TOWN OF CALEDON
PLANNING
RECEIVED

Feb.24, 2022

January 12, 2022

Jillian Britto, P.Eng.
Coordinator, Transportation Development
Transportation Engineering
Engineering Services
Office: 905-584-2272 ext.4108
e-mail: Jillian Britto@caledon.ca

RE: 12563 & 12599 Highway 50, Town of Caledon, Traffic Impact Study

Dear Ms.Britto:

BA Group has been retained by 12599 Hwy 50 Ltd. to provide transportation consulting services related to a proposed mixed-use development on a site municipally known as 12563 & 12599 Highway 50, in the Town of Caledon, in the Region of Peel. The development proposal includes the construction of 5 mixed-use buildings inclusive of 2,238 residential units and 3,179 m^2 of retail.

The attached Traffic Impact Study (Transportation Considerations Report) has been prepared and updated as part of the **Official Plan and Zoning By-law Amendment (ZBA) application** and subsequent **Site Plan Application** being submitted to the Town of Caledon.

The Traffic Impact Study (Transportation Considerations Report) was originally completed in April 2021 but has since been updated in accordance with subsequent Town of Caledon and Region of Peel's comments. A summary of the responses to the Town and Region's comments is enclosed.

I can confirm that the updated Traffic Impact Study has been prepared and updated under my supervision, and to the best of my knowledge is accurate and true.

I trust the foregoing is satisfactory.

Sincerely,
BA Consulting Group Ltd.

LICENSED PROFESSIONAL ENGINEER
D.L. GREEN
January 12, 2022
PROVINCE OF ONTARIO

Deanna Green, MSc. P.Eng.
Associate

Encl. Responses to Town and Region Comments
Updated Traffic Impact Study

12563 & 12599 HIGHWAY 50, TOWN OF CALEDON, TRAFFIC IMPACT STUDY

RESPONSES TO TOWN AND REGION COMMENTS

JANUARY 2022

RESPONSES TO TOWN OF CALEDON COMMENTS

SUMMARY CONTENTS LETTER

Comment:
A Waste Management Plan is required prior to approval of the Official Plan Amendment to access the site's Traffic Impact.

Response:

The Waste Management Plan is provided in the Traffic Impact Study (TIS) in Appendix K.

DEVELOPMENT REVIEW SERVICES

Comment 10B:
Town of Caledon staff conducted a review of minimum parking requirements within the Zoning By-laws for Brampton and Mississauga relating to apartments. The minimum parking rates for each municipality did not fall below 1 resident space per unit and 0.15 visitor spaces per unit.
i. Both Brampton and Mississauga are within Peel Region and are significantly more accessible by public transit than Caledon.
ii. The proposed parking rate of less than 1 resident space per unit requires further justification.

Response:

As compared to the First Submission, the proposed parking rates for the development have been revised as follows:

- Resident parking: increased from 0.85 to 1.0 spaces per resident unit (an increase of 0.15)
- Resident visitor parking: increased from 0.20 to 0.25 spaces per resident unit (an increase of 0.05)
- Retail parking: to be shared with resident visitor parking (a decrease from 1 space/20 m^2 GFA)

Additional information regarding the proposed vehicle parking supply is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 10N:
Section 4.4 does not provide sufficient justification for a reduced parking rate, as there is no existing frequent transit service to the subject lands and transportation to the site will remain primarily dependent on private vehicles, at least during the early phases.

Response:

As noted in the previous response, the proposed parking supply is being increased and the proposed parking rates for the development have been revised.

In consideration for the appropriate parking rate for this development proposal in Bolton, it is acknowledged that it is challenging to find a municipality with comparable travel patterns and transit service. However, the Town of Caledon has retained Voyago to provide local bus service in the Bolton area. The Bolton Line operates during weekday peak periods (Monday to Friday, 6:00 am to 9:30 am and 3:00 pm to 6:30 pm), with stops throughout the downtown Bolton core and the industrial zone. The nearest Bolton Line stops to the site are located at the intersection of Highway 50 & George Bolton Parkway and at Highway 50 & McEwan Drive. The walking time to either of these stops would be approximately 5 minutes. It is therefore reasonable to assume that some residents of the site would utilize this convenient Voyago transit service.

Additional information regarding the proposed vehicle parking supply is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 11:
Further analysis of why the City of Barrie was used as a "comparable municipality" in the Urban Transportation Considerations Report is required as the City of Barrie has a more robust public transportation system than the Town of Caledon.

Response:

In consideration of the appropriate parking rate for this development proposal in Bolton, it is noted that it is challenging to find a municipality with comparable travel patterns and transit service. While it is acknowledged that the City of Barrie has a more "robust" transit system than Bolton, the travel mode share is very similar between the municipalities for peak periods of the day with differences in auto mode share that range from only 2 to 3%. See also response to Comment 10N.

Additional information regarding the proposed vehicle parking supply is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 12:
Section 4.0 of the Urban Transportation Considerations Report should include further analysis of how the required bicycle parking rate was established. Analysis of bicycle parking rates in similar and surrounding municipalities should be included.

Response:

Although the Town of Caledon Zoning By-law does not include a requirement for bicycle parking, in order to encourage sustainable and healthy transportation, bicycle parking on the site is being proposed.

The current architectural drawings provide a total of 816 parking spaces for bicycles, including 52 spaces at-grade for visitors and 764 stacked spaces for residents, below-grade on P1.

Based on the development proposal that includes a total 2,238 residential units, the proposed bicycle parking supply aligns with a ratio of 0.34 long-term bicycle parking spaces per unit and 0.023 short-term bicycle spaces per unit, for a total bicycle parking supply rate of 0.36 spaces per unit.

The proposed bicycle parking supply is above and beyond what is required by the Town's Zoning By-law and reasonable based on the development statistics and the surrounding transportation context. It is also deemed to be a practical amount of bicycle parking in relation to the available space within the buildings.

The proposed bicycle parking supply will meet the practical needs of the site.

ENGINEERING SERVICES DEPARTMENT, DEVELOPMENT ENGINEERING

Comment 43a:
Highway 50 is under the jurisdiction of the Region of Peel. Development Engineering defers review and approval of the Proposed Mixed-Use Development Urban Transportation Consideration Report to the Region of Peel and the Town's Transportation Department.

Response:

Duly noted.

Comment 43b:
The report should be updated to reflect the reconstruction of Industrial Rd to a local cross-section. Recommendations as outlined in the study will be included within the agreement for the reconstruction of Industrial Rd, including the recommendation within the report to increase the level of safety in the vicinity of the site driveway, it is proposed that the existing curve ahead warning sign on Industrial Road be replaced with an oversized curve ahead sign that includes an advisory speed tab of 30 km/h, in addition to an amber flashing beacon.

Response:

Further information regarding the reconstruction of Industrial Road and detail design drawings will be included in a subsequent submission.

As noted in the Section 9.2 in the TIS, it is recommended that the existing curve ahead warning sign on Industrial Road be replaced with an oversized curve ahead sign that includes an advisory speed tab of 30 km/h, in addition to an amber flashing beacon.

Comment 43c:
The report is to be signed stamped and dated by a Professional Engineer.

Response:

The cover letter attached to the report has been signed, stamped and dated by a Professional Engineer.

ENGINEERING SERVICES DEPARTMENT, TRANSPORTATION ENGINEERING

Comment 45a.
The TOR provided in Appendix B states that the development will be completed in phases over 15 years; details of the development phasing should be included in the Transportation Study.

Response:

For the purpose of the traffic analysis, the site is proposed to be developed in two phases as follows:

Phase 1: Buildings 1, 2 & 3 (estimated completion by 2029)
Phase 2: Buildings 4 & 5 (estimated completion by 2036)

It is noted that in consideration of the actual *construction* phasing of the site, the architectural drawings reference each building as a numbered phase i.e. Building 1=Phase 1, Building 2=Phase 2, Building 3=Phase 3, Building 4=Phase 4 and Building 5=Phase 5.

Comment 45b:
For multiphase developments, the horizon years for the traffic analysis are generally the nearer of five years of the date of full occupancy for each phase of development.

Response:

The analysis in Section 8.0 has been updated to include the following horizon years:

- Existing traffic conditions
- Future background traffic conditions (2029)
- Future total traffic conditions (2029) – includes build-out of Phase 1 (Buildings 1, 2 & 3)
- Future background traffic conditions (2036)
- Future total traffic conditions (2036) - includes build-out of Phase 2 (Buildings 4 & 5)
- Future background traffic conditions (2041)
- Future total traffic conditions (2041) – 5 years post full build-out

A future lane configuration figure has also been included in the update report.

Comment 45c:
George Bolton Parkway has a 2-lane cross-section with a centre left-turning lane. Please revise the description in Section 2.1.1.

Response:

This has been revised in the updated TIS.

Comment 45d:
Albion Vaughan Road has an 80 km/h posted speed limit. Please revise the description in Section 2.1.1.

Response:
This has been revised in the updated TIS.

Comment 45e:
Figures 5 & 6 should be revised to include an EBTR lane instead of the EBR lane.

Response:

It is assumed that Comment 45e is in relation to the eastbound lane configuration on Highway 50 at Parr Boulevard. The eastbound lane configuration at Parr Boulevard has been updated in the TIS in both Figures 5 & 6.

Comment 45f:
Figure 6 should be revised to include EBL, EBT and EBR lanes as part of the George Bolton Parkway Extension as well as the Commercial Road intersection with Albion Vaughan Road conversion into a cul-de-sac, see attached GBP Extension Appendix P Preferred Design.

Response:

Duly noted. These changes have been incorporated into Figure 6, and the analysis has been updated accordingly within the TIS.

Comment 45g:
Caledon has local services in Bolton (Voyago). Please refer to this website for the full list of services in Caledon: https://www.caledon.ca/en/town-services/transit.aspx#Bolton

Response:

The transit context has been revised in Section 2.2.1 of the updated TIS.

Comment 45h:
There are no Brampton transit routes in Bolton; these should be removed from Table 2.

Response:

This has been revised in the transit context in Section 2.2.1 in the TIS.

Comment 45i:
The 500m and 750m radii illustrated in Figure 7 should be explained in the text above it.

Response:

Figure 7 has been revised in the TIS.

Comment 45j:
City of Barrie is quite different from Town of Caledon, especially with respect to transportation mode choice availabilities. There should be more justification provided towards the similarities of Barrie and Bolton such as comparison of transit, available active transportation facilities and vehicle ownership for the higher density areas within Barrie rather than Barrie as a whole. In addition to Barrie, parking utilization survey data for sites in other municipalities that have a similar transportation context as Caledon should be provided in the parking justification.

Response:

As noted in the previous response, the proposed parking supply is being significantly increased and the proposed parking rates for the development have been revised.

In consideration for the appropriate parking rate for this development proposal in Bolton, it is noted that it is challenging to find a municipality with comparable travel patterns and transit service. It is acknowledged that although the auto-driver mode share between Barrie and Bolton is similar (differences in auto mode share that range from only 2 to 3%), Barrie has significantly better transit service and active transportation facilities.

Section 3.3 in the TIS has been updated to include a summary of the average vehicle ownership per apartment unit (Bolton is 1.1, Barrie is 1.0 and King City is 1.3). The vehicle ownership rate per apartment unit is similar for all 3 jurisdictions.

As the Town recommended that King City be considered as a comparable municipality, Section 3.3 has been updated to include information about parking rates in King City. A discussion has been provided in the TIS regarding a site specific Zoning By-law for a 252-unit condo development at 2075 King Road in King City. The minimum parking requirement for the 2075 King Road site is 1.33 parking spaces/residential unit and 0.17 visitor spaces/residential unit. For apartments within the urban area (CAK zone) of King City, the minimum parking requirement is 1.25 spaces/unit, inclusive of visitor parking. This rate aligns with the proposed rates for the Bolton site which are equivalent to a total of 1.25 spaces/residential unit (1.0 spaces/unit for residents and 0.25 spaces/unit for resident visitors).

Additional information regarding the proposed vehicle parking supply is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 45k:
The categories included in "Auto" and "Non-Auto" should be included as a footnote for Table 4 as well as the TTS zones used for Bolton.

Response:

Duly noted. The categories included in both “Auto” and “Non-Auto” and the list of Bolton TTS zones have been included in the updated report for all relevant mode share tables.

Comment 45l:
More information should be provided about the locations of the three apartment buildings in the City of Barrie such as what transit facilities are available, unit mixes, surrounding amenities, etc. The parking supply should also be indicated for comparison and detailed survey results should be provided in the appendices.

Response:

As the proposed parking supply has been significantly increased and further justification for the parking supply has been provided in Section 3.0 of the TIS, this information (which is not all readily available) has not been included in the updated TIS.

Comment 45m:
The Town's visitor parking requirement for apartments seems to be in line with other comparable municipalities as presented in Table 6. Instead of reducing the visitor parking supply, shared parking with the retail uses should be explored. More details on the potential retail uses will be required.

Response:

As compared to the First Submission, the proposed visitor parking rates for the development have been revised as noted below. The proposed resident visitor parking rate now meets the minimum Zoning By-law requirement but the retail parking demand is proposed to be shared with the resident visitor parking supply.

- Resident visitor parking: increased from 0.20 to 0.25 spaces per resident unit (an increase of 0.05)
- Retail parking: to be shared with resident visitor parking (a decrease from 1 space/20 m2 GFA)

Additional information regarding the proposed vehicle parking supply for non-residents is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 45n:
Visitor parking utilization survey data for sites in municipalities with a similar transportation context as Caledon should be provided in Table 7.

Response:

In consideration for the appropriate visitor parking rate for this development proposal in Bolton, it is acknowledged that it is challenging to find a municipality with a similar transportation context. However, as noted in the response to 45m above, the proposed resident visitor parking rate now meets the minimum Zoning By-law requirement, but the retail parking demand is proposed to be shared with the resident visitor parking supply.

As the Town recommended that King City be considered as a comparable municipality, Section 3.3 has been updated to include information about parking rates in King City. A discussion has been provided in the TIS regarding a site specific Zoning By-law for a 252-unit condo development at 2075 King Road in King City. The minimum parking requirement for the 2075 King Road site is 1.33 parking spaces/residential unit and 0.17 visitor spaces/residential unit. For apartments within the urban area (CAK zone) of King City, the minimum parking requirement is 1.25 spaces/unit, inclusive of visitor parking. This rate aligns with the proposed rates for the Bolton site which are equivalent to a total of 1.25 spaces/residential unit (1.0 spaces/unit for residents and 0.25 spaces/unit for resident visitors).

Additional information regarding the proposed vehicle parking supply is provided in the Traffic Impact Study (TIS) in Section 3.0.

Comment 45o:
The phasing of parking should be addressed in Section 3 of the report in line with the phasing of the development.

Section 3.0 has been revised to include consideration of parking requirements by building for Phase 1 (Buildings 1, 2 & 3) and for Phase 2 (Buildings 4 & 5).

Response:

Comment 45p:
Please provide some justification for the proposed bicycle parking supply rates such as comparisons to other similar municipalities.

Response:

Although the Town of Caledon Zoning By-law does not include a requirement for bicycle parking, in order to encourage sustainable and healthy transportation, bicycle parking on the site is being proposed.

The current architectural drawings provide a total of 816 parking spaces for bicycles, including 52 spaces at-grade for visitors and 764 stacked spaces for residents, below-grade on P1.

Based on the development proposal that includes a total 2,238 residential units, the proposed bicycle parking supply aligns with a ratio of 0.34 long-term bicycle parking spaces per unit and 0.023 short-term bicycle spaces per unit, for a total bicycle parking supply rate of 0.36 spaces per unit.

The proposed bicycle parking supply is above and beyond what is required by the Town's Zoning By-law and reasonable based on the development statistics and the surrounding transportation context. It is also deemed to be a practical amount of bicycle parking in relation to the available space within the buildings.

The proposed bicycle parking supply will meet the practical needs of the site.

Comment 45q:
The loading vehicle turnaround for Buildings 2, 3, 4 and 5 utilizes the retail/visitor parking aisles. The loading considerations section should address the management of parking activities and truck turning movements for these buildings.

Response:
A trained on-site property staff member will be in charge of acting as a flag person when a waste collection truck is reversing in order to direct the truck and passenger vehicles. For any deliveries or residential moving truck movements in areas that share a drive aisle with retail / visitor parking, a warning system consisting of signs or a flashing beacon, can be implemented to caution motorists entering / leaving a parking space of heavy vehicle operations.

Comment 45r:
Has any car share service provider been approached to confirm they will provide this level of car share services?

Response:

The ability to confirm car-share services for the site is unknown at this stage. The TIS will continue to include future car-share for the site as a future possibility but expect to be able to confirm this TDM measure as part of a subsequent submission.

Comment 45s:
Please quantify the number of Presto cards that will be provided and the amount on each card.

Response:

The number of Presto cards to be provided will be confirmed as part of the Site Plan Approval (SPA) application but it would likely be a minimum of one Presto card per residential unit with a minimum value of $100.

Comment 45t:
Other potential TDM measures that should be considered:
i. Unbundled parking
ii. Telework/conference facilities

Response:

The proposed TDM measures in Section 6.0 have been revised to include unbundled parking and telework/ conference facilities.

Comment 45u:
The following developments should be included in the future background analysis (please see attached excerpts):
i. Villalago Residences Inc.
ii. 12724 Coleraine Drive (Building 'B' and Building 'C')
iii. 12400 Coleraine Drive
iv. 12300 Coleraine Drive Building 'D' and Building 'E'
v. 12300 Coleraine Drive Building 'F'
vi. 12476 Highway 50
vii. 12500 Highway 50

Response:

All background developments listed above have been included into the updated analysis in all horizon years.

Comment 45v:
Lane utilization factor adjustments should be supported with adequate survey data.

Response:

All adjustments to Synchro model parameters have been fully documented and justified in Section 8.3 of the report update. This includes a justification for adjustments to the lane utilization factor.

Comment 45w:
This specific area has a lot of heavy vehicle traffic. As such, heavy vehicle percentages should be calculated using the existing TMCs. Lane widths should also be based on existing conditions.

Response:

Heavy vehicle percentages have been calculated based on existing traffic count data. Lane widths adhere to the parameters outlined in the Region of Peel's "Regional Guidelines for Using Synchro, Version 7.73 Rev 8, dated December 2010, given that field lane width data was not available.

Comment 45x:
Please include queue lengths and available storage/link distances in the capacity analysis results tables.

Response:

An extensive queuing study has been provided in the updated report in Section 8.5. Most of the typical (or 50th percentile) queues at the study area intersections are contained within the provided storage lengths, with some exceptions. However, all queues that exceed provided storage lengths can be accommodated by adjacent through lane groups. Traffic operations along the George Bolton Parkway extension, and at the Highway 50 / Albion Vaughan Road / Mayfield Road intersection, should be monitored as travel flows continue to evolve, to determine if additional mitigation measures would be required.

Comment 45y:
The minimum width of a parking space must be increased by 0.3 metres for each side of the parking space that is obstructed by a wall, column, bollard, fence or pipe that is situated more than 1.0 metres from the front or rears of the parking space.

Response:

This has been addressed in the updated architectural drawings.

Comment 45z:

The parking plans should illustrate the development phasing and adequate access for each phase.

Response:

This has been addressed in the updated architectural drawings.

PLANNING DEPARTMENT, ZONING

Comment 71:
Please confirm Table 6.7 calculations on Site Statistics A102. Level 1 is shown as Commercial and Visitors Parking, however, only shows 97 spaces whereas site wide, 159 commercial spaces are required. Please revise the table.

Response:

The site statistics related to parking supply have been revised in the updated architectural drawings as well as in the updated TIS.

TRAFFIC DEVELOPMENT ENGINEERING SUBMISSION

Comment 1 & 2:

1. A detailed engineering submission of road and access works will be required for our review and comment, designed, stamped, and signed by a Licensed Ontario Professional Engineer. The engineering submission MUST include the removals, new construction and grading, typical sections and pavement markings and signing drawings. All works within Region's right-of-way must be designed in accordance to the Public Works "Design Criteria and Development Procedures Manual" and "Material Specifications and Standard Drawings Manual";

2. The Owner shall submit to the Region a detailed cost estimate, stamped and signed by a Licensed Ontario Professional Engineer, of the proposed road and access works within the Regional right-of-way.

Response:

These will be provided to the Town as part of the detailed road design drawings for Industrial Road to be included with a subsequent submission.

GENERAL

Comment:

In preparing your resubmission, please provide the following with your next submission:

1. Traffic Impact Study, prepared in accordance with a Terms of Reference Approved by the Region of Peel
2. Revised Urban Transportation Considerations Report
3. Waste Management Plan

Response:

1. It is noted that the Traffic Impact Study (TIS) was prepared in accordance with the Terms of Reference that were approved by the Region on January 11, 2021 (see Appendix B in the TIS).

2. The Transportation Considerations Report (which is the same as the Traffic Impact Study) has been revised. To avoid confusion, the title page has been changed to include "Traffic Impact Study" instead of "Transportation Considerations Report".

3. The Waste Management Plan is provided in the TIS in Appendix K.

RESPONSES TO REGION OF PEEL COMMENTS

WASTE MANAGEMENT

Comment:
Waste Collection Vehicle Access and Egress Route
1. A waste collection vehicle maneuvering diagram throughout the site outlining turning movements and radii will be useful to show these requirements on a Waste Management Plan.
2. The turning radius from the centre line must be a minimum of 13 metres and must be shown and labelled on all turns. This includes the turning radii to the entrance and exit of the site, and into and out of the Collection Points.
3. All roads along access route must be a minimum of 6 metres. This must be shown and labelled on subsequent submissions.
4. A minimum 18 meters straight head-on approach to a Collection Point is required.
5. In a situation where a waste collection vehicle must reverse the maximum straight back-up distance is 15 metres. The collection vehicle must not be required to turn while reversing or reverse towards oncoming traffic.

Response:

The above requirements are acknowledged and detailed on the Waste Management Plan provided in Appendix K of the TIS. A trained on-site staff member will be available to assist with waste collection operations and act as a flag person when the truck is reversing in order to direct the driver and motorists entering / leaving the respective area.

Comment:
Collection Point Requirements
6. Please refer to WCDSM Appendix 4 for an illustration of Indoor Waste Collection Point Specification and is also applicable to Outdoors.
a. The waste collection vehicle must wholly fit in the collection point during collection. A minimum of 18 metres must be provided for maneuvering during collection. This is measured from the front of the first bin staged for collection and must be labelled.
b. The Collection Point must show sufficient space for the staging of all bins of a single stream, whichever is larger and setting-out of Bulky Items (minimum 10 square meters). For 3 cubic yard front-end bin, the minimum width required is 3 metres for every front-end bin present, with a minimum depth of 2 metres. For 4 cubic yard front-end bins, a minimum depth of 3 metres is required.
c. The number, size, and type of receptacles in the Collection Point must be clearly labelled and shown on the staging areas

The Region needs to confirm feasibility of collection from the site, namely the ability for their trucks to maneuver within the site and within the collection area as described in the region's waste design manual. The Region does not need detailed drawings of any interior waste rooms that would hold all the bins required at this point; however, that information is provided to the applicant now so it can be considered as you embark on more detailed building designs.

Response:

The collection point requirements noted above are met and detailed on Drawings “SA-01” to “SA-05” within the Waste Management Plan provided in Appendix K of the TIS. The loading area will accommodate a staging area for residential solid waste bins on collection day, and will accommodate temporary storage of bulky items. At the time of collection, a trained on-site property staff member will be responsible for moving of bins for the waste collection vehicle driver.

Comment:
Submit a waste truck movement plan to demonstrate the collection areas and movement through the site meet Regional requirements. This is to ensure no major building layout or design changes are needed at the site plan stage to accommodate Regional waste services.

Response:

A waste truck movement plan consisting of vehicular manoeuvring diagrams through the collections areas and the site (VMD-01 to VMD-06) are provided within the Waste Management Plan in Appendix K of the TIS.

12563 & 12599 Highway 50
Proposed Mixed-Use Development
Traffic Impact Study
2nd Submission

Town of Caledon, Region of Peel

Prepared For: 12599 Hwy 50 Ltd.

