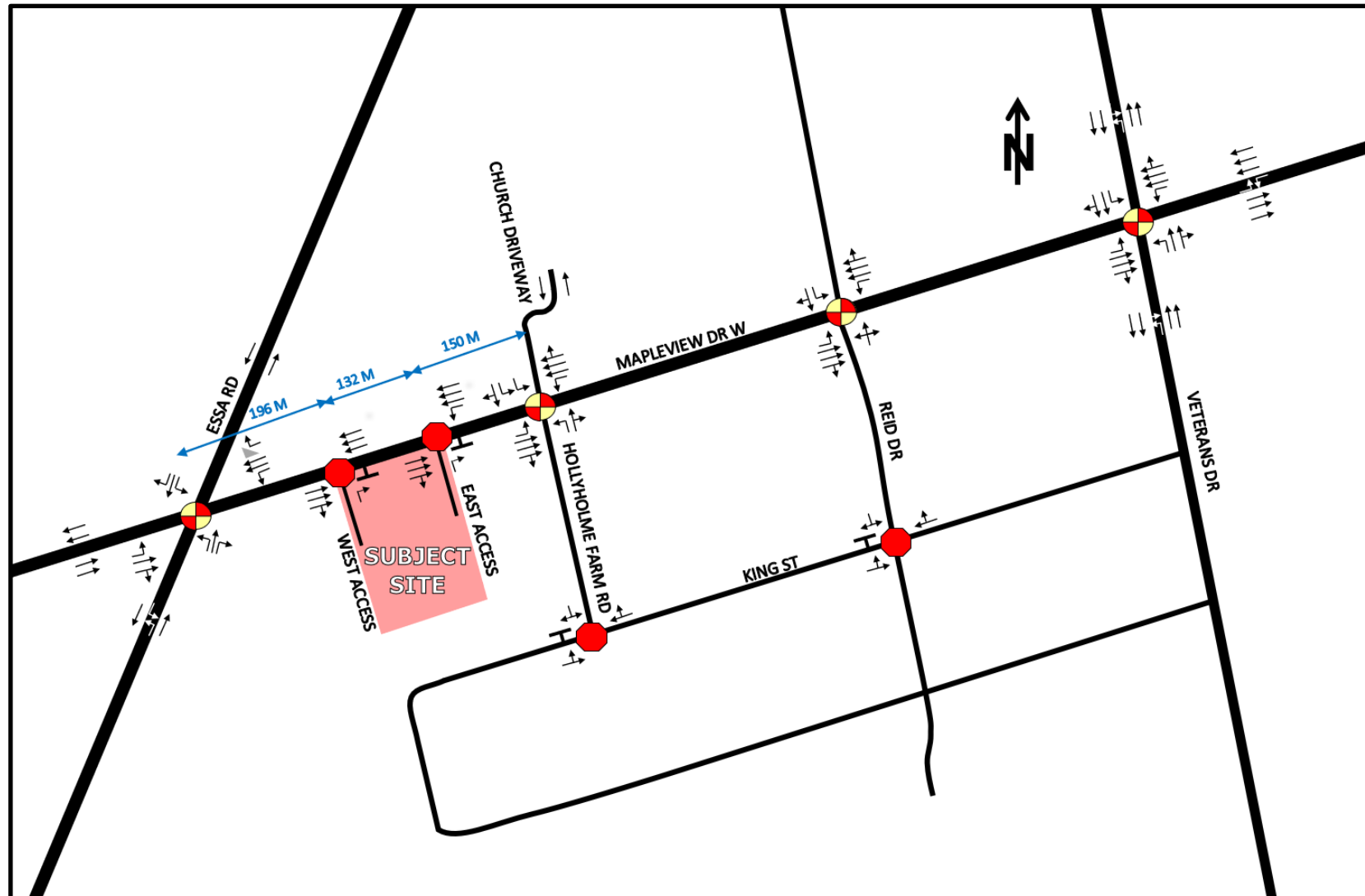
Essa Road is a two-lane arterial road north of Mapleview Drive West and a three-lane arterial road south of Mapleview Drive West. Essa Road has a rural cross-section, an asphalt or gravel shoulder, a sidewalk on the east side of the road, south of Mapleview Drive West. Essa Road has a rural cross-section, an asphalt shoulder and a short sidewalk (75 metres) on the west side of the road, south of Mapleview Drive West. Essa Road has a rural cross-section, an asphalt shoulder and no sidewalk north of Mapleview Drive West. Essa Road has a posted speed limit of 60km/h and is under the jurisdiction of the City within the study area.

Hollyholme Farm Road is a two-lane local road with an urban cross-section. Hollyholme Farm Road has no sidewalk south of Mapleview Drive West and a sidewalk on the east side of the road, north of Mapleview Drive West. Hollyholme Farm Road has an assumed (unposted) speed limit of 50km/h under the jurisdiction of the City.

Veteran's Drive is a five-lane arterial road with an urban cross-section within the study area. Veteran's Drive has a sidewalk and a bike lane on both sides of the road, a posted speed limit of 60km/h and is under the jurisdiction of the City.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing Lane Configuration within Study Area



2.2 Local Road Improvements

Based on the City's Transportation Master Plan (April 2019) [TMP] and the City's 2022-2031 Capital Plan, the following improvements are anticipated to be completed within the study area:

- Mapleview Drive West
 - Proposed In-Boulevard Pathway, by 2031
 - Proposed High Occupancy Vehicle (HOV), east of Mapleview Drive West.
- Essa Road
 - Proposed five-lane (including TWLTL or Median), by 2041
 - Proposed In-Boulevard Pathway, by 2031
 - Proposed High Occupancy Vehicle (HOV), north of Essa Road

The Mapleview Drive West / East Access & MVD West Access intersection has been assumed to be a full-movement signalized intersection by 2026. A supplementary analysis related to the signalization of this intersection is provided in Section 5.4.

2.3 Transit Access

The City's transit provider, Barrie Transit [BT], provides three bus routes within the study area; No.2 (Dunlop - Park Place), No.7 (Grove - Bear Creek), and No. 8 (RVH – Park Place).

The No.2 (Dunlop - Park Place) bus route operates between 06:15– 23:12 on weekdays with peak hour service approximately every 30 minutes, between 07:15 – 23:12 on Saturdays with service approximately every 30 minutes and between 09:15 – 22:12 on Sundays with service approximately every 60 minutes. The closest bus stop to the proposed development for the No.2 (Dunlop - Park Place) bus route, is located in the northeast corner of Mapleview Drive West / Veteran's Drive intersection and southeast corner of the Mapleview Drive West / Matsu Manufacturing Driveway intersection for the northbound and southbound directions respectively (approximately one kilometre east of the subject site).

The No.7 (Grove – Bear Creek) bus route operates between 05:28– 24:10 on weekdays with peak hour service approximately every 30 minutes, between 06:28 – 24:10 on Saturdays with service approximately every 30 minutes and between 09:28 – 20:10 on Sundays with service approximately every 60 minutes. The closest bus stop to the proposed development for the No.7 (Grove – Bear Creek) bus route, is located in the southwest and northeast corners of Mapleview Drive West / Hollyholme Farm Road intersection for the eastbound and westbound directions respectively (approximately 200 metres east of the subject site).

The No.8 (RVH – Park Place) bus route operates between 04:52– 24:48 on weekdays with peak hour service approximately every 30 minutes, between 06:52 – 24:48 on Saturdays with service approximately every 30 minutes and between 08:50 – 20:48 on Sundays with service approximately every 60 minutes. The closest bus stop to the proposed development for the No.8 (RVH – Park Place) bus route, is located in southwest and northeast corners of Mapleview Drive West / Hollyholme Farm Road intersection for the eastbound and westbound directions respectively (approximately 200 metres east of the subject site).

Figure 3 illustrates the transit service within the study area.

2.4 Other Developments within the Study Area

Based on the City webpage and on our correspondence with the City, there is one adjacent developments nearby the study area that will impact the traffic within the study area, specifically:

- Maplevue & Essa Development.

For the purposes of this study, it has been assumed that all traffic generated by the adjacent development noted above will be new traffic and would not be in the study area if the development was not constructed.

There are four additional adjacent developments within the study area; however, based on the small development size, these four developments have been assumed to be accounted for in the background growth rate discussed in Section 2.5.

- 440 Essa Road
- 90 Maplevue Drive;
- 201 Maplevue Drive; and
- 407-419 Maplevue Drive.

Figure 4 shows the location of the above noted adjacent developments in relation to the subject site.

2.4.1 Maplevue & Essa Development

The Maplevue & Essa Development is located on the northeast corner of Maplevue Drive West / Essa Road, municipally known as 664, 674, 692 Essa Road and 320, 364 Maplevue Drive West and is proposed to consist of 1,217 residential units, 28,642 sq. ft commercial space, a 1,743 sq. ft. daycare and a 7,029 sq. ft. library. The construction of Maplevue & Essa Development is planned to include multiple phases for the north and south blocks of the development. For the purpose of this study, it has been assumed that the Maplevue & Essa development north and south block will be constructed and occupied by the 2026 and 2031 horizon years respectively.

Traffic generated by the Maplevue & Essa Development has been estimated based on the Maplevue & Essa Development Traffic Impact Study (December 2022) [Maplevue & Essa TIS] by Tatham Engineering. (Excerpts provided in **Appendix B**).

Although the location of MVD West Access (Private Road E) in the Maplevue & Essa Development TIS does not exactly align with the proposed East Access, based on our correspondence with the City and the consultant team for Maplevue & Essa Development, we understand that all parties agree that the intersections will need to be aligned and the location proposed for the East Access is the preferred location. For the purpose of this study it has been assumed that the MVD West Access of the Maplevue & Essa Development will be constructed by 2031 horizon year.

Trip distribution for traffic generated by the south block in the Maplevue & Essa Development TIS is based on a RIRO configuration for MVD West Access (Private Road E). In order to estimate the traffic distribution for the full-movement configuration, the traffic generated by the south block in the has been redistributed, for consistency.

Figures 5 and 6 illustrate the Maplevue & Essa Development traffic area for the 2026 and 2031 horizon years for the AM, PM and SAT peak hour within the study area.

2.5 Background Traffic Growth

Based on our review of the EMME travel demand model used in the City TMP and based on our review of similar studies prepared for developments on Mapleview Drive West, a typical background growth rate of 2.0% per annum has been utilized for Mapleview Drive West, Essa Road and Veteran's Drive.

2.6 Traffic Counts

Detailed weekday turning movement traffic and pedestrian counts for the Mapleview Drive West / Essa Road, and Mapleview Drive West / Veteran's Drive intersections were obtained from the City. The 2021 traffic volumes at Mapleview Drive West / Hollyholme Farm Road intersection for the AM, PM peak hours and for Mapleview Drive West / Essa Road, Mapleview Drive West / Veteran's Drive and Mapleview Drive West / Hollyholme Farm Road intersections for the SAT peak hour were obtained from the previous R.J. Burnside & Associates Limited Traffic Impact Study, dated October 2021 [Burnside TIS] (excerpts provided in **Appendix C**).

Table 1 summarizes the traffic count data collection information.

Table 1 – Traffic Count Data

Intersection (E-W Street / N-S Street)	Count Date	AM Peak Hour	PM Peak Hour	SAT Peak Hour	Source
Mapleview Drive West / Essa Road	Wednesday, May 18, 2022	07:30 – 08:30	16:30 – 17:30	-	City
	Saturday, October 3, 2020	-	-	12:45 – 13:45	RJB
Mapleview Drive West / Veteran's Drive	Thursday, June 9, 2022	07:45 – 08:45	16:45 – 17:45	-	City
	Saturday, October 3, 2020	-	-	11:45 – 12:45	RJB
Mapleview Drive West / Hollyholme Farm Road	Tuesday, April 9, 2019	07:45 – 08:45	16:45 – 17:45	-	City
	Saturday, October 3, 2020	-	-	11:45 – 12:45	RJB

Detailed traffic count data can be found in **Appendix C**. The peak hour of traffic generation for the study area intersections is generally aligned with the anticipated peak hour of traffic generation by the proposed development. Although the AM and PM peak hours at all study area intersections did not exactly align, for the purpose of this report, we have assumed that the AM and PM peak hours are concurrent.

Heavy vehicle percentages from the traffic count data have also been included in the Synchro analysis.

2.6.1 Calculation of Existing (2023) Traffic Volumes

2.6.1.1 East Access / Mapleview Drive West

The eastbound and westbound traffic volumes on Mapleview Drive West at this intersection were estimated based on the traffic volumes in section 2.6.

The traffic volumes entering and exiting East Access / Mapleview Drive West intersection have been calculated based on the ITE Trip Generation Manual. The following ITE land uses have been applied to estimate the traffic from the Lexus car dealership:

- ITE land use 840 (Automobile Sales) – General Urban / Suburban Setting.

The estimated trip generation of the existing Lexus car dealership is illustrated below in **Table 2**. The AM and PM peak traffic generation for the existing Lexus car dealership is not expected to exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual.

Table 2 – Estimated Traffic Generation – Lexus car dealership

Land Use	Size	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Automobile Sales ITE Land Use: 840	22,298 sq.ft	31	11	42	22	32	54	45	45	90

The traffic assignment for the Lexus car dealership has been estimated based on the traffic distribution methodology applied for the proposed development outlined in Section 4.2.

2.6.1.2 West Access / Maplevue Drive West

The eastbound and westbound traffic volumes on Maplevue Drive West at this intersection were estimated based on the traffic volumes in section 2.6.

The 341 Maplevue Drive West development is located directly west of the subject site, south of Maplevue Drive West. This development is currently under construction. When complete, this property will include a total of 103,935 sq.ft eight self-storage commercial buildings of variable sizes. It is anticipated that the 341 Maplevue Drive West development will be occupied by the 2023 horizon year.

The traffic volumes entering and exiting West Access / Maplevue Drive West intersection have been estimated based on traffic estimates provided in the 341 Maplevue Drive West Traffic Impact Study, dated May 2021 by Crozier and Associates Inc. [341 Maplevue Drive West TIS] (excerpts provided in **Appendix C**).

Figure 7 illustrates the existing (2023) traffic volumes within the study area.

2.7 Horizon Year Traffic Volumes

In addition to the adjacent development traffic volumes discussed in Section 2.4, the background traffic growth rate discussed in Section 2.5 has been applied to the existing (2023) traffic volumes to estimate the background (2026 and 2031) horizon year traffic volumes within the study area.

Figures 8 and 9 illustrate the background (2026 and 2031) horizon year AM, PM and SAT peak hour traffic volumes in the study area.

3 Intersection Operation without Proposed Development

3.1 Introduction

Existing year operational conditions were established to determine how the street network within the study area is currently functioning without the proposed development. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the 2023 traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 11, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 11 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

3.2 Intersection Capacity Analysis Criteria

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign-controlled intersections are shown in **Table 3**. A description of traffic performance characteristics is included for each LOS.

Table 3 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	Stop Controlled Intersections
A	Very low delay; most vehicles do not stop (Excellent)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (Very Good)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping (Good)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (Satisfactory)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (Unacceptable)	greater than 80.0	greater than 50.0

3.3 Existing (2023) Intersection Operation

The results of the LOS analysis under existing (2023) traffic volumes during the AM, PM and SAT peak hour can be found below in **Table 4**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 4 – Existing (2023) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.47	26.6	C	-	-	0.64	32.6	C	-	-	0.53	28.7	C	-	-
EBL	0.38	20.5	C	95	35	0.77	37.1	D	95	57	0.49	23.8	C	95	27
EBTR	0.79	35.7	D	-	101	0.55	29.8	C	-	72	0.76	36.1	D	-	85
WBL	0.40	24.9	C	TWLTL	18	0.37	21.7	C	TWLTL	26	0.49	23.9	C	90	26
WBT	0.30	28.8	C	-	33	0.92	47.4	D	-	139	0.77	36.5	D	-	87
WBR	0.04	26.7	C	-	-	0.18	26.7	C	-	19	0.15	27.4	C	-	17
NBL	0.09	22.5	C	80	13	0.27	28.1	C	80	29	0.11	22.6	C	80	15
NBT	0.25	24.3	C	-	40	0.41	29.7	C	-	62	0.35	25.7	C	-	57
NBR	0.10	22.4	C	30	14	0.06	24.6	C	30	6	0.10	22.4	C	30	15
SBL	0.24	15.0	B	55	27	0.29	17.8	B	55	27	0.37	15.5	B	55	39
SBT	0.22	15.7	B	-	38	0.22	18.1	B	-	38	0.21	15.3	B	-	39
SBR	0.12	14.7	B	30	12	0.18	17.7	B	30	15	0.09	14.1	B	30	11
Mapleview Drive West / West Access (unsignalized)	-	0.0	A	-	-	-	0.0	A	-	-	-	0.0	A	-	-
NB	0.00	8.8	A	-	-	0.01	8.6	A	-	-	0.01	8.8	A	-	-
Mapleview Drive West / East Access (unsignalized)	-	0.2	A	-	-	-	0.2	A	-	-	-	0.3	A	-	-
NB	0.01	8.7	A	-	-	0.04	9.6	A	-	-	0.06	9.4	A	-	-
Mapleview Drive West / Hollyholme Farm Road (signalized)	0.31	13.4	A	-	-	0.36	17.3	B	-	-	0.32	17.3	B	-	-
EBL	0.00	9.9	A	TWLTL	1	0.01	13.4	B	TWLTL	1	0.01	13.1	B	TWLTL	2
EBTR	0.45	13.8	B	-	76	0.32	15.9	B	-	52	0.41	16.9	B	-	70
WBL	0.03	10.4	B	TWLTL	2	0.00	12.8	B	TWLTL	1	0.00	13.2	B	TWLTL	1
WBTR	0.18	11.6	B	-	28	0.47	17.6	B	-	83	0.39	16.8	B	-	67
NBL	0.04	28.8	C	-	7	0.16	24.9	C	-	22	0.17	25.0	C	-	22
NBTR	0.01	29.6	C	-	-	0.00	27.3	C	-	-	0.01	27.3	C	-	-
SBL	0.00	28.6	C	-	1	0.01	30.7	C	-	2	0.01	30.7	C	-	3
SBTR	-	-	-	-	-	0.00	31.6	-	-	-	0.00	31.6	C	-	-
Mapleview Drive West / Veteran's Drive (signalized)	0.64	29.1	C	-	-	0.80	36.2	D	-	-	0.84	34.5	C	-	-
EBL	0.23	25.0	C	TWLTL	18	0.55	27.2	C	TWLTL	29	0.35	26.8	C	TWLTL	15
EBTR	0.62	35.1	D	-	77	0.61	33.8	C	-	79	0.81	40.0	D	-	110
WBL	0.74	30.9	C	TWLTL	51	0.64	25.6	C	TWLTL	42	0.76	34.5	C	TWLTL	54
WBTR	0.34	27.0	C	-	45	0.93	47.2	D	-	149	0.74	33.6	C	-	108
NBL	0.11	25.2	C	TWLTL	11	0.31	22.5	C	TWLTL	30	0.21	24.7	C	TWLTL	21
NBTR	0.16	29.3	C	-	19	0.41	32.2	C	-	51	0.33	32.1	C	-	44
SBL	0.47	20.1	C	65	54	0.66	24.1	C	65	59	0.82	32.5	C	65	103
SBTR	0.23	24.1	C	-	36	0.32	28.5	C	-	46	0.19	25.0	C	-	30

The results of the LOS analysis indicate that the V/C ratio for the westbound through movement at the Mapleview Drive West / Essa Road intersection and the westbound through / right turn movement at the Mapleview Drive West / Veteran's Drive intersection are operating outside the typical design limits noted in Section 3.2 during the PM peak hour; however, no infrastructure improvements are recommended as all critical movements are operating within theoretical capacity.

The results of the LOS analysis indicate that all other study area intersections are operating within the typical design limits noted in Section 3.2.

A review of the need for an auxiliary right turn lane at the study area unsignalized intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, an auxiliary right turn lane is not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area unsignalized intersections (results are provided in **Appendix F**).

The anticipated 95th percentile queue length for the eastbound through / right turn movement at the Mapleview Drive West / Essa Road intersection exceeds the existing storage length for the eastbound left turn movements; however, no improvements are required as the eastbound left turn traffic can access the eastbound left turn lane via the taper length. The 95th percentile queue length for the southbound left turn movement at the Mapleview Drive West / Veteran's Drive intersection exceeds the existing storage length for the southbound left turn movements; however, no improvements are required as the eastbound left turn queue can be accommodated via the TWLTL.

The anticipated 95th percentile queue lengths for all movements at the study area intersections can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

3.4 Background (2026) Intersection Operation

The results of the LOS analysis under background (2026) traffic volumes during the AM, PM and SAT peak hour can be found below in **Table 5**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix E**.

Table 5 – Background (2026) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.51	27.3	C	-	-	0.68	35.9	D	-	-	0.58	29.4	C	-	-
EBL	0.41	20.5	C	95	37	0.86	48.8	D	95	69	0.57	25.6	C	95	30
EBTR	0.82	37.2	D	-	110	0.58	30.3	C	-	77	0.78	36.8	D	-	92
WBL	0.46	25.5	C	TWLTL	19	0.41	21.8	C	TWLTL	27	0.54	24.9	C	90	28
WBT	0.32	28.8	C	-	35	0.97	54.7	D	-	153	0.79	37.2	D	-	94
WBR	0.05	26.6	C	-	1	0.19	26.6	C	-	19	0.16	27.2	C	-	18
NBL	0.10	23.2	C	80	14	0.29	29.0	C	80	31	0.11	23.5	C	80	15
NBT	0.27	25.2	C	-	42	0.45	30.9	C	-	67	0.39	27.1	C	-	62
NBR	0.10	23.1	C	30	15	0.06	25.1	C	30	8	0.11	23.3	C	30	15
SBL	0.25	15.5	B	55	28	0.33	18.4	B	55	29	0.41	16.5	B	55	42
SBT	0.24	16.4	B	-	42	0.24	18.6	B	-	41	0.24	16.2	B	-	42
SBR	0.13	15.2	B	30	13	0.21	18.4	B	30	18	0.10	14.8	B	30	12
Mapleview Drive West / West Access (unsignalized)	-	0.0	A	-	-	-	0.0	A	-	-	-	0.0	A	-	-
NB	0.00	8.9	A	-	-	0.01	8.7	A	-	-	0.01	8.8	A	-	-
Mapleview Drive West / East Access (signalized)	0.37	15.2	B	-	-	0.40	12.7	B	-	-	0.41	14.7	B	-	-
EBTR	0.73	17.5	B	-	61	0.48	14.2	B	-	42	0.72	18.2	B	-	60
WBL	0.10	10.1	B	TWLTL	3	0.07	8.8	A	TWLTL	3	0.16	10.1	B	TWLTL	5
WBT	0.22	9.7	A	-	16	0.60	11.8	B	-	50	0.53	11.4	B	-	41
NBL	0.01	11.7	B	-	2	0.03	13.1	B	-	5	0.03	12.4	B	-	5
NBR	0.01	11.7	B	-	3	0.01	13.0	B	-	4	0.02	12.4	B	-	5
Mapleview Drive West / Hollyholme Farm Road (signalized)	0.35	17.2	B	-	-	0.36	17.3	B	-	-	0.34	16.8	B	-	-
EBL	0.01	12.4	B	TWLTL	2	0.07	13.3	B	TWLTL	4	0.06	12.5	B	TWLTL	4
EBTR	0.51	17.6	B	-	84	0.33	15.3	B	-	55	0.42	16.0	B	-	74
WBL	0.04	13.2	B	TWLTL	2	0.00	12.2	B	TWLTL	1	0.00	12.2	B	TWLTL	1
WBTR	0.21	14.5	B	-	31	0.52	17.4	B	-	95	0.43	16.1	B	-	77
NBL	0.04	30.2	C	-	7	0.17	26.2	C	-	22	0.18	27.6	C	-	22
NBTR	0.01	31.0	C	-	-	0.00	29.9	C	-	-	0.01	31.3	C	-	-
SBL	0.08	24.6	C	-	10	0.06	29.2	C	-	8	0.06	28.3	C	-	8
SBTR	0.01	27.8	C	-	-	0.01	32.0	C	-	-	0.01	32.2	C	-	-
Mapleview Drive West / Veteran's Drive (signalized)	0.71	31.0	C	-	-	0.87	45.9	D	-	-	0.91	37.9	D	-	-
EBL	0.25	24.9	C	TWLTL	19	0.57	28.9	C	TWLTL	32	0.37	27.2	C	TWLTL	16
EBTR	0.70	36.7	D	-	89	0.68	35.6	D	-	88	0.89	44.2	D	-	131
WBL	0.83	40.4	D	TWLTL	73	0.72	30.8	C	TWLTL	51	0.78	37.2	C	TWLTL	63
WBTR	0.37	27.0	C	-	50	1.03	70.3	E	-	175	0.81	35.4	C	-	124
NBL	0.13	24.8	C	TWLTL	12	0.36	22.6	C	TWLTL	35	0.24	24.0	C	TWLTL	25
NBTR	0.17	30.1	C	-	20	0.45	33.0	C	-	55	0.37	32.9	C	-	47
SBL	0.50	20.8	C	65	57	0.72	27.1	C	65	63	0.90	44.1	C	65	96
SBTR	0.26	25.9	C	-	38	0.35	29.6	C	-	49	0.22	27.0	C	-	32

The results of the LOS analysis indicate that the V/C ratio for the westbound through movement at the Mapleview Drive West / Essa intersection is operating outside the typical design limits noted in Section 3.2 during the PM peak hour; however, no infrastructure improvements are recommended as the critical movement is operating within theoretical capacity. The V/C ratio for the westbound through / right turn movement at Mapleview Drive West / Veteran's Drive intersection is operating outside the typical design limits noted in Section 3.2 during the PM peak hour. Signal timing optimization and extending the cycle length is recommended at the Mapleview Drive West / Veteran's Drive intersection during the PM peak hour to improve the intersection capacity. **Table 6** illustrates the results of the LOS analysis with the above noted improvement. Detailed output of the Synchro analysis can be found in **Appendix E**.

Table 6 – Background (2026) LOS with Improvements

Location (E-W Street / N-S Street)	Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model
Mapleview Drive West / Veteran's Drive (signalized)	0.82	33.8	C	-	-
EBL	0.66	28.3	C	TWLTL	46
EBTR	0.51	27.9	C	-	91
WBL	0.61	19.4	B	TWLTL	43
WBTR	0.76	31.4	C	-	140
NBL	0.45	33.3	C	TWLTL	41
NBTR	0.74	49.5	D	-	68
SBL	0.84	44.2	D	65	95
SBTR	0.49	38.5	D	-	56

The results of the LOS analysis indicate that the study area intersections are operating within the typical design limits noted in Section 3.2.

A review of the need for an auxiliary right turn lane at the study area unsignalized intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all movements; consequently, an auxiliary right turn lane is not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area unsignalized intersections (results are provided in **Appendix F**).

The anticipated 95th percentile queue length for the eastbound through / right turn movement at the Mapleview Drive West / Essa Road intersection exceeds the existing storage length for the eastbound left turn movements; however, no improvements are required as the eastbound left turn traffic can access the eastbound left turn lane via the taper length. The 95th percentile queue length for the southbound left turn movement at the Mapleview Drive West / Veteran's Drive intersection exceeds the existing storage length for the southbound left turn movements; however, no improvements are required as the eastbound left turn queue can be accommodated via the TWLTL. The anticipated 95th percentile queue lengths for all movements at the study area intersections can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

3.5 Background (2031) Intersection Operation

The results of the LOS analysis under background (2031) traffic volumes during the AM, PM and SAT peak hour can be found below in **Table 7**. Existing intersection geometry and traffic control have been utilized for this scenario with the recommended traffic signal optimization noted in section 3.4. Detailed output of the Synchro analysis can be found in **Appendix E**.

Table 7 – Background (2031) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.56	29.8	C	-	-	0.68	35.9	D	-	-	0.65	31.4	C	-	-
EBL	0.47	20.9	C	95	41	0.95	67.0	E	95	80	0.64	28.3	C	95	33
EBTR	0.90	42.8	D	-	135	0.66	32.2	C	-	89	0.83	39.1	D	-	107
WBL	0.54	27.3	C	TWLTL	23	0.53	23.2	C	TWLTL	31	0.66	29.2	C	TWLTL	34
WBT	0.36	29.0	C	-	40	1.08	87.8	F	-	182	0.83	39.2	D	-	107
WBR	0.09	26.7	C	-	14	0.28	27.6	C	-	28	0.20	27.2	C	-	20
NBL	0.11	21.1	C	80	14	0.33	30.0	C	80	34	0.13	25.1	C	80	17
NBT	0.31	26.4	C	-	46	0.50	32.1	C	-	74	0.44	29.4	C	-	68
NBR	0.12	23.9	C	30	15	0.07	25.4	C	30	12	0.15	25.1	C	30	19
SBL	0.29	16.3	B	55	31	0.38	18.9	B	55	32	0.49	18.2	B	55	46
SBT	0.27	17.3	B	-	46	0.26	18.9	B	-	44	0.27	17.6	B	-	46
SBR	0.14	15.9	B	30	13	0.26	19.0	B	30	24	0.11	15.9	B	30	12
Mapleview Drive West / West Access (unsignalized)	-	0.0	A	-	-	-	0.0	A	-	-	-	0.0	A	-	-
NB	0.00	9.1	A	-	-	0.01	8.8	A	-	-	0.01	9.0	A	-	-
Mapleview Drive West / East Access & MVD West Access (signalized)	0.46	15.1	B	-	-	0.50	12.8	B	-	-	0.49	14.8	B	-	-
EBL	0.04	11.9	B	TWLTL	4	0.24	13.0	B	TWLTL	9	0.22	14.2	B	TWLTL	9
EBTR	0.76	17.9	B	-	69	0.49	13.7	B	-	47	0.75	18.5	B	-	68
WBL	0.12	10.2	B	TWLTL	4	0.08	8.5	A	TWLTL	3	0.18	10.2	B	TWLTL	5
WBTR	0.25	9.5	A	-	18	0.65	12.0	B	-	60	0.59	11.7	B	-	49
NBL	0.01	12.5	B	-	2	0.04	14.7	B	-	6	0.04	13.4	B	-	6
NBTR	0.01	12.4	B	-	-	0.01	14.5	B	-	-	0.02	13.2	B	-	-
SBL	0.12	12.0	B	-	13	0.15	15.2	B	-	15	0.13	12.8	B	-	14
SBTR	0.05	11.7	B	-	-	0.05	14.6	B	-	3	0.05	12.3	B	-	3
Mapleview Drive West / Hollyholme Farm Road (signalized)	0.41	18.1	B	-	-	0.45	18.6	B	-	-	0.34	16.8	B	-	-
EBL	0.02	12.5	B	TWLTL	3	0.19	13.5	B	TWLTL	7	0.16	12.2	B	TWLTL	7
EBTR	0.58	18.8	B	-	102	0.36	15.0	B	-	65	0.47	16.1	B	-	88
WBL	0.06	14.0	B	TWLTL	3	0.00	12.8	B	TWLTL	1	0.01	13.1	B	TWLTL	1
WBTR	0.25	14.9	B	-	37	0.61	19.6	B	-	117	0.52	18.2	B	-	94
NBL	0.04	30.2	C	-	6	0.18	29.7	C	-	23	0.19	29.8	C	-	22
NBTR	0.01	31.1	C	-	-	0.00	33.5	C	-	-	0.01	33.6	C	-	-
SBL	0.10	24.6	C	-	13	0.09	30.5	C	-	11	0.10	30.5	C	-	12
SBTR	0.01	27.7	C	-	-	0.02	34.4	C	-	-	0.01	34.5	C	-	-

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Veteran's Drive (signalized)	0.80	35.6	D	-	-	0.94	39.5	D	-	-	1.04	53.4	D	-	-
EBL	0.29	25.6	C	TWLTL	20	0.72	35.5	D	TWLTL	55	0.40	28.7	C	TWLTL	17
EBTR	0.83	42.1	D	-	108	0.63	32.1	C	-	110	1.03	70.6	E	-	167
WBL	0.93	64.7	E	TWLTL	94	0.73	27.3	C	TWLTL	59	0.83	45.3	D	TWLTL	76
WBTR	0.43	28.0	C	-	59	0.89	38.6	D	-	184	0.93	43.7	D	-	168
NBL	0.17	25.4	C	TWLTL	15	0.55	33.9	C	TWLTL	49	0.30	24.1	C	TWLTL	30
NBTR	0.19	30.9	C	-	22	0.79	51.7	D	-	77	0.41	33.9	C	-	52
SBL	0.57	22.2	C	65	64	0.94	62.7	E	65	116	1.05	81.0	F	65	134
SBTR	0.29	26.8	C	-	43	0.54	39.8	D	-	63	0.25	27.4	C	-	36

The results of the LOS analysis indicate that the V/C ratio for the westbound through movement at the Mapleview Drive West / Essa Road intersection is operating outside the typical design limits noted in Section 3.2 during the PM peak hour; signal timing optimization, while maintaining the existing cycle length, is recommended at the Mapleview Drive West / Essa intersection during the PM peak hour to improve the intersection capacity. The V/C ratio for the westbound left turn, westbound through / right turn and southbound left turn movements at the Mapleview Drive West / Veteran's Drive intersection are operating outside the typical design limits noted in Section 3.2 during the PM peak hour; however, no infrastructure improvements are recommended as all critical movements are operating within theoretical capacity. The V/C ratio for the Mapleview Drive West / Veteran's Drive intersection operates outside the typical design limits noted in Section 3.2 during the SAT peak hour. Signal timing optimization and extending the cycle length is recommended at the Mapleview Drive West / Veteran's Drive intersection during the SAT peak hour to improve the intersection capacity. **Table 8 and 9** illustrate the results of the LOS analysis with the above noted improvement. Detailed output of the Synchro analysis can be found in **Appendix D**.

Table 8 – Background (2031) LOS with Improvements

Location (E-W Street / N-S Street)	Weekday PM Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.76	37.5	D	-	-
EBL	0.95	67.3	E	95	80
EBTR	0.60	28.9	C	-	85
WBL	0.48	20.7	C	TWLTL	29
WBT	0.98	55.8	E	-	170
WBR	0.26	25.2	C	-	22
NBL	0.34	30.6	C	80	34
NBT	0.51	32.8	C	-	74
NBR	0.07	25.8	C	30	12
SBL	0.43	21.0	C	55	34
SBT	0.28	21.0	C	-	47
SBR	0.28	21.1	C	30	29

Table 9 – Background (2031) LOS with Improvements

Location (E-W Street / N-S Street)	Saturday (MID) Peak Hour				
	V/C	Delay (s)	LOS	95% Queue (m)	
				Storage	Model
Mapleview Drive West / Veteran's Drive (signalized)	0.98	42.8	D	-	-
EBL	0.46	27.4	C	TWLTL	18
EBTR	0.91	45.2	D	-	164
WBL	0.86	51.8	D	TWLTL	89
WBTR	0.82	34.6	C	-	151
NBL	0.50	38.4	D	TWLTL	32
NBTR	0.71	49.3	D	-	62
SBL	0.99	65.2	E	65	156
SBTR	0.25	27.4	C	-	34

The results of the LOS analysis indicate that V/C ratio for the eastbound left turn and westbound through movements at the Mapleview Drive West / Essa Road intersection are operating outside the typical design limits noted in Section 3.2 during the PM peak hour; and the eastbound through / right turn, westbound left turn, and southbound left turn movements at the Mapleview Drive West / Veteran's Drive intersection are operating outside the typical design limits noted in Section 3.2 during the SAT peak hour; however, no infrastructure improvements are recommended as all critical movements are operating within theoretical capacity.

The results of the LOS analysis indicate that all other study area intersections are operating within the typical design limits noted in Section 3.2.

A review of the need for an auxiliary right turn lane at the study area unsignalized intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, an auxiliary right turn lane is not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area unsignalized intersections (results are provided in **Appendix F**).

The anticipated 95th percentile queue length for the eastbound through / right turn movement at the Mapleview Drive West / Essa Road intersection exceeds the existing storage length for the eastbound left turn movements; however, no improvements are required as the eastbound left turn traffic can access the eastbound left turn lane via the taper length. The 95th percentile queue length for the southbound left turn movement at the Mapleview Drive West / Veteran's Drive intersection exceeds the existing storage length for the southbound left turn movements; however, no improvements are required as the eastbound left turn queue can be accommodated via the TWLTL.

The anticipated 95th percentile queue lengths for all movements at the study area intersections can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

4 Proposed Development Traffic Generation and Assignment

4.1 Traffic Generation

The traffic generation for the proposed development has been based on the ITE Trip Generation Manual. The following ITE land uses have been applied to estimate the traffic from the proposed development:

- ITE land use 934 (Fast food restaurant with drive-through window) – General Urban / Suburban Setting;
- ITE land use 850 (Supermarket) – General Urban / Suburban Setting;
- ITE land use 821 (Shopping Plaza (40-140K)) – General Urban / Suburban Setting; and
- ITE land use 822 (Strip Retail Plaza (<40K)) – General Urban / Suburban Setting.

The proposed development commercial space is less than 40,000 sq.ft.; consequently, ITE land use 822 is more applicable for the commercial space of the proposed development. However, ITE land use 821 has been used for the AM peak hour as the sample size for ITE land use 822 is small for the AM peak hour.

The estimated trip generation of the proposed development is illustrated below in **Table 10**. The AM and PM peak hour traffic generation for the proposed development do not exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual

Table 10 – Estimated Traffic Generation of Proposed Development

Land Use	Size	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Shopping Plaza (40-140K) ITE land use 821	6,510 sq.ft.	7	5	12	-	-	-			
Strip Retail Plaza (<40K) ITE land use 822		-	-	-	22	21	43	22	21	43
Fast food restaurant with drive-through window ITE Land Use:934	1,996 sq.ft.	46	44	90	34	32	66	57	54	111
Supermarket ITE Land Use:850	51,165 sq.ft.	53	36	89	169	169	338	259	258	517
TOTAL RETAIL		60	41	101	191	190	381	281	279	560
TOTAL TRIP GENERATION		106	85	191	225	222	447	338	333	671
INTERNAL CAPTURE		-10	-10	-20	-23	-23	-46	-23	-23	-46
NET SITE GENERATION		95	76	171	202	198	400	315	309	624
PASS-BY TRIPS (ITE Land Use: 822 and 821)*		-	-	-	-6	-6	-12	-5	-4	-9
PASS-BY TRIPS (ITE Land Use: 934)**		-20	-20	-40	-12	-11	-23	-24	-24	-48
PASS-BY TRIPS (ITE Land Use: 850)***		-	-	-	-39	-39	-78	-48	-47	-95
PRIMARY TRIPS		75	56	131	145	142	287	238	234	472

*Commercial pass-by trips for the AM, PM and SAT peak hour are 0% and 40%, and 31% respectively, according to the ITE data for ITE land use 821 (Shopping Plaza).

**Fast Food restaurant pass-by trips for the AM, PM and SAT peak hour are 50%, 55% and 55% respectively, according to the ITE data for ITE land use 934.

***Commercial pass-by trips for the AM, PM and SAT peak hour are 0%, 24% and 19% respectively, according to the ITE data for ITE land use 850 (Supermarket).

No transportation modal split has been applied to the above-noted traffic generation calculation.

4.2 Traffic Assignment

For the purposes of this study, it has been assumed that all traffic generated by the proposed development will be new traffic and would not be in the study area if the development was not constructed.

In Section 4.1, the anticipated percentage of new traffic entering and exiting during the peak hour was established.

The distribution of traffic for the proposed development is based on the distribution of the existing traffic volumes within the study area. **Table 11** illustrates the calculation of the distribution of ingress and egress traffic for the commercial component of the proposed development.

Table 11 – Proposed Development Traffic Distribution – Commercial

Travel Direction (to / from)	AM Peak Hour		PM Peak Hour		SAT Peak Hour	
	Ingress	Egress	Ingress	Egress	Ingress	Egress
West via Mapleview Drive West	28%	15%	16%	26%	18%	19%
North via Essa Road	14%	11%	12%	14%	12%	12%
South via Essa Road	9%	9%	8%	6%	9%	7%
South via Hollyholme Farm Road	1%	2%	2%	1%	2%	1%
South via Veteran's Drive	8%	17%	14%	10%	10%	10%
North via Veteran's Drive	16%	9%	14%	17%	15%	16%
East via Mapleview Drive West	24%	37%	34%	26%	34%	35%
TOTAL	100%	100%	100%	100%	100%	100%

Using the traffic distributions pattern noted above, the primary and pass-by traffic assignment for the proposed development was calculated for the AM, PM and SAT peak hour and is illustrated in **Figure 10**, and **11**. The total traffic assignment for the proposed development is illustrated in **Figure 12**.

4.3 Total Horizon Year Traffic Volumes with the Proposed Development

For the total (2026 and 2031) horizon year traffic volumes, the proposed development traffic was added to the background (2026 and 2031) traffic volumes. The resulting total (2026 and 2031) horizon year traffic volumes for the AM, PM and SAT peak hour are illustrated in **Figures 13** and **14**.

5 Intersection Operation with Proposed Development

5.1 Total (2026) Intersection Operation

The results of the LOS analysis under total (2026) traffic volumes during the AM, PM and SAT peak hour can be found below in **Table 12**. Existing intersection geometry and traffic control have been utilized for this scenario with the recommended traffic signal optimization as noted in section 3.4 and 3.5. Detailed output of the Synchro analysis can be found in **Appendix G**.

Table 12 – Total (2026) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.53	28.0	C	-	-	0.70	32.1	C	-	-	0.65	30.4	C	-	-
EBL	0.41	20.6	C	95	37	0.89	53.3	D	95	70	0.56	25.5	C	95	29
EBTR	0.85	38.6	D	-	113	0.58	29.1	C	-	80	0.82	38.4	D	-	100
WBL	0.51	25.9	C	TWLTL	22	0.45	19.6	B	TWLTL	29	0.69	30.7	C	90	40
WBT	0.32	28.7	C	-	36	0.91	42.4	D	-	147	0.80	37.5	D	-	100
WBR	0.05	26.5	C	-	3	0.21	24.4	C	-	19	0.19	27.1	C	-	19
NBL	0.10	23.6	C	80	14	0.30	29.1	C	80	31	0.12	24.3	C	80	15
NBT	0.27	25.5	C	-	42	0.45	31.0	C	-	66	0.39	27.8	C	-	60
NBR	0.11	23.5	C	30	15	0.07	25.4	C	30	12	0.13	24.3	C	30	16
SBL	0.28	16.0	B	55	31	0.43	20.5	C	55	36	0.49	17.7	B	55	49
SBT	0.24	16.7	B	-	42	0.24	20.1	C	-	41	0.23	16.7	B	-	40
SBR	0.13	15.5	B	30	13	0.23	20.0	C	30	22	0.10	15.3	B	30	12
Mapleview Drive West / West Access (unsignalized)	-	0.1	A	-	-	-	0.2	A	-	-	-	0.3	A	-	-
NB	0.03	9.1	A	-	-	0.05	8.8	A	-	-	0.09	9.3	A	-	-
Mapleview Drive West / East Access (signalized)	0.41	16.6	B	-	-	0.47	14.1	B	-	-	0.59	16.7	B	-	-
EBTR	0.77	20.0	B	-	65	0.62	18.7	B	-	48	0.80	22.9	C	-	70
WBL	0.28	10.6	B	TWLTL	9	0.51	11.0	B	TWLTL	17	0.69	16.6	B	TWLTL	39
WBT	0.21	9.2	A	-	16	0.57	11.2	B	-	49	0.45	9.6	A	-	41
NBL	0.06	13.7	B	-	9	0.20	15.8	B	-	23	0.30	19.3	B	-	30
NBR	0.02	13.4	B	-	-	0.06	14.5	B	-	-	0.10	17.2	B	-	12
Mapleview Drive West / Hollyholme Farm Road (signalized)	0.36	17.4	B	-	-	0.43	17.8	B	-	-	0.39	17.5	B	-	-
EBL	0.01	12.4	B	TWLTL	2	0.08	13.8	B	TWLTL	4	0.08	13.0	B	TWLTL	4
EBTR	0.53	17.9	B	-	88	0.38	15.8	B	-	64	0.50	16.9	B	-	94
WBL	0.04	13.4	B	TWLTL	2	0.00	12.4	B	TWLTL	1	0.01	12.7	B	TWLTL	1
WBTR	0.23	14.7	B	-	34	0.57	18.2	B	-	107	0.51	17.0	B	-	93
NBL	0.04	30.2	C	-	7	0.17	26.2	C	-	23	0.19	27.5	C	-	23
NBTR	0.01	31.0	C	-	-	0.00	29.8	C	-	-	0.01	31.2	C	-	-
SBL	0.08	24.6	C	-	10	0.06	29.2	C	-	8	0.06	28.4	C	-	8
SBTR	0.01	27.8	C	-	-	0.01	32.0	C	-	-	0.01	32.3	C	-	-
Mapleview Drive West / Veteran's Drive (signalized)	0.72	31.7	C	-	-	0.85	35.1	D	-	-	0.95	49.0	D	-	-
EBL	0.25	25.0	C	TWLTL	20	0.83	45.4	D	TWLTL	76	0.53	28.3	C	TWLTL	28
EBTR	0.70	37.5	D	-	93	0.54	28.1	C	-	99	0.99	60.8	E	-	155
WBL	0.83	44.4	D	TWLTL	75	0.61	19.9	B	TWLTL	41	0.75	34.8	C	TWLTL	54
WBTR	0.37	27.3	C	-	53	0.80	32.8	C	-	150	0.98	54.9	D	-	161
NBL	0.13	24.8	C	TWLTL	14	0.54	34.4	C	TWLTL	48	0.30	23.2	C	TWLTL	31
NBTR	0.17	30.1	C	-	20	0.74	49.7	D	-	66	0.35	32.1	C	-	45
SBL	0.50	20.8	C	65	57	0.84	44.8	D	65	95	0.88	40.0	D	65	99
SBTR	0.27	26.1	C	-	39	0.52	40.1	D	-	57	0.23	27.3	C	-	32

The results of the LOS analysis indicate that V/C ratio for the eastbound left turn and westbound through movements at the Mapleview Drive West / Essa Road intersection are operating outside the typical design limits noted in Section 3.2 during the PM peak hour; and the eastbound through / right turn, westbound through / right turn, and southbound left turn movements at the Mapleview Drive West / Veteran's Drive intersection are operating outside the typical design limits noted in Section 3.2 during the SAT peak hour; however, no infrastructure improvements are recommended as all critical movements are operating within theoretical capacity.

The results of the LOS analysis indicate that all other study area intersections are operating within the typical design limits noted in Section 3.2.

A review of the need for an auxiliary right turn lane at the study area unsignalized intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, an auxiliary right turn lane is not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area unsignalized intersections (results are provided in **Appendix F**).

The anticipated 95th percentile queue length for the eastbound through / right turn movement at the Mapleview Drive West / Essa Road intersection exceeds the existing storage length for the eastbound left turn movements; however, no improvements are required as the eastbound left turn movement can access the eastbound left turn lane via the taper length. The 95th percentile queue length for the southbound left turn movement at the Mapleview Drive West / Veterans Drive intersection exceeds the existing storage length for the southbound left turn movements; however, no improvements are required as the eastbound left turn queue can be accommodated via the TWLTL.

The anticipated 95th percentile queue lengths for all movements at the study area intersections can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

5.2 Total (2031) Intersection Operation

The results of the LOS analysis under total (2031) traffic volumes during the AM, PM and SAT peak hour can be found below in **Table 13**. Existing intersection geometry and traffic control have been utilized for this scenario with the recommended traffic signal optimization noted in section 3.5. Detailed output of the Synchro analysis can be found in **Appendix G**.

Table 13 – Total (2031) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Essa Road (signalized)	0.59	31.7	C	-	-	0.78	38.8	D	-	-	0.73	33.1	C	-	-
EBL	0.45	21.4	C	95	40	0.99	79.4	E	95	82	0.62	27.9	C	95	32
EBTR	0.93	47.5	D	-	142	0.65	30.7	C	-	92	0.87	42.2	D	-	115
WBL	0.53	25.4	C	TWLTL	25	0.55	21.1	C	TWLTL	33	0.79	38.7	D	TWLTL	55
WBT	0.34	28.1	C	-	41	0.99	57.6	E	-	176	0.85	40.2	D	-	115
WBR	0.09	25.9	C	-	14	0.29	25.0	C	-	26	0.23	27.1	C	-	21
NBL	0.12	25.4	C	80	14	0.34	30.6	C	80	34	0.14	25.7	C	80	17
NBT	0.31	27.8	C	-	46	0.50	32.6	C	-	72	0.44	30.0	C	-	66
NBR	0.12	25.3	C	30	16	0.11	26.3	C	30	16	0.16	25.9	C	30	19
SBL	0.32	17.6	B	55	34	0.50	21.9	C	55	39	0.57	20.0	C	55	53
SBT	0.28	18.5	B	-	46	0.27	20.9	C	-	45	0.26	17.9	B	-	44
SBR	0.14	16.9	B	30	13	0.28	21.2	C	30	30	0.11	16.3	B	30	12
Mapleview Drive West / West Access (unsignalized)	-	0.1	A	-	-	-	0.2	A	-	-	-	0.3	A	-	-
NB	0.03	9.3	A	-	-	0.05	9.0	A	-	-	0.09	9.4	A	-	-
Mapleview Drive West / East Access & MVD West Access (signalized)	0.47	17.0	B	-	-	0.55	14.5	B	-	-	0.67	18.2	B	-	-
EBL	0.04	13.2	B	TWLTL	4	0.24	16.4	B	TWLTL	9	0.25	17.3	B	TWLTL	10
EBTR	0.81	21.0	C	-	74	0.65	18.8	B	-	54	0.87	26.0	C	-	88
WBL	0.29	10.8	B	TWLTL	9	0.53	11.2	B	TWLTL	17	0.70	17.5	B	TWLTL	41
WBTR	0.23	9.0	A	-	18	0.63	11.8	B	-	59	0.52	10.0	B	-	48
NBL	0.09	14.6	B	-	10	0.28	17.9	B	-	24	0.40	21.8	C	-	31
NBTR	0.02	14.0	B	-	-	0.06	15.3	B	-	-	0.10	17.4	B	-	-
SBL	0.14	14.6	B	-	14	0.16	15.7	B	-	15	0.18	17.6	B	-	15
SBTR	0.05	14.1	B	-	-	0.05	15.0	B	-	3	0.05	16.7	B	-	3
Mapleview Drive West / Hollyholme Farm Road (signalized)	0.42	18.3	B	-	-	0.48	19.3	B	-	-	0.45	19.0	B	-	-
EBL	0.02	12.5	B	TWLTL	3	0.21	14.5	B	TWLTL	7	0.19	13.3	B	TWLTL	7
EBTR	0.61	19.1	B	-	107	0.41	15.5	B	-	74	0.54	17.1	B	-	106
WBL	0.06	14.3	B	TWLTL	3	0.00	12.9	B	TWLTL	1	0.01	13.5	B	TWLTL	1
WBTR	0.27	15.1	B	-	41	0.66	20.6	C	-	131	0.59	19.1	B	-	113
NBL	0.04	30.2	C	-	6	0.18	29.7	C	-	23	0.20	29.6	C	-	23
NBTR	0.01	31.1	C	-	-	0.00	33.4	C	-	-	0.01	33.5	C	-	-
SBL	0.10	24.6	C	-	13	0.09	30.5	C	-	11	0.10	30.5	C	-	12
SBTR	0.01	27.7	C	-	-	0.02	34.5	C	-	-	0.01	34.4	C	-	-

Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / Veteran's Drive (signalized)	0.79	36.0	D	-	-	0.96	42.0	D	-	-	1.01	47.0	D	-	-
EBL	0.32	25.5	C	TWLTL	20	0.90	62.2	E	TWLTL	83	0.73	39.9	D	TWLTL	45
EBTR	0.86	43.7	D	-	108	0.66	32.2	C	-	118	0.95	49.7	D	-	179
WBL	0.92	63.0	E	TWLTL	94	0.74	30.1	C	TWLTL	58	0.95	73.9	E	TWLTL	92
WBTR	0.44	28.4	C	-	59	0.93	41.8	D	-	197	0.93	43.4	D	-	180
NBL	0.19	25.4	C	TWLTL	15	0.65	36.5	D	TWLTL	56	0.63	42.6	D	TWLTL	38
NBTR	0.19	30.9	C	-	22	0.78	51.3	D	-	75	0.71	48.8	D	-	60
SBL	0.57	22.2	C	65	64	0.94	62.7	E	65	116	0.95	53.4	D	65	150
SBTR	0.23	27.0	C	-	43	0.57	41.1	D	-	63	0.25	27.6	C	-	33

The results of the LOS analysis indicate that V/C ratio for the eastbound through right, westbound through and eastbound left turn movements at the Mapleview Drive West / Essa Road intersection are operating outside the typical design limits noted in Section 3.2 during the AM and PM peak hours; and the eastbound through / right turn, eastbound left turn, westbound through / right turn, and southbound left turn movements at the Mapleview Drive West / Veteran's Drive intersection are operating outside the typical design limits noted in Section 3.2 during the PM and SAT peak hours; however, no infrastructure improvements are recommended as all critical movements are operating within theoretical capacity.

