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12148 Albion Vaughan Road
Bolton, ON
Traffic Impact & Parking Study

Paradigm Transportation Solutions Limited

December 2022
200185

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Project Summary

12148 Albion Vaughan Road
Traffic Impact & Parking Study

Project Number
200185

December 2022

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Executive Summary

Content

This report is an update to the November 2020 study previously prepared. This update reflects changes to the site plan and development statistics, as well addresses review comments from the review agencies following the first development application submission.

This study has been prepared in support of a proposed residential development for a site located at the municipal address of 12148 Albion Vaughan Road in the community of Bolton, Town of Caledon, Region of Peel.

The development as proposed consists of two residential towers, one six-storey tower and one seven-storey tower. In total the overall development proposes a total of 265 residential dwelling units. A total of 462 parking spaces would be provided on-site to serve the development. Vehicular access would be provided via full-movement driveway connections with Albion Vaughan Road. A total of 156 bicycle parking spaces will also serve the development (84 long-term and 72 short-term spaces).

The study assesses the weekday AM and PM peak hour traffic impact of the proposed development, provides a review of the parking requirements, and a functional review of the proposed site plan.

Conclusions

The conclusions of the study are as follows:

- Under the base year conditions, all study area intersections operate at acceptable levels of service and within capacity.
- For the 2029 background traffic conditions (without subject development), all study area intersections are forecast to operate at acceptable levels of service and within capacity.

  The exception would be the Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection, where the overall intersection v/c ratio is forecast to be 0.95 during the AM peak hour. The southbound dual through movement is reported to operate with a v/c of 0.94 during the AM peak hour.
- Under the 2029 total traffic conditions (with subject development), all study area intersections are forecast to operate at acceptable levels of service and within capacity.

The previously identified critical movements would continue to be reported, albeit slightly exacerbated.

- The overall impact of the proposed residential development is anticipated to be minimal. The development is estimated to generate and add a total of 105 and 104 vehicle trips to the adjacent transportation network during the AM and PM peak hours, respectively.

  The additional traffic would be less than daily traffic variations typically experienced. It is determined the site generated traffic would increase volumes at the study area intersections between 1.0 to 2.3%.

  While not identified as a critical movement, auxiliary dual left-turn lanes were investigated at the westbound approach at the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection. The movement is acknowledged to be approaching capacity under 2029 background and total traffic conditions.

  As analyzed with dual left-turn lanes on the westbound approach and optimization of signal timing splits within exiting cycle lengths, the overall intersection is reported to operate at acceptable levels of service and with all movements within capacity under the 2029 horizon.

- At the main central site access intersection with Albion Vaughan Road, it was determined an auxiliary northbound left-turn lane would be warranted from a volume perspective. It is noted that the auxiliary left-turn lane is not required from an operational standpoint.

- The proposed overall parking results in a theoretical deficient of 2 spaces in comparison to the minimum zoning by-law requirements. That is, the visitor parking requirements would be satisfied; however, the proposed resident parking requirements would be theoretically deficient by 0.5%.

  The proposed resident parking supply is anticipated to adequately serve the residential development. The main basis in support of the minor reduction is supported by ITE Parking Generation forecasts of peak parking demands. The proposed resident supply would result in a surplus of parking based upon the forecast peak demands. Additionally, parking spaces will be unbundled from residential units.

- A review of the site plan was undertaken. No major conflicts or issues were identified for the anticipated design vehicles expected on-site.

Recommendations

The recommendations of the study are as follows:

- From a transportation perspective, the planning applications sought should be approved as the development is determined to have a minimal impact on the adjacent transportation network.
- The intersection volumes and operations at the Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection be monitored by the applicable jurisdiction to determine when dual westbound left-turn lanes should be provided.
- Regardless of being warranted, a northbound auxiliary left-turn lane is not required at the central site access intersection on Albion Vaughan Road based upon forecast traffic operations.

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1 Introduction

1.1 Overview

This report is an update to the November 2020 study previously prepared. This update reflects changes to the site plan and development statistics, as well addresses review comments from the review agencies following the first development application submission.

Paradigm Transportation Solutions Limited (Paradigm) was retained to conduct this Traffic Impact and Parking Study for a proposed residential development in the community of Bolton (Town of Caledon). **Figure 1.1** illustrates the location of the subject site situated on the west side of Albion Vaughan Road, north of Regional Road 50.

1.2 Purpose and Scope

The purpose of this report is to identify and assess the potential traffic impacts of the proposed development. The scope of the study was developed in consultation with Town of Caledon staff via e-mail correspondence in October 2020.

The study has been updated based on review comments received from Town of Caledon staff dated 06 August 2021. At the time of writing of the original study, Region of Peel staff had not responded to our request for pre-study consultation. It is further noted that following the initial development application submission, Region of Peel staff did not have any review comments on the transportation study deliverable. **Appendix A** contains the original terms of reference and pre-study consultation completed with Town staff.

The scope of this study is as follows:

- A study area comprising the following intersections:
  - Peel Regional Road 50 and Albion Vaughan Road/Mayfield Road;
  - Albion Vaughan Road and Kirby Road; and
  - Albion Vaughan Road and the proposed central site access driveway.
- Traffic forecasts for 2029, representing a five-year horizon following anticipated build-out/occupancy in 2024;
- Weekday AM and PM peak hour analysis time periods;

- A review of parking to confirm the proposed supply will be adequate for the proposed use; and
- A review of the design of site accesses, internal circulation, and loading areas to confirm they will accommodate the vehicles expected on-site.

The methodology used in this study is summarized below:

- Estimate the future peak hour background traffic for the horizon year by applying a 2% per annum growth rate as advised by Town staff;
- Estimate the net increase in vehicular traffic with the proposed development;
- Combine the future background traffic with the net increase in site traffic to determine the total traffic volumes under the horizon year;
- Analyze existing, future background, and total traffic conditions;
- Determine the net impact on operational performance due to site traffic, and the need for road and/or traffic control improvements to address the identified impacts; and
- Use of AutoTURN software to prepare on-site vehicle maneuvering diagrams.

This study has been carried out in general accordance with the Region's TIS Guidelines[1], pre-study consultation comments and addressed review comments received from Town staff. **Appendix A** contains the pre-study correspondence and comments.

[1] Regional Municipality of Peel, *Traffic Impact Study Guidelines,* Accessed 9 November 2020 from https://www.peelregion.ca/pw/transportation/business/traffic-impact-study.asp

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Study Area and Site Location

2 Proposed Development

The subject site is located at the municipal address of 12148 Albion Vaughan Road. The subject lands are currently occupied by a detached single-family home which would be demolished to facilitate redevelopment of the lands.

Figure 2.1 illustrates the site plan. The proposed residential development consists of two residential towers. In total the overall development proposes a total of 265 residential dwelling units. The development statistics are as follows:

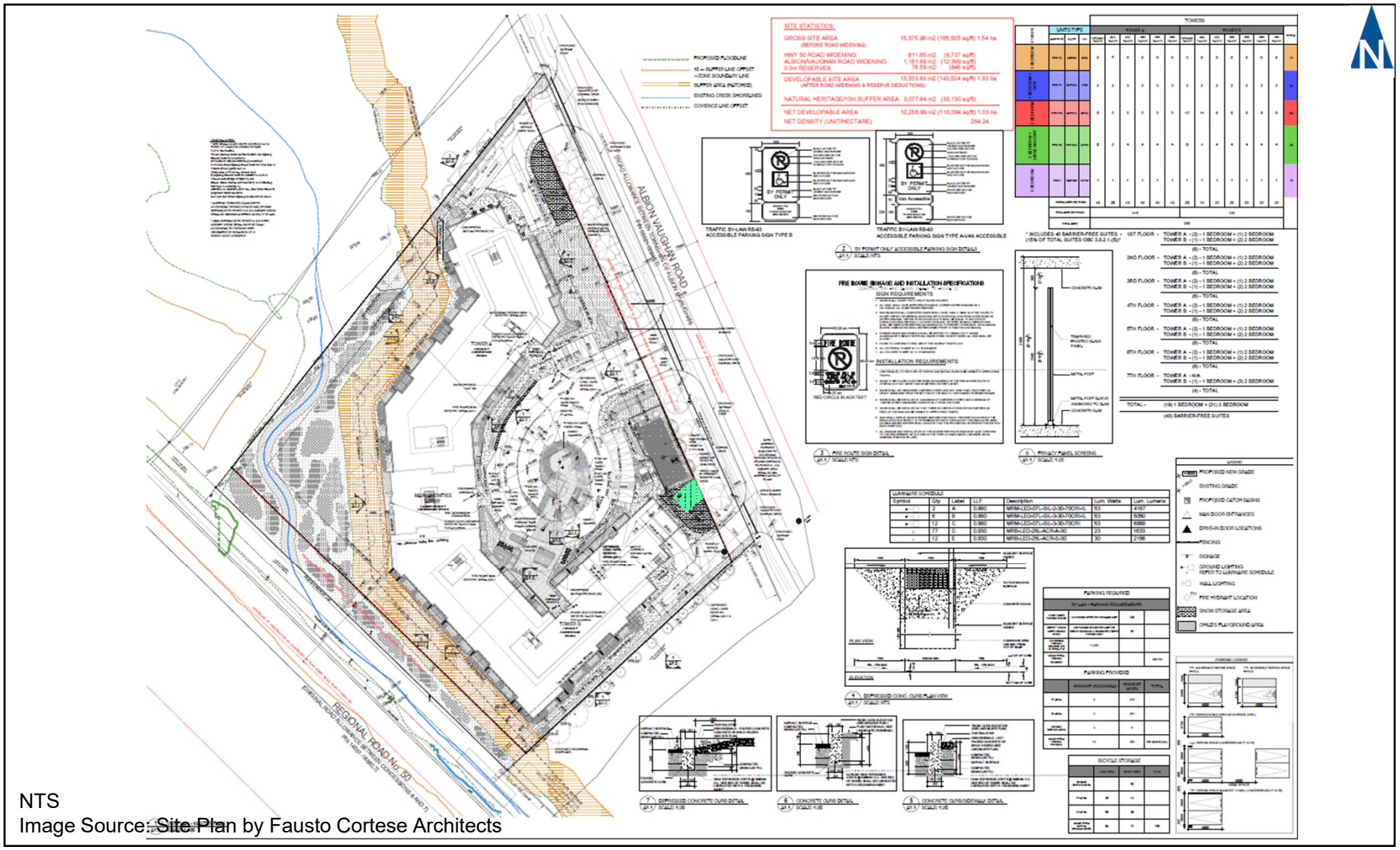
- One six-storey residential tower with 114 units total:
  - 37 one-bedroom units;
  - 22 one-bedroom + den units;
  - 31 two-bedroom units;
  - 18 two-bedroom + large balcony units;
  - 6 three-bedroom units.
- One seven-storey residential tower with 151 units total:
  - 41 one-bedroom units;
  - 14 one-bedroom + den units;
  - 68 two-bedroom units;
  - 21 two-bedroom + large balcony units;
  - 7 three-bedroom units.

The entire development would be served by several at-grade parking spaces and a two-level underground parking structure. A total parking supply of 462 spaces serving residents and visitors are proposed on-site.

A total of 156 bicycle parking spaces (72 short-term and 84 long-term) are proposed on-site. Out of the 72 short-term spaces, 30 spaces are proposed at-grade and 42 spaces are proposed in the two-level underground parking structure. All 84 long-term bicycle parking spaces are located within secured storage rooms in the underground structure serving residents.

Three full-movement access driveways are proposed, with two of the three driveways providing dedicated access to the loading area serving each residential tower (i.e., service vehicles only). The main central vehicular access serving the development provides access for building residents and visitors.

For assessment purposes it is anticipated full build-out and occupancy will occur by 2024.



NTS

Image Source: Site Plan by Fausto Cortese Architects

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Site Plan

3 Existing Conditions

3.1 Roads and Traffic Control

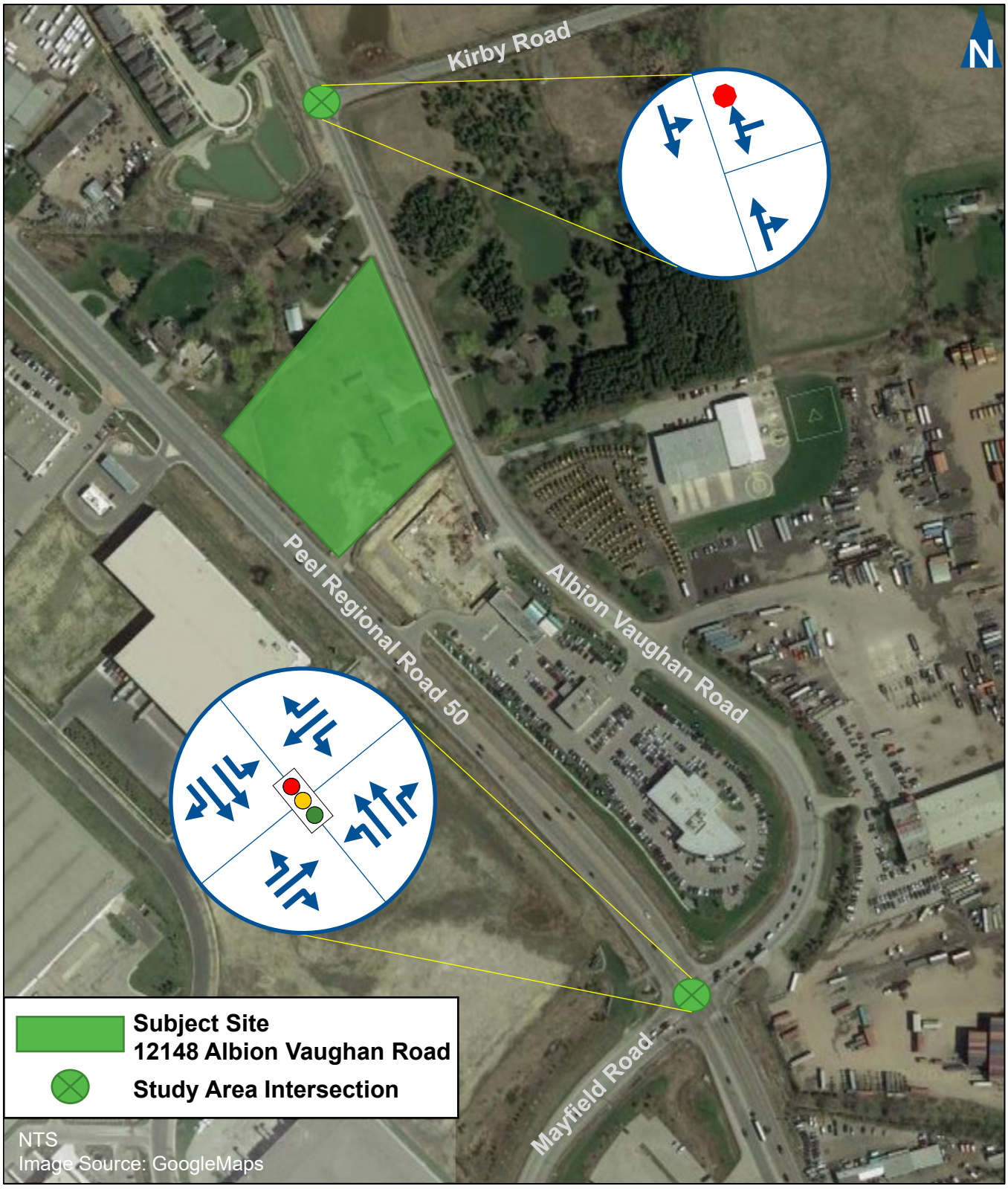
The characteristics of the roads and intersections in the vicinity of the subject site are described below. Reference is made to the Town of Caledon's Official Plan – Schedule J: Long Range Road Network[2]. The main roadways that form the study area comprise Albion Vaughan Road-Mayfield Road, Regional Road 50, and Kirby Road. Each roadway is described as follows:

- **Albion Vaughan Road** is a north-south, two-lane, undivided roadway that operates under the jurisdiction of the Town of Caledon. The road is classified as a medium capacity arterial per the Town's Official Plan, additionally this roadway is identified as the Proposed Bolton Arterial Route (BAR). The roadway has a rural cross section, with gravel shoulders on both sides. The posted maximum speed limit is 60 km/h within the study area limits;
- **Mayfield Road (Peel Regional Road 14)** is an east-west, two-lane, undivided roadway that operates under the jurisdiction of the Regional Municipality of Peel. The road is classified as a major road under the Region's Official Plan and a high capacity arterial per the Town's Official Plan. The roadway has a semi-urban cross section. The posted maximum speed limit is 60 km/h within the study area limits;
- **Highway 50 (Peel Regional Road 50)** is a north-south four-lane undivided roadway that operates under the jurisdiction of the Regional Municipality of Peel. The road is classified as a major road under the Region's Official Plan[3] and a high capacity arterial per the Town's Official Plan. The roadway has an urban cross section north of Albion Vaughan Road/Mayfield Road, and a semi-urban cross section south of Albion Vaughan Road/Mayfield Road. The posted maximum speed limit is 80 km/h within the study area limits;
- The intersection of Regional Road 50/Albion Vaughan Road-Mayfield Road is currently signalized with auxiliary left and right turn lanes are provided on each intersection approach; and

[2] Town of Caledon, *Official Plan, Schedule J – Long Range Road Network*, April 2018.
[3] Regional Municipality of Peel, *Official Plan, Schedule F-2 – Major Road Network*, April 2022.

- The intersection of Albion Vaughan Road/Kirby Road forms an unsignalized “T” intersection. Stop control is provided on the westbound Kirby Road approach.

Figure 3.1 illustrates the existing lane configurations and traffic control devices at the study area intersections.



Existing Lane Configurations and Traffic Control

3.2 Transit Services

The study area is currently served by limited transit routes/services.

Within the community of Bolton, the Town of Caledon has retained Voyago to provide local service (began November 11, 2019). The local transit line in Bolton includes 39 new bus stops along the route with service running during peak commute hours (Monday to Friday between 6:00 AM and 9:30 AM, and from 3:00 PM and 6:30 PM). Within the study area, local transit service operates along Regional Road 50.

GO Transit provides bus service to the Regional Road 50/Mayfield Road Park and Ride located on the southwest corner of the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road. The following route is operated by GO Transit:

- **Route 38 (Bolton)** operates between Downtown Bolton and Malton GO Station. Service is provided Monday to Friday only. The northbound route operates from 4:45 PM to 7:15 PM. The southbound route operates from 5:16 AM to 6:01 AM.

3.3 Active Transportation

Sidewalk and separated bicycle infrastructure is not provided on Regional Road 50 or along Albion Vaughan Road. Pedestrians and cyclists are expected to utilize the gravel shoulder on either roadway or share the travelled roadways with vehicles.

A review of the Region of Peel's Active Transportation Implementation Plan[4] did not identify any existing cycling or pedestrian facilities on the study area roadways. The Long-Term Regional Pedestrian Network (Caledon) proposes sidewalks on the west and east sides of Regional Road 50; however, no horizon year for their implementation is currently known.

The Proposed Long-Term Regional Cycling Network (Caledon) proposes bike lanes on Regional Road 50; however, no horizon year for their implementation is currently known as well. Further review of the Town of Caledon's "Explore Caledon" cycling map identified that no cycling facilities are provided on Albion Vaughan Road.

The walk phases incorporated into the signal timing plan for the Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection are push button actuated for pedestrians to cross Regional Road 50. The pedestrian phase is always provided for both the

[4] Regional Municipality of Peel, *Active Transportation Implementation Plan 2018-2022*.

northbound and southbound through phases. Pedestrian signal heads are provided for each approach crossing. The existing volume of crossing pedestrians at this intersection during the weekday AM and PM peak hours was found to have zero pedestrian crossings.

3.4 Modal Split

To gain a better understanding of existing travel characteristics of the subject site and surrounding area, 2016 Transportation Tomorrow Survey (TTS) data was reviewed for TTS Zone 3190. Zone 3190 is bounded by Queensgate Boulevard, Regional Road 50, and Albion Vaughan Road.

The existing mode share for travel during the weekday AM and PM peak periods has been reviewed. Inbound and outbound trips during the morning three-hour travel period (6:00 AM – 9:00 AM) and the afternoon three-hour travel period (4:00 PM – 7:00 PM) were assessed. **Table 3.1** summarizes the existing modal splits.

TABLE 3.1: EXISTING MODAL SPLIT

Mode	AM Inbound	AM Outbound	PM Inbound	PM Outbound
Auto Driver	84%	76%	88%	85%
Auto Passenger	6%	13%	9%	14%
Transit	0%	2%	2%	0%
Cycle	0%	0%	0%	0%
Walk	10%	9%	1%	1%
Total	***100%***	***100%***	***100%***	***100%***

Inbound and outbound trips during the AM peak period are predominately automobile based accounting for 90% of trips, whereas 10% of the trips are made via walking. This relatively high percentage of walking trips appears to be attributed to school-related trips.

Similarly, PM peak period trips are predominantly automobile based. Automobile trips account for 97% of PM inbound trips and 99% of PM outbound trips.

3.5 Traffic Volumes

Turning movement counts (TMC) quantify the volume and type of vehicles travelling through an intersection. The TMC data is typically collected during peak travel periods to capture peak traffic volumes and patterns.

Beginning in March 2020 the Province of Ontario implemented restrictions for day-to-day activities in response to the COVID-19 global pandemic. Restrictions included the closure of all school institutions

under further notice, reduced gathering sizes which has results in limited operations at places of employment. At the time of writing, restrictions were in place to varying degree. As a result, typical travel volumes and travel patterns have been impacted and the collection of turning movement counts would not reflect typical volume conditions within the study area.

For the purposes of this report, Paradigm has referenced historical turning movement counts completed by Traffic Survey Analysis (TSA). TSA completed eight-hour turning movement counts at both intersections on Thursday November 24, 2016. These counts have been factored to a 2022 base year condition by applying a 2.0% compounded per annum growth rate to through movements only as per Town staff review comments. The use of historical data and the growth rate were previously signed-off on by Town staff during pre-study consultation.

Historical traffic volume data (2009 to 2017) along Regional Road 50 and Mayfield Road were reviewed to verify the use of the 2.0% growth rate on the Regional roads. The data was obtained from Region of Peel OpenData Portal[5].

On Regional Road 50, the data indicates a growth rate of 1.1% and -0.1% north and south of Albion Vaughan Road/Mayfield Road, respectively, whereas, the Mayfield Road data indicates a growth rate of 0.4%. A conservative approach (i.e., errs on the high side) was adopted by using the same 2.0% compounded per annum growth rate. **Appendix B** contains historical data extracted and growth rate calculations for reference.

The 2016 traffic counts at Regional Road 50 and Albion Vaughan Road/Mayfield Road were completed from 6:00 AM to 10:00 AM, and 2:00 PM to 6:00 PM. The counts at Albion Vaughan Road and Kirby Road were completed from 6:00 AM to 9:00 AM, 11:30 AM to 1:30 PM, and from 3:00 PM to 6:00 PM. All traffic movements, including pedestrian crossings were counted in 15-minute intervals and vehicles were classified by type.

Figure 3.2 illustrates the base year (2022) traffic volumes. **Appendix C** contains the raw count data for reference.