January 2022

45 St Clair Avenue West, Suite 300
Toronto, ON M4V 1K9
www.bagroup.com

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1.0 INTRODUCTION

BA Group has been retained by 12599 Hwy 50 Ltd. to provide transportation consulting services related to a proposed mixed-use development on a site municipally known as 12563 and 12599 Highway 50, in the Town of Caledon in the Region of Peel. The site is located on the east side of Highway 50, north of Industrial Road. It is bounded by Highway 50 to the west, a commercial development to the north and commercial uses to the south and east. The site location is illustrated in **Figure 1.**

This Transportation Considerations Report has been prepared as part of the **Official Plan and Zoning By-law Amendment (ZBA) application** and subsequent **Site Plan Application** being submitted to the Region of Peel and the Town of Caledon.

1.1 EXISTING SITE CONTEXT

The site is currently designated as Bolton Highway Commercial (CHB) in the Town of Bolton Zoning By-law. Examples of some of the land uses permitted within CHB are business office, industrial use, motor vehicle gas bar and repair facility, commercial parking lot, accessory retail store and warehouse. Residential, convenience store and retail uses are not permitted within the CHB designation.

The site includes the properties at 12563 and 12599 Highway 50 which are described as follows:

12563 Highway 50

This property is occupied by a variety of motor vehicle maintenance, repair and storage facilities. The property includes 5 private driveways; 2 with full access at Highway 50 and 3 with full access on Industrial Road. All of the existing buildings and land uses on the property will be eliminated as part of the development of the site.

12599 Highway 50

This property is currently occupied by a small commercial plaza (Northpoint Plaza) that includes restaurants and a variety of commercial spaces. The property includes a private driveway with full access at Highway 50. It is proposed that the commercial plaza remain until the property is required for the construction of Building 5.

1.2 DEVELOPMENT CONCEPT PLAN

The development concept plan includes the eventual demolition of all existing buildings at 12563 and 12599 Highway 50 and the construction of 5 mixed-use buildings with a total of 2,238 residential units and 3,179 m^2 of retail. The development statistics for the concept plan are summarized in **Table 1**.

A key element of the development concept plan is the creation of a driveway through the middle of the site that connects to a new full access at Highway 50 and a new full access at Industrial Road. Since all of the existing access points to the properties will be closed, the consolidation of these driveways, particularly along Highway 50, will increase the level of safety for all road users.

The site concept plan is illustrated in **Figure 2**. Reduced scale architectural ground floor and parking-level plans are provided in **Appendix A**.

TABLE 1 DEVELOPMENT CONCEPT PLAN

Use		Proposed Statistics	
	**Residential Units**	Building 1	459 units
		Building 2	421 units
		Building 3	421 units
		Building 4	632 units
		Building 5	305 units
		Total	**2,238 units**
	**Retail**	Building 1	1,144 m^2
		Building 2	748 m^2
		Building 3	507 m^2
		Building 4	--
		Building 5	780 m^2
		Total	**3,179 m^2**
	**Vehicle Parking Spaces**	**2,806 spaces total** • 2,224 residential spaces • 562 spaces for non-residential (visitors and retail)	
	**Bicycle Parking Spaces**	**816 spaces total** • 52 visitor spaces at-grade • 764 stacked resident spaces below-grade on P1	
	**Loading Facilities**	• 2 loading spaces at each building (1 for residential and 1 for retail).	
	**Site Access**	• Access to site driveway at Highway 50 (full unsignalized access with a separate westbound left-turn lane). • Access at Industrial Road (full unsignalized access with a shared southbound left/through/right lane).	

Notes:
1. Site statistics based on site plans prepared by SRN Architects dated January 5, 2022.

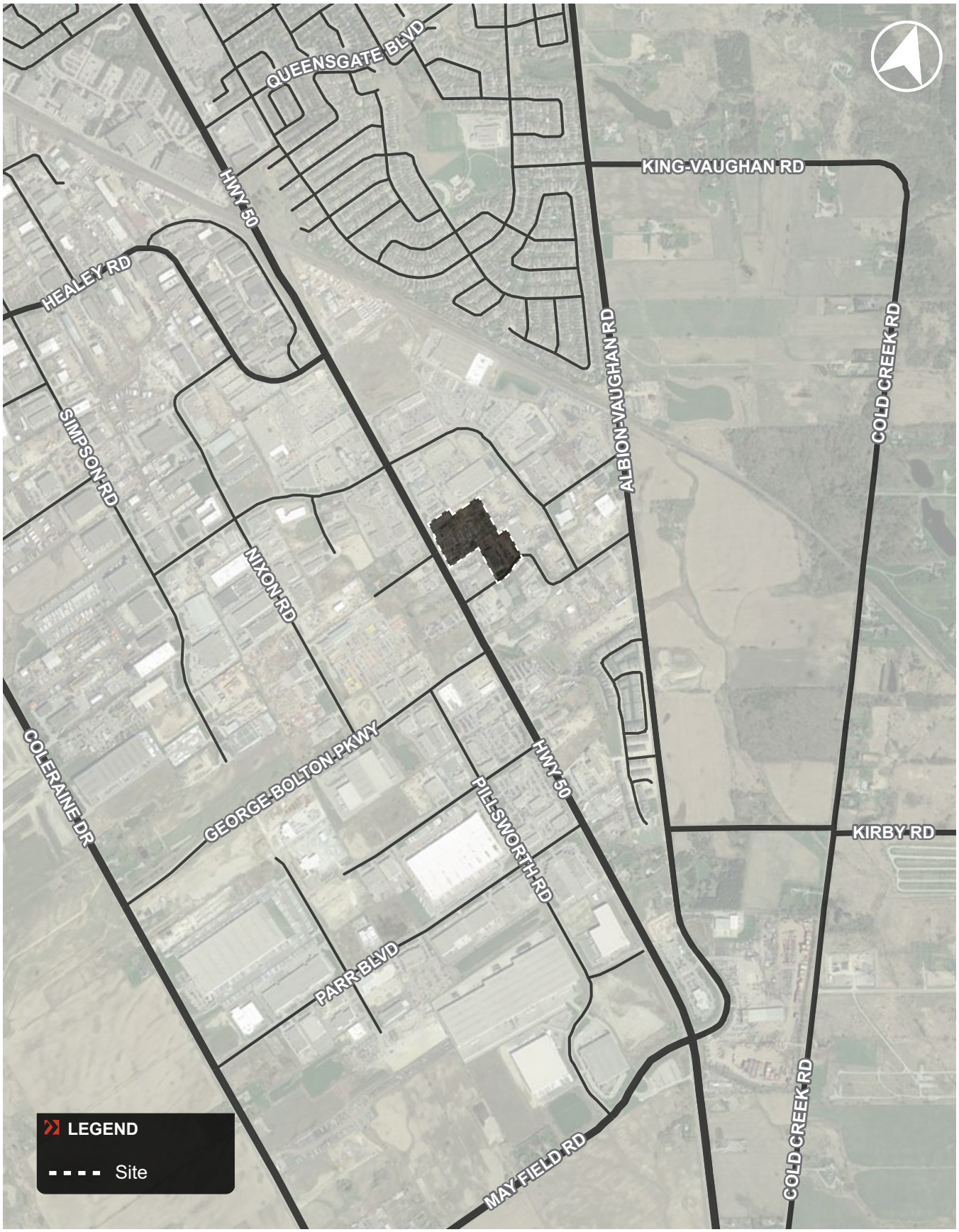

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FIGURE 1 SITE LOCATION

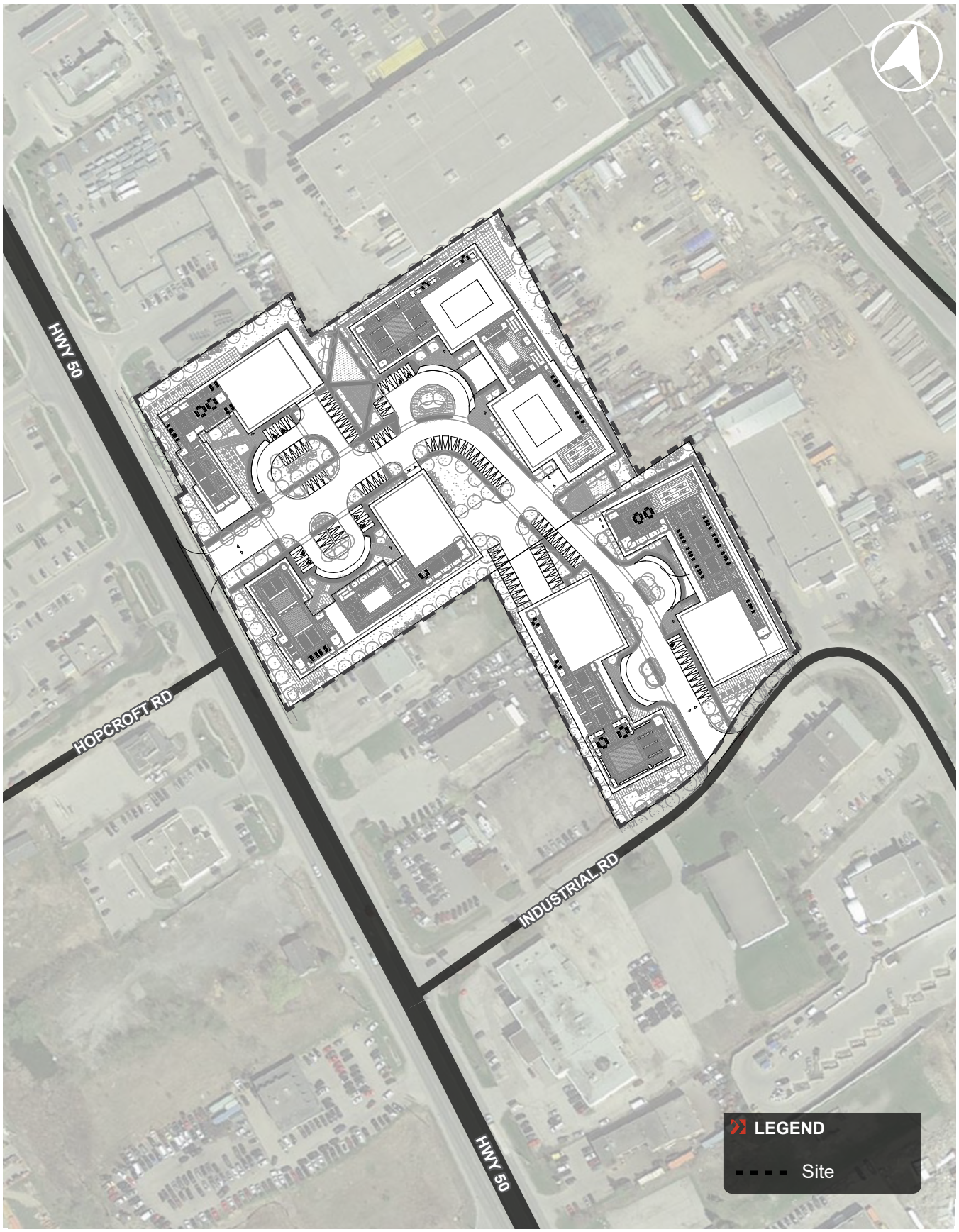

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FIGURE 2 SITE CONCEPT PLAN

1.3 STUDY SCOPE

The study scope is summarized below and the detailed Terms of Reference for the study is provided in **Appendix B**.

Development Concept Plan

- A summary of the proposed development concept plan.
- An overview of the site and the area-wide transportation system that provides for automobiles but encourages a shift towards non-automobile travel for prospective residents and visitors while still being able to meet the practical and operational needs of the proposed development plan.
- A review of the transportation elements of the proposed development plan that includes vehicle access and circulation, loading and parking facilities.

Transportation Context

- A description of the existing transportation context with consideration for the area road network, transit system and active transportation facilities.
- A description of future transportation changes and/or improvements to the area context such as planned road upgrades, transit and active transportation improvements.

Transportation Demand Management Framework

- An overview of potential Transportation Demand Management (TDM) measures and initiatives that are being considered to encourage prospective residents and visitors to use more active and sustainable modes of transportation.

Site Plan

- A review of the adequacy of the vehicle parking supply.
- A review of the adequacy of the loading space provisions.
- A review of the bicycle parking supply.
- A review of the functionality and appropriateness of the proposed vehicle, pedestrian and cycling facilities incorporated into the site plan including loading/garbage collection facility arrangements.

Traffic Operations Review

- An assessment of the existing traffic patterns and traffic volumes in the study area during the key weekday morning and afternoon peak hours.
- A comprehensive review of traffic-related changes that may occur in the area with consideration for corridor growth and construction of other area development projects.
- A review of traffic operations at intersections in the area under existing and future conditions including an assessment of the operational impacts of the proposed development.

Site Access Review

- A review of access options at the intersection of the proposed site access with Highway 50 and the proposed access at Industrial Road.
- Confirmation of the proposed traffic control and lane configuration at the site access points.
- Evaluation of the sight distance at the proposed access points.

The findings of this review are summarized in the following sections.

2.0 TRANSPORTATION CONTEXT

2.1 AREA ROAD NETWORK

2.1.1 Existing Road Network

The existing road network of arterial roads, collector roads and local roads considered in the study area are described below and illustrated in **Figure 3.** The existing lane configuration and traffic control are shown in **Figure 5.**

Highway 50 is a north-south Region of Peel "high capacity arterial road" (as identified in the Town's Official Plan) that extends from Highway 407 in the south to Highway 89 in the north and is designated as an Industrial Connector in Peel Region's 2013 Road Characterization Study. In the vicinity of the site, Highway 50 has an urban 4-lane cross section with a centre left-turning lane and a posted speed limit of 60 km/h.

George Bolton Parkway is an east-west Town of Caledon collector road that intersects Highway 50 at a signalized t-intersection and extends westerly to Coleraine Drive. This road currently has a 2-lane urban cross section with a centre left-turning lane and a de facto speed limit of 50 km/h.

Industrial Road is an east-west Town of Caledon local road with a two-lane rural cross section (one lane per direction) and a de facto speed limit of 50 km/h. Industrial Road connects Highway 50 and Albion Vaughan Road and is controlled by a stop sign at each end.

McEwan Drive is a northeast-southwest Town of Caledon local road that operates with a two-lane mostly urban cross section (one lane per direction) and a de facto speed limit of 50 km/h. McEwan Drive intersects Highway 50 with a 4-legged signalized intersection and connects easterly to Commercial Road and westerly to Simpson Road.

Albion Vaughan Road is a north/south Town of Caledon local road in the study area that is located along the boundary of the Town of Caledon and the City of Vaughan and extends northerly from Mayfield Road/Highway 50 to King Street East/King Road. This road currently has a 2-lane rural cross-section and a speed limit of 80 km/h.

Commercial Road is an east/west local Town of Caledon road that extends easterly from McEwan Drive and connects to Albion Vaughan Road as well as to Industrial Road. This road currently has a 2-lane cross section and a posted speed limit of 50 km/h.

Hopcroft Road is a dead-end unpaved local Town of Caledon Road that provides access to 3 single-family homes. As the traffic volumes on this road are extremely low, Hopcroft Road was not included as part of the analysis. Since the road is 35 metres from the proposed site access on Highway 50, it was confirmed by the Town that there are no upgrades planned for Hopcroft Road at this time.

Kirby Road is a City of Vaughan minor arterial roadway that extends easterly from the boundary with the Town of Caledon at Albion Vaughan Road to Huntington Road in the City of Vaughan. This road has a 2-lane rural cross-section and a de facto speed limit of 80 km/h.

2.1.2 Future Road Network

The future road network of roads considered in the study area is described below and illustrated in **Figure 4.** The future lane configuration and traffic control are shown in **Figure 6**.

George Bolton Parkway

In 2018, the Town of Caledon completed a Municipal Class Environmental Assessment (EA) for the extension of the George Bolton Parkway from Highway 50 to Albion Vaughan Road with stop control intersections at Industrial Road and Commercial Road. The preferred plan includes one lane in each direction and a centre left-turn lane. As outlined in the 2017 Town of Caledon Transportation Master Plan and confirmed by Town staff, there are plans to begin this work by 2023.

Albion Vaughan Road

As identified in the Town of Caledon 2017 Transportation Master Plan and the 2019 Development Charges Background Study, Albion Vaughan Road (Mayfield Road to King Street), is listed as a long-term transportation network improvement to be upgraded from 2 to 4 lanes by 2031.

GTA West

The Ontario Ministry of Transportation (MTO) is currently undertaking the GTA West Transportation Corridor Route Planning and Environmental Assessment Study with a recommendation for a new multimodal transportation corridor that extends from Highway 400 in the east to the Highway 401/407 ETR interchange area in the west. This work will identify the route, determine interchange locations and complete the preliminary design for this new transportation corridor.

The confirmed preferred alignment indicates that the new route will pass through the Bolton area, just south of the existing intersection of Mayfield Road/Highway 50 at Albion Vaughan Road. Since the timelines and budget for this proposed new transportation corridor have not been confirmed, this future road was not included in the analysis for this study.

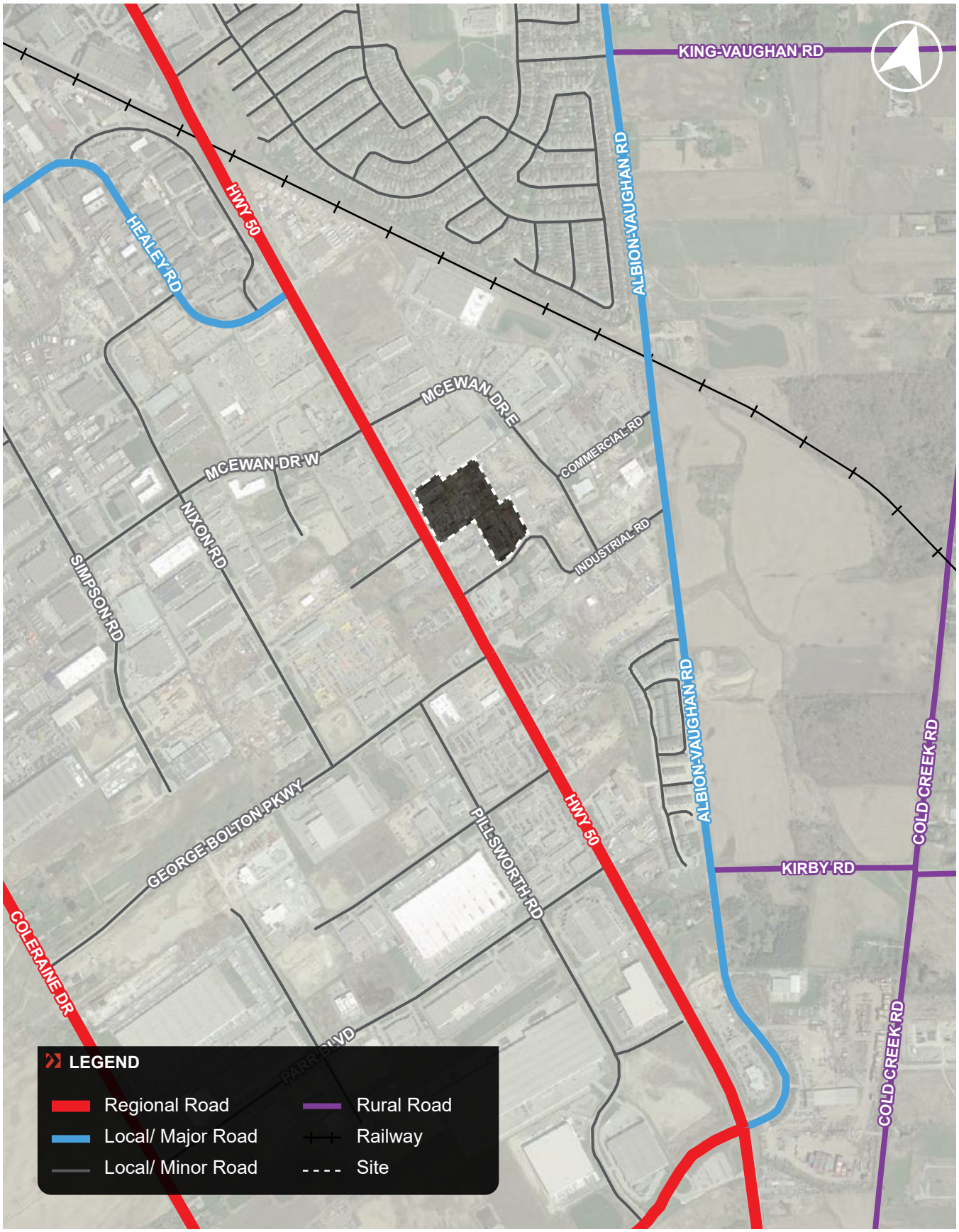

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FIGURE 3 EXISTING AREA ROAD NETWORK