The results of the LOS analysis indicate that all other study area intersections are operating within the typical design limits noted in Section 3.2.

A review of the need for an auxiliary right turn lane at the study area unsignalized intersections was completed as part of our analysis. The results of the Synchro analysis indicate that there is excess capacity for all right turn movements; consequently, an auxiliary right turn lane is not recommended.

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted at the study area unsignalized intersections (results are provided in **Appendix F**).

The anticipated 95th percentile queue length for the eastbound through / right turn movement at the Mapleview Drive West / Essa Road intersection exceeds the existing storage length for the eastbound left turn movements; however, no improvements are required as the eastbound left turn movement can access the eastbound left turn lane via the taper length. The 95th percentile queue length for the southbound left turn movement at the Mapleview Drive West / Veteran's Drive intersection exceeds the existing storage length for the southbound left turn movements; however, no improvements are required as the eastbound left turn queue can be accommodated via the TWLTL.

The anticipated 95th percentile queue lengths for all movements at the study area intersections can be accommodated by the existing auxiliary lane storage lengths.

No infrastructure improvements are recommended within the study area.

5.3 Sight Distance Review

A review of the available sight distance for the proposed Site Access driveways was completed as part of this analysis.

The sight distance east and west of the West Access at Mapleview Drive West is greater than the minimum stopping identified in the Transportation Association of Canada *Design Guide for Canadian Roads* (2017) [TAC Guidelines] for a design speed of 80km/h (130 and 170 metres).

The sight distance east and west of the East Access at Mapleview Drive West is greater than the minimum stopping identified in the Transportation Association of Canada *Design Guide for Canadian Roads* (2017) [TAC Guidelines] for a design speed of 80km/h (130 and 170 metres).

There are no issues with the sight distance available for the proposed Site Access driveways.

5.4 Site Access

The proposed spacing between the West Access and the existing driveway to the west (approximately 56 metres, measured edge to edge of driveways) is in excess of the suggested minimum corner clearance requirements for a driveway as identified in the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 35 metres for unsignalized condition along an arterial road. The proposed spacing between the West Access and the proposed East Access to the east (approximately 120 metres, measured edge to edge of driveways) is in excess of the suggested minimum corner clearance requirements for a driveway as identified in the TAC Guidelines – Figure 8.8.2 (Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections) – 70 metres for signalized condition along an arterial road.

The proposed spacing between the East Access and Essa Road to the west (approximately 328 metres, measured centre of intersection to centre of intersection), is in excess of the suggested minimum signalized intersection spacing requirements as identified in the TAC Guidelines, Section 9.4.2.1 (200 metres along an arterial road).

The proposed spacing between the East Access and Hollyholme Farm Road to the east (approximately 150 metres, measured centre of intersection to centre of intersection), is less than the suggested minimum signalized intersection spacing requirements as identified in the TAC Guidelines, Section 9.4.2.1 (200 metres along an arterial road). However, as illustrated in Section 5.1 and 5.2, there are no issues with back-to-back queuing of left turning vehicles and the two adjacent intersections are able to safely and efficiently convey the total 2031 traffic volumes (critical scenario). Consequently, the proposed spacing is acceptable for the intended use.

The West Access will operate efficiently as a RIRO access, with one-way stop control for northbound movements. No lane improvements are recommended on Mapleview Drive West at the West Access. A single southbound and northbound lane at the West Access will provide the necessary capacity to service the proposed development.

The East Access will operate efficiently as a signalized full-movement access. No lane improvements are recommended on Mapleview Drive West at the East Access. Two northbound lanes (northbound left turn and northbound through / right turn) and a southbound lane at the East Access will provide the necessary capacity to service the proposed development.

The City has expressed some concerns with the signalization of the Mapleview Drive West / East Access & MVD West Access. The following supplementary analysis has been prepared to illustrate the traffic operations at this intersection for the unsignalized condition. The results of the LOS analysis for the unsignalized configuration of the Mapleview Drive West / East Access & MVD West Access under total (2026 & 2031) traffic volumes during the AM and PM peak hour can be found below in **Table 13**. Detailed output of the Synchro analysis can be found in **Appendix G**.

Table 14 – Total (2026 & 2031) LOS

Total (2026)															
Location (E-W Street / N-S Street)	Weekday AM Peak Hour					Weekday PM Peak Hour					Saturday (MID) Peak Hour				
	V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)		V/C	Delay (s)	L O S	95% Queue (m)	
				Storage	Model				Storage	Model				Storage	Model
Mapleview Drive West / East Access (unsignalized)	-	0.9	A	-	-	-	2.0	A	-	-	-	4.3	A	-	-
NBL	0.12	18.2	B	-	-	0.34	21.7	C	-	-	0.68	50.0	D	-	-
Total (2031)															
Mapleview Drive West / East Access (unsignalized)	-	1.6	A	-	-	-	3.8	A	-	-	-	10.4	C	-	-
NBL	0.16	22.9	C	-	-	0.50	36.2	C	-	-	1.01	137.3	F	-	-
SBL	0.14	14.8	B	-	-	0.51	62.1	D	-	-	0.82	148.5	F	-	-

Based on the Ontario Traffic Manual Book 12 *Signal Justification*, traffic signals are not warranted for the total 2031 scenario at the Mapleview Drive West / East Access & MVD West Access intersection (results are provided in **Appendix F**); however, as illustrated by the Synchro analysis, the northbound and southbound left turn movements would experience a very long control delay. As outlined above, the location of the East Access can accommodate a signalized intersection without causing operational or traffic safety issues at the adjacent intersections and without compromising the transportation capacity for the corridor.

A full-movement signalized East Access provides the following advantages:

- Consolidation of full-movement access onto Mapleview Drive West
 - The proposed internal driveways with adjacent properties will facilitate interaction between existing and future land-uses along the south side of Mapleview Drive West.
 - Consolidation of full-movement access will improve traffic operations and traffic capacity along this critical corridor (Mapleview Drive West).
 - Interaction between the adjacent properties may occur for direct access and also in the form of multi-stop trips (internal capture).
 - The interconnected properties and consolidated full-movement access have been coordinated for the two adjacent properties; however, with the anticipated redevelopment along this corridor, it is expected that this interconnected area may be expanded to include additional properties beyond the adjacent properties.
 - The above-noted benefits of the full-movement access consolidation will also apply to the proposed development on the north side of Mapleview Drive West.
- Facilitate planned development density increases
 - Planned future redevelopment along the south side of Mapleview Drive West, between Essa Road and Holyholme Farm Road will have the opportunity to access the full-movement signalized East Access.
- Increased access for active transportation
 - The proposed development is intended to service the residential community in the surrounding area, including the proposed 1,217 residential units within the Mapleview & Essa Development. The proposed signalized East Access provide a safe and direct location to cross the Mapleview Drive West corridor.
 - The signalized East Access will provide improved permeability across Mapleview Drive West and avoid long gaps between controlled crossings, which would result in a corridor that is divided and inaccessible for active transportation users.

- Reduce travel distance for motorists
 - The full-movement signalized access reduce the control delay for northbound and southbound left-turn movement and allow drivers to take the shortest route to their destination.
 - If the East Access is restricted to RIRO, drivers would need to reroute for destinations from the east and to the west, which would increase the travel distance required.
- Optimal location for a full-movement access
 - The proposed location for the East Access is the optimal for a full-movement access between Essa Road and Hollyholme Farm Road, balanced based on the proportionate volume of traffic conveyed by each of the above-noted adjacent intersection.
 - If this property is developed without a full-movement signalized East Access with the driveway aligned with the development on the north side of Mapleview Drive West, future development intensification between Essa Road and Hollyholme Farm Road, east and west of the subject site will be too close to either Essa Road or Hollyholme Farm Road for a full-movement signalized access.

Based on this supplementary analysis, traffic signals are recommended at the Mapleview Drive East / East Access & MVD West Access.

5.5 Site Circulation

The proposed Site Plan has been designed to accommodate pedestrian, bicycle, vehicle traffic. Pedestrian and bicycle traffic will access the site via the existing sidewalk on the south side of Mapleview Drive West. There are two north / south routes connecting the sidewalk on Mapleview Drive West to Building C. The eastern route extends along the front (west side) of Building B and the western route extends long the front (east side) of Building A. Bicycle traffic may also travel along the driveways as mixed traffic.

Building B provides a drive-through on the east side of the building. The tenant for Building B will be a low generator drive-through restaurant, which is considered to be a medium – low generator for drive-through stacking. The proposed design provides 45 metres of stacking (measured from the drive-through window), which is less than the City's standard for a medium traffic generator (60 metres); however, the proposed design provides stacking space for three vehicles past the drive-through window (additional 15 metres). It is also noted that the drive-through stacking is located away from the primary traffic aisles within the site and will not impact ingress or egress movements onto Mapleview Drive West.

6 Transportation Demand Management

The following section provides existing and planned techniques incorporated in the design for the subject site which will help to address the transportation demand in the study area.

6.1 Transit Network

As outlined in Section 2.4, the Subject Site is well serviced by the City's transit network via the three bus routes within the study area; No.2 (Dunlop - Park Place), No.7 (Grove - Bear Creek), and No. 8 (RVH – Park Place).

As noted in Section 2.2, HOV lanes are planned on Essa Road and Mapleview Drive West, which may be designed to improve access for transit vehicles.

6.2 Pedestrian and Cycling Network

The proposed development has direct access to the existing sidewalk on the south side of Mapleview Drive West with branching connection to the network of existing sidewalk throughout the City.

As noted in Section 2.2, in-boulevard pathways are planned on Mapleview Drive West and Essa Road in the study area, which will increase pedestrian and cycling level-of-service in the area.

6.3 Recommendations

The developer is not constructing the proposed development for their own use, consequently, operational decisions are beyond their control; however, the following is a list of transportation demand management techniques that can be implemented for the proposed buildings:

- Preparation and distribution of transit information packages to all new employees;
- Provision of an information display board displayed in a central location of each building to illustrate travel information such as bicycle maps, local transit map/schedule and other relevant information;
- Provision preloaded transit cards or transit incentives to all employees;
- Provision of carpool/rideshare information for employees;
- Pedestrian connections to the municipal pedestrian infrastructure;
- Illumination of pedestrian and bicycle infrastructure; and
- 20 bicycle parking spaces will be provided.

7 Parking Analysis

7.1 Parking Summary

The proposed parking supply for the subject site meets the parking requirements specified in the City Zoning By-law 2009-141. Accessible parking for the subject site is provided according to the City Zoning By-law 2009-141. The proposed parking breakdown is provided in **Table 14**.

Table 15 – Parking Statistics

Category	Zoning By-Law Section	Parking Standard	Size	Parking	
				Required	Provided
Retail	4.6.1	1 space per 30 sq.m.	605 sq.m	21	87 spaces
Supermarket	4.6.1	1 space per 30 sq.m.	4753 sq.m.	159	163 spaces
Restaurant	4.6.1	1 space per 4 persons	40 Persons	10	47 spaces
TOTAL PARKING				190 Spaces	297 Spaces
Accessible Parking	4.6.4	1 parking space plus 3% of required parking spaces	-	7 Spaces	16 Spaces

8 Summary

Plaza REIT retained **JD Engineering** to prepare this traffic impact study in support of the property municipally known as 315 & 323 Mapleview Drive, located on the south side of Mapleview Drive West, midblock between Essa Road and Hollyholme Farm Road, City of Barrie. The Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

The proposed development is anticipated to consist of a commercial plaza with three buildings; a total of 5358 sq.m. (57,675 sq.ft.) of a retail area and a 185 sq.m. (1,996 sq.ft.) restaurant with a drive-through.

1. The proposed development is expected to generate a total of 131 AM, 287 PM and 472 SAT peak hour primary trips and 40 AM, 113 PM and 152 SAT peak hour pass-by trips
2. Detailed turning movement traffic and pedestrian counts for the Mapleview Drive West / Essa Road, and Mapleview Drive West / Veteran's Drive intersections were obtained from the City. Detailed turning movement traffic and pedestrian counts for the Mapleview Drive West / Hollyholme Farm Road were obtained from a previous study completed by R.J. Burnside & Associates Limited.
3. An intersection operation analysis was completed at the study area intersections, using the existing (2023) and background (2026 and 2031) traffic volumes, with the adjacent development traffic and without the proposed development traffic. The following infrastructure improvements are recommended:

Mapleview Drive West / Veteran's Drive

Background (2026) Traffic Volumes

- Signal timing optimization during the PM peak hour and extend the cycle length.

Background (2031) Traffic Volumes

- Signal timing optimization during the SAT peak hour and extend the cycle length.

Mapleview Drive West / Essa Road:

Background (2031) Traffic Volumes

- Signal timing optimization during the PM peak hour while maintaining the existing cycle length.
4. An estimate of the amount of traffic that would be generated by the proposed development was prepared and assigned to the study area streets and intersections.
 5. An intersection operation analysis was completed under total (2026 and 2031) traffic volumes with the proposed development operational at the study area intersections. No additional geometric lane improvements or traffic signal improvements are recommended within the study area.
 6. The West Access will operate efficiently as a Right-In-Right-Out access, with one-way stop control for northbound movements. A single northbound and southbound lane at the West Access will provide the necessary capacity to service the proposed development.
 7. The East Access will operate efficiently as a signalized full-movement access. Two northbound lanes (northbound left and northbound through / right turn) and one southbound

lane at the East Access will provide the necessary capacity to service the proposed development.

8. The sight distance available east and west of the East Access at Mapleview Drive West meets the minimum stopping and intersection sight distance requirements.
9. The sight distance available east and west of the West Access at Mapleview Drive West meets the minimum stopping and intersection sight distance requirements.
10. A full-movement signalized East Access provides the following advantages
 - Consolidation of full-movement access onto Mapleview Drive West
 - Facilitate planned development density increases
 - Increased access for active transportation
 - Reduce travel distance for motorists
 - Optimal location for a full-movement access
11. The developer is not constructing the proposed development for their own use, consequently, operational decisions are beyond their control; however, a list of transportation demand management techniques have been provided for consideration.
12. The proposed parking supply for the subject site meets the parking requirements specified in the City Zoning By-law 2009-141.
13. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Figure 3 – Transit Service within Study Area

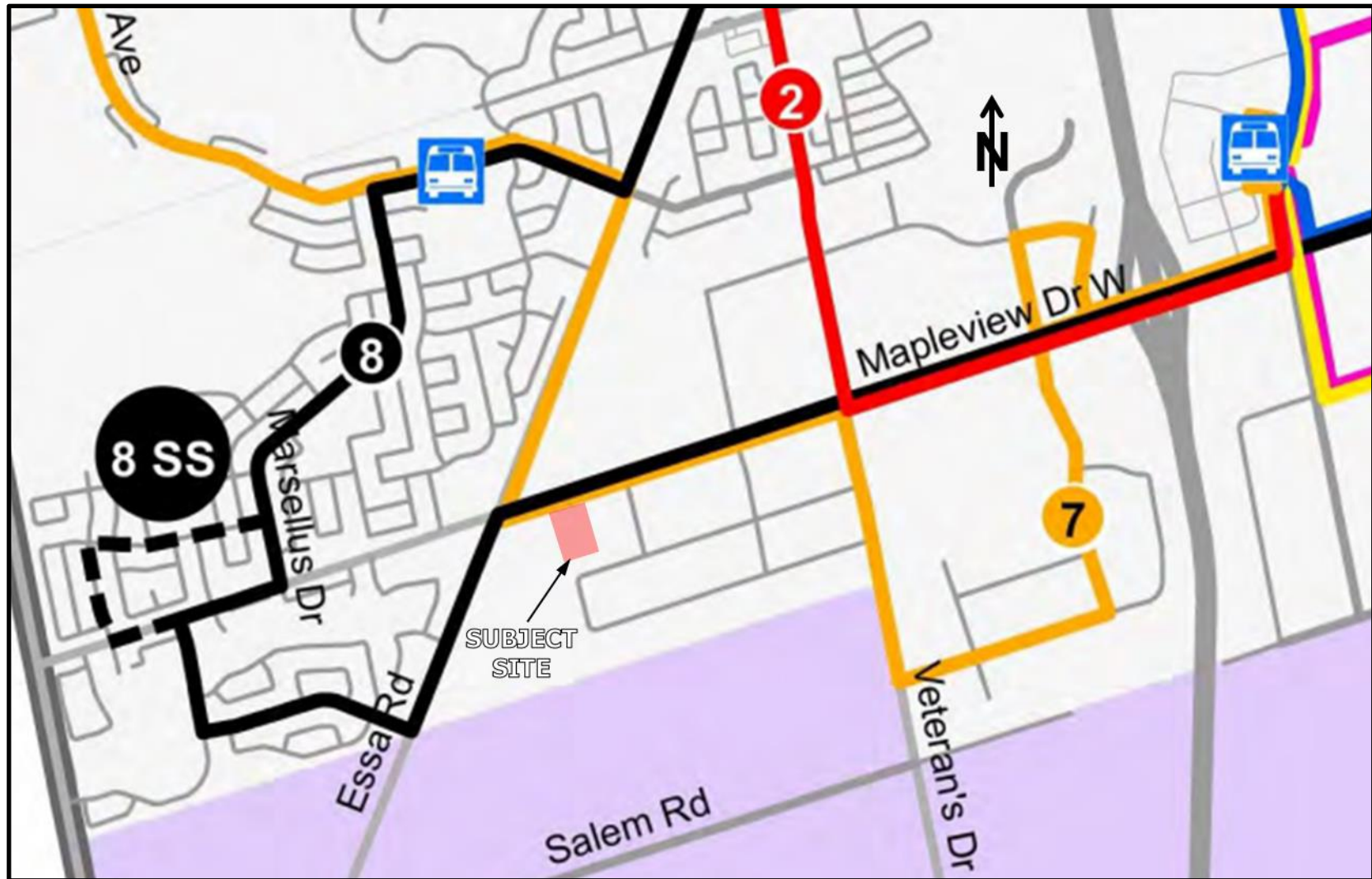


Figure 4 – Adjacent Developments within Study Area



Figure 5 – Maplevue & Essa Development Traffic Volumes within Study Area – 2026

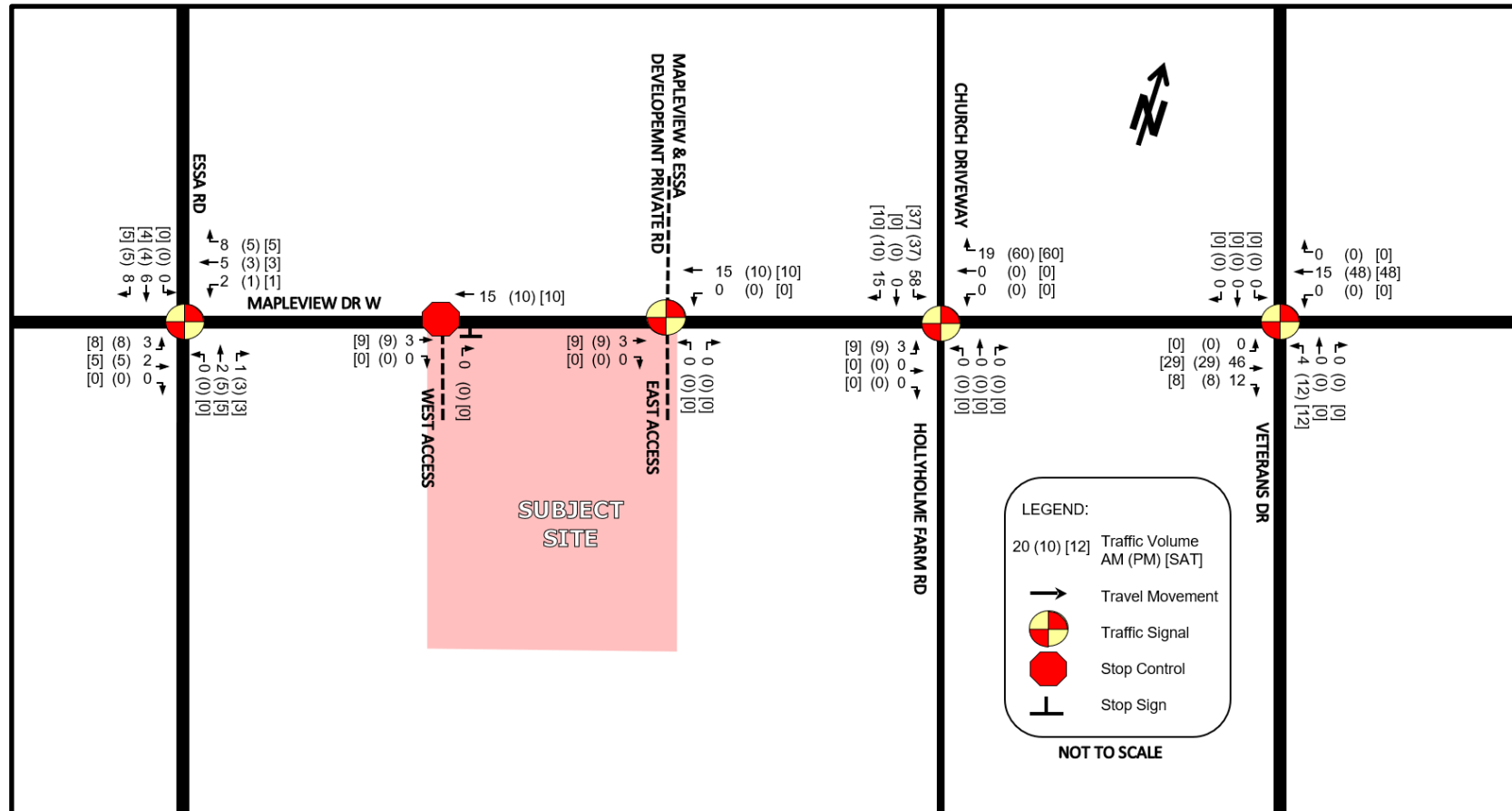


Figure 6 – Maplevue & Essa Development Traffic Volumes within Study Area – 2031

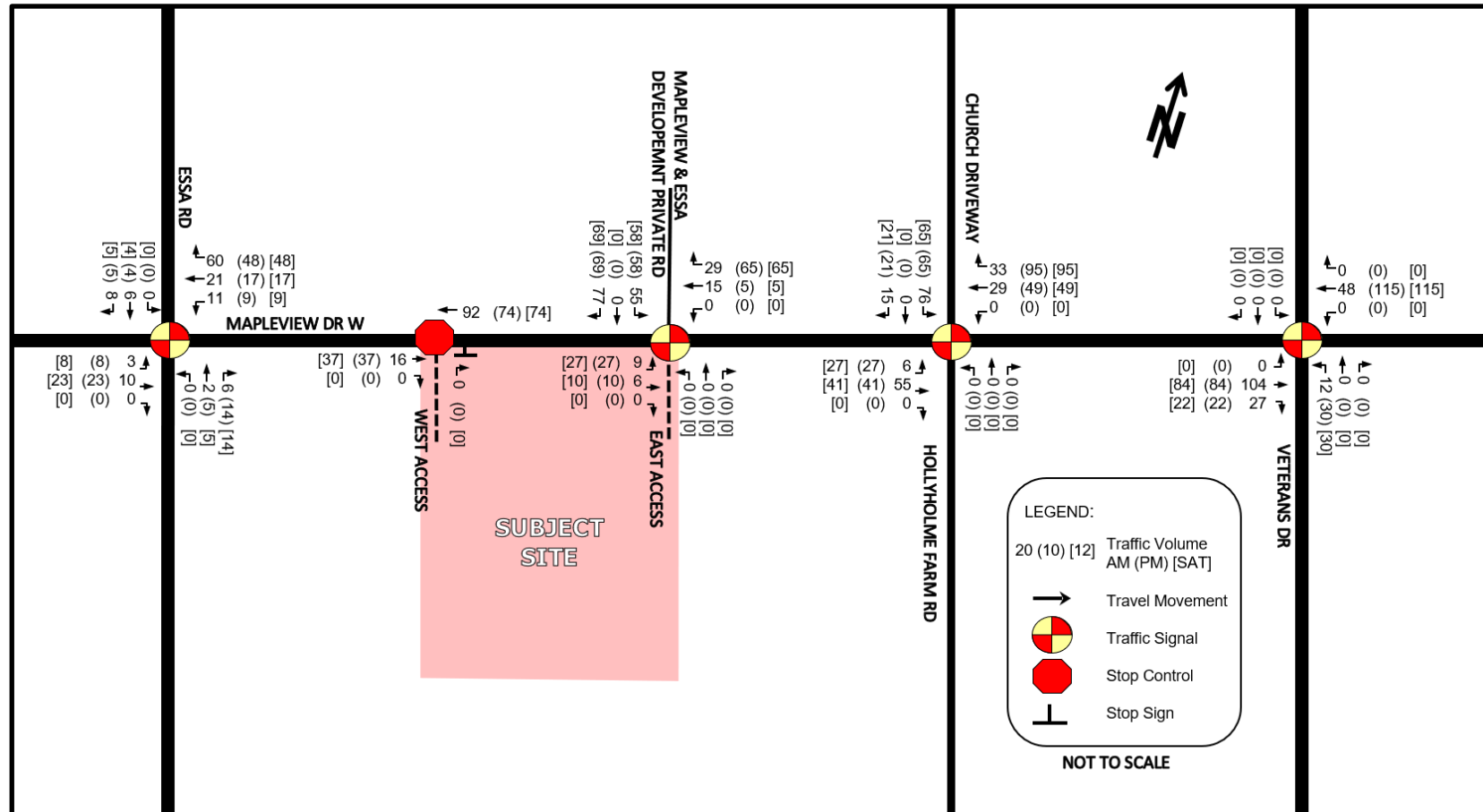


Figure 7 – Existing (2023) Traffic Volumes

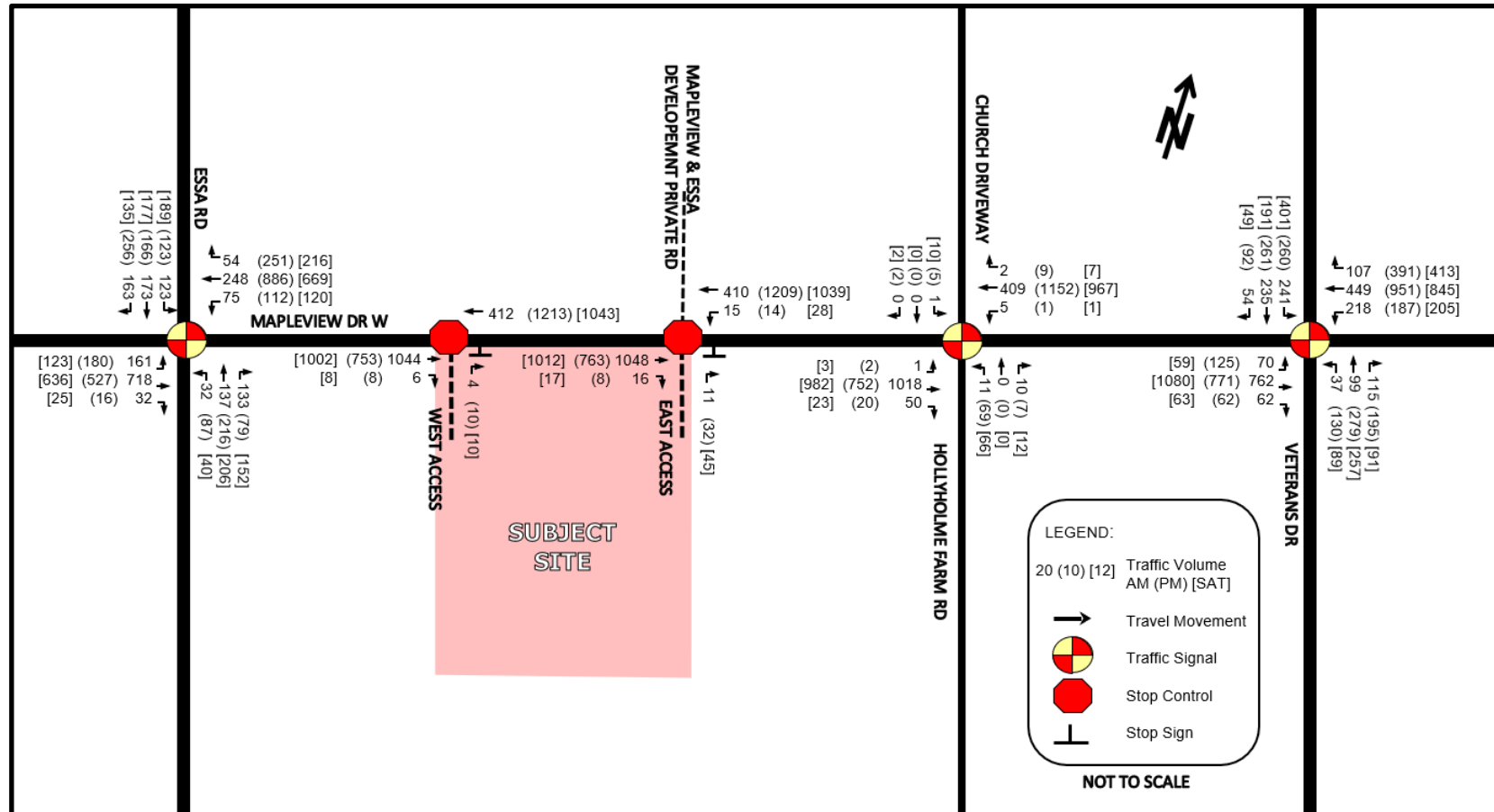


Figure 8 – Background (2026) Traffic Volumes

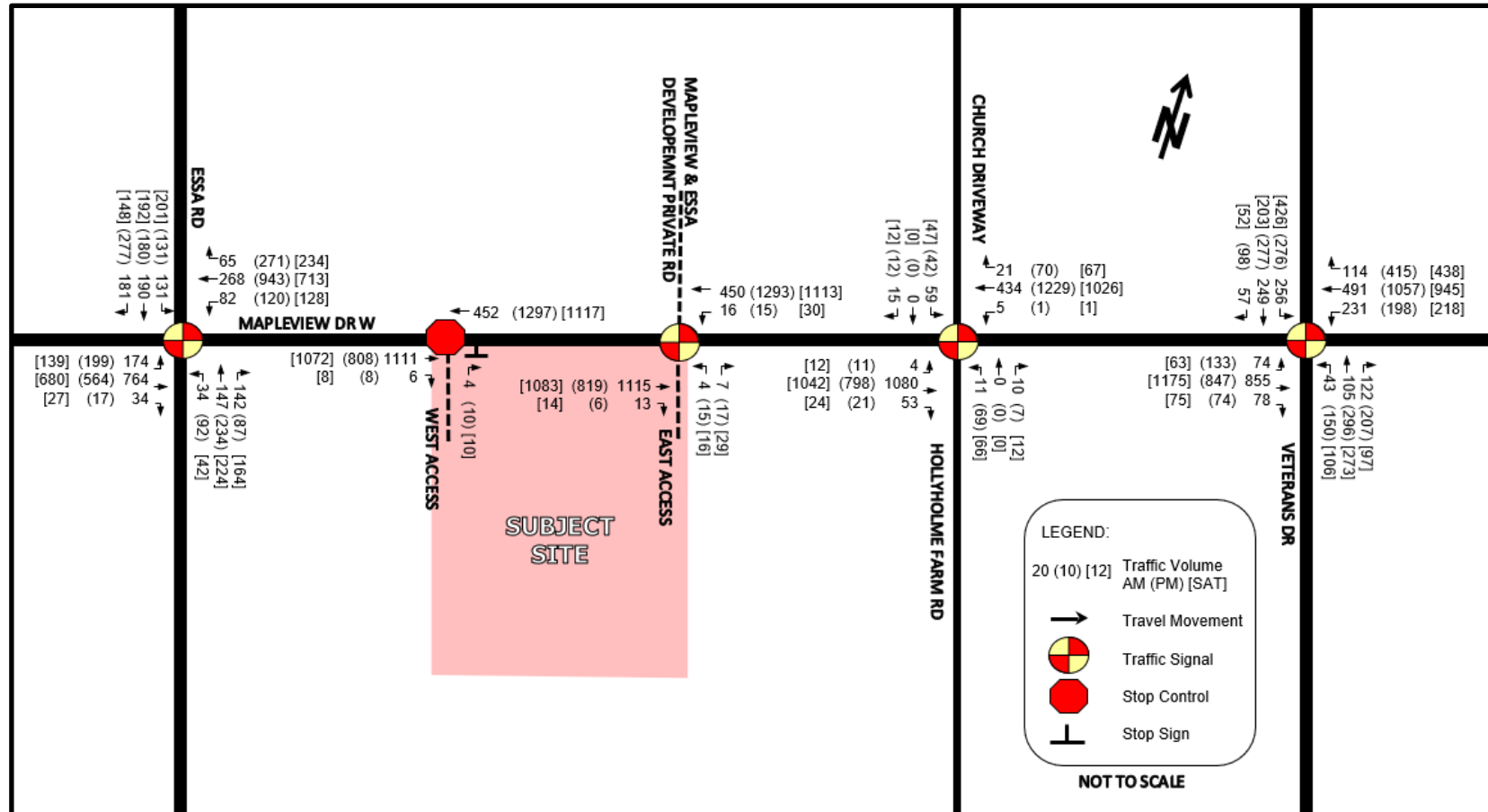


Figure 9 – Background (2031) Traffic Volumes

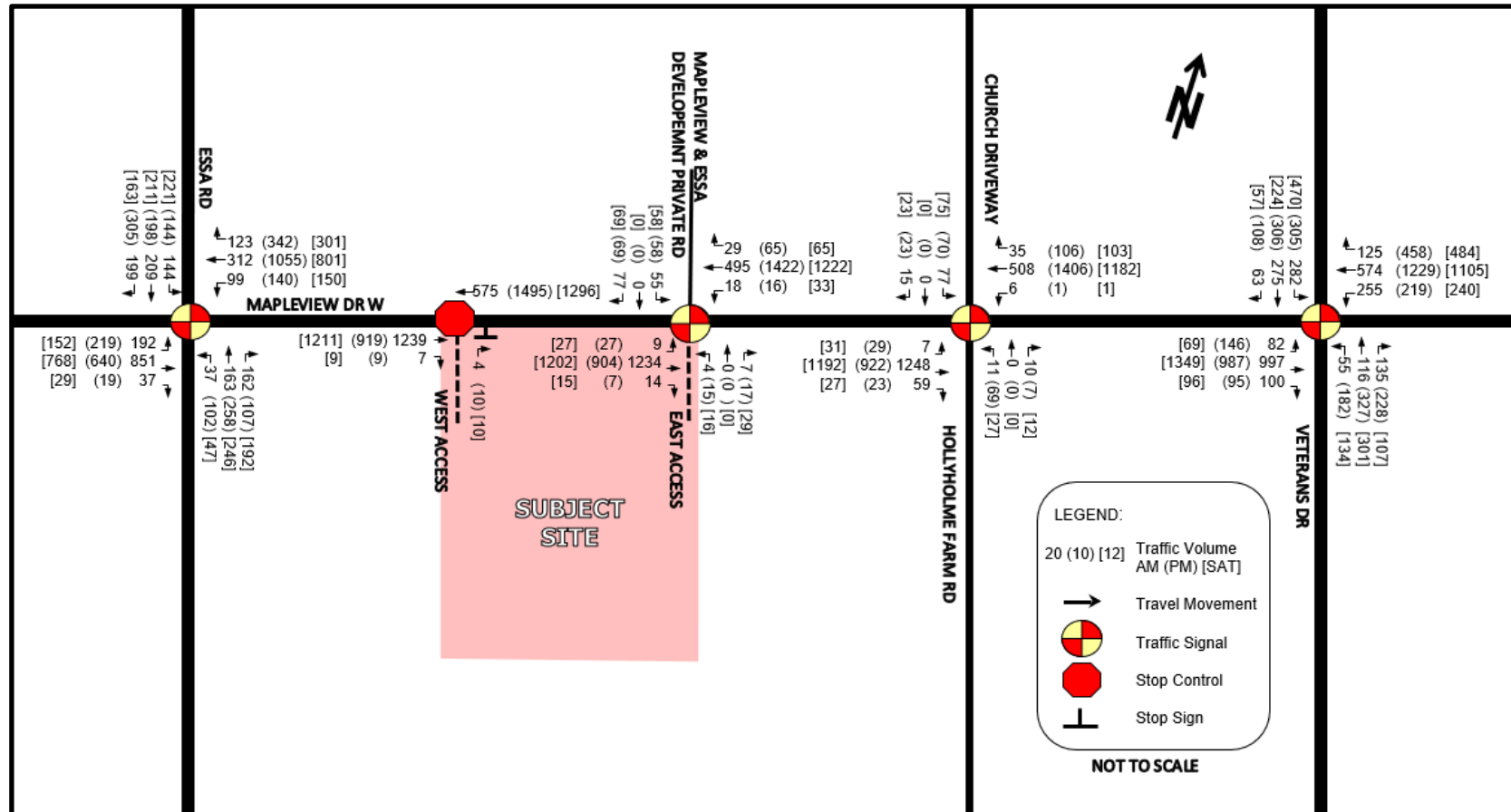


Figure 10 – Proposed Development Traffic Assignment – Primary

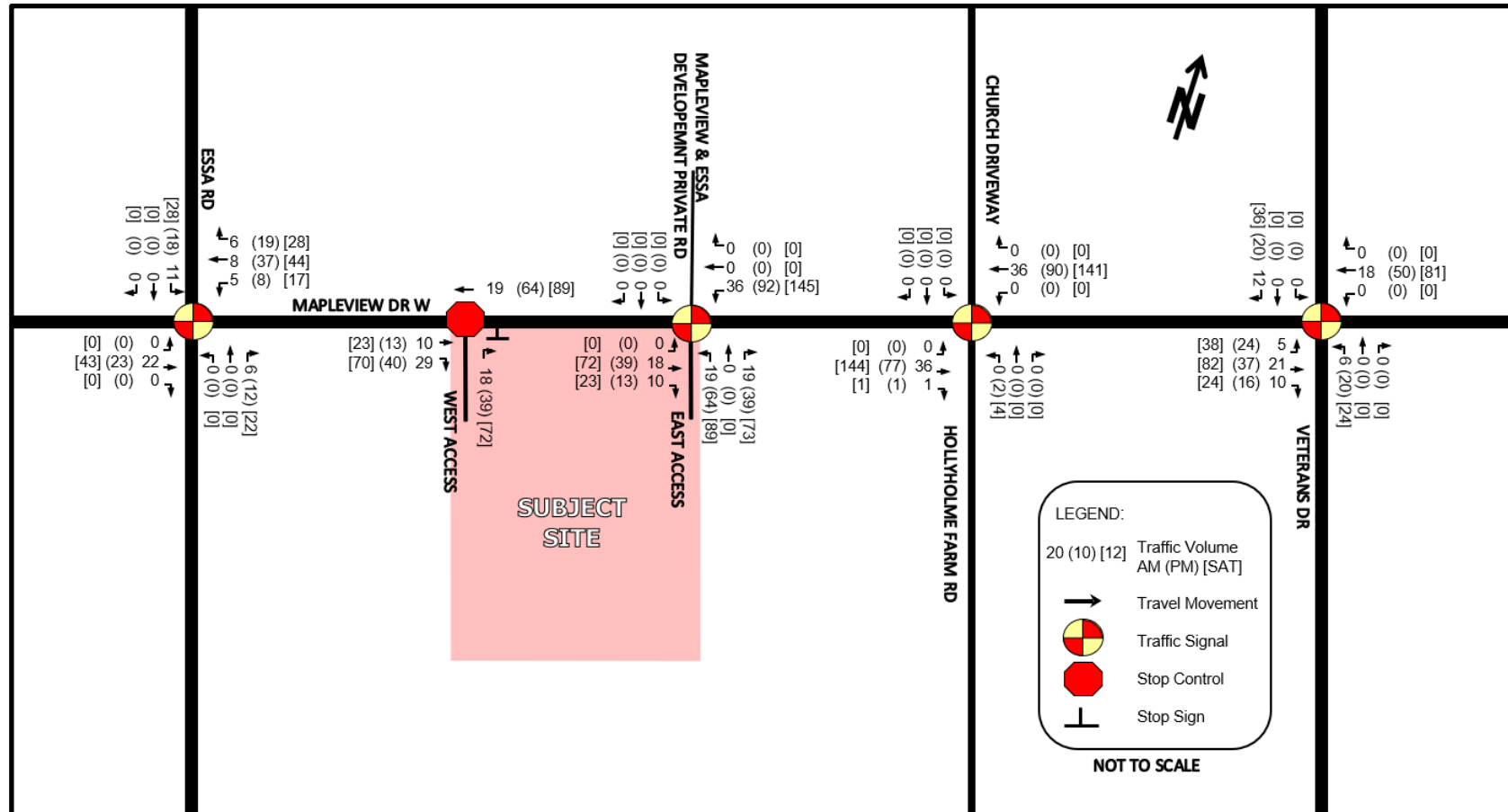


Figure 11 – Proposed Development Traffic Assignment –Pass-by

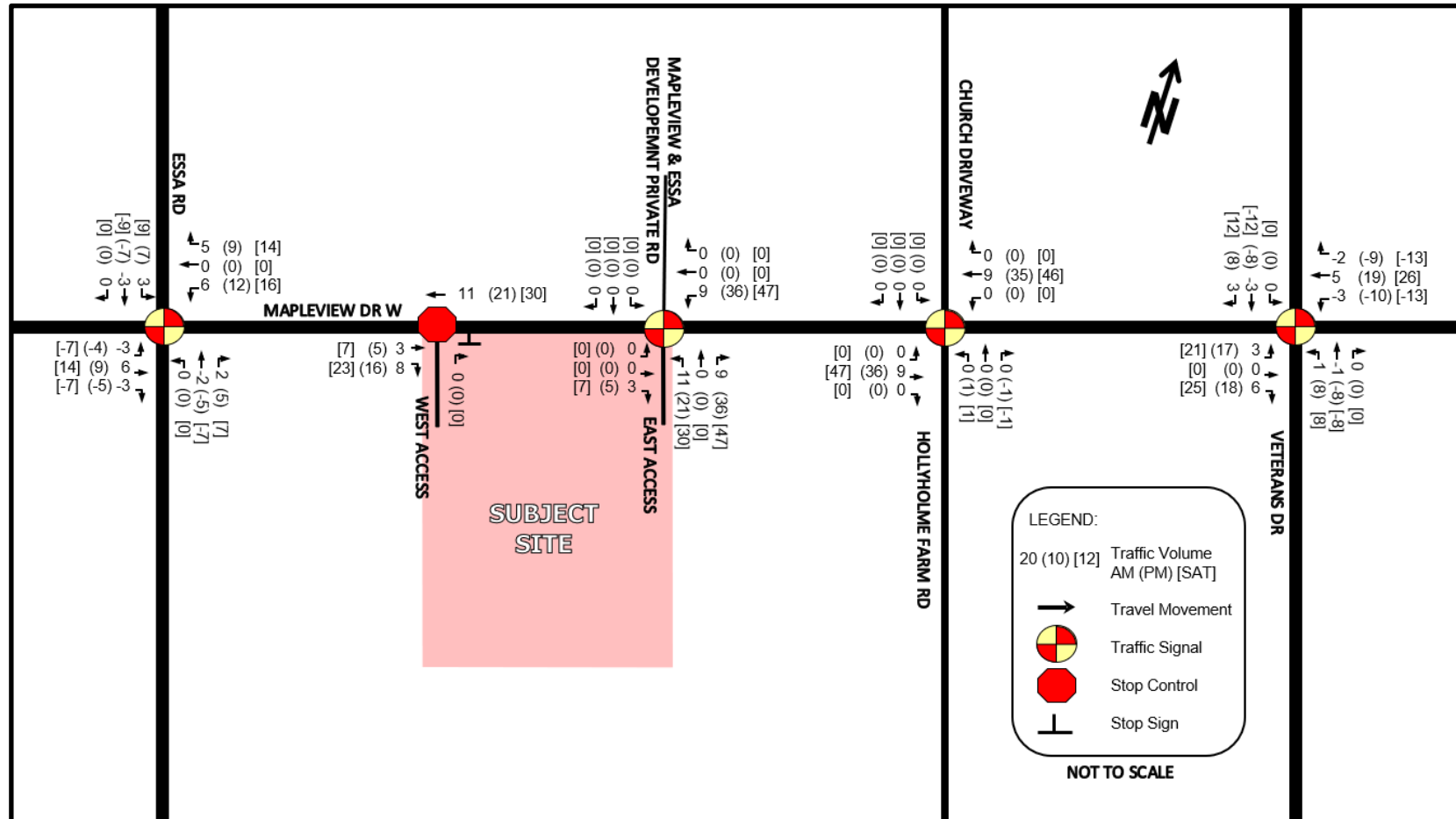


Figure 12 – Proposed Development Traffic Assignment – Total

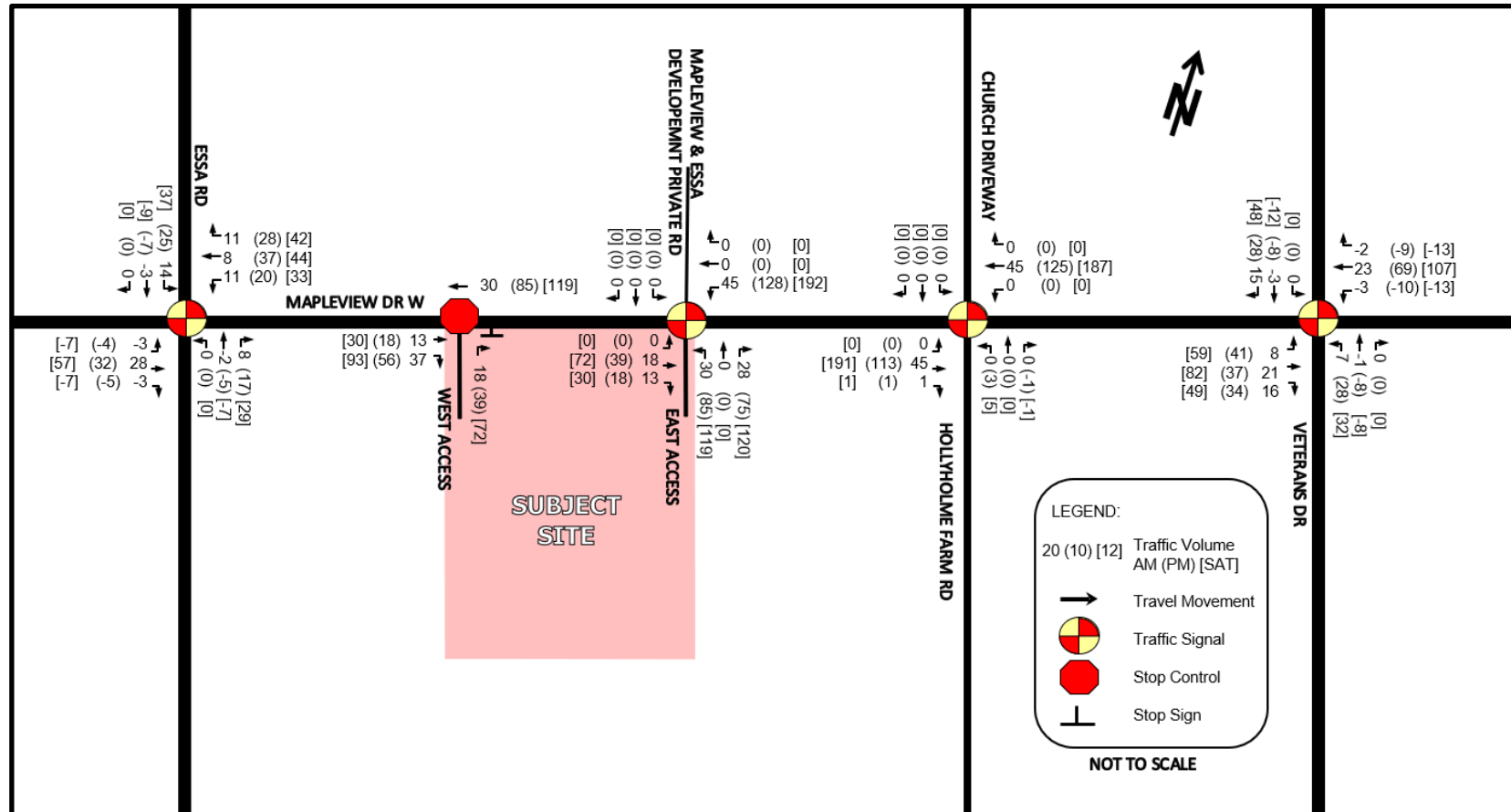


Figure 13 –Total (2026) Traffic Volumes

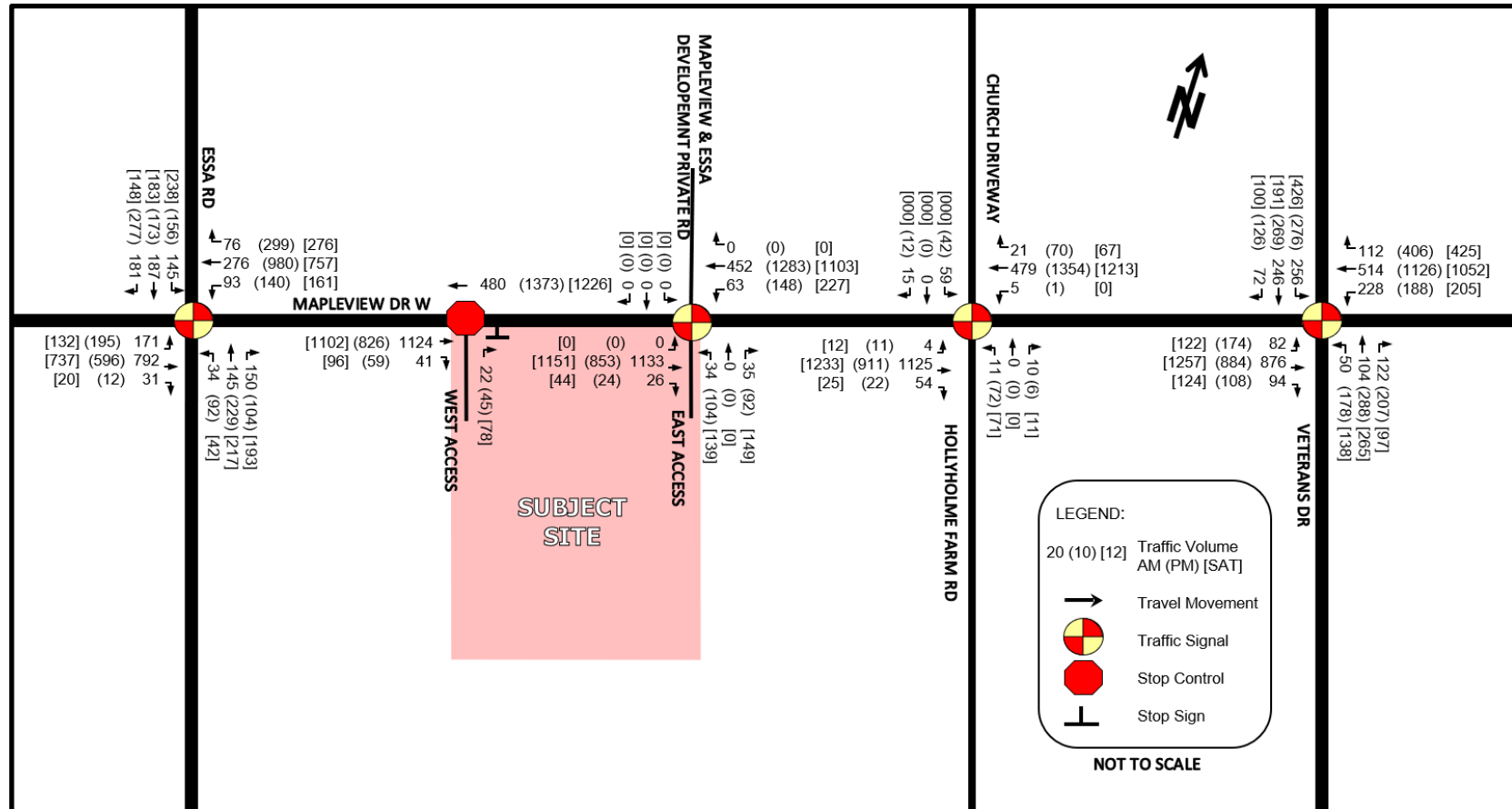
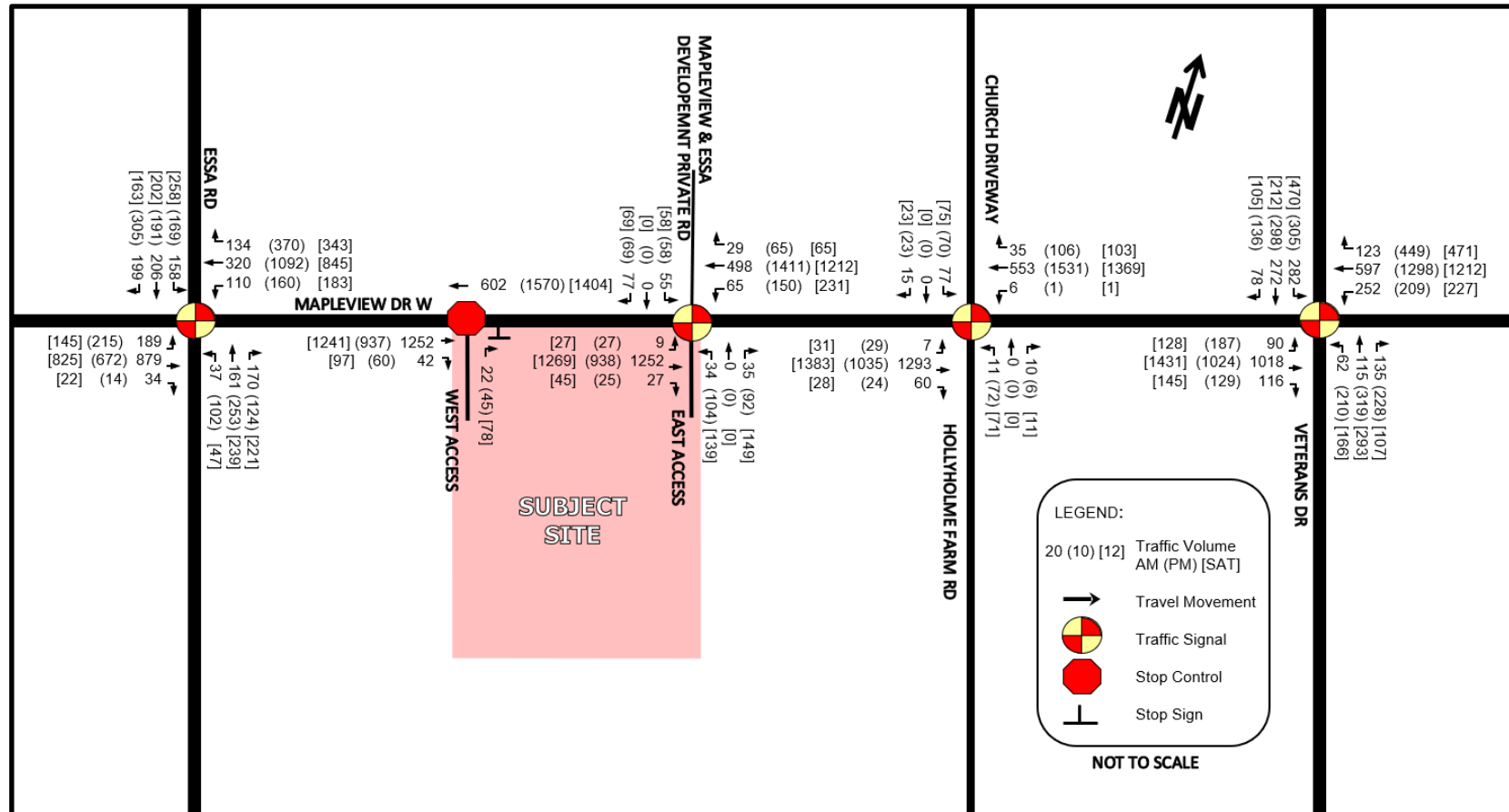