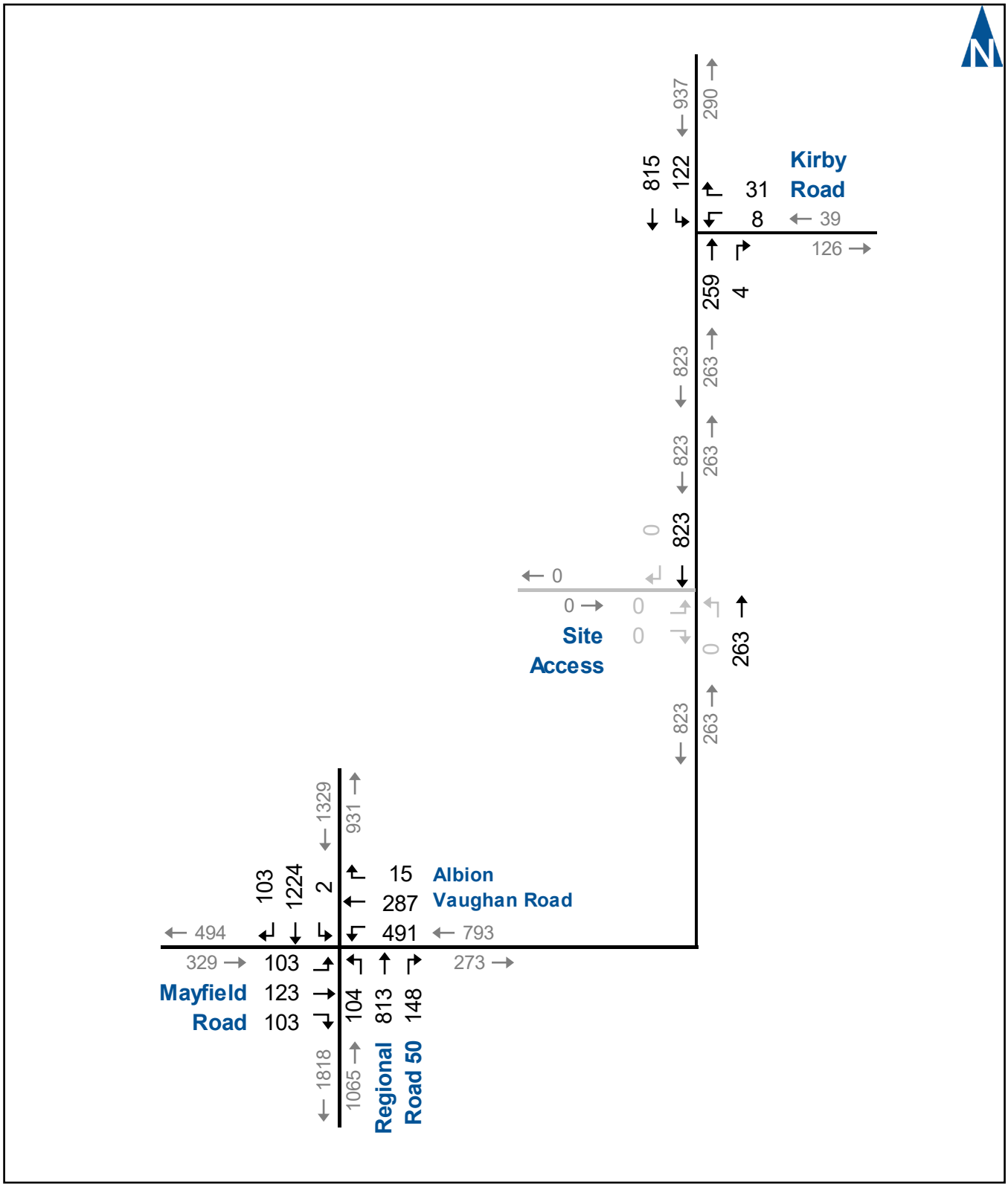
[5] https://data.peelregion.ca/datasets/844846e93de64ddd910c2b6e964105f1_0/explore?location=43.846124%2C-79.693155%2C16.21

3.6 Traffic Observations

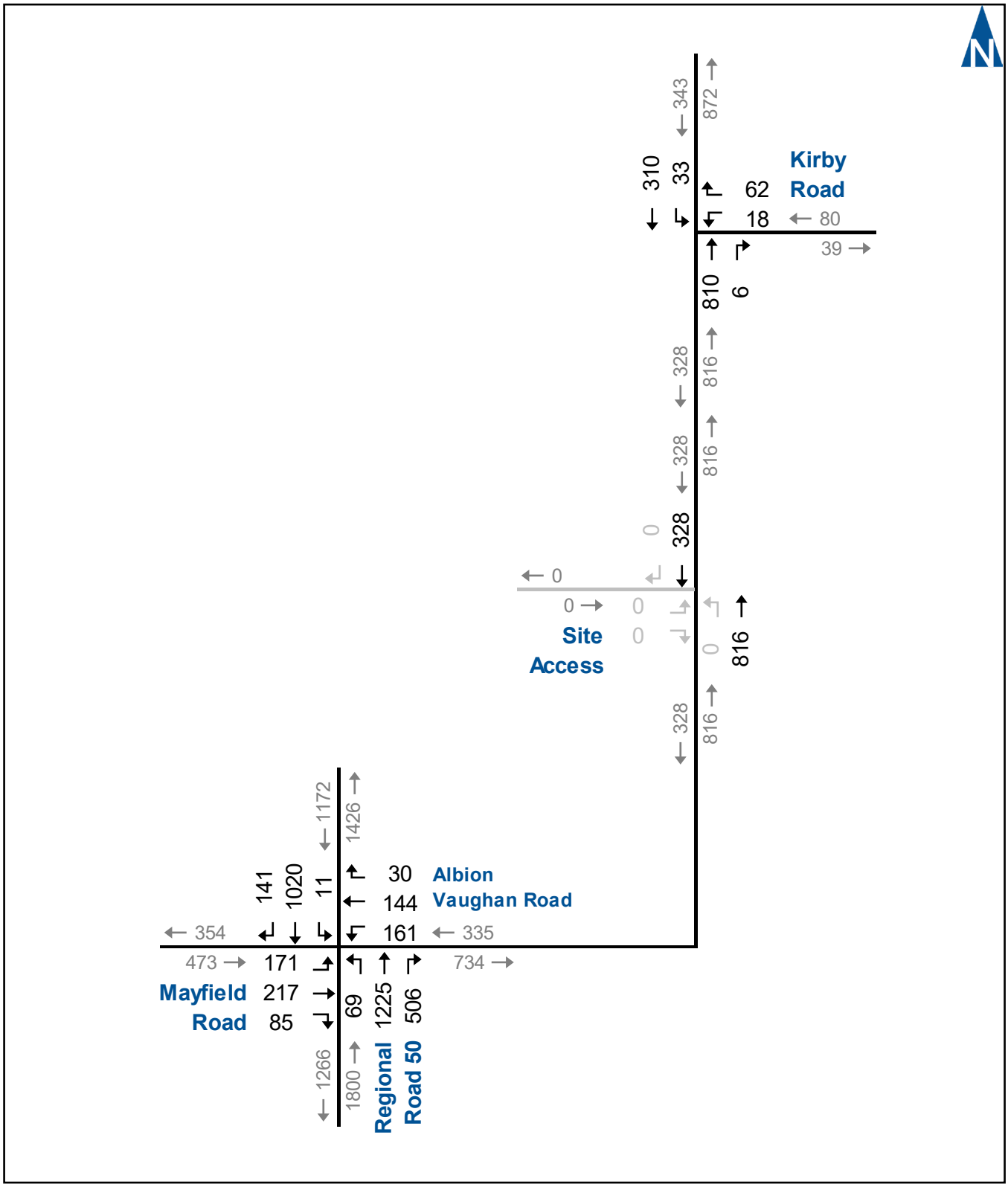
Based upon notes and observations conducted when the historical counts were collected in November 2016, it was noted that a good level of service was generally provided in the study area.

The exception being that the westbound left-turn movement on Albion Vaughan Road at Regional Road 50 was observed to experience a high level of delay in the AM peak hour.

This observation is further validated by the high volume of vehicles performing the movement. The raw unadjusted 2016 counts recorded 491 vehicles performing this movement exceeding 300 vehicles per hour during the AM peak hour, which is the threshold where both the Highway Capacity Manual and the Transportation Association of Canada Geometric Design Guide for Canadian Roads recommend the consideration of dual left-turn lanes.



Base Year Traffic Volumes AM Peak Hour



Base Year Traffic Volumes PM Peak Hour

3.7 Traffic Operations

Intersection Level of Service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections and is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to opposing traffic flows, and at signalized intersections, signal timing. Capacity is evaluated in terms of the ratio of demand flow to capacity with an at-capacity condition represented by a volume-to-capacity (v/c) ratio of 1.00 (i.e., volume demand equals capacity).

The highest possible rating is LOS A, under which the average total delay at signalized and unsignalized intersections is equal or less than 10 seconds per vehicle. When the average delay for a movement exceeds 80 seconds at signalized intersections, or 50 seconds at unsignalized intersections, the movement is classified as LOS F, and remedial measures are usually implemented, if they are feasible.

To adhere to the Region of Peel guidelines for operational analysis[6], the following criteria have been used for the determination of the need for capacity or traffic control improvements to the study area intersections.

- When v/c ratios for overall intersection operations, through movements, or shared through/turning movements exceeds 0.90;
- When v/c ratios for dedicated turning movements exceeds 1.00; and/or
- When 95th percentile queue lengths for individual movements exceeds available lane storage.

To assess the base year traffic operating conditions, a level of service analysis has been conducted using Synchro software, which implements the methods of the Highway Capacity Manual (HCM). The following parameters have been utilized in the analysis:

- Existing lane configurations;
- Signal timing as provided by the Region (and included in **Appendix C** for reference);
- Heavy vehicles percentages and crossing pedestrian volumes as extracted from the turning movement counts;

[6] Regional Municipality of Peel, *Traffic Impact Study Guidelines,* Accessed 9 November 2020 from https://www.peelregion.ca/pw/transportation/business/traffic-impact-study.asp

- Lane widths as per "Regional Guidelines for Using Synchro" [7];
- Peak hour factors of 1.00 as per "Regional Guidelines for Using Synchro" [8]; and
- Synchro default values for all other inputs.

Table 3.2 presents the operational analysis results including the level of service (LOS), average delay in seconds, volume to capacity (v/c) ratio, and 95th percentile queue length in metres. Any critical movements are highlighted in yellow.

Appendix D contains the Synchro analysis outputs for reference.

In summary, the base year operations represent acceptable levels of service. All traffic movements are currently found to operate acceptably and within capacity.

It is noted the westbound left turn movement is approaching capacity under base year traffic conditions.

The 95th percentile queue lengths were checked for all turn lanes against provided storage, and queue lengths for through movements were also checked. It was confirmed no spillback issues are present.

7 Regional Municipality of Peel, *Regional Guidelines for Using Synchro Version 7.73 Rev 8*, December 2010.

8 Regional Municipality of Peel, *Regional Guidelines for Using Synchro Version 7.73 Rev 8*, December 2010.

TABLE 3.2: BASE YEAR TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS[1]	Delay[2]	V/C[3]	Q[4]	LOS[1]	Delay[2]	V/C[3]	Q[4]
Regional Road 50 & Albion Vaughan Road/Mayfield Road *Signalized*	EB	Left	D	55	0.51	31	D	40	0.56	11
		Thru	E	64	0.59	49	D	50	0.67	40
		Right	D	54	0.09	16	D	38	0.07	46
	WB	Left	E	75	0.97	165	D	45	0.65	1
		Thru	D	52	0.66	94	D	44	0.47	12
		Right	D	39	0.01	<1	D	38	0.02	16
	NB	Left	C	27	0.56	27	B	13	0.32	3
		Dual Thru	B	16	0.41	77	B	15	0.59	20
		Right	B	13	0.10	9	B	12	0.34	23
	SB	Left	C	20	0.01	2	B	15	0.07	4
		Dual Thru	D	36	0.79	203	C	21	0.59	<1
		Right	C	21	0.07	11	B	15	0.09	<1
	Overall Intersection		***D***	***39***	***0.81***	***-***	***C***	***22***	***0.63***	***-***
Albion Vaughan Road & Kirby Road *Unsignalized*	WB	Left/Right	C	18	0.12	3	C	21	0.27	7
	NB	Thru/Right	Unopposed Movement				Unopposed Movement			
	SB	Left/Thru	A	2	0.09	2	A	1	0.04	1

[1] Level of Service; [2] Average vehicle delay, seconds; [3] Volume to capacity ratio; [4] 95th percentile queue, metres

4 Future Traffic Conditions

4.1 Horizon Years

Consistent with the terms of reference established, traffic forecasts have been developed for a period five-years from year of build-out/occupancy.

For assessment purposes it is anticipated the residential development would be built and occupied by 2024; therefore, a horizon year of 2029 will be analyzed.

4.2 Forecast Background Traffic

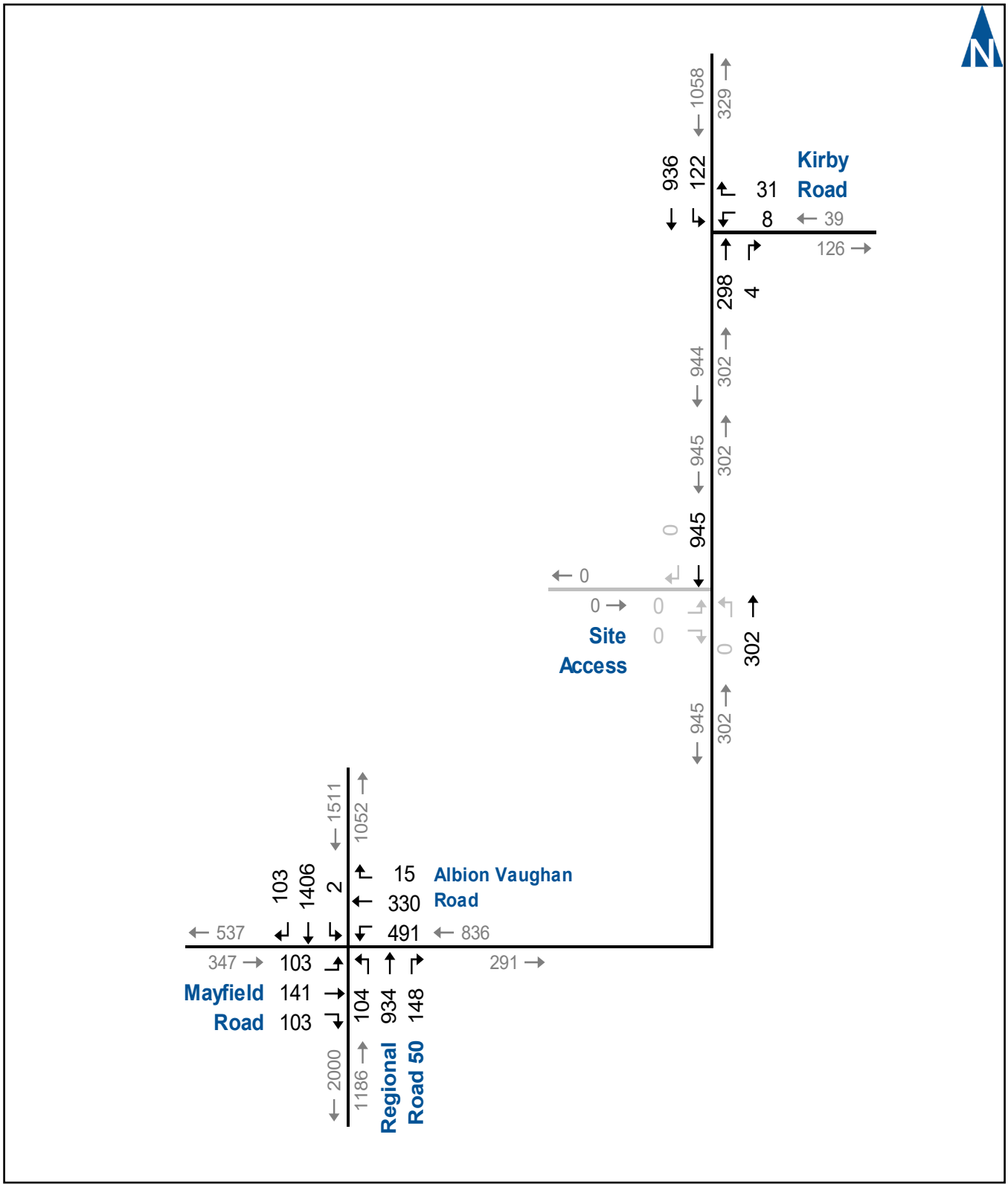
The future background traffic volumes in the study area are expected to comprise general background growth and specific traffic generated by approved or in-stream developments.

During pre-study consultation, Town staff advised the use of a 2.0% compounded per annum growth rate for application on roadways under the Town's jurisdiction.

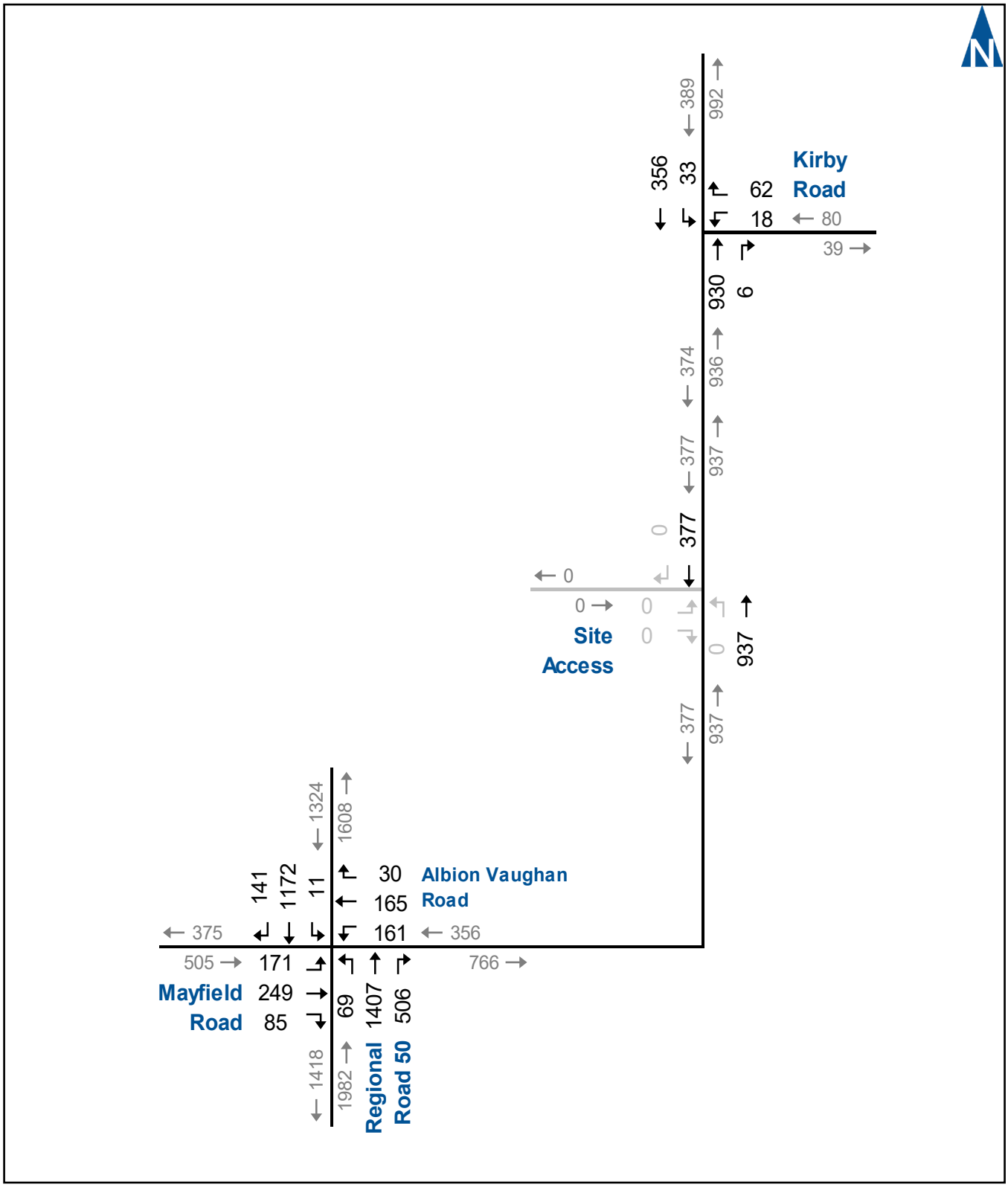
We have also applied this growth rate to the Regional roads within the study area. This 2.0% compounded growth rate represents a conservative approach (i.e., errs on the high side). Detailed discussion can be found in **Section 3.5**.

As per review comments, this growth rate has been applied to through movements only on the study roadways. Town staff also confirmed there were no background developments to include as part of the traffic forecasts.

Figure illustrates the forecast background traffic volumes for the 2029 horizon year.



2029 Background Traffic Volumes
AM Peak Hour



2029 Background Traffic Volumes PM Peak Hour

4.3 Site Trip Generation

4.3.1 Vehicle Trip Generation

Trip generation for the subject development has been estimated using information contained in the Institute of Transportation Engineers (ITE) publication, "Trip Generation Manual, 11th Edition"[9].

Specifically, trip equations for Land Use Code (LUC) 221 – Multifamily Housing (Mid-Rise) were used. This land use is defined as "apartments and condominiums located in a building that has between four and ten floors of living space".

Table summarizes the trip generation estimates and indicates the site is forecast to generate a total of 105 new vehicle trips in the AM peak hour and 104 new vehicle trips in the PM peak hour.

As noted in **Section 3.4**, trips to and from the study area are predominantly automobile based (accounting for approximately 90% or higher of all trips); therefore, no adjustments have been made to account for trips made by transit or alternative travel modes.

TABLE 4.1: SITE TRIP GENERATION

LUC	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
221	265	Eqn.[1]	24	81	105	Eqn.[2]	63	41	104
Total Trip Generation			***24***	***85***	***105***		***63***	***41***	***104***

[1] – AM: T = 0.44(X) – 11.61 (23% inbound, 77% outbound)
[2] – PM: T = 0.39(X) + 0.34 (61% inbound, 39% outbound)

4.3.2 Site Trip Distribution and Assignment

Trip distribution for the development site is based on a review of existing traffic patterns and trip distribution data extracted from 2016 Transportation Tomorrow Survey (TTS) data. **Table 4.2** and **Table 4.3** summarize existing travel patterns based on intersection turning movement count data, and 2016 TTS trip distribution data, respectively.

TTS trip distribution was then combined with existing traffic pattern distributions by estimating by route. **Table 4.4** illustrates the estimated site trip distribution. **Appendix E** details trip distribution calculations.

[9] Institute of Transportation Engineers, *Trip Generation Manual (11th Edition)*, September 2021.

TABLE 4.2: EXISTING TRAVEL PATTERN DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Regional Road 50	36%	26%	30%	36%
South via Regional Road 50	29%	52%	48%	32%
West via Mayfield Road	10%	14%	13%	10%
North via Albion Vaughan Road	25%	8%	9%	22%
Total	***100%***	***100%***	***100%***	***100%***

TABLE 4.3: TTS TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North	65%	44%	33%	61%
South	23%	50%	57%	22%
West	12%	6%	10%	17%
Total	***100%***	***100%***	***100%***	***100%***

TABLE 4.4: ESTIMATED SITE TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North via Regional Road 50	38%	34%	25%	38%
South via Regional Road 50	23%	50%	57%	22%
West via Mayfield Road	12%	6%	10%	17%
North via Albion Vaughan Road	27%	10%	8%	23%
Total	***100%***	***100%***	***100%***	***100%***

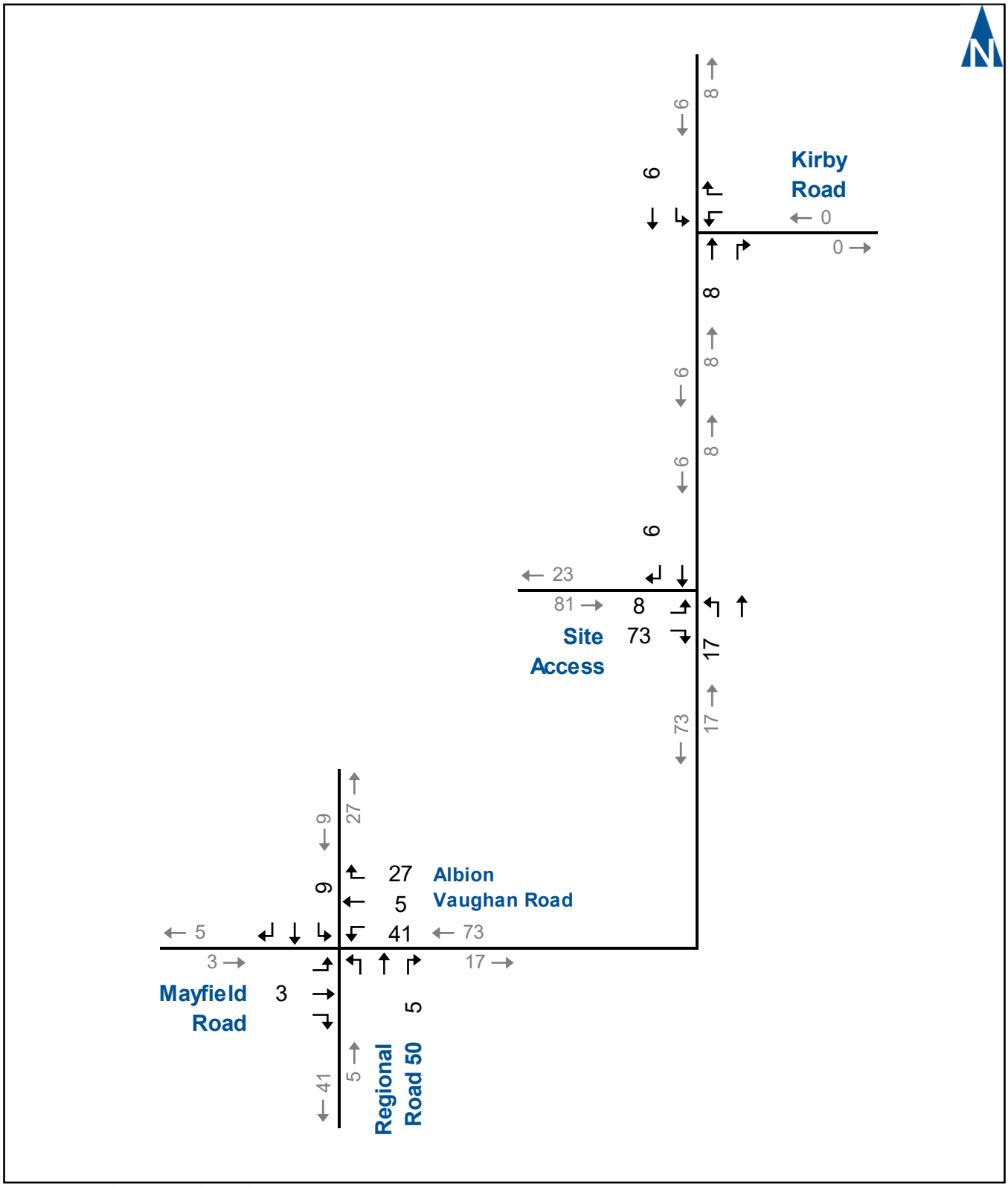
The estimated trip generation has been assigned to the study road network based on the distribution noted in **Table 4.4**. Based on the intended operation of the north and south driveway connections for service and delivery vehicles exclusively, all site traffic has been assigned to the central middle access driveway.

Figure 4.2 illustrates the site-generated vehicle traffic assignment for the AM and PM peak hours. Slight differences from the trip generation estimates are due to rounding.

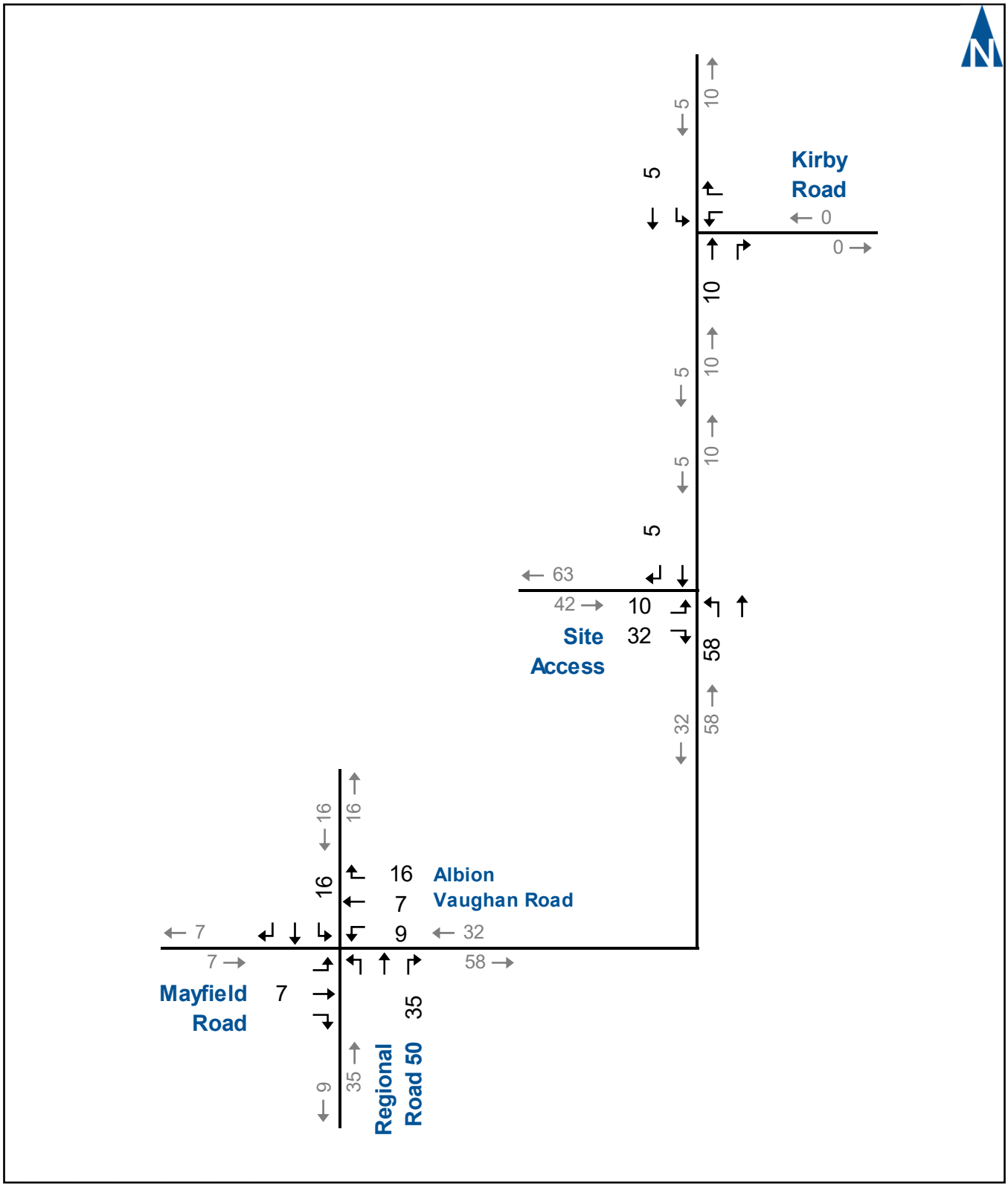
4.4 Forecast Total Traffic

The future background traffic forecasts were combined with the site traffic assignments to estimate the future total traffic volumes for the 2029 horizon year.