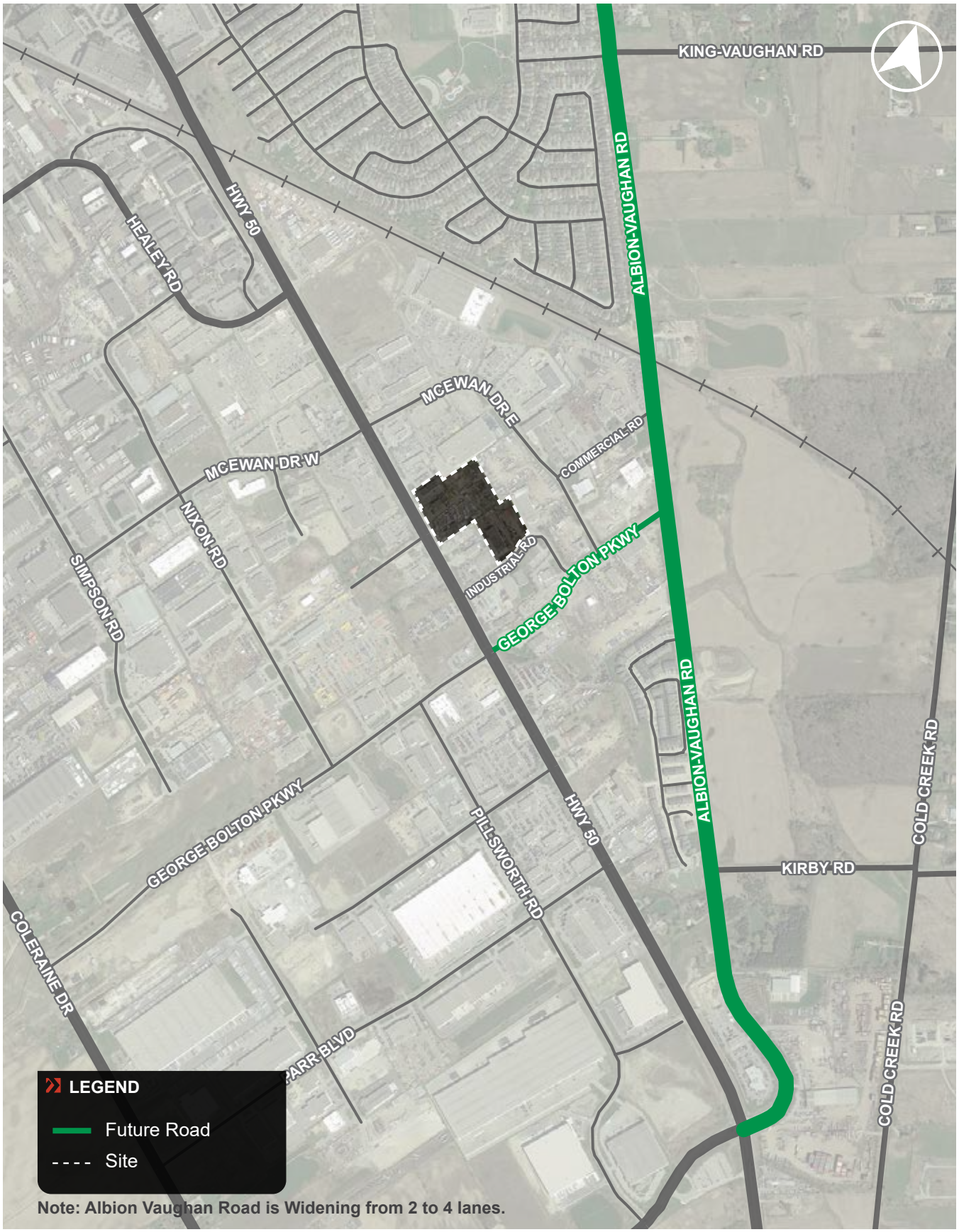

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FIGURE 4 FUTURE CHANGES TO AREA ROAD NETWORK

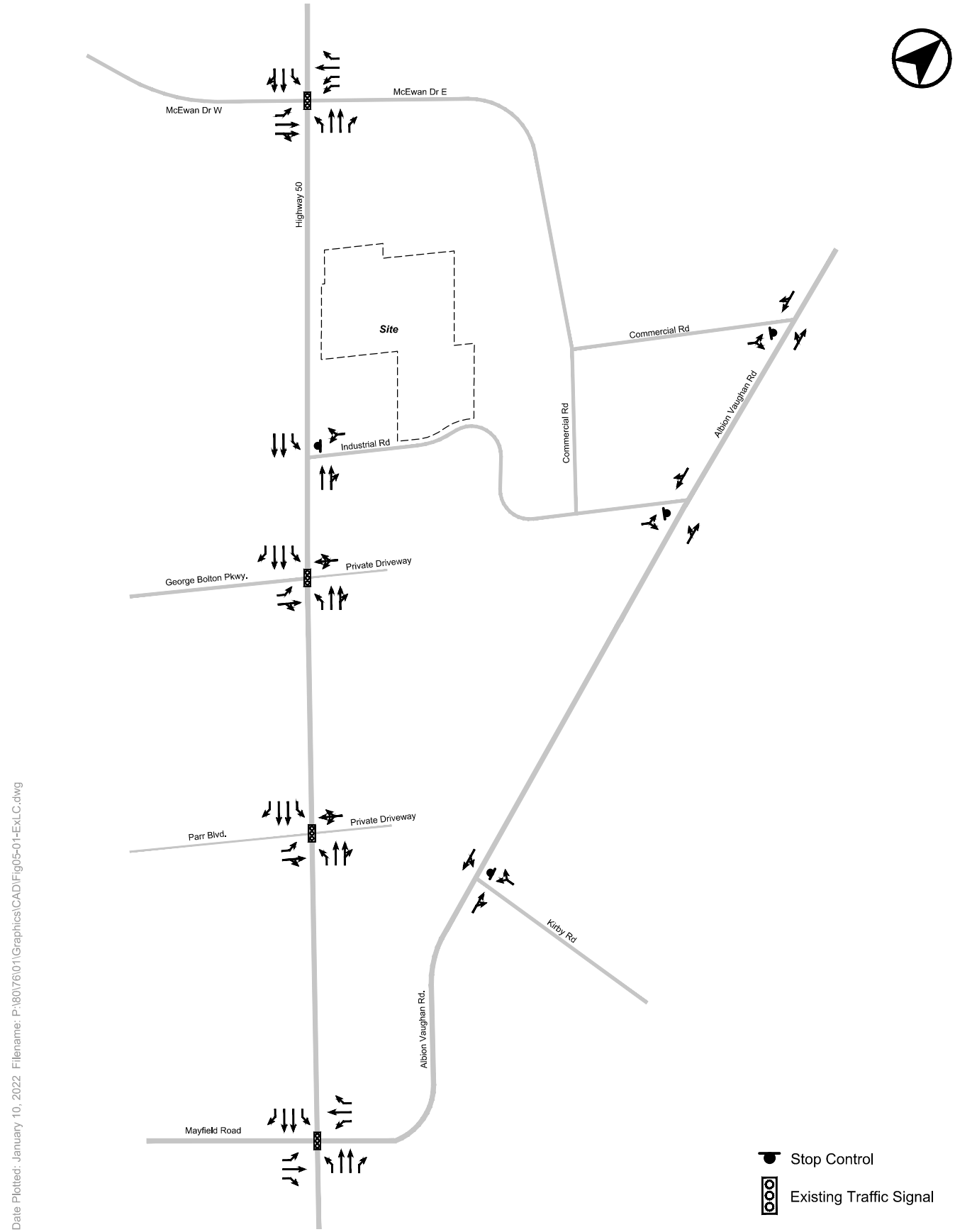

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FIGURE 5 EXISTING LANE CONFIGURATION AND TRAFFIC CONTROL

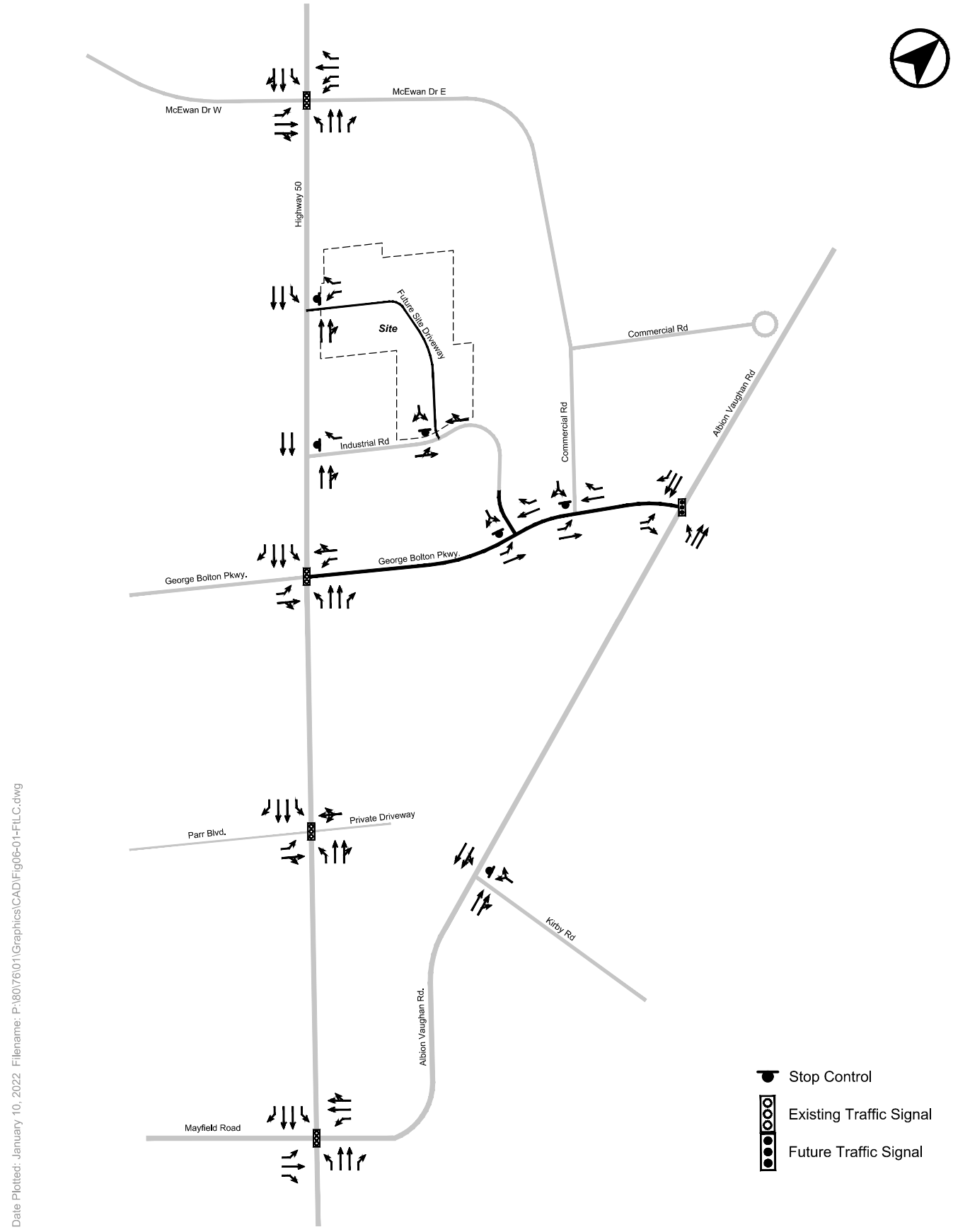

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FIGURE 6 FUTURE LANE CONFIGURATION AND TRAFFIC CONTROL

2.2 AREA TRANSIT NETWORK

2.2.1 Existing Transit Network

The Town of Caledon has retained Voyago to provide local bus service in the Bolton area. The Bolton Line operates during weekday peak periods (Monday to Friday, 6:00 am to 9:30 am and 3:00 pm to 6:30 pm), with stops throughout the downtown Bolton core and the industrial zone.

The nearest Bolton Line stops to the site are located at the intersection of Highway 50 & George Bolton Parkway and at Highway 50 & McEwan Drive. The walking time to either of these stops is approximately 5 minutes.

Inter-regional transit is provided by GO Transit with the operation of one bus route in Caledon. It should be noted that GO Transit is only operating one route in the study area due to COVID conditions. Once typical travel patterns return, it is possible that additional GO Transit routes will once again be available in the Bolton area. The current schedule only provides southbound service during the morning peak period and northbound service during the afternoon peak period.

There is a carpool lot located on the southwest corner of the Mayfield Road and Highway 50 intersection approximately 2 km from the site (25 minute walk). The carpool lot provides free 24/7 parking for drivers, a passenger pick-up/drop-off area and bike racks. The lot is serviced by the Bolton GO Transit bus route, which provides service to and from the Malton GO Station, with connections to Union Station, Brampton's ZUM network and York Region Transit.

There are no future improvements confirmed for the transit network in the vicinity of the site at this time. Once typical travel patterns return post-COVID, it is possible that the frequency of GO Bus 38 will increase and additional routes to service the area will be implemented.

The existing transit service in the area is described in detail in **Table 2.** An overview the existing area transit network is illustrated in **Figure 7**.

TABLE 2 EXISTING AREA TRANSIT NETWORK

Route	Peak Period Headways	Closest Stop Location	Description
Voyago Local Bus Service			
Voyago Bus service (retained by Town of Caledon)	Peak period weekday service only with 30 minute headways	Highway 50 at George Bolton Parkway/ Highway 50 at McEwan Drive (5 minute walk from site)	Route operates weekdays 6:00 am to 9:30 am and 3:00 pm to 6:30 pm Route operates between King & Ann Street, to the Coleraine Road industrial area to Highway 50 at George Bolton Parkway to Highway 50 & Mayfield Road to Highway 50 & Willow Street.
GO Bus Routes (Inter-regional transit)			
Route 38 Bolton /Malton (peak service only)	2 **southbound** buses 55 minutes apart during morning service. 2 **northbound** buses 120 minutes apart during evening service.	**Southbound** East side of Highway 50 at McEwan Drive East (~300m North of the site) **Northbound** West side of Highway 50 at McEwan Drive West (290m North of the site)	The 38 GO bus route provides weekday service along Highway 50 from Queen Street N. at Columbia Way to Mississauga (Malton) with GO train connections at Malton to Union Station and beyond. This route takes approximately 40 minutes to travel from the site to the end of the line at the Malton Go station.

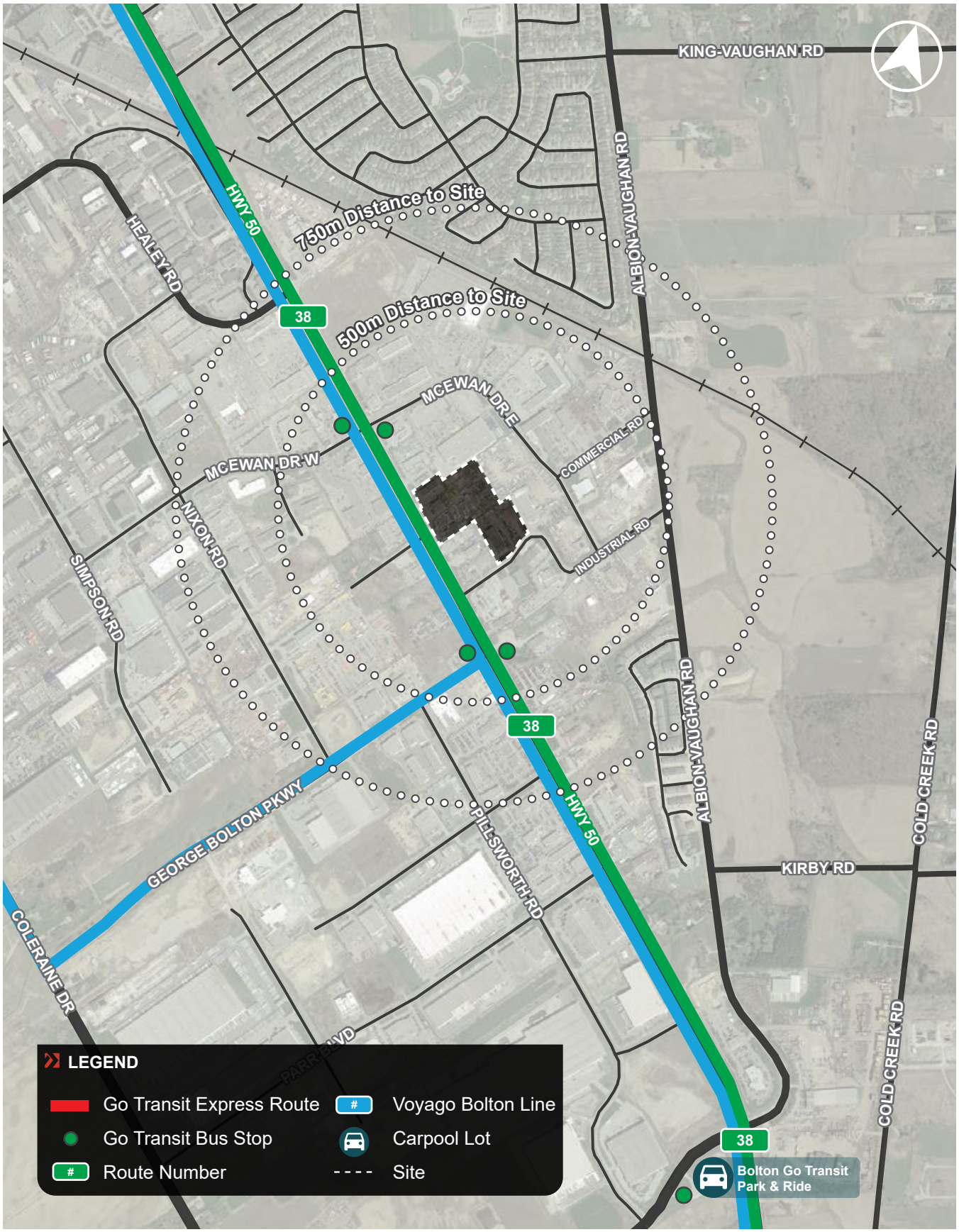

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FIGURE 7 EXISTING AREA TRANSIT NETWORK

2.3 AREA CYCLING NETWORK

2.3.1 Existing Cycling Network

The existing cycling infrastructure in the area of the site is relatively limited at this time. On-street cycling lanes exist on McEwan Drive West between Simpson Road and just east of Loring Drive and on George Bolton Parkway between Highway 50 and Coleraine Drive. These cycling lanes are not connected to other cycling infrastructure within the Town.

The existing area cycling facilities are displayed in **Figure 8**.

2.3.2 Future Cycling Network

On February 22nd, 2018, Peel Regional Council approved the Sustainable Transportation Strategy (STS) and its accompanying five-year Active Transportation and Transportation Demand Management implementation plans (ATIP and TDMIP, respectively). The STS is the result of extensive consultation efforts, involving the public, local municipalities and other stakeholders from across the Region. Although these short-term plans did not include cycling infrastructure upgrades in the vicinity of the site, a review of long-term plans identified that a cycle track is track proposed for Highway 50 from Mayfield Road to just north of the CN rail line (2023 – 2031).

As noted, the Town of Caledon has plans to extend the George Bolton Parkway from Highway 50 to Albion Vaughan Road in 2023. The plan includes a 3.0 m wide in-boulevard multi-use pathway on both sides of the road that will provide new facilities for pedestrians and cyclists.

Future changes to the area cycling facilities are displayed in **Figure 9**.

2.4 AREA PEDESTRIAN CONTEXT

2.4.1 Existing Pedestrian Network

In the vicinity of the site, a continuous sidewalk exists on the east side of Highway 50 across the frontage of 12599 Highway 50 and extends northbound to McEwan Drive and as far north as Healy Road. Directly in front 12563 Highway 50, a narrow asphalt walkway exists and continues southerly to the George Bolton Parkway.

On the west side of Highway 50, a continuous sidewalk is available between Healey Road southerly to Hopcroft Road. There are sidewalk segments between Hopcroft Road to just south of Parr Boulevard.

The existing area pedestrian facilities are displayed in **Figure 8**.

2.4.2 Future Pedestrian Network

The proposed site includes sidewalks along both sides of the site driveway that connect to the east side of Highway 50 and the north side of Industrial Road.

As noted, the Town of Caledon has plans to extend the George Bolton Parkway from Highway 50 to Albion Vaughan Road in 2023. The plan includes a 3.0 m wide in-boulevard multi-use pathway on both sides of the road that will provide new facilities for pedestrians and cyclists.

Future changes to the pedestrian facilities are displayed in **Figure 9**.

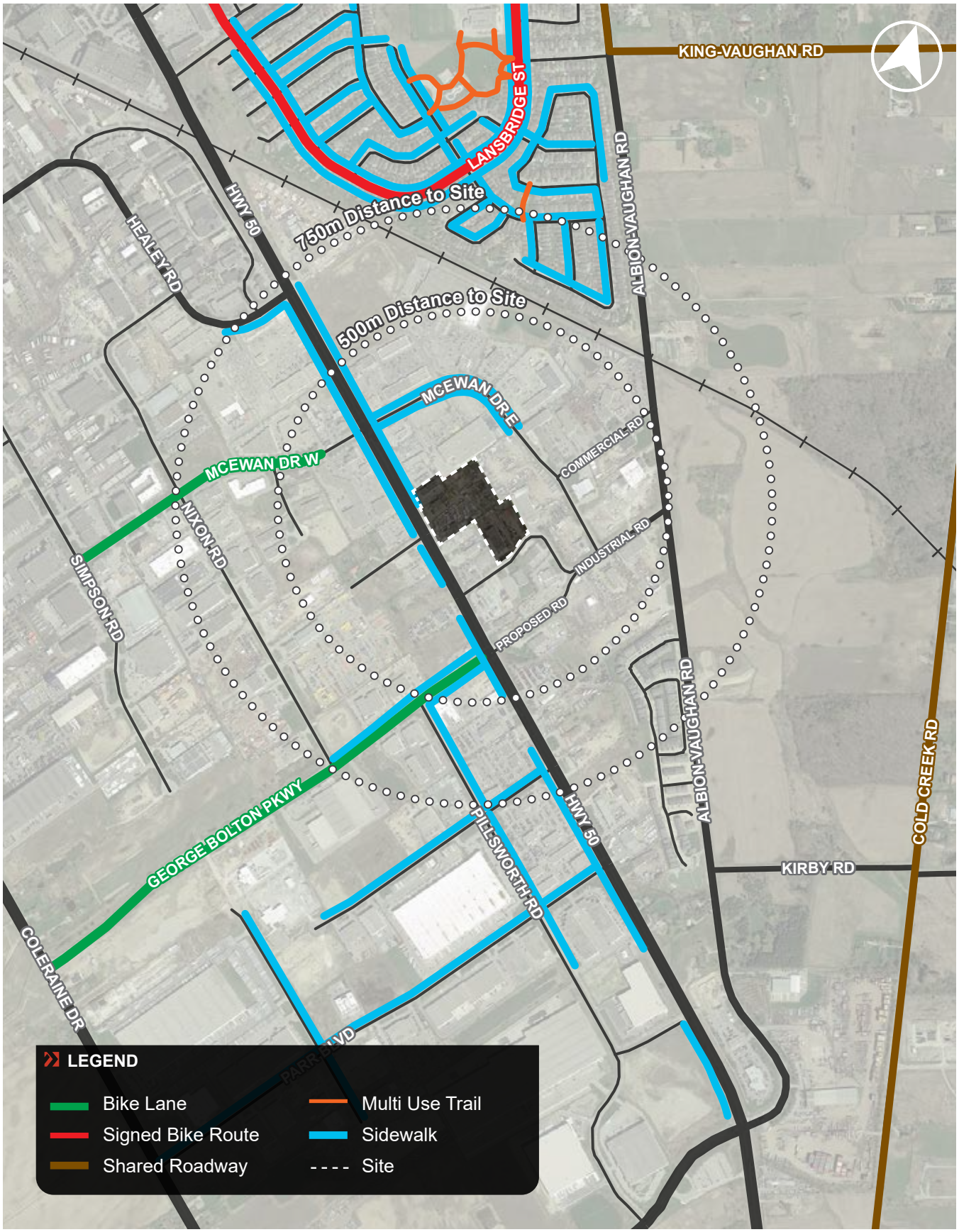

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FIGURE 8 EXISTING AREA CYCLING AND PEDESTRIAN NETWORK

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FIGURE 9 FUTURE CHANGES TO AREA CYCLING AND PEDESTRIAN NETWORK

3.0 VEHICLE PARKING CONSIDERATIONS

All vehicle parking calculations were completed to align with the phasing considered in the traffic analysis horizons as follows:

- Phase 1: Buildings 1, 2 and 3 (completion by 2029)
- Phase 2: Buildings 4 and 5 (completion by 2036)

It is noted that in consideration of the actual construction phasing of the site, the architectural drawings reference each building as a numbered phase i.e. Building 1=Phase 1, Building 2=Phase 2, Building 3=Phase 3, Building 4=Phase 4 and Building 5=Phase 5.

3.1 TOWN OF CALEDON ZONING BY-LAW

The site is subject to the Town of Caledon Zoning By-law for parking considerations. Application of this By-law is summarized by building for Phases 1 and 2 in **Table 3.**

Phase 1 would require a total of 2,402 parking spaces, inclusive of 1,953 resident spaces and 449 non-resident spaces (327 resident visitor spaces and 122 retail spaces).

Phase 2 would require a total of 1,680 parking spaces, inclusive of 1,406 resident spaces and 274 non-resident spaces (235 resident visitor spaces and 39 retail spaces).

The total parking requirement for the site (based on the Zoning By-law), for both Phases 1 and 2, is 4,082 spaces, inclusive of 3,359 resident spaces and 723 non-resident spaces (562 resident visitor spaces and 161 retail spaces).