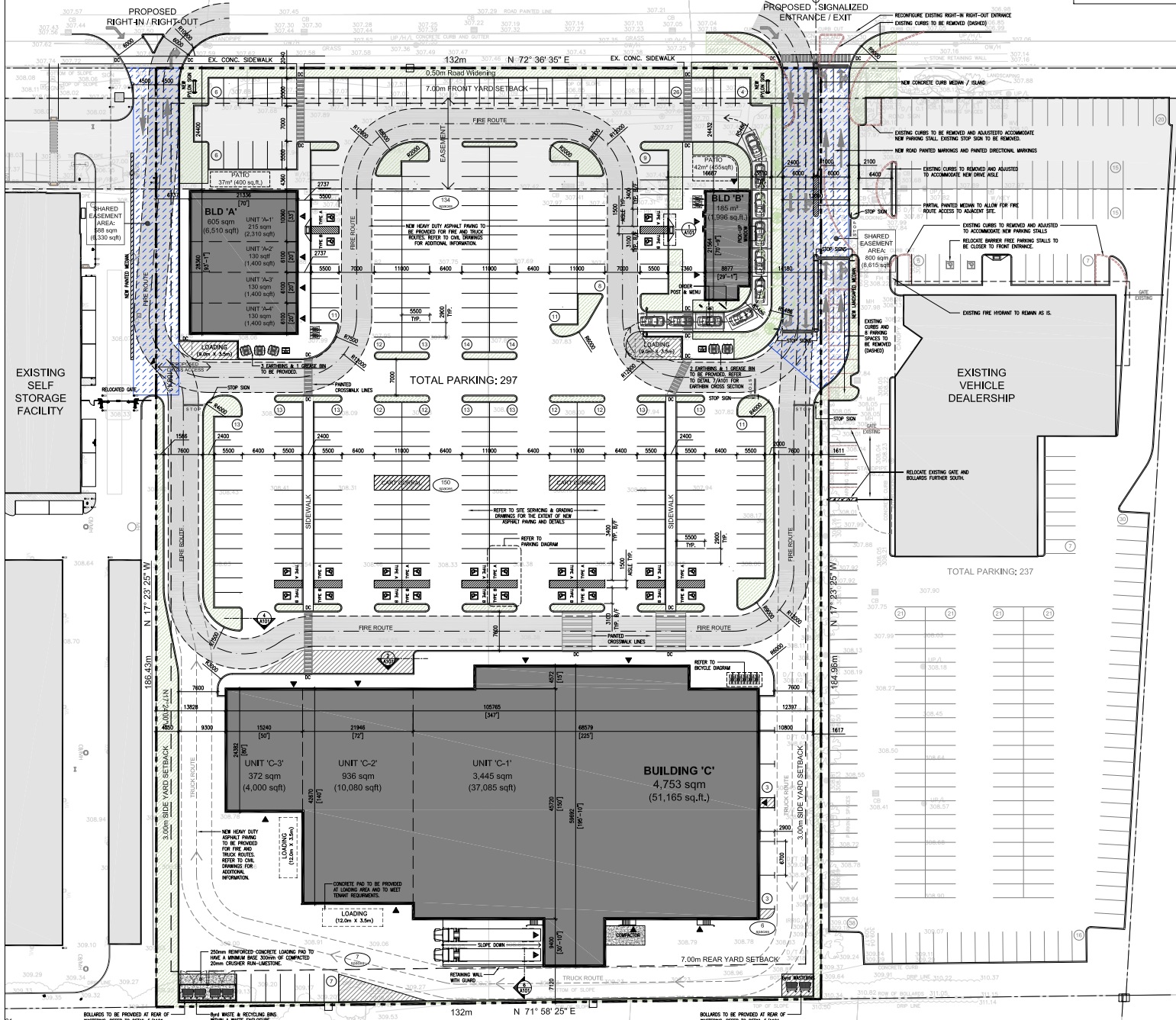
Figure 14 –Total (2031) Traffic Volumes



Appendix A – Site Plan

SITE PLAN INFORMATION IS TAKEN FROM PLAN OF SUBDIVISION
PREPARED BY SCHAEFER OZALDOY BENNETT LTD.
DATED SEPTEMBER 1st, 2021
PART OF BLOCK 41
REGISTERED PLAN 511W-882
CITY OF BARRIE
COUNTY OF SIMCOE

◀317m ± TO ESSA RD SIGNALS 152m ± TO HOLLYHOLME FARM RD SIGNALS



This drawing, as an instrument of service, is provided by and is the property of DANIEL L. CUSIMANO, ARCHITECT.

The contractor must verify and accept responsibility for all dimensions and conditions on site and must notify DANIEL L. CUSIMANO, ARCHITECT, of any variations from the supplied information.

This drawing is not to be scaled.

The architect is not responsible for the accuracy of survey, structural, mechanical, electrical, etc., information shown on this drawing. Refer to the appropriate consultant's drawings before proceeding with the work.

The contractor working from drawings not specifically marked "For Construction" must assume full responsibility and bear costs for any corrections or damages resulting from his work.

PRINT DATE:

2023-01-16

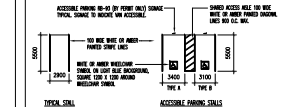
OFF STREET PARKING

REGULATIONS	REQUIRED	PROVIDED	COMPLIES
RESTAURANT (Type "A") (1 space per 50 persons)	605mm / 30 sqm = 21 SPACES REQUIRED	87 SPACES PROVIDED	
RESTAURANT (Type "B") (1 space per 40 persons)	40 PERSONS = 10 SPACES	43 SPACES PROVIDED	
RESTAURANT (Type "C") (1 space per 30 persons)	625mm / 30 sqm = 20 SPACES REQUIRED	163 SPACES PROVIDED	
TOTAL PARKING SPACES	158 SPACES REQ.	297 SPACES PROVIDED (139 SPACES EXCESS)	
PARKING SPACE SIZE	2.70m x 5.50m	2.90m x 5.50m	
MINIMUM AISLE WIDTH	6.40m	6.4m & 7.0m	
ACCESSIBLE PARKING (TYPE A)	3.40m x 5.50m	3.40m x 5.50m	
ACCESSIBLE PARKING (TYPE B)	3.10m x 5.50m	3.10m x 5.50m (plus one more)	
ACCESSIBLE PARKING REQUIRED (plus 10% of total spaces 20% of required parking space)	1 PLUS 1% OF 172 = 8 SPACES (Based on 10% of total spaces)	16 SPACES	
NO. OF BICYCLE PARKING SPACES	5 SPACES (per vehicle required)	20 SPACES	
LOADING SPACES	3,000-7,000mm ² GFA = 4 SPACES	4 SPACES	

LEGEND

 EXISTING BUILDINGS
 PROPOSED BUILDINGS
 PROPERTY LINE
 SETBACK LINE
 DEMOLITION CURBS/PARKING
 NEW CURBS
 DEPRESSSED CURBS (DC)
 LANDSCAPED AREA
 SHARED EASEMENT
 EASEMENT
 FIRE ROUTE
 TRUCK ROUTE
 PAINTED LINES

PARKING STALL DIAGRAM:



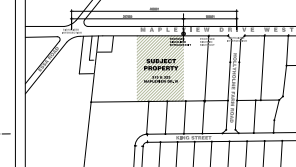
BICYCLE PARKING QUADRANT:



SIGN LEGEND



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SITE PLAN CONCEPT
FOR REVIEW ONLY
SUBJECT TO ZONING
REVIEW AND APPROVAL

No.	DESCRIPTION	DATE
R E V I S I O N S		
6	ISSUED FOR PRELIMINARY REVIEW	2002-12-2*
5	ISSUED FOR PRELIMINARY REVIEW	2002-11-1**
4	ISSUED FOR PRELIMINARY REVIEW	2002-11-1***
3	ISSUED FOR PRELIMINARY REVIEW	2002-11-1****
2	ISSUED FOR PRELIMINARY REVIEW	2002-10-8*****
1	ISSUED FOR PRELIMINARY REVIEW	2002-9-6*****
No.	DESCRIPTION	DATE



CUSIMANO ARCHITECT

T (416) 763-8193 F (416) 763-8194

PROJECT:

PLAZA REDEVELOPMENT

315 & 323 MAPLEVIEW DRIVE WEST

BARRE, ONTARIO

DATE:	OWN. BY:	CHG. BY:
-------	----------	----------

SEPT 2022	MR	OL
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SITE PLAN AND STATISTICS

SITE PLAN AND STATISTICS

SCALE	DRAWING No.:
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AS NOTED	A1C
END. NO.	

2022-42

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Appendix B – Adjacent Development Excerpts

Maplevue & Essa TIS Excerpts



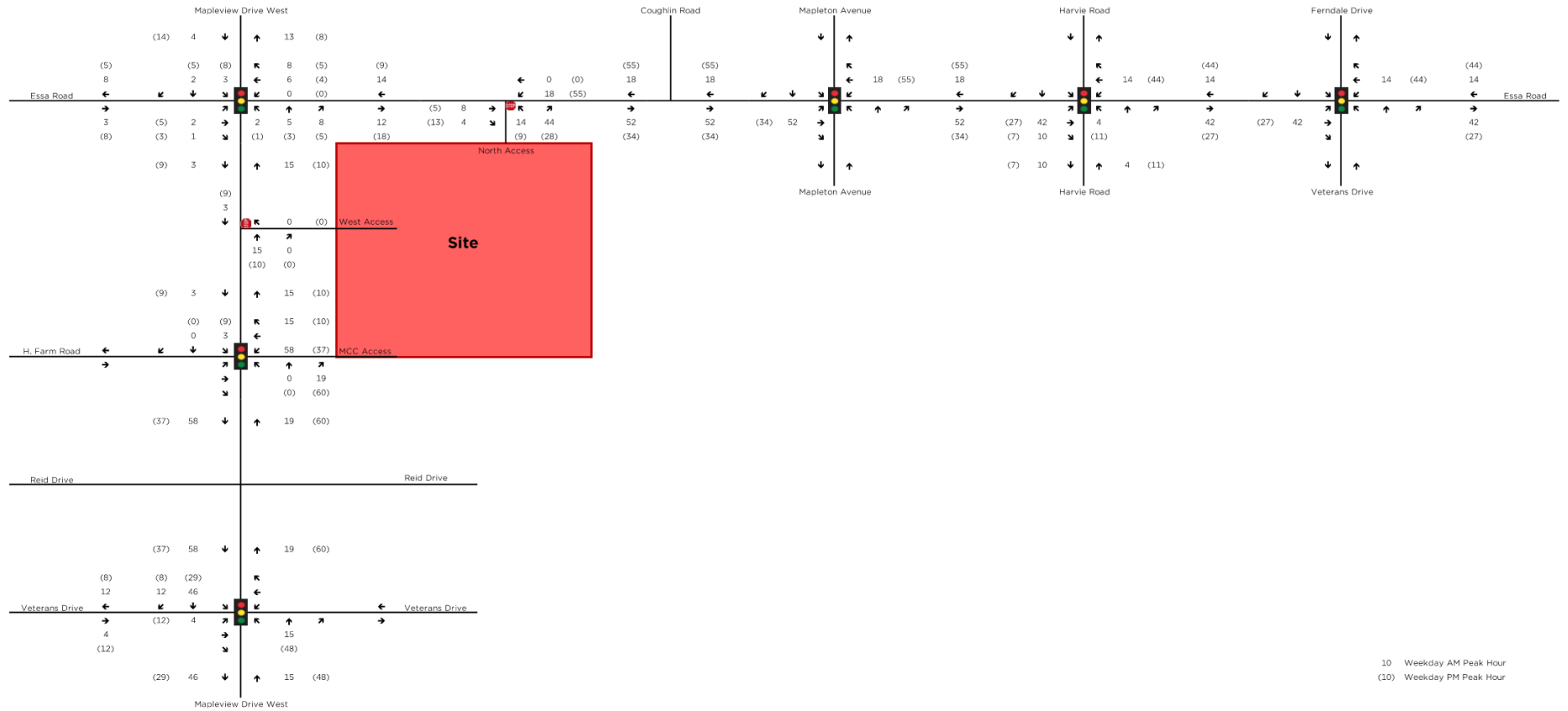
Enhancing our communities



Mapleview & Essa Development

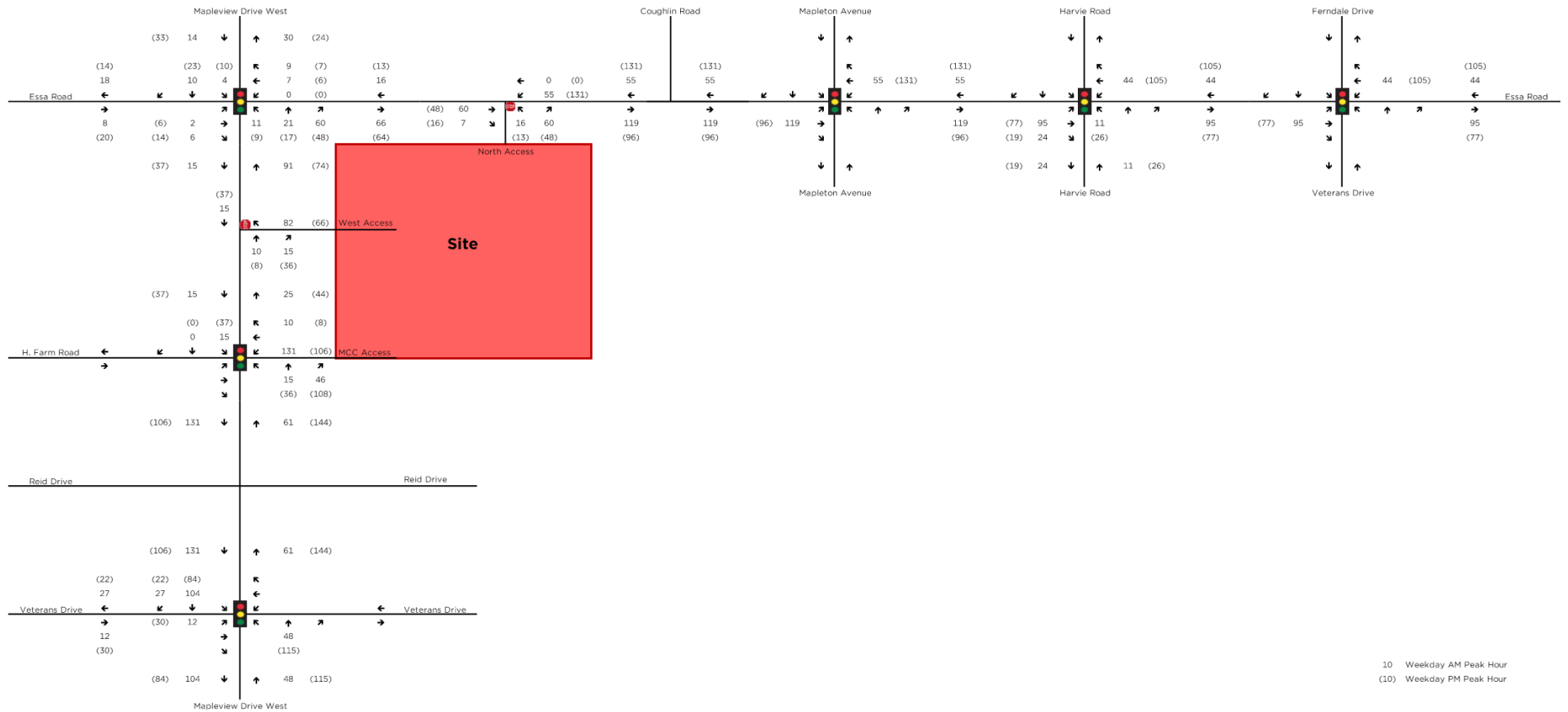
TRAFFIC IMPACT STUDY

Pearl Builders



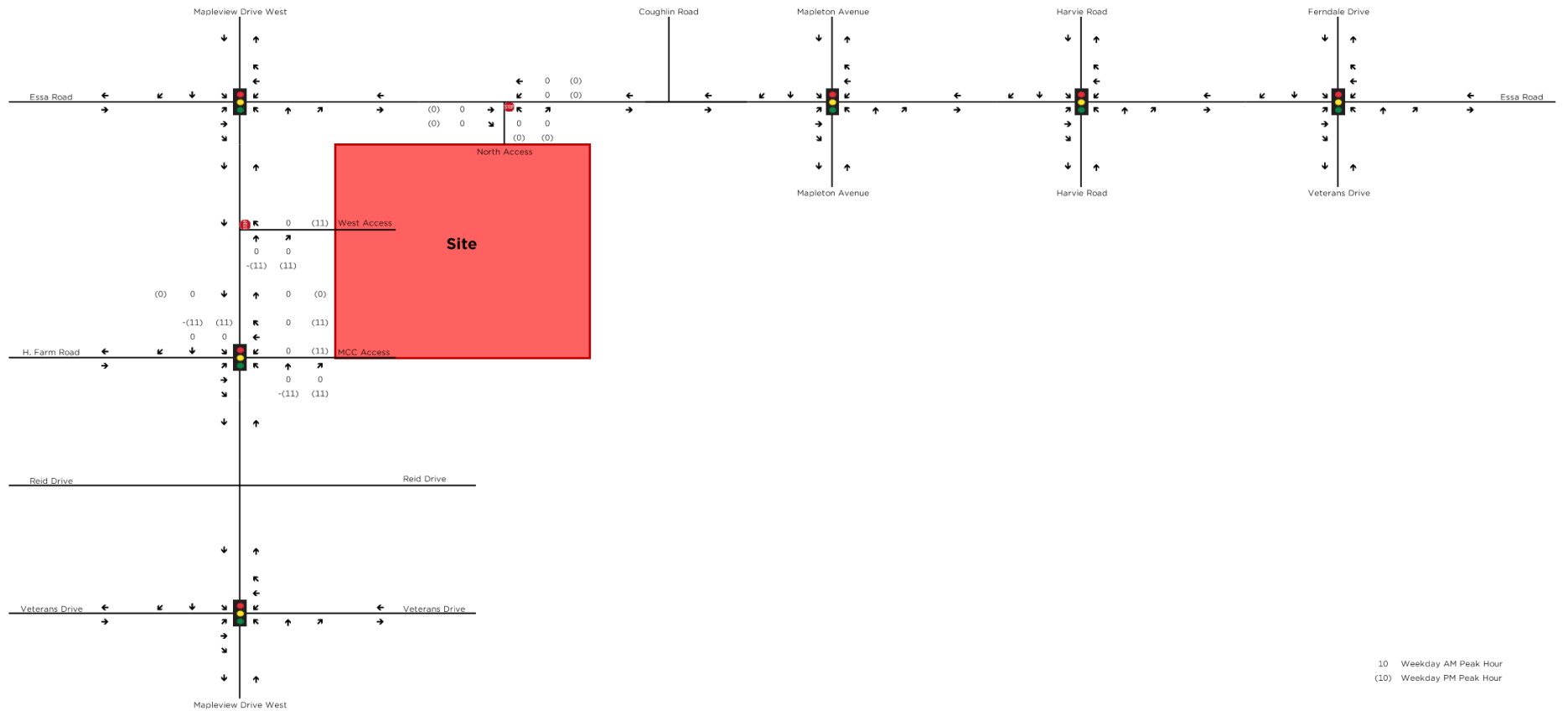
MAPLEVIEW & ESSA DEVELOPMENT
Figure 13: Site-Generated Traffic – New Trips (2027)





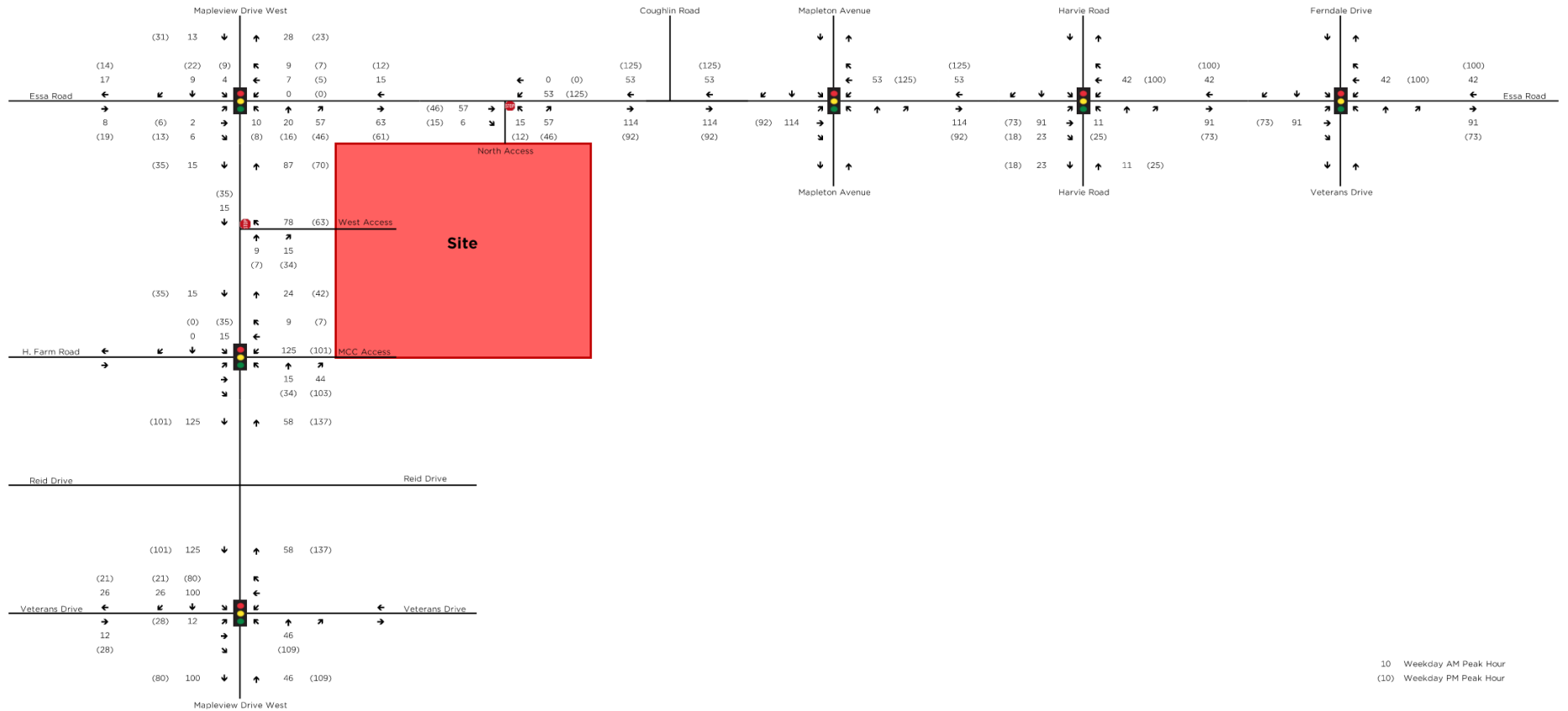
MAPLEVIEW & ESSA DEVELOPMENT
Figure 14: Site-Generated Traffic – New Trips (2031)





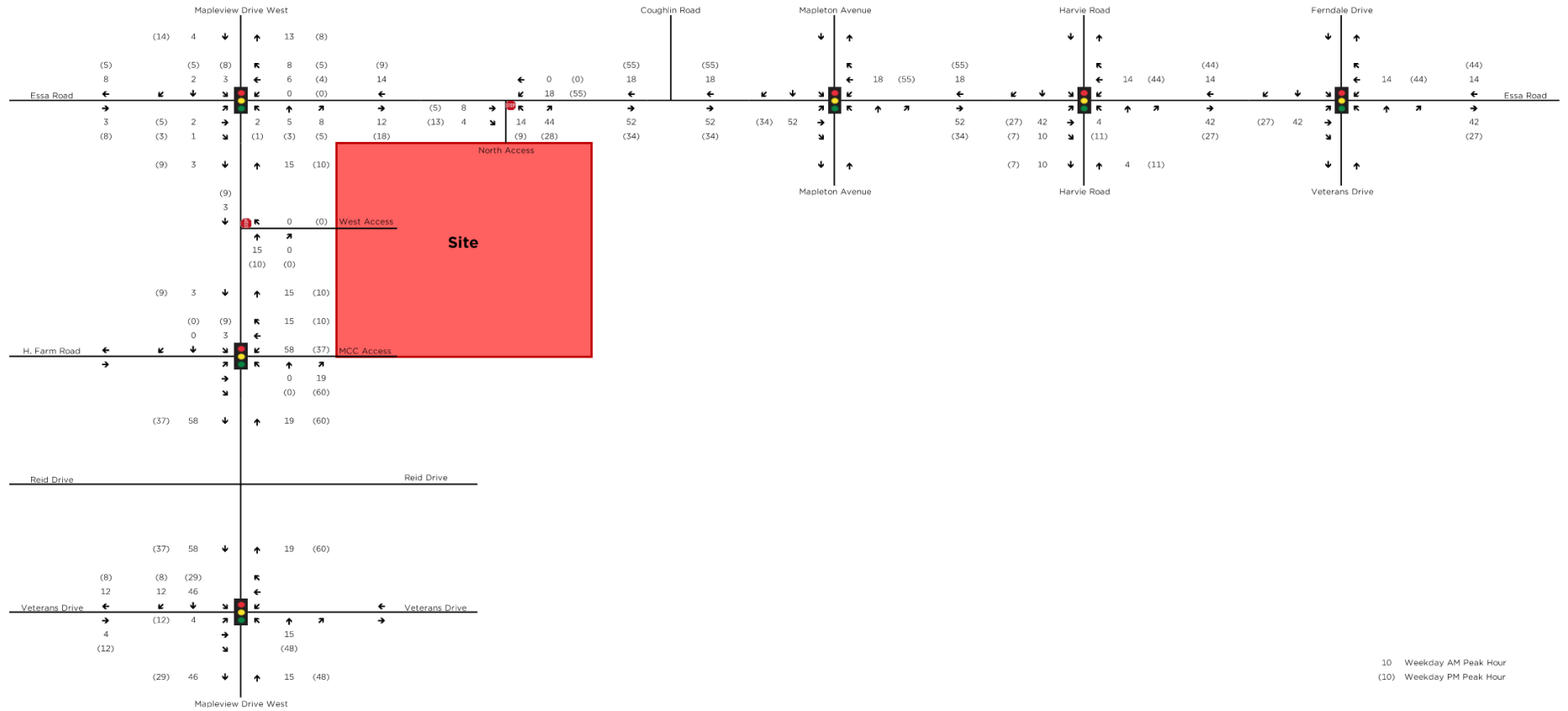
MAPLEVIEW & ESSA DEVELOPMENT
Figure 17: Site-Generated Traffic – Pass-by Trips





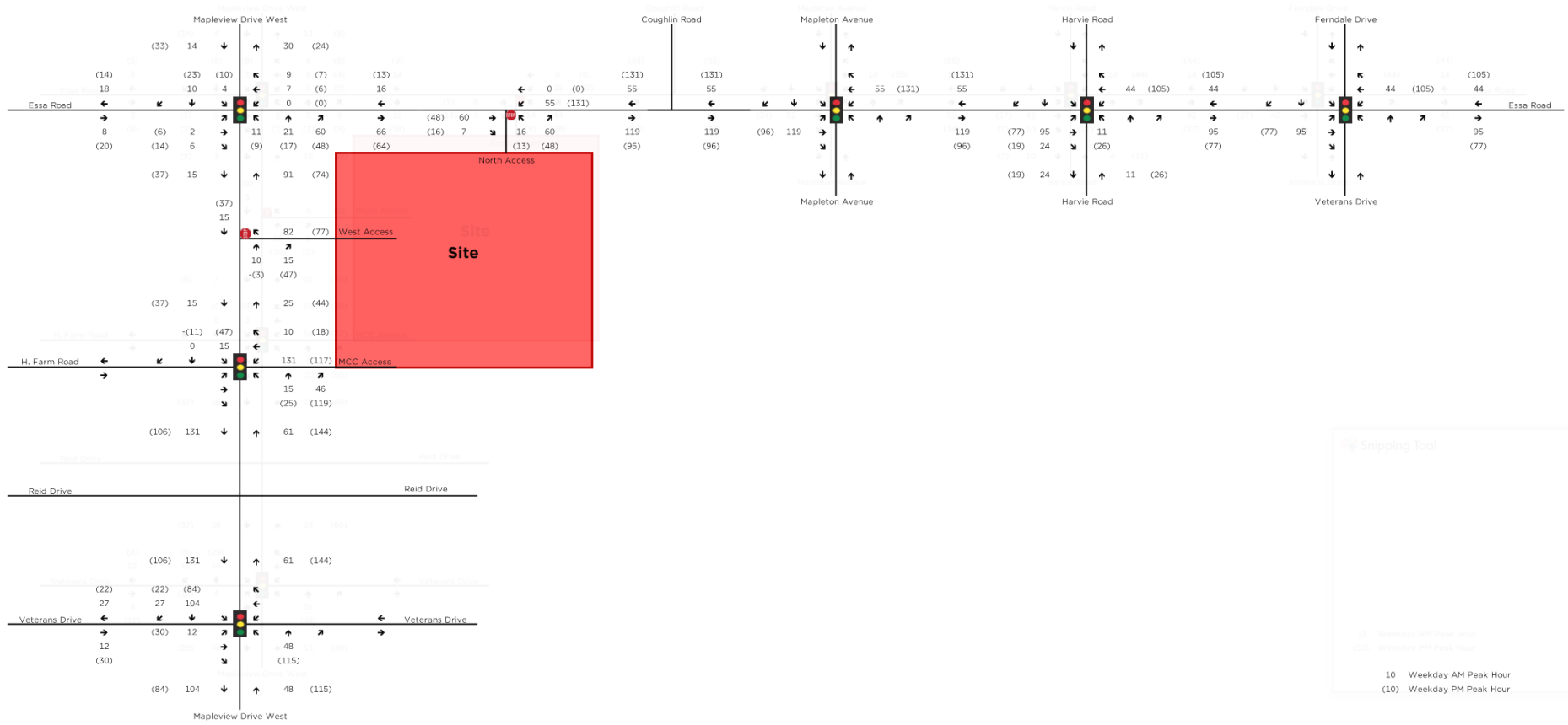
MAPLEVIEW & ESSA DEVELOPMENT
Figure 15: Site-Generated Traffic – New Trips (2036)





MAPLEVIEW & ESSA DEVELOPMENT
Figure 18: Site-Generated Traffic – Total Trips (2027)





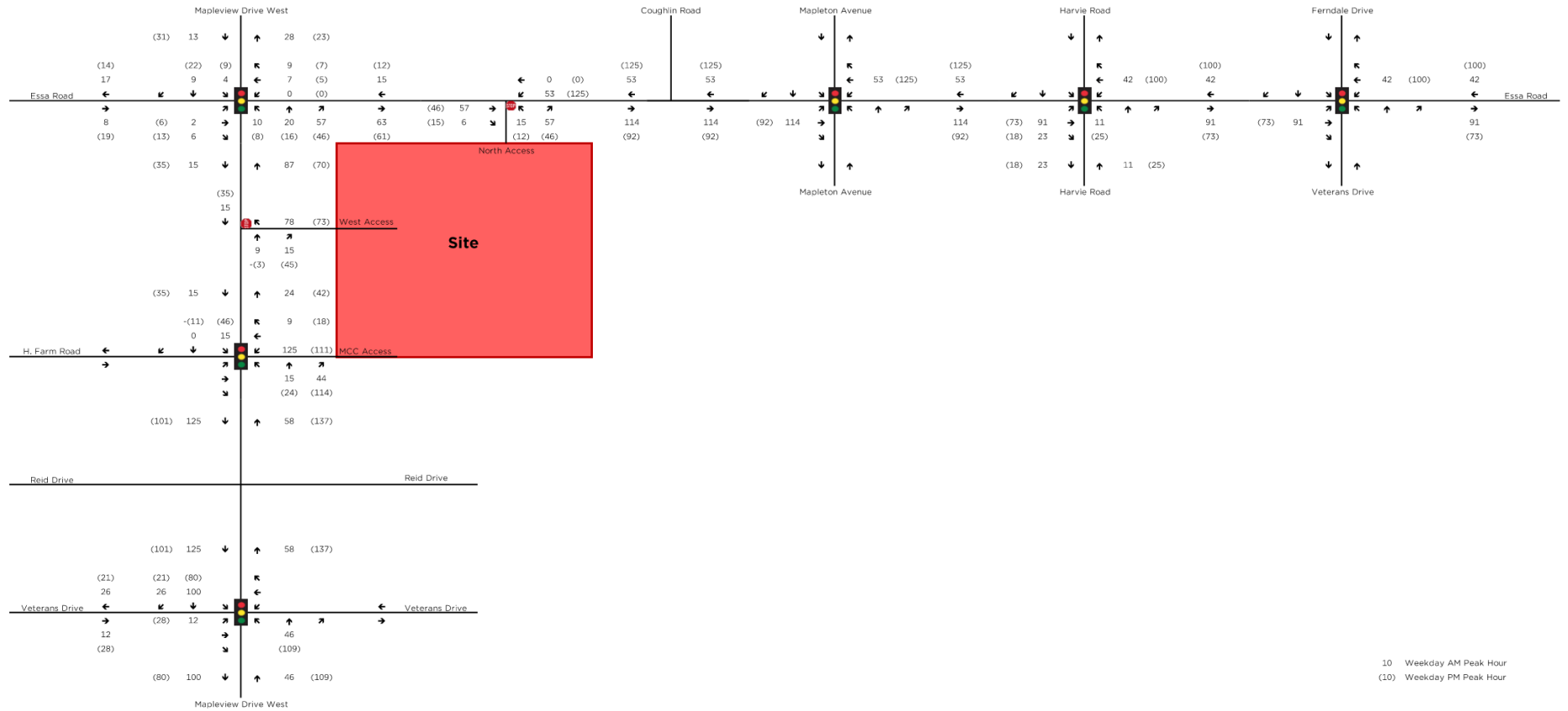
MAPLEVIEW & ESSA DEVELOPMENT

Figure 18: Site-Generated Traffic - Total Trips (2027)

MAPLEVIEW & ESSA DEVELOPMENT

Figure 19: Site-Generated Traffic - Total Trips (2031)





MAPLEVIEW & ESSA DEVELOPMENT

Figure 20: Site-Generated Traffic – Total Trips (2036)



Appendix C – Traffic Count Data

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 07:30:00
To: 08:30:00

Intersection: Mapleview Dr & Essa Rd
Site Code: 2213200087
Count Date: May 18, 2022

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Mapleview Dr runs E/W

North Approach

	Out	In	Total
	422	327	749
	27	17	44
	1	1	2
Totals	450	345	795

Essa Rd

	0	1	0	0
	11	10	6	0
	149	159	114	0
Totals	160	170	120	0






East Approach

	Out	In	Total
	349	930	1279
	21	21	42
	0	0	0
Totals	370	951	1321

Mapleview Dr

				Totals
0	0	2		2
1	5	152		158
0	4	697		701
0	5	26		31






Peds: 4



Peds: 1

Peds: 1

Peds: 3

Mapleview Dr

Totals			
0	0	0	0
53	51	2	0
243	230	13	0
74	68	6	0






West Approach

	Out	In	Total
	877	409	1286
	14	27	41
	1	0	1
Totals	892	436	1328

Totals				
31	28	124	119	0
134	3	10	11	0
130	0	0	0	0
0				

Essa Rd

South Approach

	Out	In	Total
	271	253	524
	24	21	45
	0	1	1
Totals	295	275	570

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Mapleview Dr & Essa Rd
Site Code: 2213200087
Count Date: May 18, 2022
Period: 07:00 - 09:00

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Essa Rd						South Approach Essa Rd						East Approach Mapleview Dr						West Approach Mapleview Dr						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:30	17	40	44	0	0	101	4	33	37	0	0	74	12	66	9	0	0	87	33	174	8	0	0	215	477
07:45	43	47	42	0	3	132	3	28	35	0	1	66	16	51	11	0	0	78	48	200	10	0	0	258	534
08:00	24	45	46	0	0	115	9	33	33	0	0	75	30	60	14	0	0	104	39	171	6	0	0	216	510
08:15	36	38	28	0	1	102	15	40	25	0	2	80	16	66	19	0	1	101	38	156	7	2	1	203	486
Grand Total	120	170	160	0	4	450	31	134	130	0	3	295	74	243	53	0	1	370	158	701	31	2	1	892	2007
Approach %	26.7	37.8	35.6	0	-	-	10.5	45.4	44.1	0	-	-	20	65.7	14.3	0	-	-	17.7	78.6	3.5	0.2	-	-	-
Totals %	6	8.5	8	0	-	22.4	1.5	6.7	6.5	0	-	14.7	3.7	12.1	2.6	0	-	18.4	7.9	34.9	1.5	0.1	-	44.4	-
PHF	0.7	0.9	0.87	0	-	0.85	0.52	0.84	0.88	0	-	0.92	0.62	0.92	0.7	0	-	0.89	0.82	0.88	0.78	0.25	-	0.86	0.94
Cars	114	159	149	0	-	422	28	124	119	0	-	271	68	230	51	0	-	349	152	697	26	2	-	877	1919
% Cars	95	93.5	93.1	0	-	93.8	90.3	92.5	91.5	0	-	91.9	91.9	94.7	96.2	0	-	94.3	96.2	99.4	83.9	100	-	98.3	95.6
Trucks	6	10	11	0	-	27	3	10	11	0	-	24	6	13	2	0	-	21	5	4	5	0	-	14	86
% Trucks	5	5.9	6.9	0	-	6	9.7	7.5	8.5	0	-	8.1	8.1	5.3	3.8	0	-	5.7	3.2	0.6	16.1	0	-	1.6	4.3
Bicycles	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	2
% Bicycles	0	0.6	0	0	-	0.2	0	0	0	0	-	0	0	0	0	0	-	0	0.6	0	0	0	-	0.1	0.1
Peds	-	-	-	-	4	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	1	-	9
% Peds	-	-	-	-	44.4	-	-	-	-	-	33.3	-	-	-	-	-	11.1	-	-	-	-	-	11.1	-	-

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:30:00

To: 17:30:00

Intersection: Mapleview Dr & Essa Rd

Site Code: 2213200087

Count Date: May 18, 2022

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Mapleview Dr runs E/W

North Approach

	Out	In	Total
	521	621	1142
	13	11	24
	0	1	1
Totals	534	633	1167

Essa Rd

	0	0	0	0
	4	2	7	0
	247	161	113	0
Totals	251	163	120	0






East Approach

	Out	In	Total
	1210	696	1906
	10	16	26
	1	0	1
Totals	1221	712	1933

Mapleview Dr

				Totals
0	0	0	0	0
1	2	173	176	176
0	6	509	515	515
0	1	15	16	16






Peds: 3

Peds: 0



Peds: 0

Mapleview Dr

Totals			
0	0	0	0
245	243	2	0
866	860	6	0
110	107	2	1






Peds: 3

West Approach

	Out	In	Total
	697	1185	1882
	9	17	26
	1	0	1
Totals	707	1202	1909

Totals				
	85	212	77	0
	7	7	3	0
	0	0	0	0

Essa Rd

South Approach

	Out	In	Total
	357	283	640
	17	5	22
	0	1	1
Totals	374	289	663

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Mapleview Dr & Essa Rd
Site Code: 2213200087
Count Date: May 18, 2022
Period: 15:00 - 18:00

Peak Hour Data (16:30 - 17:30)

Start Time	North Approach Essa Rd						South Approach Essa Rd						East Approach Mapleview Dr						West Approach Mapleview Dr						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:30	34	44	58	0	1	136	22	66	17	0	1	105	24	211	72	0	0	307	47	131	4	0	0	182	730
16:45	28	38	75	0	1	141	20	46	14	0	0	80	27	198	50	0	0	275	34	125	2	0	0	161	657
17:00	35	36	62	0	1	133	30	54	28	0	0	112	31	242	69	0	0	342	46	128	7	0	0	181	768
17:15	23	45	56	0	0	124	13	46	18	0	2	77	28	215	54	0	0	297	49	131	3	0	0	183	681
Grand Total	120	163	251	0	3	534	85	212	77	0	3	374	110	866	245	0	0	1221	176	515	16	0	0	707	2836
Approach %	22.5	30.5	47	0	-	-	22.7	56.7	20.6	0	-	-	9	70.9	20.1	0	-	-	24.9	72.8	2.3	0	-	-	-
Totals %	4.2	5.7	8.9	0	-	18.8	3	7.5	2.7	0	-	13.2	3.9	30.5	8.6	0	-	43.1	6.2	18.2	0.6	0	-	24.9	-
PHF	0.86	0.91	0.84	0	-	0.95	0.71	0.8	0.69	0	-	0.83	0.89	0.89	0.85	0	-	0.89	0.9	0.98	0.57	0	-	0.97	0.92
Cars	113	161	247	0	-	521	78	205	74	0	-	357	107	860	243	0	-	1210	173	509	15	0	-	697	2785
% Cars	94.2	98.8	98.4	0	-	97.6	91.8	96.7	96.1	0	-	95.5	97.3	99.3	99.2	0	-	99.1	98.3	98.8	93.8	0	-	98.6	98.2
Trucks	7	2	4	0	-	13	7	7	3	0	-	17	2	6	2	0	-	10	2	6	1	0	-	9	49
% Trucks	5.8	1.2	1.6	0	-	2.4	8.2	3.3	3.9	0	-	4.5	1.8	0.7	0.8	0	-	0.8	1.1	1.2	6.3	0	-	1.3	1.7
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	1	0	0	0	-	1	2
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0.9	0	0	0	-	0.1	0.6	0	0	0	-	0.1	0.1
Peds	-	-	-	-	3	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	0	-	6
% Peds	-	-	-	-	50	-	-	-	-	-	50	-	-	-	-	-	0	-	-	-	-	-	0	-	-



Ontario Traffic Inc.

TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:45:00

To: 13:45:00

Intersection: Mapleview Dr W & Essa Rd

Site ID: 2016000002

Count Date: Oct 03, 2020

Weather conditions:

**** Signalized Intersection ****

Major Road: Essa Rd runs N/S

North Approach

	Out	In	Total
	463	504	967
	8	3	11
	3	1	4
Totals	474	508	982

Essa Rd

	0	3	0	0
	1	5	2	0
	126	162	175	0
Totals	127	170	177	0

East Approach

	Out	In	Total
	908	910	1818
	7	7	14
	1	0	1
Totals	916	917	1833

Mapleview Dr W

				Totals
	0	0	0	0
	0	0	116	116
	0	2	595	597
	0	0	24	24

Peds: 3



Peds: 7

Peds: 1

Mapleview Dr W

Totals			
	0	0	0
	197	196	1
	611	608	2
	108	104	4

Peds: 0

West Approach

	Out	In	Total
	735	771	1506
	2	3	5
	0	1	1
Totals	737	775	1512

Totals				
	37	192	140	0
	0	2	3	0
	0	1	0	0

Essa Rd

South Approach

	Out	In	Total
	369	290	659
	5	9	14
	1	3	4
Totals	375	302	677

- Cars

- Trucks

- Bicycles

Comments



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Summary

Intersection: Mapleview Dr W & Essa Rd
Count Date: Oct 03, 2020
Period: 11:00 - 14:00

Peak Hour Data (12:45 - 13:45)

Start Time	North Approach Essa Rd						South Approach Essa Rd						East Approach Mapleview Dr W						West Approach Mapleview Dr W						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
12:45	36	42	36	0	0	114	4	54	33	0	0	91	31	147	50	0	0	228	24	151	4	0	1	179	612
13:00	58	48	29	0	0	135	11	51	33	0	0	95	23	136	48	0	0	207	34	152	6	0	2	192	629
13:15	43	43	31	0	0	117	13	50	46	0	0	109	23	175	51	0	0	249	28	147	5	0	0	180	655
13:30	40	37	31	0	7	108	9	40	31	0	0	80	31	153	48	0	1	232	30	147	9	0	0	186	606
Grand Total	177	170	127	0	7	474	37	195	143	0	0	375	108	611	197	0	1	916	116	597	24	0	3	737	2502
Approach %	37.3	35.9	26.8	0	-	-	9.9	52	38.1	0	-	-	11.8	66.7	21.5	0	-	-	15.7	81	3.3	0	-	-	-
Totals %	7.1	6.8	5.1	0	-	18.9	1.5	7.8	5.7	0	-	15	4.3	24.4	7.9	0	-	36.6	4.6	23.9	1	0	-	29.5	-
PHF	0.76	0.89	0.88	0	-	0.88	0.71	0.9	0.78	0	-	0.86	0.87	0.87	0.97	0	-	0.92	0.85	0.98	0.67	0	-	0.96	0.95
Cars	175	162	126	0	-	463	37	192	140	0	-	369	104	608	196	0	-	908	116	595	24	0	-	735	2475
% Cars	98.9	95.3	99.2	0	-	97.7	100	98.5	97.9	0	-	98.4	96.3	99.5	99.5	0	-	99.1	100	99.7	100	0	-	99.7	98.9
Trucks	2	5	1	0	-	8	0	2	3	0	-	5	4	2	1	0	-	7	0	2	0	0	-	2	22
% Trucks	1.1	2.9	0.8	0	-	1.7	0	1	2.1	0	-	1.3	3.7	0.3	0.5	0	-	0.8	0	0.3	0	0	-	0.3	0.9
Bicycles	0	3	0	0	-	3	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	5
% Bicycles	0	1.8	0	0	-	0.6	0	0.5	0	0	-	0.3	0	0.2	0	0	-	0.1	0	0	0	0	-	0	0.2
Peds	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	11
% Peds	-	-	-	-	63.6	-	-	-	-	-	0	-	-	-	-	-	9.1	-	-	-	-	-	27.3	-	-

Peak Hour Diagram

Specified Period

From: 07:00:00

To: 09:00:00

One Hour Peak

From: 07:45:00

To: 08:45:00

Intersection: Mapleview Dr & Veterans Dr

Site Code: 2213200088

Count Date: Jun 09, 2022

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Mapleview Dr runs E/W

North Approach

	Out	In	Total
	499	257	756
	19	13	32
	0	0	0
Totals	518	270	788

Veterans Dr

	0	0	0	0
	1	11	7	0
	51	219	229	0
Totals	52	230	236	0

East Approach

	Out	In	Total
	719	1044	1763
	39	50	89
	0	0	0
Totals	758	1094	1852

Mapleview Dr

				Totals
	0	0	0	0
	0	3	65	68
	0	30	715	745
	0	2	58	60

Peds: 4

Peds: 2



Peds: 1

Peds: 6

Mapleview Dr

Totals			
0	0	0	0
105	101	4	0
439	418	21	0
214	200	14	0

West Approach

	Out	In	Total
	838	500	1338
	35	27	62
	0	0	0
Totals	873	527	1400

Totals				
	31	91	100	0
	5	6	13	0
	0	0	0	0

Veterans Dr

South Approach

	Out	In	Total
	222	477	699
	24	27	51
	0	0	0
Totals	246	504	750

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Mapleview Dr & Veterans Dr
Site Code: 2213200088
Count Date: Jun 09, 2022
Period: 07:00 - 09:00

Peak Hour Data (07:45 - 08:45)

Start Time	North Approach Veterans Dr						South Approach Veterans Dr						East Approach Mapleview Dr						West Approach Mapleview Dr						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
07:45	61	61	13	0	1	135	8	25	27	0	2	60	54	103	22	0	0	179	27	203	17	0	2	247	621
08:00	71	55	15	0	0	141	7	22	31	0	1	60	58	133	29	0	0	220	15	185	9	0	2	209	630
08:15	50	56	11	0	0	117	10	27	25	0	3	62	51	94	29	0	0	174	15	188	16	0	0	219	572
08:30	54	58	13	0	1	125	11	23	30	0	0	64	51	109	25	0	1	185	11	169	18	0	0	198	572
Grand Total	236	230	52	0	2	518	36	97	113	0	6	246	214	439	105	0	1	758	68	745	60	0	4	873	2395
Approach %	45.6	44.4	10	0	-	-	14.6	39.4	45.9	0	-	-	28.2	57.9	13.9	0	-	-	7.8	85.3	6.9	0	-	-	-
Totals %	9.9	9.6	2.2	0	-	21.6	1.5	4.1	4.7	0	-	10.3	8.9	18.3	4.4	0	-	31.6	2.8	31.1	2.5	0	-	36.5	-
PHF	0.83	0.94	0.87	0	-	0.92	0.82	0.9	0.91	0	-	0.96	0.92	0.83	0.91	0	-	0.86	0.63	0.92	0.83	0	-	0.88	0.95
Cars	229	219	51	0	-	499	31	91	100	0	-	222	200	418	101	0	-	719	65	715	58	0	-	838	2278
% Cars	97	95.2	98.1	0	-	96.3	86.1	93.8	88.5	0	-	90.2	93.5	95.2	96.2	0	-	94.9	95.6	96	96.7	0	-	96	95.1
Trucks	7	11	1	0	-	19	5	6	13	0	-	24	14	21	4	0	-	39	3	30	2	0	-	35	117
% Trucks	3	4.8	1.9	0	-	3.7	13.9	6.2	11.5	0	-	9.8	6.5	4.8	3.8	0	-	5.1	4.4	4	3.3	0	-	4	4.9
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds	-	-	-	-	2	-	-	-	-	-	6	-	-	-	-	-	1	-	-	-	-	-	4	-	13
% Peds	-	-	-	-	15.4	-	-	-	-	-	46.2	-	-	-	-	-	7.7	-	-	-	-	-	30.8	-	-

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 16:45:00

To: 17:45:00

Intersection: Mapleview Dr & Veterans Dr

Site Code: 2213200088

Count Date: Jun 09, 2022

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Mapleview Dr runs E/W

North Approach

	Out	In	Total
	592	769	1361
	8	8	16
	0	1	1
Totals	600	778	1378

Veterans Dr

	0	0	0	0
	1	4	3	0
	88	252	252	0
Totals	89	256	255	0

East Approach

	Out	In	Total
	1467	1184	2651
	27	15	42
	1	0	1
Totals	1495	1199	2694

Mapleview Dr

				Totals
	0	0	0	0
	0	1	120	121
	0	10	743	753
	0	2	58	60

Peds: 2

Peds: 12



Peds: 4

Peds: 6

Mapleview Dr

Totals			
0	0	0	0
383	375	7	1
929	912	17	0
183	180	3	0

West Approach

	Out	In	Total
	921	1124	2045
	13	20	33
	0	0	0
Totals	934	1144	2078

				
Totals	126	274	191	0
	124	274	189	0
	2	0	2	0
	0	0	0	0

Veterans Dr

South Approach

	Out	In	Total
	587	490	1077
	4	9	13
	0	0	0
Totals	591	499	1090

 - Cars

 - Trucks

 - Bicycles

Comments

Peak Hour Summary

Intersection: Mapleview Dr & Veterans Dr
Site Code: 2213200088
Count Date: Jun 09, 2022
Period: 15:00 - 18:00

Peak Hour Data (16:45 - 17:45)

Start Time	North Approach Veterans Dr						South Approach Veterans Dr						East Approach Mapleview Dr						West Approach Mapleview Dr						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
16:45	60	61	21	0	2	142	24	66	47	0	1	137	51	219	85	0	0	355	29	179	21	0	0	229	863
17:00	68	72	27	0	2	167	30	91	56	0	3	177	39	212	95	0	2	346	30	202	13	0	2	245	935
17:15	65	75	22	0	5	162	33	72	44	0	1	149	54	258	96	0	1	408	33	193	15	0	0	241	960
17:30	62	48	19	0	3	129	39	45	44	0	1	128	39	240	107	0	1	386	29	179	11	0	0	219	862
Grand Total	255	256	89	0	12	600	126	274	191	0	6	591	183	929	383	0	4	1495	121	753	60	0	2	934	3620
Approach %	42.5	42.7	14.8	0	-	-	21.3	46.4	32.3	0	-	-	12.2	62.1	25.6	0	-	-	13	80.6	6.4	0	-	-	-
Totals %	7	7.1	2.5	0	-	16.6	3.5	7.6	5.3	0	-	16.3	5.1	25.7	10.6	0	-	41.3	3.3	20.8	1.7	0	-	25.8	-
PHF	0.94	0.85	0.82	0	-	0.9	0.81	0.75	0.85	0	-	0.83	0.85	0.9	0.89	0	-	0.92	0.92	0.93	0.71	0	-	0.95	0.94
Cars	252	252	88	0	-	592	124	274	189	0	-	587	180	912	375	0	-	1467	120	743	58	0	-	921	3567
% Cars	98.8	98.4	98.9	0	-	98.7	98.4	100	99	0	-	99.3	98.4	98.2	97.9	0	-	98.1	99.2	98.7	96.7	0	-	98.6	98.5
Trucks	3	4	1	0	-	8	2	0	2	0	-	4	3	17	7	0	-	27	1	10	2	0	-	13	52
% Trucks	1.2	1.6	1.1	0	-	1.3	1.6	0	1	0	-	0.7	1.6	1.8	1.8	0	-	1.8	0.8	1.3	3.3	0	-	1.4	1.4
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	1
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0.3	0	-	0.1	0	0	0	0	-	0	0
Peds	-	-	-	-	12	-	-	-	-	-	6	-	-	-	-	-	4	-	-	-	-	-	2	-	24
% Peds	-	-	-	-	50	-	-	-	-	-	25	-	-	-	-	-	16.7	-	-	-	-	-	8.3	-	-



Ontario Traffic Inc.

TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Diagram

Specified Period

From: 11:00:00
To: 14:00:00

One Hour Peak

From: 11:45:00
To: 12:45:00

Intersection: Maplevue Dr W & Veterans Dr
Site ID: 2016000001
Count Date: Oct 03, 2020

Weather conditions:

**** Signalized Intersection ****

Major Road: Veterans Dr runs N/S

North Approach

	Out	In	Total
	600	681	1281
	2	4	6
	0	0	0
Totals	602	685	1287

Veterans Dr

	0	0	0	0
	1	1	0	0
	44	179	377	0
Totals	45	180	377	0

East Approach

	Out	In	Total
	1365	1569	2934
	10	6	16
	1	0	1
Totals	1376	1575	2951

Maplevue Dr W

	Out	In	Total
	0	0	0
	0	0	54
	0	5	1010
Totals	0	59	1015

Peds: 0



Peds: 1

Peds: 1

Maplevue Dr W

	Out	In	Total
	0	0	0
	389	386	3
	794	786	7
Totals	193	193	0

West Approach

	Out	In	Total
	1121	911	2032
	7	10	17
	0	1	1
Totals	1128	922	2050

	83	242	183	0
	81	241	182	0
	2	1	1	0
	0	0	0	0
Totals	83	242	183	0

Veterans Dr

South Approach

	Out	In	Total
	504	429	933
	4	3	7
	0	0	0
Totals	508	432	940

- Cars

- Trucks

- Bicycles

Comments



Ontario Traffic Inc.
TRAFFIC MONITORING SERVICES & PRODUCTS

Peak Hour Summary

Intersection: Mapleview Dr W & Veterans Dr

Count Date: Oct 03, 2020

Period: 11:00 - 14:00

Peak Hour Data (11:45 - 12:45)

Start Time	North Approach Veterans Dr						South Approach Veterans Dr						East Approach Mapleview Dr W						West Approach Mapleview Dr W						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
11:45	97	47	15	0	0	159	19	48	44	0	1	111	58	200	99	0	0	357	13	263	16	0	0	292	919
12:00	81	31	11	0	0	123	19	67	62	0	0	148	42	177	70	0	0	289	13	248	22	0	1	283	843
12:15	91	54	7	0	0	152	25	55	34	0	0	114	53	194	105	0	0	352	19	272	11	0	0	302	920
12:30	108	48	12	0	0	168	20	72	43	0	0	135	40	223	115	0	0	378	9	232	10	0	0	251	932
Grand Total	377	180	45	0	0	602	83	242	183	0	1	508	193	794	389	0	0	1376	54	1015	59	0	1	1128	3614
Approach %	62.6	29.9	7.5	0	-	-	16.3	47.6	36	0	-	-	14	57.7	28.3	0	-	-	4.8	90	5.2	0	-	-	-
Totals %	10.4	5	1.2	0	-	16.7	2.3	6.7	5.1	0	-	14.1	5.3	22	10.8	0	-	38.1	1.5	28.1	1.6	0	-	31.2	-
PHF	0.87	0.83	0.75	0	-	0.9	0.83	0.84	0.74	0	-	0.86	0.83	0.89	0.85	0	-	0.91	0.71	0.93	0.67	0	-	0.93	0.97
Cars	377	179	44	0	-	600	81	241	182	0	-	504	193	786	386	0	-	1365	54	1010	57	0	-	1121	3590
% Cars	100	99.4	97.8	0	-	99.7	97.6	99.6	99.5	0	-	99.2	100	99	99.2	0	-	99.2	100	99.5	96.6	0	-	99.4	99.3
Trucks	0	1	1	0	-	2	2	1	1	0	-	4	0	7	3	0	-	10	0	5	2	0	-	7	23
% Trucks	0	0.6	2.2	0	-	0.3	2.4	0.4	0.5	0	-	0.8	0	0.9	0.8	0	-	0.7	0	0.5	3.4	0	-	0.6	0.6
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0.1	0	0	-	0.1	0	0	0	0	-	0	0
Peds	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	2
% Peds	-	-	-	-	0	-	-	-	-	-	50	-	-	-	-	-	0	-	-	-	-	-	50	-	-



Turning Movement Count Diagram

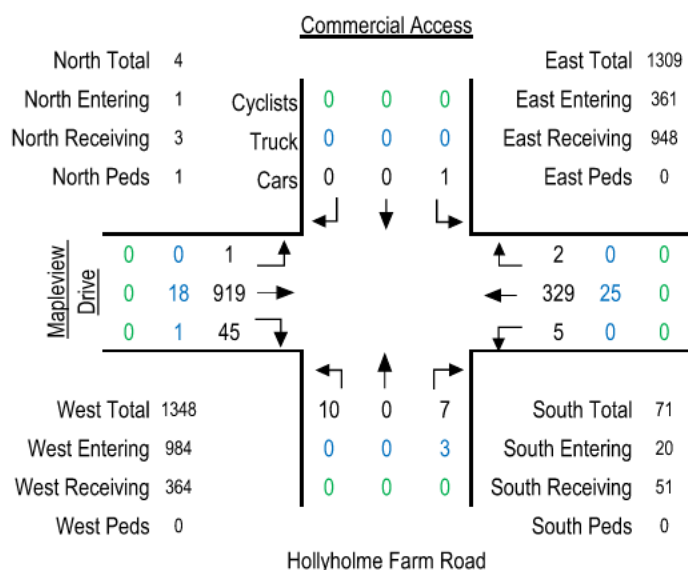
Intersection: Mapleview Drive & Hollyholme Farm Road

Municipality: Barrie, Ontario

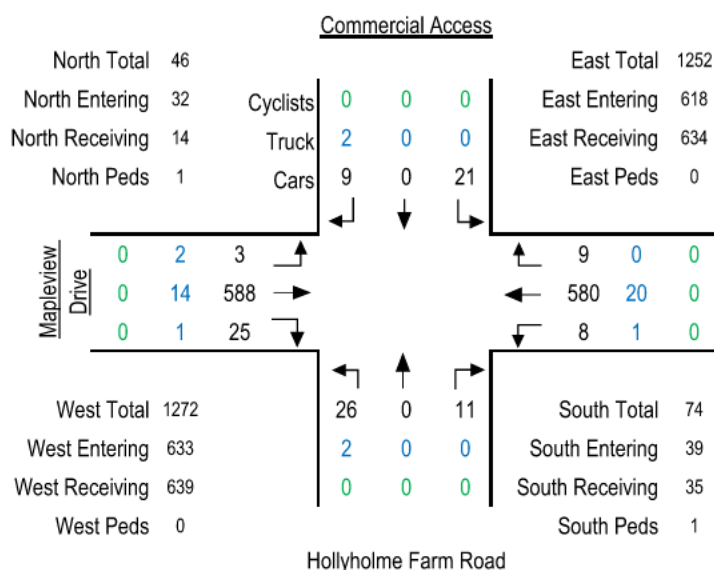
Intersection ID:

Date: Tuesday April 9, 2019

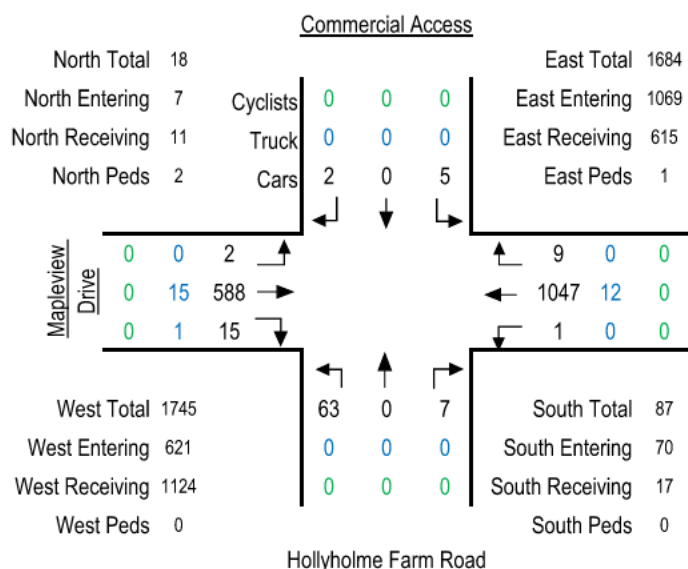
AM Peak Hour: 7:45 to 8:45



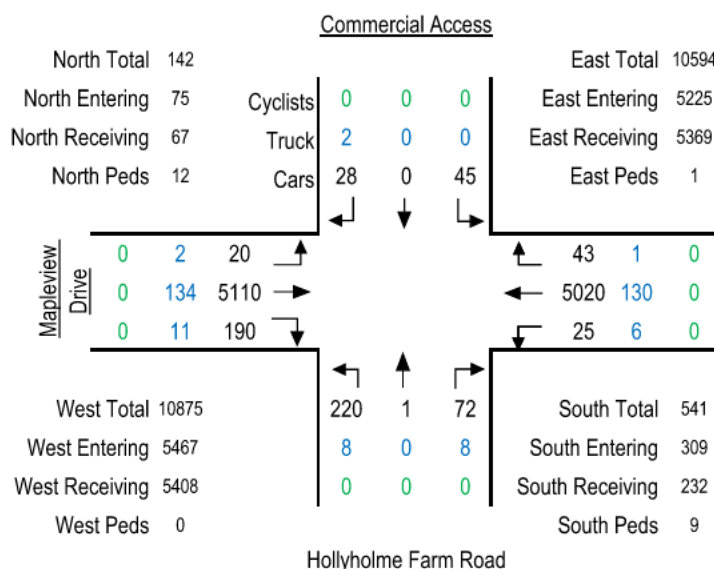
MD Peak Hour: 12:00 to 13:00



PM Peak Hour: 16:45 to 17:45



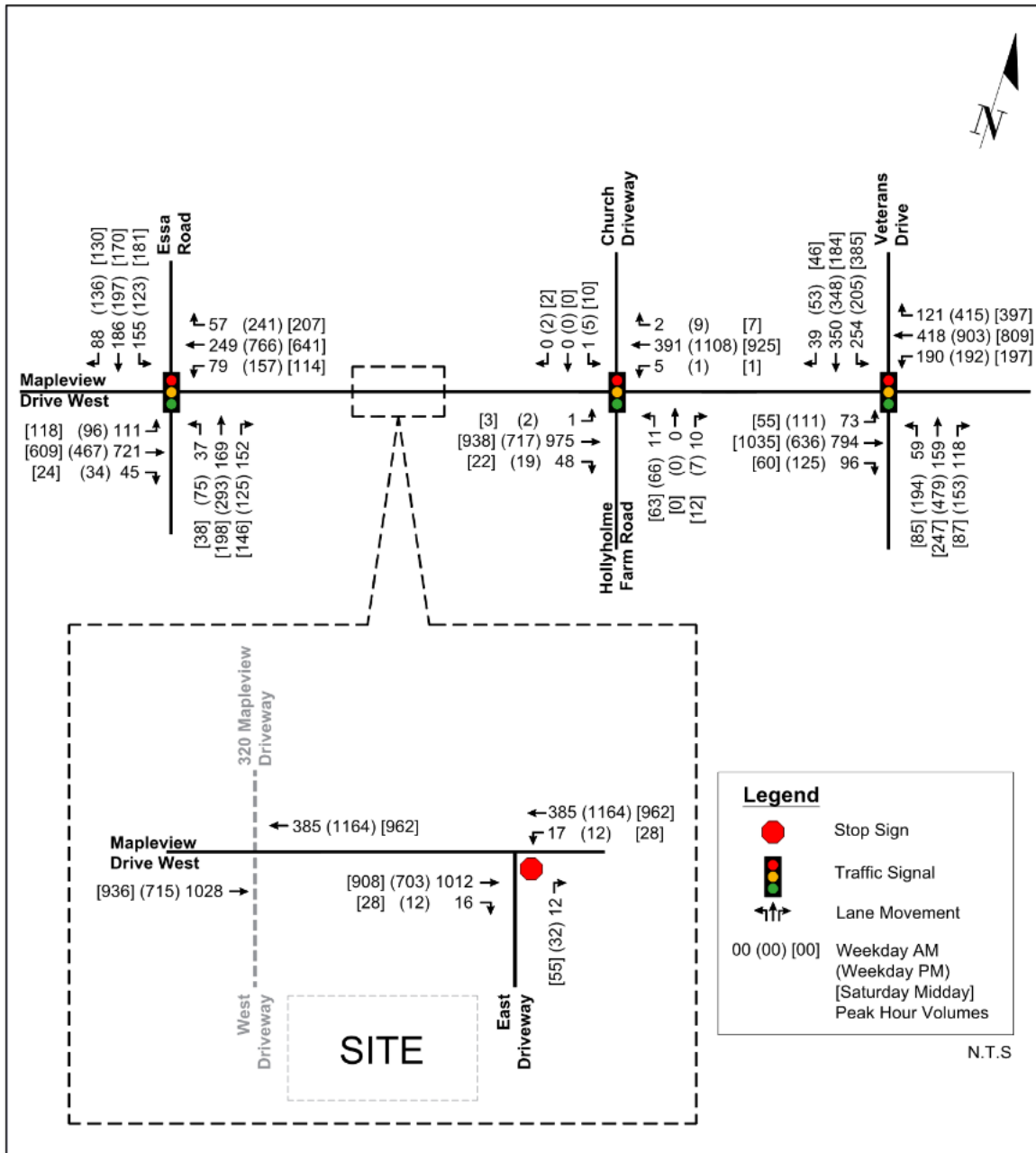
Total 8-Hour Count



Trans-Plan Transportation Inc.

Site ID Code:
 Intersection Location: Maplevue Drive & Hollyholme Farm Road
 Municipality: Barrie, Ontario
 Count Date: Tuesday April 9, 2019
 Weather and Temperature: Cloudy, 7 Degrees
 Surveyor: TP

AM	NORTH APPROACH										Total	EAST APPROACH										Total	SOUTH APPROACH										Total	WEST APPROACH										Total	Grand Total
	CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds		CAR			TRUCKS			CYCLISTS			Peds													
	L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R			L	T	R	L	T	R	L	T	R														
7:00	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	3	0	0	0	0	0	53	1	0	0	0	0	1	0	0	0	0	2	0	153	5	0	1	0	0	0	0	159	214	
7:15	0	0	0	0	0	0	0	0	0	0	0	0	63	0	0	6	0	0	0	0	0	69	3	0	1	0	0	0	0	0	0	4	0	154	10	0	4	0	0	0	0	168	241		
7:30	0	0	0	0	0	0	0	0	0	0	0	0	62	0	0	7	0	0	0	0	0	69	1	0	0	0	0	1	0	0	0	1	3	0	216	12	0	1	0	0	0	0	229	301	
7:45	0	0	0	0	0	0	0	0	0	0	1	1	89	1	0	8	0	0	0	0	0	101	1	0	3	0	0	0	0	0	0	4	0	263	21	0	2	0	0	0	0	286	392		
8:00	0	0	0	0	0	0	0	0	0	0	0	0	67	0	0	8	0	0	0	0	0	75	3	0	1	0	0	1	0	0	0	5	0	222	7	0	6	0	0	0	0	235	315		
8:15	1	0	0	0	0	0	0	0	0	0	0	1	77	1	0	3	0	0	0	0	0	82	3	0	2	0	0	1	0	0	0	6	0	215	10	0	6	0	0	0	0	231	320		
8:30	0	0	0	0	0	0	0	0	0	0	0	0	96	0	0	6	0	0	0	0	0	103	3	0	1	0	0	1	0	0	0	5	1	219	7	0	4	1	0	0	0	232	340		
8:45	0	0	1	0	0	0	0	0	0	1	2	1	61	0	0	6	0	0	0	0	0	68	4	0	2	1	0	0	0	0	0	7	7	232	7	0	6	1	0	0	0	253	330		
MD																																													
11:00	0	0	0	0	0	0	0	0	0	0	0	0	124	2	0	7	0	0	0	0	0	133	4	0	1	0	0	0	0	0	0	5	1	154	2	0	2	0	0	0	0	159	297		
11:15	1	0	1	0	0	0	0	0	0	0	2	0	131	0	2	4	0	0	0	0	0	137	3	0	1	1	0	1	0	0	0	6	0	162	1	0	7	1	0	0	0	0	171	316	
11:30	3	0	4	0	0	0	0	0	0	0	7	1	129	1	0	6	0	0	0	0	0	137	4	0	2	1	0	0	0	0	0	7	0	125	0	0	5	1	0	0	0	0	131	282	
11:45	6	0	2	0	0	0	0	0	0	0	8	1	149	2	0	3	0	0	0	0	0	155	4	0	3	0	0	0	0	0	0	7	0	138	4	0	5	1	0	0	0	0	148	318	
12:00	8	0	6	0	0	1	0	0	0	0	15	0	164	1	0	3	0	0	0	0	0	168	8	0	0	0	0	0	0	0	0	8	0	133	7	1	4	0	0	0	0	0	145	336	
12:15	11	0	1	0	0	1	0	0	0	0	13	2	143	2	0	8	0	0	0	0	0	155	7	0	3	1	0	0	0	0	1	12	3	136	7	1	2	0	0	0	0	0	149	329	
12:30	1	0	1	0	0	0	0	0	0	1	3	4	129	5	0	4	0	0	0	0	0	142	3	0	4	0	0	0	0	0	0	7	0	157	9	0	3	1	0	0	0	0	170	322	
12:45	1	0	1	0	0	0	0	0	0	0	2	2	144	1	1	5	0	0	0	0	0	153	8	0	4	1	0	0	0	0	0	13	0	162	2	0	5	0	0	0	0	0	169	337	
13:00	1	0	0	0	0	0	0	0	0	1	2	0	144	1	0	3	0	0	0	0	0	148	8	0	5	0	0	0	0	0	0	13	0	138	7	0	4	0	0	0	0	0	149	312	
13:15	0	0	1	0	0	0	0	0	0	0	1	1	151	2	0	2	0	0	0	0	0	156	4	0	5	1	0	1	0	0	0	11	0	127	7	0	5	0	0	0	0	0	139	307	
13:30	0	0	1	0	0	0	0	0	0	2	3	0	143	1	1	2	0	0	0	0	0	147	2	0	1	0	0	0	0	0	2	5	1	152	6	0	6	0	0	0	0	0	165	320	
13:45	3	0	1	0	0	0	0	0	0	1	5	2	136	4	0	3	1	0	0	0	0	146	5	0	3	1	0	0	0	0	0	9	1	132	6	0	7	0	0	0	0	0	146	306	
PM																																													
15:00	0	0	2	0	0	0	0	0	0	0	2	0	174	0	0	4	0	0	0	0	0	178	4	0	6	0	0	0	0	0	1	11	0	155	7	0	9	1	0	0	0	0	172	363	
15:15	1	0	0	0	0	0	0	0	0	0	1	1	185	0	1	2	0	0	0	0	0	189	7	0	3	0	0	0	0	0	0	10	0	104	5	0	3	2	0	0	0	0	0	114	314
15:30	0	0	0	0	0	0	0	0	0	1	1	0	210	0	0	2	0	0	0	0	0	212	6	0	3	0	0	0	0	0	0	9	0	154	6	0	3	0	0	0	0	0	0	163	385
15:45	0	0	1	0	0	0	0	0	0	0	1	1	207	1	1	4	0	0	0	0	0	214	6	0																					

Figure 5: Existing Traffic Volumes

Mapleview Drive & Essa Road – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Essa Road (main street)	Advanced Southbound Left Turn	7	10	3	1	N/A	N/A
Essa Road (main street)	Northbound	30	30	5	2	13	17
Essa Road (main street)	Southbound	30	30	5	2	13	17
Mapleview Drive (side street)	Advanced Eastbound Left Turn	7	10	3	1	N/A	N/A
Mapleview Drive (side street)	Advanced Westbound Left Turn	7	10	3	1	N/A	N/A
Mapleview Drive (side street)	Eastbound	12	30	4	2	11	17
Mapleview Drive (side street)	Westbound	12	30	4	2	11	17

NOTE: All times are recorded in seconds, based on full demand.

Mapleview Drive & Veterans Drive – FREE PLAN (NO COORDINATION)

Roadway	Direction	Vehicular Indications				Pedestrian Indications	
		Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Mapleview Drive (main street)	Advanced Eastbound Left Turn	7	15	3	1	N/A	N/A
Mapleview Drive (main street)	Advanced Westbound Left Turn	7	15	3	1	N/A	N/A
Mapleview Drive (main street)	Eastbound	30	30	4	2	13	17
Mapleview Drive (main street)	Westbound	30	30	4	2	13	17
Veterans Drive (side street)	Advanced Northbound Left Turn	7	15	3	1	N/A	N/A
Veterans Drive (side street)	Advanced Southbound Left Turn	7	15	3	1	N/A	N/A
Veterans Drive (side street)	Northbound	10	30	4	2	10	16
Veterans Drive (side street)	Southbound	10	30	4	2	10	16

NOTE: All times are recorded in seconds, based on full demand.

Mapleview Drive & Hollyholme Farm Road – FREE PLAN (NO COORDINATION)

		Vehicular Indications				Pedestrian Indications	
Roadway	Direction	Minimum Green	Maximum Green	Amber	All Red	Walk	Flashing Don't Walk
Mapleview Drive (main street)	Advanced Eastbound Left Turn	7	15	3	1	N/A	N/A
Mapleview Drive (main street)	Advanced Westbound Left Turn	7	15	3	1	N/A	N/A
Mapleview Drive (main street)	Eastbound	54	54	4	2	42	12
Mapleview Drive (main street)	Westbound	54	54	4	2	42	12
Hollyholme Farm Rd (side street)	Advanced Northbound Left Turn	7	10	3	1	N/A	N/A
Hollyholme Farm Rd (side street)	Advanced Southbound Left Turn	7	10	3	1	N/A	N/A
Hollyholme Farm Rd (side street)	Northbound	10	15	4	2	9	14
Hollyholme Farm Rd (side street)	Southbound	10	15	4	2	9	14

NOTE: All times are recorded in seconds, based on full demand.

The intersection of Mapleview Drive West and Hollyholme Farm Road is expected to operate with a LOS "B" through all horizon years with a maximum delay of 17.1 seconds and reserve capacity for increases in traffic volumes.

5.0 Trip Generation

5.1 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that previously did not exist. The trip generation of the proposed development was forecasted using the average rates provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Self-Storage facilities are classified as Land Use Code (LUC) 151: Mini-Warehouse. The forecasted trips are tabulated in **Table 7**. Relevant ITE excerpts have been included in **Appendix I**.

Table 7: ITE Trip Generation

	Peak Hour	Inbound	Outbound	Total
LUC 151: Mini-Warehouse (103,935 ft ²)	A.M.	6	4	10
	P.M.	8	10	18

5.2 Trip Distribution and Assignment

The trips generated by the proposed development were distributed to the boundary road network based on the travel patterns observed on the boundary road network, expected catchment areas, and proposed access restrictions. The site access will be restricted to left-in, right-in/right out movements only. Accordingly, 100% of the outbound a.m. and p.m. peak hour volumes were distributed to the east, through the intersection of Mapleview Drive West and Hollyholme Farm Road towards the Highway 400.

During the weekday a.m. peak hour, 30% of existing volumes travelled westbound on Mapleview Drive West and 70% travelled eastbound on Mapleview Drive. In the weekday p.m. peak hour 65% of existing volumes travelled westbound on Mapleview Drive West and 35% eastbound on Mapleview Drive. At the intersection of Mapleview and Essa Road, the inbound trips were distributed based on the local residential neighbourhoods and expected catchment area. The resulting trip distribution is as follows:

A.M. Peak Hour

- 30% from the east via Mapleview Drive West
- 55% from the west via Mapleview Drive West
- 15% from the north via Essa Road

PM Peak Hours

- 65% from the east via Mapleview Drive West
- 25% from the west via Mapleview Drive West
- 10% from the north via Essa Road

The trip distribution is illustrated in **Figure 8** and the corresponding trip assignment is illustrated in **Figure 9**. The traffic volumes illustrated in **Figure 9** were superimposed on the 2023, 2028 and 2033 future background traffic volumes illustrated in **Figure 5**, **Figure 6**, and **Figure 7**. The 2023, 2028 and 2033 future total traffic volumes are illustrated in **Figure 10**, **Figure 11**, and **Figure 12**.

Appendix D – Synchro Analysis Output – Existing Traffic Volumes

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Existing (2023) AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	161	718	75	248	54	32	137	133	123	173	163
Future Volume (vph)	161	718	75	248	54	32	137	133	123	173	163
Lane Group Flow (vph)	171	798	80	264	57	34	146	141	131	184	173
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.37	0.79	0.35	0.31	0.12	0.09	0.25	0.24	0.22	0.22	0.22
Control Delay	20.0	37.6	20.7	29.4	0.5	25.8	26.6	5.8	15.4	17.2	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	37.6	20.7	29.4	0.5	25.8	26.6	5.8	15.4	17.2	3.5
Queue Length 50th (m)	20.7	75.8	9.1	21.7	0.0	4.7	21.3	0.0	13.7	21.2	0.0
Queue Length 95th (m)	34.6	101.0	18.1	32.6	0.0	12.8	39.9	14.0	26.7	38.4	12.0
Internal Link Dist (m)		193.7		172.5			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	461	1132	262	1101	572	368	590	585	604	842	791
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.70	0.31	0.24	0.10	0.09	0.25	0.24	0.22	0.22	0.22

Intersection Summary

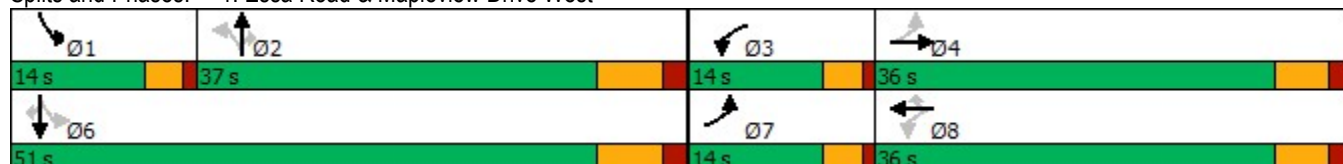
Cycle Length: 101

Actuated Cycle Length: 94.2

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Essa Road & Maplevue Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Existing (2023) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	718	32	75	248	54	32	137	133	123	173	163
Future Volume (vph)	161	718	32	75	248	54	32	137	133	123	173	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1749	3525		1671	3438	1511	1640	1776	1476	1718	1792	1490
Flt Permitted	0.53	1.00		0.18	1.00	1.00	0.64	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	968	3525		316	3438	1511	1107	1776	1476	1065	1792	1490
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	171	764	34	80	264	57	34	146	141	131	184	173
RTOR Reduction (vph)	0	3	0	0	0	42	0	0	94	0	0	92
Lane Group Flow (vph)	171	795	0	80	264	15	34	146	47	131	184	81
Confl. Peds. (#/hr)	4		3	3		4	1		1	1		1
Heavy Vehicles (%)	3%	1%	16%	8%	5%	4%	10%	7%	8%	5%	6%	7%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.7	27.1		30.9	24.2	24.2	31.4	31.4	31.4	44.3	44.3	44.3
Effective Green, g (s)	36.7	27.1		30.9	24.2	24.2	31.4	31.4	31.4	44.3	44.3	44.3
Actuated g/C Ratio	0.39	0.28		0.32	0.25	0.25	0.33	0.33	0.33	0.47	0.47	0.47
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	452	1004		198	874	384	365	586	487	557	834	694
v/s Ratio Prot	c0.04	c0.23		0.03	0.08			0.08		c0.02	0.10	
v/s Ratio Perm	0.11			0.10		0.01	0.03		0.03	c0.09		0.05
v/c Ratio	0.38	0.79		0.40	0.30	0.04	0.09	0.25	0.10	0.24	0.22	0.12
Uniform Delay, d1	19.9	31.4		23.6	28.6	26.7	22.0	23.2	22.0	14.8	15.1	14.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	4.3		1.3	0.2	0.0	0.5	1.0	0.4	0.2	0.6	0.3
Delay (s)	20.5	35.7		24.9	28.8	26.7	22.5	24.3	22.4	15.0	15.7	14.7
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		33.0			27.8			23.3			15.2	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			26.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			95.1			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			96.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

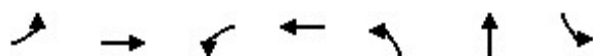
HCM Unsignalized Intersection Capacity Analysis
Existing (2023) AM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1044	6	0	412	0	4	
Future Volume (Veh/h)	1044	6	0	412	0	4	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1135	7	0	448	0	4	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	197			279			
pX, platoon unblocked			0.87		0.87	0.87	
vC, conflicting volume			1142		1288	382	
vC1, stage 1 conf vol					1138		
vC2, stage 2 conf vol					149		
vCu, unblocked vol			626		794	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			825		414	940	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	454	454	234	149	149	149	4
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	7	0	0	0	4
cSH	1700	1700	1700	1700	1700	1700	940
Volume to Capacity	0.27	0.27	0.14	0.09	0.09	0.09	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.8
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			30.3%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Existing (2023) AM Peak Hour

	→	↘	↙	←	↖	↗									
Movement	EBT	EBR	WBL	WBT	NBL	NBR									
Lane Configurations	↑↑↑↘		↙	↑↑↑		↗									
Traffic Volume (veh/h)	1048	16	15	410	0	11									
Future Volume (Veh/h)	1048	16	15	410	0	11									
Sign Control	Free			Free	Stop										
Grade	0%			0%	0%										
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92									
Hourly flow rate (vph)	1139	17	16	446	0	12									
Pedestrians															
Lane Width (m)															
Walking Speed (m/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	TWLTL			TWLTL											
Median storage veh)	2			2											
Upstream signal (m)	327			149											
pX, platoon unblocked				0.92	0.93	0.92									
vC, conflicting volume				1156	1328	388									
vC1, stage 1 conf vol					1148										
vC2, stage 2 conf vol					181										
vCu, unblocked vol				849	902	10									
tC, single (s)				4.1	6.8	6.9									
tC, 2 stage (s)					5.8										
tF (s)				2.2	3.5	3.3									
p0 queue free %				98	100	99									
cM capacity (veh/h)				719	341	978									
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1							
Volume Total	456	456	245	16	149	149	149	12							
Volume Left	0	0	0	16	0	0	0	0							
Volume Right	0	0	17	0	0	0	0	12							
cSH	1700	1700	1700	719	1700	1700	1700	978							
Volume to Capacity	0.27	0.27	0.14	0.02	0.09	0.09	0.09	0.01							
Queue Length 95th (m)	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.3							
Control Delay (s)	0.0	0.0	0.0	10.1	0.0	0.0	0.0	8.7							
Lane LOS				B		A									
Approach Delay (s)	0.0			0.4			8.7								
Approach LOS						A									
Intersection Summary															
Average Delay				0.2											
Intersection Capacity Utilization				30.6%	ICU Level of Service		A								
Analysis Period (min)				15											



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	Ø6
Lane Configurations	↰	↑↑↑	↰	↑↑↑	↰	↑	↰	
Traffic Volume (vph)	1	1018	5	409	11	0	1	
Future Volume (vph)	1	1018	5	409	11	0	1	
Lane Group Flow (vph)	1	1227	6	472	13	11	1	
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	24%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.00	0.42	0.02	0.17	0.03	0.02	0.00	
Control Delay	8.0	12.2	7.8	10.2	24.7	0.1	24.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.0	12.2	7.8	10.2	24.7	0.1	24.0	
Queue Length 50th (m)	0.1	37.9	0.4	12.3	1.7	0.0	0.0	
Queue Length 95th (m)	0.8	76.3	2.1	27.7	6.5	0.0	0.7	
Internal Link Dist (m)		124.9		797.8		126.6		
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	705	2945	449	2822	453	582	875	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.00	0.42	0.01	0.17	0.03	0.02	0.00	

Intersection Summary

Cycle Length: 122

Actuated Cycle Length: 93.4

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Ø1	Ø2	Ø3	Ø4
14 s	29 s	19 s	60 s
Ø5	Ø6	Ø7	Ø8
14 s	29 s	19 s	60 s

315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Existing (2023) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1018	50	5	409	2	11	0	10	1	0	0
Future Volume (vph)	1	1018	50	5	409	2	11	0	10	1	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0		
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97		
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00		
Frt	1.00	0.99		1.00	1.00		1.00	0.85		1.00		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95		
Satd. Flow (prot)	1805	5050		1805	4845		1805	1242		3502		
Flt Permitted	0.47	1.00		0.18	1.00		0.76	1.00		0.75		
Satd. Flow (perm)	897	5050		342	4845		1439	1242		2766		
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	1170	57	6	470	2	13	0	11	1	0	0
RTOR Reduction (vph)	0	4	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	1	1223	0	6	472	0	13	3	0	1	0	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	2%	0%	7%	0%	0%	0%	30%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.6	54.4		55.6	54.4		24.4	23.2		24.4		
Effective Green, g (s)	55.6	54.4		55.6	54.4		24.4	23.2		24.4		
Actuated g/C Ratio	0.56	0.54		0.56	0.54		0.24	0.23		0.24		
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0		
Lane Grp Cap (vph)	509	2747		207	2635		355	288		683		
v/s Ratio Prot	0.00	c0.24		c0.00	0.10		c0.00	0.00		0.00		
v/s Ratio Perm	0.00			0.02			c0.01			0.00		
v/c Ratio	0.00	0.45		0.03	0.18		0.04	0.01		0.00		
Uniform Delay, d1	9.9	13.7		10.3	11.5		28.8	29.6		28.6		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00		
Incremental Delay, d2	0.0	0.1		0.1	0.0		0.0	0.1		0.0		
Delay (s)	9.9	13.8		10.4	11.6		28.8	29.6		28.6		
Level of Service	A	B		B	B		C	C		C		
Approach Delay (s)		13.8			11.5			29.2			28.6	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		13.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		63.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Existing (2023) AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	70	762	218	449	37	99	241	235
Future Volume (vph)	70	762	218	449	37	99	241	235
Lane Group Flow (vph)	74	867	229	586	39	225	254	304
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.20	0.62	0.72	0.34	0.10	0.24	0.46	0.24
Control Delay	18.4	35.8	32.2	25.1	17.5	14.9	21.2	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.4	35.8	32.2	25.1	17.5	14.9	21.2	22.7
Queue Length 50th (m)	9.1	62.3	31.2	33.1	4.7	9.3	34.9	23.4
Queue Length 95th (m)	17.9	77.3	50.5	45.3	11.0	19.3	54.2	35.7
Internal Link Dist (m)		797.8		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	471	1392	339	1709	502	933	569	1288
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.62	0.68	0.34	0.08	0.24	0.45	0.24

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 107

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Existing (2023) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	762	62	218	449	107	37	99	115	241	235	54
Future Volume (vph)	70	762	62	218	449	107	37	99	115	241	235	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4928		1687	4793		1580	3017		1752	3349	
Flt Permitted	0.42	1.00		0.18	1.00		0.57	1.00		0.54	1.00	
Satd. Flow (perm)	767	4928		320	4793		943	3017		1001	3349	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	802	65	229	473	113	39	104	121	254	247	57
RTOR Reduction (vph)	0	9	0	0	33	0	0	86	0	0	16	0
Lane Group Flow (vph)	74	858	0	229	553	0	39	139	0	254	288	0
Confl. Peds. (#/hr)	2		6	6		2	4		1	1		4
Heavy Vehicles (%)	4%	4%	3%	7%	5%	4%	14%	6%	12%	3%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.6	30.8		48.2	37.4		36.4	31.8		49.3	40.7	
Effective Green, g (s)	37.6	30.8		48.2	37.4		36.4	31.8		49.3	40.7	
Actuated g/C Ratio	0.34	0.28		0.44	0.34		0.33	0.29		0.45	0.37	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	323	1386		308	1637		340	876		543	1244	
v/s Ratio Prot	0.01	0.17		c0.09	0.12		0.00	0.05		c0.06	0.09	
v/s Ratio Perm	0.06			c0.24			0.03			c0.15		
v/c Ratio	0.23	0.62		0.74	0.34		0.11	0.16		0.47	0.23	
Uniform Delay, d1	24.7	34.2		21.6	26.8		25.0	28.9		19.4	23.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		9.3	0.1		0.2	0.4		0.6	0.4	
Delay (s)	25.0	35.1		30.9	27.0		25.2	29.3		20.1	24.1	
Level of Service	C	D		C	C		C	C		C	C	
Approach Delay (s)		34.3			28.1			28.7			22.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			109.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			88.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Existing (2023) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	180	527	112	886	251	87	216	79	123	166	256
Future Volume (vph)	180	527	112	886	251	87	216	79	123	166	256
Lane Group Flow (vph)	196	590	122	963	273	95	235	86	134	180	278
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.76	0.55	0.36	0.92	0.42	0.27	0.41	0.15	0.28	0.22	0.33
Control Delay	40.3	31.6	19.4	49.5	5.6	29.7	30.8	2.8	17.3	18.6	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	31.6	19.4	49.5	5.6	29.7	30.8	2.8	17.3	18.6	3.3
Queue Length 50th (m)	24.0	53.0	14.3	100.2	0.0	15.0	38.9	0.0	15.5	22.6	0.0
Queue Length 95th (m)	#57.1	71.5	25.5	#138.5	18.6	29.3	61.7	6.0	27.4	37.5	14.7
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	258	1080	362	1069	657	349	568	560	489	825	850
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.55	0.34	0.90	0.42	0.27	0.41	0.15	0.27	0.22	0.33

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 100.3

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West

 Ø1	 Ø2	 Ø3	 Ø4
14 s	37 s	14 s	36 s
 Ø6		 Ø7	 Ø8
51 s		14 s	36 s

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Existing (2023) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	180	527	16	112	886	251	87	216	79	123	166	256
Future Volume (vph)	180	527	16	112	886	251	87	216	79	123	166	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3551		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.13	1.00		0.32	1.00	1.00	0.64	1.00	1.00	0.48	1.00	1.00
Satd. Flow (perm)	248	3551		595	3574	1559	1133	1845	1553	864	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	196	573	17	122	963	273	95	235	86	134	180	278
RTOR Reduction (vph)	0	2	0	0	0	193	0	0	60	0	0	156
Lane Group Flow (vph)	196	588	0	122	963	80	95	235	26	134	180	122
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	40.4	30.4		38.2	29.3	29.3	30.9	30.9	30.9	44.0	44.0	44.0
Effective Green, g (s)	40.4	30.4		38.2	29.3	29.3	30.9	30.9	30.9	44.0	44.0	44.0
Actuated g/C Ratio	0.40	0.30		0.38	0.29	0.29	0.31	0.31	0.31	0.44	0.44	0.44
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	253	1076		330	1044	455	349	568	478	455	825	694
v/s Ratio Prot	c0.08	0.17		0.03	c0.27			c0.13		c0.03	0.10	
v/s Ratio Perm	0.23			0.11		0.05	0.08		0.02	0.10		0.08
v/c Ratio	0.77	0.55		0.37	0.92	0.18	0.27	0.41	0.06	0.29	0.22	0.18
Uniform Delay, d1	23.3	29.2		21.0	34.4	26.5	26.2	27.5	24.4	17.5	17.5	17.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.7	0.6		0.7	13.0	0.2	1.9	2.2	0.2	0.4	0.6	0.6
Delay (s)	37.1	29.8		21.7	47.4	26.7	28.1	29.7	24.6	17.8	18.1	17.7
Level of Service	D	C		C	D	C	C	C	C	B	B	B
Approach Delay (s)		31.6			40.9			28.3			17.8	
Approach LOS		C			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			32.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			100.3			Sum of lost time (s)				21.0		
Intersection Capacity Utilization			104.5%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Existing (2023) PM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	753	8	0	1213	0	10	
Future Volume (Veh/h)	753	8	0	1213	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	818	9	0	1318	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	195			287			
pX, platoon unblocked			0.93		0.89	0.93	
vC, conflicting volume			827		1262	277	
vC1, stage 1 conf vol					822		
vC2, stage 2 conf vol					439		
vCu, unblocked vol			539		316	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			951		504	1006	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	327	327	173	439	439	439	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	1006
Volume to Capacity	0.19	0.19	0.10	0.26	0.26	0.26	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.6
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.6
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			26.8%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Existing (2023) PM Peak Hour