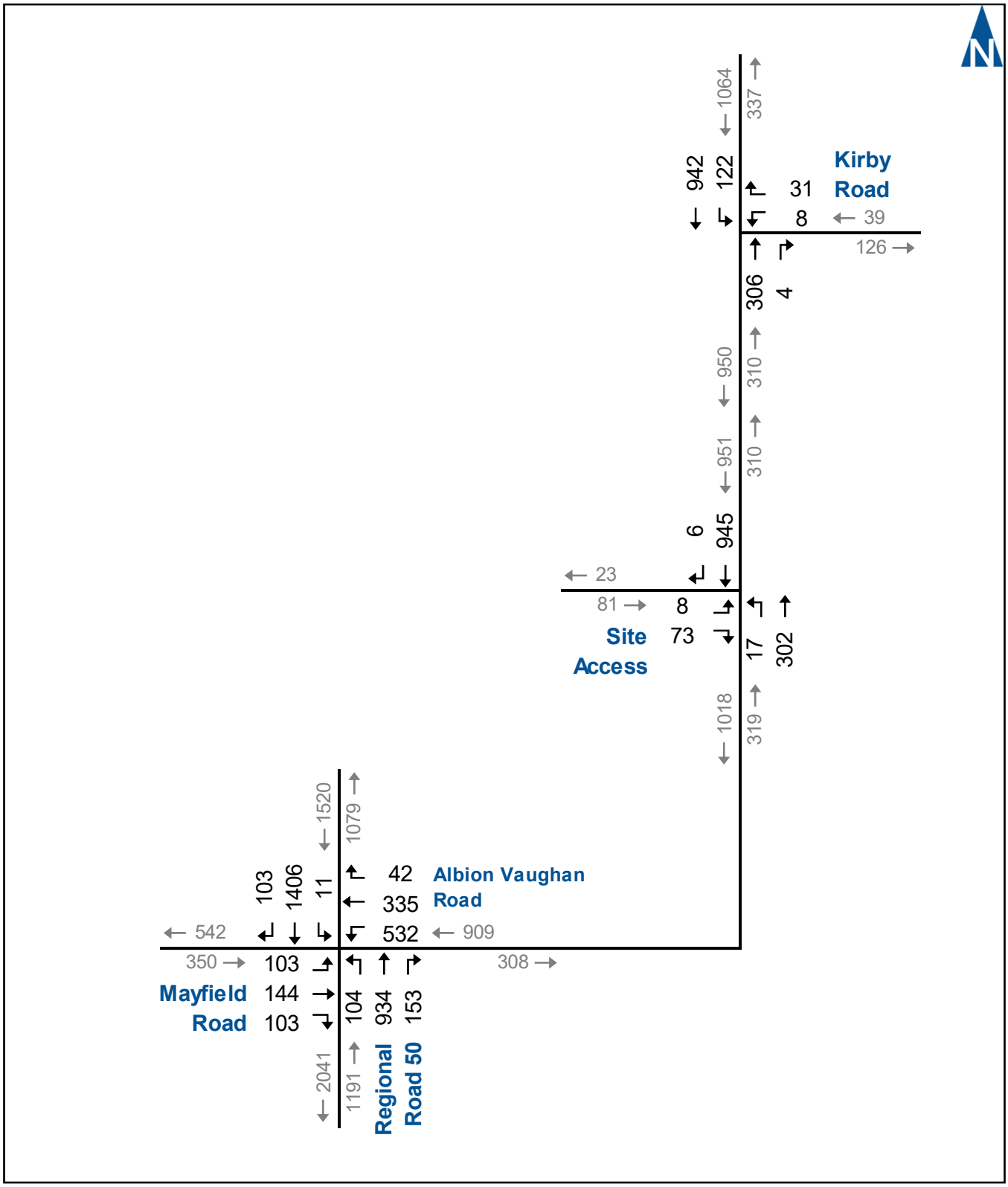
Figure 4.3 illustrates the 2029 total traffic forecasts.



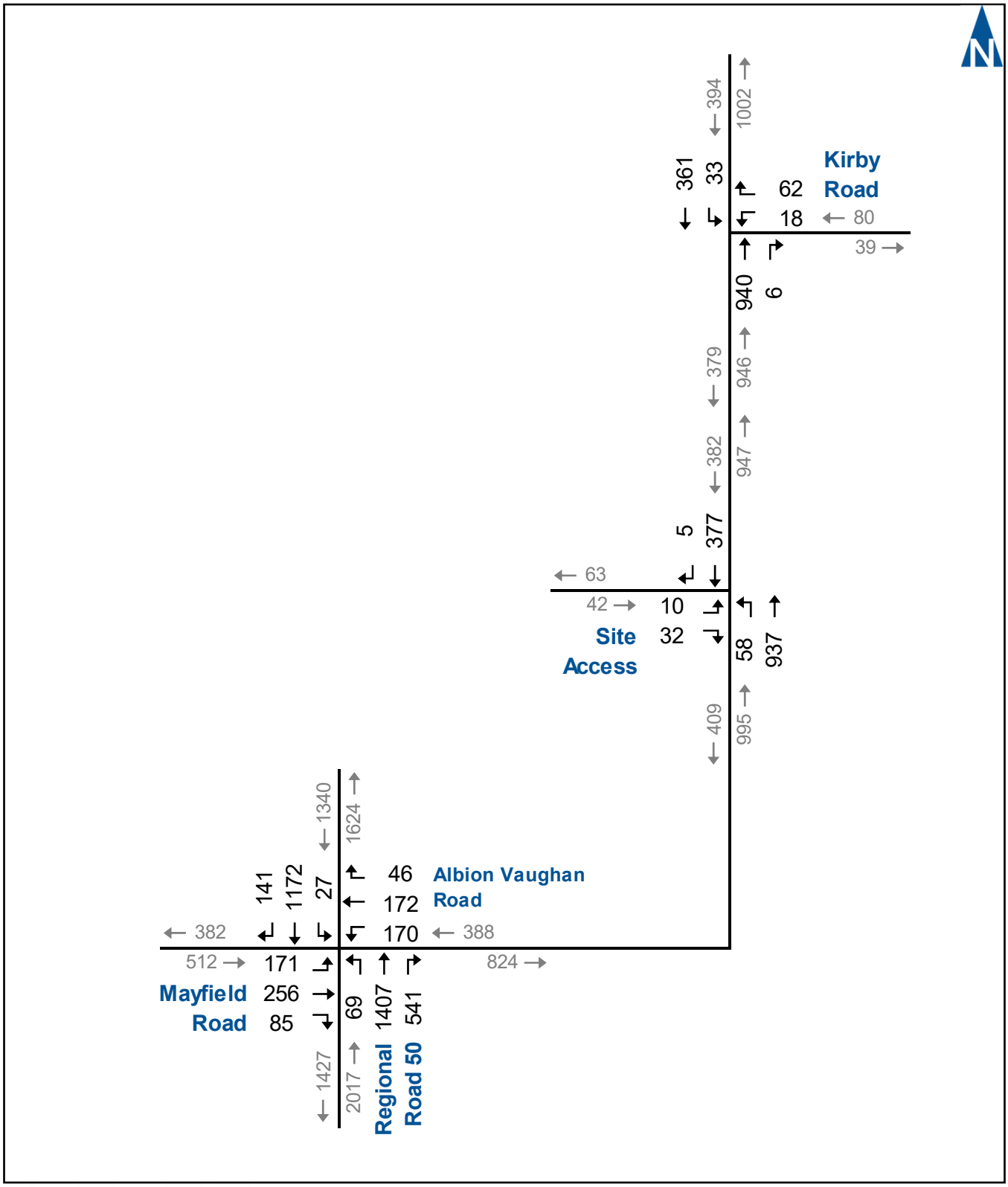
Site Traffic Volumes
AM Peak Hour



Site Traffic Volumes
PM Peak Hour



2029 Total Traffic Volumes AM Peak Hour



2029 Total Traffic Volumes PM Peak Hour

5 Transportation Impact Assessment

5.1 Future Background Traffic

To assess the operating conditions for the 2029 horizon year, analyses were undertaken using the same methodology, parameters, and traffic control devices as in the analysis of base year conditions.

The exception includes the optimization of timing splits within existing cycle lengths to improve traffic operations for all movements. **Table 5.1** presents the signal timing splits at the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road for the existing and background conditions.

TABLE 5.1: SIGNAL TIMING SPLITS

Condition	Phase 1	Phase 2	Phase 3	Phase 4	Phase 6	Phase 7	Phase 8
	NBL	SBTL	WBL	EBTL	NBTL	EBL	WBTL
AM Peak Hour							
Existing	25 s	63 s	27 s	45 s	88 s	10 s	62 s
2029 Background	16 s	75.5 s	39 s	29.5 s	91.5 s	10 s	58.5 s
Change	*-9 s*	*+12.5 s*	*+12 s*	*-15.5 s*	*+3.5 s*	*Nil*	*-3.5 s*
PM Peak Hour							
Existing	25 s	50 s	10 s	40 s	75 s	10 s	40 s
2029 Background	25 s	50 s	10 s	40 s	75 s	10 s	40 s
Change	Nil	Nil	Nil	Nil	Nil	Nil	Nil

Table 5.2 presents the operational analysis results including level of service (LOS), average vehicle delay in seconds, volume to capacity (v/c) ratio, and 95th percentile queues length in metres for the 2029 horizon. Critical movements are highlighted in yellow, if any.

Appendix F contains the detailed Synchro reports.

The analysis of background conditions (without the subject development) indicates the study area intersections are forecast to operate at acceptable level of services and within capacity.

The exception would be at the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road during the AM peak hour. The following critical movements are reported:

- The overall intersection reports a v/c ratio of 0.95; and
- Southbound dual through movement is forecast to operate at LOS D with a v/c ratio of 0.94.

TABLE 5.2: 2029 BACKGROUND TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS[1]	Delay[2]	V/C[3]	Q[4]	LOS[1]	Delay[2]	V/C[3]	Q[4]
Regional Road 50 & Albion Vaughan Road/Mayfield Road *Signalized*	EB	Left	E	64	0.55	32	D	40	0.56	10
		Thru	E	77	0.69	62	D	51	0.71	41
		Right	E	61	0.09	17	D	38	0.07	46
	WB	Left	E	72	0.95	153	D	46	0.67	1
		Thru	D	49	0.61	111	D	44	0.50	15
		Right	D	38	0.01	0	D	37	0.02	19
	NB	Left	E	76	0.80	51	B	17	0.39	4
		Dual Thru	C	23	0.50	108	B	18	0.70	24
		Right	B	17	0.10	10	B	13	0.36	27
	SB	Left	C	24	0.01	2	B	17	0.10	4
		Dual Thru	D	54	0.94	256	C	25	0.69	<1
		Right	C	25	0.07	11	B	16	0.09	<1
	Overall Intersection		***D***	***48***	***0.95***	***-***	***C***	***25***	***0.72***	***-***
Albion Vaughan Road & Kirby Road *Unsignalized*	WB	Left/Right	C	21	0.14	4	D	27	0.33	10
	NB	Thru/Right	Unopposed Movement				Unopposed Movement			
	SB	Left/Thru	A	3	0.10	2	A	1	0.05	1

[1] Level of Service; [2] Average vehicle delay, seconds; [3] Volume to capacity ratio; [4] 95th percentile queue, metres

5.2 Future Total Traffic

To assess operating conditions for the future total forecasts, an operational analysis was undertaken using the same methodology, parameters, and traffic control devices as in the analysis of background conditions.

Table 5.3 presents the operational analysis results including level of service (LOS), average vehicle delay in seconds, volume to capacity (v/c) ratio, and 95th percentile queues length in metres for the 2029 horizon. Critical movements are highlighted in yellow, if any.

Appendix G contains the detailed Synchro reports.

The analysis of total conditions (with the subject development) indicates the study area intersections would continue to operate at acceptable conditions, albeit slightly exacerbated with the inclusion of site-generated traffic.

The previously identified critical movements under background conditions would continue to be reported, albeit slightly exacerbated under total conditions. No additional critical movements were identified.

The site access intersection with Albion Vaughan Road is noted to operate at good levels of service and well within capacity.

TABLE 5.3: 2029 TOTAL TRAFFIC OPERATIONS

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS[1]	Delay[2]	V/C[3]	Q[4]	LOS[1]	Delay[2]	V/C[3]	Q[4]
Regional Road 50 & Albion Vaughan Road/Mayfield Road *Signalized*	EB	Left	E	67	0.58	31	D	40	0.56	43
		Thru	F	86	0.75	68	D	51	0.72	75
		Right	E	63	0.09	17	D	38	0.07	11
	WB	Left	E	76	0.98	180	D	49	0.71	43
		Thru	D	47	0.59	112	D	44	0.51	51
		Right	D	37	0.03	4	D	37	0.04	2
	NB	Left	F	85	0.84	53	B	17	0.39	13
		Dual Thru	C	25	0.52	110	B	18	0.70	151
		Right	B	19	0.11	10	B	14	0.40	30
	SB	Left	C	27	0.08	6	C	22	0.24	12
		Dual Thru	E	58	0.96	256	C	25	0.70	152
		Right	C	26	0.07	11	B	16	0.09	11
	Overall Intersection		***D***	***51***	***0.97***	**-**	***C***	***25***	***0.73***	**-**
Albion Vaughan Road & Kirby Road *Unsignalized*	WB	Left/Right	C	21	0.15	4	D	27	0.33	10
	NB	Thru/Right	Unopposed Movement				Unopposed Movement			
	SB	Left/Thru	A	3	0.10	2	A	1	0.05	1
Albion Vaughan Road & Site Access *Unsignalized*	EB	Left/Right	C	22	0.28	8	C	17	0.12	3
	NB	Left/Thru	A	1	0.02	1	A	1	0.05	1
	SB	Thru/Right	Unopposed Movement				Unopposed Movement			

[1] Level of Service; [2] Average vehicle delay, seconds; [3] Volume to capacity ratio; [4] 95th percentile queue, metres

5.3 Impact Assessment Summary

5.3.1 Site Traffic

Overall, the incremental impact of the proposed residential development is considered minor. The additional traffic would be less than daily traffic variations typically experienced (approximately 10%).

Table 5.4 provides a summary of how much traffic volumes will increase by with the subject residential development.

TABLE 5.4: TRAFFIC VOLUME INCREASE

Intersection	2029 Background vs. 2029 Total % Volume Increase (Total Entering)	
	AM Peak Hour	PM Peak Hour
Regional Road 50 & Albion Vaughan Road/Mayfield Road	2.3%	2.2%
Albion Vaughan Road & Kirby Road	1.0%	1.1%

Under the 2029 background conditions, the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road is reported to operate approaching capacity (with an overall v/c of 0.95). The southbound dual through movement is forecast to operate with a v/c of 0.94. The same critical movements were identified under 2029 total conditions.

With employers beginning to shift away from traditional office-based environments to work-from-home models and with commercial/retail and service-based businesses adapting by adjusting business hours and/or switching to web-based e-commerce storefronts, travel demands and patterns are changing.

In a post-COVID condition, it is plausible that traffic volumes may never reach pre-COVID levels as a result of this quantum shift that is being experienced. With changes in travel demand, behaviour, and patterns post-COVID due to changes in how office and business environments operate. The forecasts as analyzed are conservative and potentially under post-COVID conditions, traffic volumes may be considerably lower than forecast if the forecast growth is not materialized.

5.3.2 Intersection Improvements

Regional Road 50 and Albion Vaughan Road/Mayfield Road

Dual left-turn lanes for the westbound approach have been investigated as a potential mitigation measure to improve the overall intersection operations and the westbound left turn movement. While the movement has not been identified as a critical movement, from a volume perspective the movement would warrant the consideration of a dual left-turn lanes.

The westbound left-turn traffic volume is reported as 491 and 534 vehicles during the AM peak hour under the 2029 background and total traffic conditions, respectively. The amount of left-turn traffic exceeds the 300 vehicles per hour threshold identified by both the Highway Capacity Manual and the Transportation Association of Canada Geometric Design Guide for Canadian Roads for the consideration of dual left-turn lanes.

The following signal timing plan changes are proposed to provide the best possible traffic operations for all movements in the event that westbound dual left-turn lanes are implemented.

- The westbound left-turn movement turn type shall be changed from permitted/protected to a fully-protected movement; and
- Optimization of signal timing splits within the existing cycle lengths.

Table 5.5 presents the proposed signal timing split changes for the AM peak hour for the existing, background and total conditions.

TABLE 5.5: SIGNAL TIMING SPLITS – WB DUAL LEFT-TURN LANES

Condition	Phase 1	Phase 2	Phase 3	Phase 4	Phase 6	Phase 7	Phase 8
	NBL	SBTL	WBL	EBTL	NBTL	EBL	WBTL
AM Peak Hour							
Existing	25 s	63 s	27 s	45 s	88 s	10 s	62 s
2029 Background	16 s	76 s	28.5 s	39.5 s	92 s	11.5 s	56.5 s
2029 Total	16 s	76 s	29 s	39 s	92 s	10 s	58 s
PM Peak Hour							
Existing	25 s	50 s	10 s	40 s	75 s	10 s	40 s
2029 Background	11 s	60.4 s	14 s	39.6 s	71.4 s	13 s	40.6 s
2029 Total	11 s	60.4 s	14 s	39.6 s	71.4 s	13 s	40.6 s

Table 5.6 and **Table 5.7** present the results of the operational analysis at the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road for the 2029 background and total traffic conditions, respectively with the implementation of westbound dual left-turn lanes. **Appendix H** contains the Synchro analysis outputs for reference.

With the provision of dual left-turn lanes on the westbound approach, the intersection is reported to operate at acceptable levels of service and with all movements within capacity. No more critical movements are identified.

TABLE 5.6: 2029 BACKGROUND TRAFFIC OPERATIONS – DUAL LEFT-TURN LANES

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS[1]	Delay[2]	V/C[3]	Q[4]	LOS[1]	Delay[2]	V/C[3]	Q[4]
Regional Road 50 & Albion Vaughan Road/Mayfield Road *Signalized*	EB	Left	D	55	0.49	32	C	35	0.48	41
		Thru	E	68	0.63	57	D	51	0.71	73
		Right	E	56	0.09	16	D	38	0.07	11
	WB	Dual Left	E	71	0.83	97	D	54	0.53	29
		Thru	E	59	0.75	114	D	43	0.48	49
		Right	D	41	0.01	<1	D	37	0.02	<1
	NB	Left	E	59	0.74	47	C	21	0.47	14
		Dual Thru	B	19	0.47	101	C	21	0.74	161
		Right	B	14	0.10	10	B	15	0.34	16
	SB	Left	C	21	0.01	2	B	19	0.11	6
		Dual Thru	D	42	0.87	242	C	26	0.71	145
		Right	C	21	0.07	10	B	16	0.09	11
	Overall Intersection		***D***	***42***	***0.85***	***-***	***C***	***26***	***0.73***	***-***

[1] Level of Service; [2] Average vehicle delay, seconds; [3] Volume to capacity ratio; [4] 95th percentile queue, metres

TABLE 5.7: 2029 TOTAL TRAFFIC OPERATIONS – DUAL LEFT-TURN LANES

Intersection	Approach/ Movement		AM Peak Hour				PM Peak Hour			
			LOS[1]	Delay[2]	V/C[3]	Q[4]	LOS[1]	Delay[2]	V/C[3]	Q[4]
Regional Road 50 & Albion Vaughan Road/Mayfield Road *Signalized*	EB	Left	E	57	0.52	32	C	35	0.48	40
		Thru	E	69	0.65	59	D	51	0.72	75
		Right	E	57	0.09	16	D	38	0.07	11
	WB	Dual Left	E	74	0.88	108	D	54	0.56	30
		Thru	E	56	0.72	114	D	43	0.50	51
		Right	D	40	0.03	4	D	37	0.04	2
	NB	Left	E	60	0.74	47	C	21	0.48	14
		Dual Thru	B	19	0.47	100	C	22	0.74	162
		Right	B	14	0.11	10	B	16	0.39	24
	SB	Left	C	22	0.06	6	C	26	0.29	13
		Dual Thru	D	42	0.88	233	C	26	0.71	145
		Right	C	21	0.07	10	B	17	0.09	11
	Overall Intersection		***D***	***43***	***0.85***	***-***	***C***	***27***	***0.73***	***-***

[1] Level of Service; [2] Average vehicle delay, seconds; [3] Volume to capacity ratio; [4] 95th percentile queue, metres

Albion Vaughan Road and Site Access

From an operational standpoint, auxiliary turn lanes on Albion Vaughan Road are not necessary as the shared northbound left/through movement and the shared southbound through/right movements are both are reported to operate at LOS A and the movements are forecast to be well within capacity.

Regardless, the warrants for left-turn lanes within the Ontario Ministry of Transportation's (MTO) *Design Supplement* to the TAC *Geometric Design Guide for Canadian Roads* (TAC Guide) were investigated. The warrant is based on a combination of the advancing and opposing design hour volumes, the design speed of the road, and the percentage of left-turning vehicles in the advancing volume.

A warrant analysis has been completed using the nomographs for two-lane, unsignalized intersections, with a design speed of 80 km/h (20 km/h over the posted speed limit). **Table 5.8** summarizes the details of the left-turn warrant analysis.

TABLE 5.8: LEFT-TURN LANE WARRANT ANALYSIS

Major Street	**Albion Vaughan Road**	
Minor Street	**Site Access**	
Approach Direction	Northbound	
Design Speed	80 km/h	
Peak Hour	**AM**	**PM**
Advancing Volume	319	995
Opposing Volume	951	382
Left-Turn Volume	17	58
% Left Turns	5%	6%
Warranted	**Yes**	**Yes**

Based upon 2029 total traffic forecasts, a northbound auxiliary left-turn lane is determined to be warranted from a volume perspective.

However, aforementioned, from an operational perspective it is noted that the shared northbound left/through movement is reported to operate at LOS A and the movement is forecast to be well within capacity.

Based upon the low forecast volume of southbound right-turn volumes, it is determined an auxiliary right-turn lane would not be necessary. As the forecast volume of turning traffic is low, it is anticipated these vehicles will not impede southbound traffic on Albion Vaughan Road or cause any undue hazard to through traffic.

In summary, a northbound auxiliary left-turn lane and southbound auxiliary right-turn lane at the site access is not recommended as determined from the traffic operational analysis, the noted movements would operate with minimal delay and well within capacity. Furthermore, the reported 95th percentile queues at the site access are not anticipated to encroach or spill back to adjacent intersections.

6 Parking Review

6.1 Development Overview

The proposed residential development comprises two residential towers, with a total of 265 residential dwelling units. The development statistics are as follows:

- One six-storey residential tower with 114 units total:
  - 37 one-bedroom units;
  - 22 one-bedroom + den units;
  - 31 two-bedroom units;
  - 18 two-bedroom + large balcony units;
  - 6 three-bedroom units.
- One seven-storey residential tower with 151 units total:
  - 41 one-bedroom units;
  - 14 one-bedroom + den units;
  - 68 two-bedroom units;
  - 21 two-bedroom + large balcony units;
  - 7 three-bedroom units.

A total of 462 parking spaces serving residents and visitors are proposed on-site, including 12 accessible parking spaces. The parking supply breakdown is as follows:

- 10 spaces at-grade;
- 221 spaces on parking level P1; and
- 231 spaces on parking level P2.

6.2 Zoning By-law Parking Requirements

Table 6.1 presents a comparison of the required and proposed number of vehicle parking spaces under the Town of Caledon Zoning By-law, Section 5: Parking, Loading and Delivery Standards[10].

The proposed vehicle parking supply does not meet the Town's By-law requirements and results in a theoretical deficit of 2 parking spaces.

[10] Town of Caledon, *Zoning By-law, Section 5: Parking, Loading and Delivery Standards*, February 10 2022.

Specifically, the development is proposing to satisfy the visitor parking requirement, and is seeking a 0.5% reduction in the resident parking component (rate of 1.49 spaces/unit vs. 1.50 spaces/unit).

TABLE 6.1: REQUIRED AND PROVIDED PARKING

Type of Use	By-law Requirement	Parking Spaces		
		Required	Provided	Net Surplus (Deficiency)
Building, Apartment (265 units)	1.5 spaces per dwelling unit for residents	398	396	-2
	0.25 spaces per unit for visitors	66	66	-
Total		***464***	***462***	***-2***

6.3 Accessible Parking Requirements

The accessible parking requirements for the subject site have been verified against the Town of Caledon Zoning By-law 2015-58, Schedule K: Designed Accessible Parking Spaces[11].

The minimum number of accessible parking spaces is two accessible spaces plus 2% of the proposed parking spaces, when the required number of parking spaces is between 201 and 1000.

Table 6.2 presents a comparison of the required and proposed number of accessible parking spaces. The proposed accessible parking supply for the residential development meets and satisfies the Town's By-law requirements with a surplus of one accessible parking space.

TABLE 6.2: REQUIRED AND PROVIDED ACCESSIBLE PARKING

Proposed Parking Supply	By-law Requirement	Parking Spaces		
		Required	Provided	Net Surplus (Deficiency)
462 spaces	2 spaces + 2% of total proposed parking spaces	11	12	+1
Total		***11***	***12***	***+1***

[11] Town of Caledon, *Zoning By-law 2015-58, Schedule K: Designed Accessible Parking Spaces*, Effective 27 April 2021.

6.4 Parking Justification

In our professional opinion, the resultant resident component deficiency of 2 spaces is considered acceptable for the proposed development. The rationale and justification is as follows:

- The proposed resident parking supply represents a 0.5% reduction from the Town's municipal requirement. A rate of 1.49 spaces/unit is proposed in comparison to the requirement of 1.50 spaces/unit.