TABLE 3 TOWN OF CALEDON ZONING BY-LAW - MINIMUM PARKING REQUIREMENTS

Land Use		Units or Gross Floor Area (GFA m^2)	Zoning By-law Minimum Parking Rate	Parking Requirement (number of spaces)
PHASE 1				
Building 1	Resident	459	1.5 spaces/unit	689
	Visitor		0.25 spaces/unit	115
	Retail	1,144	1 space/20 m^2	58
	Sub-Total			**862**
Building 2	Resident	421	1.5 spaces/unit	632
	Visitor		0.25 spaces/unit	106
	Retail	748	1 space/20 m^2	38
	Sub-Total			**776**
Building 3	Resident	421	1.5 spaces/unit	632
	Visitor		0.25 spaces/unit	106

Land Use		Units or Gross Floor Area (GFA m^2)	Zoning By-law Minimum Parking Rate	Parking Requirement (number of spaces)
	Retail	507	1 space/20 m^2	26
	Sub-Total			**764**
TOTAL PHASE 1	**Resident**	**1,301**	1.5 spaces/unit	**1,953**
	Visitor		0.25 spaces/unit	**327**
	Retail	**2,399**	1 space/20 m^2	**122**
			Total Non-Resident	**449**
			TOTAL	**2,402**
PHASE 2				
Building 4	Resident	632	1.5 spaces/unit	948
	Visitor		0.25 spaces/unit	158
	Retail	--	1 space/20 m^2	--
	Sub-Total			**1,106**
Building 5	Resident	305	1.5 spaces/unit	458
	Visitor		0.25 spaces/unit	77
	Retail	780	1 space/20 m^2	39
	Sub-Total			**574**
TOTAL PHASE 2	**Resident**	**937**	1.5 spaces/unit	**1,406**
	Visitor		0.25 spaces/unit	**235**
	Retail	**780**	1 space/20 m^2	**39**
			Total Non-Resident	**274**
			TOTAL	**1,680**
TOTAL SITE	Resident	**2,238**	1.5 spaces/unit	**3,359**
	Visitor		0.25 spaces/unit	**562**
	Retail	**3,179**	1 space/20 m^2	**161**
			Total Non-Resident	**723**
			TOTAL	**4,082**

Notes:
1. Site statistics based on site plans prepared by SRN Architects dated January 5, 2022.
2. As per Section 5.2.4, where the minimum number of parking, loading or delivery spaces is calculated on the basis of a rate or ratio, the required number of parking, loading or delivery spaces shall be rounded to the next higher whole number.
3. Net floor Area (NFA) assumed to equal Gross Floor Area (GFA) for the purposes of these calculations

3.2 PROPOSED PARKING RATES

The proposed parking rates for the site are summarized in **Table 4** and are based on a ratio of 1.0 spaces per unit for resident parking and 0.25 spaces per unit for resident visitor parking. It is proposed that the resident visitor parking supply would be shared with the retail parking demand.

Phase 1 would require a total of 1,628 parking spaces, inclusive of 1,301 resident spaces and 327 non-resident spaces.

Phase 2 would require a total of 1,172 parking spaces, inclusive of 937 resident spaces and 235 non-resident spaces.

The total parking required for the site (based on the proposed rates), as developed in 2 phases, is 2,800 spaces, inclusive of 2,238 resident spaces and 562 non-resident spaces.

TABLE 4 PROPOSED PARKING RATES

Land Use		Units or Gross Floor Area (GFA m^2)	Proposed Parking Rates	Parking Requirement (number of spaces)
PHASE 1				
Building 1	Resident	459	1.0 spaces/unit	459
	Visitor		0.25 spaces/unit	115
	Retail	1,144	--	--
	Sub-Total			**574**
Building 2	Resident	421	1.0 spaces/unit	421
	Visitor		0.25 spaces/unit	106
	Retail	748	--	--
	Sub-Total			**527**
Building 3	Resident	421	1.0 spaces/unit	421
	Visitor		0.25 spaces/unit	106
	Retail	507	--	--
	Sub-Total			**527**
TOTAL PHASE 1	**Resident**	**1,301**	1.0 spaces/unit	**1,301**
	Visitor		0.25 spaces/unit	**327**
	Retail	**2,399**	--	**--**
			TOTAL	**1,628**
PHASE 2				
Building 4	Resident	632	1.0 spaces/unit	632
	Visitor		0.25 spaces/unit	158
	Retail	--	--	--

Land Use		Units or Gross Floor Area (GFA m^2)	Proposed Parking Rates	Parking Requirement (number of spaces)
	Sub-Total			**790**
Building 5	Resident	305	1.0 spaces/unit	305
	Visitor		0.25 spaces/unit	77
	Retail	780	--	--
	Sub-Total			**382**
TOTAL PHASE 2	**Resident**	**937**	1.0 spaces/unit	**937**
	Visitor		0.25 spaces/unit	**235**
	Retail	**780**	--	**--**
			TOTAL	**1,172**
TOTAL SITE	**Resident**	**2,238**	1.0 spaces/unit	**2,238**
	Visitor		0.25 spaces/unit	**562**
	Retail	**3,179**	--	**--**
			TOTAL	**2,800**

Notes:
1. Site statistics based on site plans prepared by SRN Architects dated January 5, 2022.
2. As per Section 5.2.4, where the minimum number of parking, loading or delivery spaces is calculated on the basis of a rate or ratio, the required number of parking, loading or delivery spaces shall be rounded to the next higher whole number.
3. Net floor Area (NFA) assumed to equal Gross Floor Area (GFA) for the purposes of these calculations.

3.3 PARKING JUSTIFICATION

In consideration for the appropriate parking rate for the site, it is acknowledged that it is challenging to find a municipality in relation to Bolton, with comparable travel patterns and transit service. However, as described in the following sections, comparisons with Bolton have been provided for both King City and the City of Barrie.

As summarized in **Table 5**, a review of TTS data shows that the average vehicle ownership per apartment unit is similar in Bolton, Barrie and King City. While the percentage of apartments as a housing type is much higher in Barrie, the difference between Bolton and King City is only 2%.

TABLE 5 VEHICLE OWNERSHIP BY APARTMENT COMPARISON

	Bolton	Barrie	King City
Average vehicle ownership per apartment unit	1.1	1.0	1.3
Percent of households in municipality that are apartments	7%	25%	5%

3.3.1 City of Barrie

Although the parking supply for the site has been significantly increased, the comparisons with the City of Barrie remain in the updated report due to the challenges to find a more comparable municipality in relation to Bolton. It is also acknowledged that although the auto-driver mode share between Barrie and Bolton is similar, Barrie currently has significantly better transit service and active transportation facilities than Bolton.

To determine the appropriate resident and visitor parking rates for the site, Zoning By-law parking requirements and parking demand studies at apartments in the City of Barrie were reviewed as a comparison.

Parking demand studies previously completed at three apartment buildings in the City of Barrie were reviewed, since data for similar developments were not available for the Town of Caledon. Although the City of Barrie (population 150,000) has more than twice the population of the Town of Caledon (population less than 70,000), they are deemed to be comparable municipalities for parking consideration due to similar travel patterns and similar Zoning By-law requirements for residential parking.

3.3.2 Bolton vs. City of Barrie Travel Patterns

To confirm that travel patterns are similar between the Town of Caledon and the City of Barrie, data from the Transportation Tomorrow Survey (TTS) was analyzed for each municipality. The City of Barrie data considered apartment dwellings while the Town of Caledon considered all residential types since the sample size was too small to consider only apartments. As shown in **Table 6**, the travel mode share is very similar between the municipalities for peak periods of the day with differences in auto mode share of only 2%.

TABLE 6 TRAVEL MODE SHARES – BOLTON VS. BARRIE

Peak Period / Peak Direction						
Travel Mode	Morning Out			Afternoon In		
	Barrie	Bolton	Difference	Barrie	Bolton	Difference
Auto	83%	81%	**-2%**	86%	84%	**-2%**
Non-Auto	17%	19%	**2%**	14%	16%	**2%**

Notes:
1. "Auto" includes auto drivers, motorcyclists, private auto passengers, school bus ridership and taxi passengers.
2. "Non-Auto" includes all forms of transit, cycling and walking trips.
3. TTS zones for Bolton included in this summary are 3190-3194 and 3153.

3.3.3 Town of Caledon vs. City of Barrie Zoning By-law Parking Requirements

Both the Town of Caledon Zoning By-law and the City of Barrie Zoning By-law 2009-141, require a minimum of 1.5 parking spaces per residential unit. The Town of Caledon By-law however requires an additional 0.25 spaces per unit for visitors while the City of Barrie's Zoning By-law does not include a requirement for visitor parking. Since this provision does not differentiate between resident and visitor parking and because the City of Barrie does not have a specific Zoning By-law for visitor parking, it can be assumed that the ratio of 1.5 parking spaces per residential unit includes both resident and visitor parking. This is lower than the Town of Caledon Zoning By-law requirement of 1.75 spaces per unit for residents plus visitors.

3.3.3.1 City of Barrie Site-Specific Zoning By-law 2018-031

As per the City of Barrie's By-law 2018-031, this Site-Specific Zoning By-law amendment designates a property on Grove Street West for apartment dwellings. This By-law includes the requirement for 1.0 parking space per residential unit which is much lower than the 1.5 spaces per unit required by the City of Barrie Zoning By-law 2009-141. Since this provision does not differentiate between resident and visitor parking and because the City of Barrie does not have a specific Zoning By-law for visitor parking, it may be assumed that the ratio of 1.0 parking spaces per residential unit includes both resident and visitor parking.

3.3.4 King City, Region of York

King City could represent a reasonable municipal comparable to Bolton, particularly in consideration of transportation context and transit service. There is a GO station in King City centrally located on Keele Street, just south of King Road and a "mobility on-request" weekday service that provides connections for passengers to and from a fixed address to/ from the GO station at peak periods of the day in a York Region Transit-marked vehicle. This is somewhat comparable to the local bus service in Bolton that provides peak weekday connections to the GO station.

To compare travel patterns between Bolton and King City, data from the Transportation Tomorrow Survey (TTS) was analyzed for each municipality. Both King City data and Bolton considered all residential types since the sample sizes were too small to consider only apartments. As shown in **Table 7**, it is noted that King City has a higher auto mode share than Bolton as the difference in peak period/peak direction travel mode share varies from 10 to 12%.

TABLE 7 TRAVEL MODE SHARES – BOLTON VS. KING CITY

Peak Period / Peak Direction						
Travel Mode	Morning Out			Afternoon In		
	King City	Bolton	Difference	King City	Bolton	Difference
Auto	93%	81%	**12%**	94%	84%	**12%**
Non-Auto	7%	19%	**12%**	6%	16%	**10%**

Notes:
1. "Auto" includes auto drivers, motorcyclists, private auto passengers, school bus ridership and taxi passengers.
2. "Non-Auto" includes all forms of transit, cycling and walking trips.
3. TTS zones for Bolton included in this summary are 3190-3194 and 3153.
4. Travel modes for King City from the "Planning District" of King City (identified as PD zone #32).

3.3.4.1 2075 King Road, King City, Township of King, Region of Peel

At the time of writing this report update, there was very limited information available in relation to parking rates at multi-unit residential sites in King City. However, a comparable site-specific Zoning By-law (*Township of King Zoning By-law 2020-039* is provided in **Appendix L**) for a 252-unit condo development at 2075 King Road, includes a minimum parking requirement of 1.33 resident spaces/unit and 0.17 visitor spaces/unit for a total parking requirement of 1.5 spaces/unit.

It is noted that the minimum required resident parking rate of 1.33 spaces/unit is slightly higher for the King City condo site than the 1.0 spaces/unit being proposed for the Bolton site, but this could be expected since

King City has a higher auto travel mode share than Bolton. Furthermore, the minimum required visitor parking rate at the King City condo of 0.17 spaces/unit is much lower than the 0.25 spaces/unit proposed for the Bolton site. This provides further justification that the proposed resident visitor parking rate for the site will be able to accommodate both the visitor and retail parking demand.

As construction of the 2075 King Road condo is not yet completed, parking demand surveys were not able to be completed as part of this report.

3.3.5 Resident Parking Rate

The current architectural drawings illustrate a total of 2,244 resident parking spaces for 2,238 residential units. The effective resident parking supply ratio is 1.0 spaces per unit.

To determine the appropriate resident parking supply, parking demand surveys were previously completed by BA Group at three apartment buildings in the City of Barrie. The peak resident parking demand observed at the three proxy sites ranged from 0.74 to 0.81 spaces per unit. These rates are significantly lower than both the City of Barrie Zoning By-law 2009-141 requirement of 1.5 spaces per unit and the Town of Caledon Zoning By-law requirement of 1.5 spaces per unit.

TABLE 8 RESIDENT PARKING DEMANDS (CITY OF BARRIE)

Address	Number of Units	Survey Date	Time of Day	Peak Parking Demand (spaces)	Resident Parking Ratio (spaces/unit)
37 Johnson Street	188[1]	Wednesday June 10, 2015	3:00 am	139	0.74
		Thursday June 18, 2015		134	0.71
		Saturday July 11, 2015	3:00 pm – 11:00 pm	115	0.61
7 & 15 Vancouver Street	67	Tuesday June 2, 2015	3:00 am	53	0.79
		Wednesday June 10, 2015		49	0.73
		Thursday June 18, 2015		47	0.70
		Saturday July 11, 2015	3:00 pm – 11:00 pm	51	0.76
262 Rose Street	84	Tuesday June 2, 2015	3:00 am	59 [2]	0.70
		Wednesday June 10, 2015		55 [2]	0.65
		Thursday June 18, 2015		68 [2]	0.81
		Saturday July 11, 2015	3:00 pm – 11:00 pm	64 [2]	0.76

Notes:
1. Number of units at the time of the study.
2. Parking demands observed at 262 Rose Street include both resident and visitor parking areas. Visitor demands at 3:00 am were unusually high and assumed to include some resident demand.

3.3.6 Resident Visitor Parking Rate

The current architectural drawings illustrate a total of 562 visitor parking spaces for 2,238 residential units. The effective resident visitor parking supply ratio is 0.25 spaces per unit, which aligns with the minimum requirements of Caledon's Zoning By-law.

3.3.6.1 Zoning By-law Comparison

A review of the Zoning By-law visitor parking requirements for apartments in municipalities in proximity to, or similar to the Town of Caledon, has been completed and is summarized in **Table 9.** The review confirms that visitor parking requirements for comparable municipalities range from 0.20 to 0.25 spaces per unit.

TABLE 9 ZONING BY-LAW VISITOR PARKING REQUIREMENTS

City / Town	Zoning By-law	Type of Use	Visitor Parking Requirement (spaces/unit)
City of Barrie	--	Apartment Dwelling	Resident 1.5 – no visitor requirement
	2018-031 (Site-specific for Grove Street West)	Apartment Dwelling	Resident 1.0 – no visitor requirement
King City	2020-039 (Site-specific for 2075 King Road)	Condominium	0.17
	2017-66 (Urban Area CAK)	Apartment Dwelling	Resident 1.25 – no visitor requirement
Town of Caledon	--	Apartment Dwelling	0.25
Brampton	270-2004	Rental Apartment	0.20
Mississauga	0225-2007	Apartment Dwelling	0.20
Ajax	95-2003	Apartment Dwelling	0.25
Markham	28-97	Apartment Dwelling	0.25
Richmond Hill	313-96	Multiple or Apartment Dwelling	0.25
Whitchurch-Stouffville	2010-001	Apartment Dwelling	0.25
Collingwood	2010-040	Dwelling, Apartment	0.25

3.3.6.2 Proxy Site Comparison

To determine appropriate visitor parking supply, BA Group previously conducted a residential visitor parking survey at three apartment buildings in the City of Barrie on Saturday July 11, 2015 between 3:00 pm and 11:00 pm (times when visitor parking demands are typically highest).

As shown in **Table 10**, the peak visitor parking demand observed at the three proxy sites ranged from 0.03 to 0.05 spaces per unit. These rates are significantly lower than the Town of Caledon Zoning By-law

requirement of 0.25 spaces per unit as well as the Zoning By-law visitor parking requirements set out in other municipalities (0.20 to 0.25 spaces per unit).

TABLE 10 PROXY VISITOR PARKING DEMANDS (CITY OF BARRIE)

Address	Number of Units	Survey Day	Time of Day	Peak Parking Demand (spaces)	Visitor Parking Ratio (spaces/unit)
37 Johnson Street	188	Saturday July 11, 2015	3:00 pm – 11:00 pm	9	0.05
7 & 15 Vancouver Street	67	Saturday July 11, 2015	3:00 pm – 11:00 pm	3	0.03
262 Rose Street	84	Saturday July 11, 2015	3:00 pm – 11:00 pm	3	0.04

3.3.7 Retail Parking

As noted in Section 3.1, the Town's Zoning By-law requires a minimum of 1 parking space per 20 m^2 of retail GFA. As the proposed retail for the site includes a total GFA of only 3,179 m^2, as per the Town's suggestion, it is reasonable to expect that the retail parking demand could be shared with the resident visitor parking supply.

As summarized in the previous section, the peak visitor parking demand observed at the three proxy sites in Barrie ranged from 0.03 to 0.05 spaces per unit. These rates are significantly lower than the Town of Caledon Zoning By-law requirement of 0.25 spaces per unit, which indicates that the demand for retail parking could be shared with the visitor parking supply.

Furthermore, as the proposed retail uses may be ancillary, in that they will support residents of the site that would walk to the retail uses, it is appropriate to expect that the proposed visitor parking supply of 562 spaces (0.25 spaces/unit), of which 93 spaces are at-grade, would be adequate to meet all non-resident parking needs of the site, inclusive of resident visitors and retail visitors.

3.4 PROPOSED PARKING SUPPLY

3.4.1 Summary of Proposed Parking Supply

The proposed parking supply for the site is summarized in **Table 11** and is based on a ratio of 1.0 spaces per unit for resident parking and 0.25 spaces per unit for resident visitor parking. It is proposed that the resident visitor parking supply would be shared with the retail parking demand.

Phase 1 includes a total of 1,716 parking spaces, inclusive of 1,389 resident spaces and 327 non-resident spaces.

Phase 2 includes a total of 1,090 parking spaces, inclusive of 855 resident spaces and 235 non-resident spaces.

The total proposed parking supply for the site is 2,806 spaces, inclusive of 2,244 resident spaces and 562 non-resident spaces. The non-resident spaces would be used by both residential visitors and retail visitors. This supply represents an additional 6 spaces beyond what is required with the proposed parking rates.

TABLE 11 PROPOSED PARKING SUPPLY

Land Use		Units or Gross Floor Area (GFA m^2)	Proposed Parking Rates	Parking Requirement (number of spaces)	Proposed Number of Parking Spaces
PHASE 1					
Building 1	Resident	459	1.0 spaces/unit	459	468
	Visitor		0.25 spaces/unit	115	115
	Retail	1,144	--	--	--
	Sub-Total			**574**	**583**
Building 2	Resident	421	1.0 spaces/unit	421	496
	Visitor		0.25 spaces/unit	106	106
	Retail	748	--	--	
	Sub-Total			**527**	**602**
Building 3	Resident	421	1.0 spaces/unit	421	425
	Visitor		0.25 spaces/unit	106	106
	Retail	507	--	--	--
	Sub-Total			**527**	**531**
TOTAL PHASE 1	**Resident**	**1,301**	1.0 spaces/unit	**1,301**	**1,389**
	Visitor		0.25 spaces/unit	**327**	**327**
	Retail	**2,399**	--	**--**	**--**
			TOTAL	**1,628**	**1,716**
PHASE 2					
Building 4	Resident	632	1.0 spaces/unit	632	489
	Visitor		0.25 spaces/unit	158	158
	Retail	--	--	--	--
	Sub-Total			**790**	**647**
Building 5	Resident	305	1.0 spaces/unit	305	366
	Visitor		0.25 spaces/unit	77	77
	Retail	780	--	--	--
	Sub-Total			**382**	**443**
TOTAL PHASE 2	**Resident**	**937**	1.0 spaces/unit	**937**	**855**
	Visitor		0.25 spaces/unit	**235**	**235**

	Land Use	Units or Gross Floor Area (GFA m^2)	Proposed Parking Rates	Parking Requirement (number of spaces)	Proposed Number of Parking Spaces
	Retail	**780**	--	**--**	**--**
			TOTAL	**1,172**	**1,090**
TOTAL SITE	**Resident**	**2,238**	1.0 spaces/unit	**2,238**	**2,244**
	Visitor		0.25 spaces/unit	**562**	**562**
	Retail	**3,179**	--	**--**	**--**
			TOTAL	**2,800**	**2,806**

Notes:
1. Site statistics based on site plans prepared by SRN Architects dated January 5, 2022.
2. As per Section 5.2.4, where the minimum number of parking, loading or delivery spaces is calculated on the basis of a rate or ratio, the required number of parking, loading or delivery spaces shall be rounded to the next higher whole number.
3. Net floor Area (NFA) assumed to equal Gross Floor Area (GFA) for the purposes of these calculations

3.4.2 Accessible Parking

As per the Town of Caledon Traffic By-law 2015-058, the required minimum number of accessible parking spaces is 11 spaces plus 1% of the total parking supply. In accordance with the By-law, where an even number of accessible parking spaces are required, an equal number of Type A and B accessible parking spaces shall be provided. Where an odd number of accessible parking spaces are required, an equal number of Type A and B accessible parking spaces shall be provided but the last accessible parking space may be Type B.

For the proposed site total of 2,806 spaces, application of the By-law results in the requirement of 39 accessible parking spaces.

The architectural drawings for the site include a total of 39 accessible parking spaces (19 Type A and 20 Type B). The designated accessible parking spaces will be located in proximity to the primary entrances to the buildings and will have direct access to the entrances by a minimum 1.5 metres wide unobstructed route.

The proposed accessible parking supply will meet the By-law requirements.

3.4.3 Electric Vehicle Parking

Although the provision of electric vehicle (EV) parking for the site is not a Zoning By-law requirement, as summarized in **Table 12**, in order to encourage more environmentally friendly travel options, EV parking is being proposed at a rate of 0.20 EV spaces of the total parking supply.

TABLE 12 ELECTRIC VEHICLE PARKING SUPPLY

Phase	Total Parking Supply (number of spaces)	Proposed EV Parking Supply (number of spaces)
Phase 1	1,716	**343**
Phase 2	1,090	**218**
SITE TOTAL	**2,806**	**561**

3.4.4 Location of Parking Supply

As shown in the architectural drawings, the parking supply will be located at-grade and in a below-grade facility with 3 levels as summarized in **Table 13**.

TABLE 13 LOCATION OF PARKING SUPPLY

Level	Resident Parking Spaces	Non-Resident Parking Spaces	Total Number of Spaces
At-Grade	--	93	**93**
Level P1	523	469	**992**
Level P2	1,014	0	**1,014**
Level P3	707	0	**707**
Site Total	**2,244**	**562**	**2,806**

Notes:
1. Accessible spaces are included within total number of parking spaces required.
2. Site statistics based on site plans prepared by SRN Architects dated January 5, 2022

The proposed parking supply will meet the practical requirements of the site.

4.0 BICYCLE PARKING CONSIDERATIONS

4.1 PROPOSED BICYCLE PARKING SUPPLY

Although the Town of Caledon Zoning By-law does not include a requirement for bicycle parking, in order to encourage sustainable and healthy transportation, bicycle parking on the site is being proposed.

The current architectural drawings provide a total of 816 parking spaces for bicycles, including 52 spaces at-grade for visitors and 764 stacked spaces for residents, below-grade on P1.

Based on the development proposal that includes a total 2,238 residential units, the proposed bicycle parking supply aligns with a ratio of 0.34 long-term bicycle parking spaces per unit and 0.023 short-term bicycle spaces per unit, for a total bicycle parking supply rate of 0.36 spaces per unit.

The proposed bicycle parking supply is reasonable based on the development statistics and the surrounding transportation context. It is also deemed to be a practical amount of bicycle parking based on the available space within the buildings.

The proposed bicycle parking supply will meet the practical needs of the site. The location of the bicycle parking areas is illustrated in the architectural drawings for the site included in **Appendix A.**

5.0 LOADING CONSIDERATIONS

The loading requirements for the site have been considered based on land use and municipal requirements. As the proposed development would be serviced by the Region of Peel for residential garbage collection, the requirements of the Region's Waste Collection Design Standards have been applied for the residential components of the site. As per the Town of Caledon Zoning By-law, the retail components of the site would require a private waste collection service.

5.1 PROPOSED LOADING ARRANGMENTS

5.1.1 Residential Refuse / Recycling Collection Facilities

In accordance with the Region's Waste Collection Design Standards, the residential waste collection loading space (1 per building) is proposed to be a minimum of 6.0 m wide and 18.0 m long with a 7.5 m height clearance.

It is proposed that the loading space designated for residential waste collection be shared with residential deliveries. A scheduling system is to be implemented to minimize the potential for conflicts with the arrival of loading vehicles when spaces are occupied.

The "*Region of Peel Waste Collection Design Standards Manual" (2020)* was used to aid in the design of the bin staging area. These standards indicate that a requirement of one 3-cubic yard bin for compacted refuse would meet the demand for every 54 residential units and one 3-cubic yard bin for recycling would meet the demand for every 45 residential units. Bin calculations are provided in **Table 14**.