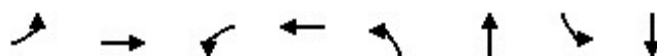
	→	↘	↙	←	↖	↗				
Movement	EBT	EBR	WBL	WBT	NBL	NBR				
Lane Configurations	↑↑↑↘		↙	↑↑↑		↗				
Traffic Volume (veh/h)	763	8	14	1209	0	32				
Future Volume (Veh/h)	763	8	14	1209	0	32				
Sign Control	Free			Free	Stop					
Grade	0%			0%	0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				
Hourly flow rate (vph)	829	9	15	1314	0	35				
Pedestrians										
Lane Width (m)										
Walking Speed (m/s)										
Percent Blockage										
Right turn flare (veh)										
Median type	TWLTL			TWLTL						
Median storage veh)	2			2						
Upstream signal (m)	326			155						
pX, platoon unblocked				0.98	0.86	0.98				
vC, conflicting volume				838	1302	281				
vC1, stage 1 conf vol					834					
vC2, stage 2 conf vol					468					
vCu, unblocked vol				746	599	175				
tC, single (s)				4.1	6.8	6.9				
tC, 2 stage (s)					5.8					
tF (s)				2.2	3.5	3.3				
p0 queue free %				98	100	96				
cM capacity (veh/h)				837	411	818				
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1		
Volume Total	332	332	175	15	438	438	438	35		
Volume Left	0	0	0	15	0	0	0	0		
Volume Right	0	0	9	0	0	0	0	35		
cSH	1700	1700	1700	837	1700	1700	1700	818		
Volume to Capacity	0.20	0.20	0.10	0.02	0.26	0.26	0.26	0.04		
Queue Length 95th (m)	0.0	0.0	0.0	0.4	0.0	0.0	0.0	1.1		
Control Delay (s)	0.0	0.0	0.0	9.4	0.0	0.0	0.0	9.6		
Lane LOS				A				A		
Approach Delay (s)	0.0			0.1				9.6		
Approach LOS										
Intersection Summary										
Average Delay				0.2						
Intersection Capacity Utilization				26.7%	ICU Level of Service			A		
Analysis Period (min)				15						

315 Mapleview Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Existing (2023) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	2	752	1	1158	69	0	5	0
Future Volume (vph)	2	752	1	1158	69	0	5	0
Lane Group Flow (vph)	2	804	1	1215	72	7	5	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.01	0.30	0.00	0.44	0.15	0.01	0.01	0.00
Control Delay	10.0	14.3	10.0	16.0	23.8	0.0	23.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	14.3	10.0	16.0	23.8	0.0	23.0	0.0
Queue Length 50th (m)	0.2	32.1	0.1	53.9	9.7	0.0	0.3	0.0
Queue Length 95th (m)	1.3	51.7	0.8	83.1	22.4	0.0	1.8	0.0
Internal Link Dist (m)		130.7		792.0		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	407	2708	517	2744	484	782	971	605
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.00	0.30	0.00	0.44	0.15	0.01	0.01	0.00

Intersection Summary

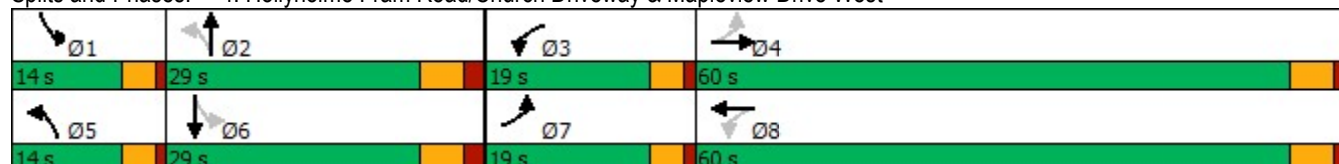
Cycle Length: 122

Actuated Cycle Length: 101.6

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Existing (2023) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	752	20	1	1158	9	69	0	7	5	0	2
Future Volume (vph)	2	752	20	1	1158	9	69	0	7	5	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5060		1805	5129		1805	1615		3502	1583	
Flt Permitted	0.17	1.00		0.31	1.00		0.65	1.00		0.75	1.00	
Satd. Flow (perm)	327	5060		586	5129		1242	1615		2776	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	2	783	21	1	1206	9	72	0	7	5	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	5	0	0	2	0
Lane Group Flow (vph)	2	802	0	1	1215	0	72	2	0	5	0	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	0%	2%	6%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		36.4	31.2		26.6	25.4	
Effective Green, g (s)	55.5	54.3		55.5	54.3		36.4	31.2		26.6	25.4	
Actuated g/C Ratio	0.51	0.50		0.51	0.50		0.34	0.29		0.25	0.24	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	2546		314	2581		455	466		692	372	
v/s Ratio Prot	c0.00	0.16		0.00	c0.24		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.00			c0.04			0.00		
v/c Ratio	0.01	0.32		0.00	0.47		0.16	0.00		0.01	0.00	
Uniform Delay, d1	13.4	15.8		12.8	17.4		24.8	27.3		30.7	31.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1		0.2	0.0		0.0	0.0	
Delay (s)	13.4	15.9		12.8	17.6		24.9	27.3		30.7	31.6	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.9			17.6			25.1			30.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			107.9			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.5%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Existing (2023) PM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	125	771	187	951	130	279	260	261
Future Volume (vph)	125	771	187	951	130	279	260	261
Lane Group Flow (vph)	133	886	199	1428	138	504	277	376
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.54	0.62	0.63	0.94	0.29	0.48	0.65	0.34
Control Delay	26.1	35.3	27.4	46.7	18.8	23.4	26.0	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	35.3	27.4	46.7	18.8	23.4	26.0	26.3
Queue Length 50th (m)	16.9	62.0	26.4	106.1	16.9	32.8	37.1	29.0
Queue Length 95th (m)	29.4	78.8	42.4	#149.0	30.2	50.7	59.0	45.5
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	327	1440	356	1525	546	1060	444	1099
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.62	0.56	0.94	0.25	0.48	0.62	0.34

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 106.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Existing (2023) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	771	62	187	951	391	130	279	195	260	261	92
Future Volume (vph)	125	771	62	187	951	391	130	279	195	260	261	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5064		1769	4828		1768	3350		1786	3397	
Flt Permitted	0.13	1.00		0.19	1.00		0.53	1.00		0.32	1.00	
Satd. Flow (perm)	251	5064		345	4828		984	3350		600	3397	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	133	820	66	199	1012	416	138	297	207	277	278	98
RTOR Reduction (vph)	0	8	0	0	65	0	0	113	0	0	30	0
Lane Group Flow (vph)	133	878	0	199	1363	0	138	391	0	277	346	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.3	30.0		44.5	32.1		40.3	30.0		47.1	33.4	
Effective Green, g (s)	40.3	30.0		44.5	32.1		40.3	30.0		47.1	33.4	
Actuated g/C Ratio	0.38	0.28		0.42	0.30		0.38	0.28		0.44	0.31	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	244	1431		311	1460		449	947		419	1069	
v/s Ratio Prot	0.05	0.17		c0.07	c0.28		0.03	0.12		c0.09	0.10	
v/s Ratio Perm	0.15			0.19			0.09			c0.21		
v/c Ratio	0.55	0.61		0.64	0.93		0.31	0.41		0.66	0.32	
Uniform Delay, d1	24.7	33.0		21.3	36.0		22.1	30.9		20.2	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	0.8		4.3	11.2		0.4	1.3		3.9	0.8	
Delay (s)	27.2	33.8		25.6	47.2		22.5	32.2		24.1	28.5	
Level of Service	C	C		C	D		C	C		C	C	
Approach Delay (s)		32.9			44.5			30.1			26.6	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			106.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			88.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Existing (2023) SAT (MID) Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	123	636	120	669	216	40	206	152	189	177	135
Future Volume (vph)	123	636	120	669	216	40	206	152	189	177	135
Lane Group Flow (vph)	129	695	126	704	227	42	217	160	199	186	142
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.48	0.76	0.48	0.77	0.40	0.11	0.35	0.26	0.35	0.21	0.17
Control Delay	23.2	38.3	23.4	38.7	6.1	25.6	27.8	5.6	16.3	16.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	38.3	23.4	38.7	6.1	25.6	27.8	5.6	16.3	16.8	3.5
Queue Length 50th (m)	15.1	65.0	14.8	66.2	0.0	5.7	32.1	0.0	20.9	20.7	0.0
Queue Length 95th (m)	26.9	85.4	26.3	87.0	17.3	14.9	57.0	14.8	39.2	38.7	11.0
Internal Link Dist (m)		193.7		171.9			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	290	1150	282	1155	649	396	614	618	577	866	814
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.60	0.45	0.61	0.35	0.11	0.35	0.26	0.34	0.21	0.17

Intersection Summary

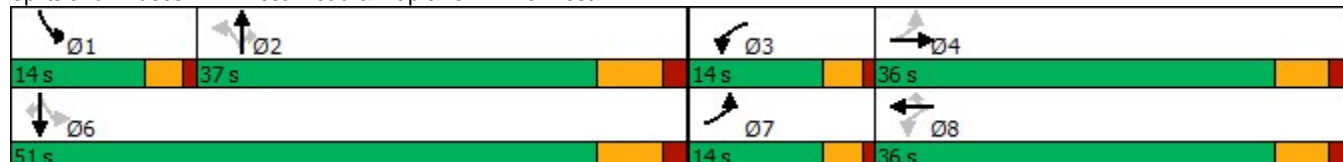
Cycle Length: 101

Actuated Cycle Length: 94.1

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Essa Road & Mapleview Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Existing (2023) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	636	25	120	669	216	40	206	152	189	177	135
Future Volume (vph)	123	636	25	120	669	216	40	206	152	189	177	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1804	3590		1736	3610	1549	1801	1881	1563	1787	1845	1575
Flt Permitted	0.19	1.00		0.19	1.00	1.00	0.64	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	357	3590		355	3610	1549	1214	1881	1563	980	1845	1575
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	129	669	26	126	704	227	42	217	160	199	186	142
RTOR Reduction (vph)	0	3	0	0	0	169	0	0	108	0	0	75
Lane Group Flow (vph)	129	692	0	126	704	58	42	217	52	199	186	67
Confl. Peds. (#/hr)	7					7	3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	1%	0%	1%	2%	1%	3%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	32.9	23.9		32.9	23.9	23.9	30.8	30.8	30.8	44.2	44.2	44.2
Effective Green, g (s)	32.9	23.9		32.9	23.9	23.9	30.8	30.8	30.8	44.2	44.2	44.2
Actuated g/C Ratio	0.35	0.25		0.35	0.25	0.25	0.33	0.33	0.33	0.47	0.47	0.47
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	263	911		256	916	393	397	615	511	540	866	739
v/s Ratio Prot	0.05	0.19		c0.05	c0.20			0.12		c0.04	0.10	
v/s Ratio Perm	0.12			0.12		0.04	0.03		0.03	c0.14		0.04
v/c Ratio	0.49	0.76		0.49	0.77	0.15	0.11	0.35	0.10	0.37	0.21	0.09
Uniform Delay, d1	22.4	32.4		22.4	32.5	27.2	22.1	24.1	22.0	15.1	14.7	13.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	3.7		1.5	3.9	0.2	0.5	1.6	0.4	0.4	0.6	0.2
Delay (s)	23.8	36.1		23.9	36.5	27.4	22.6	25.7	22.4	15.5	15.3	14.1
Level of Service	C	D		C	D	C	C	C	C	B	B	B
Approach Delay (s)		34.2			33.0			24.1			15.0	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			28.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			94.1			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			96.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Existing (2023) SAT (MID) Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1002	8	0	1043	0	10	
Future Volume (Veh/h)	1002	8	0	1043	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1089	9	0	1134	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	196			281			
pX, platoon unblocked			0.89		0.94	0.89	
vC, conflicting volume			1098		1472	368	
vC1, stage 1 conf vol					1094		
vC2, stage 2 conf vol					378		
vCu, unblocked vol			681		524	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			809		406	966	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	436	436	227	378	378	378	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	966
Volume to Capacity	0.26	0.26	0.13	0.22	0.22	0.22	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.8
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			29.5%		ICU Level of Service		A
Analysis Period (min)			15				

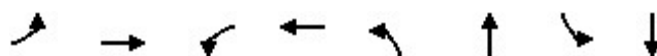
315 Maplevue Drive

3: East Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

Existing (2023) SAT (MID) Peak Hour

	→	↘	↙	←	↖	↗						
Movement	EBT	EBR	WBL	WBT	NBL	NBR						
Lane Configurations	↑↑↑↘		↙	↑↑↑		↗						
Traffic Volume (veh/h)	1012	17	28	1039	0	45						
Future Volume (Veh/h)	1012	17	28	1039	0	45						
Sign Control	Free			Free	Stop							
Grade	0%			0%	0%							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	1100	18	30	1129	0	49						
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh)	2			2								
Upstream signal (m)	326			151								
pX, platoon unblocked				0.94	0.92	0.94						
vC, conflicting volume				1118	1545	376						
vC1, stage 1 conf vol					1109							
vC2, stage 2 conf vol					436							
vCu, unblocked vol				894	814	103						
tC, single (s)				4.1	6.8	6.9						
tC, 2 stage (s)					5.8							
tF (s)				2.2	3.5	3.3						
p0 queue free %				96	100	94						
cM capacity (veh/h)				708	332	875						
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1				
Volume Total	440	440	238	30	376	376	376	49				
Volume Left	0	0	0	30	0	0	0	0				
Volume Right	0	0	18	0	0	0	0	49				
cSH	1700	1700	1700	708	1700	1700	1700	875				
Volume to Capacity	0.26	0.26	0.14	0.04	0.22	0.22	0.22	0.06				
Queue Length 95th (m)	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4				
Control Delay (s)	0.0	0.0	0.0	10.3	0.0	0.0	0.0	9.4				
Lane LOS				B			A					
Approach Delay (s)	0.0			0.3			9.4					
Approach LOS				A								
Intersection Summary												
Average Delay						0.3						
Intersection Capacity Utilization				29.9%	ICU Level of Service			A				
Analysis Period (min)				15								



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	3	982	1	967	66	0	10	0
Future Volume (vph)	3	982	1	967	66	0	10	0
Lane Group Flow (vph)	3	1047	1	1014	69	13	10	2
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.01	0.38	0.00	0.37	0.16	0.02	0.01	0.00
Control Delay	10.3	15.3	10.0	15.2	24.1	0.1	22.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	15.3	10.0	15.2	24.1	0.1	22.8	0.0
Queue Length 50th (m)	0.3	44.7	0.1	43.0	9.3	0.0	0.6	0.0
Queue Length 95th (m)	1.6	69.5	0.8	67.0	21.9	0.0	2.7	0.0
Internal Link Dist (m)		126.7		795.9		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	454	2736	445	2741	433	755	967	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.38	0.00	0.37	0.16	0.02	0.01	0.00

Intersection Summary

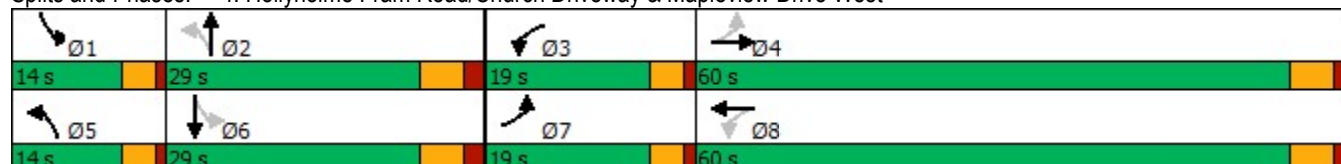
Cycle Length: 122

Actuated Cycle Length: 101.7

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Existing (2023) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	982	23	1	967	7	66	0	12	10	0	2
Future Volume (vph)	3	982	23	1	967	7	66	0	12	10	0	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5117		1805	5130		1612	1615		3502	1615	
Flt Permitted	0.23	1.00		0.22	1.00		0.65	1.00		0.75	1.00	
Satd. Flow (perm)	438	5117		418	5130		1109	1615		2761	1615	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	1023	24	1	1007	7	69	0	12	10	0	2
RTOR Reduction (vph)	0	2	0	0	0	0	0	9	0	0	2	0
Lane Group Flow (vph)	3	1045	0	1	1014	0	69	4	0	10	0	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	12%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		36.6	31.4		26.7	25.5	
Effective Green, g (s)	55.5	54.3		55.5	54.3		36.6	31.4		26.7	25.5	
Actuated g/C Ratio	0.51	0.50		0.51	0.50		0.34	0.29		0.25	0.24	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	2570		230	2576		408	469		690	380	
v/s Ratio Prot	c0.00	c0.20		0.00	0.20		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.01			0.00			c0.05			0.00		
v/c Ratio	0.01	0.41		0.00	0.39		0.17	0.01		0.01	0.00	
Uniform Delay, d1	13.1	16.8		13.1	16.7		24.8	27.3		30.7	31.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.1		0.0	0.1		0.2	0.0		0.0	0.0	
Delay (s)	13.1	16.9		13.2	16.8		25.0	27.3		30.7	31.6	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		16.9			16.8			25.3			30.9	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			108.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Existing (2023) SAT (MID) Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	59	1080	205	845	89	257	401	191
Future Volume (vph)	59	1080	205	845	89	257	401	191
Lane Group Flow (vph)	61	1178	211	1297	92	359	413	248
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.30	0.82	0.74	0.74	0.19	0.36	0.79	0.20
Control Delay	21.1	42.1	38.0	31.9	17.9	28.6	33.8	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	42.1	38.0	31.9	17.9	28.6	33.8	23.2
Queue Length 50th (m)	7.4	89.3	28.2	86.7	11.1	29.2	61.1	18.0
Queue Length 95th (m)	15.3	109.8	53.8	108.1	21.3	43.6	#103.0	29.7
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	323	1434	319	1756	577	995	520	1248
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.82	0.66	0.74	0.16	0.36	0.79	0.20

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 107.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Existing (2023) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	1080	63	205	845	413	89	257	91	401	191	49
Future Volume (vph)	59	1080	63	205	845	413	89	257	91	401	191	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5132		1805	4883		1769	3459		1805	3448	
Flt Permitted	0.13	1.00		0.11	1.00		0.60	1.00		0.43	1.00	
Satd. Flow (perm)	246	5132		218	4883		1113	3459		810	3448	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	61	1113	65	211	871	426	92	265	94	413	197	51
RTOR Reduction (vph)	0	6	0	0	73	0	0	32	0	0	19	0
Lane Group Flow (vph)	61	1172	0	211	1224	0	92	327	0	413	229	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.3	30.9		47.6	37.2		38.3	30.9		49.9	38.5	
Effective Green, g (s)	37.3	30.9		47.6	37.2		38.3	30.9		49.9	38.5	
Actuated g/C Ratio	0.34	0.28		0.43	0.34		0.35	0.28		0.46	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	174	1448		278	1658		433	976		505	1212	
v/s Ratio Prot	0.02	0.23		c0.09	0.25		0.01	0.09		c0.11	0.07	
v/s Ratio Perm	0.10			c0.24			0.06			c0.26		
v/c Ratio	0.35	0.81		0.76	0.74		0.21	0.33		0.82	0.19	
Uniform Delay, d1	25.6	36.6		23.4	31.9		24.4	31.2		22.6	24.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	3.5		11.3	1.8		0.2	0.9		9.9	0.3	
Delay (s)	26.8	40.0		34.7	33.6		24.7	32.1		32.5	25.0	
Level of Service	C	D		C	C		C	C		C	C	
Approach Delay (s)		39.4			33.8			30.6			29.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			34.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			109.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			85.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

Appendix E – Synchro Analysis Output – Background Traffic Volumes

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Background (2026) AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	174	764	82	268	65	34	147	142	131	190	181
Future Volume (vph)	174	764	82	268	65	34	147	142	131	190	181
Lane Group Flow (vph)	185	849	87	285	69	36	156	151	139	202	193
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.41	0.82	0.39	0.33	0.14	0.10	0.27	0.26	0.24	0.24	0.24
Control Delay	20.5	39.2	21.5	29.4	0.8	26.4	27.4	5.8	15.9	17.8	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	39.2	21.5	29.4	0.8	26.4	27.4	5.8	15.9	17.8	3.4
Queue Length 50th (m)	22.5	82.6	10.0	23.6	0.0	5.2	23.9	0.0	15.4	24.8	0.0
Queue Length 95th (m)	37.4	109.0	19.4	35.0	0.9	13.5	42.2	14.5	28.4	42.2	12.6
Internal Link Dist (m)		193.7		172.5			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	455	1120	253	1089	567	356	581	585	593	833	796
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.76	0.34	0.26	0.12	0.10	0.27	0.26	0.23	0.24	0.24

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 95.3

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Essa Road & Mapleview Drive West

			
14 s	37 s	14 s	36 s
			
51 s		14 s	36 s

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	764	34	82	268	65	34	147	142	131	190	181
Future Volume (vph)	174	764	34	82	268	65	34	147	142	131	190	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1749	3526		1671	3438	1511	1640	1776	1476	1718	1792	1490
Flt Permitted	0.51	1.00		0.16	1.00	1.00	0.63	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	935	3526		280	3438	1511	1089	1776	1476	1055	1792	1490
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	185	813	36	87	285	69	36	156	151	139	202	193
RTOR Reduction (vph)	0	3	0	0	0	51	0	0	102	0	0	104
Lane Group Flow (vph)	185	846	0	87	285	18	36	156	49	139	202	89
Confl. Peds. (#/hr)	4		3	3		4	1		1	1		1
Heavy Vehicles (%)	3%	1%	16%	8%	5%	4%	10%	7%	8%	5%	6%	7%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	37.7	28.0		31.9	25.1	25.1	31.2	31.2	31.2	44.3	44.3	44.3
Effective Green, g (s)	37.7	28.0		31.9	25.1	25.1	31.2	31.2	31.2	44.3	44.3	44.3
Actuated g/C Ratio	0.39	0.29		0.33	0.26	0.26	0.32	0.32	0.32	0.46	0.46	0.46
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	448	1027		191	897	394	353	576	479	549	826	686
v/s Ratio Prot	c0.04	c0.24		0.03	0.08			0.09		0.02	c0.11	
v/s Ratio Perm	0.12			0.12		0.01	0.03		0.03	c0.09		0.06
v/c Ratio	0.41	0.82		0.46	0.32	0.05	0.10	0.27	0.10	0.25	0.24	0.13
Uniform Delay, d1	19.9	31.8		23.7	28.6	26.5	22.7	24.0	22.7	15.3	15.7	14.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	5.5		1.7	0.2	0.0	0.6	1.2	0.4	0.2	0.7	0.4
Delay (s)	20.5	37.2		25.5	28.8	26.6	23.2	25.2	23.1	15.5	16.4	15.2
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		34.2			27.8			24.1			15.8	
Approach LOS		C			C			C			B	

Intersection Summary

HCM 2000 Control Delay	27.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	21.0
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Background (2026) AM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1111	6	0	452	0	4	
Future Volume (Veh/h)	1111	6	0	452	0	4	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1208	7	0	491	0	4	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	197			130			
pX, platoon unblocked			0.85		0.87	0.85	
vC, conflicting volume			1215		1375	406	
vC1, stage 1 conf vol					1212		
vC2, stage 2 conf vol					164		
vCu, unblocked vol			636		652	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			802		407	922	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	483	483	249	164	164	164	4
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	7	0	0	0	4
cSH	1700	1700	1700	1700	1700	1700	922
Volume to Capacity	0.28	0.28	0.15	0.10	0.10	0.10	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.9
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			31.6%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive 3: East Access & Maplevue Drive West

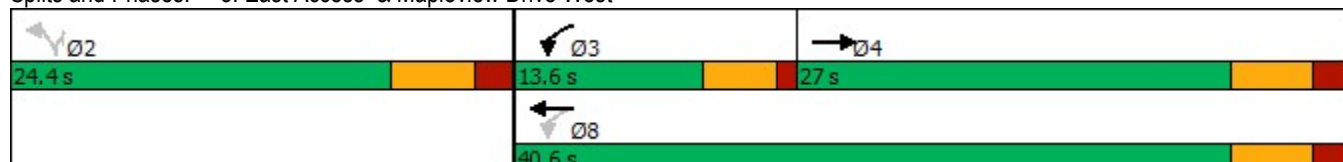
Queues
Background (2026) AM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	1115	16	450	4	7
Future Volume (vph)	1115	16	450	4	7
Lane Group Flow (vph)	1226	17	489	4	8
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.68	0.06	0.25	0.01	0.01
Control Delay	16.4	8.0	10.2	13.5	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	8.0	10.2	13.5	8.9
Queue Length 50th (m)	32.0	0.9	10.7	0.3	0.0
Queue Length 95th (m)	60.9	3.3	15.8	2.2	2.7
Internal Link Dist (m)	106.1		124.9	30.4	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	2136	401	3525	652	588
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.57	0.04	0.14	0.01	0.01

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 50.6
Natural Cycle: 60
Control Type: Semi Act-Uncoord

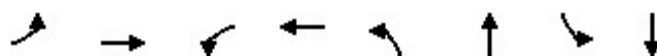
Splits and Phases: 3: East Access & Maplevue Drive West



315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Background (2026) AM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	1115	13	16	450	4	7
Future Volume (vph)	1115	13	16	450	4	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5077		1770	5085	1770	1583
Flt Permitted	1.00		0.18	1.00	0.95	1.00
Satd. Flow (perm)	5077		331	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1212	14	17	489	4	8
RTOR Reduction (vph)	2	0	0	0	0	5
Lane Group Flow (vph)	1224	0	17	489	4	3
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	18.0		23.5	23.5	18.7	18.7
Effective Green, g (s)	18.0		23.5	23.5	18.7	18.7
Actuated g/C Ratio	0.33		0.43	0.43	0.35	0.35
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1686		170	2204	610	546
v/s Ratio Prot	c0.24		0.00	c0.10		
v/s Ratio Perm			0.04		c0.00	0.00
v/c Ratio	0.73		0.10	0.22	0.01	0.01
Uniform Delay, d1	15.9		9.8	9.6	11.7	11.6
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6		0.3	0.1	0.0	0.0
Delay (s)	17.5		10.1	9.7	11.7	11.7
Level of Service	B		B	A	B	B
Approach Delay (s)	17.5			9.7	11.7	
Approach LOS	B			A	B	
Intersection Summary						
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.37			
Actuated Cycle Length (s)			54.2		Sum of lost time (s)	16.5
Intersection Capacity Utilization			36.0%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	1080	5	434	11	0	59	0
Future Volume (vph)	4	1080	5	434	11	0	59	0
Lane Group Flow (vph)	5	1302	6	523	13	11	68	17
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.01	0.48	0.02	0.20	0.03	0.02	0.08	0.02
Control Delay	9.5	15.7	9.6	12.8	23.4	0.1	23.1	0.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	16.1	9.6	12.8	23.4	0.1	23.1	0.1
Queue Length 50th (m)	0.4	56.6	0.5	18.7	1.7	0.0	4.5	0.0
Queue Length 95th (m)	2.0	83.8	2.2	30.9	6.5	0.0	10.3	0.0
Internal Link Dist (m)		124.9		797.8		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	636	2737	396	2615	504	530	916	838
Starvation Cap Reductn	0	774	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.66	0.02	0.20	0.03	0.02	0.07	0.02

Intersection Summary

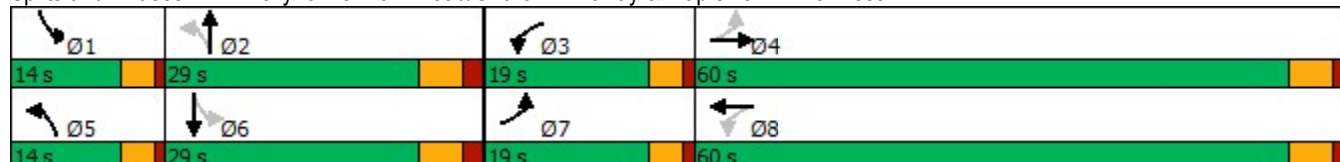
Cycle Length: 122

Actuated Cycle Length: 100.3

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1080	53	5	434	21	11	0	10	59	0	15
Future Volume (vph)	4	1080	53	5	434	21	11	0	10	59	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5050		1805	4824		1805	1242		3502	1615	
Flt Permitted	0.45	1.00		0.15	1.00		0.75	1.00		0.65	1.00	
Satd. Flow (perm)	847	5050		289	4824		1418	1242		2392	1615	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	5	1241	61	6	499	24	13	0	11	68	0	17
RTOR Reduction (vph)	0	4	0	0	4	0	0	8	0	0	12	0
Lane Group Flow (vph)	5	1298	0	6	519	0	13	3	0	68	5	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	2%	0%	7%	0%	0%	0%	30%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.6	54.3		55.6	54.3		26.9	25.6		35.3	30.0	
Effective Green, g (s)	55.6	54.3		55.6	54.3		26.9	25.6		35.3	30.0	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.25	0.24		0.33	0.28	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	452	2565		168	2450		361	297		849	453	
v/s Ratio Prot	0.00	c0.26		c0.00	0.11		0.00	0.00		c0.00	0.00	
v/s Ratio Perm	0.01			0.02			0.01			c0.02		
v/c Ratio	0.01	0.51		0.04	0.21		0.04	0.01		0.08	0.01	
Uniform Delay, d1	12.3	17.4		13.1	14.5		30.2	31.0		24.5	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.1	0.0		0.0	0.1		0.0	0.0	
Delay (s)	12.4	17.6		13.2	14.5		30.2	31.0		24.6	27.8	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		17.6			14.5			30.6			25.2	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Background (2026) AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	74	855	231	491	43	105	256	249
Future Volume (vph)	74	855	231	491	43	105	256	249
Lane Group Flow (vph)	78	982	243	637	45	239	269	322
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.22	0.71	0.81	0.37	0.12	0.26	0.49	0.27
Control Delay	18.7	38.3	43.3	25.8	17.7	15.0	22.0	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.7	38.3	43.3	25.8	17.7	15.0	22.0	24.4
Queue Length 50th (m)	9.6	72.8	33.5	36.8	5.5	9.9	37.5	25.2
Queue Length 95th (m)	18.7	89.2	#72.8	49.9	12.2	20.3	57.4	38.1
Internal Link Dist (m)		797.8		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	457	1379	314	1715	493	932	561	1212
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.71	0.77	0.37	0.09	0.26	0.48	0.27

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 107.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	855	78	231	491	114	43	105	122	256	249	57
Future Volume (vph)	74	855	78	231	491	114	43	105	122	256	249	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4921		1687	4796		1581	3018		1752	3349	
Flt Permitted	0.40	1.00		0.14	1.00		0.56	1.00		0.53	1.00	
Satd. Flow (perm)	729	4921		246	4796		926	3018		985	3349	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	78	900	82	243	517	120	45	111	128	269	262	60
RTOR Reduction (vph)	0	9	0	0	31	0	0	92	0	0	16	0
Lane Group Flow (vph)	78	973	0	243	606	0	45	147	0	269	306	0
Confl. Peds. (#/hr)	2		6	6		2	4		1	1		4
Heavy Vehicles (%)	4%	4%	3%	7%	5%	4%	14%	6%	12%	3%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.0	31.0		48.9	37.9		37.1	30.9		48.7	38.5	
Effective Green, g (s)	38.0	31.0		48.9	37.9		37.1	30.9		48.7	38.5	
Actuated g/C Ratio	0.35	0.28		0.45	0.35		0.34	0.28		0.44	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	317	1391		292	1658		350	850		534	1176	
v/s Ratio Prot	0.02	0.20		c0.11	0.13		0.01	0.05		c0.06	0.09	
v/s Ratio Perm	0.07			c0.26			0.04			c0.16		
v/c Ratio	0.25	0.70		0.83	0.37		0.13	0.17		0.50	0.26	
Uniform Delay, d1	24.5	35.1		22.4	26.8		24.7	29.7		20.1	25.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.6		18.0	0.1		0.2	0.4		0.8	0.5	
Delay (s)	24.9	36.7		40.4	27.0		24.8	30.1		20.8	25.9	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		35.8			30.7			29.3			23.6	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			109.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			90.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Background (2026) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	199	564	120	943	271	92	234	87	131	180	277
Future Volume (vph)	199	564	120	943	271	92	234	87	131	180	277
Lane Group Flow (vph)	216	631	130	1025	295	100	254	95	142	196	301
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.85	0.58	0.40	0.97	0.44	0.29	0.45	0.17	0.31	0.24	0.36
Control Delay	50.5	32.2	20.1	56.4	5.5	30.2	31.8	3.8	17.8	19.0	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	32.2	20.1	56.4	5.5	30.2	31.8	3.8	17.8	19.0	4.1
Queue Length 50th (m)	26.8	57.8	15.3	109.2	0.0	15.9	42.6	0.0	16.6	24.8	2.4
Queue Length 95th (m)	#68.5	76.9	27.1	#153.0	19.3	30.6	66.9	7.9	28.8	40.5	18.0
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	255	1090	345	1061	670	340	562	555	466	819	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.58	0.38	0.97	0.44	0.29	0.45	0.17	0.30	0.24	0.36

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 101

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Mapleview Drive West

			
Ø1	Ø2	Ø3	Ø4
14 s	37 s	14 s	36 s
			
Ø5	Ø6	Ø7	Ø8
51 s	14 s	36 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	564	17	120	943	271	92	234	87	131	180	277
Future Volume (vph)	199	564	17	120	943	271	92	234	87	131	180	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3551		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.13	1.00		0.29	1.00	1.00	0.63	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	244	3551		539	3574	1559	1116	1845	1553	814	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	216	613	18	130	1025	295	100	254	95	142	196	301
RTOR Reduction (vph)	0	2	0	0	0	207	0	0	66	0	0	158
Lane Group Flow (vph)	216	629	0	130	1025	88	100	254	29	142	196	143
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	40.9	30.9		39.1	30.0	30.0	30.8	30.8	30.8	44.0	44.0	44.0
Effective Green, g (s)	40.9	30.9		39.1	30.0	30.0	30.8	30.8	30.8	44.0	44.0	44.0
Actuated g/C Ratio	0.40	0.31		0.39	0.30	0.30	0.30	0.30	0.30	0.44	0.44	0.44
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	251	1086		319	1061	463	340	562	473	435	819	689
v/s Ratio Prot	c0.09	0.18		0.04	c0.29			c0.14		c0.03	0.10	
v/s Ratio Perm	0.26			0.12		0.06	0.09		0.02	0.11		0.09
v/c Ratio	0.86	0.58		0.41	0.97	0.19	0.29	0.45	0.06	0.33	0.24	0.21
Uniform Delay, d1	24.1	29.6		21.0	35.0	26.4	26.8	28.3	24.9	18.0	18.0	17.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.7	0.8		0.9	19.7	0.2	2.2	2.6	0.2	0.4	0.7	0.7
Delay (s)	48.8	30.3		21.8	54.7	26.6	29.0	30.9	25.1	18.4	18.6	18.4
Level of Service	D	C		C	D	C	C	C	C	B	B	B
Approach Delay (s)		35.0			46.1			29.3			18.5	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay		35.9			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		101.0			Sum of lost time (s)			21.0				
Intersection Capacity Utilization		107.1%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Background (2026) PM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	808	8	0	1297	0	10	
Future Volume (Veh/h)	808	8	0	1297	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	878	9	0	1410	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	195			132			
pX, platoon unblocked			0.92		0.84	0.92	
vC, conflicting volume			887		1352	297	
vC1, stage 1 conf vol					882		
vC2, stage 2 conf vol					470		
vCu, unblocked vol			553		79	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			928		796	993	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	351	351	185	470	470	470	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	993
Volume to Capacity	0.21	0.21	0.11	0.28	0.28	0.28	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.7
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.7
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			28.4%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive 3: East Access & Maplevue Drive West

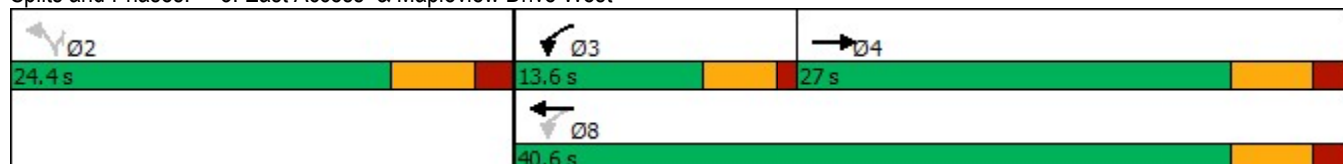
Queues
Background (2026) PM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	819	15	1293	15	17
Future Volume (vph)	819	15	1293	15	17
Lane Group Flow (vph)	897	16	1405	16	18
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.45	0.05	0.65	0.03	0.03
Control Delay	13.4	7.6	13.5	14.2	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	7.6	13.5	14.2	7.8
Queue Length 50th (m)	21.6	0.8	38.6	1.0	0.0
Queue Length 95th (m)	42.3	3.1	50.1	5.2	4.0
Internal Link Dist (m)	107.7		130.7	30.4	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	2116	423	3339	617	564
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.04	0.42	0.03	0.03

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 53.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord

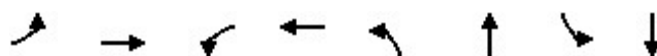
Splits and Phases: 3: East Access & Maplevue Drive West



315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Background (2026) PM Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↵	↑↑↑	↵	↵
Traffic Volume (vph)	819	6	15	1293	15	17
Future Volume (vph)	819	6	15	1293	15	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5079		1770	5085	1770	1583
Flt Permitted	1.00		0.23	1.00	0.95	1.00
Satd. Flow (perm)	5079		420	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	890	7	16	1405	16	18
RTOR Reduction (vph)	1	0	0	0	0	12
Lane Group Flow (vph)	896	0	16	1405	16	6
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	20.7		26.3	26.3	18.6	18.6
Effective Green, g (s)	20.7		26.3	26.3	18.6	18.6
Actuated g/C Ratio	0.36		0.46	0.46	0.33	0.33
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1847		220	2350	578	517
v/s Ratio Prot	0.18		0.00	c0.28		
v/s Ratio Perm			0.03		c0.01	0.00
v/c Ratio	0.48		0.07	0.60	0.03	0.01
Uniform Delay, d1	14.0		8.7	11.4	13.0	12.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		0.1	0.4	0.1	0.0
Delay (s)	14.2		8.8	11.8	13.1	13.0
Level of Service	B		A	B	B	B
Approach Delay (s)	14.2			11.8	13.0	
Approach LOS	B			B	B	
Intersection Summary						
HCM 2000 Control Delay			12.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.40			
Actuated Cycle Length (s)			56.9		Sum of lost time (s)	16.5
Intersection Capacity Utilization			39.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	798	1	1229	69	0	42	0
Future Volume (vph)	11	798	1	1229	69	0	42	0
Lane Group Flow (vph)	11	853	1	1353	72	7	44	13
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.04	0.31	0.00	0.50	0.15	0.01	0.05	0.02
Control Delay	10.5	14.4	10.0	16.5	23.9	0.0	22.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	14.4	10.0	16.5	23.9	0.0	22.7	0.1
Queue Length 50th (m)	1.0	34.2	0.1	61.2	9.7	0.0	2.9	0.0
Queue Length 95th (m)	3.6	55.3	0.8	95.0	22.4	0.0	7.7	0.0
Internal Link Dist (m)		130.7		792.0		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	383	2713	504	2732	485	703	973	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.31	0.00	0.50	0.15	0.01	0.05	0.02

Intersection Summary

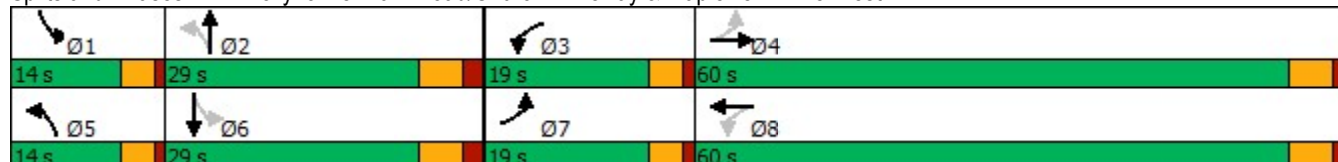
Cycle Length: 122

Actuated Cycle Length: 101.4

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  					 		
Traffic Volume (vph)	11	798	21	1	1229	70	69	0	7	42	0	12
Future Volume (vph)	11	798	21	1	1229	70	69	0	7	42	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5061		1805	5091		1805	1615		3502	1583	
Flt Permitted	0.14	1.00		0.29	1.00		0.67	1.00		0.75	1.00	
Satd. Flow (perm)	269	5061		552	5091		1279	1615		2776	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	11	831	22	1	1280	73	72	0	7	44	0	12
RTOR Reduction (vph)	0	2	0	0	4	0	0	5	0	0	10	0
Lane Group Flow (vph)	11	851	0	1	1349	0	72	2	0	44	3	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	0%	2%	6%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		33.4	26.6		28.0	23.9	
Effective Green, g (s)	55.5	54.3		55.5	54.3		33.4	26.6		28.0	23.9	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.31	0.25		0.26	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	157	2587		302	2603		435	404		759	356	
v/s Ratio Prot	c0.00	0.17		0.00	c0.26		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.04			0.00			c0.04			0.01		
v/c Ratio	0.07	0.33		0.00	0.52		0.17	0.00		0.06	0.01	
Uniform Delay, d1	13.1	15.2		12.2	17.3		26.0	29.9		29.2	31.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.0	0.2		0.2	0.0		0.0	0.0	
Delay (s)	13.3	15.3		12.2	17.4		26.2	29.9		29.2	32.0	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.3			17.4			26.5			29.8	
Approach LOS		B			B			C			C	

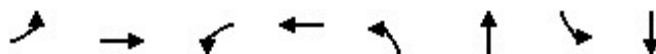
Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	106.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Background (2026) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	133	847	198	1057	150	296	276	277
Future Volume (vph)	133	847	198	1057	150	296	276	277
Lane Group Flow (vph)	141	980	211	1565	160	535	294	399
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.56	0.68	0.71	1.03	0.34	0.51	0.71	0.37
Control Delay	27.2	37.0	34.0	67.0	19.5	24.6	29.1	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	37.0	34.0	67.0	19.5	24.6	29.1	27.6
Queue Length 50th (m)	18.1	70.6	28.2	~130.6	20.1	36.8	40.2	31.9
Queue Length 95th (m)	31.5	88.4	51.3	#175.3	34.5	55.2	#63.3	49.2
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	325	1431	332	1517	527	1054	430	1075
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.68	0.64	1.03	0.30	0.51	0.68	0.37

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 106.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

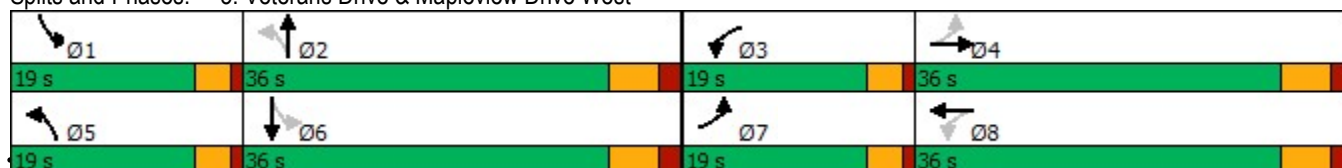
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	133	847	74	198	1057	415	150	296	207	276	277	98
Future Volume (vph)	133	847	74	198	1057	415	150	296	207	276	277	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5058		1769	4837		1768	3350		1786	3397	
Flt Permitted	0.13	1.00		0.15	1.00		0.50	1.00		0.30	1.00	
Satd. Flow (perm)	251	5058		274	4837		932	3350		566	3397	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	141	901	79	211	1124	441	160	315	220	294	295	104
RTOR Reduction (vph)	0	9	0	0	62	0	0	113	0	0	30	0
Lane Group Flow (vph)	141	971	0	211	1503	0	160	422	0	294	369	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.6	30.0		44.8	32.1		41.3	30.1		46.9	32.9	
Effective Green, g (s)	40.6	30.0		44.8	32.1		41.3	30.1		46.9	32.9	
Actuated g/C Ratio	0.38	0.28		0.42	0.30		0.39	0.28		0.44	0.31	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	1420		292	1453		448	944		408	1046	
v/s Ratio Prot	0.06	0.19		c0.09	c0.31		0.04	0.13		c0.09	0.11	
v/s Ratio Perm	0.16			0.22			0.10			c0.22		
v/c Ratio	0.57	0.68		0.72	1.03		0.36	0.45		0.72	0.35	
Uniform Delay, d1	25.7	34.2		22.3	37.3		22.1	31.5		21.0	28.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	1.4		8.5	32.9		0.5	1.5		6.2	0.9	
Delay (s)	28.9	35.6		30.8	70.3		22.6	33.0		27.1	29.6	
Level of Service	C	D		C	E		C	C		C	C	
Approach Delay (s)		34.7			65.6			30.6			28.6	
Approach LOS		C			E			C			C	
Intersection Summary												
HCM 2000 Control Delay			45.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			106.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			91.0%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Background (2026) SAT (MID) Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	139	680	128	713	234	42	224	164	201	192	148
Future Volume (vph)	139	680	128	713	234	42	224	164	201	192	148
Lane Group Flow (vph)	146	744	135	751	246	44	236	173	212	202	156
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.56	0.78	0.53	0.79	0.42	0.12	0.39	0.28	0.39	0.24	0.19
Control Delay	25.5	38.8	24.9	39.4	5.9	26.4	29.2	5.5	17.5	17.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	38.8	24.9	39.4	5.9	26.4	29.2	5.5	17.5	17.7	3.5
Queue Length 50th (m)	17.3	70.8	15.9	72.1	0.0	6.3	37.1	0.0	24.0	24.1	0.0
Queue Length 95th (m)	30.0	92.4	28.0	93.6	17.8	15.4	61.7	15.3	41.7	41.9	11.5
Internal Link Dist (m)		193.7		171.9			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	278	1131	271	1135	655	382	601	617	546	851	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.66	0.50	0.66	0.38	0.12	0.39	0.28	0.39	0.24	0.19

Intersection Summary

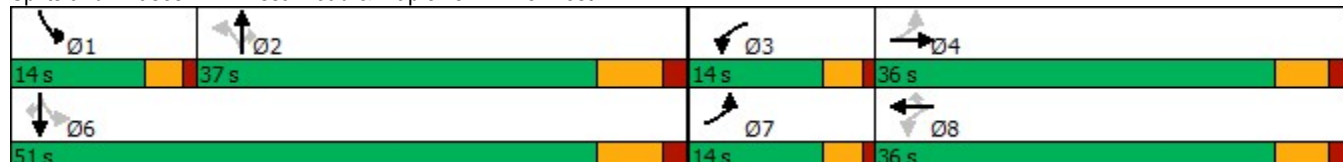
Cycle Length: 101

Actuated Cycle Length: 95.7

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Essa Road & Maplevue Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	139	680	27	128	713	234	42	224	164	201	192	148
Future Volume (vph)	139	680	27	128	713	234	42	224	164	201	192	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1804	3590		1736	3610	1548	1801	1881	1563	1787	1845	1575
Flt Permitted	0.17	1.00		0.17	1.00	1.00	0.63	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	314	3590		315	3610	1548	1196	1881	1563	925	1845	1575
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	146	716	28	135	751	246	44	236	173	212	202	156
RTOR Reduction (vph)	0	3	0	0	0	181	0	0	117	0	0	84
Lane Group Flow (vph)	146	741	0	135	751	65	44	236	56	212	202	72
Confl. Peds. (#/hr)	7					7	3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	1%	0%	1%	2%	1%	3%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	34.5	25.3		34.3	25.2	25.2	30.7	30.7	30.7	44.2	44.2	44.2
Effective Green, g (s)	34.5	25.3		34.3	25.2	25.2	30.7	30.7	30.7	44.2	44.2	44.2
Actuated g/C Ratio	0.36	0.26		0.36	0.26	0.26	0.32	0.32	0.32	0.46	0.46	0.46
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	256	950		248	951	408	384	604	501	513	853	728
v/s Ratio Prot	c0.05	0.21		0.05	c0.21			0.13		c0.04	0.11	
v/s Ratio Perm	0.15			0.14		0.04	0.04		0.04	c0.15		0.05
v/c Ratio	0.57	0.78		0.54	0.79	0.16	0.11	0.39	0.11	0.41	0.24	0.10
Uniform Delay, d1	22.5	32.6		22.5	32.7	27.1	22.9	25.2	22.8	16.0	15.5	14.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.1	4.2		2.4	4.4	0.2	0.6	1.9	0.4	0.5	0.7	0.3
Delay (s)	25.6	36.8		24.9	37.2	27.2	23.5	27.1	23.3	16.5	16.2	14.8
Level of Service	C	D		C	D	C	C	C	C	B	B	B
Approach Delay (s)		34.9			33.5			25.3			15.9	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay		29.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		95.6			Sum of lost time (s)			21.0				
Intersection Capacity Utilization		98.2%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

Background (2026) SAT (MID) Peak Hour

							
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑↱			↑↑↑↑		↱	
Traffic Volume (veh/h)	1072	8	0	1117	0	10	
Future Volume (Veh/h)	1072	8	0	1117	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1165	9	0	1214	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLTL			TWLTL			
Median storage veh)	2			2			
Upstream signal (m)	196			130			
pX, platoon unblocked				0.88	0.90	0.88	
vC, conflicting volume				1174	1574	393	
vC1, stage 1 conf vol					1170		
vC2, stage 2 conf vol					405		
vCu, unblocked vol				705	309	0	
tC, single (s)				4.1	6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)				2.2	3.5	3.3	
p0 queue free %				100	100	99	
cM capacity (veh/h)				779	516	950	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	466	466	242	405	405	405	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	9	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	950
Volume to Capacity	0.27	0.27	0.14	0.24	0.24	0.24	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.8
Approach LOS							A
Intersection Summary							
Average Delay				0.0			
Intersection Capacity Utilization				30.9%	ICU Level of Service		A
Analysis Period (min)				15			

315 Maplevue Drive 3: East Access & Maplevue Drive West

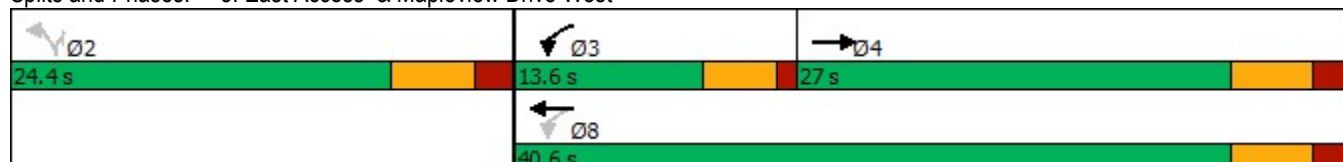
Queues
Background (2026) SAT (MID) Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	1083	30	1113	16	29
Future Volume (vph)	1083	30	1113	16	29
Lane Group Flow (vph)	1192	33	1210	17	32
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.69	0.11	0.58	0.03	0.05
Control Delay	18.0	8.0	12.6	15.1	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	8.0	12.6	15.1	7.2
Queue Length 50th (m)	30.9	1.7	31.5	0.9	0.0
Queue Length 95th (m)	59.7	5.1	41.4	5.4	5.3
Internal Link Dist (m)	106.6		126.7	19.0	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	2061	398	3399	629	583
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.08	0.36	0.03	0.05

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 52.9
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access & Maplevue Drive West