  Based upon a policy review of adjacent neighbouring municipalities, in the City of Vaughan and in the City of Mississauga, a relatively minor parking reduction is considered to be 10% or less of the By-law requirements per their parking study guidelines;

- Institute of Transportation Engineers (ITE) Parking Generation 5th Edition data was referenced which further supports the proposed resident parking rate.

  For LUC 221, the forecast peak parking demand for 265 dwelling units is 347 based upon the both the fitted curve and average rate. The forecast demand is less than the proposed resident supply of 398 space, resulting in a potential surplus of 51 parking spaces. **Appendix C** contains the ITE data for reference;

- While the subject site is served by limited transit service and active transportation infrastructure, it is anticipated that prospective residents will continue to travel to and from the site via automobile.

  However, with parking for the development to be unbundled from residential units. That is, parking spaces are to be rented/sold separately from the dwelling units. Prospective residents may choose not to own a vehicle or opt to forego their vehicle based upon as they see fit.

  Overall, there will be a self-regulating process where building residents with cars will favour units where parking is readily available, and those without cars will tend to choose units without regard to the parking provisions/arrangements.

  Therefore, prospective unit buyers or renters will either choose to live in this building or not to if parking is or is not available based upon their needs;

- With recent paradigm shifts occurring in work environments. Typical in-person models have been shifting towards remote work-from-home models. As a result of increased work from

home opportunities, average vehicle ownership rates have decreased from an anecdotal standpoint;

- The provision of on-site long-term and short-term bicycle parking to encourage and promote alternative travel modes to the automobile;
- A reduced parking supply is in line with smart growth policies; and
- The development and implementation of a Transportation Demand Management (TDM) Plan will assist in reducing single occupancy vehicle (SOV) trips and the associated parking demands.

6.5 Summary

Based on the information presented above, the proposed parking supply is considered to be sufficient in serving the proposed residential development.

In summary the proposed 2 resident component parking space deficiency is not determined to be a critical issue. The proposed 0.5% reduction in resident supply is considered minor.

At a minimum, 1.49 parking spaces will be provided for each dwelling unit. Prospective residents of this building will effectively operate on a self-regulation basis determined by available parking as resident parking spaces will be unbundled from each dwelling unit.

The proposed resident supply of 396 spaces is supported by ITE Parking Generation demand data. The 265 dwelling units are forecast to generate a peak parking demand of 347 spaces, resulting in a surplus of 51 spaces.

As the visitor parking requirements will be met, it is not anticipated that there will be any undue impact on the Township or the adjacent neighbourhoods.

7 Circulation Review

AutoTURN software was used to review and confirm that design of the site accesses, internal circulation, and loading areas will accommodate the types of vehicles expected on-site. This involved the following tasks:

- Showing how a Region of Peel waste collection vehicle would enter the site, access the loading spaces, and exit the site;
- Showing how a Pumper Fire Truck would enter the site, circulate the designated fire route, and exit the site;
- Showing how a TAC Medium Single-Unit (MSU) truck (design vehicle representing typical service and delivery truck) would enter the site, access the loading spaces, and exit the site; and
- Showing how a TAC Passenger Car (design vehicle representing a large car) would enter the site, circulate, access the underground parking structure, and exit the site.

Our review of the underground parking levels noted that all parking spaces and drive aisle widths meet zoning requirements. Furthermore, no dead-end drive aisles were noted and no parking spaces were flagged to have ingress or egress issues.

Each of the design vehicle manoeuvres described above are accommodated by the design of the site without issue or conflict.

Appendix I contains the vehicle maneuvering diagrams for reference.

8 Conclusions and Recommendations

8.1 Conclusions

The conclusions of the study are as follows:

- Under the base year conditions, all study area intersections operate at acceptable levels of service and within capacity.
- For the 2029 background traffic conditions (without subject development), all study area intersections are forecast to operate at acceptable levels of service and within capacity.

  The exception would be the Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection, where the overall intersection v/c ratio is forecast to be 0.95 during the AM peak hour. The southbound dual through movement is reported to operate with a v/c of 0.94 during the AM peak hour.
- Under the 2029 total traffic conditions (with subject development), all study area intersections are forecast to operate at acceptable levels of service and within capacity.

  The previously identified critical movements would continue to be reported, albeit slightly exacerbated.
- The overall impact of the proposed residential development is anticipated to be minimal. The development is estimated to generate and add a total of 105 and 104 vehicle trips to the adjacent transportation network during the AM and PM peak hours, respectively.

  The additional traffic would be less than daily traffic variations typically experienced. It is determined the site generated traffic would increase volumes at the study area intersections between 1.0 to 2.3%.

  While not identified as a critical movement, auxiliary dual left-turn lanes were investigated at the westbound approach at the intersection of Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection. The movement is acknowledged to be approaching capacity under 2029 background and total traffic conditions.

  As analyzed with dual left-turn lanes on the westbound approach and optimization of signal timing splits within exiting cycle lengths, the overall intersection is reported to operate at acceptable levels of service and with all movements within capacity under the 2029 horizon.
- At the main central site access intersection with Albion Vaughan Road, it was determined an auxiliary northbound left-turn lane

would be warranted from a volume perspective. It is noted that the auxiliary left-turn lane is not required from an operational standpoint.

- The proposed overall parking results in a theoretical deficient of 2 spaces in comparison to the minimum zoning by-law requirements. That is, the visitor parking requirements would be satisfied; however, the proposed resident parking requirements would be theoretically deficient by 0.5%.

  The proposed resident parking supply is anticipated to adequately serve the residential development. The main basis in support of the minor reduction is supported by ITE Parking Generation forecasts of peak parking demands. The proposed resident supply would result in a surplus of parking based upon the forecast peak demands. Additionally, parking spaces will be unbundled from residential units.

- A review of the site plan was undertaken. No major conflicts or issues were identified for the anticipated design vehicles expected on-site.

8.2 Recommendations

The recommendations of the study are as follows:

- From a transportation perspective, the planning applications sought should be approved as the development is determined to have a minimal impact on the adjacent transportation network.
- The intersection volumes and operations at the Regional Road 50 and Albion Vaughan Road/Mayfield Road intersection be monitored by the applicable jurisdiction to determine when dual westbound left-turn lanes should be provided.
- Regardless of being warranted, a northbound auxiliary left-turn lane is not required at the central site access intersection on Albion Vaughan Road based upon forecast traffic operations.

Appendix A

Pre-Study Consultation Correspondence

Adrian Soo

From: Arash Olia <Arash.Olia@caledon.ca>
Sent: October 23, 2020 11:14 AM
To: Andrew Steinsky; catherine.barnes@peelregion.ca
Cc: Adrian Soo
Subject: RE: 200428 - 12148 Albion Vaughan Road TIS Scope of Work

Hi Andrew,

Please see my comments below in red.

Thanks,

Arash Olia, Ph.D., P.Eng.
Manager, Transportation Engineering
Finance & Infrastructure Services

Office: 905.584.2272 x.4073
Cell: 416.452.7091
Email: arash.olia@caledon.ca

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---

From: Andrew Steinsky <asteinsky@ptsl.com>
Sent: Thursday, October 22, 2020 10:45 AM
To: catherine.barnes@peelregion.ca; Arash Olia <Arash.Olia@caledon.ca>
Cc: Adrian Soo <asoo@ptsl.com>
Subject: 200428 - 12148 Albion Vaughan Road TIS Scope of Work

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the contents to be safe.

Hi Arash & Catherine,

We've been retained to prepare a Traffic Impact Study (TIS) for a residential development on the west side of Albion Vaughan Road, south of Kirby Road in Bolton. We're reaching out to both the Region and Town to confirm our scope of work. If you are not the correct point of contact, please let us know so we can contact the correct person. We would appreciate any comments by the week of November 2.

The development proposal includes 240 condominiums in a six-storey building, and 10 townhomes. Access is proposed through a new all-moves driveway connection to Albion Vaughan Road. Two separate driveway connections for loading and delivery vehicles are also proposed on the north and south edges of the site.

Based on the above, we propose the following work plan to carry out the TIS:

1. Analysis of AM and PM peak hours.

2. Horizon year five years ~~from date of study~~ (2025). **Please confirm.** **From completion/built out date**

3. Study area to include:
   - Highway 50 & Mayfield Road/Albion Vaughan Road; and
   - Albion Vaughan Road & Kirby Road.

   We have turning movements completed at both intersections on Thursday November 24, 2016. Are these counts acceptable given the current impacts of COVID-19 on traffic volumes? **Please confirm** an appropriate growth rate to factor these volumes to a 2020 base year. **I suggest adopt 2%**

4. Background traffic to be forecast using a per annum growth rate. **Please confirm appropriate growth rate. 2%**

5. Background developments to be included? **Please confirm**. **No background development**

6. ITE *Trip Generation Manual (10th Edition)* rates to establish trip generation

7. Mode share based on TTS.

8. Trip distribution derived from turning movement counts and origin/destination information obtained from TTS.

9. AutoTURN assessment to include relevant design vehicles expected on the site, and swept path analysis.

Please let me and Adrian Soo (cc'd on this e-mail) if you have any questions on the above work plan.

Thanks,

Andrew Steinsky, P.Eng.
Transportation Engineer

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x507
e: asteinsky@ptsl.com
w: www.ptsl.com

Since 1998, our unique "work at home" business model has enabled us to harness technology, offer high quality service and strong communication with our clients and now allows us to carry on our work for you during COVID-19.

Let's stay safe and look out for each other. We will get through this together.

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Appendix B

Growth Rate Calculation Based on Historical Traffic Volume Data

Project: 12148 Albion Vaughan
Project #: 200185
Task: Growth Rate Calculation

HIGHWAY 50, 1.0 km north of mayfield road

NE	Volume	SW	Volume	Total
Y_2009_NE	16325	Y_2009_SW	15690	32015
Y_2011_NE	13700	Y_2011_SW	13133	26833
Y_2012_NE	14784	Y_2012_SW	14130	28914
Y_2013_NE	16816	Y_2013_SW	15887	32703
Y_2014_NE	16719	Y_2014_SW	15954	32673
Y_2015_NE	17803	Y_2015_SW	16408	34211
Growth Rate	***1.45%***		***0.75%***	***1.11%***

HIGHWAY 50, 0.5 km north of countryside/nashville

NE	Volume	SW	Volume	Total
Y_2011_NE	12065	Y_2011_SW	12029	24094
Y_2012_NE	12100	Y_2012_SW	0	12100
Y_2013_NE	15333	Y_2013_SW	13319	28652
Y_2014_NE	13552	Y_2014_SW	14574	28126
Y_2015_NE	14835	Y_2015_SW	14804	29639
Y_2016_NE	16860	Y_2016_SW	16767	33627
Y_2017_NE	10860	Y_2017_SW	13040	23900
Growth Rate	***-1.74%***		***1.35%***	***-0.13%***

Mayfield Road, 0.8 km west of hwy 50

NE	Volume	SW	Volume	Total
Y_2012_NE	5266	Y_2012_SW	5232	10498
Y_2013_NE	5067	Y_2013_SW	5054	10121
Y_2014_NE	5451	Y_2014_SW	4960	10411
Y_2015_NE	4324	Y_2015_SW	4203	8527
Y_2016_NE	0	Y_2016_SW	0	0
Y_2017_NE	5542	Y_2017_SW	5181	10723
Growth Rate	***1.03%***		***-0.20%***	***0.43%***

Appendix C

Traffic Data

Albion Vaughan Road & Highway 50

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 10:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

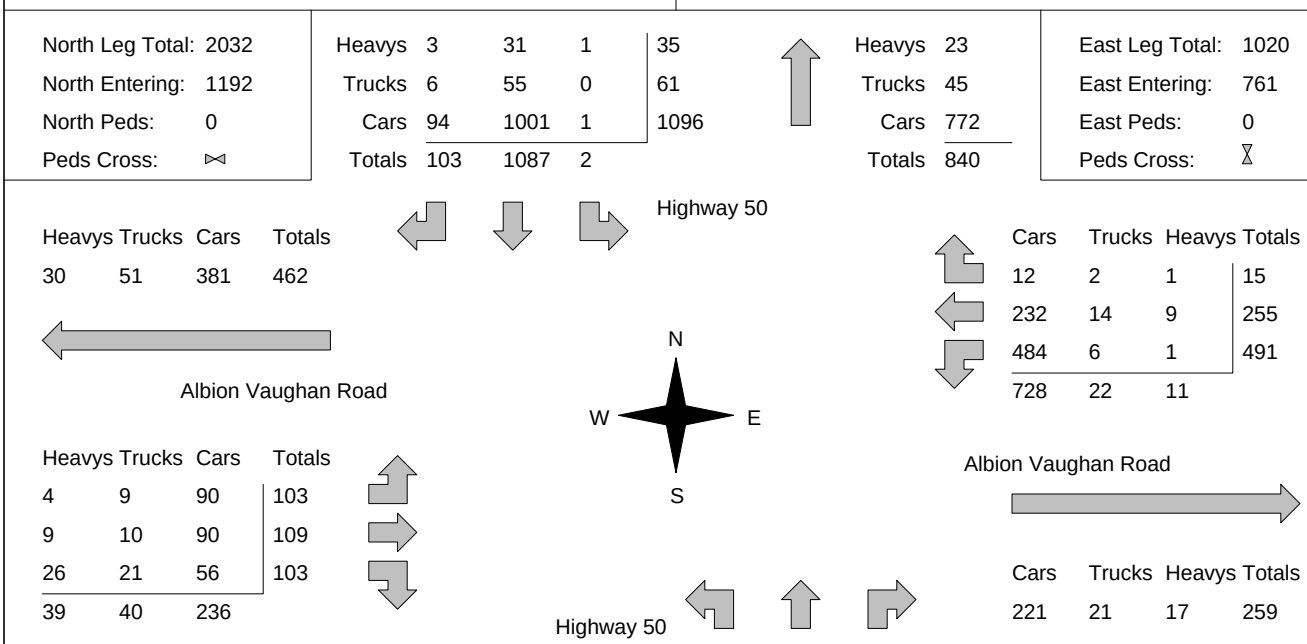
Municipality: Nobleton
Site #: 0000009401
Intersection: Highway 50 & Albion Vaughan Roa
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Highway 50 runs N/S



Comments

Albion Vaughan Road & Highway 50

Afternoon Peak Diagram

Specified Period
From: 14:00:00
To: 18:00:00

One Hour Peak
From: 16:00:00
To: 17:00:00

Municipality: Nobleton
Site #: 0000009401
Intersection: Highway 50 & Albion Vaughan Roa
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Highway 50 runs N/S

North Leg Total:	2347			
North Entering:	1058			
North Peds:	0			
Peds Cross:	⋈			
Heavys	3	25	1	29
Trucks	6	35	1	42
Cars	132	846	9	987
Totals	141	906	11	
Heavys	41			
Trucks	61			
Cars	1187			
Totals	1289			
East Leg Total:	1029			
East Entering:	319			
East Peds:	0			
Peds Cross:	⧖			

Highway 50

Heavys	Trucks	Cars	Totals
40	26	272	338

Albion Vaughan Road

Cars	Trucks	Heavys	Totals
23	6	1	30
106	7	15	128
152	6	3	161
281	19	19	

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Heavys	Trucks	Cars	Totals
2	9	160	171
11	9	173	193
20	10	55	85
33	28	388	

Albion Vaughan Road

Cars	Trucks	Heavys	Totals
654	12	44	710

Highway 50

Peds Cross:	⧖			
West Peds:	0			
West Entering:	449			
West Leg Total:	787			
Cars	1053			
Trucks	51			
Heavys	48			
Totals	1152			
Cars	34	1004	472	1510
Trucks	13	46	2	61
Heavys	22	38	32	92
Totals	69	1088	506	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	1663			
South Leg Total:	2815			

Comments

Albion Vaughan Road & Highway 50

Total Count Diagram

Municipality: Nobleton
Site #: 0000009401
Intersection: Highway 50 & Albion Vaughan Roa
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain
Person(s) who counted:

**** Signalized Intersection ****

Major Road: Highway 50 runs N/S

North Leg Total:	14934			
North Entering:	7544			
North Peds:	0			
Peds Cross:	⋈			
Heavys	37	299	6	342
Trucks	49	394	7	450
Cars	759	5946	47	6752
Totals	845	6639	60	
Heavys	296			
Trucks	423			
Cars	6671			
Totals	7390			
East Leg Total:	6580			
East Entering:	3502			
East Peds:	1			
Peds Cross:	⧖			

Highway 50

Heavys	Trucks	Cars	Totals
286	318	1982	2586

Cars	Trucks	Heavys	Totals
123	18	8	149
926	82	50	1058
2184	65	46	2295
3233	165	104	

Albion Vaughan Road

N
W E
S

Heavys	Trucks	Cars	Totals
22	44	800	866
62	79	832	973
208	163	299	670
292	286	1931	

Albion Vaughan Road

Cars	Trucks	Heavys	Totals
2726	144	208	3078

Highway 50

Peds Cross:	⧖			
West Peds:	0			
West Entering:	2509			
West Leg Total:	5095			
Cars	8429			
Trucks	622			
Heavys	553			
Totals	9604			
Cars	297	5748	1847	7892
Trucks	187	361	58	606
Heavys	199	266	140	605
Totals	683	6375	2045	
Peds Cross:	⋈			
South Peds:	2			
South Entering:	9103			
South Leg Total:	18707			

Comments

Albion Vaughan Road & Highway 50
Traffic Count Summary

Intersection: Highway 50 & Albion Vaughan Roa | **Count Date:** 24-Nov-2016 | **Municipality:** Nobleton

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	0	711	54	765	0	1354
8:00:00	3	1055	90	1148	0	2048
9:00:00	4	917	117	1038	0	1971
10:00:00	14	844	89	947	0	1752
14:00:00	0	0	0	0	0	0
15:00:00	17	637	127	781	0	2069
16:00:00	9	723	134	866	0	2449
17:00:00	11	906	141	1058	0	2721
18:00:00	2	846	93	941	0	2283
Totals:	60	6639	845	7544	0	16647

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	58	457	74	589	0
8:00:00	93	681	126	900	0
9:00:00	97	705	131	933	0
10:00:00	85	634	86	805	2
14:00:00	0	0	0	0	0
15:00:00	102	927	259	1288	0
16:00:00	107	1103	373	1583	0
17:00:00	69	1088	506	1663	0
18:00:00	72	780	490	1342	0
Totals:	683	6375	2045	9103	2

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	377	128	8	513	0	696
8:00:00	481	259	14	754	0	1053
9:00:00	451	154	22	627	0	926
10:00:00	278	109	17	404	0	715
14:00:00	0	0	0	0	0	0
15:00:00	178	73	18	269	0	587
16:00:00	178	105	25	308	0	656
17:00:00	161	128	30	319	0	768
18:00:00	191	102	15	308	1	610
Totals:	2295	1058	149	3502	1	6011

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	35	97	51	183	0
8:00:00	79	102	118	299	0
9:00:00	126	90	83	299	0
10:00:00	102	107	102	311	0
14:00:00	0	0	0	0	0
15:00:00	136	91	91	318	0
16:00:00	127	137	84	348	0
17:00:00	171	193	85	449	0
18:00:00	90	156	56	302	0
Totals:	866	973	670	2509	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Crossing Values:	540	819	731	491	405	442	525	437

Albion Vaughan Road & Kirby Road

Morning Peak Diagram

Specified Period
From: 6:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Nobleton
Site #: 0000009402
Intersection: Albion Vaughan Road & Kirby Road
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Non-Signalized Intersection ****

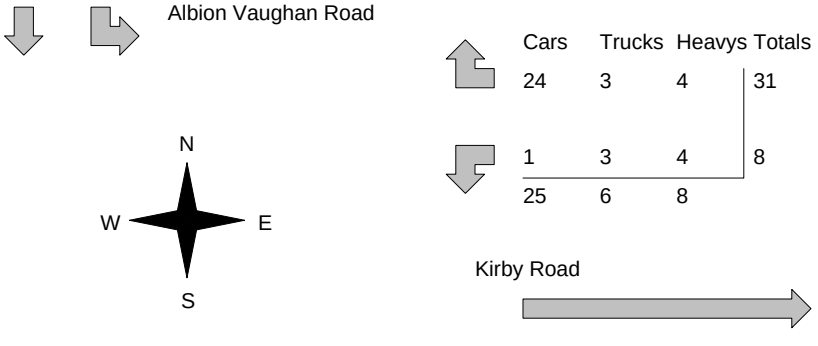
Major Road: Albion Vaughan Road runs N/S

North Leg Total: 1107
North Entering: 846
North Peds: 0
Peds Cross: ⋈

Heavys	5	2	7
Trucks	20	3	23
Cars	699	117	816
Totals	724	122	

Heavys	15	
Trucks	17	
Cars	229	
Totals	261	

East Leg Total: 165
East Entering: 39
East Peds: 0
Peds Cross: ⋈



Cars	Trucks	Heavys	Totals
24	3	4	31
1	3	4	8
25	6	8	

Cars	Trucks	Heavys	Totals
121	3	2	126

Cars	700		
Trucks	23		
Heavys	9		
Totals	732		

Cars	205	4	209
Trucks	14	0	14
Heavys	11	0	11
Totals	230	4	

Peds Cross: ⋈
South Peds: 0
South Entering: 234
South Leg Total: 966

Comments

Albion Vaughan Road & Kirby Road

Mid-day Peak Diagram

Specified Period
From: 11:30:00
To: 13:30:00

One Hour Peak
From: 12:15:00
To: 13:15:00

Municipality: Nobleton
Site #: 0000009402
Intersection: Albion Vaughan Road & Kirby Road
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Non-Signalized Intersection ****

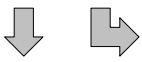
Major Road: Albion Vaughan Road runs N/S

North Leg Total: 497
North Entering: 270
North Peds: 0
Peds Cross: ⋈

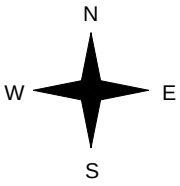
Heavys	18	0	18
Trucks	16	4	20
Cars	196	36	232
Totals	230	40	

Heavys	10
Trucks	16
Cars	201
Totals	227

East Leg Total: 74
East Entering: 28
East Peds: 0
Peds Cross: ⋈



	Cars	Trucks	Heavys	Totals
	21	2	1	24
	3	1	0	4
	24	3	1	



	Cars	Trucks	Heavys	Totals
	40	5	1	46

Cars	199		
Trucks	17		
Heavys	18		
Totals	234		

Cars	180	4	184
Trucks	14	1	15
Heavys	9	1	10
Totals	203	6	

Peds Cross: ⋈
South Peds: 0
South Entering: 209
South Leg Total: 443

Comments

Albion Vaughan Road & Kirby Road

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Nobleton
Site #: 0000009402
Intersection: Albion Vaughan Road & Kirby Road
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Albion Vaughan Road runs N/S

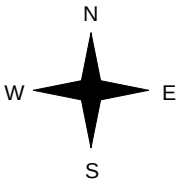
North Leg Total: 1089
North Entering: 308
North Peds: 0
Peds Cross: ⋈

Heavys	10	0	10
Trucks	8	1	9
Cars	257	32	289
Totals	275	33	

Heavys	10
Trucks	11
Cars	760
Totals	781

East Leg Total: 119
East Entering: 80
East Peds: 1
Peds Cross: ⧖

Cars	Trucks	Heavys	Totals	
61	1	0	62	
12	0	6	18	
73	1	6		



Cars	Trucks	Heavys	Totals	
37	2	0	39	

Cars	269
Trucks	8
Heavys	16
Totals	293

Cars	699	5	704
Trucks	10	1	11
Heavys	10	0	10
Totals	719	6	

Peds Cross: ⋈
South Peds: 0
South Entering: 725
South Leg Total: 1018

Comments

Albion Vaughan Road & Kirby Road

Total Count Diagram

Municipality: Nobleton
Site #: 0000009402
Intersection: Albion Vaughan Road & Kirby Road
TFR File #: 1
Count date: 24-Nov-2016

Weather conditions:
Cloudy / Rain

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Albion Vaughan Road runs N/S

North Leg Total: 6632
North Entering: 3543
North Peds: 0
Peds Cross: ⋈

Heavys	73	3	76
Trucks	120	16	136
Cars	2949	382	3331
Totals	3142	401	

Heavys	80
Trucks	110
Cars	2899
Totals	3089

East Leg Total: 818
East Entering: 355
East Peds: 1
Peds Cross: ⧖

Albion Vaughan Road

	Cars	Trucks	Heavys	Totals
	264	10	8	282
	52	7	14	73
	316	17	22	

N
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S

Kirby Road

Cars	Trucks	Heavys	Totals
434	22	7	463

Albion Vaughan Road

Cars	3001
Trucks	127
Heavys	87
Totals	3215

Cars	2635	52	2687
Trucks	100	6	106
Heavys	72	4	76
Totals	2807	62	

Peds Cross: ⋈
South Peds: 0
South Entering: 2869
South Leg Total: 6084

Comments

Albion Vaughan Road & Kirby Road
Traffic Count Summary

Intersection: Albion Vaughan Road & Kirby Roa | **Count Date:** 24-Nov-2016 | **Municipality:** Nobleton

North Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	41	549	0	590	0	764
8:00:00	128	732	0	860	0	1075
9:00:00	69	612	0	681	0	885
12:00:00	13	95	0	108	0	206
13:00:00	39	209	0	248	0	462
15:00:00	21	119	0	140	0	247
16:00:00	29	272	0	301	0	796
17:00:00	35	287	0	322	0	980
18:00:00	26	267	0	293	0	997
Totals:	401	3142	0	3543	0	6412

South Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	0	168	6	174	0
8:00:00	0	207	8	215	0
9:00:00	0	198	6	204	0
12:00:00	0	90	8	98	0
13:00:00	0	207	7	214	0
15:00:00	0	101	6	107	0
16:00:00	0	491	4	495	0
17:00:00	0	653	5	658	0
18:00:00	0	692	12	704	0
Totals:	0	2807	62	2869	0

East Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches
6:00:00	0	0	0	0	0	0
7:00:00	2	0	9	11	0	11
8:00:00	8	0	23	31	0	31
9:00:00	7	0	29	36	0	36
12:00:00	3	0	13	16	0	16
13:00:00	6	0	26	32	0	32
15:00:00	5	0	7	12	0	12
16:00:00	12	0	64	76	0	76
17:00:00	13	0	55	68	1	68
18:00:00	17	0	56	73	0	73
Totals:	73	0	282	355	1	355

West Approach Totals

Hour Ending	Includes Cars, Trucks, & Heavys: Left	Thru	Right	Grand Total	Total Peds
6:00:00	0	0	0	0	0
7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0
9:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0
13:00:00	0	0	0	0	0
15:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0
18:00:00	0	0	0	0	0
Totals:	0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	7:00	8:00	9:00	13:00	15:00	16:00	17:00	18:00
Crossing Values:	2	8	7	6	5	12	13	17