TABLE 14 REGIONAL OF PEEL WASTE COLLECTION BIN CALCULATION

	Building 1	Building 2	Building 3	Building 4	Building 5
Number of Units	459	421	421	632	305
Refuse Bins Required *(1 per 54 units)*	9	8	8	12	6
Recycle Bins Required *(1 per 45 units)*	11	10	10	14	7
Total Bins Required	20	18	18	26	13
Maximum Bins to Set-Out	**11**	**10**	**10**	**14**	**7**

Notes:
1. All bins for each stream are compacted, 3-cubic yards bins.
2. Number of bins are calculated as per Section 4.1.1 and 4.1.2 of the *Region of Peel Waste Collection Design Standards Manual* (WCDSM) 2020.
3. Bin calculations resulting in a fraction have been rounded up to the nearest whole number in accordance with the Region of Peel WCDSM 2020.

The planned waste collection points within the site accommodate the staging of all bins of a single stream, whichever is larger, and the setting-out of bulky items (minimum 10 square meters). Given that the pick-up of refuse and recycling would not occur at the same time, building maintenance workers would shuffle the bins on the day of collection. A trained on-site property staff member would move bins for the waste collection truck driver and act as a flag person when the truck is reversing to direct the truck in / out of the site and prevent conflict with passenger vehicles.

The waste management plan provided in **Appendix K**, details the bin calculations, number, size and type of receptacles within the staging areas.

5.1.2 Non-Residential Refuse / Recycling Collection Facilities

In accordance with the Town of Caledon Zoning By-law, waste collection for the retail components of the site must be serviced by a private contractor. The size of the loading space is dependent on the retail use. The retail uses for the site are unknown at this time hence the size of the loading spaces will range from 9.0 to 14.0 m in length with a width of 3.5 metres and will meet the minimum requirements of the Town of Caledon Zoning By-law.

One retail waste collection loading space per building will be provided. It is proposed that the loading space designated for private waste collection be shared with retail deliveries.

For any truck movements in loading areas that share a drive aisle with retail / visitor parking, a warning system consisting of signs and mirrors, can be implemented to caution motorists entering / leaving a parking space of heavy vehicle operations.

5.1.3 Operations and Manoeuvring

Vehicle Manoeuvring Diagrams (VMD's) have been developed which demonstrate the ability for Peel Region front loading refuse collection vehicles and other service and delivery vehicles to manoeuvre appropriately within the site when entering / exiting each of the loading spaces.

The design vehicles utilized in assessing the configuration of the proposed loading areas include:

- Region of Peel Front Loading Refuse Collection Vehicle (TAC HSU) and,
- TAC Single-Unit Vehicle.

Vehicular manoeuvring diagrams (VMD-01 and VMD-12) are provided in **Appendix C** and illustrate the turning movements for the design vehicles entering / exiting each of the proposed loading spaces.

These vehicle manoeuvring diagrams confirm that the proposed loading arrangements are appropriate and will facilitate the manoeuvring requirements of the vehicles that are expected to access the site.

5.1.4 Loading Summary

The proposed supply and arrangement of loading spaces will meet the practical servicing requirements of the site.

6.0 TRANSPORTATION DEMAND MANAGEMENT FRAMEWORK

6.1 TDM OBJECTIVES

The Transportation Demand Management (TDM) framework strives to reduce automobile use through an on-going strategy by supporting and promoting the use of non-auto transportation modes.

The key objective of the TDM framework is to reduce peak hour single occupant automobile traffic by focusing on four specific policy areas:

1. Encourage the use of alternate travel modes (transit, cycling, walking);
2. Increase vehicle occupancy;
3. Shift travel to off-peak periods; and
4. Reduce vehicle kilometres travelled.

The following sections summarize the TDM strategies which will be refined at the Site Plan Application (SPA) stage of the project.

6.2 TDM STRATEGIES

The existing site context provides for public transit service as well as pedestrian and cycling facilities. Potential TDM strategies have been developed to further support the use of non-auto modes of travel. Potential TDM measures for the site are summarized in **Table 15.**

6.3 TDM IMPLEMENTATION

The physical infrastructure components or ‘hard’ TDM measures outlined in this plan (i.e. pedestrian connections and bicycle parking spaces) will be incorporated into the development design. The implementation of these elements and the associated costs will be the responsibility of the developer. After construction, a qualified engineer or planner will confirm the incorporation of these design elements within the development.

The ‘soft’ measures of the TDM plan (i.e. travel mode choice information packages) will be implemented by the developer.

TABLE 15 TRANSPORTATION DEMAND MANAGEMENT STRATEGIES

Measure	Description	Cost Estimate	Implementation Strategy
Hard Measures			
Pedestrian Connections	Provide sidewalks along both sides of the site driveway that connect to the proposed sidewalk on the east side of Highway 50.	Integrated into overall development cost.	Construct as part of development.
Bicycle Parking	Provide 52 bicycle parking spaces at-grade for visitors and 864 stacked bicycle parking spaces for residents in a below-grade parking facility on P1.	Integrated into overall development cost.	Construct as part of development.
Car Share	Potential to provide up to 10 car share spaces on-site.	To be determined if/when car share services are available in Bolton.	To be confirmed as part of the Site Plan Approval (SPA) application.
Tele-work/ conference facilities	Provide tele-work/ conference facilities that would enable residents to “work from home”.	Integrated into overall development cost.	Construct as part of development.
Soft Measures			
Unbundled Parking	Parking to be separated “unbundled” from unit purchase.	To be determined.	During sales, offer units without a parking space or with a parking space at a separate cost
Travel Mode Information Packages	Implement programs to inform new residents of available travel mode choices and existing mobile apps providing transit information.	To be determined.	Travel mode information packages will be distributed at the sales centre.
Presto Cards	Provide Presto cards to new residents.	To be determined.	Presto cards will be distributed at the sales centre. The amount on each card to be confirmed at Site Plan Approval (SPA) but would likely be a minimum of one card/unit with a minimum value of $100.

7.0 TRAFFIC VOLUME FORECASTING

7.1 EXISTING TRAFFIC VOLUMES

As a result of the current COVID pandemic, existing traffic volumes on the public road network do not reflect typical travel patterns. As a result, traffic data collected in November of 2020 was compared and balanced with traffic data from 2018 and 2019 to represent non-COVID conditions as best as possible.

Baseline existing turning movement volumes were established for intersections within the study area road network based on the most recently available traffic count data not impacted by COVID conditions and collected by Spectrum Traffic Inc. on behalf of BA Group. Based on discussions with Region of Peel staff and as summarized in the terms of reference letter[1], a 1.5% annual growth rate for years between 2016 and 2021 were applied to the traffic count information to present a more conservative "existing traffic volume" baseline for the current year of 2021.

The most recent traffic count information is summarized in **Table 16**. Detailed traffic count data is attached in **Appendix D**.

TABLE 16 EXISTING TRAFFIC COUNT INFORMATION

Intersection	Date of Count	Source
Highway 50 / McEwan Drive East & West	Wednesday, November 25, 2020	Spectrum Traffic Inc. 7:00 a.m. to 9:00 a.m. 4:00 p.m. to 6:00 p.m.
Albion Vaughan Road / Commercial Road		
Albion Vaughan Road / Industrial Road		
Albion Vaughan Road / Kirby Road		
Highway 50 / Albion Vaughan Road / Mayfield Road	Tuesday, October 8, 2019	
Highway 50 / Parr Boulevard	Wednesday, October 2, 2019	
Highway 50 / Industrial Road	Wednesday, May 8, 2019	
Highway 50 / George Bolton Parkway	Tuesday, March 20, 2018	

Existing turning movement volumes were rounded to the nearest 5 vehicles and reviewed to ensure a general consistency in the traffic volumes on links between intersections. Where necessary, minor volume adjustments were made to *conservatively* balance through traffic volumes between intersections to ensure consistency in the corridor.

Existing traffic volumes for the weekday morning and afternoon peak hours adopted for the analysis are illustrated in **Figure 10**.

[1] As requested by the Region of Peel, a terms of reference was prepared and submitted by BA Group in a letter dated December 2020 and titled "*Traffic Impact Study Terms of Reference – 12563 & 12599 Highway 50, Bolton, Proposed Multi-Use Development*".

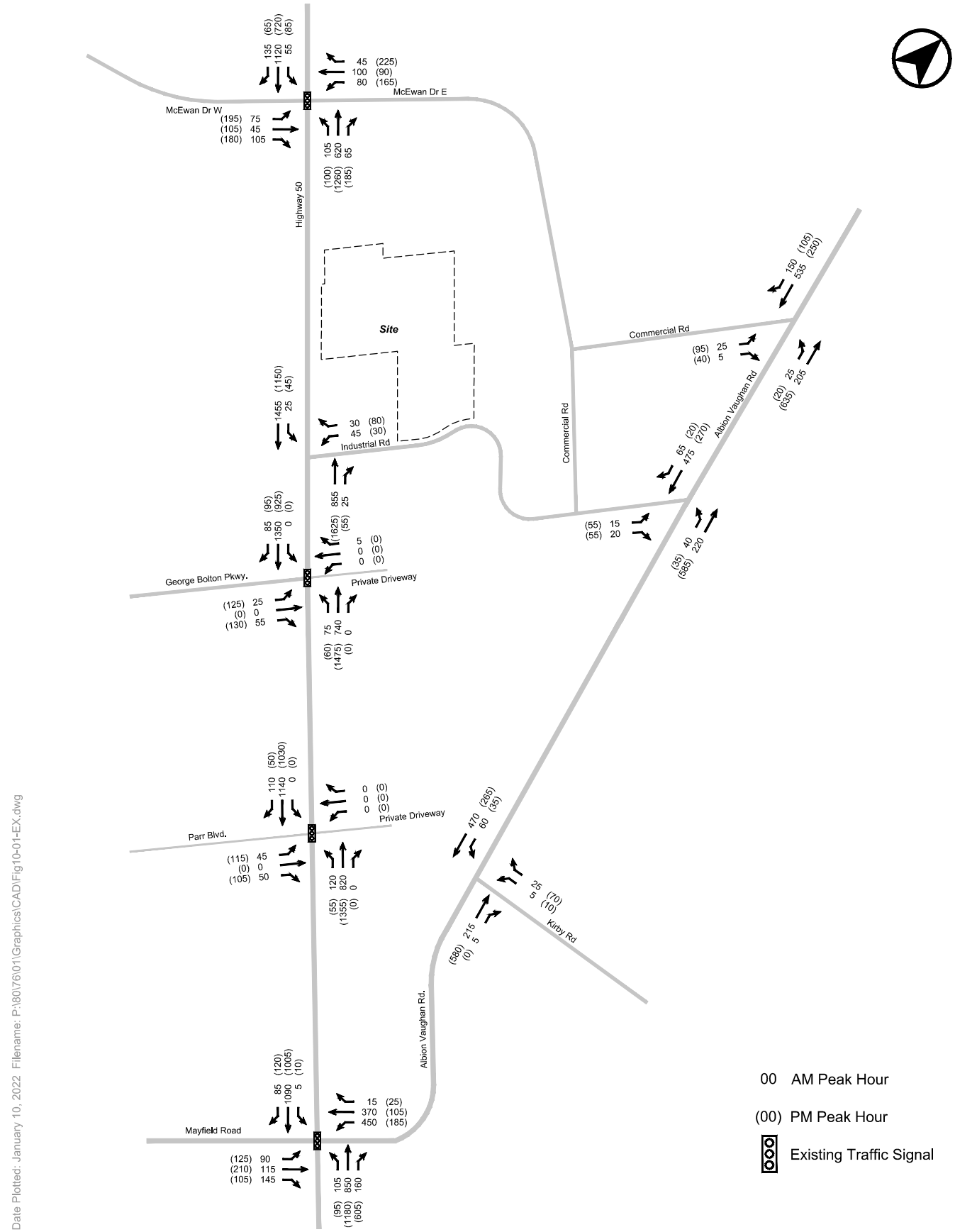

FIGURE 10 EXISTING TRAFFIC VOLUMES

7.2 FUTURE BACKGROUND TRAFFIC VOLUMES

7.2.1 Analysis Horizon Years and Phasing

Future horizon years analyzed in this study include 2029, 2036 and 2041. The 2029 horizon represents the completion of Phase 1 (Buildings 1, 2 and 3 only), the 2036 horizon represents the build-out of the entire site (Buildings 1, 2, 3, 4 and 5), while the 2041 horizon represents the five-year post build-out analysis.

Future background traffic volumes in the 2029, 2036 and 2041 horizon years represent the summation of the existing traffic volumes plus traffic redistribution resulting from the George Bolton Parkway extension and general corridor growth allowances in the 2029, 2036 and 2041 horizon years, plus background development traffic allowances. The future background traffic volumes for the 2029, 2031 and 2041 horizon years are shown in **Figure 16**, **Figure 17** and **Figure 18**, respectively.

7.2.2 George Bolton Parkway Extension Traffic Redistribution

As part of the George Bolton Parkway EA discussed in **Section 2.1.2**, a traffic analysis was conducted to project the traffic redistribution related to the extension and to provide a preliminary analysis on the study area intersections. The study forecasts both heavy vehicle and light vehicle redistributions as a result of the George Bolton Parkway extension.

In addition to these adjustments, manual traffic volume adjustments were made to account for:

1. The conversion of the intersection of Albion Vaughan Road / Commercial Road to a dead-end cul-de-sac;
2. The conversion of the intersection of Highway 50 / Industrial Road to a right-in / right-out (RIRO) only configuration; and
3. The George Bolton Parkway extension further relieving existing traffic operations at Highway 50 / Albion Vaughan Road / Mayfield Road, especially for westbound left-turning movements.

Relevant excerpts from the EA are attached in **Appendix E** while the total traffic volume redistribution is illustrated in **Figure 11**.

7.2.3 General Corridor Growth

In order to conservatively capture development progress outside of the site vicinity and study area for the horizon years of 2029 (Phase 1 build-out), 2036 (site build-out) and 2041 (five-years beyond build-out), the following growth rates were applied during both weekday morning and afternoon peak hours based on discussions with Region of Peel staff:

- 2021 to 2031: 1.0% annual growth rate
- 2031 to 2041: 0.5% annual growth rate

General corridor growth allowances for the 2029, 2036 and 2041 horizon years are illustrated on the study area road network in **Figure 12**, **Figure 13** and **Figure 14**, respectively.

7.2.4 Background Development Traffic

Allowances were made under future traffic conditions to account for new traffic generated by other development proposals in proximity to the proposed site that are either under construction, approved, being reviewed, or for which an application is expected to be submitted to the Town of Caledon in the near future. Traffic volume allowances related to the list of background developments are included in the study.

As summarized in **Table 17**, a total of 10 background developments were considered and include the following:

- 109 residential units
- 111 hotel suites
- 306,570 m^2 industrial GFA
- 2,191 m^2 medical-dental office GFA
- 1,493 m^2 auto dealership GFA
- 461 m^2 office GFA
- 279 m^2 retail GFA
- 8 gas station positions

TABLE 17 BACKGROUND DEVELOPMENTS

Development	Description	Report Source	Trip Assignment Source
12544 Highway 50	8 gas station positions 279 m^2 retail GFA 461 m^2 office GFA	LMM	TIS Report Excerpt
12700 Highway 50	2,191 m^2 medical-dental office GFA	Trans-Plan	
7 Loring Drive	3,247 m^2 industrial GFA	LEA	
Villalago Residences Inc.	109 residential units	Nextrans	
12724 Coleraine Drive (Buildings 'B' and 'C')	53,241 m^2 industrial GFA	BA	
12300 Coleraine Drive (Buildings 'D' and 'E')	93,222 m^2 industrial GFA	BA	
12300 Coleraine Drive (Building 'F')	37,878 m^2 industrial GFA	BA	
12400 Coleraine Drive	118,982 m^2 industrial GFA	BA	
12476 Highway 50	111 hotel suites	Crozier	
12500 Highway 50	1,493 m^2 auto dealership GFA	JD	
Total	• **109 residential units** • **111 hotel suites** • **306,570 m^2 industrial GFA** • **2,191 m^2 medical-dental office GFA** • **1,493 m^2 auto dealership GFA** • **461 m^2 office GFA** • **279 m^2 retail GFA** • **8 gas station positions**		

Notes:
1. GFA = Gross Floor Area.

The background development traffic is illustrated in **Figure 15**. These allowances were carried forward to the 2029, 2036 and 2041 horizon years.

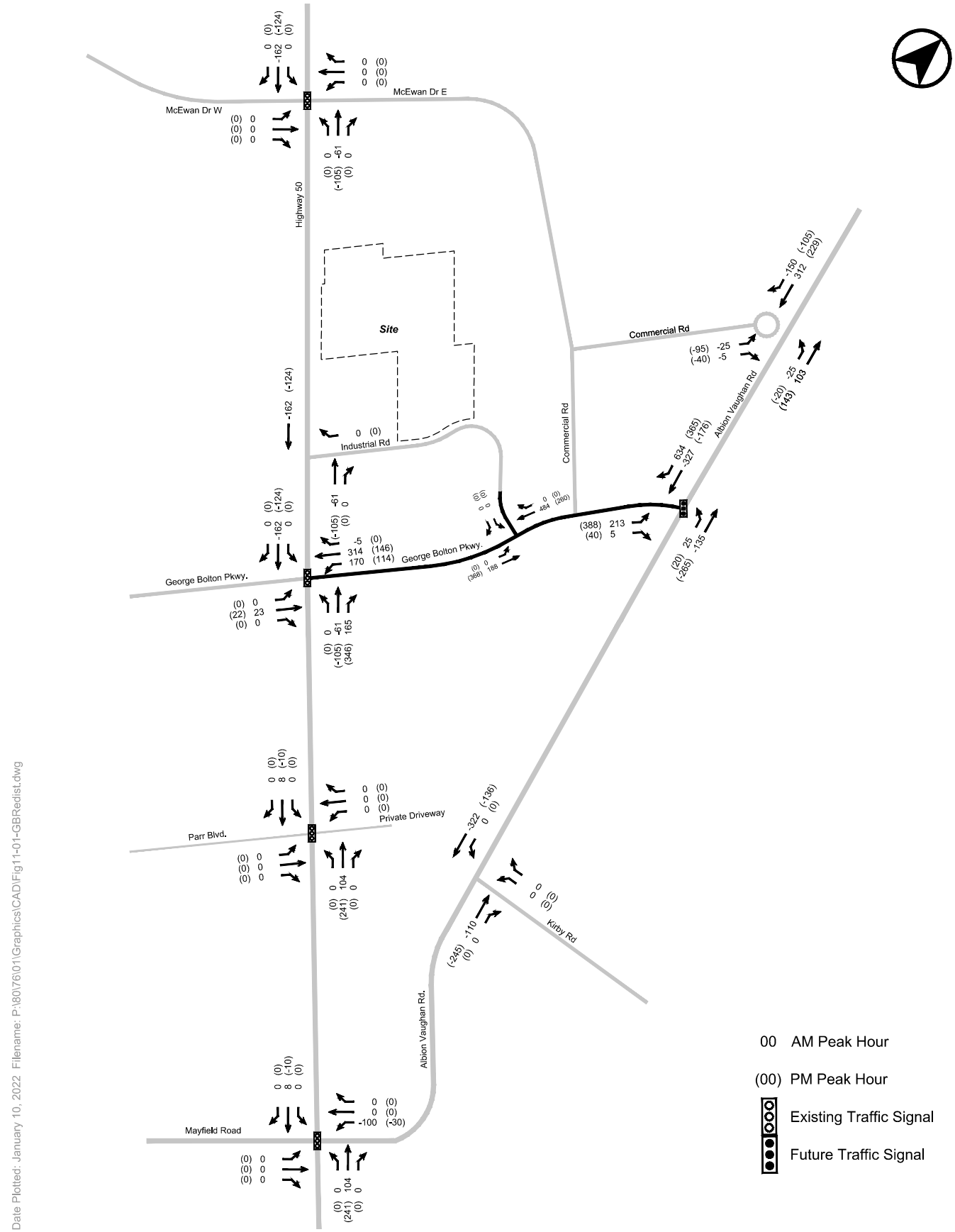

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FIGURE 11 GEORGE BOLTON PARKWAY EXTENSION TRAFFIC REDISTRIBUTION

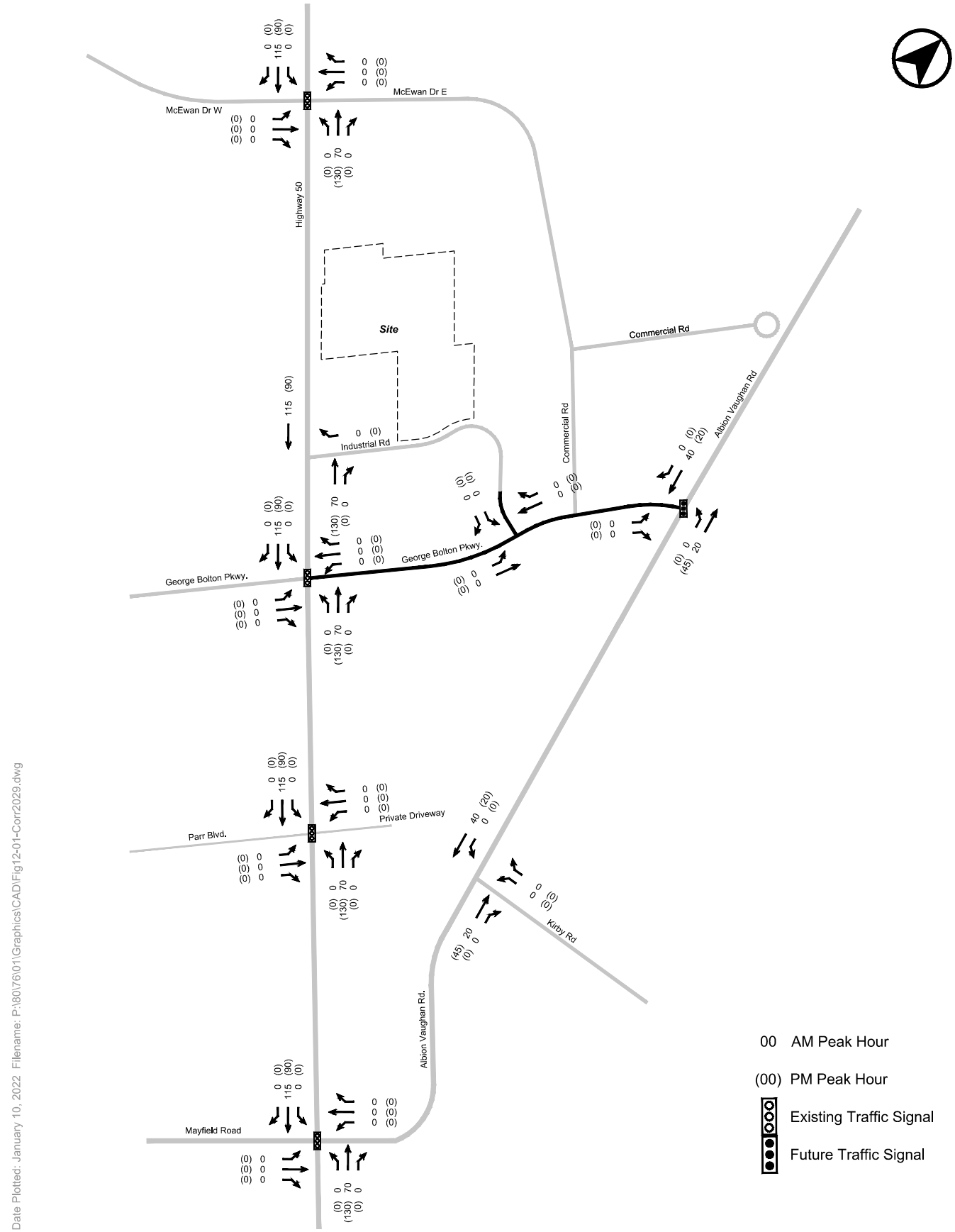

FIGURE 12 CORRIDOR GROWTH (2029 HORIZON)