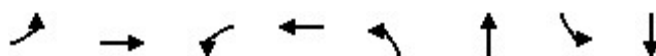


315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) SAT (MID) Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	↱
Traffic Volume (vph)	1083	14	30	1113	16	29
Future Volume (vph)	1083	14	30	1113	16	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5076		1770	5085	1770	1583
Flt Permitted	1.00		0.18	1.00	0.95	1.00
Satd. Flow (perm)	5076		330	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1177	15	33	1210	17	32
RTOR Reduction (vph)	2	0	0	0	0	21
Lane Group Flow (vph)	1190	0	33	1210	17	11
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	18.1		24.9	24.9	18.8	18.8
Effective Green, g (s)	18.1		24.9	24.9	18.8	18.8
Actuated g/C Ratio	0.32		0.45	0.45	0.34	0.34
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1649		206	2273	597	534
v/s Ratio Prot	c0.23		0.01	c0.24		
v/s Ratio Perm			0.06		c0.01	0.01
v/c Ratio	0.72		0.16	0.53	0.03	0.02
Uniform Delay, d1	16.6		9.7	11.2	12.3	12.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6		0.4	0.2	0.1	0.1
Delay (s)	18.2		10.1	11.4	12.4	12.4
Level of Service	B		B	B	B	B
Approach Delay (s)	18.2			11.4	12.4	
Approach LOS	B			B	B	
Intersection Summary						
HCM 2000 Control Delay			14.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			55.7		Sum of lost time (s)	16.5
Intersection Capacity Utilization			39.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	12	1042	1	1026	66	0	47	0
Future Volume (vph)	12	1042	1	1026	66	0	47	0
Lane Group Flow (vph)	13	1110	1	1139	69	13	49	13
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.04	0.40	0.00	0.42	0.16	0.02	0.06	0.02
Control Delay	10.5	15.5	10.0	15.5	24.1	0.1	22.7	0.1
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	15.7	10.0	15.5	24.1	0.1	22.7	0.1
Queue Length 50th (m)	1.2	47.6	0.1	48.9	9.3	0.0	3.2	0.0
Queue Length 95th (m)	3.8	74.4	0.8	76.5	21.9	0.0	8.4	0.0
Internal Link Dist (m)		126.7		795.9		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	427	2742	433	2728	447	647	969	623
Starvation Cap Reductn	0	837	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.58	0.00	0.42	0.15	0.02	0.05	0.02

Intersection Summary

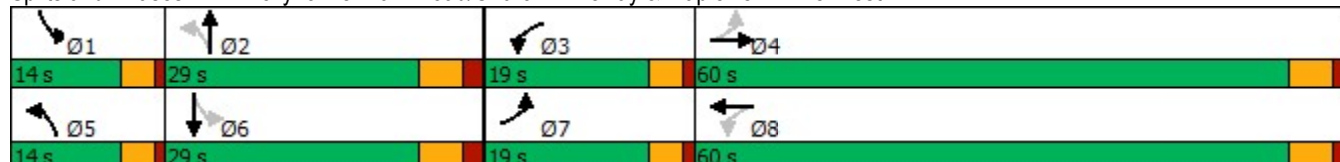
Cycle Length: 122

Actuated Cycle Length: 101.5

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2026) SAT (MID) Peak Hour

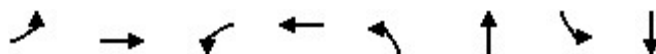
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	1042	24	1	1026	67	66	0	12	47	0	12
Future Volume (vph)	12	1042	24	1	1026	67	66	0	12	47	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5117		1805	5085		1612	1615		3502	1615	
Flt Permitted	0.20	1.00		0.20	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	372	5117		388	5085		1208	1615		2761	1615	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	12	1085	25	1	1069	70	69	0	12	49	0	12
RTOR Reduction (vph)	0	1	0	0	5	0	0	10	0	0	10	0
Lane Group Flow (vph)	13	1109	0	1	1134	0	69	3	0	49	3	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	12%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		31.2	24.4		28.8	23.2	
Effective Green, g (s)	55.5	54.3		55.5	54.3		31.2	24.4		28.8	23.2	
Actuated g/C Ratio	0.53	0.51		0.53	0.51		0.30	0.23		0.27	0.22	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	211	2633		220	2617		383	373		793	355	
v/s Ratio Prot	c0.00	0.22		0.00	c0.22		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.03			0.00			c0.04			0.01		
v/c Ratio	0.06	0.42		0.00	0.43		0.18	0.01		0.06	0.01	
Uniform Delay, d1	12.4	15.9		12.2	16.0		27.3	31.2		28.3	32.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.0	0.1		0.2	0.0		0.0	0.0	
Delay (s)	12.5	16.0		12.2	16.1		27.6	31.3		28.3	32.2	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.9			16.1			28.2			29.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			16.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			105.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.3%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues

Background (2026) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	63	1175	218	945	106	273	426	203
Future Volume (vph)	63	1175	218	945	106	273	426	203
Lane Group Flow (vph)	65	1288	225	1426	109	381	439	263
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.32	0.90	0.77	0.81	0.23	0.38	0.87	0.23
Control Delay	21.4	47.6	40.9	34.8	18.3	29.3	42.0	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	47.6	40.9	34.8	18.3	29.3	42.0	24.7
Queue Length 50th (m)	8.0	101.6	31.0	100.5	13.5	31.9	67.2	19.7
Queue Length 95th (m)	16.1	#130.9	#62.9	124.0	24.5	46.7	#96.0	32.1
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	322	1428	319	1761	569	992	503	1153
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.90	0.71	0.81	0.19	0.38	0.87	0.23

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 108.2

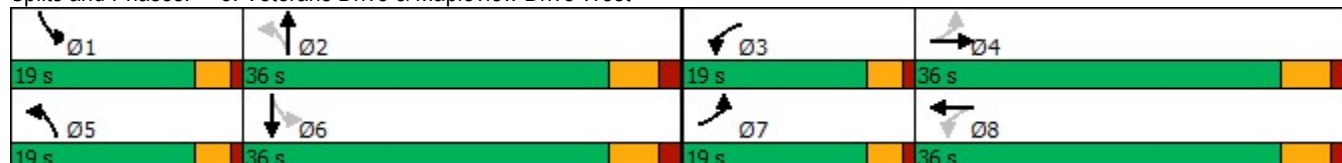
Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2026) SAT (MID) Peak Hour

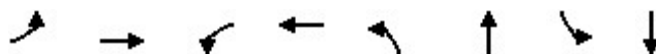
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	1175	75	218	945	438	106	273	97	426	203	52
Future Volume (vph)	63	1175	75	218	945	438	106	273	97	426	203	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5127		1805	4891		1769	3459		1805	3448	
Flt Permitted	0.13	1.00		0.11	1.00		0.59	1.00		0.40	1.00	
Satd. Flow (perm)	247	5127		218	4891		1097	3459		767	3448	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	65	1211	77	225	974	452	109	281	100	439	209	54
RTOR Reduction (vph)	0	6	0	0	69	0	0	33	0	0	20	0
Lane Group Flow (vph)	65	1282	0	225	1357	0	109	348	0	439	243	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.3	30.8		48.0	37.5		39.4	30.0		49.0	35.6	
Effective Green, g (s)	37.3	30.8		48.0	37.5		39.4	30.0		49.0	35.6	
Actuated g/C Ratio	0.34	0.28		0.44	0.34		0.36	0.28		0.45	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	177	1448		288	1682		454	952		487	1126	
v/s Ratio Prot	0.02	c0.25		c0.09	0.28		0.02	0.10		c0.12	0.07	
v/s Ratio Perm	0.10			0.25			0.07			c0.28		
v/c Ratio	0.37	0.89		0.78	0.81		0.24	0.37		0.90	0.22	
Uniform Delay, d1	25.9	37.4		24.3	32.5		23.7	31.8		24.4	26.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	6.8		12.9	2.9		0.3	1.1		19.7	0.4	
Delay (s)	27.2	44.2		37.2	35.4		24.0	32.9		44.1	27.0	
Level of Service	C	D		D	D		C	C		D	C	
Approach Delay (s)		43.4			35.6			30.9			37.7	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			37.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			109.0			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			88.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues

Background (2026) PM Peak Hour - with improvements



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑↑	←	↑↑↑	←	↑↑	←	↑↑
Traffic Volume (vph)	133	847	198	1057	150	296	276	277
Future Volume (vph)	133	847	198	1057	150	296	276	277
Lane Group Flow (vph)	141	980	211	1565	160	535	294	399
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	22.0	32.0
Total Split (s)	14.0	43.0	23.0	52.0	19.0	32.0	22.0	35.0
Total Split (%)	11.7%	35.8%	19.2%	43.3%	15.8%	26.7%	18.3%	29.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.65	0.51	0.61	0.77	0.43	0.79	0.82	0.51
Control Delay	35.7	29.0	21.8	30.5	27.7	42.1	47.1	37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.7	29.0	21.8	30.5	27.7	42.1	47.1	37.2
Queue Length 50th (m)	15.4	62.1	24.1	107.5	25.0	48.0	50.0	39.0
Queue Length 95th (m)	#46.4	90.5	43.2	139.9	40.8	67.6	#95.4	56.2
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	229	1921	431	2036	416	877	357	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.51	0.49	0.77	0.38	0.61	0.82	0.44

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.6

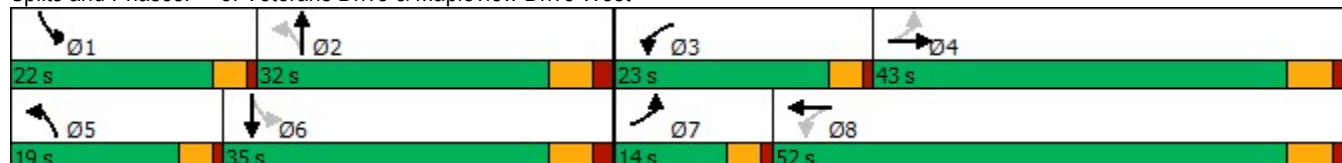
Natural Cycle: 105

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Background (2026) PM Peak Hour - with improvements

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	133	847	74	198	1057	415	150	296	207	276	277	98
Future Volume (vph)	133	847	74	198	1057	415	150	296	207	276	277	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5058		1769	4836		1768	3350		1787	3397	
Flt Permitted	0.09	1.00		0.19	1.00		0.52	1.00		0.17	1.00	
Satd. Flow (perm)	177	5058		353	4836		962	3350		324	3397	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	141	901	79	211	1124	441	160	315	220	294	295	104
RTOR Reduction (vph)	0	7	0	0	57	0	0	111	0	0	30	0
Lane Group Flow (vph)	141	973	0	211	1508	0	160	424	0	294	369	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.9	42.6		58.9	46.1		31.2	19.2		41.2	25.2	
Effective Green, g (s)	51.9	42.6		58.9	46.1		31.2	19.2		41.2	25.2	
Actuated g/C Ratio	0.46	0.38		0.52	0.41		0.28	0.17		0.37	0.22	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214	1913		345	1979		352	571		352	760	
v/s Ratio Prot	0.05	0.19		c0.07	c0.31		0.05	0.13		c0.13	0.11	
v/s Ratio Perm	0.25			0.25			0.08			c0.17		
v/c Ratio	0.66	0.51		0.61	0.76		0.45	0.74		0.84	0.49	
Uniform Delay, d1	21.2	26.9		16.2	28.5		32.3	44.4		28.6	38.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.1	1.0		3.2	2.8		0.9	5.2		15.6	0.5	
Delay (s)	28.3	27.9		19.4	31.4		33.3	49.5		44.2	38.5	
Level of Service	C	C		B	C		C	D		D	D	
Approach Delay (s)		28.0			30.0			45.8			40.9	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			33.8			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			112.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			85.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Background (2031) AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	192	851	99	312	123	37	163	162	144	209	199
Future Volume (vph)	192	851	99	312	123	37	163	162	144	209	199
Lane Group Flow (vph)	204	944	105	332	131	39	173	172	153	222	212
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.47	0.89	0.46	0.37	0.27	0.11	0.30	0.29	0.27	0.27	0.27
Control Delay	21.6	44.5	23.3	29.7	6.4	27.0	28.4	5.7	16.6	18.6	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	44.5	23.3	29.7	6.4	27.0	28.4	5.7	16.6	18.6	3.4
Queue Length 50th (m)	25.2	96.2	12.2	27.9	0.0	5.8	27.3	0.0	17.6	28.3	0.0
Queue Length 95th (m)	41.0	#135.2	22.7	40.3	13.5	14.2	46.4	15.4	30.8	46.1	13.2
Internal Link Dist (m)		193.7		172.5			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	438	1105	249	1075	562	344	571	591	578	821	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.85	0.42	0.31	0.23	0.11	0.30	0.29	0.26	0.27	0.27

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 96.6

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Mapleview Drive West

 Ø1	 Ø2	 Ø3	 Ø4
14 s	37 s	14 s	36 s
 Ø6	 Ø7	 Ø8	
51 s	14 s	36 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	192	851	37	99	312	123	37	163	162	144	209	199
Future Volume (vph)	192	851	37	99	312	123	37	163	162	144	209	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1749	3527		1671	3438	1511	1640	1776	1476	1718	1792	1490
Flt Permitted	0.47	1.00		0.15	1.00	1.00	0.62	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	863	3527		268	3438	1511	1070	1776	1476	1037	1792	1490
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	204	905	39	105	332	131	39	173	172	153	222	212
RTOR Reduction (vph)	0	3	0	0	0	96	0	0	117	0	0	116
Lane Group Flow (vph)	204	941	0	105	332	35	39	173	55	153	222	96
Confl. Peds. (#/hr)	4		3	3		4	1		1	1		1
Heavy Vehicles (%)	3%	1%	16%	8%	5%	4%	10%	7%	8%	5%	6%	7%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	38.8	29.0		33.4	26.3	26.3	31.1	31.1	31.1	44.3	44.3	44.3
Effective Green, g (s)	38.8	29.0		33.4	26.3	26.3	31.1	31.1	31.1	44.3	44.3	44.3
Actuated g/C Ratio	0.40	0.30		0.34	0.27	0.27	0.32	0.32	0.32	0.45	0.45	0.45
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	432	1050		194	928	408	341	567	471	535	815	677
v/s Ratio Prot	c0.05	c0.27		0.04	0.10			0.10		0.03	c0.12	
v/s Ratio Perm	0.14			0.15		0.02	0.04		0.04	c0.10		0.06
v/c Ratio	0.47	0.90		0.54	0.36	0.09	0.11	0.31	0.12	0.29	0.27	0.14
Uniform Delay, d1	20.1	32.8		24.2	28.7	26.6	23.4	25.0	23.4	16.0	16.5	15.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	10.1		3.1	0.2	0.1	0.7	1.4	0.5	0.3	0.8	0.4
Delay (s)	20.9	42.8		27.3	29.0	26.7	24.1	26.4	23.9	16.3	17.3	15.9
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		38.9			28.1			25.1			16.6	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			29.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			97.4			Sum of lost time (s)				21.0		
Intersection Capacity Utilization			100.5%			ICU Level of Service				G		
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

Background (2031) AM Peak Hour

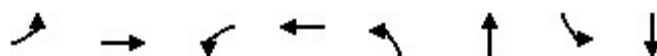
							
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑↓			↑↑↑↑		↑↗	
Traffic Volume (veh/h)	1239	7	0	575	0	4	
Future Volume (Veh/h)	1239	7	0	575	0	4	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1347	8	0	625	0	4	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLTL		TWLTL				
Median storage veh)	2		2				
Upstream signal (m)	197		130				
pX, platoon unblocked			0.82		0.84	0.82	
vC, conflicting volume			1355		1559	453	
vC1, stage 1 conf vol					1351		
vC2, stage 2 conf vol					208		
vCu, unblocked vol			648		677	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	100	
cM capacity (veh/h)			762		386	885	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	539	539	277	208	208	208	4
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	8	0	0	0	4
cSH	1700	1700	1700	1700	1700	1700	885
Volume to Capacity	0.32	0.32	0.16	0.12	0.12	0.12	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A
Intersection Summary							
Average Delay	0.0						
Intersection Capacity Utilization	34.1%		ICU Level of Service		A		
Analysis Period (min)	15						

315 Maplevue Drive

3: East Access /364 MVD-West Access & Maplevue Drive West

Queues

Background (2031) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰↰↰	↰	↰↰↰	↰	↰	↰	↰
Traffic Volume (vph)	9	1234	18	495	4	0	55	0
Future Volume (vph)	9	1234	18	495	4	0	55	0
Lane Group Flow (vph)	10	1356	20	570	4	8	60	84
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	22.5	22.5
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	22.5	22.5
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	34.6%	34.6%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.03	0.71	0.07	0.27	0.01	0.01	0.11	0.11
Control Delay	12.3	16.8	8.0	9.8	13.8	0.0	13.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	16.8	8.0	9.8	13.8	0.0	13.0	0.3
Queue Length 50th (m)	0.5	36.6	1.0	12.2	0.2	0.0	3.6	0.0
Queue Length 95th (m)	3.8	69.4	3.6	17.8	2.3	0.0	12.7	0.0
Internal Link Dist (m)		106.1		124.9		30.4		143.0
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	323	2065	393	3386	466	777	539	790
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.66	0.05	0.17	0.01	0.01	0.11	0.11

Intersection Summary

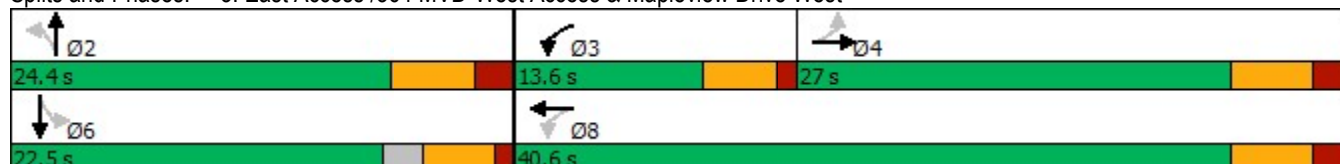
Cycle Length: 65

Actuated Cycle Length: 52.2

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

3: East Access /364 MVD-West Access & Maplevue Drive West

Background (2031) AM Peak Hour

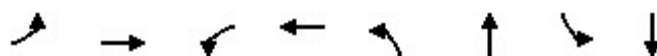
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1234	14	18	495	29	4	0	7	55	0	77
Future Volume (vph)	9	1234	14	18	495	29	4	0	7	55	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		4.5	4.5	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5077		1770	5042		1770	1583		1770	1583	
Flt Permitted	0.43	1.00		0.17	1.00		0.70	1.00		0.75	1.00	
Satd. Flow (perm)	796	5077		309	5042		1308	1583		1402	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	1341	15	20	538	32	4	0	8	60	0	84
RTOR Reduction (vph)	0	2	0	0	12	0	0	5	0	0	54	0
Lane Group Flow (vph)	10	1354	0	20	558	0	4	3	0	60	30	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.6	19.6		25.2	25.2		18.6	18.6		20.1	20.1	
Effective Green, g (s)	19.6	19.6		25.2	25.2		18.6	18.6		20.1	20.1	
Actuated g/C Ratio	0.35	0.35		0.45	0.45		0.33	0.33		0.36	0.36	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	279	1783		168	2277		436	527		505	570	
v/s Ratio Prot		c0.27		0.00	c0.11			0.00			0.02	
v/s Ratio Perm	0.01			0.05			0.00			c0.04		
v/c Ratio	0.04	0.76		0.12	0.25		0.01	0.01		0.12	0.05	
Uniform Delay, d1	11.9	16.0		9.9	9.4		12.4	12.4		11.9	11.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.9		0.3	0.1		0.0	0.0		0.1	0.0	
Delay (s)	11.9	17.9		10.2	9.5		12.5	12.4		12.0	11.7	
Level of Service	B	B		B	A		B	B		B	B	
Approach Delay (s)		17.9			9.5			12.5			11.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.1			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			55.8			Sum of lost time (s)				16.5		
Intersection Capacity Utilization			42.6%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Background (2031) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	1248	6	508	11	0	77	0
Future Volume (vph)	7	1248	6	508	11	0	77	0
Lane Group Flow (vph)	8	1502	7	624	13	11	89	17
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.02	0.55	0.03	0.24	0.03	0.02	0.10	0.02
Control Delay	9.7	17.0	10.0	13.2	23.3	0.1	23.1	0.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	17.5	10.0	13.2	23.3	0.1	23.1	0.1
Queue Length 50th (m)	0.7	69.4	0.6	22.9	1.7	0.0	6.0	0.0
Queue Length 95th (m)	2.7	102.1	2.5	37.3	6.3	0.0	12.7	0.0
Internal Link Dist (m)		124.9		797.8		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	590	2731	361	2605	503	515	920	812
Starvation Cap Reductn	0	729	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.75	0.02	0.24	0.03	0.02	0.10	0.02

Intersection Summary

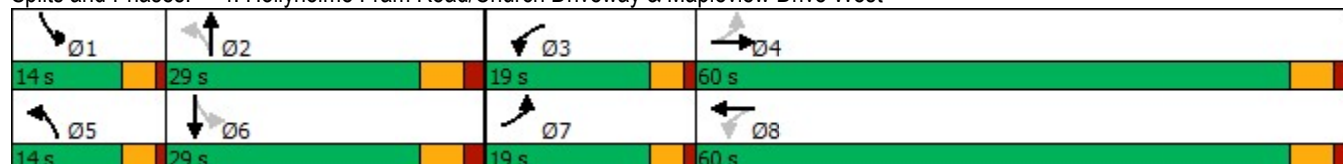
Cycle Length: 122

Actuated Cycle Length: 100.5

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1248	59	6	508	35	11	0	10	77	0	15
Future Volume (vph)	7	1248	59	6	508	35	11	0	10	77	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5051		1805	4815		1805	1242		3502	1615	
Flt Permitted	0.39	1.00		0.11	1.00		0.75	1.00		0.65	1.00	
Satd. Flow (perm)	744	5051		210	4815		1418	1242		2392	1615	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	8	1434	68	7	584	40	13	0	11	89	0	17
RTOR Reduction (vph)	0	3	0	0	5	0	0	8	0	0	12	0
Lane Group Flow (vph)	8	1499	0	7	619	0	13	3	0	89	5	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	2%	0%	7%	0%	0%	0%	30%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		26.9	25.6		35.5	30.2	
Effective Green, g (s)	55.5	54.3		55.5	54.3		26.9	25.6		35.5	30.2	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.25	0.24		0.33	0.28	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	397	2563		126	2443		361	297		854	455	
v/s Ratio Prot	0.00	c0.30		c0.00	0.13		0.00	0.00		c0.01	0.00	
v/s Ratio Perm	0.01			0.03			0.01			c0.03		
v/c Ratio	0.02	0.58		0.06	0.25		0.04	0.01		0.10	0.01	
Uniform Delay, d1	12.5	18.5		13.9	14.9		30.2	31.0		24.6	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3		0.2	0.1		0.0	0.1		0.1	0.0	
Delay (s)	12.5	18.8		14.0	14.9		30.2	31.1		24.6	27.7	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		18.8			14.9			30.6			25.1	
Approach LOS		B			B			C			C	

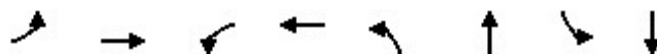
Intersection Summary

HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Background (2031) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	82	997	255	574	55	116	282	275
Future Volume (vph)	82	997	255	574	55	116	282	275
Lane Group Flow (vph)	86	1154	268	736	58	264	297	355
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.26	0.85	0.91	0.43	0.15	0.28	0.55	0.30
Control Delay	19.2	44.0	61.8	27.3	18.1	15.0	23.5	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	44.0	61.8	27.3	18.1	15.0	23.5	25.4
Queue Length 50th (m)	10.7	89.6	43.6	44.7	7.1	11.0	42.1	28.6
Queue Length 95th (m)	20.2	108.1	#93.7	59.3	14.9	21.8	63.6	42.5
Internal Link Dist (m)		797.8		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	431	1363	298	1712	480	932	545	1200
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.85	0.90	0.43	0.12	0.28	0.54	0.30

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 109.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	997	100	255	574	125	55	116	135	282	275	63
Future Volume (vph)	82	997	100	255	574	125	55	116	135	282	275	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4915		1687	4803		1581	3017		1752	3349	
Flt Permitted	0.36	1.00		0.11	1.00		0.54	1.00		0.51	1.00	
Satd. Flow (perm)	658	4915		204	4803		897	3017		940	3349	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	1049	105	268	604	132	58	122	142	297	289	66
RTOR Reduction (vph)	0	11	0	0	28	0	0	102	0	0	16	0
Lane Group Flow (vph)	86	1143	0	268	708	0	58	162	0	297	339	0
Confl. Peds. (#/hr)	2		6	6		2	4		1	1		4
Heavy Vehicles (%)	4%	4%	3%	7%	5%	4%	14%	6%	12%	3%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.2	30.9		49.6	38.3		37.5	30.9		49.2	38.6	
Effective Green, g (s)	38.2	30.9		49.6	38.3		37.5	30.9		49.2	38.6	
Actuated g/C Ratio	0.34	0.28		0.45	0.35		0.34	0.28		0.44	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	1370		288	1660		344	841		522	1166	
v/s Ratio Prot	0.02	0.23		c0.12	0.15		0.01	0.05		c0.07	0.10	
v/s Ratio Perm	0.08			c0.29			0.05			c0.18		
v/c Ratio	0.29	0.83		0.93	0.43		0.17	0.19		0.57	0.29	
Uniform Delay, d1	25.0	37.5		29.7	27.8		25.2	30.4		20.8	26.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	4.5		35.1	0.2		0.2	0.5		1.4	0.6	
Delay (s)	25.6	42.1		64.7	28.0		25.4	30.9		22.2	26.8	
Level of Service	C	D		E	C		C	C		C	C	
Approach Delay (s)		40.9			37.8			29.9			24.7	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			35.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			110.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			93.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Background (2031) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	219	640	140	1055	342	102	258	107	144	198	305
Future Volume (vph)	219	640	140	1055	342	102	258	107	144	198	305
Lane Group Flow (vph)	238	717	152	1147	372	111	280	116	157	215	332
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.93	0.66	0.51	1.08	0.53	0.33	0.50	0.21	0.36	0.26	0.39
Control Delay	65.7	34.2	23.0	87.2	7.2	31.2	32.9	5.8	18.5	19.3	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	34.2	23.0	87.2	7.2	31.2	32.9	5.8	18.5	19.3	5.4
Queue Length 50th (m)	31.6	67.9	18.1	~139.8	4.1	17.8	47.7	0.0	18.5	27.5	6.6
Queue Length 95th (m)	#80.1	88.8	31.1	#181.8	27.7	33.8	73.8	12.4	31.6	44.3	24.3
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	256	1082	309	1061	704	332	559	553	443	819	845
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.66	0.49	1.08	0.53	0.33	0.50	0.21	0.35	0.26	0.39

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 101

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
14 s	37 s	14 s	36 s
			
Ø6		Ø7	Ø8
51 s		14 s	36 s

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	640	19	140	1055	342	102	258	107	144	198	305
Future Volume (vph)	219	640	19	140	1055	342	102	258	107	144	198	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3551		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.13	1.00		0.23	1.00	1.00	0.62	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	245	3551		425	3574	1559	1097	1845	1553	750	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	238	696	21	152	1147	372	111	280	116	157	215	332
RTOR Reduction (vph)	0	2	0	0	0	242	0	0	81	0	0	156
Lane Group Flow (vph)	238	715	0	152	1147	130	111	280	35	157	215	176
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	40.7	30.7		39.3	30.0	30.0	30.6	30.6	30.6	44.0	44.0	44.0
Effective Green, g (s)	40.7	30.7		39.3	30.0	30.0	30.6	30.6	30.6	44.0	44.0	44.0
Actuated g/C Ratio	0.40	0.30		0.39	0.30	0.30	0.30	0.30	0.30	0.44	0.44	0.44
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	251	1079		289	1061	463	332	558	470	415	819	689
v/s Ratio Prot	c0.09	0.20		0.05	c0.32			c0.15		c0.04	0.11	
v/s Ratio Perm	0.29			0.16		0.08	0.10		0.02	0.13		0.11
v/c Ratio	0.95	0.66		0.53	1.08	0.28	0.33	0.50	0.07	0.38	0.26	0.26
Uniform Delay, d1	24.8	30.6		21.5	35.5	27.2	27.3	28.9	25.1	18.3	18.2	18.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	42.2	1.5		1.7	52.3	0.3	2.7	3.2	0.3	0.6	0.8	0.9
Delay (s)	67.0	32.2		23.2	87.8	27.6	30.0	32.1	25.4	18.9	18.9	19.0
Level of Service	E	C		C	F	C	C	C	C	B	B	B
Approach Delay (s)		40.9			68.5			30.1			19.0	
Approach LOS		D			E			C			B	
Intersection Summary												
HCM 2000 Control Delay			47.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			101.0			Sum of lost time (s)				21.0		
Intersection Capacity Utilization			111.3%			ICU Level of Service				H		
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Background (2031) PM Peak Hour

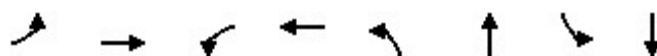
	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	919	9	0	1495	0	10	
Future Volume (Veh/h)	919	9	0	1495	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	999	10	0	1625	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	195			132			
pX, platoon unblocked			0.89		0.82	0.89	
vC, conflicting volume			1009		1546	338	
vC1, stage 1 conf vol					1004		
vC2, stage 2 conf vol					542		
vCu, unblocked vol			573		5	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			885		837	964	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	400	400	210	542	542	542	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	10	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	964
Volume to Capacity	0.24	0.24	0.12	0.32	0.32	0.32	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.8
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			32.2%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive

3: East Access /364 MVD-West Access & Maplevue Drive West

Queues

Background (2031) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	27	904	16	1422	15	0	58	0
Future Volume (vph)	27	904	16	1422	15	0	58	0
Lane Group Flow (vph)	29	991	17	1617	16	18	63	75
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	24.4	24.4
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.22	0.46	0.05	0.70	0.04	0.02	0.14	0.12
Control Delay	17.1	12.9	7.2	13.6	15.9	0.1	16.6	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.1	12.9	7.2	13.6	15.9	0.1	16.6	1.9
Queue Length 50th (m)	1.8	24.4	0.9	46.6	1.2	0.0	4.7	0.0
Queue Length 95th (m)	9.3	46.9	3.2	59.7	5.6	0.0	14.5	3.4
Internal Link Dist (m)		107.7		130.7		30.4		80.2
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	134	2202	409	3119	432	749	455	603
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.45	0.04	0.52	0.04	0.02	0.14	0.12

Intersection Summary

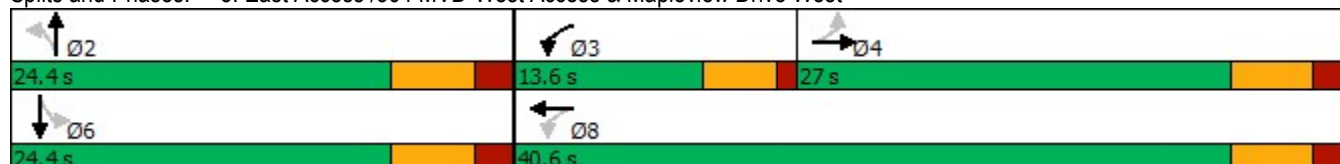
Cycle Length: 65

Actuated Cycle Length: 56.6

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



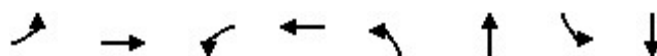
315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

3: East Access /364 MVD-West Access & Maplevue Drive West

Background (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	904	7	16	1422	65	15	0	17	58	0	69
Future Volume (vph)	27	904	7	16	1422	65	15	0	17	58	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5079		1770	5052		1770	1583		1770	1583	
Flt Permitted	0.17	1.00		0.20	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	310	5079		377	5052		1319	1583		1389	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	983	8	17	1546	71	16	0	18	63	0	75
RTOR Reduction (vph)	0	1	0	0	8	0	0	12	0	0	52	0
Lane Group Flow (vph)	29	990	0	17	1609	0	16	6	0	63	23	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	24.0	24.0		29.6	29.6		18.6	18.6		18.6	18.6	
Effective Green, g (s)	24.0	24.0		29.6	29.6		18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.40	0.40		0.49	0.49		0.31	0.31		0.31	0.31	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	123	2024		210	2484		407	489		429	489	
v/s Ratio Prot		0.19		0.00	c0.32			0.00			0.01	
v/s Ratio Perm	0.09			0.04			0.01			c0.05		
v/c Ratio	0.24	0.49		0.08	0.65		0.04	0.01		0.15	0.05	
Uniform Delay, d1	12.0	13.5		8.4	11.4		14.6	14.4		15.1	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.2		0.2	0.6		0.2	0.0		0.2	0.0	
Delay (s)	13.0	13.7		8.5	12.0		14.7	14.5		15.2	14.6	
Level of Service	B	B		A	B		B	B		B	B	
Approach Delay (s)		13.7			12.0			14.6			14.9	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			60.2			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			48.8%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	29	922	1	1406	69	0	70	0
Future Volume (vph)	29	922	1	1406	69	0	70	0
Lane Group Flow (vph)	30	984	1	1575	72	7	73	24
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.14	0.35	0.00	0.60	0.16	0.01	0.08	0.04
Control Delay	11.3	14.4	10.0	20.6	26.4	0.0	25.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	14.4	10.0	20.6	26.4	0.0	25.3	0.1
Queue Length 50th (m)	2.7	41.2	0.1	96.9	11.5	0.0	5.8	0.0
Queue Length 95th (m)	7.0	65.0	0.8	116.8	22.5	0.0	11.3	0.0
Internal Link Dist (m)		130.7		792.0		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	337	2803	477	2619	476	633	932	587
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.35	0.00	0.60	0.15	0.01	0.08	0.04

Intersection Summary

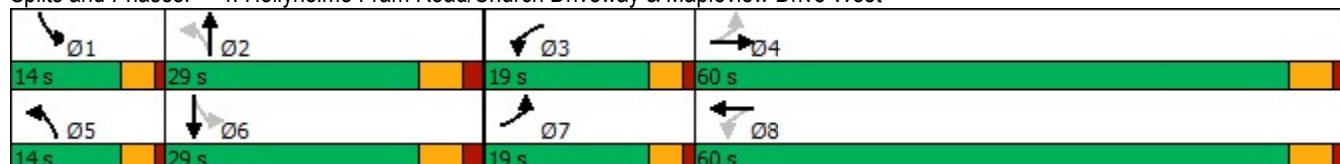
Cycle Length: 122

Actuated Cycle Length: 106

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

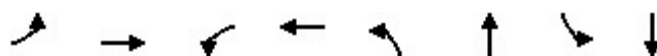
4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	922	23	1	1406	106	69	0	7	70	0	23
Future Volume (vph)	29	922	23	1	1406	106	69	0	7	70	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5062		1805	5078		1805	1615		3502	1583	
Flt Permitted	0.09	1.00		0.26	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	177	5062		491	5078		1351	1615		2776	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	960	24	1	1465	110	72	0	7	73	0	24
RTOR Reduction (vph)	0	2	0	0	6	0	0	5	0	0	19	0
Lane Group Flow (vph)	30	982	0	1	1569	0	72	2	0	73	5	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	0%	2%	6%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	62.7	58.7		57.3	56.0		31.1	24.3		29.1	23.3	
Effective Green, g (s)	62.7	58.7		57.3	56.0		31.1	24.3		29.1	23.3	
Actuated g/C Ratio	0.57	0.53		0.52	0.51		0.28	0.22		0.26	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	2698		271	2582		409	356		771	335	
v/s Ratio Prot	c0.01	0.19		0.00	c0.31		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.10			0.00			c0.04			0.02		
v/c Ratio	0.19	0.36		0.00	0.61		0.18	0.00		0.09	0.02	
Uniform Delay, d1	12.9	14.9		12.7	19.2		29.5	33.5		30.4	34.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.1		0.0	0.4		0.2	0.0		0.1	0.1	
Delay (s)	13.5	15.0		12.8	19.6		29.7	33.5		30.5	34.4	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		14.9			19.6			30.1			31.5	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		18.6			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		110.1			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		65.5%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Background (2031) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	146	987	219	1229	182	327	305	306
Future Volume (vph)	146	987	219	1229	182	327	305	306
Lane Group Flow (vph)	155	1151	233	1794	194	591	324	441
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	22.0	32.0
Total Split (s)	14.0	43.0	23.0	52.0	19.0	32.0	22.0	35.0
Total Split (%)	11.7%	35.8%	19.2%	43.3%	15.8%	26.7%	18.3%	29.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.71	0.63	0.73	0.90	0.53	0.82	0.93	0.55
Control Delay	42.2	33.3	32.5	38.0	29.7	44.8	62.8	38.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	33.3	32.5	38.0	29.7	44.8	62.8	38.8
Queue Length 50th (m)	18.4	82.0	28.3	138.9	31.0	55.8	58.1	45.1
Queue Length 95th (m)	#54.7	109.6	58.9	#183.9	48.7	76.9	#116.2	62.6
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	224	1819	382	2001	397	865	350	890
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.63	0.61	0.90	0.49	0.68	0.93	0.50

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.6

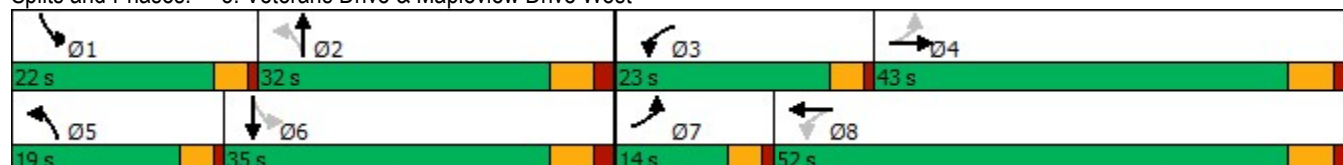
Natural Cycle: 105

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	146	987	95	219	1229	458	182	327	228	305	306	108
Future Volume (vph)	146	987	95	219	1229	458	182	327	228	305	306	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5051		1769	4845		1769	3350		1787	3397	
Flt Permitted	0.10	1.00		0.13	1.00		0.45	1.00		0.16	1.00	
Satd. Flow (perm)	183	5051		239	4845		829	3350		303	3397	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	155	1050	101	233	1307	487	194	348	243	324	326	115
RTOR Reduction (vph)	0	9	0	0	54	0	0	110	0	0	30	0
Lane Group Flow (vph)	155	1142	0	233	1740	0	194	481	0	324	411	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	50.7	41.1		59.7	46.1		33.8	20.8		42.8	25.8	
Effective Green, g (s)	50.7	41.1		59.7	46.1		33.8	20.8		42.8	25.8	
Actuated g/C Ratio	0.44	0.36		0.52	0.40		0.30	0.18		0.37	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1813		319	1950		351	608		346	765	
v/s Ratio Prot	0.06	0.23		c0.09	c0.36		0.06	0.14		c0.15	0.12	
v/s Ratio Perm	0.26			0.29			0.10			c0.20		
v/c Ratio	0.72	0.63		0.73	0.89		0.55	0.79		0.94	0.54	
Uniform Delay, d1	24.2	30.4		19.0	31.9		32.0	44.8		30.6	39.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.3	1.7		8.3	6.7		1.9	6.9		32.1	0.7	
Delay (s)	35.5	32.1		27.3	38.6		33.9	51.7		62.7	39.8	
Level of Service	D	C		C	D		C	D		E	D	
Approach Delay (s)		32.5			37.3			47.3			49.5	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			114.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			93.1%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Background (2031) SAT (MID) Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	152	768	150	801	301	47	246	192	221	211	163
Future Volume (vph)	152	768	150	801	301	47	246	192	221	211	163
Lane Group Flow (vph)	160	839	158	843	317	49	259	202	233	222	172
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.63	0.83	0.64	0.83	0.48	0.13	0.44	0.33	0.46	0.27	0.21
Control Delay	28.8	41.2	30.2	41.4	5.8	27.2	30.9	6.7	19.4	18.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	41.2	30.2	41.4	5.8	27.2	30.9	6.7	19.4	18.7	3.4
Queue Length 50th (m)	19.1	82.8	19.0	83.6	0.0	7.4	43.3	2.0	28.5	28.5	0.0
Queue Length 95th (m)	33.3	106.6	33.6	107.3	19.9	16.8	67.6	18.8	45.7	45.7	12.0
Internal Link Dist (m)		193.7		171.9			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	267	1104	257	1108	694	365	584	615	506	830	804
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.76	0.61	0.76	0.46	0.13	0.44	0.33	0.46	0.27	0.21

Intersection Summary

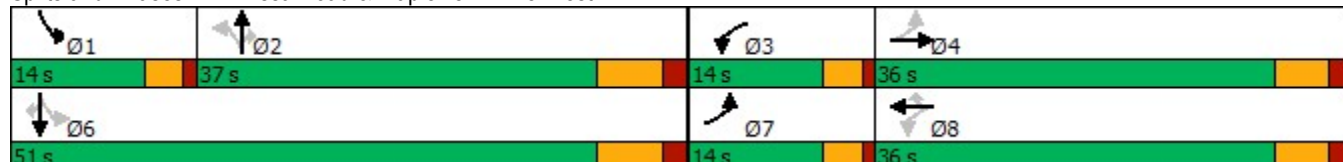
Cycle Length: 101

Actuated Cycle Length: 97.9

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Splits and Phases: 1: Essa Road & Maplevue Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	768	29	150	801	301	47	246	192	221	211	163
Future Volume (vph)	152	768	29	150	801	301	47	246	192	221	211	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3590		1736	3610	1548	1801	1881	1563	1787	1845	1575
Flt Permitted	0.15	1.00		0.15	1.00	1.00	0.62	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	277	3590		267	3610	1548	1175	1881	1563	853	1845	1575
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	160	808	31	158	843	317	49	259	202	233	222	172
RTOR Reduction (vph)	0	3	0	0	0	228	0	0	130	0	0	95
Lane Group Flow (vph)	160	836	0	158	843	89	49	259	72	233	222	77
Confl. Peds. (#/hr)	7					7	3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	1%	0%	1%	2%	1%	3%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	36.8	27.4		36.8	27.4	27.4	30.4	30.4	30.4	44.1	44.1	44.1
Effective Green, g (s)	36.8	27.4		36.8	27.4	27.4	30.4	30.4	30.4	44.1	44.1	44.1
Actuated g/C Ratio	0.38	0.28		0.38	0.28	0.28	0.31	0.31	0.31	0.45	0.45	0.45
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	250	1004		241	1010	433	364	584	485	476	831	709
v/s Ratio Prot	0.06	0.23		c0.06	c0.23			0.14		c0.05	0.12	
v/s Ratio Perm	0.18			0.18		0.06	0.04		0.05	c0.17		0.05
v/c Ratio	0.64	0.83		0.66	0.83	0.20	0.13	0.44	0.15	0.49	0.27	0.11
Uniform Delay, d1	22.8	33.1		22.9	33.1	26.9	24.3	27.0	24.4	17.4	16.8	15.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	6.0		6.3	6.1	0.2	0.8	2.4	0.6	0.8	0.8	0.3
Delay (s)	28.3	39.1		29.2	39.2	27.2	25.1	29.4	25.1	18.2	17.6	15.9
Level of Service	C	D		C	D	C	C	C	C	B	B	B
Approach Delay (s)		37.4			35.1			27.3			17.4	
Approach LOS		D			D			C			B	
Intersection Summary												
HCM 2000 Control Delay			31.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			97.9			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			100.8%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

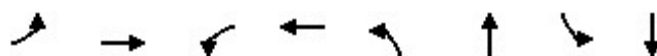
Background (2031) SAT (MID) Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1211	9	0	1296	0	10	
Future Volume (Veh/h)	1211	9	0	1296	0	10	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1316	10	0	1409	0	11	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	196			130			
pX, platoon unblocked			0.85		0.88	0.85	
vC, conflicting volume			1326		1791	444	
vC1, stage 1 conf vol					1321		
vC2, stage 2 conf vol					470		
vCu, unblocked vol			751		268	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	99	
cM capacity (veh/h)			723		647	918	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	526	526	273	470	470	470	11
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	10	0	0	0	11
cSH	1700	1700	1700	1700	1700	1700	918
Volume to Capacity	0.31	0.31	0.16	0.28	0.28	0.28	0.01
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.0
Approach LOS							A
Intersection Summary							
Average Delay			0.0				
Intersection Capacity Utilization			33.6%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive

Queues

3: East Access /364 MVD-West Access & Maplevue Drive West Background (2031) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑↑	←	↑↑↑	←	↑	←	↑
Traffic Volume (vph)	27	1202	33	1222	16	0	58	0
Future Volume (vph)	27	1202	33	1222	16	0	58	0
Lane Group Flow (vph)	29	1323	36	1399	17	32	63	75
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	22.5	22.5
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	22.5	22.5
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	34.6%	34.6%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	3.5	3.5
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	4.5	4.5
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.21	0.72	0.12	0.63	0.04	0.04	0.12	0.11
Control Delay	19.1	18.3	8.0	12.9	15.6	0.1	14.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	18.3	8.0	12.9	15.6	0.1	14.9	1.7
Queue Length 50th (m)	1.7	35.4	1.9	37.8	1.1	0.0	3.9	0.0
Queue Length 95th (m)	8.9	68.2	5.4	49.1	5.5	0.0	13.5	3.3
Internal Link Dist (m)		106.6		126.7		19.0		122.2
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	147	1997	388	3246	450	759	506	664
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.66	0.09	0.43	0.04	0.04	0.12	0.11

Intersection Summary

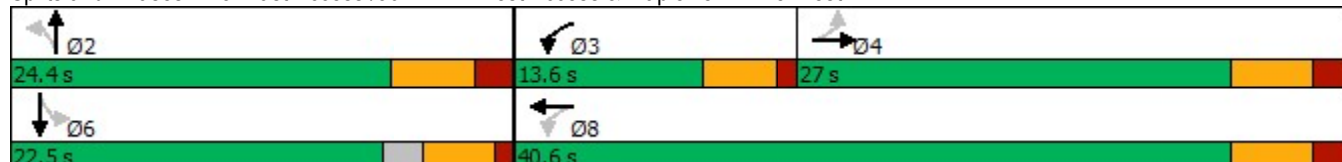
Cycle Length: 65

Actuated Cycle Length: 54.7

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

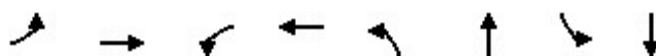
3: East Access /364 MVD-West Access & Maplevue Drive West Background (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1202	15	33	1222	65	16	0	29	58	0	69
Future Volume (vph)	27	1202	15	33	1222	65	16	0	29	58	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		4.5	4.5	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5076		1770	5047		1770	1583		1770	1583	
Flt Permitted	0.20	1.00		0.16	1.00		0.71	1.00		0.74	1.00	
Satd. Flow (perm)	374	5076		305	5047		1319	1583		1372	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	1307	16	36	1328	71	17	0	32	63	0	75
RTOR Reduction (vph)	0	2	0	0	10	0	0	22	0	0	49	0
Lane Group Flow (vph)	29	1321	0	36	1389	0	17	10	0	63	26	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.9	19.9		26.8	26.8		18.7	18.7		20.2	20.2	
Effective Green, g (s)	19.9	19.9		26.8	26.8		18.7	18.7		20.2	20.2	
Actuated g/C Ratio	0.35	0.35		0.47	0.47		0.33	0.33		0.35	0.35	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	129	1756		203	2352		428	514		481	556	
v/s Ratio Prot		c0.26		0.01	c0.28			0.01			0.02	
v/s Ratio Perm	0.08			0.08			0.01			c0.05		
v/c Ratio	0.22	0.75		0.18	0.59		0.04	0.02		0.13	0.05	
Uniform Delay, d1	13.3	16.6		9.8	11.3		13.3	13.2		12.7	12.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.9		0.4	0.4		0.2	0.1		0.1	0.0	
Delay (s)	14.2	18.5		10.2	11.7		13.4	13.2		12.8	12.3	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		18.4			11.7			13.3			12.6	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			57.5			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			46.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West Background (2031) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑↑	←	↑↑↑	←	↑	←	↑
Traffic Volume (vph)	31	1192	1	1182	66	0	75	0
Future Volume (vph)	31	1192	1	1182	66	0	75	0
Lane Group Flow (vph)	32	1270	1	1338	69	13	78	24
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.12	0.45	0.00	0.51	0.17	0.02	0.09	0.04
Control Delay	10.9	15.6	10.0	19.0	26.7	0.1	25.3	0.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	16.1	10.0	19.0	26.7	0.1	25.3	0.1
Queue Length 50th (m)	2.9	57.5	0.1	77.3	11.0	0.0	6.2	0.0
Queue Length 95th (m)	7.2	87.8	0.8	94.1	22.0	0.0	11.8	0.0
Internal Link Dist (m)		126.7		795.9		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	374	2833	405	2611	425	612	927	602
Starvation Cap Reductn	0	998	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.69	0.00	0.51	0.16	0.02	0.08	0.04

Intersection Summary

Cycle Length: 122

Actuated Cycle Length: 106.1

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Ø1	Ø2	Ø3	Ø4
14 s	29 s	19 s	60 s
Ø5	Ø6	Ø7	Ø8
14 s	29 s	19 s	60 s

315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Background (2031) SAT (MID) Peak Hour

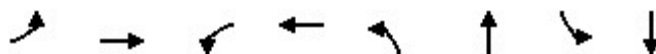
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	1192	27	1	1182	103	66	0	12	75	0	23
Future Volume (vph)	31	1192	27	1	1182	103	66	0	12	75	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5117		1805	5070		1612	1615		3502	1615	
Flt Permitted	0.14	1.00		0.17	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	260	5117		328	5070		1206	1615		2761	1615	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	1242	28	1	1231	107	69	0	12	78	0	24
RTOR Reduction (vph)	0	1	0	0	7	0	0	10	0	0	19	0
Lane Group Flow (vph)	32	1269	0	1	1331	0	69	3	0	78	5	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	12%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	62.7	58.7		57.3	56.0		31.2	24.3		29.2	23.3	
Effective Green, g (s)	62.7	58.7		57.3	56.0		31.2	24.3		29.2	23.3	
Actuated g/C Ratio	0.57	0.53		0.52	0.51		0.28	0.22		0.26	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	204	2725		187	2576		366	356		771	341	
v/s Ratio Prot	c0.01	0.25		0.00	c0.26		c0.01	0.00		0.01	0.00	
v/s Ratio Perm	0.08			0.00			c0.04			0.02		
v/c Ratio	0.16	0.47		0.01	0.52		0.19	0.01		0.10	0.01	
Uniform Delay, d1	11.9	16.0		13.1	18.1		29.6	33.5		30.4	34.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.0	0.2		0.3	0.0		0.1	0.1	
Delay (s)	12.2	16.1		13.1	18.2		29.8	33.6		30.5	34.5	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		16.0			18.2			30.4			31.4	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		18.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		110.2			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		65.3%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues

Background (2031) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	69	1349	240	1105	134	301	470	224
Future Volume (vph)	69	1349	240	1105	134	301	470	224
Lane Group Flow (vph)	71	1490	247	1638	138	420	485	290
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.34	1.05	0.82	0.92	0.29	0.43	1.02	0.26
Control Delay	22.0	77.1	46.5	42.8	19.0	30.5	72.0	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.0	77.1	46.5	42.8	19.0	30.5	72.0	26.4
Queue Length 50th (m)	8.7	~135.7	36.4	125.2	17.6	36.5	~80.9	23.0
Queue Length 95th (m)	17.2	#167.0	#75.9	#168.2	30.2	51.8	#133.8	36.2
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	320	1418	318	1772	558	986	476	1113
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	1.05	0.78	0.92	0.25	0.43	1.02	0.26