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**October 2, 2019**		**Prepared Date**	**November 11, 2020**
Database Rev	**18**		**Completed By**	**S.J**
Timing Card / Field rev	**-**		**Checked By**	**A.P**

Location — **Highway 50 at Mayfield Road**

Phase #	Street Name - Direction	Vehicle Minimum (s)	Pedestrian Minimum (s)		Amber (s)	All Red (s)	TIME PERIOD (s) (Green+Amber+All Red)		
			WALK	FDWALK			AM SPLITS	PM-1 SPLITS	PM-2 SPLITS
1	Highway 50 - NBLT Prot. Perm.	5	-	-	3.0	-	25	25	22
2	Highway 50 - SB	20	8	23	4.6	2.0	63	50	39
3	Mayfield Road - WBLT Prot. Perm.	5	-	-	3.0	-	27	10	9
4	Mayfield Road - EB	12	8	25	4.0	2.5	45	40	40
5	Not In Use	-	-	-	-	-	-	-	-
6	Highway 50 - NB	20	8	23	4.6	2.0	88	75	61
7	Mayfield Road - EBLT Prot. Perm.	5	-	-	3.0	-	10	10	9
8	Mayfield Road - WB	12	8	25	4.0	2.5	62	40	40

System Control
No

Semi-Actuated Mode
No, Fully Actuated

TIME (M-F)	PEAK	CYCLE LENGTH (s)	OFFSET (s)
06:00 - 09:00	AM	160	27
15:00 - 19:30	PM-1	125	72
19:30 - 22:00	PM-2	110	7

Appendix D

Base Year Traffic Operations Reports

Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Future Volume (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1580	1642	1094	1767	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.584			0.598			0.098			0.345		
Satd. Flow (perm)	971	1642	1094	1112	1762	1331	125	3411	1426	432	3380	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103			65			148			103
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			563.9			378.1			686.1	
Travel Time (s)		17.4			33.8			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Adj. Flow (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

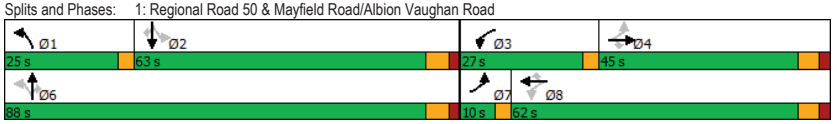
Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	45.0	45.0	27.0	62.0	62.0	25.0	88.0	88.0	63.0	63.0	63.0
Total Split (%)	6.3%	28.1%	28.1%	16.9%	38.8%	38.8%	15.6%	55.0%	55.0%	39.4%	39.4%	39.4%
Maximum Green (s)	7.0	38.5	38.5	24.0	55.5	55.5	22.0	81.4	81.4	56.4	56.4	56.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	-3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	0.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	28.1	17.6	17.6	51.1	34.6	34.6	85.1	81.5	81.5	64.0	64.0	64.0
Actuated g/C Ratio	0.20	0.13	0.13	0.37	0.25	0.25	0.61	0.59	0.59	0.46	0.46	0.46
v/c Ratio	0.46	0.59	0.45	0.92	0.66	0.04	0.55	0.41	0.17	0.01	0.79	0.14
Control Delay	42.4	69.4	16.1	62.9	54.7	0.2	27.8	16.9	2.5	25.5	37.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	69.4	16.1	62.9	54.7	0.2	27.8	16.9	2.5	25.5	37.6	5.2
LOS	D	E	B	E	D	A	C	B	A	C	D	A
Approach Delay		44.3			58.7			16.0			35.1	
Approach LOS		D			E			B			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 139.2			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 35.5		Intersection LOS: D	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
v/c Ratio	0.46	0.59	0.45	0.92	0.66	0.04	0.55	0.41	0.17	0.01	0.79	0.14
Control Delay	42.4	69.4	16.1	62.9	54.7	0.2	27.8	16.9	2.5	25.5	37.6	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	69.4	16.1	62.9	54.7	0.2	27.8	16.9	2.5	25.5	37.6	5.2
Queue Length 50th (m)	18.2	29.9	0.0	108.4	65.7	0.0	10.6	56.3	0.0	0.3	134.1	0.0
Queue Length 95th (m)	30.9	49.1	15.5	#164.9	93.8	0.0	27.0	77.0	8.9	2.2	#203.4	10.8
Internal Link Dist (m)		265.2			539.9			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	226	454	377	535	703	570	248	1996	896	198	1555	729
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.27	0.27	0.92	0.41	0.03	0.42	0.41	0.17	0.01	0.79	0.14

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Future Volume (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	0.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1642	1094	1767	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.58	1.00	1.00	0.60	1.00	1.00	0.10	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	971	1642	1094	1113	1762	1331	126	3411	1426	432	3380	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	123	103	491	287	15	104	813	148	2	1224	103
RTOR Reduction (vph)	0	0	90	0	0	11	0	0	61	0	0	56
Lane Group Flow (vph)	103	123	13	491	287	4	104	813	87	2	1224	47
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	24.6	17.6	17.6	44.6	34.6	34.6	81.5	81.5	81.5	64.1	64.1	64.1
Effective Green, g (s)	24.6	17.6	17.6	47.6	34.6	34.6	81.5	81.5	81.5	64.1	64.1	64.1
Actuated g/C Ratio	0.18	0.13	0.13	0.34	0.25	0.25	0.59	0.59	0.59	0.46	0.46	0.46
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	202	207	138	507	437	330	186	1997	834	198	1556	674
v/s Ratio Prot	0.03	0.07		c0.19	0.16		c0.06	0.24			c0.36	
v/s Ratio Perm	0.06		0.01	0.14		0.00	0.27		0.06	0.00		0.03
v/c Ratio	0.51	0.59	0.09	0.97	0.66	0.01	0.56	0.41	0.10	0.01	0.79	0.07
Uniform Delay, d1	50.5	57.4	53.8	42.8	47.0	39.4	21.2	15.7	12.7	20.4	31.8	20.9
Progression Factor	1.00	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	4.2	6.8	0.6	32.1	4.7	0.0	6.1	0.6	0.3	0.1	4.1	0.2
Delay (s)	54.7	64.2	54.4	74.9	51.7	39.4	27.3	16.3	13.0	20.4	35.9	21.1
Level of Service	D	E	D	E	D	D	C	B	B	C	D	C
Approach Delay (s)		58.1			65.8			16.9			34.7	
Approach LOS		E			E			B			C	

Intersection Summary				
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	139.2	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	96.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Base Year: AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	31	259	4	122	815
Future Volume (vph)	8	31	259	4	122	815
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893		0.998			
Flt Protected	0.990					0.994
Satd. Flow (prot)	1246	0	1730	0	0	1852
Flt Permitted	0.990					0.994
Satd. Flow (perm)	1246	0	1730	0	0	1852
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	88%	23%	11%	0%	4%	3%
Adj. Flow (vph)	8	31	259	4	122	815
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	263	0	0	937
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Base Year: AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	31	259	4	122	815
Future Volume (Veh/h)	8	31	259	4	122	815
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	31	259	4	122	815
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1320	261			263	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1320	261			263	
tC, single (s)	7.3	6.4			4.1	
tC, 2 stage (s)						
tF (s)	4.3	3.5			2.2	
p0 queue free %	92	96			91	
cM capacity (veh/h)	104	729			1290	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	39	263	937
Volume Left	8	0	122
Volume Right	31	4	0
cSH	328	1700	1290
Volume to Capacity	0.12	0.15	0.09
Queue Length 95th (m)	2.8	0.0	2.2
Control Delay (s)	17.5	0.0	2.3
Lane LOS	C		A
Approach Delay (s)	17.5	0.0	2.3
Approach LOS	C		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Base Year: AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	263	823	0
Future Volume (vph)	0	0	0	263	823	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	0	1842	1883	0
Flt Permitted						
Satd. Flow (perm)	1883	0	0	1842	1883	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			563.9	186.1	
Travel Time (s)	5.4			33.8	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	263	823	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	263	823	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Base Year: AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	263	823	0
Future Volume (Veh/h)	0	0	0	263	823	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	263	823	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)						
pX, platoon unblocked						
vC, conflicting volume	1086	823	823			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1086	823	823			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	239	373	807			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	263	823
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	807	1700
Volume to Capacity	0.00	0.00	0.48
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	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	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Future Volume (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.617			0.440			0.188			0.203		
Satd. Flow (perm)	1094	1746	1183	780	1642	1298	234	3380	1493	323	3411	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			84			505			141
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			552.1			378.1			686.1	
Travel Time (s)		17.4			33.1			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Adj. Flow (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

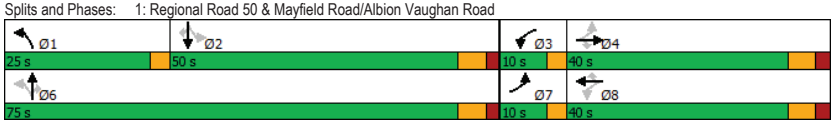
Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	40.0	40.0	10.0	40.0	40.0	25.0	75.0	75.0	50.0	50.0	50.0
Total Split (%)	8.0%	32.0%	32.0%	8.0%	32.0%	32.0%	20.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	7.0	33.5	33.5	7.0	33.5	33.5	22.0	68.4	68.4	43.4	43.4	43.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	31.5	21.0	21.0	31.5	21.0	21.0	72.2	68.5	68.5	57.7	57.7	57.7
Actuated g/C Ratio	0.28	0.19	0.19	0.28	0.19	0.19	0.64	0.61	0.61	0.51	0.51	0.51
v/c Ratio	0.50	0.67	0.29	0.59	0.47	0.10	0.29	0.60	0.46	0.07	0.58	0.17
Control Delay	36.3	52.9	10.6	40.3	45.8	0.6	12.2	15.8	2.5	19.9	22.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	52.9	10.6	40.3	45.8	0.6	12.2	15.8	2.5	19.9	22.8	3.7
LOS	D	D	B	D	D	A	B	B	A	B	C	A
Approach Delay		39.3			39.1			11.9			20.5	
Approach LOS		D			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 112.7			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 90.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
v/c Ratio	0.50	0.67	0.29	0.59	0.47	0.10	0.29	0.60	0.46	0.07	0.58	0.17
Control Delay	36.3	52.9	10.6	40.3	45.8	0.6	12.2	15.8	2.5	19.9	22.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	52.9	10.6	40.3	45.8	0.6	12.2	15.8	2.5	19.9	22.8	3.7
Queue Length 50th (m)	26.7	41.2	0.0	24.9	26.2	0.0	4.9	74.5	0.1	1.1	75.7	0.0
Queue Length 95th (m)	42.8	63.7	11.6	40.7	43.8	0.0	12.2	111.7	13.1	5.1	115.4	10.6
Internal Link Dist (m)		265.2			528.1			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	342	519	412	274	488	445	335	2055	1105	165	1745	840
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.42	0.21	0.59	0.30	0.07	0.21	0.60	0.46	0.07	0.58	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Base Year: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Future Volume (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.62	1.00	1.00	0.44	1.00	1.00	0.19	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1093	1746	1183	780	1642	1298	234	3380	1493	323	3411	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	217	85	161	144	30	69	1225	506	11	1020	141
RTOR Reduction (vph)	0	0	69	0	0	24	0	0	197	0	0	69
Lane Group Flow (vph)	171	217	16	161	144	6	69	1225	309	11	1020	72
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	28.0	21.0	21.0	28.0	21.0	21.0	69.2	69.2	69.2	57.7	57.7	57.7
Effective Green, g (s)	28.0	21.0	21.0	28.0	21.0	21.0	69.2	69.2	69.2	57.7	57.7	57.7
Actuated g/C Ratio	0.25	0.19	0.19	0.25	0.19	0.19	0.61	0.61	0.61	0.51	0.51	0.51
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	306	323	219	248	304	240	214	2064	911	164	1737	767
v/s Ratio Prot	0.03	c0.12		c0.04	0.09		0.02	c0.36			0.30	
v/s Ratio Perm	0.10		0.01	0.12		0.00	0.17		0.21	0.03		0.05
v/c Ratio	0.56	0.67	0.07	0.65	0.47	0.02	0.32	0.59	0.34	0.07	0.59	0.09
Uniform Delay, d1	36.3	42.9	38.1	37.0	41.2	37.8	11.3	13.5	10.8	14.1	19.5	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	1.00
Incremental Delay, d2	3.7	7.0	0.3	7.8	2.4	0.1	1.8	1.3	1.0	0.8	1.5	0.2
Delay (s)	40.0	50.0	38.4	44.8	43.6	37.8	13.2	14.7	11.8	14.9	20.9	14.6
Level of Service	D	D	D	D	D	D	B	B	B	B	C	B
Approach Delay (s)		44.3			43.7			13.9			20.1	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	113.3	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	90.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Base Year: PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	62	810	6	33	310
Future Volume (vph)	18	62	810	6	33	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895		0.999			
Flt Protected	0.989					0.995
Satd. Flow (prot)	1560	0	1861	0	0	1793
Flt Permitted	0.989					0.995
Satd. Flow (perm)	1560	0	1861	0	0	1793
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	2%	3%	17%	3%	7%
Adj. Flow (vph)	18	62	810	6	33	310
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	816	0	0	343
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Base Year: PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	62	810	6	33	310
Future Volume (Veh/h)	18	62	810	6	33	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	18	62	810	6	33	310
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1189	813			816	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1189	813			816	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	90	84			96	
cM capacity (veh/h)	173	378			807	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	816	343
Volume Left	18	0	33
Volume Right	62	6	0
cSH	299	1700	807
Volume to Capacity	0.27	0.48	0.04
Queue Length 95th (m)	7.4	0.0	0.9
Control Delay (s)	21.4	0.0	1.4
Lane LOS	C		A
Approach Delay (s)	21.4	0.0	1.4
Approach LOS	C		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Base Year: PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	816	328	0
Future Volume (vph)	0	0	0	816	328	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	0	1842	1883	0
Flt Permitted						
Satd. Flow (perm)	1883	0	0	1842	1883	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			552.1	186.1	
Travel Time (s)	5.4			33.1	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	816	328	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	816	328	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Base Year: PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	816	328	0
Future Volume (Veh/h)	0	0	0	816	328	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	816	328	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)						
pX, platoon unblocked						
vC, conflicting volume	1144	328	328			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1144	328	328			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	221	713	1232			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	816	328
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1232	1700
Volume to Capacity	0.00	0.00	0.19
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	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	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Trip Distribution Calculation

Project: 12148 Albion Vaughan Road
Project #: 200185
Task: Trip Distribution

TTS Results

Into/Out of Caledon	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North	20%	3%	6%	9%
East	0%	0%	0%	0%
South	23%	50%	57%	22%
West	9%	3%	1%	7%
Total	51%	56%	64%	38%

Within Caledon	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North	46%	40%	27%	52%
East	0%	0%	0%	0%
South	0%	0%	0%	0%
West	3%	3%	9%	10%
Total	49%	44%	36%	62%

All TTS Zones	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North	65%	44%	33%	61%
East	0%	0%	0%	0%
South	23%	50%	57%	22%
West	12%	6%	10%	17%
Total	100%	100%	100%	100%

TMC Travel Patterns

Direction	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
North	61%	34%	39%	58%
East	0%	0%	0%	0%
South	29%	52%	48%	32%
West	10%	14%	13%	10%

TMC Travel Patterns by Route

Distribution by Direction (from TMCs)		AM Peak Hour		PM Peak Hour	
		IN	OUT	IN	OUT
North	via Regional Road 50	59%	76%	77%	62%
North	via Albion Vaughan Road	41%	24%	23%	38%
South	via Regional Road 50	100%	100%	100%	100%
West	via Mayfield Road	100%	100%	100%	100%

Note: number represents % of traffic assigned to each direction by route

Estimated Site Trip Distribution

Distribution by Direction		AM Peak Hour		PM Peak Hour	
		IN	OUT	IN	OUT
North	via Regional Road 50	38%	34%	25%	38%
North	via Albion Vaughan Road	27%	10%	8%	23%
South	via Regional Road 50	23%	50%	57%	22%
West	via Mayfield Road	12%	6%	10%	17%
Total		**100%**	**100%**	**100%**	**100%**

Note: Cross-multiplication of TTS distribution (all TTS zones) and TMC travel patterns by route

AM Inbound
Fri Nov 18 2022 14:34:38 GMT-0500 (Eastern Standard Time) - Run Time: 2485ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Planning district of origin - pd_orig

Filters:
(2006 GTA zone of destination - gta06_dest In 3190
and
Start time of trip - start_time In 599-900)

Trip 2016
ROW : gta06_dest
COLUMN : pd_orig

gta06_dest	pd_orig	total	Jurisdiction	Study Direc	Percent
3190	10	32	Toronto	South	1.94%
3190	32	115	King	North	6.97%
3190	33	101	Vaughan	South	6.12%
3190	34	809	Caleodn	Internal	49.00%
3190	35	124	Brampton	South	7.51%
		123	Brampton	West	7%
3190	36	58	Mississauga	South	3.51%
3190	38	20	Milton	South	1.21%
3190	39	12	Oakville	South	0.73%
3190	72	25	Guelph/Eramosa	South	1.51%
		24	Guelph/Eramosa	West	1%
3190	80	11	Orangeville	North	0.67%
3190	84	165	Tecumseth	North	9.99%
3190	85	23	Adjala-Tosorontio	North	1.39%
3190	140	9	Mulmur	North	0.55%

1651

AM Outbound
Fri Nov 18 2022 14:36:31 GMT-0500 (Eastern Standard Time) - Run Time: 2705ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Planning district of destination - pd_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 3190
and
Start time of trip - start_time In 599-900)

Trip 2016
ROW : gta06_orig
COLUMN : pd_dest

gta06_orig	pd_dest	total	Jurisdiction	Study Direc	Percent
3190	1	96	Toronto	South	3.90%
3190	3	63	Toronto	South	2.56%
3190	4	60	Toronto	South	2.44%
3190	8	101	Toronto	South	4.10%
3190	9	57	Toronto	South	2.32%
3190	10	107	Toronto	South	4.35%
3190	13	46	Toronto	South	1.87%
3190	28	22	Aurora	North	0.89%
3190	29	10	Richmond Hill	South	0.41%
3190	31	23	Markham	South	0.93%
3190	33	405	Vaughan	South	16.45%
3190	34	1072	Caleodn	Internal	43.54%
3190	35	64	Brampton	South	2.60%
		63	Brampton	West	2.56%
3190	36	210	Mississauga	South	8.53%
3190	80	20	Orangeville	North	0.81%
3190	81	43	Barrie	North	1.75%

2462

	AM In	AM Out	PM In	PM Out
North	19.56%	3.45%	6.31%	9.17%
East	0.00%	0.00%	0.00%	0.00%
South	22.53%	50.45%	56.53%	22.01%
West	8.90%	2.56%	1.07%	6.94%
Total	**51.00%**	**56.46%**	**63.92%**	**38.12%**
Internal	**49.00%**	**43.54%**	**36.08%**	**61.88%**

PM Inbound
Fri Nov 18 2022 14:35:11 GMT-0500 (Eastern Standard Time) - Run Time: 2535ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: Planning district of origin - pd_orig

Filters:
(2006 GTA zone of destination - gta06_dest In 3190
and
Start time of trip - start_time In 1599-1900)

Trip 2016
ROW : gta06_dest
COLUMN : pd_orig

gta06_dest	pd_orig	total	Jurisdiction	Study Direc	Percent
3190	1	64	Toronto	South	2.75%
3190	3	63	Toronto	South	2.71%
3190	4	27	Toronto	South	1.16%
3190	8	101	Toronto	South	4.34%
3190	9	93	Toronto	South	3.99%
3190	10	159	Toronto	South	6.83%
3190	11	30	Toronto	South	1.29%
3190	26	43	East Gwillibury	North	1.85%
3190	28	39	Aurora	North	1.68%
3190	29	10	Richmond Hill	South	0.43%
3190	31	23	Markham	South	0.99%
3190	32	43	King	North	1.85%
3190	33	490	Vaughan	South	21.05%
3190	34	840	Caleodn	Internal	36.08%
3190	35	25	Brampton	South	1.07%
		25	Brampton	West	1.07%
3190	36	231	Mississauga	South	9.92%
3190	85	22	Adjala-Tosorontio	North	0.95%

2328

PM Outbound
Fri Nov 18 2022 14:36:02 GMT-0500 (Eastern Standard Time) - Run Time: 3130ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: Planning district of destination - pd_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 3190
and
Start time of trip - start_time In 1599-1900)

Trip 2016
ROW : gta06_orig
COLUMN : pd_dest

gta06_orig	pd_dest	total	Jurisdiction	Study Direc	Percent
3190	5	9	Toronto	South	0.54%
3190	10	43	Toronto	South	2.59%
3190	14	8	Toronto	South	0.48%
3190	32	39	King	North	2.35%
3190	33	114	Vaughan	South	6.88%
3190	34	1026	Caleodn	Internal	61.88%
3190	35	61	Brampton	South	3.68%
		62	Brampton	West	4%
3190	36	94	Mississauga	South	5.67%
3190	39	12	Oakville	South	0.72%
3190	72	24	Guelph/Eramosa	South	1.45%
		25	Guelph/Eramosa	West	2%
3190	84	85	Tecumseth	North	5.13%
3190	144	28	Mono	North	1.69%
		28	Mono	West	1.69%

1658

AM Inbound
Fri Nov 18 2022 14:40:50 GMT-0500 (Eastern Standard Time) - Run Time: 2852ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(2006 GTA zone of destination - gta06_dest In 3190
and
Start time of trip - start_time In 599-900
and
Planning district of origin - pd_orig In 34,)

Trip 2016
ROW : gta06_dest
COLUMN : gta06_orig

gta06_dest	gta06_orig	total		From TTS (I	49.00%
			Study Dire	%	Weighting
3190	3002	10	North	1.23%	0.60%
		9	West	1.11%	0.54%
3190	3003	27	North	3.33%	1.63%
3190	3152	41	North	5.06%	2.48%
		41	West	5.06%	2.48%
3190	3189	6	North	0.74%	0.36%
		7	West	0.86%	0.42%
3190	3190	418	North	51.60%	25.29%
3190	3192	32	North	3.95%	1.94%
3190	3193	157	North	19.38%	9.50%
3190	3194	55	North	6.79%	3.33%
3190	3195	7	North	0.86%	0.42%
		810			

AM Outbound
Fri Nov 18 2022 14:42:08 GMT-0500 (Eastern Standard Time) - Run Time: 2504ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 3190
and
Start time of trip - start_time In 599-900
and
Planning district of destination - pd_dest In 34,)

Trip 2016
ROW : gta06_orig
COLUMN : gta06_dest

gta06_orig	gta06_dest	total		From TTS (	43.54%
			Study Dire	%	Weighting
3190	3002	10	North	0.93%	0.41%
		9	West	0.84%	0.37%
3190	3003	194	North	18.08%	7.87%
3190	3189	2	North	0.19%	0.08%
		2	West	0.19%	0.08%
3190	3190	418	North	38.96%	16.96%
3190	3191	67	West	6.24%	2.72%
3190	3192	69	North	6.43%	2.80%
3190	3193	260	North	24.23%	10.55%
3190	3194	42	North	3.91%	1.70%
		1073			

	AM In	AM Out	PM In	PM Out
North	45.55%	40.38%	26.80%	52.00%
East	0.00%	0.00%	0.00%	0.00%
South	0.00%	0.00%	0.00%	0.00%
West	3.45%	3.17%	9.28%	9.88%
Total	49.00%	43.54%	36.08%	61.88%

PM Inbound
Fri Nov 18 2022 14:41:25 GMT-0500 (Eastern Standard Time) - Run Time: 2492ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
(2006 GTA zone of destination - gta06_dest In 3190
and
Start time of trip - start_time In 1599-1900
and
Planning district of origin - pd_orig In 34,)

Trip 2016
ROW : gta06_dest
COLUMN : gta06_orig

gta06_dest	gta06_orig	total		From TTS (PD)	36.08%
			Study Dire	%	Weighting
3190	3003	31	North	3.69%	1.33%
3190	3010	23	West	2.74%	0.99%
3190	3015	43	West	5.12%	1.85%
3190	3100	14	North	1.67%	0.60%
		14	West	1.67%	0.60%
3190	3190	114	North	13.57%	4.90%
3190	3191	136	West	16.19%	5.84%
3190	3192	142	North	16.90%	6.10%
3190	3193	188	North	22.38%	8.08%
3190	3194	83	North	9.88%	3.57%
3190	3195	36	North	4.29%	1.55%
3190	3199	16	North	1.90%	0.69%
		840			

PM Outbound
Fri Nov 18 2022 14:42:24 GMT-0500 (Eastern Standard Time) - Run Time: 3014ms

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
(2006 GTA zone of origin - gta06_orig In 3190
and
Start time of trip - start_time In 1599-1900
and
Planning district of destination - pd_dest In 34,)

Trip 2016
ROW : gta06_orig
COLUMN : gta06_dest

gta06_orig	gta06_dest	total		From TTS (PD)	61.88%
			Study Dire	%	Weighting
3190	3003	42	North	4.09%	2.53%
3190	3010	23	West	2.24%	1.39%
3190	3015	77	West	7.50%	4.64%
3190	3151	8	North	0.78%	0.48%
		9	West	0.88%	0.54%
3190	3153	83	North	8.08%	5.00%
3190	3190	114	North	11.10%	6.87%
3190	3191	27	West	2.63%	1.63%
3190	3192	220	North	21.42%	13.26%
3190	3193	260	North	25.32%	15.67%
3190	3194	61	North	5.94%	3.68%
3190	3195	10	North	0.97%	0.60%
3190	3197	19	North	1.85%	1.14%
		20	West	1.95%	1.21%
3190	3198	8	North	0.78%	0.48%
		8	West	0.78%	0.48%
3190	3199	38	North	3.70%	2.29%
		1027			