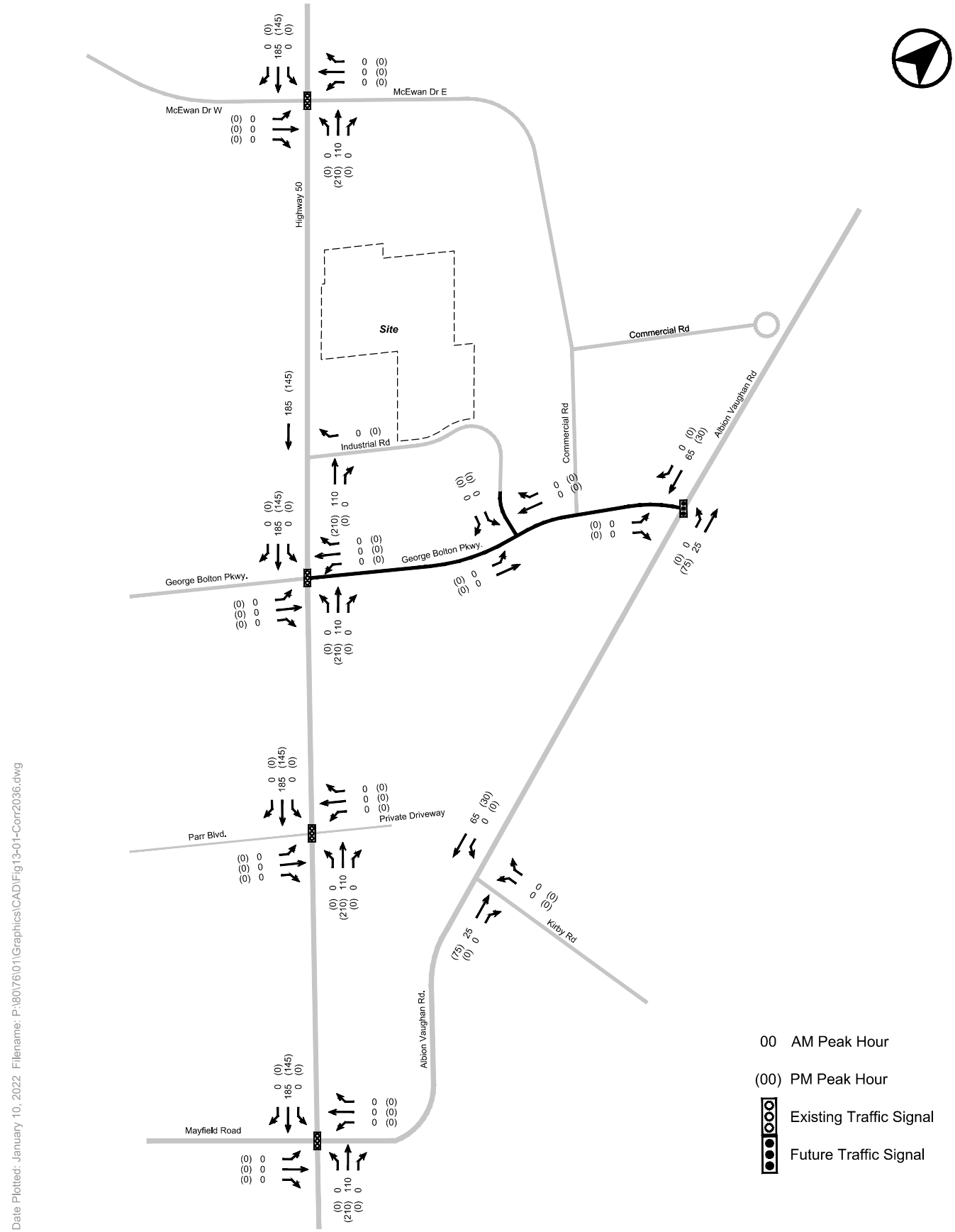

FIGURE 13 CORRIDOR GROWTH (2036 HORIZON)

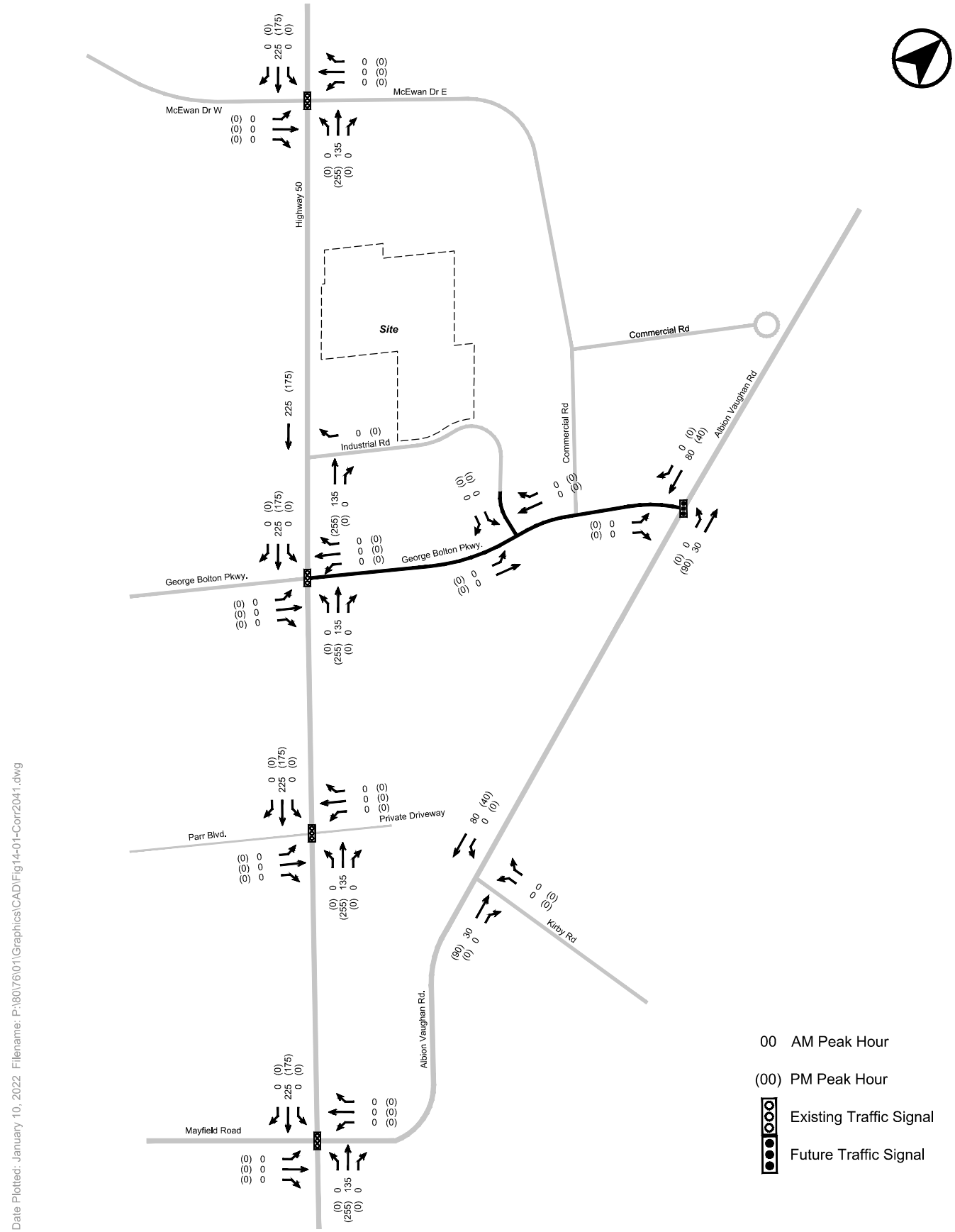

FIGURE 14 CORRIDOR GROWTH (2041 HORIZON)

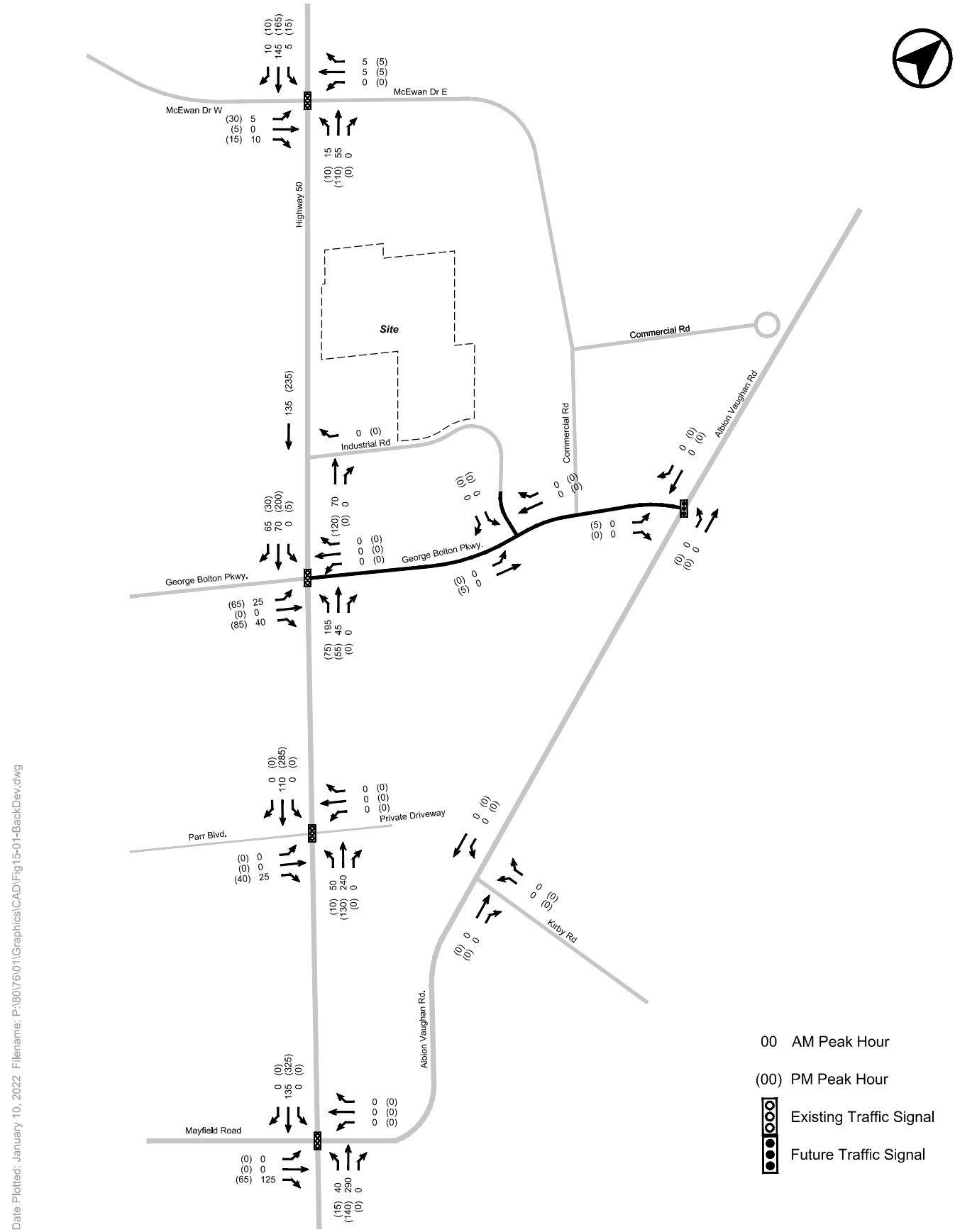

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FIGURE 15 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES

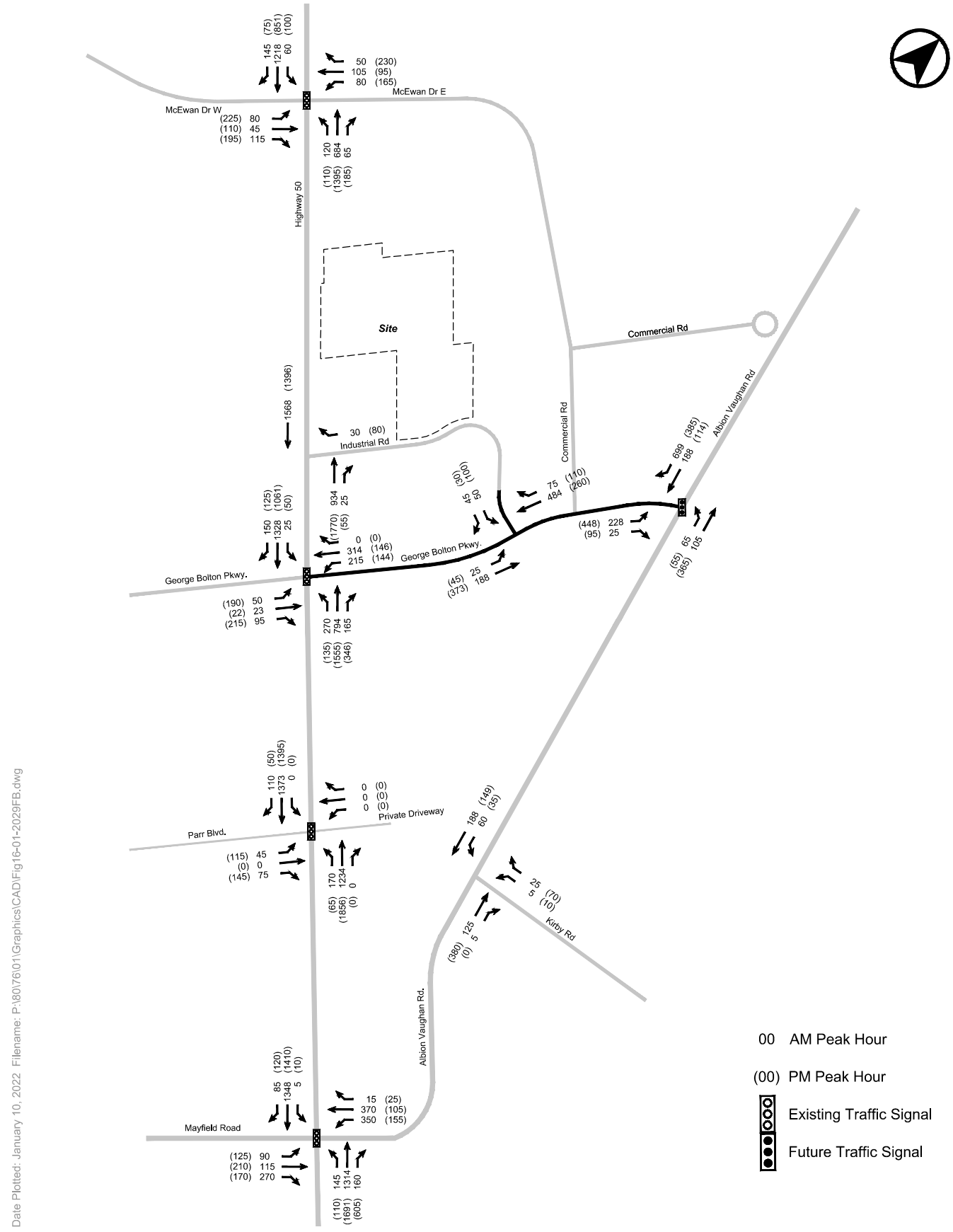

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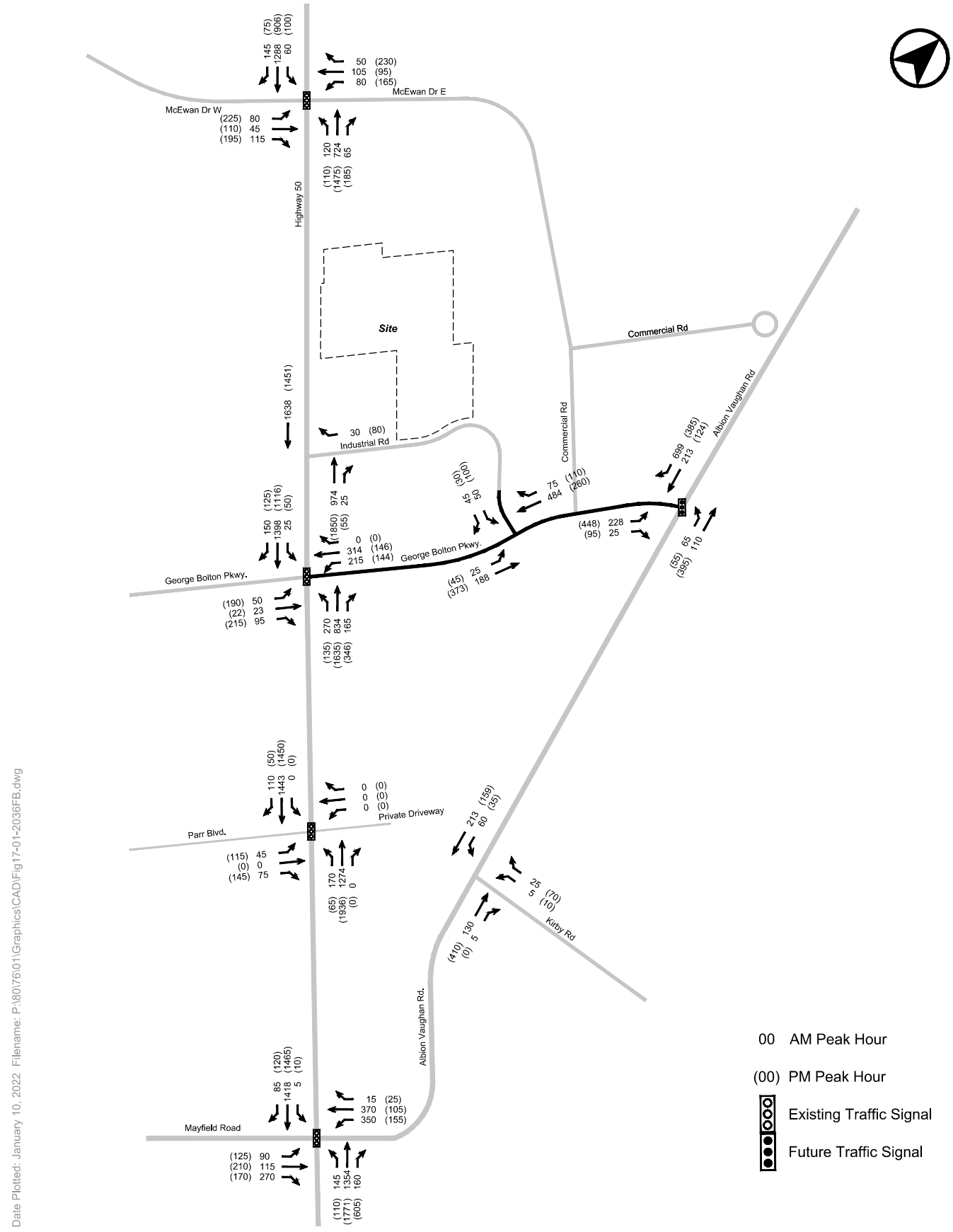
FIGURE 16 2029 FUTURE BACKGROUND TRAFFIC VOLUMES



Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig17-01-2036FB.dwg

FIGURE 17 2036 FUTURE BACKGROUND TRAFFIC VOLUMES

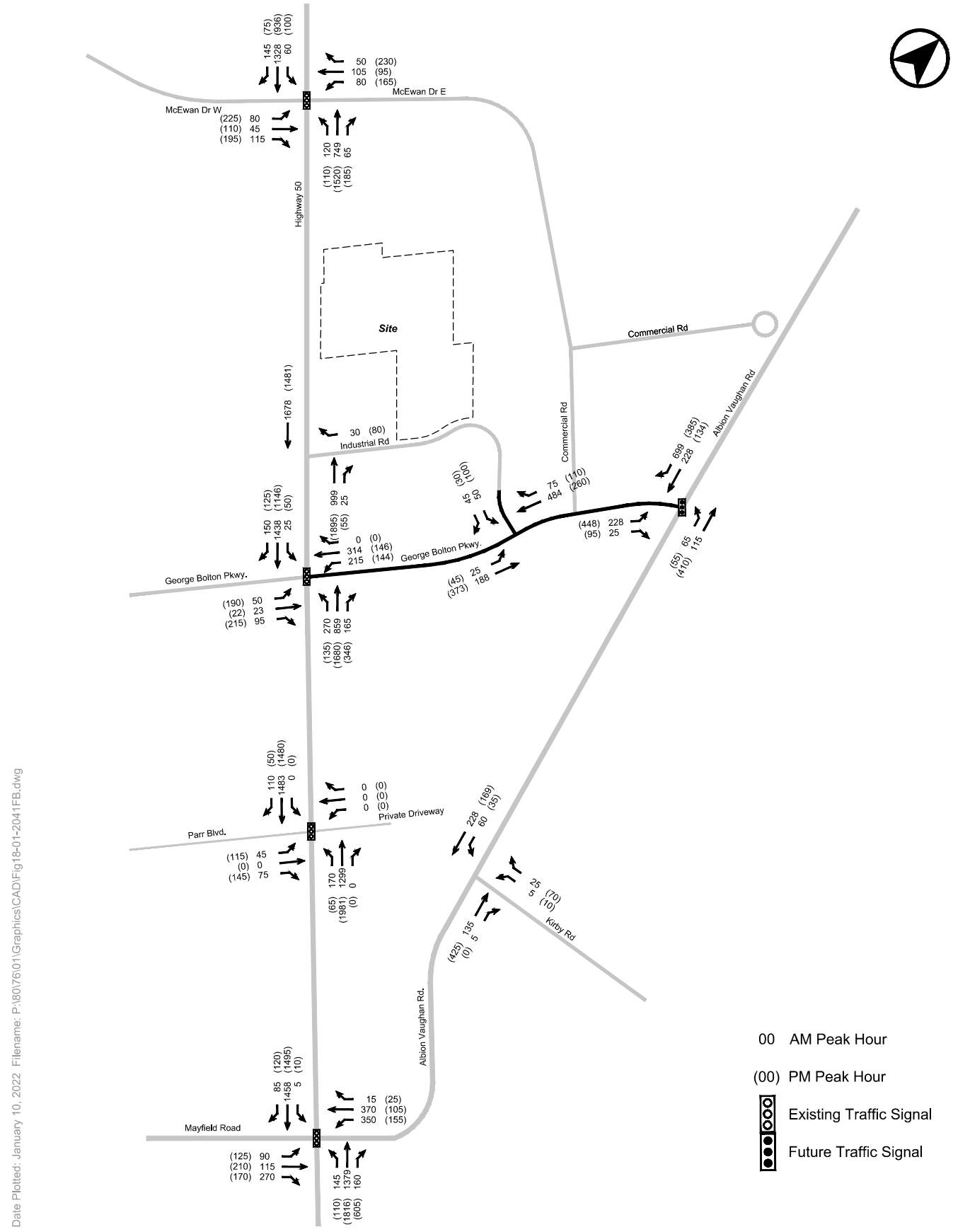


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FIGURE 18 2041 FUTURE BACKGROUND TRAFFIC VOLUMES

7.3 SITE TRAFFIC VOLUMES

7.3.1 Residential Site Traffic Volumes

Trip Generation

The residential trip generation potential of the proposed site is based upon trip behaviour observed within the ITE Trip Generation Manual (10th Edition), Land Use Code (LUC) 222 (High-Rise Multi-family Housing). The trip rates and resultant trips are summarized in **Table 18**.

Phase 1 is expected to generate 370 and 445 residential vehicle trips during the weekday morning and afternoon peak hours, respectively. The full build-out of the site anticipates in the order of 645 and 760 residential vehicle trips during the weekday morning and afternoon peak hours, respectively.

TABLE 18 RESIDENTIAL TRIP GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Directional Distribution	24%	76%	100%	61%	39%	100%
Residential Trip Rate	0.07	0.22	0.29	0.21	0.13	0.34
Phase 1 Residential Site Trips (1,301 units)	**90**	**280**	**370**	**275**	**170**	**445**
Full-Build Residential Site Trips (2,238 units)	**155**	**490**	**645**	**470**	**290**	**760**

Notes:
1. Site trips are rounded to the nearest 5.