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 108.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

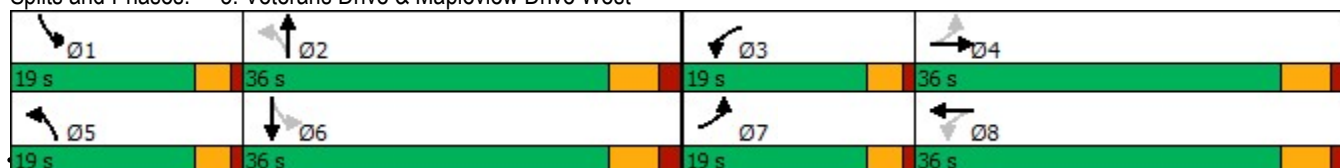
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



JD Engineering

Synchro 11 Report
02-12-2023

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) SAT (MID) Peak Hour

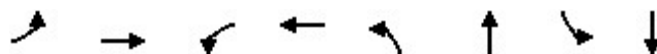
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1349	96	240	1105	484	134	301	107	470	224	57
Future Volume (vph)	69	1349	96	240	1105	484	134	301	107	470	224	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5121		1805	4901		1769	3459		1805	3449	
Flt Permitted	0.13	1.00		0.11	1.00		0.57	1.00		0.37	1.00	
Satd. Flow (perm)	246	5121		218	4901		1069	3459		703	3449	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	71	1391	99	247	1139	499	138	310	110	485	231	59
RTOR Reduction (vph)	0	7	0	0	65	0	0	33	0	0	19	0
Lane Group Flow (vph)	71	1483	0	247	1573	0	138	387	0	485	271	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	37.6	30.9		48.7	38.0		40.4	30.0		49.0	34.6	
Effective Green, g (s)	37.6	30.9		48.7	38.0		40.4	30.0		49.0	34.6	
Actuated g/C Ratio	0.34	0.28		0.44	0.35		0.37	0.27		0.45	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	1442		296	1697		460	945		464	1087	
v/s Ratio Prot	0.02	c0.29		c0.10	0.32		0.03	0.11		c0.14	0.08	
v/s Ratio Perm	0.11			0.27			0.08			c0.32		
v/c Ratio	0.40	1.03		0.83	0.93		0.30	0.41		1.05	0.25	
Uniform Delay, d1	27.2	39.4		27.3	34.5		23.7	32.6		26.9	27.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	31.2		18.0	9.2		0.4	1.3		54.1	0.5	
Delay (s)	28.7	70.6		45.3	43.7		24.1	33.9		81.0	28.4	
Level of Service	C	E		D	D		C	C		F	C	
Approach Delay (s)		68.7			43.9			31.5			61.4	
Approach LOS		E			D			C			E	
Intersection Summary												
HCM 2000 Control Delay			53.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			109.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			95.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues

Background (2031) SAT (MID) Peak Hour-with improvements



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	69	1349	240	1105	134	301	470	224
Future Volume (vph)	69	1349	240	1105	134	301	470	224
Lane Group Flow (vph)	71	1490	247	1638	138	420	485	290
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	11.0	41.0	18.0	48.0	11.0	32.0	29.0	50.0
Total Split (%)	9.2%	34.2%	15.0%	40.0%	9.2%	26.7%	24.2%	41.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.39	0.92	0.85	0.82	0.46	0.73	0.96	0.26
Control Delay	23.2	47.4	52.5	33.5	28.0	48.2	59.3	25.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	47.4	52.5	33.5	28.0	48.2	59.3	25.5
Queue Length 50th (m)	8.3	120.0	38.2	118.9	19.0	44.4	85.7	23.0
Queue Length 95th (m)	17.9	#163.4	#88.7	150.9	32.0	61.7	#155.6	34.1
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	183	1618	296	1997	299	838	504	1383
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.92	0.83	0.82	0.46	0.50	0.96	0.21

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.3

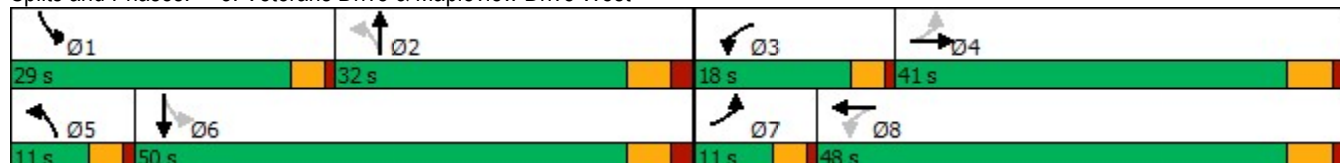
Natural Cycle: 90

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Background (2031) SAT (MID) Peak Hour-with improvements

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1349	96	240	1105	484	134	301	107	470	224	57
Future Volume (vph)	69	1349	96	240	1105	484	134	301	107	470	224	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.96		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5121		1805	4901		1769	3459		1805	3449	
Flt Permitted	0.11	1.00		0.10	1.00		0.57	1.00		0.24	1.00	
Satd. Flow (perm)	212	5121		190	4901		1069	3459		462	3449	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	71	1391	99	247	1139	499	138	310	110	485	231	59
RTOR Reduction (vph)	0	6	0	0	61	0	0	32	0	0	20	0
Lane Group Flow (vph)	71	1484	0	247	1577	0	138	388	0	485	270	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	41.4	35.9		53.5	44.0		24.6	17.6		46.6	35.6	
Effective Green, g (s)	41.4	35.9		53.5	44.0		24.6	17.6		46.6	35.6	
Actuated g/C Ratio	0.37	0.32		0.48	0.39		0.22	0.16		0.42	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	156	1639		286	1923		278	543		491	1095	
v/s Ratio Prot	0.02	0.29		c0.10	0.32		0.03	0.11		c0.22	0.08	
v/s Ratio Perm	0.15			c0.31			0.08			c0.19		
v/c Ratio	0.46	0.91		0.86	0.82		0.50	0.71		0.99	0.25	
Uniform Delay, d1	25.3	36.5		29.2	30.5		37.0	44.9		28.1	28.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	8.7		22.6	4.1		1.4	4.4		37.1	0.1	
Delay (s)	27.4	45.2		51.8	34.6		38.4	49.3		65.2	28.4	
Level of Service	C	D		D	C		D	D		E	C	
Approach Delay (s)		44.4			36.8			46.6			51.4	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			112.1			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			95.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Background (2031) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	219	640	140	1055	342	102	258	107	144	198	305
Future Volume (vph)	219	640	140	1055	342	102	258	107	144	198	305
Lane Group Flow (vph)	238	717	152	1147	372	111	280	116	157	215	332
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	13.5	37.0	16.0	39.5	39.5	37.0	37.0	37.0	11.0	48.0	48.0
Total Split (%)	13.4%	36.6%	15.8%	39.1%	39.1%	36.6%	36.6%	36.6%	10.9%	47.5%	47.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.97	0.62	0.46	0.97	0.49	0.34	0.51	0.21	0.40	0.28	0.42
Control Delay	74.9	31.8	19.5	53.5	5.5	31.4	33.4	5.9	21.3	21.4	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	31.8	19.5	53.5	5.5	31.4	33.4	5.9	21.3	21.4	6.7
Queue Length 50th (m)	32.0	65.2	17.0	121.6	1.5	17.8	47.7	0.0	19.6	29.1	8.7
Queue Length 95th (m)	#83.5	87.4	29.2	#167.8	22.1	33.8	73.8	12.4	33.5	46.9	28.5
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	246	1161	365	1185	758	326	548	544	389	763	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.62	0.42	0.97	0.49	0.34	0.51	0.21	0.40	0.28	0.42

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 101

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
11 s	37 s	16 s	37 s
			
Ø5	Ø6	Ø7	Ø8
48 s	13.5 s	39.5 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Background (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	640	19	140	1055	342	102	258	107	144	198	305
Future Volume (vph)	219	640	19	140	1055	342	102	258	107	144	198	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3551		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.12	1.00		0.24	1.00	1.00	0.62	1.00	1.00	0.41	1.00	1.00
Satd. Flow (perm)	228	3551		442	3574	1559	1097	1845	1553	741	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	238	696	21	152	1147	372	111	280	116	157	215	332
RTOR Reduction (vph)	0	2	0	0	0	241	0	0	82	0	0	156
Lane Group Flow (vph)	238	715	0	152	1147	131	111	280	34	157	215	176
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	42.5	33.0		43.5	33.5	33.5	30.0	30.0	30.0	41.0	41.0	41.0
Effective Green, g (s)	42.5	33.0		43.5	33.5	33.5	30.0	30.0	30.0	41.0	41.0	41.0
Actuated g/C Ratio	0.42	0.33		0.43	0.33	0.33	0.30	0.30	0.30	0.41	0.41	0.41
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	242	1160		321	1185	517	325	548	461	367	763	642
v/s Ratio Prot	c0.09	0.20		0.05	c0.32			c0.15		c0.03	0.11	
v/s Ratio Perm	0.32			0.16		0.08	0.10		0.02	0.14		0.11
v/c Ratio	0.98	0.62		0.47	0.97	0.25	0.34	0.51	0.07	0.43	0.28	0.27
Uniform Delay, d1	25.0	28.7		18.9	33.2	24.6	27.8	29.4	25.5	20.2	20.1	20.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	52.9	1.0		1.1	18.7	0.3	2.8	3.4	0.3	0.8	0.9	1.1
Delay (s)	77.9	29.6		20.0	51.9	24.9	30.6	32.8	25.8	21.0	21.0	21.1
Level of Service	E	C		C	D	C	C	C	C	C	C	C
Approach Delay (s)		41.7			43.0			30.7			21.1	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix F – OTM Signal Justification Sheets

Justification No. 7 - 2031 Total Traffic (Critical Case)

East Access / Maplevue Drive West

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
			Rest. Flow	Numerical			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	900	1551	172%	48%	YES	YES
	B. Vehicle volume, along minor streets (average hour)	255	185	72%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	900	1316	146%	35%	NO	YES
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	170	90	53%		NO	NO

Justification No. 7 - 2031 Total Traffic (Critical Case)

West Access / Maplevue Drive West

Justification	Description		Compliance			Signal Warrant	Underground Provisions Warrant
			Sectional		Entire %		
		Rest. Flow	Numerical	%			
1. Minimum Vehicluar Volume	A. Vehicle volume, all aproaches (average hour)	900	1358	151%	8%	YES	YES
	B. Vehicle volume, along minor streets (average hour)	255	31	12%		NO	NO
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	900	1288	143%	0%	NO	YES
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	170	0	0%		NO	NO

Appendix G– Synchro Analysis Output – Total Traffic Volumes

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Total (2026) AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	171	792	93	276	76	34	145	150	145	187	181
Future Volume (vph)	171	792	93	276	76	34	145	150	145	187	181
Lane Group Flow (vph)	182	876	99	294	81	36	154	160	154	199	193
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.40	0.84	0.43	0.33	0.17	0.10	0.27	0.27	0.26	0.24	0.24
Control Delay	20.3	40.5	22.6	29.3	2.0	26.6	27.7	5.8	16.4	18.0	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	40.5	22.6	29.3	2.0	26.6	27.7	5.8	16.4	18.0	3.4
Queue Length 50th (m)	22.1	86.6	11.5	24.4	0.0	5.3	24.0	0.0	17.7	24.8	0.0
Queue Length 95th (m)	36.8	113.2	21.6	36.0	3.2	13.5	41.6	14.9	31.0	41.5	12.6
Internal Link Dist (m)		193.7		172.5			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	454	1115	252	1083	565	354	576	587	591	828	792
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.79	0.39	0.27	0.14	0.10	0.27	0.27	0.26	0.24	0.24

Intersection Summary

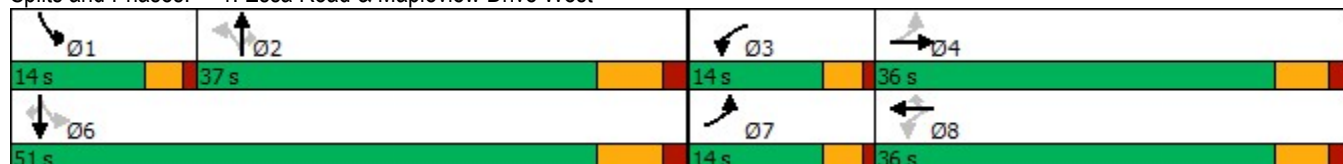
Cycle Length: 101

Actuated Cycle Length: 95.8

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

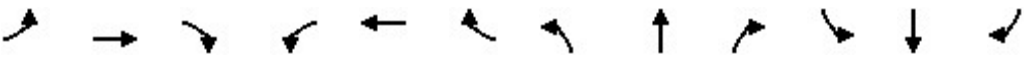
Splits and Phases: 1: Essa Road & Maplevue Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	792	31	93	276	76	34	145	150	145	187	181
Future Volume (vph)	171	792	31	93	276	76	34	145	150	145	187	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1749	3531		1671	3438	1511	1640	1776	1476	1718	1792	1490
Flt Permitted	0.51	1.00		0.16	1.00	1.00	0.63	1.00	1.00	0.58	1.00	1.00
Satd. Flow (perm)	931	3531		274	3438	1511	1092	1776	1476	1056	1792	1490
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	182	843	33	99	294	81	36	154	160	154	199	193
RTOR Reduction (vph)	0	3	0	0	0	59	0	0	109	0	0	105
Lane Group Flow (vph)	182	873	0	99	294	22	36	154	51	154	199	88
Confl. Peds. (#/hr)	4		3	3		4	1		1	1		1
Heavy Vehicles (%)	3%	1%	16%	8%	5%	4%	10%	7%	8%	5%	6%	7%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	38.0	28.3		32.8	25.7	25.7	31.1	31.1	31.1	44.3	44.3	44.3
Effective Green, g (s)	38.0	28.3		32.8	25.7	25.7	31.1	31.1	31.1	44.3	44.3	44.3
Actuated g/C Ratio	0.39	0.29		0.34	0.27	0.27	0.32	0.32	0.32	0.46	0.46	0.46
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	447	1033		195	913	401	351	571	474	546	820	682
v/s Ratio Prot	c0.04	c0.25		c0.04	0.09			0.09		c0.03	0.11	
v/s Ratio Perm	0.12			0.13		0.01	0.03		0.03	c0.10		0.06
v/c Ratio	0.41	0.85		0.51	0.32	0.05	0.10	0.27	0.11	0.28	0.24	0.13
Uniform Delay, d1	20.0	32.1		23.8	28.5	26.4	23.0	24.4	23.1	15.7	16.0	15.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	6.5		2.1	0.2	0.1	0.6	1.2	0.5	0.3	0.7	0.4
Delay (s)	20.6	38.6		25.9	28.7	26.5	23.6	25.5	23.5	16.0	16.7	15.5
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		35.5			27.7			24.4			16.1	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			28.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			96.7			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			98.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Total (2026) AM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1124	41	0	480	0	22	
Future Volume (Veh/h)	1124	41	0	480	0	22	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1222	45	0	522	0	24	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	197			130			
pX, platoon unblocked			0.84		0.85	0.84	
vC, conflicting volume			1267		1418	430	
vC1, stage 1 conf vol					1244		
vC2, stage 2 conf vol					174		
vCu, unblocked vol			646		663	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	97	
cM capacity (veh/h)			785		408	910	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	489	489	289	174	174	174	24
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	45	0	0	0	24
cSH	1700	1700	1700	1700	1700	1700	910
Volume to Capacity	0.29	0.29	0.17	0.10	0.10	0.10	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.1
Approach LOS							A
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			32.6%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive 3: East Access & Maplevue Drive West

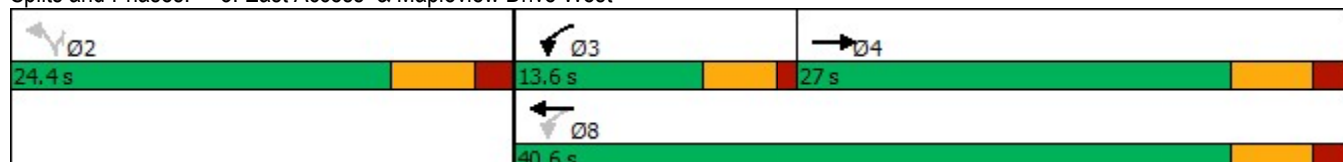
Queues
Total (2026) AM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	1133	63	452	34	35
Future Volume (vph)	1133	63	452	34	35
Lane Group Flow (vph)	1260	68	491	37	38
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.75	0.21	0.22	0.06	0.07
Control Delay	20.4	8.7	9.1	16.5	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	8.7	9.1	16.5	6.9
Queue Length 50th (m)	48.2	3.6	10.8	3.2	0.0
Queue Length 95th (m)	65.5	8.5	15.8	9.4	6.0
Internal Link Dist (m)	106.1		124.9	30.4	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	1948	392	3215	595	557
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.17	0.15	0.06	0.07

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 56.2
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access & Maplevue Drive West



315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Total (2026) AM Peak Hour

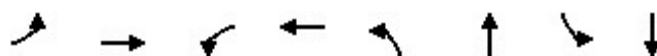
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	↰
Traffic Volume (vph)	1133	26	63	452	34	35
Future Volume (vph)	1133	26	63	452	34	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5068		1770	5085	1770	1583
Flt Permitted	1.00		0.17	1.00	0.95	1.00
Satd. Flow (perm)	5068		321	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1232	28	68	491	37	38
RTOR Reduction (vph)	3	0	0	0	0	26
Lane Group Flow (vph)	1257	0	68	491	37	12
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	18.7		27.1	27.1	18.9	18.9
Effective Green, g (s)	18.7		27.1	27.1	18.9	18.9
Actuated g/C Ratio	0.32		0.47	0.47	0.33	0.33
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1633		247	2375	576	515
v/s Ratio Prot	c0.25		0.02	c0.10		
v/s Ratio Perm			0.11		c0.02	0.01
v/c Ratio	0.77		0.28	0.21	0.06	0.02
Uniform Delay, d1	17.7		10.0	9.1	13.5	13.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2		0.6	0.0	0.2	0.1
Delay (s)	20.0		10.6	9.2	13.7	13.4
Level of Service	B		B	A	B	B
Approach Delay (s)	20.0			9.3	13.5	
Approach LOS	B			A	B	
Intersection Summary						
HCM 2000 Control Delay			16.6		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.41			
Actuated Cycle Length (s)			58.0		Sum of lost time (s)	16.5
Intersection Capacity Utilization			44.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

315 Maplevue Drive

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Queues

Total (2026) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	1125	5	479	11	0	59	0
Future Volume (vph)	4	1125	5	479	11	0	59	0
Lane Group Flow (vph)	5	1355	6	575	13	11	68	17
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.01	0.50	0.02	0.22	0.03	0.02	0.08	0.02
Control Delay	9.5	16.0	9.6	13.0	23.4	0.1	23.1	0.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	16.4	9.6	13.0	23.4	0.1	23.1	0.1
Queue Length 50th (m)	0.4	59.8	0.5	20.9	1.7	0.0	4.5	0.0
Queue Length 95th (m)	2.0	88.1	2.2	34.0	6.5	0.0	10.3	0.0
Internal Link Dist (m)		124.9		797.8		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	612	2737	385	2617	504	528	916	820
Starvation Cap Reductn	0	762	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.69	0.02	0.22	0.03	0.02	0.07	0.02

Intersection Summary

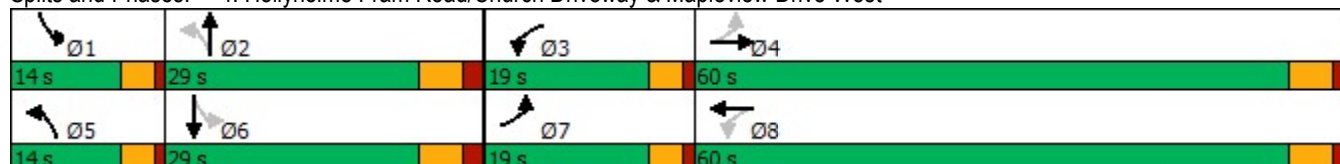
Cycle Length: 122

Actuated Cycle Length: 100.3

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Total (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1125	54	5	479	21	11	0	10	59	0	15
Future Volume (vph)	4	1125	54	5	479	21	11	0	10	59	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5050		1805	4826		1805	1242		3502	1615	
Flt Permitted	0.42	1.00		0.14	1.00		0.75	1.00		0.65	1.00	
Satd. Flow (perm)	793	5050		266	4826		1418	1242		2392	1615	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	5	1293	62	6	551	24	13	0	11	68	0	17
RTOR Reduction (vph)	0	4	0	0	3	0	0	8	0	0	12	0
Lane Group Flow (vph)	5	1351	0	6	572	0	13	3	0	68	5	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	2%	0%	7%	0%	0%	0%	30%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.6	54.3		55.6	54.3		26.9	25.6		35.3	30.0	
Effective Green, g (s)	55.6	54.3		55.6	54.3		26.9	25.6		35.3	30.0	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.25	0.24		0.33	0.28	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	424	2565		157	2451		361	297		849	453	
v/s Ratio Prot	0.00	c0.27		c0.00	0.12		0.00	0.00		c0.00	0.00	
v/s Ratio Perm	0.01			0.02			0.01			c0.02		
v/c Ratio	0.01	0.53		0.04	0.23		0.04	0.01		0.08	0.01	
Uniform Delay, d1	12.3	17.7		13.3	14.7		30.2	31.0		24.5	27.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2		0.1	0.0		0.0	0.1		0.0	0.0	
Delay (s)	12.4	17.9		13.4	14.7		30.2	31.0		24.6	27.8	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		17.8			14.7			30.6			25.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		17.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		106.9			Sum of lost time (s)			20.0				
Intersection Capacity Utilization		63.3%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Total (2026) AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		 		 
Traffic Volume (vph)	82	876	228	514	50	104	256	246
Future Volume (vph)	82	876	228	514	50	104	256	246
Lane Group Flow (vph)	86	1021	240	659	53	237	269	335
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.24	0.74	0.82	0.39	0.14	0.25	0.49	0.28
Control Delay	18.9	39.0	46.6	26.5	17.9	14.9	22.0	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	39.0	46.6	26.5	17.9	14.9	22.0	24.1
Queue Length 50th (m)	10.7	76.3	34.7	39.0	6.5	9.7	37.5	25.7
Queue Length 95th (m)	20.2	93.2	#75.0	52.5	14.0	20.1	57.4	39.0
Internal Link Dist (m)		797.8		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	452	1378	306	1701	490	931	562	1204
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.74	0.78	0.39	0.11	0.25	0.48	0.28

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 107.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	82	876	94	228	514	112	50	104	122	256	246	72
Future Volume (vph)	82	876	94	228	514	112	50	104	122	256	246	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4911		1687	4803		1581	3015		1752	3330	
Flt Permitted	0.39	1.00		0.13	1.00		0.55	1.00		0.54	1.00	
Satd. Flow (perm)	712	4911		222	4803		915	3015		987	3330	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	922	99	240	541	118	53	109	128	269	259	76
RTOR Reduction (vph)	0	11	0	0	28	0	0	92	0	0	22	0
Lane Group Flow (vph)	86	1010	0	240	631	0	53	145	0	269	313	0
Confl. Peds. (#/hr)	2		6	6		2	4		1	1		4
Heavy Vehicles (%)	4%	4%	3%	7%	5%	4%	14%	6%	12%	3%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.1	30.9		48.8	37.6		37.3	30.9		48.7	38.3	
Effective Green, g (s)	38.1	30.9		48.8	37.6		37.3	30.9		48.7	38.3	
Actuated g/C Ratio	0.35	0.28		0.45	0.34		0.34	0.28		0.44	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	315	1385		284	1649		350	850		535	1164	
v/s Ratio Prot	0.02	0.21		c0.11	0.13		0.01	0.05		c0.06	0.09	
v/s Ratio Perm	0.08			c0.27			0.04			c0.16		
v/c Ratio	0.27	0.73		0.85	0.38		0.15	0.17		0.50	0.27	
Uniform Delay, d1	24.5	35.5		24.4	27.2		24.6	29.6		20.0	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.0		20.0	0.1		0.2	0.4		0.7	0.6	
Delay (s)	25.0	37.5		44.4	27.3		24.8	30.1		20.8	26.1	
Level of Service	C	D		D	C		C	C		C	C	
Approach Delay (s)		36.5			31.9			29.1			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			109.5			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			90.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Total (2026) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	195	596	140	980	299	92	229	104	156	173	277
Future Volume (vph)	195	596	140	980	299	92	229	104	156	173	277
Lane Group Flow (vph)	212	661	152	1065	325	100	249	113	170	188	301
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	13.2	37.0	16.0	39.8	39.8	37.0	37.0	37.0	11.0	48.0	48.0
Total Split (%)	13.1%	36.6%	15.8%	39.4%	39.4%	36.6%	36.6%	36.6%	10.9%	47.5%	47.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.87	0.58	0.44	0.91	0.45	0.30	0.45	0.21	0.40	0.24	0.38
Control Delay	55.0	31.1	18.9	44.5	4.9	30.3	31.8	5.6	21.1	20.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	31.1	18.9	44.5	4.9	30.3	31.8	5.6	21.1	20.7	5.4
Queue Length 50th (m)	25.2	59.0	17.0	108.6	0.0	15.9	41.6	0.0	21.4	25.0	5.1
Queue Length 95th (m)	#69.8	79.7	29.2	#147.3	18.8	30.6	65.5	11.5	36.1	41.3	22.1
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	244	1140	384	1208	741	336	553	548	422	770	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.58	0.40	0.88	0.44	0.30	0.45	0.21	0.40	0.24	0.38

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 100.1

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
11 s	37 s	16 s	37 s
			
Ø5	Ø6	Ø7	Ø8
48 s	13.2 s	39.8 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	596	12	140	980	299	92	229	104	156	173	277
Future Volume (vph)	195	596	12	140	980	299	92	229	104	156	173	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3558		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.12	1.00		0.27	1.00	1.00	0.64	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	235	3558		494	3574	1559	1124	1845	1553	821	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	212	648	13	152	1065	325	100	249	113	170	188	301
RTOR Reduction (vph)	0	1	0	0	0	218	0	0	79	0	0	153
Lane Group Flow (vph)	212	660	0	152	1065	107	100	249	34	170	188	148
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	41.2	32.0		42.8	32.8	32.8	30.0	30.0	30.0	41.0	41.0	41.0
Effective Green, g (s)	41.2	32.0		42.8	32.8	32.8	30.0	30.0	30.0	41.0	41.0	41.0
Actuated g/C Ratio	0.41	0.32		0.43	0.33	0.33	0.30	0.30	0.30	0.41	0.41	0.41
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	239	1138		338	1172	511	337	553	465	398	771	649
v/s Ratio Prot	c0.08	0.19		0.04	c0.30			0.13		c0.03	0.10	
v/s Ratio Perm	0.28			0.15		0.07	0.09		0.02	c0.15		0.09
v/c Ratio	0.89	0.58		0.45	0.91	0.21	0.30	0.45	0.07	0.43	0.24	0.23
Uniform Delay, d1	23.3	28.4		18.7	32.2	24.2	26.9	28.3	25.0	19.7	19.3	19.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	30.0	0.7		1.0	10.3	0.2	2.2	2.6	0.3	0.7	0.8	0.8
Delay (s)	53.3	29.1		19.6	42.4	24.4	29.1	31.0	25.4	20.5	20.1	20.0
Level of Service	D	C		B	D	C	C	C	C	C	C	C
Approach Delay (s)		35.0			36.4			29.2			20.2	
Approach LOS		C			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			107.9%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

Total (2026) PM Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	826	59	0	1373	0	45	
Future Volume (Veh/h)	826	59	0	1373	0	45	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	898	64	0	1492	0	49	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	195			132			
pX, platoon unblocked			0.91		0.86	0.91	
vC, conflicting volume			962		1427	331	
vC1, stage 1 conf vol					930		
vC2, stage 2 conf vol					497		
vCu, unblocked vol			603		181	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	95	
cM capacity (veh/h)			881		701	984	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	359	359	244	497	497	497	49
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	64	0	0	0	49
cSH	1700	1700	1700	1700	1700	1700	984
Volume to Capacity	0.21	0.21	0.14	0.29	0.29	0.29	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	8.8
Lane LOS							A
Approach Delay (s)	0.0			0.0			8.8
Approach LOS							A
Intersection Summary							
Average Delay			0.2				
Intersection Capacity Utilization			29.9%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive
3: East Access & Maplevue Drive West

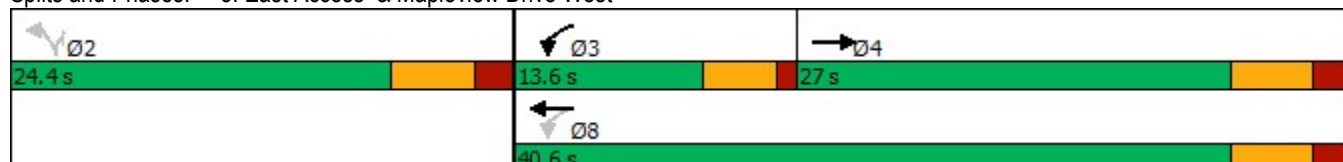
Queues
Total (2026) PM Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	853	148	1283	104	92
Future Volume (vph)	853	148	1283	104	92
Lane Group Flow (vph)	953	161	1395	113	100
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.62	0.44	0.58	0.20	0.17
Control Delay	19.9	11.5	11.9	18.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	19.9	11.5	11.9	18.1	5.4
Queue Length 50th (m)	35.2	9.0	38.2	9.6	0.0
Queue Length 95th (m)	48.1	17.3	49.3	22.6	9.6
Internal Link Dist (m)	107.7		130.7	30.4	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	1847	393	3048	564	572
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.41	0.46	0.20	0.17

Intersection Summary

Cycle Length: 65
Actuated Cycle Length: 58.6
Natural Cycle: 60
Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access & Maplevue Drive West



315 Maplevue Drive
3: East Access & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis
Total (2026) PM Peak Hour

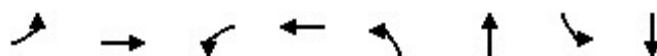
						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	↰
Traffic Volume (vph)	853	24	148	1283	104	92
Future Volume (vph)	853	24	148	1283	104	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5064		1770	5085	1770	1583
Flt Permitted	1.00		0.18	1.00	0.95	1.00
Satd. Flow (perm)	5064		333	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	927	26	161	1395	113	100
RTOR Reduction (vph)	5	0	0	0	0	69
Lane Group Flow (vph)	948	0	161	1395	113	31
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	17.9		28.8	28.8	18.7	18.7
Effective Green, g (s)	17.9		28.8	28.8	18.7	18.7
Actuated g/C Ratio	0.30		0.48	0.48	0.31	0.31
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1523		315	2461	556	497
v/s Ratio Prot	0.19		0.05	c0.27		
v/s Ratio Perm			0.19		c0.06	0.02
v/c Ratio	0.62		0.51	0.57	0.20	0.06
Uniform Delay, d1	17.9		9.6	10.9	14.9	14.3
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		1.4	0.3	0.8	0.2
Delay (s)	18.7		11.0	11.2	15.8	14.5
Level of Service	B		B	B	B	B
Approach Delay (s)	18.7			11.2	15.2	
Approach LOS	B			B	B	
Intersection Summary						
HCM 2000 Control Delay			14.1		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.47			
Actuated Cycle Length (s)			59.5		Sum of lost time (s)	16.5
Intersection Capacity Utilization			44.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

315 Mapleview Drive

4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Queues

Total (2026) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	11	911	1	1354	72	0	42	0
Future Volume (vph)	11	911	1	1354	72	0	42	0
Lane Group Flow (vph)	11	972	1	1483	75	6	44	13
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.05	0.36	0.00	0.54	0.16	0.01	0.05	0.02
Control Delay	10.5	14.9	10.0	17.3	23.9	0.0	22.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	14.9	10.0	17.3	23.9	0.0	22.7	0.1
Queue Length 50th (m)	1.0	40.3	0.1	70.0	10.1	0.0	2.9	0.0
Queue Length 95th (m)	3.6	63.9	0.8	107.1	23.3	0.0	7.7	0.0
Internal Link Dist (m)		130.7		792.0		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	361	2711	468	2733	486	689	973	597
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.36	0.00	0.54	0.15	0.01	0.05	0.02

Intersection Summary

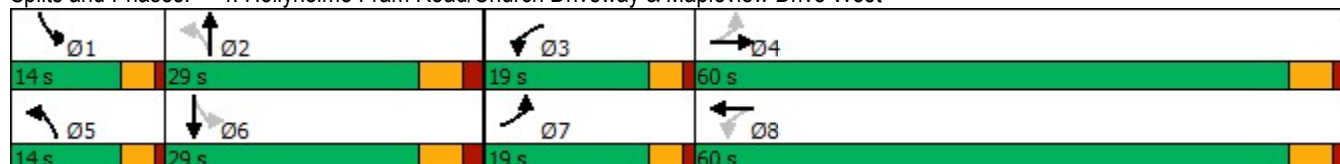
Cycle Length: 122

Actuated Cycle Length: 101.5

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Total (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	911	22	1	1354	70	72	0	6	42	0	12
Future Volume (vph)	11	911	22	1	1354	70	72	0	6	42	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5063		1805	5095		1805	1615		3502	1583	
Flt Permitted	0.11	1.00		0.25	1.00		0.67	1.00		0.75	1.00	
Satd. Flow (perm)	218	5063		469	5095		1279	1615		2779	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	11	949	23	1	1410	73	75	0	6	44	0	12
RTOR Reduction (vph)	0	2	0	0	4	0	0	4	0	0	10	0
Lane Group Flow (vph)	11	970	0	1	1479	0	75	2	0	44	3	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	0%	2%	6%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		33.5	26.7		28.1	24.0	
Effective Green, g (s)	55.5	54.3		55.5	54.3		33.5	26.7		28.1	24.0	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.32	0.25		0.26	0.23	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	131	2586		259	2602		436	405		762	357	
v/s Ratio Prot	c0.00	0.19		0.00	c0.29		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.04			0.00			c0.04			0.01		
v/c Ratio	0.08	0.38		0.00	0.57		0.17	0.00		0.06	0.01	
Uniform Delay, d1	13.5	15.7		12.4	17.9		26.0	29.8		29.1	31.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.0	0.3		0.2	0.0		0.0	0.0	
Delay (s)	13.8	15.8		12.4	18.2		26.2	29.8		29.2	32.0	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		15.8			18.2			26.5			29.8	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			17.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			106.3			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Total (2026) PM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		 		 
Traffic Volume (vph)	174	884	188	1126	178	288	276	269
Future Volume (vph)	174	884	188	1126	178	288	276	269
Lane Group Flow (vph)	185	1055	200	1630	189	526	294	420
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	22.0	32.0
Total Split (s)	14.0	43.0	23.0	52.0	19.0	32.0	22.0	35.0
Total Split (%)	11.7%	35.8%	19.2%	43.3%	15.8%	26.7%	18.3%	29.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.81	0.54	0.61	0.80	0.52	0.78	0.83	0.55
Control Delay	52.5	29.1	22.1	32.1	29.9	41.6	47.6	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	29.1	22.1	32.1	29.9	41.6	47.6	36.9
Queue Length 50th (m)	24.6	66.7	22.4	114.1	30.1	46.2	50.0	39.7
Queue Length 95th (m)	#75.6	98.5	40.7	149.3	47.7	65.6	#94.6	56.9
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	228	1947	419	2028	396	876	356	909
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.54	0.48	0.80	0.48	0.60	0.83	0.46

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 113

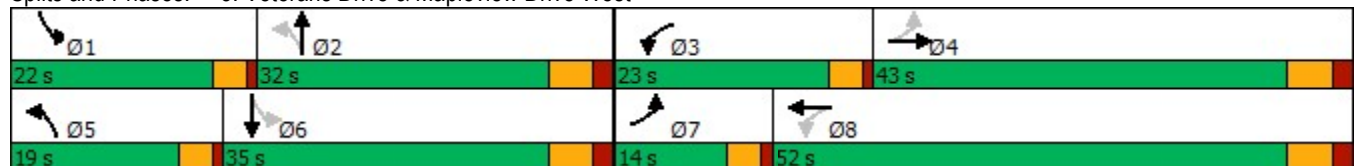
Natural Cycle: 105

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	174	884	108	188	1126	406	178	288	207	276	269	126
Future Volume (vph)	174	884	108	188	1126	406	178	288	207	276	269	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5031		1769	4850		1768	3345		1787	3365	
Flt Permitted	0.09	1.00		0.17	1.00		0.47	1.00		0.17	1.00	
Satd. Flow (perm)	173	5031		319	4850		875	3345		329	3365	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	185	940	115	200	1198	432	189	306	220	294	286	134
RTOR Reduction (vph)	0	11	0	0	52	0	0	115	0	0	48	0
Lane Group Flow (vph)	185	1044	0	200	1578	0	189	411	0	294	372	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.5	43.5		58.7	46.1		31.8	18.9		40.9	24.0	
Effective Green, g (s)	53.5	43.5		58.7	46.1		31.8	18.9		40.9	24.0	
Actuated g/C Ratio	0.47	0.38		0.52	0.41		0.28	0.17		0.36	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	224	1936		327	1978		348	559		351	714	
v/s Ratio Prot	c0.07	0.21		c0.07	c0.33		0.06	0.12		c0.13	0.11	
v/s Ratio Perm	0.32			0.25			0.09			c0.17		
v/c Ratio	0.83	0.54		0.61	0.80		0.54	0.74		0.84	0.52	
Uniform Delay, d1	24.1	27.0		16.5	29.4		32.7	44.7		29.0	39.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	21.3	1.1		3.4	3.5		1.7	5.0		15.8	0.7	
Delay (s)	45.4	28.1		19.9	32.8		34.4	49.7		44.8	40.1	
Level of Service	D	C		B	C		C	D		D	D	
Approach Delay (s)		30.6			31.4			45.6			42.0	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM 2000 Control Delay	35.1			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	113.0			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	89.0%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

315 Maplevue Drive
18: East Access & Lexus Access

HCM Unsignalized Intersection Capacity Analysis

Total (2026) PM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						54
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1084			1622	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	0	0	0	0	0	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

315 Maplevue Drive
18: East Access & Lexus Access

HCM Unsignalized Intersection Capacity Analysis

Total (2026) AM Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						54
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1084			1622	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	0	0	0	0	0	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Total (2026) SAT (MID) Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	132	737	161	757	276	42	217	193	238	183	148
Future Volume (vph)	132	737	161	757	276	42	217	193	238	183	148
Lane Group Flow (vph)	139	797	169	797	291	44	228	203	251	193	156
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.55	0.82	0.67	0.80	0.46	0.12	0.39	0.32	0.46	0.23	0.19
Control Delay	25.4	40.6	32.2	39.7	5.8	26.7	29.5	5.5	19.1	17.9	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.4	40.6	32.2	39.7	5.8	26.7	29.5	5.5	19.1	17.9	3.5
Queue Length 50th (m)	16.4	77.5	20.4	77.7	0.0	6.4	36.5	0.0	30.0	23.6	0.0
Queue Length 95th (m)	28.7	100.2	#39.8	100.3	19.1	15.4	59.5	16.4	49.2	40.0	11.5
Internal Link Dist (m)		193.7		171.9			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	271	1118	260	1120	681	378	589	628	542	839	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.71	0.65	0.71	0.43	0.12	0.39	0.32	0.46	0.23	0.19

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 96.9

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
14 s	37 s	14 s	36 s
			
Ø6	Ø7	Ø8	
51 s	14 s	36 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	132	737	20	161	757	276	42	217	193	238	183	148
Future Volume (vph)	132	737	20	161	757	276	42	217	193	238	183	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1804	3596		1736	3610	1548	1801	1881	1563	1787	1845	1575
Flt Permitted	0.15	1.00		0.15	1.00	1.00	0.64	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)	290	3596		275	3610	1548	1206	1881	1563	936	1845	1575
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	139	776	21	169	797	291	44	228	203	251	193	156
RTOR Reduction (vph)	0	2	0	0	0	211	0	0	139	0	0	85
Lane Group Flow (vph)	139	795	0	169	797	80	44	228	64	251	193	71
Confl. Peds. (#/hr)	7					7	3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	1%	0%	1%	2%	1%	3%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	35.3	26.2		36.1	26.6	26.6	30.4	30.4	30.4	44.1	44.1	44.1
Effective Green, g (s)	35.3	26.2		36.1	26.6	26.6	30.4	30.4	30.4	44.1	44.1	44.1
Actuated g/C Ratio	0.36	0.27		0.37	0.27	0.27	0.31	0.31	0.31	0.46	0.46	0.46
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	248	973		245	992	425	378	590	490	511	840	717
v/s Ratio Prot	0.05	c0.22		c0.07	0.22			0.12		c0.05	0.10	
v/s Ratio Perm	0.15			0.19		0.05	0.04		0.04	c0.17		0.05
v/c Ratio	0.56	0.82		0.69	0.80	0.19	0.12	0.39	0.13	0.49	0.23	0.10
Uniform Delay, d1	22.6	33.1		22.8	32.7	26.8	23.6	25.9	23.7	17.0	16.0	15.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	5.4		7.9	4.8	0.2	0.6	1.9	0.5	0.7	0.6	0.3
Delay (s)	25.5	38.4		30.7	37.5	27.1	24.3	27.8	24.3	17.7	16.7	15.3
Level of Service	C	D		C	D	C	C	C	C	B	B	B
Approach Delay (s)		36.5			34.1			26.0			16.8	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			30.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			96.8			Sum of lost time (s)			21.0			
Intersection Capacity Utilization			99.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Total (2026) SAT (MID) Peak Hour

	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1102	96	0	1226	0	78	
Future Volume (Veh/h)	1102	96	0	1226	0	78	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1198	104	0	1333	0	85	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	196			130			
pX, platoon unblocked			0.86		0.93	0.86	
vC, conflicting volume			1302		1694	451	
vC1, stage 1 conf vol					1250		
vC2, stage 2 conf vol					444		
vCu, unblocked vol			764		455	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	91	
cM capacity (veh/h)			723		388	928	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	479	479	344	444	444	444	85
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	104	0	0	0	85
cSH	1700	1700	1700	1700	1700	1700	928
Volume to Capacity	0.28	0.28	0.20	0.26	0.26	0.26	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.4
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.3
Approach LOS							A
Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			34.9%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive 3: East Access & Maplevue Drive West

Queues
Total (2026) SAT (MID) Peak Hour

	→	↖	←	↗	↘
Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↖	↑↑↑	↖	↖
Traffic Volume (vph)	1151	227	1103	139	149
Future Volume (vph)	1151	227	1103	139	149
Lane Group Flow (vph)	1299	247	1199	151	162
Turn Type	NA	pm+pt	NA	Perm	Perm
Protected Phases	4	3	8		
Permitted Phases		8		2	2
Detector Phase	4	3	8	2	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	9.5	24.0	24.0	24.0
Total Split (s)	27.0	13.6	40.6	24.4	24.4
Total Split (%)	41.5%	20.9%	62.5%	37.5%	37.5%
Yellow Time (s)	4.0	3.5	4.0	4.0	4.0
All-Red Time (s)	2.0	1.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.5	6.0	6.0	6.0
Lead/Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes			
Recall Mode	None	None	None	Max	Max
v/c Ratio	0.81	0.68	0.45	0.30	0.28
Control Delay	24.6	19.8	10.1	20.2	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	19.8	10.1	20.2	5.1
Queue Length 50th (m)	53.6	14.6	31.1	14.9	0.0
Queue Length 95th (m)	69.8	#38.8	40.7	28.9	12.1
Internal Link Dist (m)	106.6		126.7	19.0	
Turn Bay Length (m)		1.0			
Base Capacity (vph)	1666	373	2750	509	571
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.78	0.66	0.44	0.30	0.28

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 64

Natural Cycle: 60

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: East Access & Maplevue Drive West

↖ Ø2	↖ Ø3	→ Ø4
24.4 s	13.6 s	27 s
	↖ Ø8	
	40.6 s	

315 Maplevue Drive
3: East Access & Maplevue Drive West

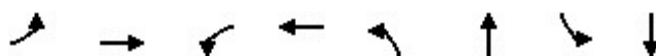
HCM Signalized Intersection Capacity Analysis
Total (2026) SAT (MID) Peak Hour

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑		↰	↑↑↑	↰	↰
Traffic Volume (vph)	1151	44	227	1103	139	149
Future Volume (vph)	1151	44	227	1103	139	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		4.5	6.0	6.0	6.0
Lane Util. Factor	0.91		1.00	0.91	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	5057		1770	5085	1770	1583
Flt Permitted	1.00		0.16	1.00	0.95	1.00
Satd. Flow (perm)	5057		299	5085	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1251	48	247	1199	151	162
RTOR Reduction (vph)	6	0	0	0	0	115
Lane Group Flow (vph)	1293	0	247	1199	151	47
Turn Type	NA		pm+pt	NA	Perm	Perm
Protected Phases	4		3	8		
Permitted Phases			8		2	2
Actuated Green, G (s)	20.4		33.6	33.6	18.4	18.4
Effective Green, g (s)	20.4		33.6	33.6	18.4	18.4
Actuated g/C Ratio	0.32		0.53	0.53	0.29	0.29
Clearance Time (s)	6.0		4.5	6.0	6.0	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1611		356	2669	508	455
v/s Ratio Prot	c0.26		c0.09	0.24		
v/s Ratio Perm			0.27		c0.09	0.03
v/c Ratio	0.80		0.69	0.45	0.30	0.10
Uniform Delay, d1	20.0		10.8	9.4	17.8	16.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0		5.8	0.1	1.5	0.5
Delay (s)	22.9		16.6	9.6	19.3	17.2
Level of Service	C		B	A	B	B
Approach Delay (s)	22.9			10.8	18.2	
Approach LOS	C			B	B	
Intersection Summary						
HCM 2000 Control Delay			16.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.59			
Actuated Cycle Length (s)			64.0		Sum of lost time (s)	16.5
Intersection Capacity Utilization			57.2%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						

315 Maplevue Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Total (2026) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	12	1233	1	1213	71	0	47	0
Future Volume (vph)	12	1233	1	1213	71	0	47	0
Lane Group Flow (vph)	13	1310	1	1334	74	11	49	13
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.05	0.48	0.00	0.49	0.17	0.02	0.06	0.02
Control Delay	10.7	16.5	10.0	16.5	24.2	0.1	22.7	0.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	16.9	10.0	16.5	24.2	0.1	22.7	0.1
Queue Length 50th (m)	1.2	59.5	0.1	60.7	10.0	0.0	3.2	0.0
Queue Length 95th (m)	3.8	91.4	0.8	93.3	23.3	0.0	8.4	0.0
Internal Link Dist (m)		126.7		795.9		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	386	2739	391	2728	446	638	969	611
Starvation Cap Reductn	0	792	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.67	0.00	0.49	0.17	0.02	0.05	0.02

Intersection Summary

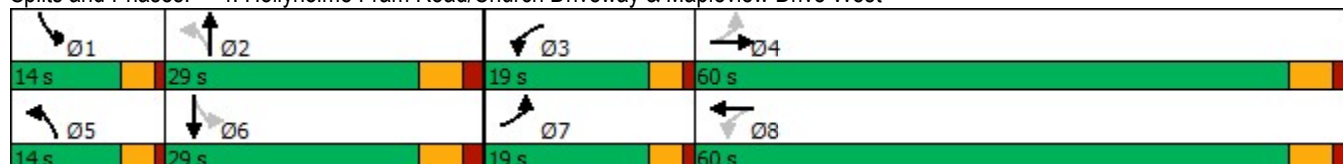
Cycle Length: 122

Actuated Cycle Length: 101.6

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Total (2026) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	1233	25	1	1213	67	71	0	11	47	0	12
Future Volume (vph)	12	1233	25	1	1213	67	71	0	11	47	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5119		1805	5092		1612	1615		3502	1615	
Flt Permitted	0.15	1.00		0.15	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	279	5119		289	5092		1198	1615		2766	1615	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	12	1284	26	1	1264	70	74	0	11	49	0	12
RTOR Reduction (vph)	0	1	0	0	4	0	0	8	0	0	10	0
Lane Group Flow (vph)	13	1309	0	1	1330	0	74	3	0	49	3	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	12%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		31.5	24.5		28.7	23.1	
Effective Green, g (s)	55.5	54.3		55.5	54.3		31.5	24.5		28.7	23.1	
Actuated g/C Ratio	0.53	0.51		0.53	0.51		0.30	0.23		0.27	0.22	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	163	2632		169	2618		384	374		790	353	
v/s Ratio Prot	c0.00	0.26		0.00	c0.26		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.04			0.00			c0.04			0.01		
v/c Ratio	0.08	0.50		0.01	0.51		0.19	0.01		0.06	0.01	
Uniform Delay, d1	12.8	16.7		12.7	16.9		27.3	31.2		28.4	32.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.0	0.2		0.2	0.0		0.0	0.0	
Delay (s)	13.0	16.9		12.7	17.0		27.5	31.2		28.4	32.3	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		16.9			17.0			28.0			29.2	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	105.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Total (2026) SAT (MID) Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	122	1257	205	1052	138	265	426	191
Future Volume (vph)	122	1257	205	1052	138	265	426	191
Lane Group Flow (vph)	126	1424	211	1523	142	373	439	300
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.52	1.00	0.73	0.98	0.29	0.37	0.87	0.26
Control Delay	26.0	61.8	37.4	53.5	18.8	28.8	41.3	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	61.8	37.4	53.5	18.8	28.8	41.3	20.9
Queue Length 50th (m)	16.0	~115.0	28.2	115.7	17.6	30.5	66.2	18.2
Queue Length 95th (m)	27.8	#155.0	53.9	#160.7	31.0	45.4	#99.4	31.8
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	325	1430	323	1558	561	996	507	1133
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	1.00	0.65	0.98	0.25	0.37	0.87	0.26

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 107.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2026) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	1257	124	205	1052	425	138	265	97	426	191	100
Future Volume (vph)	122	1257	124	205	1052	425	138	265	97	426	191	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5097		1805	4914		1769	3456		1805	3363	
Flt Permitted	0.13	1.00		0.12	1.00		0.57	1.00		0.41	1.00	
Satd. Flow (perm)	252	5097		232	4914		1059	3456		784	3363	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	126	1296	128	211	1085	438	142	273	100	439	197	103
RTOR Reduction (vph)	0	11	0	0	63	0	0	34	0	0	57	0
Lane Group Flow (vph)	126	1413	0	211	1460	0	142	339	0	439	243	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.1	30.1		45.5	32.8		40.5	30.0		49.0	34.5	
Effective Green, g (s)	40.1	30.1		45.5	32.8		40.5	30.0		49.0	34.5	
Actuated g/C Ratio	0.37	0.28		0.42	0.30		0.38	0.28		0.45	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	237	1423		283	1495		467	961		498	1076	
v/s Ratio Prot	0.05	0.28		c0.09	c0.30		0.03	0.10		c0.12	0.07	
v/s Ratio Perm	0.15			0.23			0.08			c0.28		
v/c Ratio	0.53	0.99		0.75	0.98		0.30	0.35		0.88	0.23	
Uniform Delay, d1	26.0	38.7		24.6	37.1		22.8	31.1		23.5	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	22.1		10.2	17.7		0.4	1.0		16.6	0.5	
Delay (s)	28.3	60.8		34.8	54.9		23.2	32.1		40.0	27.3	
Level of Service	C	E		C	D		C	C		D	C	
Approach Delay (s)		58.2			52.4			29.7			34.9	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			49.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			107.8			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			89.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive
18: East Access & Lexus Access