Appendix F

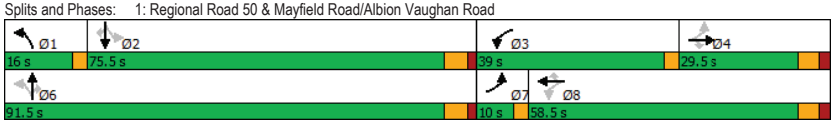
Background Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Future Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1580	1642	1094	1767	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.561			0.427			0.055			0.286		
Satd. Flow (perm)	933	1642	1094	794	1762	1331	70	3411	1426	358	3380	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103			65			148			103
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			563.9			378.1			686.1	
Travel Time (s)		17.4			33.8			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Adj. Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	29.5	29.5	39.0	58.5	58.5	16.0	91.5	91.5	75.5	75.5	75.5
Total Split (%)	6.3%	18.4%	18.4%	24.4%	36.6%	36.6%	10.0%	57.2%	57.2%	47.2%	47.2%	47.2%
Maximum Green (s)	7.0	23.0	23.0	36.0	52.0	52.0	13.0	84.9	84.9	68.9	68.9	68.9
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	30.0	19.5	19.5	61.5	48.0	48.0	88.6	85.0	85.0	69.4	69.4	69.4
Actuated g/C Ratio	0.19	0.12	0.12	0.39	0.31	0.31	0.57	0.54	0.54	0.44	0.44	0.44
v/c Ratio	0.50	0.69	0.46	0.92	0.61	0.03	0.79	0.50	0.18	0.01	0.94	0.15
Control Delay	46.3	83.2	17.0	63.9	51.4	0.1	74.4	23.9	3.1	26.5	54.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	83.2	17.0	63.9	51.4	0.1	74.4	23.9	3.1	26.5	54.0	5.0
LOS	D	F	B	E	D	A	E	C	A	C	D	A
Approach Delay		52.6			57.8			25.7			50.6	
Approach LOS		D			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 156.1			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 99.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
v/c Ratio	0.50	0.69	0.46	0.92	0.61	0.03	0.79	0.50	0.18	0.01	0.94	0.15
Control Delay	46.3	83.2	17.0	63.9	51.4	0.1	74.4	23.9	3.1	26.5	54.0	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	83.2	17.0	63.9	51.4	0.1	74.4	23.9	3.1	26.5	54.0	5.0
Queue Length 50th (m)	19.0	39.3	0.0	117.1	80.5	0.0	19.4	87.8	0.0	0.3	203.6	0.0
Queue Length 95th (m)	31.5	61.7	16.9	#152.6	111.1	0.0	#50.8	108.0	10.1	2.1	#255.9	10.5
Internal Link Dist (m)		265.2			539.9			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	207	242	249	537	587	487	135	1856	843	159	1502	708
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.58	0.41	0.91	0.56	0.03	0.77	0.50	0.18	0.01	0.94	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Future Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1642	1094	1767	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.56	1.00	1.00	0.43	1.00	1.00	0.06	1.00	1.00	0.29	1.00	1.00
Satd. Flow (perm)	933	1642	1094	794	1762	1331	71	3411	1426	358	3380	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
RTOR Reduction (vph)	0	0	90	0	0	10	0	0	67	0	0	57
Lane Group Flow (vph)	103	141	13	491	330	5	104	934	81	2	1406	46
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	26.5	19.5	19.5	58.0	48.0	48.0	85.0	85.0	85.0	69.4	69.4	69.4
Effective Green, g (s)	26.5	19.5	19.5	58.0	48.0	48.0	85.0	85.0	85.0	69.4	69.4	69.4
Actuated g/C Ratio	0.17	0.12	0.12	0.37	0.31	0.31	0.54	0.54	0.54	0.44	0.44	0.44
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	187	205	136	516	541	409	130	1857	776	159	1502	651
v/s Ratio Prot	0.02	0.09		c0.22	0.19		c0.06	0.27			c0.42	
v/s Ratio Perm	0.07		0.01	c0.14		0.00	0.37		0.06	0.01		0.03
v/c Ratio	0.55	0.69	0.09	0.95	0.61	0.01	0.80	0.50	0.10	0.01	0.94	0.07
Uniform Delay, d1	57.7	65.4	60.5	43.6	46.1	37.6	43.8	22.3	17.2	24.2	41.2	24.9
Progression Factor	1.00	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	5.9	11.7	0.6	28.3	2.9	0.0	31.9	1.0	0.3	0.1	12.3	0.2
Delay (s)	63.6	77.1	61.1	71.9	48.9	37.6	75.7	23.3	17.4	24.4	53.5	25.1
Level of Service	E	E	E	E	D	D	E	C	B	C	D	C
Approach Delay (s)		68.3			62.2			27.1			51.6	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	156.1	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	99.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Future Background: AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	31	298	4	122	936
Future Volume (vph)	8	31	298	4	122	936
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893		0.998			
Flt Protected	0.990					0.994
Satd. Flow (prot)	1246	0	1730	0	0	1852
Flt Permitted	0.990					0.994
Satd. Flow (perm)	1246	0	1730	0	0	1852
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	88%	23%	11%	0%	4%	3%
Adj. Flow (vph)	8	31	298	4	122	936
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	302	0	0	1058
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Future Background: AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	31	298	4	122	936
Future Volume (Veh/h)	8	31	298	4	122	936
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	31	298	4	122	936
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1480	300			302	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1480	300			302	
tC, single (s)	7.3	6.4			4.1	
tC, 2 stage (s)						
tF (s)	4.3	3.5			2.2	
p0 queue free %	90	96			90	
cM capacity (veh/h)	81	693			1248	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	39	302	1058
Volume Left	8	0	122
Volume Right	31	4	0
cSH	271	1700	1248
Volume to Capacity	0.14	0.18	0.10
Queue Length 95th (m)	3.5	0.0	2.3
Control Delay (s)	20.5	0.0	2.5
Lane LOS	C		A
Approach Delay (s)	20.5	0.0	2.5
Approach LOS	C		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Future Background: AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	302	945	0
Future Volume (vph)	0	0	0	302	945	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	0	1842	1883	0
Flt Permitted						
Satd. Flow (perm)	1883	0	0	1842	1883	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			563.9	186.1	
Travel Time (s)	5.4			33.8	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	302	945	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	302	945	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Future Background: AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	302	945	0
Future Volume (Veh/h)	0	0	0	302	945	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	302	945	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)						
pX, platoon unblocked						
vC, conflicting volume	1247	945	945			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1247	945	945			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	192	318	726			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	302	945
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	726	1700
Volume to Capacity	0.00	0.00	0.56
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

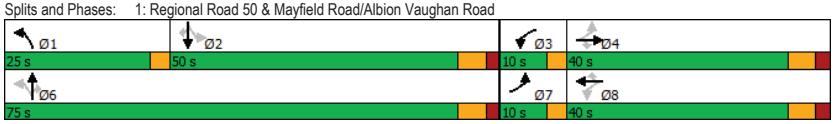
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Future Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.574			0.389			0.135			0.144		
Satd. Flow (perm)	1017	1746	1183	690	1642	1298	168	3380	1493	229	3411	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			84			458			141
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			552.1			378.1			686.1	
Travel Time (s)		17.4			33.1			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Adj. Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	40.0	40.0	10.0	40.0	40.0	25.0	75.0	75.0	50.0	50.0	50.0
Total Split (%)	8.0%	32.0%	32.0%	8.0%	32.0%	32.0%	20.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	7.0	33.5	33.5	7.0	33.5	33.5	22.0	68.4	68.4	43.4	43.4	43.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	33.9	23.3	23.3	33.9	23.3	23.3	72.2	68.6	68.6	57.4	57.4	57.4
Actuated g/C Ratio	0.29	0.20	0.20	0.29	0.20	0.20	0.63	0.60	0.60	0.50	0.50	0.50
v/c Ratio	0.50	0.71	0.28	0.61	0.50	0.09	0.35	0.70	0.47	0.10	0.69	0.17
Control Delay	35.8	53.7	10.0	41.0	45.6	0.5	14.8	19.4	3.5	23.5	27.1	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	53.7	10.0	41.0	45.6	0.5	14.8	19.4	3.5	23.5	27.1	4.0
LOS	D	D	B	D	D	A	B	B	A	C	C	A
Approach Delay		40.3			39.7			15.1			24.6	
Approach LOS		D			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 115.1			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 93.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
v/c Ratio	0.50	0.71	0.28	0.61	0.50	0.09	0.35	0.70	0.47	0.10	0.69	0.17
Control Delay	35.8	53.7	10.0	41.0	45.6	0.5	14.8	19.4	3.5	23.5	27.1	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	53.7	10.0	41.0	45.6	0.5	14.8	19.4	3.5	23.5	27.1	4.0
Queue Length 50th (m)	26.7	48.3	0.0	24.9	30.5	0.0	5.2	99.1	3.9	1.2	97.4	0.0
Queue Length 95th (m)	42.7	72.8	11.4	40.4	49.3	0.0	13.0	148.7	20.6	5.6	150.5	11.1
Internal Link Dist (m)		265.2			528.1			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	339	509	405	263	479	438	299	2014	1074	114	1700	822
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.49	0.21	0.61	0.34	0.07	0.23	0.70	0.47	0.10	0.69	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Future Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.57	1.00	1.00	0.39	1.00	1.00	0.13	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	1017	1746	1183	689	1642	1298	167	3380	1493	229	3411	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
RTOR Reduction (vph)	0	0	68	0	0	24	0	0	184	0	0	71
Lane Group Flow (vph)	171	249	17	161	165	6	69	1407	322	11	1172	70
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	30.3	23.3	23.3	30.3	23.3	23.3	69.2	69.2	69.2	57.4	57.4	57.4
Effective Green, g (s)	30.3	23.3	23.3	30.3	23.3	23.3	69.2	69.2	69.2	57.4	57.4	57.4
Actuated g/C Ratio	0.26	0.20	0.20	0.26	0.20	0.20	0.60	0.60	0.60	0.50	0.50	0.50
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	306	351	238	240	330	261	177	2023	893	113	1693	748
v/s Ratio Prot	0.03	c0.14		c0.04	0.10		0.03	c0.42			0.34	
v/s Ratio Perm	0.11		0.01	0.13		0.00	0.20		0.22	0.05		0.05
v/c Ratio	0.56	0.71	0.07	0.67	0.50	0.02	0.39	0.70	0.36	0.10	0.69	0.09
Uniform Delay, d1	35.9	43.0	37.4	36.9	41.0	37.0	13.9	16.0	11.9	15.4	22.3	15.4
Progression Factor	1.00	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	3.7	8.0	0.3	9.3	2.5	0.1	3.0	2.0	1.1	1.7	2.4	0.2
Delay (s)	39.6	51.0	37.7	46.1	43.5	37.1	16.9	18.0	13.0	17.1	24.7	15.6
Level of Service	D	D	D	D	D	D	B	B	B	B	C	B
Approach Delay (s)		44.9			44.1			16.7			23.6	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	93.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Future Background: PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	62	930	6	33	356
Future Volume (vph)	18	62	930	6	33	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895		0.999			
Flt Protected	0.989					0.996
Satd. Flow (prot)	1560	0	1862	0	0	1794
Flt Permitted	0.989					0.996
Satd. Flow (perm)	1560	0	1862	0	0	1794
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	2%	3%	17%	3%	7%
Adj. Flow (vph)	18	62	930	6	33	356
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	936	0	0	389
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.8%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Future Background: PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	62	930	6	33	356
Future Volume (Veh/h)	18	62	930	6	33	356
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	18	62	930	6	33	356
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1355	933			936	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1355	933			936	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	87	81			95	
cM capacity (veh/h)	135	323			728	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	936	389
Volume Left	18	0	33
Volume Right	62	6	0
cSH	246	1700	728
Volume to Capacity	0.33	0.55	0.05
Queue Length 95th (m)	9.5	0.0	1.0
Control Delay (s)	26.5	0.0	1.4
Lane LOS	D		A
Approach Delay (s)	26.5	0.0	1.4
Approach LOS	D		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Future Background: PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	937	377	0
Future Volume (vph)	0	0	0	937	377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1883	0	0	1842	1883	0
Flt Permitted						
Satd. Flow (perm)	1883	0	0	1842	1883	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			552.1	186.1	
Travel Time (s)	5.4			33.1	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	937	377	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	0	937	377	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Future Background: PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	937	377	0
Future Volume (Veh/h)	0	0	0	937	377	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	937	377	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)						
pX, platoon unblocked						
vC, conflicting volume	1314	377	377			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1314	377	377			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	174	670	1181			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	937	377
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1181	1700
Volume to Capacity	0.00	0.00	0.22
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	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	52.6%	ICU Level of Service	A
Analysis Period (min)	15		

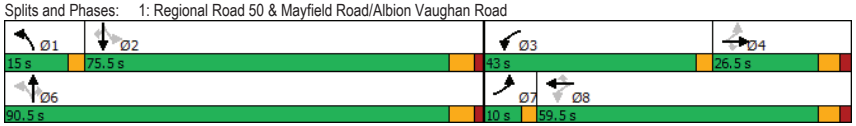
Appendix G

Total Traffic Operations Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	26.5	26.5	43.0	59.5	59.5	15.0	90.5	90.5	75.5	75.5	75.5
Total Split (%)	6.3%	16.6%	16.6%	26.9%	37.2%	37.2%	9.4%	56.6%	56.6%	47.2%	47.2%	47.2%
Maximum Green (s)	7.0	20.0	20.0	40.0	53.0	53.0	12.0	83.9	83.9	68.9	68.9	68.9
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	29.0	18.5	18.5	64.8	51.3	51.3	87.5	83.9	83.9	68.9	68.9	68.9
Actuated g/C Ratio	0.18	0.12	0.12	0.41	0.32	0.32	0.55	0.53	0.53	0.44	0.44	0.44
v/c Ratio	0.52	0.75	0.47	0.95	0.59	0.09	0.83	0.52	0.19	0.07	0.96	0.15
Control Delay	47.8	91.5	18.1	67.4	49.5	3.1	80.5	25.6	3.1	28.6	58.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	91.5	18.1	67.4	49.5	3.1	80.5	25.6	3.1	28.6	58.3	5.0
LOS	D	F	B	E	D	A	F	C	A	C	E	A
Approach Delay		57.0			57.9			27.5			54.5	
Approach LOS		E			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 158.3			
Natural Cycle: 115			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 47.4		Intersection LOS: D	
Intersection Capacity Utilization 101.7%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
v/c Ratio	0.52	0.75	0.47	0.95	0.59	0.09	0.83	0.52	0.19	0.07	0.96	0.15
Control Delay	47.8	91.5	18.1	67.4	49.5	3.1	80.5	25.6	3.1	28.6	58.3	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	91.5	18.1	67.4	49.5	3.1	80.5	25.6	3.1	28.6	58.3	5.0
Queue Length 50th (m)	18.8	41.1	0.0	129.6	81.3	0.0	19.8	92.2	0.0	1.9	209.5	0.0
Queue Length 95th (m)	31.1	#67.6	17.3	#179.8	111.8	3.8	#52.6	109.6	10.3	6.0	#255.9	10.5
Internal Link Dist (m)		265.2			539.9			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	198	207	228	562	589	488	126	1807	827	151	1471	696
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.70	0.45	0.95	0.57	0.09	0.83	0.52	0.19	0.07	0.96	0.15

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
Future Volume (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1642	1094	1767	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.56	1.00	1.00	0.40	1.00	1.00	0.06	1.00	1.00	0.28	1.00	1.00
Satd. Flow (perm)	929	1642	1094	739	1762	1331	71	3411	1426	348	3380	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
RTOR Reduction (vph)	0	0	91	0	0	28	0	0	72	0	0	58
Lane Group Flow (vph)	103	144	12	532	335	14	104	934	81	11	1406	45
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	25.5	18.5	18.5	61.3	51.3	51.3	83.9	83.9	83.9	68.9	68.9	68.9
Effective Green, g (s)	25.5	18.5	18.5	61.3	51.3	51.3	83.9	83.9	83.9	68.9	68.9	68.9
Actuated g/C Ratio	0.16	0.12	0.12	0.39	0.32	0.32	0.53	0.53	0.53	0.44	0.44	0.44
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	178	191	127	544	571	431	124	1807	755	151	1471	637
v/s Ratio Prot	0.03	0.09		c0.25	0.19		c0.06	0.27			c0.42	
v/s Ratio Perm	0.07		0.01	c0.13		0.01	0.38		0.06	0.03		0.03
v/c Ratio	0.58	0.75	0.09	0.98	0.59	0.03	0.84	0.52	0.11	0.07	0.96	0.07
Uniform Delay, d1	59.8	67.7	62.4	43.4	44.7	36.5	45.3	24.1	18.5	26.1	43.2	26.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	18.1	0.7	32.9	2.4	0.1	39.8	1.1	0.3	0.9	15.1	0.2
Delay (s)	66.9	85.8	63.1	76.3	47.0	36.6	85.0	25.1	18.8	27.0	58.3	26.3
Level of Service	E	F	E	E	D	D	F	C	B	C	E	C
Approach Delay (s)		73.6			63.7			29.6			55.9	
Approach LOS		E			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	158.3	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	101.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Future Total: AM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	8	31	306	4	122	942
Future Volume (vph)	8	31	306	4	122	942
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.893		0.998			
Flt Protected	0.990					0.994
Satd. Flow (prot)	1246	0	1729	0	0	1852
Flt Permitted	0.990					0.994
Satd. Flow (perm)	1246	0	1729	0	0	1852
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	88%	23%	11%	0%	4%	3%
Adj. Flow (vph)	8	31	306	4	122	942
Shared Lane Traffic (%)						
Lane Group Flow (vph)	39	0	310	0	0	1064
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Future Total: AM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	8	31	306	4	122	942
Future Volume (Veh/h)	8	31	306	4	122	942
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	31	306	4	122	942
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1494	308			310	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1494	308			310	
tC, single (s)	7.3	6.4			4.1	
tC, 2 stage (s)						
tF (s)	4.3	3.5			2.2	
p0 queue free %	90	95			90	
cM capacity (veh/h)	79	685			1239	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	39	310	1064
Volume Left	8	0	122
Volume Right	31	4	0
cSH	266	1700	1239
Volume to Capacity	0.15	0.18	0.10
Queue Length 95th (m)	3.5	0.0	2.3
Control Delay (s)	20.8	0.0	2.6
Lane LOS	C		A
Approach Delay (s)	20.8	0.0	2.6
Approach LOS	C		

Intersection Summary				
Average Delay		2.5		
Intersection Capacity Utilization		86.0%	ICU Level of Service	E
Analysis Period (min)		15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Future Total: AM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	8	73	17	302	945	6
Future Volume (vph)	8	73	17	302	945	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878				0.999	
Flt Protected	0.995			0.997		
Satd. Flow (prot)	1645	0	0	1837	1882	0
Flt Permitted	0.995			0.997		
Satd. Flow (perm)	1645	0	0	1837	1882	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			563.9	186.1	
Travel Time (s)	5.4			33.8	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	8	73	17	302	945	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	81	0	0	319	951	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Future Total: AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	73	17	302	945	6
Future Volume (Veh/h)	8	73	17	302	945	6
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	8	73	17	302	945	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1284	948	951			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1284	948	951			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	77	98			
cM capacity (veh/h)	178	316	722			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	81	319	951
Volume Left	8	17	0
Volume Right	73	0	6
cSH	294	722	1700
Volume to Capacity	0.28	0.02	0.56
Queue Length 95th (m)	7.7	0.5	0.0
Control Delay (s)	21.9	0.8	0.0
Lane LOS	C	A	
Approach Delay (s)	21.9	0.8	0.0
Approach LOS	C		

Intersection Summary					
Average Delay		1.5			
Intersection Capacity Utilization		61.7%	ICU Level of Service		B
Analysis Period (min)		15			

Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Future Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.560			0.379			0.133			0.143		
Satd. Flow (perm)	993	1746	1183	672	1642	1298	165	3380	1493	228	3411	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			84			449			141
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			552.1			378.1			686.1	
Travel Time (s)		17.4			33.1			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Adj. Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

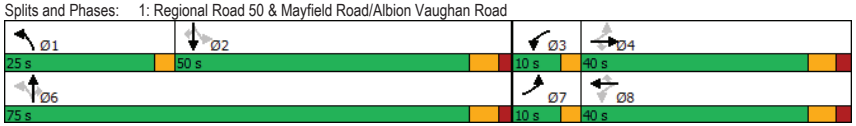
Lanes, Volumes, Timings
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	40.0	40.0	10.0	40.0	40.0	25.0	75.0	75.0	50.0	50.0	50.0
Total Split (%)	8.0%	32.0%	32.0%	8.0%	32.0%	32.0%	20.0%	60.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	7.0	33.5	33.5	7.0	33.5	33.5	22.0	68.4	68.4	43.4	43.4	43.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	34.4	23.8	23.8	34.4	23.8	23.8	72.2	68.6	68.6	57.4	57.4	57.4
Actuated g/C Ratio	0.30	0.21	0.21	0.30	0.21	0.21	0.62	0.59	0.59	0.50	0.50	0.50
v/c Ratio	0.51	0.71	0.27	0.65	0.51	0.14	0.35	0.70	0.51	0.24	0.69	0.17
Control Delay	35.8	53.9	9.8	43.3	45.7	2.2	15.1	19.7	4.5	29.1	27.5	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	0.0
Total Delay	35.8	53.9	9.8	43.3	45.7	2.2	15.1	19.7	4.5	29.1	27.5	4.1
LOS	D	D	A	D	D	A	B	B	A	C	C	A
Approach Delay		40.5			39.5			15.5			25.0	
Approach LOS		D			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 115.6			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 23.7		Intersection LOS: C	
Intersection Capacity Utilization 94.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
v/c Ratio	0.51	0.71	0.27	0.65	0.51	0.14	0.35	0.70	0.51	0.24	0.69	0.17
Control Delay	35.8	53.9	9.8	43.3	45.7	2.2	15.1	19.7	4.5	29.1	27.5	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	0.0
Total Delay	35.8	53.9	9.8	43.3	45.7	2.2	15.1	19.7	4.5	29.1	27.5	4.1
Queue Length 50th (m)	26.7	49.9	0.0	26.5	32.0	0.0	5.3	100.4	7.8	3.2	98.4	0.0
Queue Length 95th (m)	42.5	74.7	11.3	42.5	51.2	1.9	13.1	150.5	30.2	12.3	151.8	11.2
Internal Link Dist (m)		265.2			528.1			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	337	507	404	261	477	436	297	2005	1068	113	1692	818
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.50	0.21	0.65	0.36	0.11	0.23	0.70	0.51	0.24	0.69	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Future Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1746	1183	1684	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.56	1.00	1.00	0.38	1.00	1.00	0.13	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	992	1746	1183	671	1642	1298	166	3380	1493	228	3411	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
RTOR Reduction (vph)	0	0	68	0	0	37	0	0	181	0	0	71
Lane Group Flow (vph)	171	256	17	170	172	9	69	1407	360	27	1172	70
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4	8		8	6		6	2		2
Actuated Green, G (s)	30.8	23.8	23.8	30.8	23.8	23.8	69.2	69.2	69.2	57.3	57.3	57.3
Effective Green, g (s)	30.8	23.8	23.8	30.8	23.8	23.8	69.2	69.2	69.2	57.3	57.3	57.3
Actuated g/C Ratio	0.27	0.20	0.20	0.27	0.20	0.20	0.60	0.60	0.60	0.49	0.49	0.49
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	304	357	242	239	336	266	176	2014	889	112	1683	743
v/s Ratio Prot	0.03	c0.15		c0.04	0.10		0.03	c0.42			0.34	
v/s Ratio Perm	0.11		0.01	0.15		0.01	0.20		0.24	0.12		0.05
v/c Ratio	0.56	0.72	0.07	0.71	0.51	0.04	0.39	0.70	0.40	0.24	0.70	0.09
Uniform Delay, d1	35.8	43.0	37.2	37.5	41.0	37.0	14.2	16.2	12.5	16.9	22.7	15.6
Progression Factor	1.00	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	3.9	8.3	0.3	11.7	2.6	0.1	3.0	2.0	1.4	5.0	2.4	0.3
Delay (s)	39.7	51.3	37.5	49.2	43.6	37.1	17.2	18.3	13.9	21.9	25.1	15.9
Level of Service	D	D	D	D	D	D	B	B	B	C	C	B
Approach Delay (s)		45.1			45.3			17.0			24.1	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	116.1	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	94.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lanes, Volumes, Timings
2: Albion Vaughan Road & Kirby Road

Future Total: PM Peak Hour

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	18	62	940	6	33	361
Future Volume (vph)	18	62	940	6	33	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.895		0.999			
Flt Protected	0.989					0.996
Satd. Flow (prot)	1560	0	1862	0	0	1794
Flt Permitted	0.989					0.996
Satd. Flow (perm)	1560	0	1862	0	0	1794
Link Speed (k/h)	80		60			60
Link Distance (m)	414.0		186.1			286.8
Travel Time (s)	18.6		11.2			17.2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	33%	2%	3%	17%	3%	7%
Adj. Flow (vph)	18	62	940	6	33	361
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	946	0	0	394
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.7		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15		15	25	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 61.3%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
2: Albion Vaughan Road & Kirby Road

Future Total: PM Peak Hour

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	18	62	940	6	33	361
Future Volume (Veh/h)	18	62	940	6	33	361
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	18	62	940	6	33	361
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1370	943			946	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1370	943			946	
tC, single (s)	6.7	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.3			2.2	
p0 queue free %	86	81			95	
cM capacity (veh/h)	132	318			721	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	946	394
Volume Left	18	0	33
Volume Right	62	6	0
cSH	242	1700	721
Volume to Capacity	0.33	0.56	0.05
Queue Length 95th (m)	9.7	0.0	1.0
Control Delay (s)	27.1	0.0	1.4
Lane LOS	D		A
Approach Delay (s)	27.1	0.0	1.4
Approach LOS	D		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
3: Albion Vaughan Road & Driveway

Future Total: PM Peak Hour

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	10	32	58	937	377	5
Future Volume (vph)	10	32	58	937	377	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.7	3.5	3.7	3.5	3.7	3.7
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897				0.998	
Flt Protected	0.988			0.997		
Satd. Flow (prot)	1669	0	0	1837	1880	0
Flt Permitted	0.988			0.997		
Satd. Flow (perm)	1669	0	0	1837	1880	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	75.2			552.1	186.1	
Travel Time (s)	5.4			33.1	11.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	10	32	58	937	377	5
Shared Lane Traffic (%)						
Lane Group Flow (vph)	42	0	0	995	382	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.7			3.5	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	0.99	1.01	0.99	1.01	0.99	0.99
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Albion Vaughan Road & Driveway

Future Total: PM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	32	58	937	377	5
Future Volume (Veh/h)	10	32	58	937	377	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	10	32	58	937	377	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1432	380	382			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1432	380	382			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	95	95			
cM capacity (veh/h)	140	667	1176			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	42	995	382
Volume Left	10	58	0
Volume Right	32	0	5
cSH	353	1176	1700
Volume to Capacity	0.12	0.05	0.22
Queue Length 95th (m)	2.8	1.1	0.0
Control Delay (s)	16.6	1.3	0.0
Lane LOS	C	A	
Approach Delay (s)	16.6	1.3	0.0
Approach LOS	C		

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	86.0%	ICU Level of Service	E	
Analysis Period (min)	15			

Appendix H

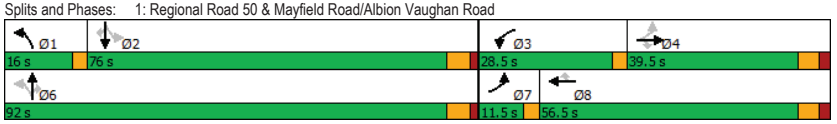
Traffic Operations Reports for Proposed Westbound Dual Left-Turn Lanes