Trip Distribution

The new residential site trips in the weekday morning and afternoon peak hours are assigned to the study area road network based on the observed travel pattern of home-based trips within the site area as provided by the 2016 Transportation Tomorrow Survey (TTS). TTS queries are provided in **Appendix F.**

The residential site traffic distribution is summarized in **Table 19**. The Phase 1 and full-build residential site traffic volumes on the area road network are illustrated in **Figure 19** and **Figure 22**, respectively.

TABLE 19 RESIDENTIAL SITE TRAFFIC DISTRIBUTION

To / From Site	Corridor	Inbound	Outbound
North	Highway 50	15%	15%
	Albion Vaughan Road	15%	15%
South	Highway 50	50%	50%
West	McEwan Drive West	5%	5%
	Mayfield Road	15%	15%
Total		**100%**	**100%**

Notes:
1. 2006 TTS zones considered include 3190 and 3192.
2. Inbound and outbound distributions are based on collected data from the weekday afternoon and morning peak hours, respectively.

7.3.2 Retail Site Traffic Volumes

Trip Generation

The trip generation potential of the commercial site uses were estimated based on the ITE Trip Generation Manual (10th Edition), LUC 820 (Shopping Center). The trip rates and resultant trips are summarized in **Table 20**. Phase 1 is expected to generate 20 and 100 retail vehicle trips during the weekday morning and afternoon peak hours, respectively. The full build-out of the site anticipates in the order of 30 and 135 retail vehicle trips during the weekday morning and afternoon peak hours, respectively.

TABLE 20 RETAIL TRIP GENERATION, LUC 820 (SHOPPING CENTER)

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Directional Distribution	62%	38%	100%	48%	52%	100%
Retail Trip Rate (trips/100 m^2 GFA)	0.58	0.36	0.94	1.83	1.98	3.81
Phase 1 Retail Site Trips (2,399 m^2 GFA)	**15**	**5**	**20**	**50**	**50**	**100**
Passby Retail Site Trips[1]	*5*	*5*	*10*	*30*	*30*	*60*
Primary Retail Site Trips	*10*	*0*	*10*	*20*	*20*	*40*
Full-Build Retail Site Trips (3,179 m^2 GFA)	**20**	**10**	**30**	**65**	**70**	**135**
Passby Retail Site Trips[1]	*10*	*10*	*20*	*35*	*35*	*70*
Primary Retail Site Trips	*10*	*0*	*10*	*30*	*35*	*65*

Notes:
1. Passby percentage is obtained from passby data found in the ITE Trip Generation Handbook, 3rd Edition (September 2017), and calculated as approximately 55% based on the commercial GFA proposed as part of this site.
2. Site trips are rounded to the nearest 5.

Trip Distribution

The retail site trips were distributed onto the area road network based upon existing travel patterns observed at the study area intersections. The Phase 1 and full-build retail site traffic volumes on the area road network are illustrated in **Figure 20** and **Figure 23**, respectively.

7.3.3 Total Site Traffic Volumes

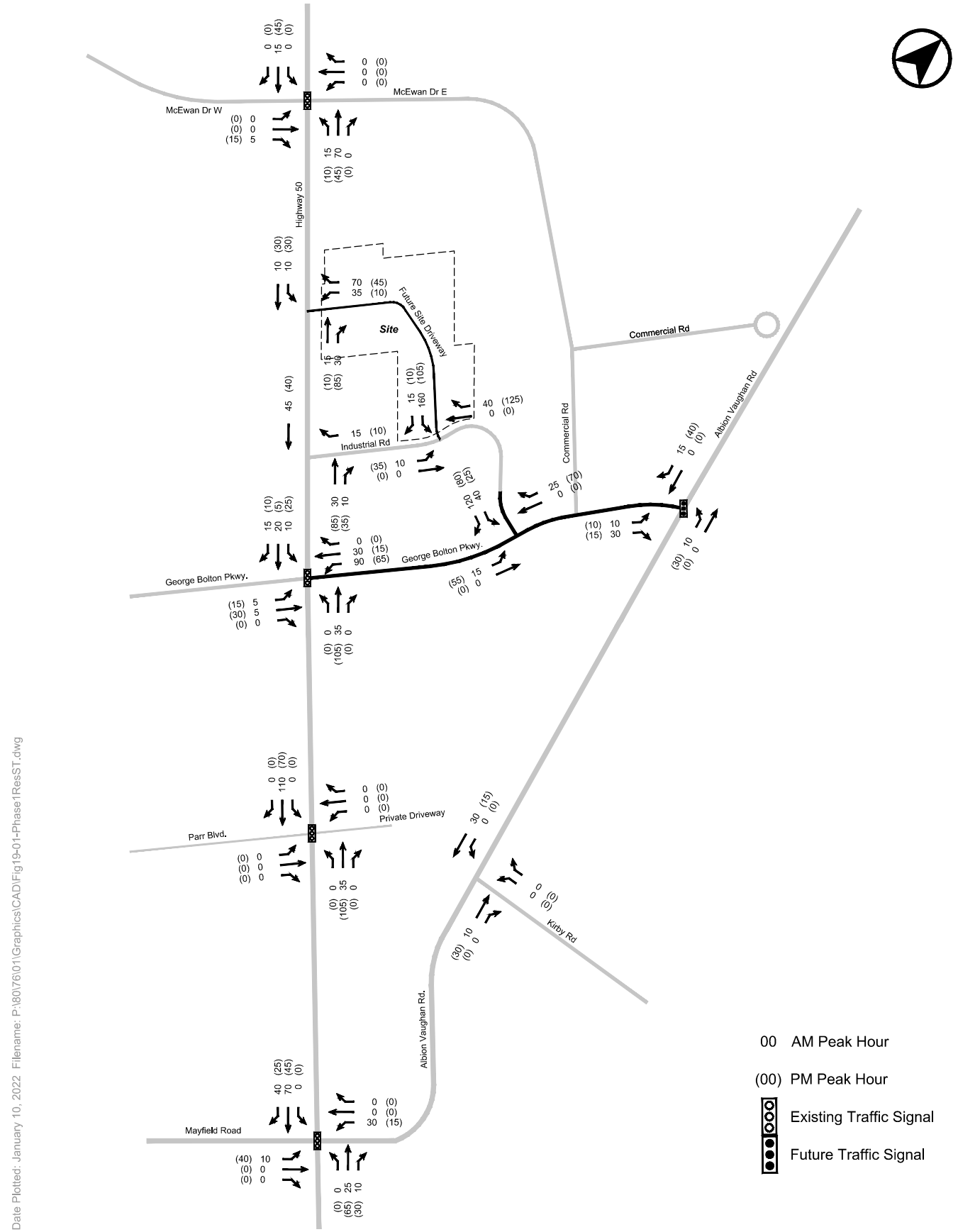
Phase 1 is expected to generate 390 and 545 vehicle trips during the weekday morning and afternoon peak hours, respectively. The full build-out of the site anticipates in the order of 675 and 895 vehicle trips during the weekday morning and afternoon peak hours, respectively. The total site traffic volumes are summarized in **Table 21**.

The Phase 1 and full-build total site traffic volumes on the area road network are illustrated in **Figure 21** and **Figure 24**, respectively.

TABLE 21 TOTAL TRIP GENERATION

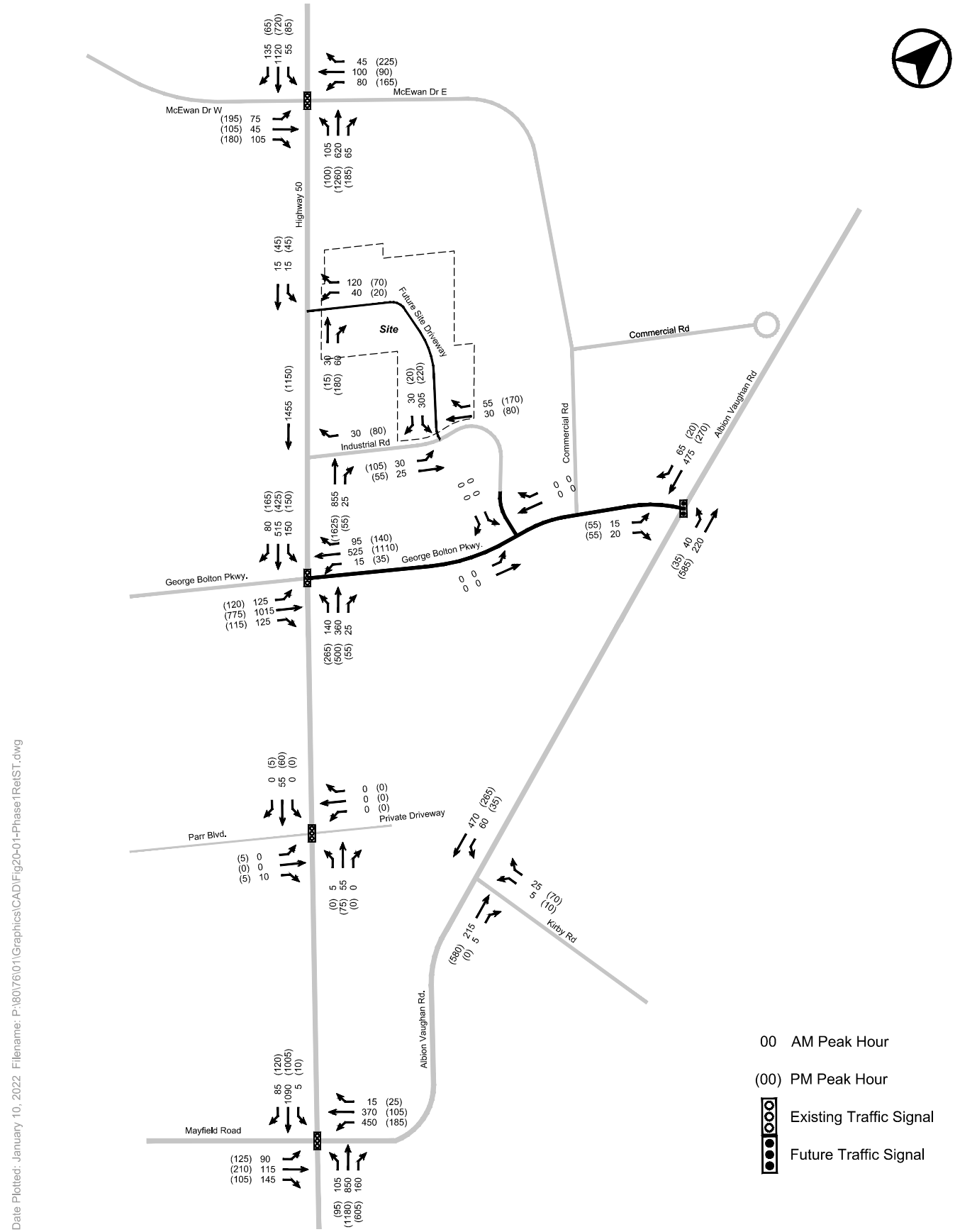
	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Phase 1 Build-Out (Buildings 1, 2 and 3)						
Residential Trip Generation (1,301 units)	90	280	370	275	170	445
Retail Trip Generation (2,399 m^2 GFA)	15	5	20	50	50	100
Total Trip Generation	**105**	**285**	**390**	**325**	**220**	**545**
Full Site Build-Out (Buildings 1, 2, 3, 4 and 5)						
Residential Trip Generation (2,238 units)	155	490	645	470	290	760
Retail Trip Generation (3,179 m^2 GFA)	20	10	30	65	70	135
Total Trip Generation	**175**	**500**	**675**	**535**	**360**	**895**

Notes:
1. Site trips are rounded to the nearest 5.



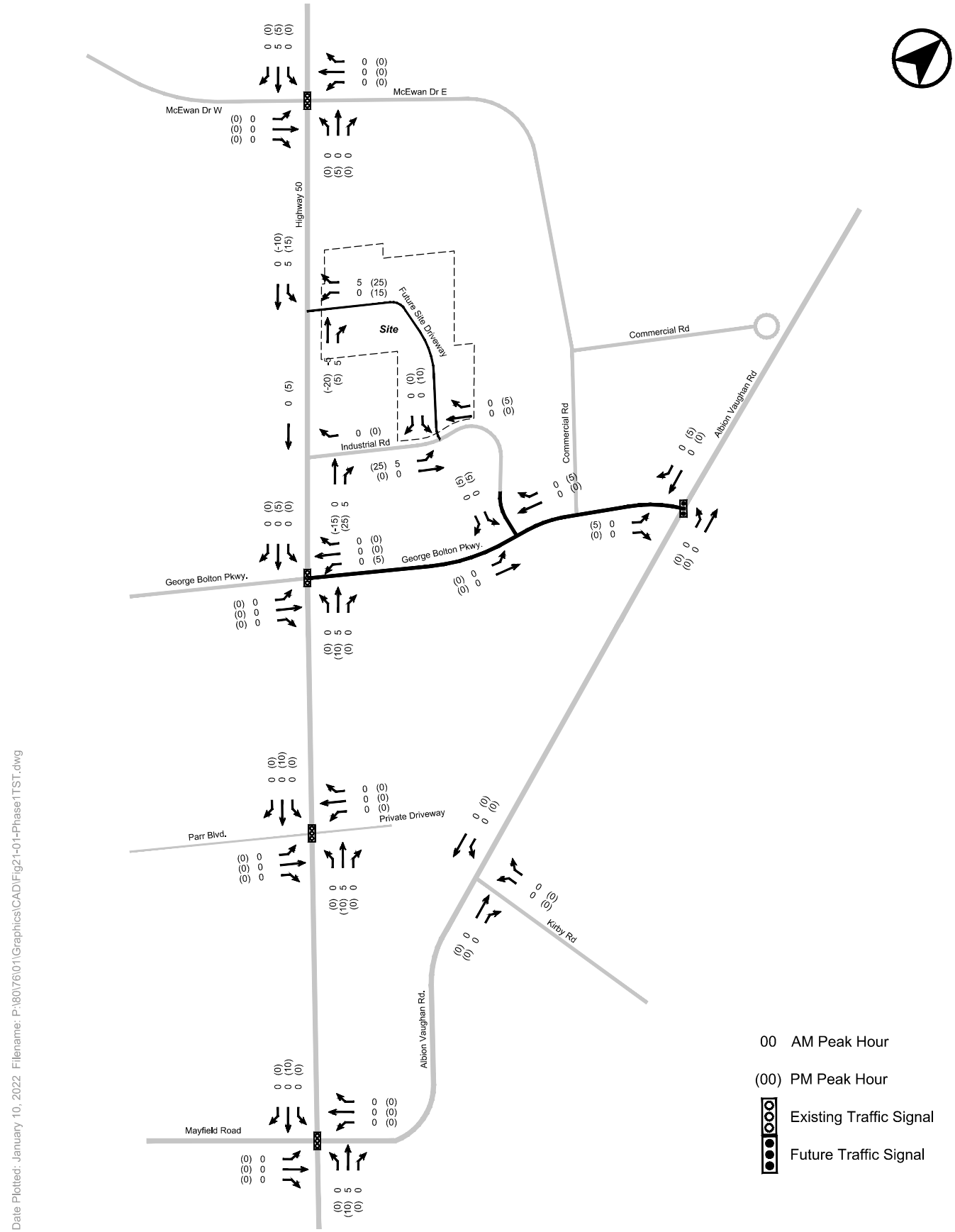
Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig19-01-Phase1ResST.dwg

FIGURE 19 PHASE 1 RESIDENTIAL SITE TRAFFIC VOLUMES



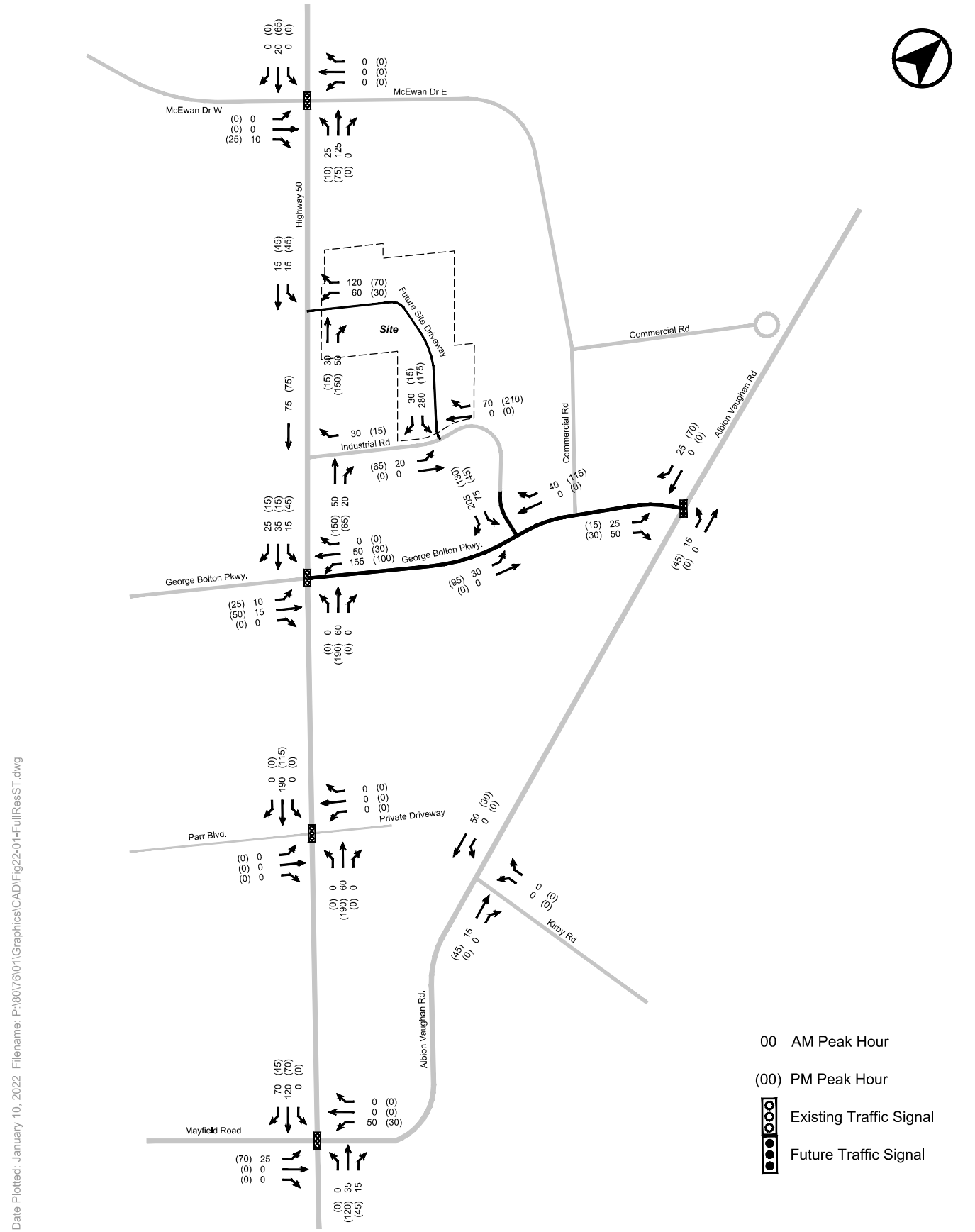
Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig20-01-Phase1RetST.dwg

FIGURE 20 PHASE 1 RETAIL SITE TRAFFIC VOLUMES



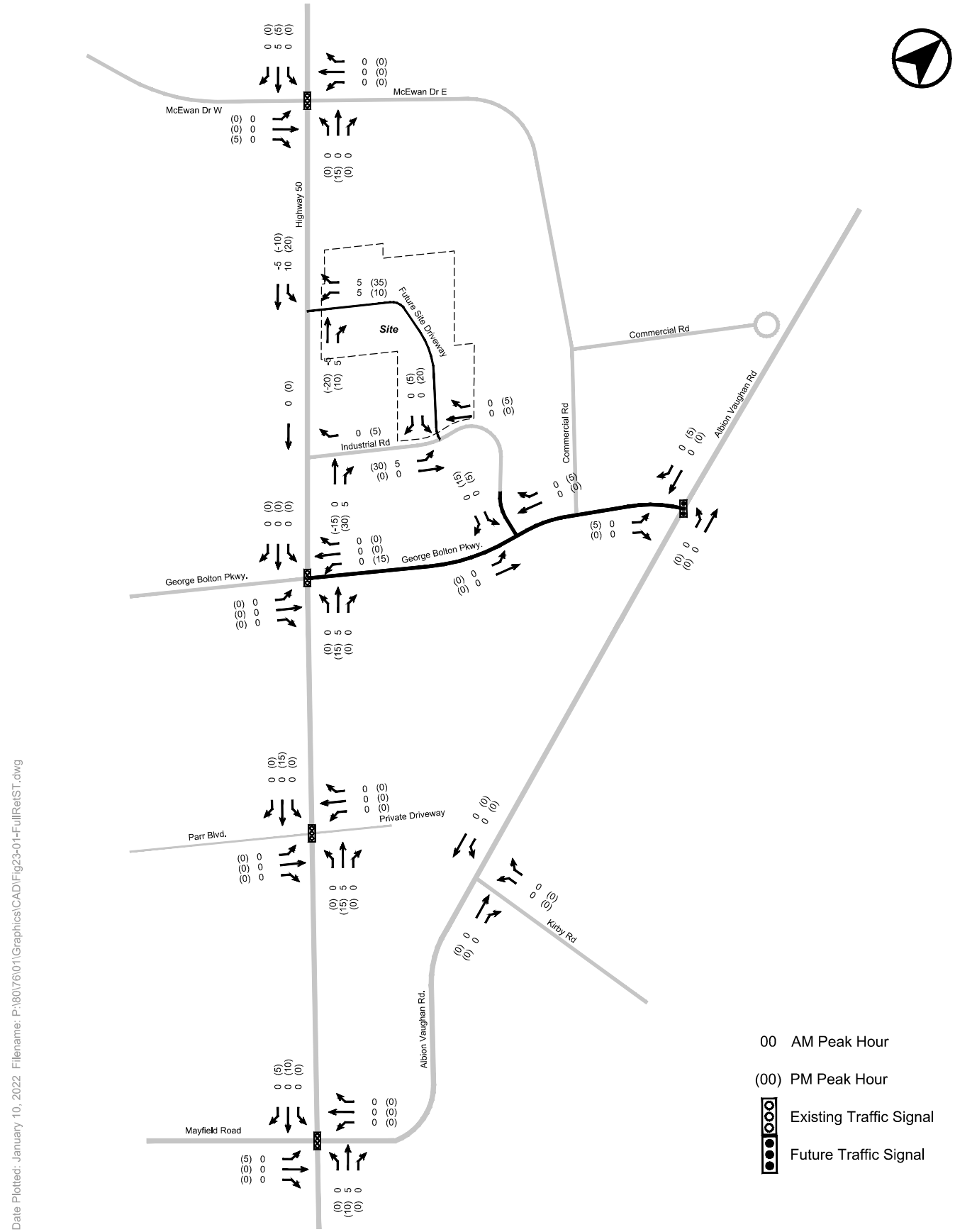
Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig21-01-Phase1TST.dwg