HCM Unsignalized Intersection Capacity Analysis

Total (2026) SAT (MID) Peak Hour

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh						
Upstream signal (m)						43
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1084			1622	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	0	0	0	0	0	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	0	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	0.0	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service		A
Analysis Period (min)			15			

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Total (2031) AM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	189	879	110	320	134	37	161	170	158	206	199
Future Volume (vph)	189	879	110	320	134	37	161	170	158	206	199
Lane Group Flow (vph)	201	971	117	340	143	39	171	181	168	219	212
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.44	0.93	0.52	0.34	0.27	0.12	0.31	0.31	0.30	0.28	0.27
Control Delay	20.7	49.8	25.1	29.0	6.0	27.1	29.0	5.7	17.4	19.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	49.8	25.1	29.0	6.0	27.1	29.0	5.7	17.4	19.1	3.4
Queue Length 50th (m)	24.7	100.6	13.7	28.6	0.0	5.8	27.2	0.0	19.7	28.1	0.0
Queue Length 95th (m)	40.4	#141.6	24.9	41.3	14.0	14.2	45.8	15.7	33.6	45.5	13.2
Internal Link Dist (m)		193.7		172.5			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	466	1069	243	1038	556	330	547	580	557	793	778
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.91	0.48	0.33	0.26	0.12	0.31	0.31	0.30	0.28	0.27

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 99.4

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Mapleview Drive West

 Ø1	 Ø2	 Ø3	 Ø4
14 s	37 s	14 s	36 s
 Ø5	 Ø6	 Ø7	 Ø8
51 s	14 s	36 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	879	34	110	320	134	37	161	170	158	206	199
Future Volume (vph)	189	879	34	110	320	134	37	161	170	158	206	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1749	3532		1671	3438	1511	1640	1776	1476	1718	1792	1490
Flt Permitted	0.50	1.00		0.14	1.00	1.00	0.62	1.00	1.00	0.57	1.00	1.00
Satd. Flow (perm)	922	3532		245	3438	1511	1072	1776	1476	1031	1792	1490
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	201	935	36	117	340	143	39	171	181	168	219	212
RTOR Reduction (vph)	0	3	0	0	0	102	0	0	125	0	0	118
Lane Group Flow (vph)	201	968	0	117	340	41	39	171	56	168	219	94
Confl. Peds. (#/hr)	4		3	3		4	1		1	1		1
Heavy Vehicles (%)	3%	1%	16%	8%	5%	4%	10%	7%	8%	5%	6%	7%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	39.1	29.4		37.7	28.7	28.7	30.6	30.6	30.6	44.0	44.0	44.0
Effective Green, g (s)	39.1	29.4		37.7	28.7	28.7	30.6	30.6	30.6	44.0	44.0	44.0
Actuated g/C Ratio	0.39	0.30		0.38	0.29	0.29	0.31	0.31	0.31	0.44	0.44	0.44
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	443	1044		222	992	436	330	546	454	521	793	659
v/s Ratio Prot	0.04	c0.27		c0.05	0.10			0.10		c0.03	0.12	
v/s Ratio Perm	0.13			0.15		0.03	0.04		0.04	c0.11		0.06
v/c Ratio	0.45	0.93		0.53	0.34	0.09	0.12	0.31	0.12	0.32	0.28	0.14
Uniform Delay, d1	20.7	34.0		23.1	27.9	25.9	24.7	26.4	24.7	17.2	17.6	16.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	13.6		2.3	0.2	0.1	0.7	1.5	0.6	0.4	0.9	0.5
Delay (s)	21.4	47.5		25.4	28.1	25.9	25.4	27.8	25.3	17.6	18.5	16.9
Level of Service	C	D		C	C	C	C	C	C	B	B	B
Approach Delay (s)		43.1			27.1			26.4			17.7	
Approach LOS		D			C			C			B	

Intersection Summary

HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis

Total (2031) AM Peak Hour

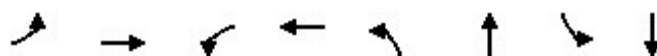
	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	1252	42	0	602	0	22	
Future Volume (Veh/h)	1252	42	0	602	0	22	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1361	46	0	654	0	24	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	197			130			
pX, platoon unblocked			0.80		0.82	0.80	
vC, conflicting volume			1407		1602	477	
vC1, stage 1 conf vol					1384		
vC2, stage 2 conf vol					218		
vCu, unblocked vol			647		680	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	97	
cM capacity (veh/h)			750		390	870	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	544	544	318	218	218	218	24
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	46	0	0	0	24
cSH	1700	1700	1700	1700	1700	1700	870
Volume to Capacity	0.32	0.32	0.19	0.13	0.13	0.13	0.03
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.3
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.3
Approach LOS							A
Intersection Summary							
Average Delay			0.1				
Intersection Capacity Utilization			35.1%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive

3: East Access /364 MVD-West Access & Maplevue Drive West

Queues

Total (2031) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰↰↰	↰	↰↰↰	↰	↰	↰	↰
Traffic Volume (vph)	9	1252	65	498	34	0	55	0
Future Volume (vph)	9	1252	65	498	34	0	55	0
Lane Group Flow (vph)	10	1390	71	573	37	38	60	84
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	24.4	24.4
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.04	0.79	0.22	0.25	0.09	0.05	0.13	0.12
Control Delay	15.0	21.8	8.8	8.8	17.0	0.1	17.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	21.8	8.8	8.8	17.0	0.1	17.4	0.3
Queue Length 50th (m)	0.8	55.3	3.8	12.3	3.2	0.0	5.3	0.0
Queue Length 95th (m)	3.8	74.4	8.8	17.8	9.6	0.0	13.7	0.0
Internal Link Dist (m)		106.1		124.9		30.4		80.2
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	296	1894	385	3109	427	740	445	713
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.73	0.18	0.18	0.09	0.05	0.13	0.12

Intersection Summary

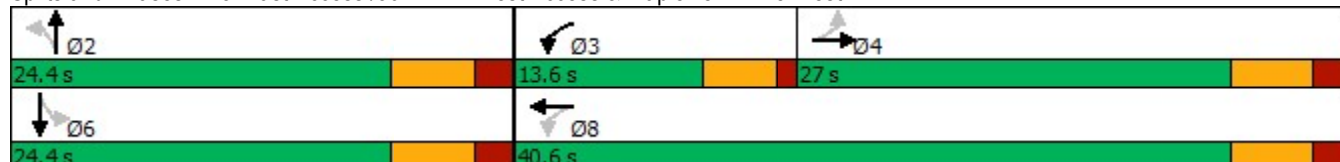
Cycle Length: 65

Actuated Cycle Length: 57.3

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

3: East Access /364 MVD-West Access & Maplevue Drive West

Total (2031) AM Peak Hour

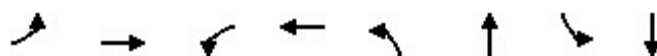
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  						 	
Traffic Volume (vph)	9	1252	27	65	498	29	34	0	35	55	0	77
Future Volume (vph)	9	1252	27	65	498	29	34	0	35	55	0	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5069		1770	5043		1770	1583		1770	1583	
Flt Permitted	0.43	1.00		0.16	1.00		0.70	1.00		0.73	1.00	
Satd. Flow (perm)	793	5069		305	5043		1308	1583		1364	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	1361	29	71	541	32	37	0	38	60	0	84
RTOR Reduction (vph)	0	3	0	0	11	0	0	26	0	0	57	0
Lane Group Flow (vph)	10	1387	0	71	562	0	37	12	0	60	27	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.9	19.9		28.4	28.4		18.7	18.7		18.7	18.7	
Effective Green, g (s)	19.9	19.9		28.4	28.4		18.7	18.7		18.7	18.7	
Actuated g/C Ratio	0.34	0.34		0.48	0.48		0.32	0.32		0.32	0.32	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	1706		245	2423		413	500		431	500	
v/s Ratio Prot		c0.27		0.02	c0.11			0.01			0.02	
v/s Ratio Perm	0.01			0.12			0.03			c0.04		
v/c Ratio	0.04	0.81		0.29	0.23		0.09	0.02		0.14	0.05	
Uniform Delay, d1	13.2	17.9		10.1	9.0		14.2	13.9		14.4	14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.1		0.7	0.0		0.4	0.1		0.1	0.0	
Delay (s)	13.2	21.0		10.8	9.0		14.6	14.0		14.6	14.1	
Level of Service	B	C		B	A		B	B		B	B	
Approach Delay (s)		20.9			9.2			14.3			14.3	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.0			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			59.1			Sum of lost time (s)			16.5			
Intersection Capacity Utilization			52.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West

Queues

Total (2031) AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	7	1293	6	553	11	0	77	0
Future Volume (vph)	7	1293	6	553	11	0	77	0
Lane Group Flow (vph)	8	1555	7	676	13	11	89	17
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.02	0.57	0.03	0.26	0.03	0.02	0.10	0.02
Control Delay	9.7	17.3	10.0	13.4	23.3	0.1	23.1	0.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	17.9	10.0	13.4	23.3	0.1	23.1	0.1
Queue Length 50th (m)	0.7	72.9	0.6	25.2	1.7	0.0	6.0	0.0
Queue Length 95th (m)	2.7	107.1	2.5	40.6	6.3	0.0	12.7	0.0
Internal Link Dist (m)		124.9		797.8		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	569	2731	353	2607	503	514	920	798
Starvation Cap Reductn	0	717	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.77	0.02	0.26	0.03	0.02	0.10	0.02

Intersection Summary

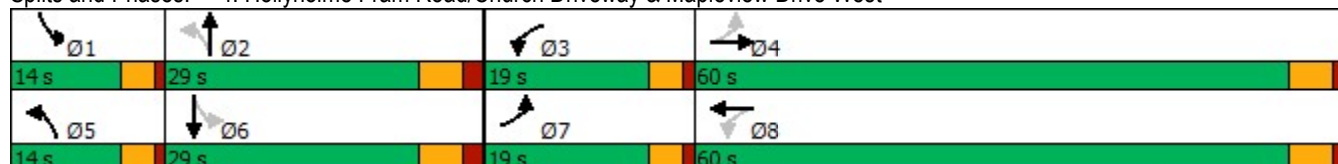
Cycle Length: 122

Actuated Cycle Length: 100.5

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Mapleview Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Total (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	1293	60	6	553	35	11	0	10	77	0	15
Future Volume (vph)	7	1293	60	6	553	35	11	0	10	77	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5051		1805	4817		1805	1242		3502	1615	
Flt Permitted	0.37	1.00		0.10	1.00		0.75	1.00		0.65	1.00	
Satd. Flow (perm)	696	5051		192	4817		1418	1242		2392	1615	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	8	1486	69	7	636	40	13	0	11	89	0	17
RTOR Reduction (vph)	0	3	0	0	5	0	0	8	0	0	12	0
Lane Group Flow (vph)	8	1552	0	7	671	0	13	3	0	89	5	0
Confl. Peds. (#/hr)	1					1						
Heavy Vehicles (%)	0%	2%	2%	0%	7%	0%	0%	0%	30%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.5	54.3		55.5	54.3		26.9	25.6		35.5	30.2	
Effective Green, g (s)	55.5	54.3		55.5	54.3		26.9	25.6		35.5	30.2	
Actuated g/C Ratio	0.52	0.51		0.52	0.51		0.25	0.24		0.33	0.28	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	373	2563		117	2444		361	297		854	455	
v/s Ratio Prot	0.00	c0.31		c0.00	0.14		0.00	0.00		c0.01	0.00	
v/s Ratio Perm	0.01			0.03			0.01			c0.03		
v/c Ratio	0.02	0.61		0.06	0.27		0.04	0.01		0.10	0.01	
Uniform Delay, d1	12.5	18.7		14.1	15.1		30.2	31.0		24.6	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4		0.2	0.1		0.0	0.1		0.1	0.0	
Delay (s)	12.5	19.1		14.3	15.1		30.2	31.1		24.6	27.7	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		19.1			15.1			30.6			25.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay	18.3			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	107.0			Sum of lost time (s)			20.0					
Intersection Capacity Utilization	63.9%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Total (2031) AM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		 		 
Traffic Volume (vph)	90	1018	252	597	62	115	282	272
Future Volume (vph)	90	1018	252	597	62	115	282	272
Lane Group Flow (vph)	95	1194	265	757	65	263	297	368
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	19.0	36.0	19.0	36.0	19.0	36.0	19.0	36.0
Total Split (%)	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%	17.3%	32.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.29	0.88	0.90	0.45	0.17	0.28	0.55	0.31
Control Delay	19.6	45.8	60.6	28.0	18.2	15.0	23.5	25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	45.8	60.6	28.0	18.2	15.0	23.5	25.2
Queue Length 50th (m)	11.9	93.6	42.9	46.8	8.0	10.9	42.1	29.2
Queue Length 95th (m)	21.9	#114.6	#92.3	61.9	16.3	21.8	63.6	43.7
Internal Link Dist (m)		797.8		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	426	1363	298	1696	478	933	546	1193
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.88	0.89	0.45	0.14	0.28	0.54	0.31

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 109

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West

			
Ø1	Ø2	Ø3	Ø4
19 s	36 s	19 s	36 s
			
Ø5	Ø6	Ø7	Ø8
19 s	36 s	19 s	36 s

315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	90	1018	116	252	597	123	62	115	135	282	272	78
Future Volume (vph)	90	1018	116	252	597	123	62	115	135	282	272	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.92		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1735	4907		1687	4810		1581	3015		1752	3332	
Flt Permitted	0.35	1.00		0.11	1.00		0.53	1.00		0.51	1.00	
Satd. Flow (perm)	639	4907		204	4810		886	3015		942	3332	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	1072	122	265	628	129	65	121	142	297	286	82
RTOR Reduction (vph)	0	12	0	0	26	0	0	102	0	0	22	0
Lane Group Flow (vph)	95	1182	0	265	731	0	65	161	0	297	346	0
Confl. Peds. (#/hr)	2		6	6		2	4		1	1		4
Heavy Vehicles (%)	4%	4%	3%	7%	5%	4%	14%	6%	12%	3%	5%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.5	30.9		49.5	37.9		37.6	30.8		49.1	38.3	
Effective Green, g (s)	38.5	30.9		49.5	37.9		37.6	30.8		49.1	38.3	
Actuated g/C Ratio	0.35	0.28		0.45	0.34		0.34	0.28		0.44	0.35	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	1370		287	1648		343	839		522	1153	
v/s Ratio Prot	0.02	0.24		c0.12	0.15		0.01	0.05		c0.07	0.10	
v/s Ratio Perm	0.09			c0.29			0.05			c0.18		
v/c Ratio	0.32	0.86		0.92	0.44		0.19	0.19		0.57	0.30	
Uniform Delay, d1	24.9	37.8		29.5	28.2		25.1	30.4		20.7	26.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	5.8		33.4	0.2		0.3	0.5		1.4	0.7	
Delay (s)	25.5	43.7		63.0	28.4		25.4	30.9		22.2	27.0	
Level of Service	C	D		E	C		C	C		C	C	
Approach Delay (s)		42.3			37.3			29.8			24.9	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			36.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			110.6			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			92.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive

1: Essa Road & Maplevue Drive West

Queues
Total (2031) PM Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	215	672	160	1092	370	102	253	124	169	191	305
Future Volume (vph)	215	672	160	1092	370	102	253	124	169	191	305
Lane Group Flow (vph)	234	745	174	1187	402	111	275	135	184	208	332
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	13.5	37.0	16.0	39.5	39.5	37.0	37.0	37.0	11.0	48.0	48.0
Total Split (%)	13.4%	36.6%	15.8%	39.1%	39.1%	36.6%	36.6%	36.6%	10.9%	47.5%	47.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.95	0.65	0.54	1.00	0.52	0.34	0.50	0.25	0.47	0.27	0.42
Control Delay	70.9	32.8	21.5	61.1	6.2	31.4	33.2	7.9	22.7	21.3	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	32.8	21.5	61.1	6.2	31.4	33.2	7.9	22.7	21.3	6.7
Queue Length 50th (m)	31.1	69.3	19.8	~128.2	3.5	17.8	46.7	2.3	23.4	28.1	8.8
Queue Length 95th (m)	#80.7	91.6	33.2	#177.1	26.3	33.8	72.4	16.3	38.8	45.4	28.6
Internal Link Dist (m)		193.7		170.8			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	246	1146	350	1185	769	328	548	544	393	763	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.65	0.50	1.00	0.52	0.34	0.50	0.25	0.47	0.27	0.42

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 101

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

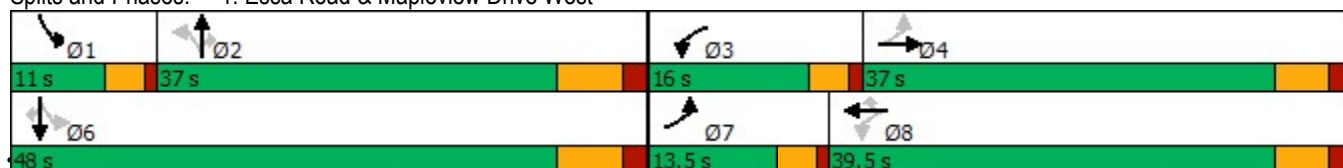
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Maplevue Drive West



315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	672	14	160	1092	370	102	253	124	169	191	305
Future Volume (vph)	215	672	14	160	1092	370	102	253	124	169	191	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3558		1769	3574	1559	1671	1845	1553	1703	1881	1583
Flt Permitted	0.12	1.00		0.21	1.00	1.00	0.63	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	232	3558		398	3574	1559	1104	1845	1553	753	1881	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	234	730	15	174	1187	402	111	275	135	184	208	332
RTOR Reduction (vph)	0	1	0	0	0	252	0	0	84	0	0	156
Lane Group Flow (vph)	234	744	0	174	1187	150	111	275	51	184	208	176
Confl. Peds. (#/hr)	3		3	3		3						
Heavy Vehicles (%)	1%	1%	6%	2%	1%	1%	8%	3%	4%	6%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	42.0	32.5		44.0	33.5	33.5	30.0	30.0	30.0	41.0	41.0	41.0
Effective Green, g (s)	42.0	32.5		44.0	33.5	33.5	30.0	30.0	30.0	41.0	41.0	41.0
Actuated g/C Ratio	0.42	0.32		0.44	0.33	0.33	0.30	0.30	0.30	0.41	0.41	0.41
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	242	1144		315	1185	517	327	548	461	371	763	642
v/s Ratio Prot	c0.09	0.21		0.06	c0.33			0.15		c0.03	0.11	
v/s Ratio Perm	0.31			0.18		0.10	0.10		0.03	c0.17		0.11
v/c Ratio	0.97	0.65		0.55	1.00	0.29	0.34	0.50	0.11	0.50	0.27	0.27
Uniform Delay, d1	24.7	29.4		19.2	33.8	25.0	27.8	29.3	25.8	20.8	20.0	20.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.1	1.3		2.1	26.5	0.3	2.8	3.3	0.5	1.0	0.9	1.1
Delay (s)	72.8	30.7		21.2	60.3	25.3	30.6	32.6	26.3	21.9	20.9	21.1
Level of Service	E	C		C	E	C	C	C	C	C	C	C
Approach Delay (s)		40.8			48.5			30.5			21.3	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	39.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	112.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Total (2031) PM Peak Hour

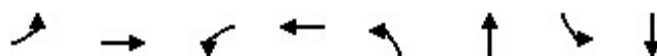
	→	↘	↙	←	↖	↗	
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑			↑↑↑		↗	
Traffic Volume (veh/h)	937	60	0	1570	0	45	
Future Volume (Veh/h)	937	60	0	1570	0	45	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1018	65	0	1707	0	49	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	195			132			
pX, platoon unblocked			0.88		0.83	0.88	
vC, conflicting volume			1083		1620	372	
vC1, stage 1 conf vol					1050		
vC2, stage 2 conf vol					569		
vCu, unblocked vol			627		91	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	95	
cM capacity (veh/h)			839		772	957	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	407	407	269	569	569	569	49
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	65	0	0	0	49
cSH	1700	1700	1700	1700	1700	1700	957
Volume to Capacity	0.24	0.24	0.16	0.33	0.33	0.33	0.05
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	1.3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.0
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.0
Approach LOS							A
Intersection Summary							
Average Delay			0.2				
Intersection Capacity Utilization			33.7%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive

3: East Access /364 MVD-West Access & Maplevue Drive West

Queues

Total (2031) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↰↰↰	↰	↰↰↰	↰	↰	↰	↰
Traffic Volume (vph)	27	938	150	1411	104	0	58	0
Future Volume (vph)	27	938	150	1411	104	0	58	0
Lane Group Flow (vph)	29	1047	163	1605	113	100	63	75
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	24.4	24.4
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.23	0.64	0.46	0.65	0.28	0.14	0.16	0.13
Control Delay	22.1	20.0	11.8	12.5	20.1	0.4	18.5	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.1	20.0	11.8	12.5	20.1	0.4	18.5	1.9
Queue Length 50th (m)	2.6	39.8	9.2	46.1	10.5	0.0	5.6	0.0
Queue Length 95th (m)	9.4	53.7	17.4	59.0	23.7	0.0	14.7	3.4
Internal Link Dist (m)		107.7		130.7		30.4		80.2
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	135	1793	383	2946	408	724	398	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.58	0.43	0.54	0.28	0.14	0.16	0.13

Intersection Summary

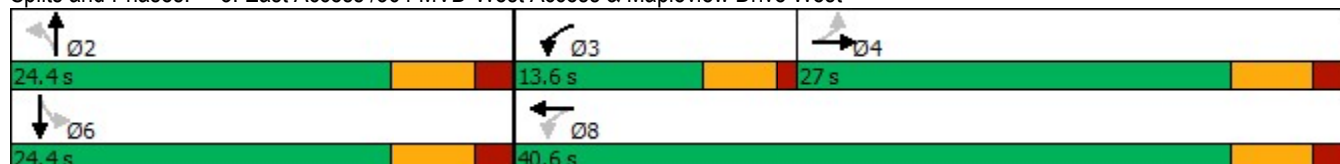
Cycle Length: 65

Actuated Cycle Length: 60.1

Natural Cycle: 60

Control Type: Semi Act-Uncoord

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

3: East Access /364 MVD-West Access & Maplevue Drive West

Total (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (vph)	27	938	25	150	1411	65	104	0	92	58	0	69
Future Volume (vph)	27	938	25	150	1411	65	104	0	92	58	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5066		1770	5052		1770	1583		1770	1583	
Flt Permitted	0.21	1.00		0.17	1.00		0.71	1.00		0.69	1.00	
Satd. Flow (perm)	384	5066		312	5052		1319	1583		1290	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	1020	27	163	1534	71	113	0	100	63	0	75
RTOR Reduction (vph)	0	4	0	0	8	0	0	70	0	0	52	0
Lane Group Flow (vph)	29	1043	0	163	1597	0	113	30	0	63	23	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.4	19.4		30.4	30.4		18.6	18.6		18.6	18.6	
Effective Green, g (s)	19.4	19.4		30.4	30.4		18.6	18.6		18.6	18.6	
Actuated g/C Ratio	0.32	0.32		0.50	0.50		0.30	0.30		0.30	0.30	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	122	1611		310	2517		402	482		393	482	
v/s Ratio Prot		0.21		0.06	c0.32			0.02			0.01	
v/s Ratio Perm	0.08			0.21			c0.09			0.05		
v/c Ratio	0.24	0.65		0.53	0.63		0.28	0.06		0.16	0.05	
Uniform Delay, d1	15.3	17.9		9.6	11.2		16.1	15.0		15.5	15.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	0.9		1.6	0.5		1.7	0.3		0.2	0.0	
Delay (s)	16.4	18.8		11.2	11.8		17.9	15.3		15.7	15.0	
Level of Service	B	B		B	B		B	B		B	B	
Approach Delay (s)		18.7			11.7			16.6			15.3	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
Analysis Period (min)	15		

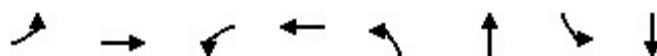
c Critical Lane Group

315 Maplevue Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Total (2031) PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	29	1035	1	1531	72	0	70	0
Future Volume (vph)	29	1035	1	1531	72	0	70	0
Lane Group Flow (vph)	30	1103	1	1705	75	6	73	24
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.15	0.39	0.00	0.65	0.16	0.01	0.08	0.04
Control Delay	11.6	14.9	10.0	21.6	26.4	0.0	25.2	0.1
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	15.2	10.0	21.6	26.4	0.0	25.2	0.1
Queue Length 50th (m)	2.7	47.8	0.1	109.5	12.0	0.0	5.8	0.0
Queue Length 95th (m)	7.0	74.2	0.8	130.7	23.4	0.0	11.3	0.0
Internal Link Dist (m)		130.7		792.0		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	321	2804	444	2616	476	625	932	584
Starvation Cap Reductn	0	943	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.59	0.00	0.65	0.16	0.01	0.08	0.04

Intersection Summary

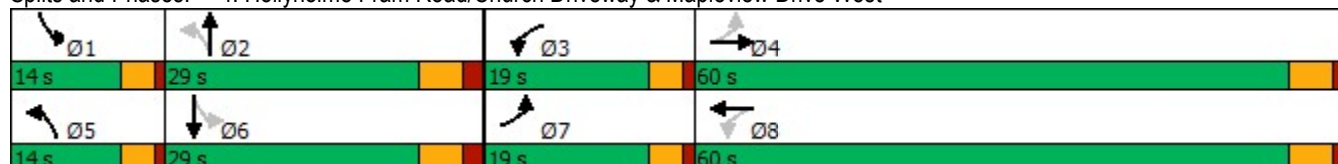
Cycle Length: 122

Actuated Cycle Length: 106.1

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West

Total (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1035	24	1	1531	106	72	0	6	70	0	23
Future Volume (vph)	29	1035	24	1	1531	106	72	0	6	70	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5064		1805	5082		1805	1615		3502	1583	
Flt Permitted	0.07	1.00		0.22	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	140	5064		416	5082		1346	1615		2779	1583	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	30	1078	25	1	1595	110	75	0	6	73	0	24
RTOR Reduction (vph)	0	1	0	0	5	0	0	5	0	0	19	0
Lane Group Flow (vph)	30	1102	0	1	1700	0	75	1	0	73	5	0
Confl. Peds. (#/hr)	2					2						
Heavy Vehicles (%)	0%	2%	6%	0%	1%	0%	0%	0%	0%	0%	0%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	62.7	58.7		57.3	56.0		31.3	24.4		29.1	23.3	
Effective Green, g (s)	62.7	58.7		57.3	56.0		31.3	24.4		29.1	23.3	
Actuated g/C Ratio	0.57	0.53		0.52	0.51		0.28	0.22		0.26	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	140	2697		232	2582		411	357		771	334	
v/s Ratio Prot	c0.01	0.22		0.00	c0.33		c0.01	0.00		0.00	0.00	
v/s Ratio Perm	0.11			0.00			c0.04			0.02		
v/c Ratio	0.21	0.41		0.00	0.66		0.18	0.00		0.09	0.02	
Uniform Delay, d1	13.8	15.4		12.9	20.0		29.5	33.4		30.5	34.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.1		0.0	0.6		0.2	0.0		0.1	0.1	
Delay (s)	14.5	15.5		12.9	20.6		29.7	33.4		30.5	34.5	
Level of Service	B	B		B	C		C	C		C	C	
Approach Delay (s)		15.5			20.6			30.0			31.5	
Approach LOS		B			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			19.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			110.2			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			65.7%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

315 Maplevue Drive 5: Veterans Drive & Maplevue Drive West

Queues
Total (2031) PM Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		  		  
Traffic Volume (vph)	187	1024	209	1298	210	319	305	298
Future Volume (vph)	187	1024	209	1298	210	319	305	298
Lane Group Flow (vph)	199	1226	222	1859	223	582	324	462
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	22.0	32.0
Total Split (s)	14.0	43.0	23.0	52.0	19.0	32.0	22.0	35.0
Total Split (%)	11.7%	35.8%	19.2%	43.3%	15.8%	26.7%	18.3%	29.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.89	0.66	0.74	0.93	0.62	0.82	0.93	0.60
Control Delay	65.3	33.4	35.2	41.2	33.1	44.1	63.3	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.3	33.4	35.2	41.2	33.1	44.1	63.3	38.6
Queue Length 50th (m)	29.8	87.5	28.2	146.7	36.3	54.0	58.5	46.0
Queue Length 95th (m)	#83.0	118.3	58.2	#196.6	56.0	74.8	#115.6	63.4
Internal Link Dist (m)		792.0		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	224	1846	371	1999	377	866	350	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.66	0.60	0.93	0.59	0.67	0.93	0.52

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.7

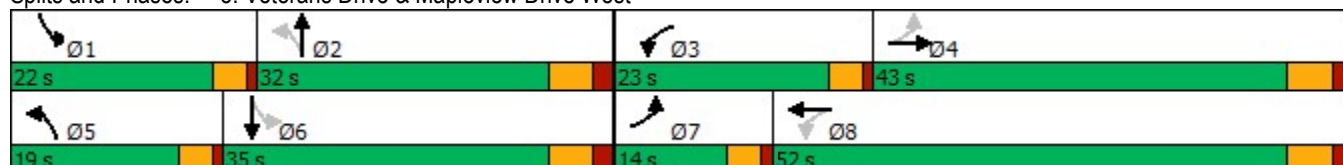
Natural Cycle: 105

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (vph)	187	1024	129	209	1298	449	210	319	228	305	298	136
Future Volume (vph)	187	1024	129	209	1298	449	210	319	228	305	298	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	5028		1770	4857		1769	3346		1787	3368	
Flt Permitted	0.10	1.00		0.11	1.00		0.40	1.00		0.16	1.00	
Satd. Flow (perm)	180	5028		208	4857		742	3346		306	3368	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	199	1089	137	222	1381	478	223	339	243	324	317	145
RTOR Reduction (vph)	0	12	0	0	50	0	0	114	0	0	46	0
Lane Group Flow (vph)	199	1214	0	222	1809	0	223	468	0	324	416	0
Confl. Peds. (#/hr)	12		6	6		12	2		4	4		2
Heavy Vehicles (%)	1%	1%	3%	2%	2%	2%	2%	0%	1%	1%	2%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	51.9	41.9		60.1	46.1		34.3	20.6		42.6	24.9	
Effective Green, g (s)	51.9	41.9		60.1	46.1		34.3	20.6		42.6	24.9	
Actuated g/C Ratio	0.45	0.37		0.52	0.40		0.30	0.18		0.37	0.22	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	221	1836		302	1952		344	600		346	731	
v/s Ratio Prot	c0.08	0.24		c0.09	c0.37		0.08	0.14		c0.15	0.12	
v/s Ratio Perm	0.33			0.29			0.12			c0.20		
v/c Ratio	0.90	0.66		0.74	0.93		0.65	0.78		0.94	0.57	
Uniform Delay, d1	27.8	30.5		21.1	32.7		32.3	44.9		30.6	40.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	34.8	1.9		9.0	9.1		4.2	6.4		32.1	1.0	
Delay (s)	62.6	32.3		30.1	41.8		36.5	51.3		62.7	41.1	
Level of Service	E	C		C	D		D	D		E	D	
Approach Delay (s)		36.6			40.6			47.2			50.0	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			114.7			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			96.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

315 Mapleview Drive

1: Essa Road & Mapleview Drive West

Queues
Total (2031) SAT (MID) Peak Hour

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	145	825	183	845	343	47	239	221	258	202	163
Future Volume (vph)	145	825	183	845	343	47	239	221	258	202	163
Lane Group Flow (vph)	153	891	193	889	361	49	252	233	272	213	172
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4	3	8			2		1	6	
Permitted Phases	4		8		8	2		2	6		6
Detector Phase	7	4	3	8	8	2	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	7.0	12.0	7.0	12.0	12.0	30.0	30.0	30.0	7.0	30.0	30.0
Minimum Split (s)	11.0	34.0	11.0	34.0	34.0	37.0	37.0	37.0	11.0	37.0	37.0
Total Split (s)	14.0	36.0	14.0	36.0	36.0	37.0	37.0	37.0	14.0	51.0	51.0
Total Split (%)	13.9%	35.6%	13.9%	35.6%	35.6%	36.6%	36.6%	36.6%	13.9%	50.5%	50.5%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	5.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	Max	Max	Max	None	Max	Max
v/c Ratio	0.61	0.88	0.77	0.85	0.51	0.14	0.44	0.37	0.54	0.26	0.22
Control Delay	28.0	44.5	40.7	42.6	5.8	27.3	31.2	6.2	21.3	18.8	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	44.5	40.7	42.6	5.8	27.3	31.2	6.2	21.3	18.8	3.4
Queue Length 50th (m)	18.2	89.8	23.7	89.6	0.0	7.4	42.0	1.5	34.2	27.3	0.0
Queue Length 95th (m)	31.7	114.8	#55.3	114.6	20.9	16.8	66.0	19.1	53.4	43.9	12.0
Internal Link Dist (m)		193.7		171.9			294.3			264.1	
Turn Bay Length (m)	95.0		90.0			80.0		30.0	55.0		30.0
Base Capacity (vph)	264	1095	254	1097	721	361	573	632	504	822	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.81	0.76	0.81	0.50	0.14	0.44	0.37	0.54	0.26	0.22

Intersection Summary

Cycle Length: 101

Actuated Cycle Length: 98.8

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Essa Road & Mapleview Drive West

			
Ø1	Ø2	Ø3	Ø4
14 s	37 s	14 s	36 s
			
Ø5	Ø6	Ø7	Ø8
51 s	14 s	36 s	

315 Maplevue Drive
1: Essa Road & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	825	22	183	845	343	47	239	221	258	202	163
Future Volume (vph)	145	825	22	183	845	343	47	239	221	258	202	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3596		1736	3610	1548	1801	1881	1563	1787	1845	1575
Flt Permitted	0.14	1.00		0.14	1.00	1.00	0.62	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	271	3596		256	3610	1548	1184	1881	1563	863	1845	1575
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	153	868	23	193	889	361	49	252	233	272	213	172
RTOR Reduction (vph)	0	2	0	0	0	257	0	0	155	0	0	95
Lane Group Flow (vph)	153	889	0	193	889	104	49	252	78	272	213	77
Confl. Peds. (#/hr)	7					7	3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	1%	0%	1%	2%	1%	3%	1%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Actuated Green, G (s)	37.3	28.0		38.3	28.5	28.5	30.2	30.2	30.2	44.1	44.1	44.1
Effective Green, g (s)	37.3	28.0		38.3	28.5	28.5	30.2	30.2	30.2	44.1	44.1	44.1
Actuated g/C Ratio	0.38	0.28		0.39	0.29	0.29	0.31	0.31	0.31	0.45	0.45	0.45
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	7.0	7.0	7.0	4.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	246	1018		245	1040	446	361	574	477	477	822	702
v/s Ratio Prot	0.06	c0.25		c0.08	0.25			0.13		c0.06	0.12	
v/s Ratio Perm	0.18			0.23		0.07	0.04		0.05	c0.20		0.05
v/c Ratio	0.62	0.87		0.79	0.85	0.23	0.14	0.44	0.16	0.57	0.26	0.11
Uniform Delay, d1	23.1	33.8		23.4	33.2	26.9	24.9	27.6	25.1	18.4	17.2	16.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	8.4		15.3	7.0	0.3	0.8	2.4	0.7	1.6	0.8	0.3
Delay (s)	27.9	42.2		38.7	40.2	27.1	25.7	30.0	25.9	20.0	17.9	16.3
Level of Service	C	D		D	D	C	C	C	C	C	B	B
Approach Delay (s)		40.1			36.8			27.8			18.4	
Approach LOS		D			D			C			B	

Intersection Summary

HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	21.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

315 Maplevue Drive
2: West Access & Maplevue Drive West

HCM Unsignalized Intersection Capacity Analysis
Total (2031) SAT (MID) Peak Hour

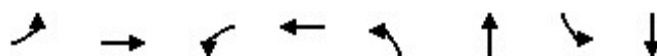
							
Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations	↑↑↑↱			↑↑↑		↱	
Traffic Volume (veh/h)	1241	97	0	1404	0	78	
Future Volume (Veh/h)	1241	97	0	1404	0	78	
Sign Control	Free			Free	Stop		
Grade	0%			0%	0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	1349	105	0	1526	0	85	
Pedestrians							
Lane Width (m)							
Walking Speed (m/s)							
Percent Blockage							
Right turn flare (veh)							
Median type	TWLT			TWLT			
Median storage veh	2			2			
Upstream signal (m)	196			130			
pX, platoon unblocked			0.83		0.91	0.83	
vC, conflicting volume			1454		1910	502	
vC1, stage 1 conf vol					1402		
vC2, stage 2 conf vol					509		
vCu, unblocked vol			811		413	0	
tC, single (s)			4.1		6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)			2.2		3.5	3.3	
p0 queue free %			100		100	91	
cM capacity (veh/h)			670		394	895	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	540	540	375	509	509	509	85
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	105	0	0	0	85
cSH	1700	1700	1700	1700	1700	1700	895
Volume to Capacity	0.32	0.32	0.22	0.30	0.30	0.30	0.09
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.4
Lane LOS							A
Approach Delay (s)	0.0			0.0			9.4
Approach LOS							A
Intersection Summary							
Average Delay			0.3				
Intersection Capacity Utilization			37.6%		ICU Level of Service		A
Analysis Period (min)			15				

315 Maplevue Drive

3: East Access /364 MVD-West Access & Maplevue Drive West

Queues

Total (2031) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑↑	←	↑↑↑	←	↑	←	↑
Traffic Volume (vph)	27	1269	231	1212	139	0	58	0
Future Volume (vph)	27	1269	231	1212	139	0	58	0
Lane Group Flow (vph)	29	1428	251	1388	151	162	63	75
Turn Type	Perm	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	3	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	9.5	24.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	27.0	13.6	40.6	24.4	24.4	24.4	24.4
Total Split (%)	41.5%	41.5%	20.9%	62.5%	37.5%	37.5%	37.5%	37.5%
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.5	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	None	None
v/c Ratio	0.25	0.87	0.69	0.52	0.40	0.24	0.18	0.14
Control Delay	23.1	28.1	21.0	10.6	22.8	0.8	19.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	28.1	21.0	10.6	22.8	0.8	19.4	2.0
Queue Length 50th (m)	2.7	61.2	14.9	37.4	15.4	0.0	6.0	0.0
Queue Length 95th (m)	9.6	#87.5	#41.3	48.4	30.8	0.0	14.7	3.4
Internal Link Dist (m)		106.6		126.7		19.0		80.2
Turn Bay Length (m)	1.0		1.0					
Base Capacity (vph)	116	1654	370	2716	376	689	347	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.86	0.68	0.51	0.40	0.24	0.18	0.14

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 64.5

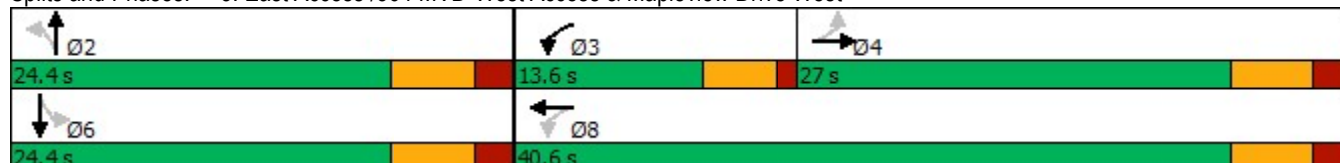
Natural Cycle: 60

Control Type: Semi Act-Uncoord

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 3: East Access /364 MVD-West Access & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

3: East Access /364 MVD-West Access & Maplevue Drive West

Total (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1269	45	231	1212	65	139	0	149	58	0	69
Future Volume (vph)	27	1269	45	231	1212	65	139	0	149	58	0	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	5059		1770	5046		1770	1583		1770	1583	
Flt Permitted	0.19	1.00		0.16	1.00		0.71	1.00		0.65	1.00	
Satd. Flow (perm)	358	5059		295	5046		1319	1583		1219	1583	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	1379	49	251	1317	71	151	0	162	63	0	75
RTOR Reduction (vph)	0	5	0	0	9	0	0	116	0	0	54	0
Lane Group Flow (vph)	29	1423	0	251	1379	0	151	46	0	63	21	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.8	20.8		34.1	34.1		18.4	18.4		18.4	18.4	
Effective Green, g (s)	20.8	20.8		34.1	34.1		18.4	18.4		18.4	18.4	
Actuated g/C Ratio	0.32	0.32		0.53	0.53		0.29	0.29		0.29	0.29	
Clearance Time (s)	6.0	6.0		4.5	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	115	1631		357	2667		376	451		347	451	
v/s Ratio Prot		c0.28		c0.10	0.27			0.03			0.01	
v/s Ratio Perm	0.08			0.28			c0.11			0.05		
v/c Ratio	0.25	0.87		0.70	0.52		0.40	0.10		0.18	0.05	
Uniform Delay, d1	16.1	20.6		11.3	9.9		18.6	17.0		17.4	16.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	5.4		6.2	0.2		3.2	0.5		0.3	0.0	
Delay (s)	17.3	26.0		17.5	10.0		21.8	17.4		17.6	16.7	
Level of Service	B	C		B	B		C	B		B	B	
Approach Delay (s)		25.9			11.2			19.5			17.1	
Approach LOS		C			B			B			B	

Intersection Summary

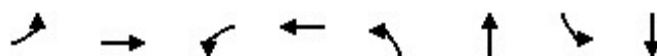
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	64.5	Sum of lost time (s)	16.5
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

315 Maplevue Drive

Queues

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Total (2031) SAT (MID) Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	31	1383	1	1369	71	0	75	0
Future Volume (vph)	31	1383	1	1369	71	0	75	0
Lane Group Flow (vph)	32	1470	1	1533	74	11	78	24
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	54.0	7.0	54.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	60.0	11.0	60.0	11.0	29.0	11.0	29.0
Total Split (s)	19.0	60.0	19.0	60.0	14.0	29.0	14.0	29.0
Total Split (%)	15.6%	49.2%	15.6%	49.2%	11.5%	23.8%	11.5%	23.8%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	None	Max
v/c Ratio	0.15	0.52	0.00	0.59	0.18	0.02	0.09	0.04
Control Delay	11.4	16.6	10.0	20.4	26.8	0.1	25.3	0.1
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	17.4	10.0	20.4	26.8	0.1	25.3	0.1
Queue Length 50th (m)	2.9	70.6	0.1	94.2	11.9	0.0	6.2	0.0
Queue Length 95th (m)	7.2	106.0	0.8	112.7	23.3	0.0	11.8	0.0
Internal Link Dist (m)		126.7		795.9		126.6		131.6
Turn Bay Length (m)	50.0		50.0					
Base Capacity (vph)	342	2831	366	2613	425	607	927	593
Starvation Cap Reductn	0	941	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.78	0.00	0.59	0.17	0.02	0.08	0.04

Intersection Summary

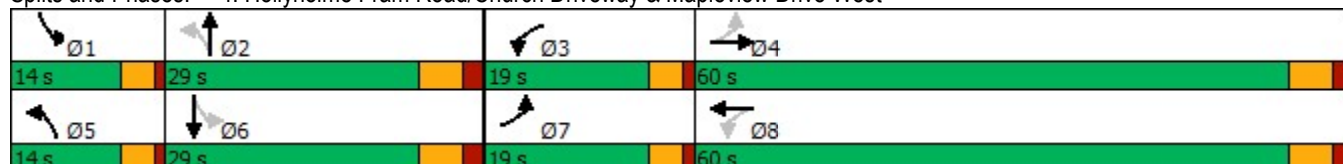
Cycle Length: 122

Actuated Cycle Length: 106.2

Natural Cycle: 115

Control Type: Semi Act-Uncoord

Splits and Phases: 4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West



315 Maplevue Drive

HCM Signalized Intersection Capacity Analysis

4: Hollyholme Fram Road/Church Driveway & Maplevue Drive West Total (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  					 		
Traffic Volume (vph)	31	1383	28	1	1369	103	71	0	11	75	0	23
Future Volume (vph)	31	1383	28	1	1369	103	71	0	11	75	0	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5119		1805	5078		1612	1615		3502	1615	
Flt Permitted	0.10	1.00		0.13	1.00		0.71	1.00		0.75	1.00	
Satd. Flow (perm)	189	5119		242	5078		1201	1615		2766	1615	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	32	1441	29	1	1426	107	74	0	11	78	0	24
RTOR Reduction (vph)	0	1	0	0	6	0	0	9	0	0	19	0
Lane Group Flow (vph)	32	1469	0	1	1527	0	74	2	0	78	5	0
Confl. Peds. (#/hr)	1		1	1		1						
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	12%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	62.7	58.7		57.3	56.0		31.4	24.4		29.2	23.3	
Effective Green, g (s)	62.7	58.7		57.3	56.0		31.4	24.4		29.2	23.3	
Actuated g/C Ratio	0.57	0.53		0.52	0.51		0.28	0.22		0.26	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	166	2724		144	2578		367	357		771	341	
v/s Ratio Prot	c0.01	0.29		0.00	c0.30		c0.01	0.00		0.01	0.00	
v/s Ratio Perm	0.10			0.00			c0.04			0.02		
v/c Ratio	0.19	0.54		0.01	0.59		0.20	0.01		0.10	0.01	
Uniform Delay, d1	12.8	16.9		13.5	19.1		29.6	33.5		30.5	34.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.2		0.0	0.4		0.3	0.0		0.1	0.1	
Delay (s)	13.3	17.1		13.6	19.5		29.9	33.5		30.6	34.5	
Level of Service	B	B		B	B		C	C		C	C	
Approach Delay (s)		17.1			19.5			30.3			31.5	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

315 Maplevue Drive

5: Veterans Drive & Maplevue Drive West

Queues
Total (2031) SAT (MID) Peak Hour

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations		  		  		 		 
Traffic Volume (vph)	128	1431	227	1212	166	293	470	212
Future Volume (vph)	128	1431	227	1212	166	293	470	212
Lane Group Flow (vph)	132	1624	234	1735	171	412	485	327
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	7.0	30.0	7.0	30.0	7.0	10.0	7.0	10.0
Minimum Split (s)	11.0	36.0	11.0	36.0	11.0	32.0	11.0	32.0
Total Split (s)	11.0	41.0	18.0	48.0	11.0	32.0	29.0	50.0
Total Split (%)	9.2%	34.2%	15.0%	40.0%	9.2%	26.7%	24.2%	41.7%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	None	Max	None
v/c Ratio	0.71	0.99	0.82	0.91	0.59	0.72	0.96	0.29
Control Delay	41.7	57.2	47.5	39.5	33.7	48.1	58.8	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	57.2	47.5	39.5	33.7	48.1	58.8	21.8
Queue Length 50th (m)	15.9	~136.8	34.4	130.2	24.0	43.3	84.8	21.8
Queue Length 95th (m)	#45.4	#187.6	#80.5	#176.1	39.0	60.4	#153.7	33.5
Internal Link Dist (m)		795.9		487.9		326.5		492.6
Turn Bay Length (m)	70.0		30.0		45.0		65.0	
Base Capacity (vph)	185	1647	297	1912	289	837	504	1380
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.99	0.79	0.91	0.59	0.49	0.96	0.24

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.4

Natural Cycle: 90

Control Type: Semi Act-Uncoord

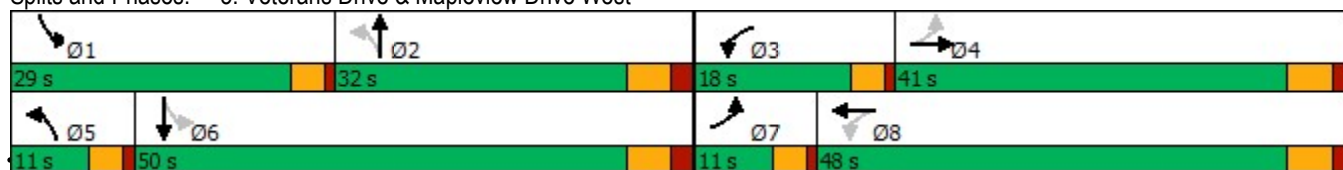
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: Veterans Drive & Maplevue Drive West



315 Maplevue Drive
5: Veterans Drive & Maplevue Drive West

HCM Signalized Intersection Capacity Analysis

Total (2031) SAT (MID) Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	1431	145	227	1212	471	166	293	107	470	212	105
Future Volume (vph)	128	1431	145	227	1212	471	166	293	107	470	212	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.96		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	5095		1805	4920		1769	3456		1805	3371	
Flt Permitted	0.11	1.00		0.10	1.00		0.55	1.00		0.25	1.00	
Satd. Flow (perm)	212	5095		191	4920		1032	3456		475	3371	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	132	1475	149	234	1249	486	171	302	110	485	219	108
RTOR Reduction (vph)	0	9	0	0	56	0	0	33	0	0	55	0
Lane Group Flow (vph)	132	1615	0	234	1679	0	171	379	0	485	272	0
Confl. Peds. (#/hr)			1	1			1					1
Heavy Vehicles (%)	0%	0%	3%	0%	1%	1%	2%	0%	1%	0%	1%	2%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	42.8	35.8		53.0	42.0		24.3	17.3		46.3	35.3	
Effective Green, g (s)	42.8	35.8		53.0	42.0		24.3	17.3		46.3	35.3	
Actuated g/C Ratio	0.38	0.32		0.48	0.38		0.22	0.16		0.42	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	181	1638		282	1856		271	537		496	1069	
v/s Ratio Prot	0.05	c0.32		c0.10	0.34		0.04	0.11		c0.22	0.08	
v/s Ratio Perm	0.23			0.30			0.10			c0.19		
v/c Ratio	0.73	0.99		0.83	0.90		0.63	0.71		0.98	0.25	
Uniform Delay, d1	26.3	37.5		28.4	32.8		37.8	44.6		27.4	28.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.7	19.1		17.9	7.8		4.7	4.2		34.3	0.1	
Delay (s)	40.0	56.6		46.4	40.5		42.6	48.8		61.7	28.4	
Level of Service	D	E		D	D		D	D		E	C	
Approach Delay (s)		55.3			41.2			47.0			48.3	
Approach LOS		E			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			47.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			111.3			Sum of lost time (s)			20.0			
Intersection Capacity Utilization			97.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												