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Future Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1580	1642	1094	3429	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.527			0.950			0.059			0.302		
Satd. Flow (perm)	876	1642	1094	3429	1762	1331	75	3411	1426	378	3380	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			103			65			148			103
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			563.9			378.1			686.1	
Travel Time (s)		17.4			33.8			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Adj. Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Shared Lane Traffic (%)												
Lane Group Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	11.5	39.5	39.5	28.5	56.5	56.5	16.0	92.0	92.0	76.0	76.0	76.0
Total Split (%)	7.2%	24.7%	24.7%	17.8%	35.3%	35.3%	10.0%	57.5%	57.5%	47.5%	47.5%	47.5%
Maximum Green (s)	8.5	33.0	33.0	25.5	50.0	50.0	13.0	85.4	85.4	69.4	69.4	69.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	Max	None	None	Min	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	32.0	20.0	20.0	25.5	37.0	37.0	89.1	85.5	85.5	70.0	70.0	70.0
Actuated g/C Ratio	0.22	0.14	0.14	0.17	0.25	0.25	0.61	0.58	0.58	0.48	0.48	0.48
v/c Ratio	0.45	0.63	0.43	0.83	0.74	0.04	0.73	0.47	0.17	0.01	0.88	0.14
Control Delay	41.6	72.8	15.3	71.6	61.7	0.2	60.0	19.3	2.7	23.5	42.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	72.8	15.3	71.6	61.7	0.2	60.0	19.3	2.7	23.5	42.7	4.6
LOS	D	E	B	E	E	A	E	B	A	C	D	A
Approach Delay		46.5			66.4			20.8			40.1	
Approach LOS		D			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 147.2			
Natural Cycle: 125			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 40.5		Intersection LOS: D	
Intersection Capacity Utilization 86.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
v/c Ratio	0.45	0.63	0.43	0.83	0.74	0.04	0.73	0.47	0.17	0.01	0.88	0.14
Control Delay	41.6	72.8	15.3	71.6	61.7	0.2	60.0	19.3	2.7	23.5	42.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	72.8	15.3	71.6	61.7	0.2	60.0	19.3	2.7	23.5	42.7	4.6
Queue Length 50th (m)	19.1	36.3	0.0	66.1	82.1	0.0	16.1	72.6	0.0	0.3	175.3	0.0
Queue Length 95th (m)	31.9	57.3	15.8	#97.0	114.0	0.0	#47.1	101.3	9.5	1.9	#242.4	10.1
Internal Link Dist (m)		265.2			539.9			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	231	368	325	594	599	495	146	1981	890	179	1606	750
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.38	0.32	0.83	0.55	0.03	0.71	0.47	0.17	0.01	0.88	0.14

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Future Volume (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1642	1094	3429	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.53	1.00	1.00	0.95	1.00	1.00	0.06	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	876	1642	1094	3429	1762	1331	76	3411	1426	378	3380	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	141	103	491	330	15	104	934	148	2	1406	103
RTOR Reduction (vph)	0	0	89	0	0	11	0	0	62	0	0	54
Lane Group Flow (vph)	103	141	14	491	330	4	104	934	86	2	1406	49
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Actuated Green, G (s)	28.5	20.0	20.0	25.5	37.0	37.0	85.6	85.6	85.6	70.0	70.0	70.0
Effective Green, g (s)	28.5	20.0	20.0	25.5	37.0	37.0	85.6	85.6	85.6	70.0	70.0	70.0
Actuated g/C Ratio	0.19	0.14	0.14	0.17	0.25	0.25	0.58	0.58	0.58	0.48	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	210	223	148	594	442	334	141	1983	829	179	1607	696
v/s Ratio Prot	0.03	0.09		c0.14	c0.19		c0.06	0.27			c0.42	
v/s Ratio Perm	0.07		0.01			0.00	0.37		0.06	0.01		0.03
v/c Ratio	0.49	0.63	0.09	0.83	0.75	0.01	0.74	0.47	0.10	0.01	0.87	0.07
Uniform Delay, d1	51.2	60.1	55.7	58.7	50.8	41.4	37.3	17.8	13.7	20.4	34.7	20.9
Progression Factor	1.00	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	3.7	7.9	0.6	12.5	8.1	0.0	21.5	0.8	0.3	0.1	7.0	0.2
Delay (s)	54.9	68.0	56.3	71.2	58.8	41.4	58.8	18.6	14.0	20.5	41.6	21.1
Level of Service	D	E	E	E	E	D	E	B	B	C	D	C
Approach Delay (s)		60.6			65.8			21.5			40.2	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	147.2	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	86.2%	ICU Level of Service	E	
Analysis Period (min)	15			

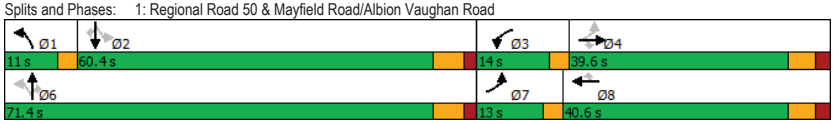
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Future Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1684	1746	1183	3267	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.595			0.950			0.130			0.126		
Satd. Flow (perm)	1055	1746	1183	3267	1642	1298	162	3380	1493	201	3411	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			84			500			141
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			552.1			378.1			686.1	
Travel Time (s)		17.4			33.1			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Adj. Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	13.0	39.6	39.6	14.0	40.6	40.6	11.0	71.4	71.4	60.4	60.4	60.4
Total Split (%)	10.4%	31.7%	31.7%	11.2%	32.5%	32.5%	8.8%	57.1%	57.1%	48.3%	48.3%	48.3%
Maximum Green (s)	10.0	33.1	33.1	11.0	34.1	34.1	8.0	64.8	64.8	53.8	53.8	53.8
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	36.9	23.4	23.4	10.8	24.1	24.1	68.6	65.0	65.0	56.4	56.4	56.4
Actuated g/C Ratio	0.32	0.20	0.20	0.09	0.21	0.21	0.59	0.56	0.56	0.49	0.49	0.49
v/c Ratio	0.44	0.70	0.28	0.53	0.48	0.09	0.41	0.74	0.48	0.11	0.70	0.17
Control Delay	30.6	53.8	10.0	57.8	44.5	0.5	19.2	22.8	3.0	23.8	27.6	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	53.8	10.0	57.8	44.5	0.5	19.2	22.8	3.0	23.8	27.6	3.9
LOS	C	D	B	E	D	A	B	C	A	C	C	A
Approach Delay		38.6			46.8			17.6			25.1	
Approach LOS		D			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 115.3			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 25.0		Intersection LOS: C	
Intersection Capacity Utilization 91.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
v/c Ratio	0.44	0.70	0.28	0.53	0.48	0.09	0.41	0.74	0.48	0.11	0.70	0.17
Control Delay	30.6	53.8	10.0	57.8	44.5	0.5	19.2	22.8	3.0	23.8	27.6	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	53.8	10.0	57.8	44.5	0.5	19.2	22.8	3.0	23.8	27.6	3.9
Queue Length 50th (m)	25.3	48.5	0.0	16.6	30.3	0.0	5.8	109.2	0.5	1.3	101.0	0.0
Queue Length 95th (m)	40.5	72.8	11.3	28.7	48.9	0.0	14.1	160.8	15.6	5.5	144.5	10.7
Internal Link Dist (m)		265.2			528.1			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	392	503	401	312	487	443	167	1905	1060	98	1667	808
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.50	0.21	0.52	0.34	0.07	0.41	0.74	0.48	0.11	0.70	0.17

Intersection Summary

HCM Signalized Intersection Capacity Analysis
1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Background: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Future Volume (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1746	1183	3267	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.60	1.00	1.00	0.95	1.00	1.00	0.13	1.00	1.00	0.13	1.00	1.00
Satd. Flow (perm)	1055	1746	1183	3267	1642	1298	161	3380	1493	200	3411	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	249	85	161	165	30	69	1407	506	11	1172	141
RTOR Reduction (vph)	0	0	68	0	0	24	0	0	217	0	0	72
Lane Group Flow (vph)	171	249	17	161	165	6	69	1407	289	11	1172	69
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Actuated Green, G (s)	33.4	23.4	23.4	10.7	24.1	24.1	65.6	65.6	65.6	56.3	56.3	56.3
Effective Green, g (s)	33.4	23.4	23.4	10.7	24.1	24.1	65.6	65.6	65.6	56.3	56.3	56.3
Actuated g/C Ratio	0.29	0.20	0.20	0.09	0.21	0.21	0.57	0.57	0.57	0.49	0.49	0.49
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	358	352	239	301	341	270	146	1914	845	97	1658	732
v/s Ratio Prot	0.04	c0.14		c0.05	0.10		0.03	c0.42			0.34	
v/s Ratio Perm	0.10		0.01			0.00	0.24		0.19	0.06		0.05
v/c Ratio	0.48	0.71	0.07	0.53	0.48	0.02	0.47	0.74	0.34	0.11	0.71	0.09
Uniform Delay, d1	32.7	43.0	37.4	50.2	40.4	36.5	15.8	18.6	13.5	16.2	23.3	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	1.00
Incremental Delay, d2	2.1	7.9	0.3	3.3	2.3	0.1	5.0	2.6	1.1	2.4	2.6	0.3
Delay (s)	34.7	50.9	37.7	53.5	42.6	36.6	20.7	21.2	14.6	18.5	25.9	16.3
Level of Service	C	D	D	D	D	D	C	C	B	B	C	B
Approach Delay (s)		43.2			47.0			19.5			24.8	
Approach LOS		D			D			B			C	

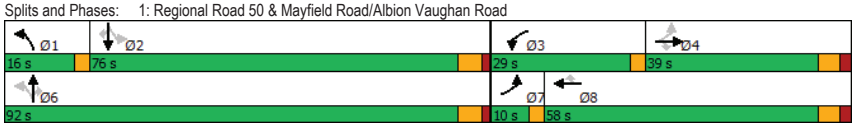
Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	115.8	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	91.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	10.0	39.0	39.0	29.0	58.0	58.0	16.0	92.0	92.0	76.0	76.0	76.0
Total Split (%)	6.3%	24.4%	24.4%	18.1%	36.3%	36.3%	10.0%	57.5%	57.5%	47.5%	47.5%	47.5%
Maximum Green (s)	7.0	32.5	32.5	26.0	51.5	51.5	13.0	85.4	85.4	69.4	69.4	69.4
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	30.4	19.9	19.9	26.0	38.9	38.9	89.1	85.5	85.5	69.9	69.9	69.9
Actuated g/C Ratio	0.21	0.13	0.13	0.18	0.26	0.26	0.60	0.58	0.58	0.47	0.47	0.47
v/c Ratio	0.46	0.65	0.44	0.88	0.72	0.11	0.74	0.47	0.17	0.06	0.88	0.14
Control Delay	44.2	74.3	15.5	76.4	58.9	3.7	60.9	19.5	2.7	24.5	43.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	74.3	15.5	76.4	58.9	3.7	60.9	19.5	2.7	24.5	43.1	4.6
LOS	D	E	B	E	E	A	E	B	A	C	D	A
Approach Delay		48.1			66.6			20.9			40.3	
Approach LOS		D			E			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 147.5			
Natural Cycle: 135			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 41.2		Intersection LOS: D	
Intersection Capacity Utilization 87.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
v/c Ratio	0.46	0.65	0.44	0.88	0.72	0.11	0.74	0.47	0.17	0.06	0.88	0.14
Control Delay	44.2	74.3	15.5	76.4	58.9	3.7	60.9	19.5	2.7	24.5	43.1	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	74.3	15.5	76.4	58.9	3.7	60.9	19.5	2.7	24.5	43.1	4.6
Queue Length 50th (m)	19.1	37.3	0.0	72.8	82.4	0.0	16.4	73.7	0.0	1.6	177.3	0.0
Queue Length 95th (m)	32.1	58.5	16.1	#107.5	114.1	3.8	#46.6	99.5	9.5	5.6	#233.0	10.2
Internal Link Dist (m)		265.2			539.9			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	222	362	321	604	615	507	145	1976	890	178	1602	748
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.40	0.32	0.88	0.54	0.08	0.72	0.47	0.17	0.06	0.88	0.14

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
Future Volume (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1580	1642	1094	3429	1762	1331	1214	3411	1426	1190	3380	1465
Flt Permitted	0.56	1.00	1.00	0.95	1.00	1.00	0.06	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	929	1642	1094	3429	1762	1331	75	3411	1426	377	3380	1465
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	103	144	103	532	335	42	104	934	153	11	1406	103
RTOR Reduction (vph)	0	0	89	0	0	31	0	0	64	0	0	54
Lane Group Flow (vph)	103	144	14	532	335	11	104	934	89	11	1406	49
Heavy Vehicles (%)	13%	17%	46%	1%	9%	20%	47%	7%	12%	50%	8%	9%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Actuated Green, G (s)	26.9	19.9	19.9	26.0	38.9	38.9	85.5	85.5	85.5	69.9	69.9	69.9
Effective Green, g (s)	26.9	19.9	19.9	26.0	38.9	38.9	85.5	85.5	85.5	69.9	69.9	69.9
Actuated g/C Ratio	0.18	0.13	0.13	0.18	0.26	0.26	0.58	0.58	0.58	0.47	0.47	0.47
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	200	221	147	604	464	351	140	1977	826	178	1601	694
v/s Ratio Prot	0.02	0.09		c0.16	c0.19		c0.06	0.27			c0.42	
v/s Ratio Perm	0.07		0.01			0.01	0.37		0.06	0.03		0.03
v/c Ratio	0.52	0.65	0.09	0.88	0.72	0.03	0.74	0.47	0.11	0.06	0.88	0.07
Uniform Delay, d1	52.8	60.5	55.9	59.2	49.4	40.3	37.9	17.9	13.9	21.0	35.0	21.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	8.9	0.6	15.1	6.7	0.1	22.4	0.8	0.3	0.7	7.2	0.2
Delay (s)	57.2	69.4	56.5	74.3	56.1	40.4	60.3	18.8	14.2	21.7	42.1	21.3
Level of Service	E	E	E	E	E	D	E	B	B	C	D	C
Approach Delay (s)		62.0			66.0			21.8			40.6	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	19.1	
Intersection Capacity Utilization	87.4%	ICU Level of Service	E	
Analysis Period (min)	15			

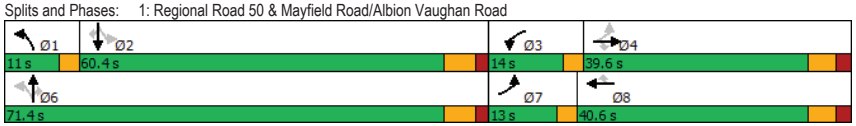
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Future Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Storage Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Storage Lanes	1		1	2		1	1		1	1		1
Taper Length (m)	60.0			40.0			20.0			0.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1684	1746	1183	3267	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.583			0.950			0.129			0.124		
Satd. Flow (perm)	1033	1746	1183	3267	1642	1298	161	3380	1493	197	3411	1507
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			84			492			141
Link Speed (k/h)		60			60			70			70	
Link Distance (m)		289.2			552.1			378.1			686.1	
Travel Time (s)		17.4			33.1			19.4			35.3	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Adj. Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Shared Lane Traffic (%)												
Lane Group Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.0			7.0			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane											Yes	
Headway Factor	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01	1.01	0.99	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	2	2	2
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	5.0	12.0	12.0	5.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	8.0	39.5	39.5	8.0	37.6	37.6	37.6	37.6	37.6
Total Split (s)	13.0	39.6	39.6	14.0	40.6	40.6	11.0	71.4	71.4	60.4	60.4	60.4
Total Split (%)	10.4%	31.7%	31.7%	11.2%	32.5%	32.5%	8.8%	57.1%	57.1%	48.3%	48.3%	48.3%
Maximum Green (s)	10.0	33.1	33.1	11.0	34.1	34.1	8.0	64.8	64.8	53.8	53.8	53.8
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	0.0	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	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Recall Mode	None	None	None	None	None	None	None	Max	Max	Max	Max	Max
Walk Time (s)		8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0
Flash Dont Walk (s)		25.0	25.0		25.0	25.0		23.0	23.0	23.0	23.0	23.0
Pedestrian Calls (#/hr)		0	0		0	0		0	0	0	0	0
Act Effct Green (s)	37.3	23.8	23.8	10.8	24.6	24.6	68.6	65.0	65.0	56.3	56.3	56.3
Actuated g/C Ratio	0.32	0.21	0.21	0.09	0.21	0.21	0.59	0.56	0.56	0.49	0.49	0.49
v/c Ratio	0.44	0.71	0.27	0.56	0.49	0.13	0.42	0.74	0.51	0.28	0.71	0.18
Control Delay	30.6	54.1	9.9	59.0	44.7	2.1	19.5	23.1	4.0	31.9	28.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	54.1	9.9	59.0	44.7	2.1	19.5	23.1	4.0	31.9	28.0	3.9
LOS	C	D	A	E	D	A	B	C	A	C	C	A
Approach Delay		38.9			45.9			17.9			25.5	
Approach LOS		D			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 125			
Actuated Cycle Length: 115.7			
Natural Cycle: 95			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 25.4		Intersection LOS: C	
Intersection Capacity Utilization 91.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Regional Road 50 & Mayfield Road/Albion Vaughan Road



Queues

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
v/c Ratio	0.44	0.71	0.27	0.56	0.49	0.13	0.42	0.74	0.51	0.28	0.71	0.18
Control Delay	30.6	54.1	9.9	59.0	44.7	2.1	19.5	23.1	4.0	31.9	28.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	54.1	9.9	59.0	44.7	2.1	19.5	23.1	4.0	31.9	28.0	3.9
Queue Length 50th (m)	25.3	50.1	0.0	17.7	31.7	0.0	5.9	110.5	4.4	3.4	102.0	0.0
Queue Length 95th (m)	40.4	75.0	11.3	30.2	50.8	1.8	14.1	161.5	23.9	12.6	145.0	10.7
Internal Link Dist (m)		265.2			528.1			354.1			662.1	
Turn Bay Length (m)	100.0		90.0	170.0		70.0	125.0		180.0	35.0		150.0
Base Capacity (vph)	389	500	399	311	485	442	166	1897	1054	95	1660	805
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.51	0.21	0.55	0.35	0.10	0.42	0.74	0.51	0.28	0.71	0.18

Intersection Summary

HCM Signalized Intersection Capacity Analysis

1: Regional Road 50 & Mayfield Road/Albion Vaughan Road

Future Total: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Future Volume (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5	3.5	3.7	3.5
Total Lost time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1746	1183	3267	1642	1298	1182	3380	1493	1513	3411	1507
Flt Permitted	0.58	1.00	1.00	0.95	1.00	1.00	0.13	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	1034	1746	1183	3267	1642	1298	160	3380	1493	198	3411	1507
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	171	256	85	170	172	46	69	1407	541	27	1172	141
RTOR Reduction (vph)	0	0	68	0	0	36	0	0	214	0	0	73
Lane Group Flow (vph)	171	256	17	170	172	10	69	1407	327	27	1172	68
Heavy Vehicles (%)	6%	10%	35%	6%	17%	23%	51%	8%	7%	18%	7%	6%
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		1	6			2	
Permitted Phases	4		4			8	6		6	2		2
Actuated Green, G (s)	33.8	23.8	23.8	10.8	24.6	24.6	65.6	65.6	65.6	56.3	56.3	56.3
Effective Green, g (s)	33.8	23.8	23.8	10.8	24.6	24.6	65.6	65.6	65.6	56.3	56.3	56.3
Actuated g/C Ratio	0.29	0.20	0.20	0.09	0.21	0.21	0.56	0.56	0.56	0.48	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	3.0	6.6	6.6	6.6	6.6	6.6
Vehicle Extension (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	356	357	242	303	347	274	145	1906	842	95	1651	729
v/s Ratio Prot	0.04	c0.15		c0.05	0.10		0.03	c0.42			0.34	
v/s Ratio Perm	0.10		0.01			0.01	0.24		0.22	0.14		0.05
v/c Ratio	0.48	0.72	0.07	0.56	0.50	0.04	0.48	0.74	0.39	0.28	0.71	0.09
Uniform Delay, d1	32.6	43.1	37.3	50.5	40.4	36.4	16.0	18.9	14.1	17.9	23.6	16.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	8.3	0.3	3.9	2.3	0.1	5.1	2.6	1.3	7.4	2.6	0.3
Delay (s)	34.7	51.4	37.6	54.4	42.7	36.5	21.1	21.5	15.5	25.3	26.2	16.5
Level of Service	C	D	D	D	D	D	C	C	B	C	C	B
Approach Delay (s)		43.5			47.1			19.9			25.2	
Approach LOS		D			D			B			C	

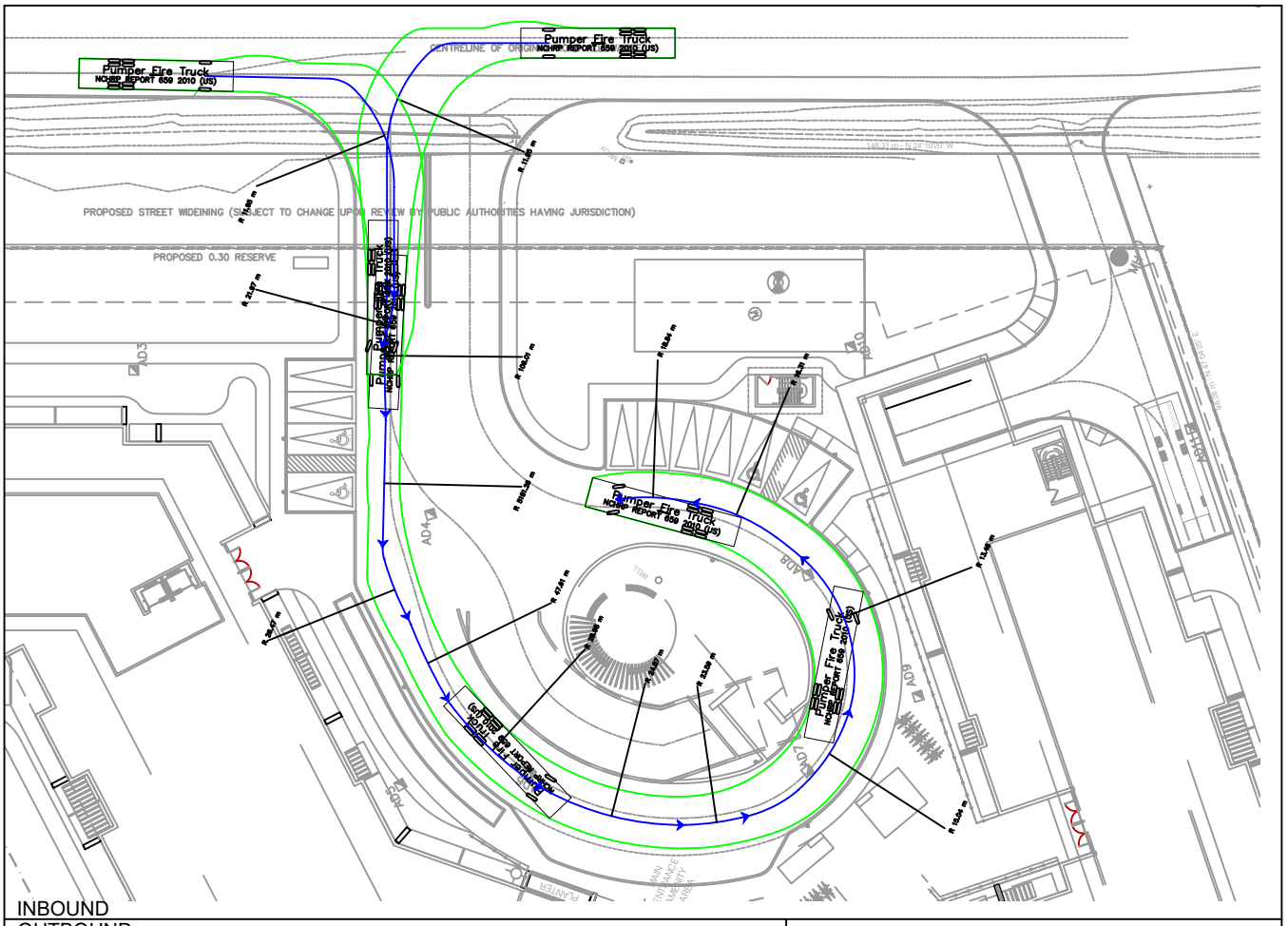
Intersection Summary					
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	19.1		
Intersection Capacity Utilization	91.1%	ICU Level of Service	F		
Analysis Period (min)	15				

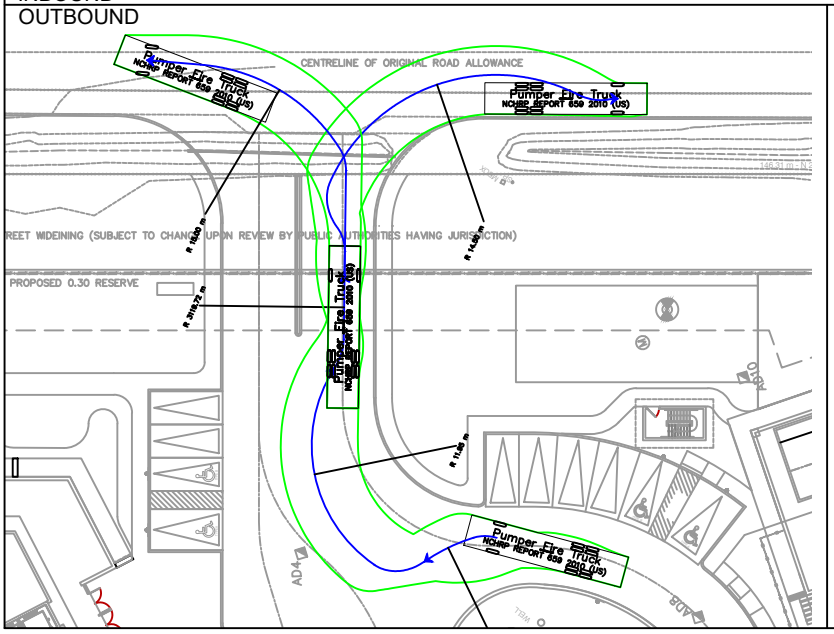
c Critical Lane Group

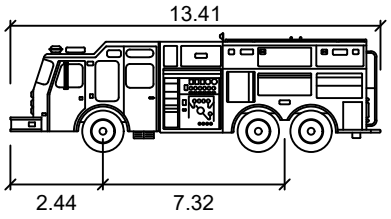
Appendix I

AutoTURN Analysis – Vehicle Maneuvering Diagrams

Fire route assessment. Fire truck, inbound and outbound movements



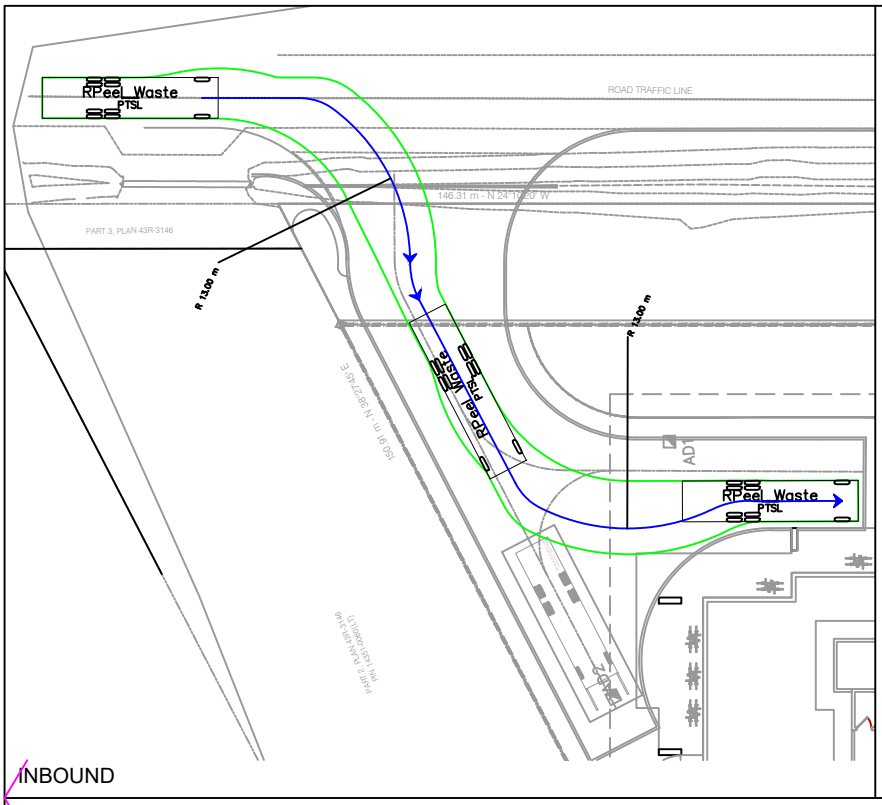




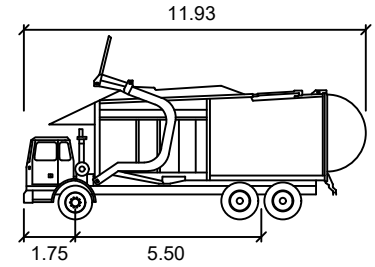
Pumper Fire Truck

	meters
Width	: 2.59
Track	: 2.59
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

Waste Truck Loading area assessment. Inbound and outbound movements.
North Tower



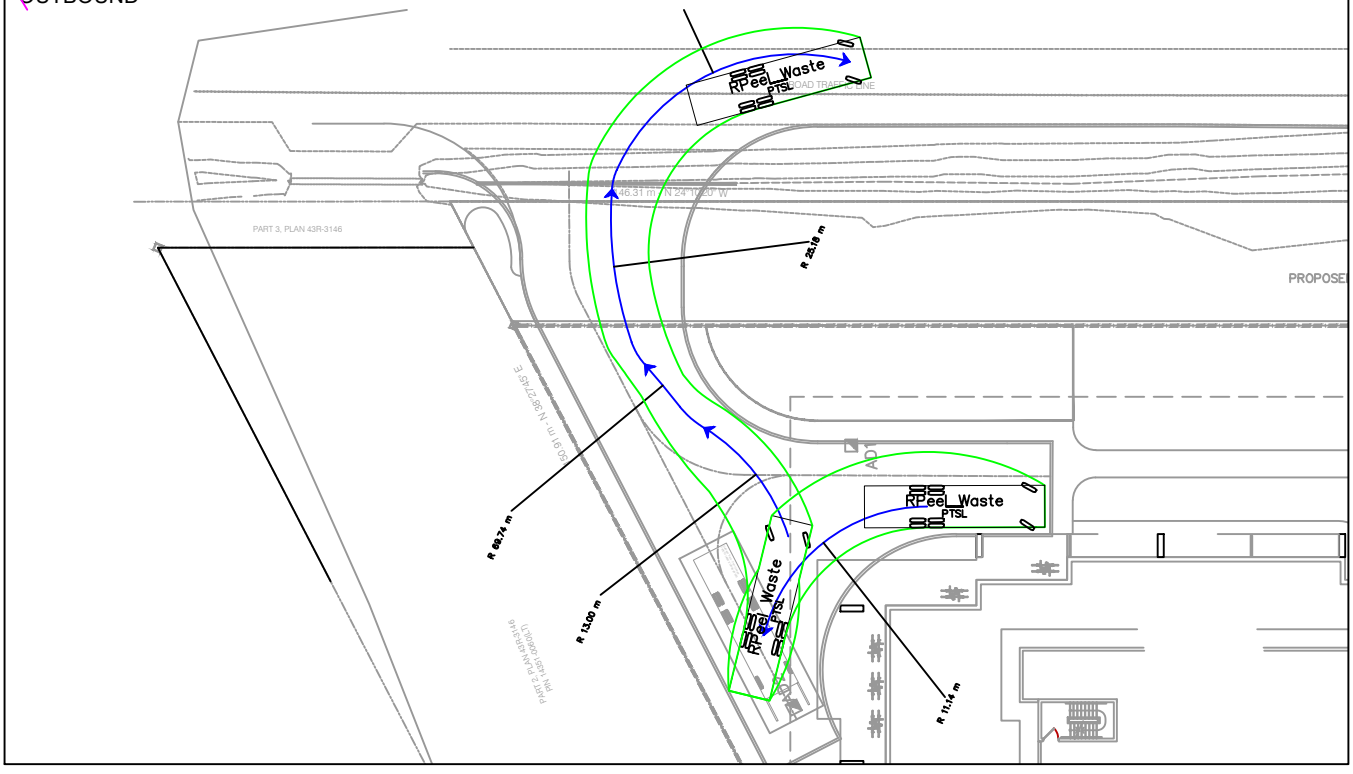
INBOUND



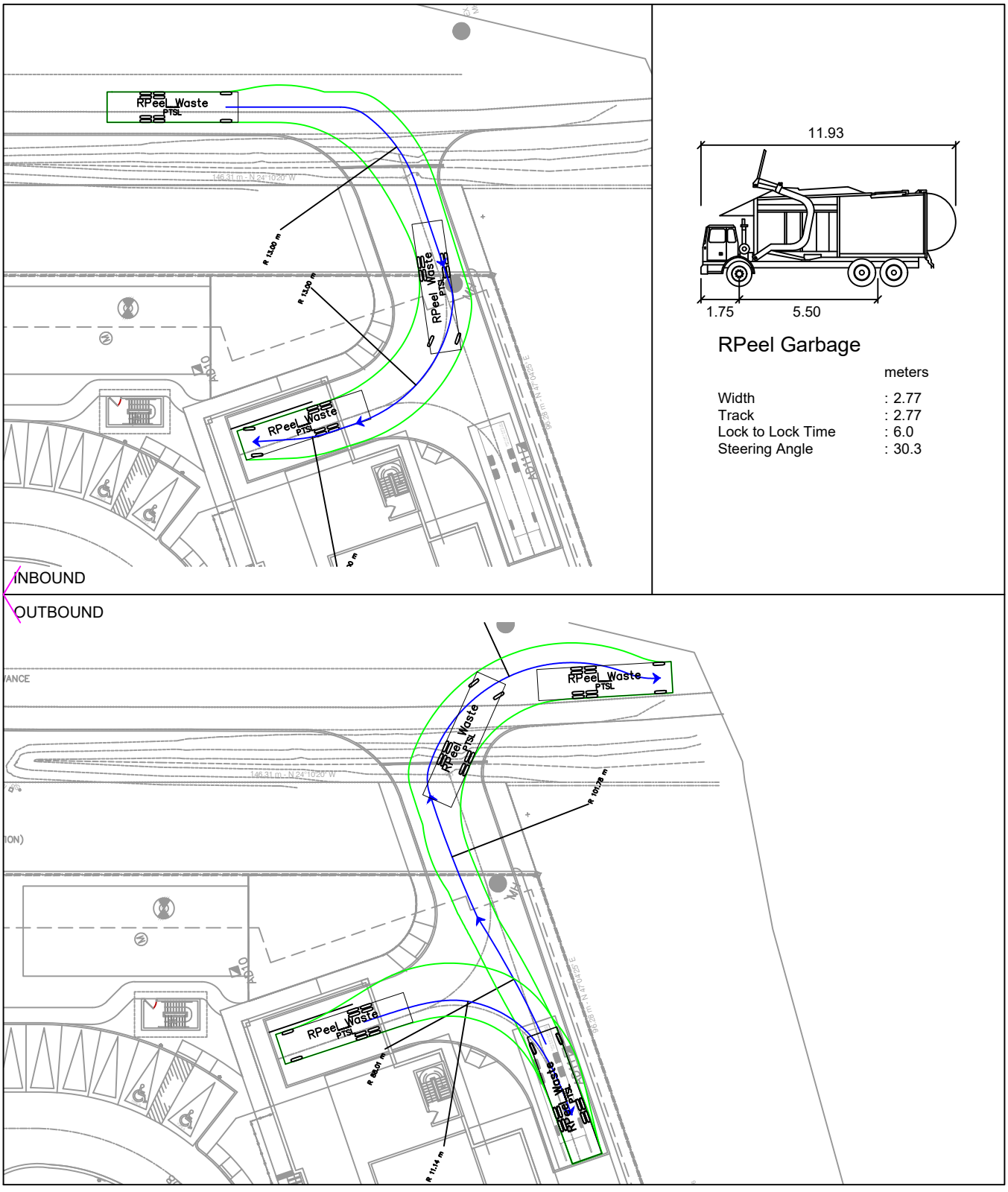
RPeel Garbage

	meters
Width	: 2.77
Track	: 2.77
Lock to Lock Time	: 6.0
Steering Angle	: 30.3

OUTBOUND



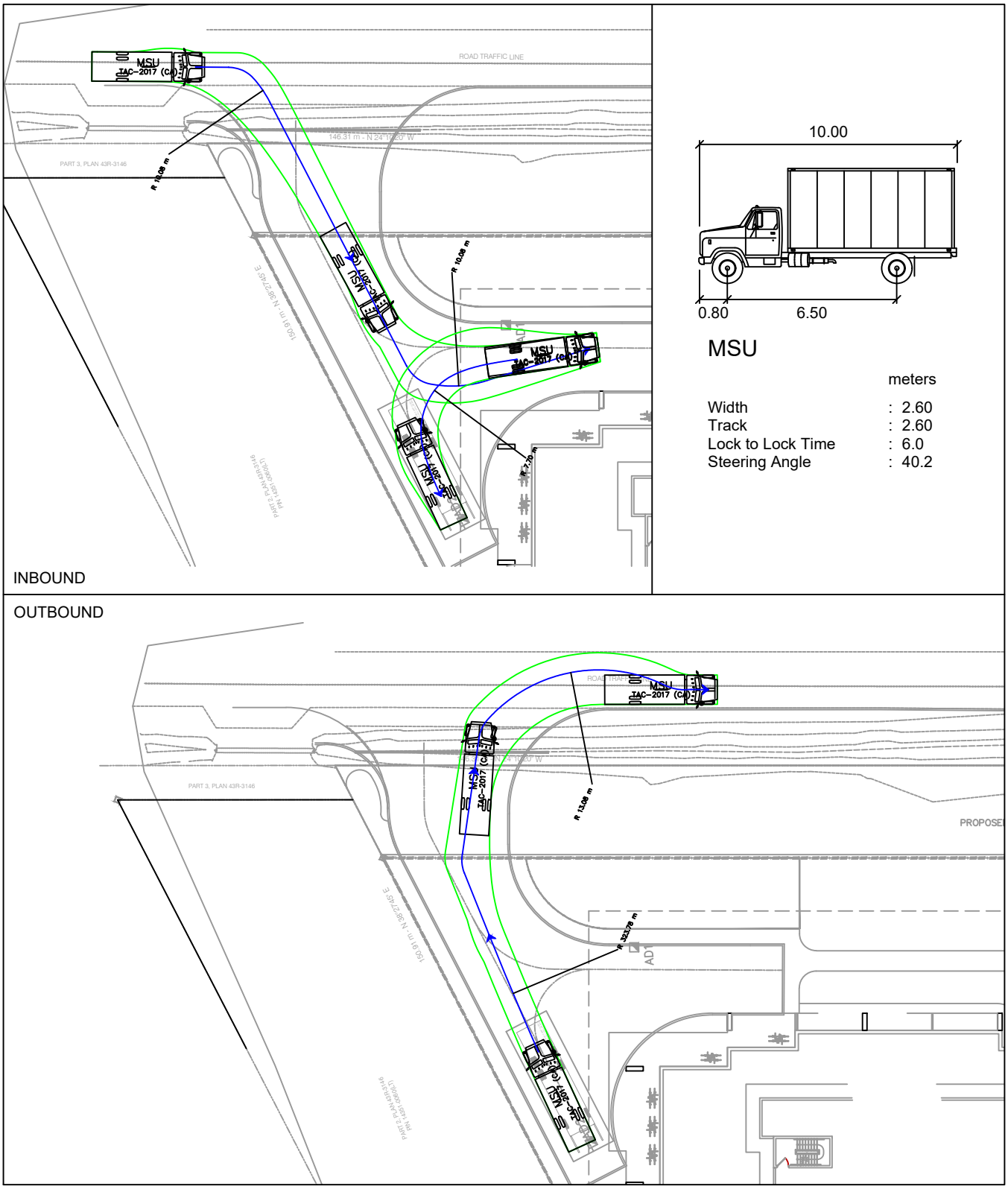
Waste Truck Loading area assessment. Inbound and outbound movements.
South Tower



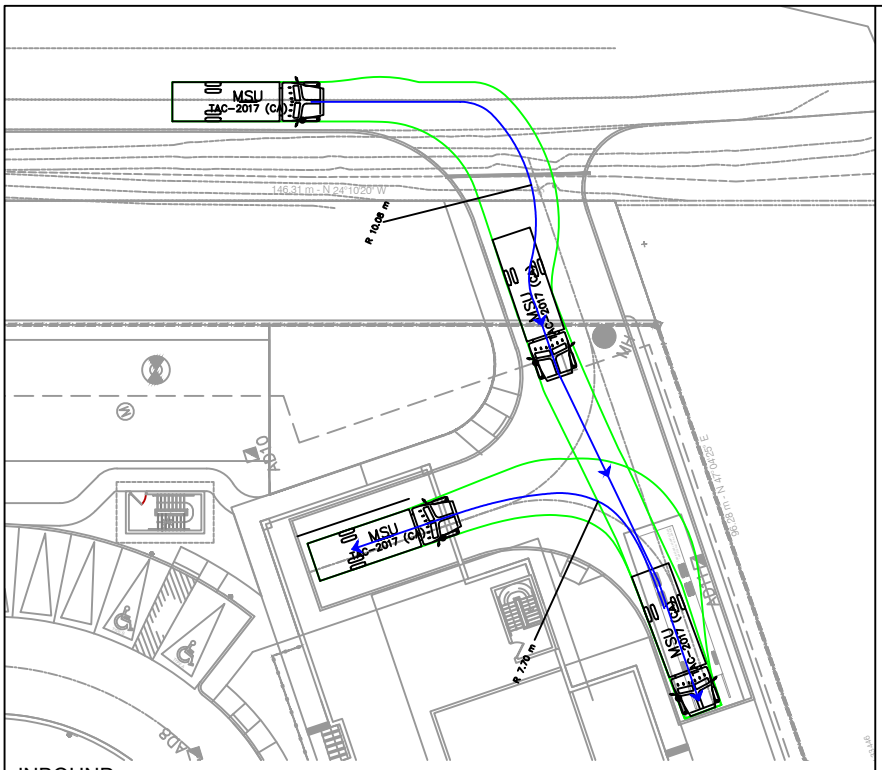
RPeel Garbage

	meters
Width	: 2.77
Track	: 2.77
Lock to Lock Time	: 6.0
Steering Angle	: 30.3

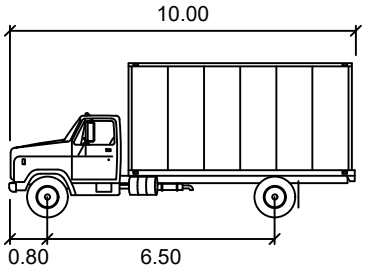
Typical Delivery Vehicle Loading area assessment. Inbound and outbound movements.
North Tower



Typical Delivery Vehicle Loading area assessment. Inbound and outbound movements.
South Tower



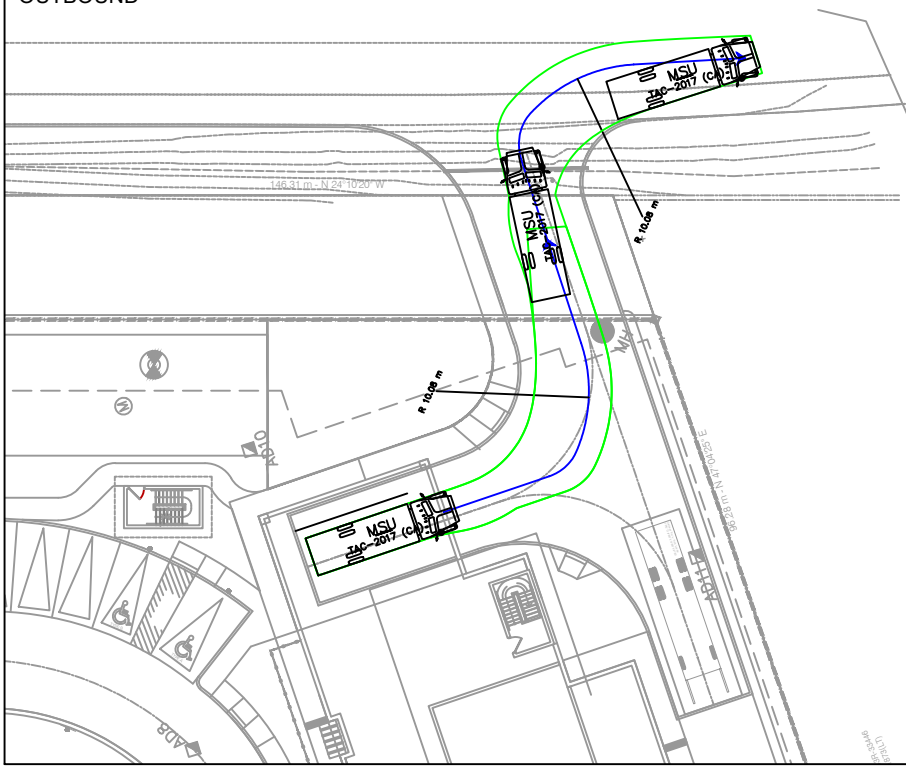
INBOUND



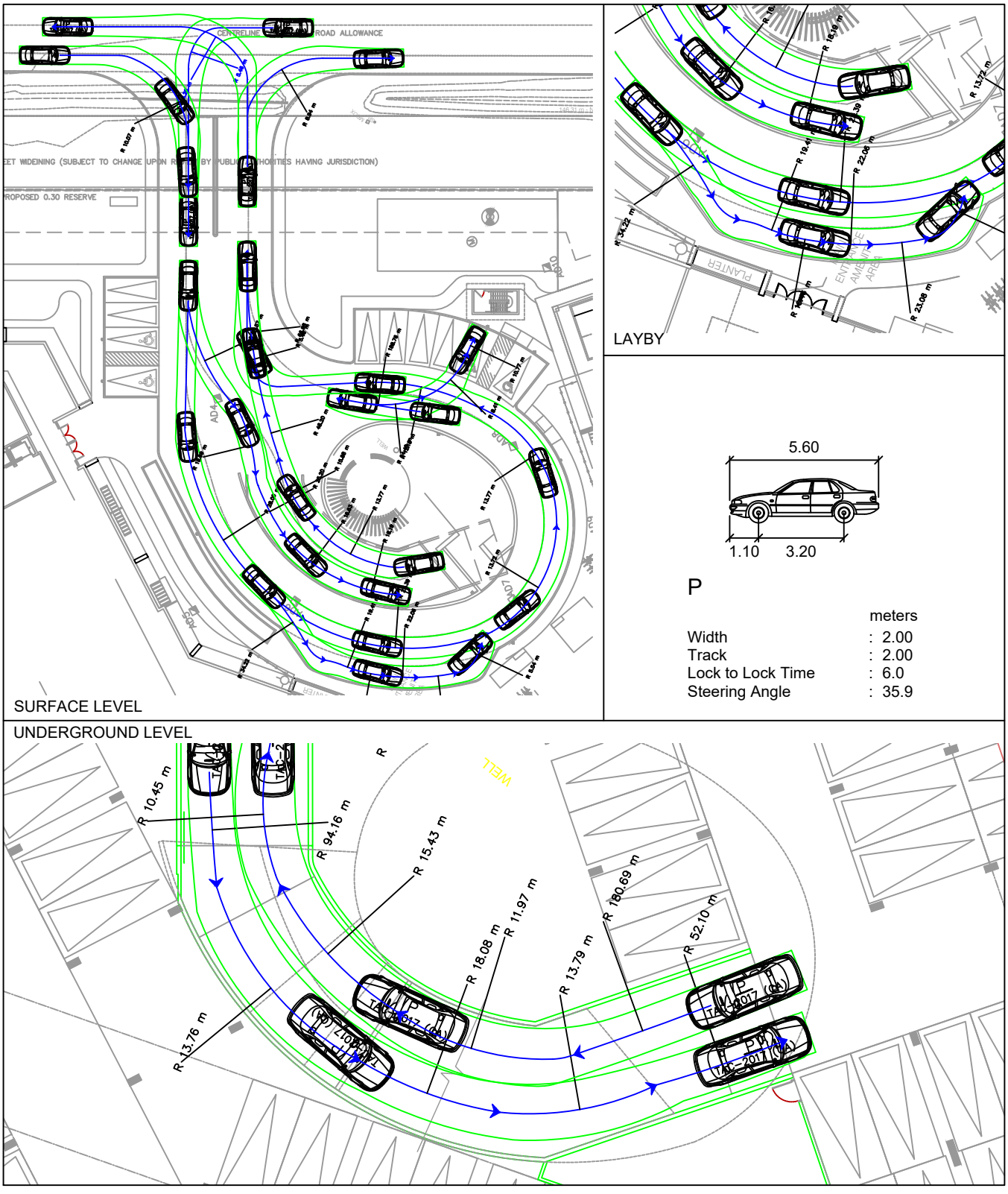
MSU

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

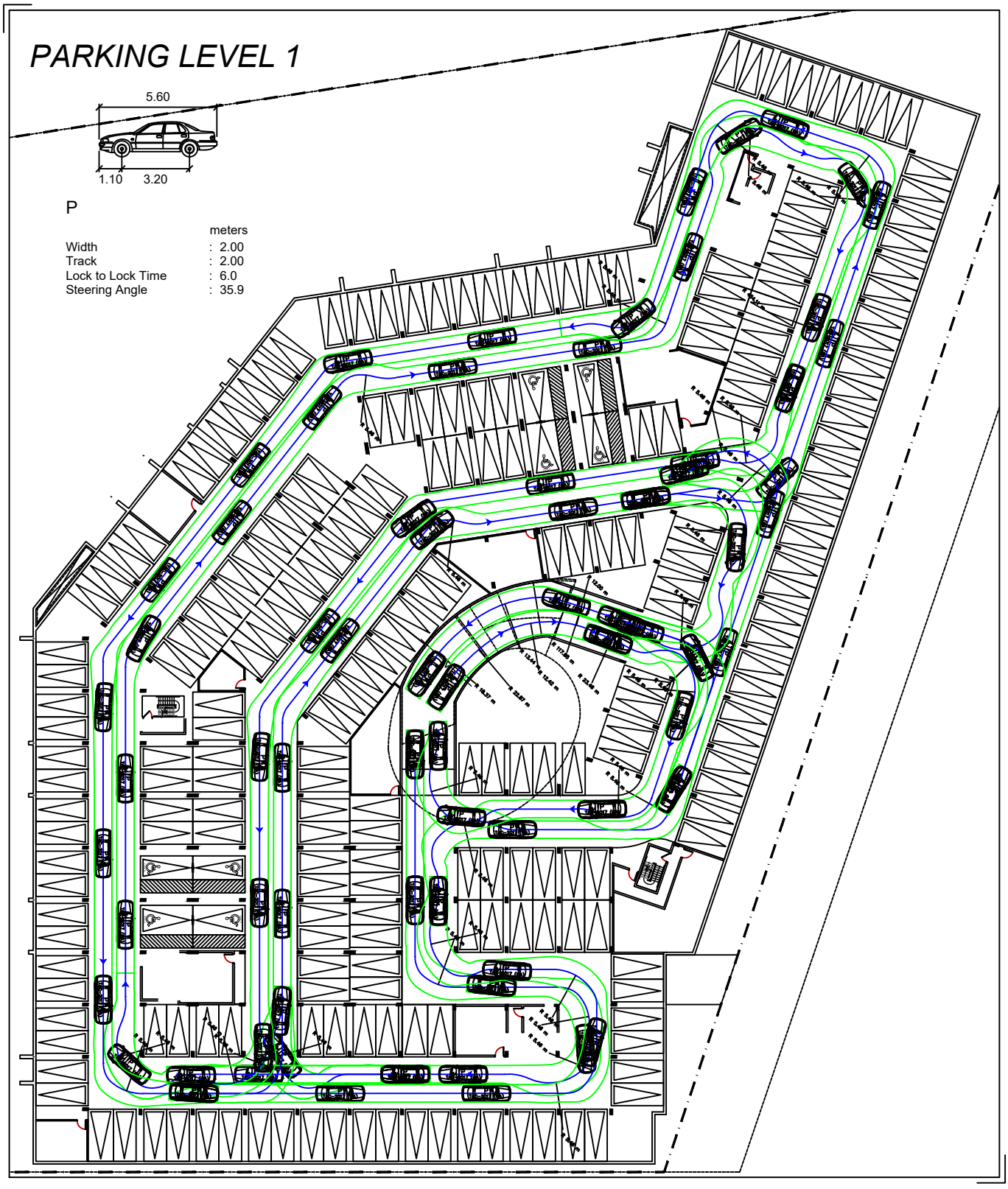
OUTBOUND



Passenger Vehicle circulation at-grade.
Inbound and outbound movements.



Passenger Vehicle circulation within underground level 1.



Passenger Vehicle circulation within underground level 2.