FIGURE 21 PHASE 1 TOTAL SITE TRAFFIC VOLUMES



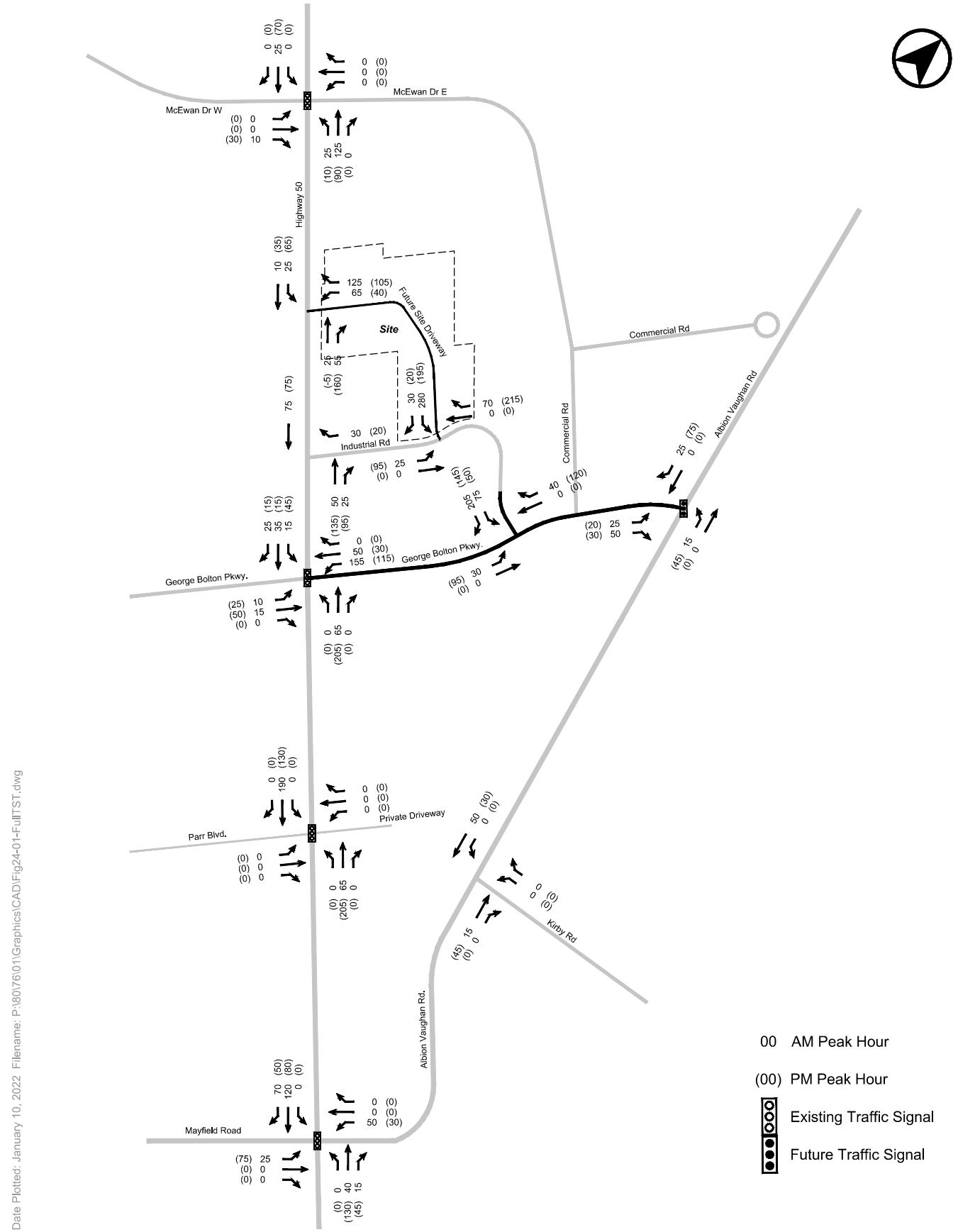
Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig22-01-FullResST.dwg

FIGURE 22 FULL BUILD-OUT RESIDENTIAL SITE TRAFFIC VOLUMES



Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig23-01-FullRetST.dwg

FIGURE 23 FULL BUILD-OUT RETAIL SITE TRAFFIC VOLUMES

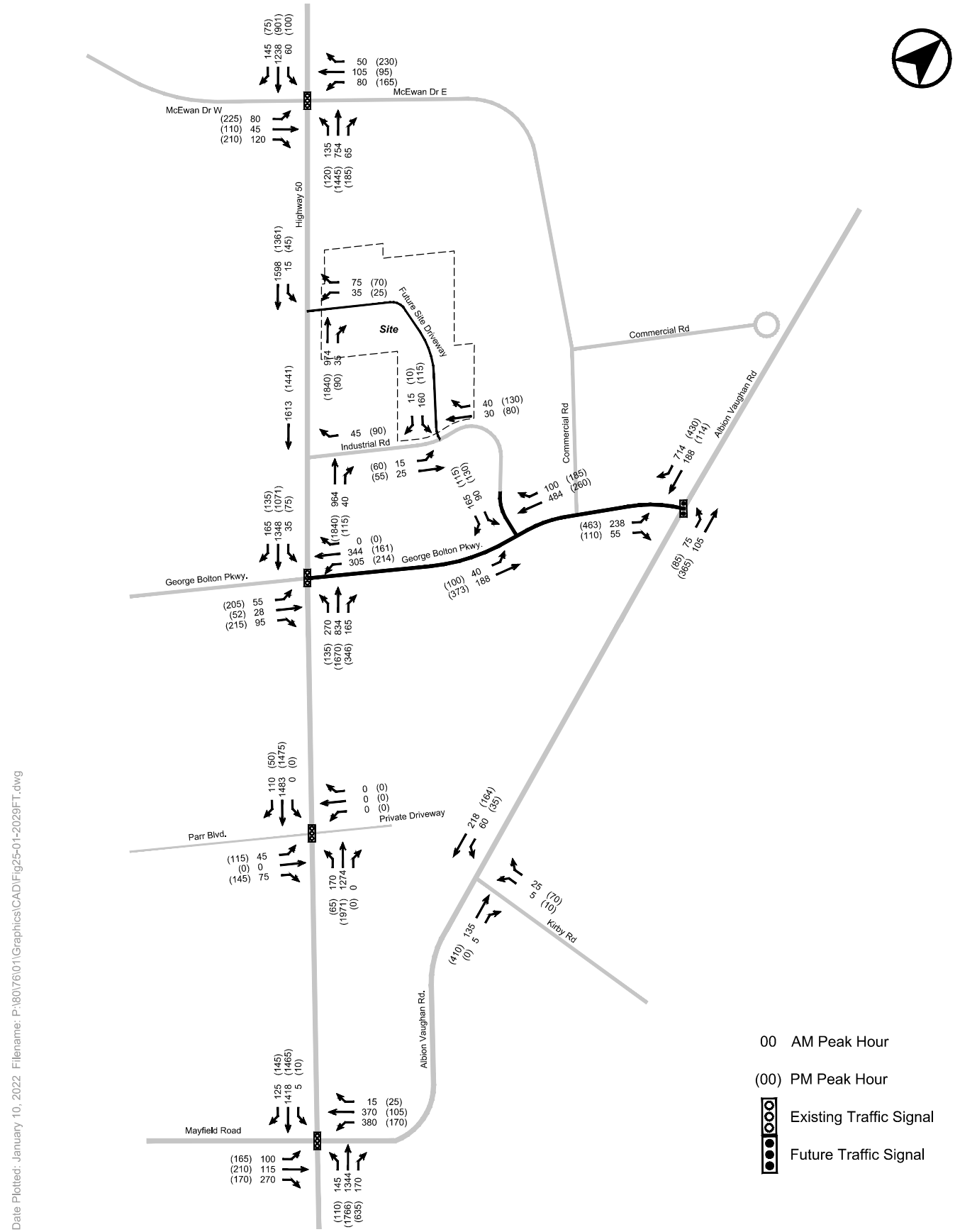


Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig24-01-FullTST.dwg

FIGURE 24 FULL BUILD-OUT TOTAL SITE TRAFFIC VOLUMES

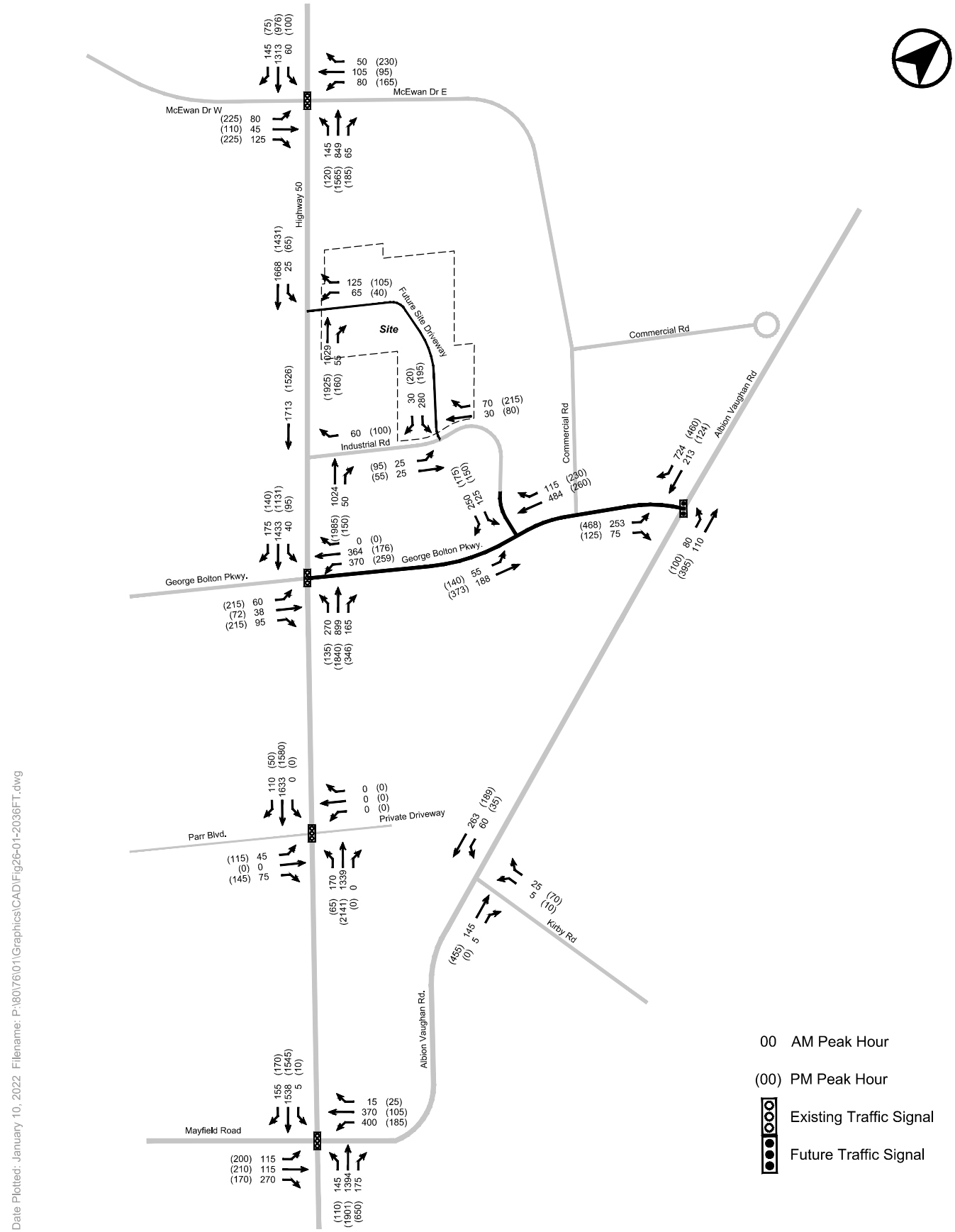
7.4 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes in the 2029, 2036 and 2041 horizon years reflect the sum of future background traffic volumes in the respective horizons with total site traffic volumes and are summarized in **Figure 25**, **Figure 26** and **Figure 27**, respectively.



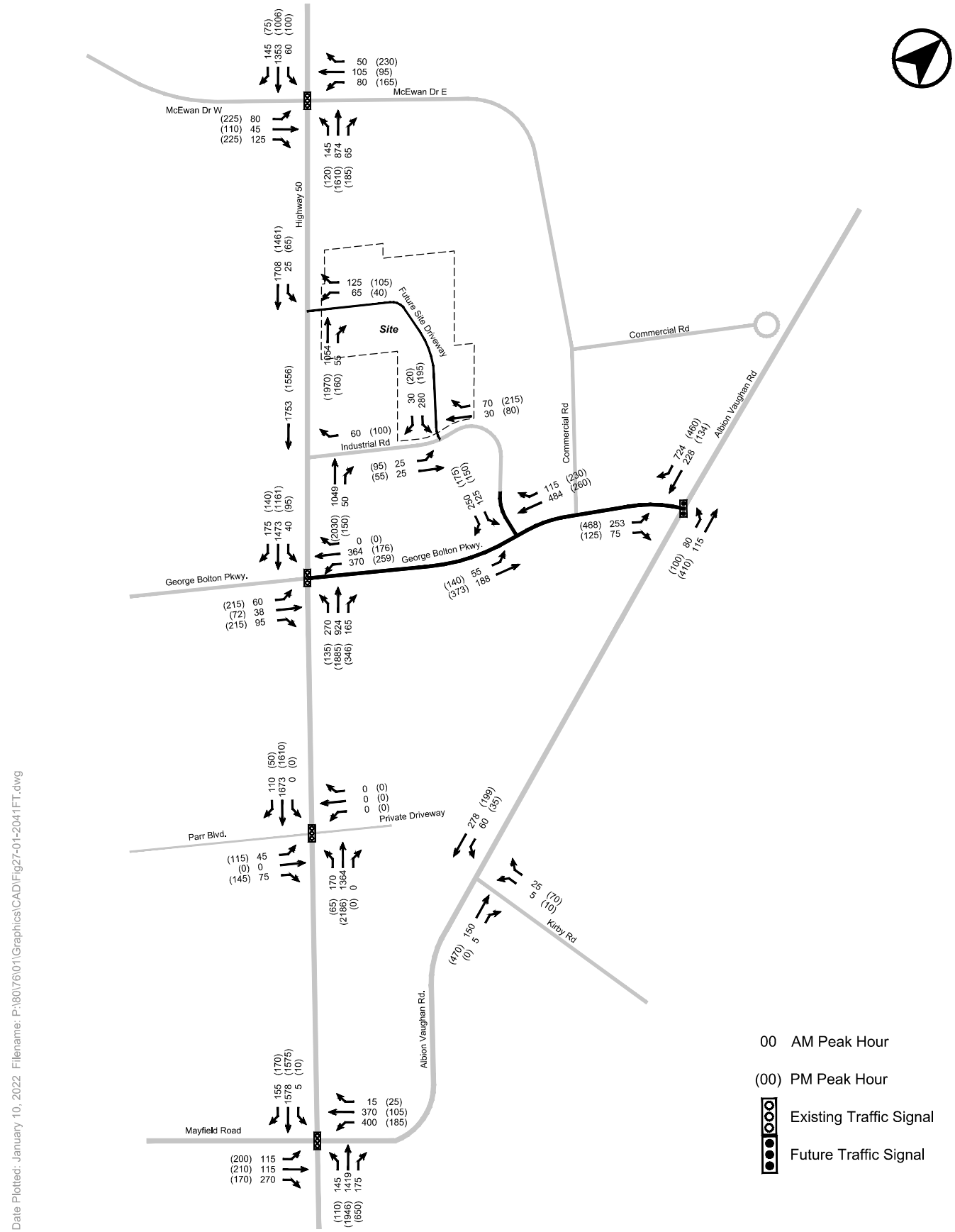
Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig25-01-2029FT.dwg

FIGURE 25 2029 FUTURE TOTAL TRAFFIC VOLUMES



Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig26-01-2036FT.dwg

FIGURE 26 2036 FUTURE TOTAL TRAFFIC VOLUMES



Date Plotted: January 10, 2022 Filename: P:\8076\01\Graphics\CAD\Fig27-01-2041FT.dwg

FIGURE 27 2041 FUTURE TOTAL TRAFFIC VOLUMES

8.0 TRAFFIC OPERATIONS ANALYSIS

8.1 TRAFFIC OPERATIONS SCENARIOS

A traffic operations analysis was completed for the following scenarios:

- Existing traffic conditions
- Future background traffic conditions (2029)
- Future total traffic conditions (2029) – includes build-out of Phase 1 (Buildings 1, 2 & 3)
- Future background traffic conditions (2036)
- Future total traffic conditions (2036) – includes full build-out of Phase 1 + Phase 2 (Buildings 4 & 5)
- Future background traffic conditions (2041)
- Future total traffic conditions (2041) – 5 years post full build-out

8.2 ANALYSIS METHODOLOGY

The intersection capacity analysis was completed using Synchro Version 11 and the Highway Capacity Manual (HCM) methodology.

For signalized intersections, the volume-to-capacity ratio (v/c) is an indicator of the capacity utilization for the key movements in the intersection. A v/c of 1.00 indicates that certain governing traffic movements through the intersection are operating at or near maximum capacity. The primary overall level of service (LOS) indicator is delay, both on individual movements and expressed as an average for all vehicles processed. Many busy urban intersections operate at LOS D to E, which reflect average (control) delays in the range of 35 to 80 seconds[2].

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of delay within the traffic stream[3]. LOS A represents a good level of service with short delays. Based on the Region of Peel's Synchro Guidelines, LOS E represents "an unacceptable LOS"; this implies long delays. The volume to capacity ratio (v/c) is an indicator of the capacity utilization for key movements at the intersection and resultant residual capacity potential.

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[2] HCM Level of Service criteria for signalized intersections:
- LOS A: Control Delay ≤ 10s
- LOS B: 10s < Control Delay ≤ 20s
- LOS C: 20s < Control Delay ≤ 35s
- LOS D: 35s < Control Delay ≤ 55s
- LOS E: 55s < Control Delay ≤ 80s
- LOS F: Control Delay > 80s

[3] HCM Level of Service criteria for unsignalized intersections:
- LOS A: Control Delay ≤ 10s
- LOS B: 10s < Control Delay ≤ 15s
- LOS C: 15s < Control Delay ≤ 25s
- LOS D: 25s < Control Delay ≤ 35s
- LOS E: 35s < Control Delay ≤ 50s
- LOS F: Control Delay > 50s

8.3 INPUT AND CALIBRATION PARAMETERS

Key parameters adopted in the analysis include:

Lane Configurations

Under existing conditions analysis scenarios, the existing lane configurations of the area road network were assumed. Under future conditions analysis scenarios, the George Bolton Parkway Extension and the widening of Albion Vaughan Road from 2 to 4 lanes were incorporated into the traffic model, as previously discussed in **Section 2.1.2**. **Appendix G** illustrates the preferred road design of the George Bolton Parkway Extension.

Based on the Region of Peel's "*Regional Guidelines for Using Synchro, Version 7.73 Rev 8*" dated December 2010 (herein referred to as the "Region of Peel's Synchro Guidelines"), lane widths of 3.7 and 3.5 metres have been adopted for through and auxiliary turn lanes, respectively.

Traffic Signal Timings

Traffic signal timings have been obtained from the Region of Peel and are provided in **Appendix H**. The existing traffic signal timings have been adopted for existing conditions analysis.

Under future background and future total conditions, traffic signal timings may have been optimized to best accommodate the forecasted future travel demands and patterns and to respond to evolving traffic conditions. Where signal optimization is recommended, it has been noted in the subsequent sections discussing intersection operations. It is noteworthy that existing cycle lengths and pedestrian minimum (i.e. walk and flash-don't-walk) times were maintained in all cases.

Peak Hour Factors (PHF)

The Region of Peel's Synchro Guidelines state that the peak hour factor should be 1.00 for all movements on all approaches. This is applied to all intersections in all scenarios.

Lane Utilization Factor (LUF)

A lane utilization factor (LUF) of less than 1.00 reflects the inefficient use of lanes, where vehicles may favour one lane over another for a variety of reasons such as avoiding transit traffic and turning vehicles or positioning for an upcoming manoeuver. Significant left and right-turn storage lanes are provided at various intersections along Highway 50 in the site vicinity, removing turning vehicles from the through travel lanes well in advance of the intersections. Moreover, as Highway 50 approaches capacity, it can be reasonably expected that through volumes will evenly distribute across available lanes to reduce the travel time across an intersection. To replicate this driving behaviour, a theoretical LUF of 1.00 (rather than a default of 0.95) has therefore been applied under future traffic conditions at the following intersections / conditions:

- Highway 50 / Albion Vaughan Road / Mayfield Road: Southbound Through, Weekday Morning Peak Hour Only
- Highway 50 / George Bolton Parkway: Northbound Through, Weekday Afternoon Peak Hour Only

Protected Left-Turn Factor (LTF)

The protected left-turn factor (LTF) in the Synchro model influences the “aggressiveness” of drivers making a left turn movement on advance phases. Values closer to 1.00 represent vehicles making left turns with a higher aggressiveness (i.e. lesser headways or faster turn speeds). Thus, the movement can process more vehicles per cycle as the LTF approaches 1.00.

Under future conditions, the operations of several left-turn lanes are approaching capacity. As a left-turn movement approaches capacity, drivers travelling with the advance phase will generally become more aggressive (i.e. lower headways and increased turning speed). Ideally, left-turning movements in the Synchro models should also include lost time adjustments given the observed field condition where drivers continue to turn left during the traffic signal’s amber and all-red phase. However, this lost time adjustment value was not changed to present likely conservative analysis results.

Based on the foregoing, a protected LTF of 1.00 (rather than a default of 0.95) has been adopted for several left-turning movements at intersections along Highway 50.

Pedestrian and Bicycle Volumes

Pedestrian and bicycle volumes are based on those observed at the study area intersections under existing conditions.

Heavy Vehicle Percentages

Heavy vehicle percentages were derived from existing turning movement counts. Where the intersection is not existing, such as at the site accesses, the Synchro default of 2% is assumed for all movements.

Synchro Defaults

Synchro defaults have been adopted for all other parameters.

8.4 STUDY AREA INTERSECTION OPERATIONS

The following sections discuss the operations of the study area intersections. Synchro reports are provided in **Appendix I**. All signalized intersections in the study area are expected to operate under capacity under future total conditions, with the consideration of the George Bolton Parkway Extension and related road improvements. No mitigation measures or improvements are recommended, with the exception of traffic signal timing optimization at Highway 50 / George Bolton Parkway (due to the future extension) and the Highway 50 / Albion Vaughan Road / Mayfield Road intersection. All movements at unsignalized intersections in the study area, including the site access points, are expected to operate acceptably at LOS D or better. No mitigation measures or improvements are recommended.

8.4.1 Signalized Intersections

8.4.1.1 Highway 50 / McEwan Drive

At Highway 50 / McEwan Drive, the intersection currently operates under traffic signal control with cycle lengths of 120 and 140 seconds during the weekday morning and afternoon peak hours, respectively. The existing cycle length and timing splits were maintained in all analysis scenarios. Analysis results are summarized in **Table 22**.

Under existing conditions, the intersection operates under capacity during the weekday morning and afternoon peak hours with overall v/c ratios of 0.58 and 0.60, respectively.

Under all future conditions, the intersection continues to operate under capacity with overall v/c ratios of 0.70 and 0.75 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no improvements or mitigation measures are recommended at this intersection.

TABLE 22 HIGHWAY 50 / MCEWAN DRIVE TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.32 (0.58)	D (D)	0.38 (0.66)	D (D)	0.38 (0.68)	D (D)	0.42 (0.69)	D (D)	0.43 (0.73)	D (E)	0.44 (0.71)	D (E)	0.46 (0.78)	D (E)
EBTR	0.20 (0.36)	D (E)	0.22 (0.36)	D (E)	0.22 (0.38)	D (E)	0.23 (0.39)	D (E)	0.24 (0.46)	D (E)	0.23 (0.40)	D (E)	0.24 (0.50)	D (E)
WBL	0.41 (0.56)	E (E)	0.41 (0.57)	E (E)	0.41 (0.57)	E (E)	0.41 (0.57)	E (E)	0.41 (0.57)	E (E)	0.41 (0.57)	E (E)	0.41 (0.57)	E (E)
WBT	0.43 (0.56)	D (E)	0.44 (0.54)	D (E)	0.44 (0.54)	D (E)	0.44 (0.54)	D (E)	0.44 (0.52)	D (E)	0.43 (0.53)	D (E)	0.42 (0.51)	D (E)
WBR	0.03 (0.28)	D (E)	0.03 (0.39)	D (E)	0.03 (0.39)	D (E)	0.03 (0.39)	D (E)	0.03 (0.36)	D (E)	0.03 (0.38)	D (E)	0.03 (0.36)	D (E)
NBL	0.42 (0.27)	B (B)	0.52 (0.35)	C (B)	0.58 (0.40)	C (B)	0.55 (0.37)	C (B)	0.64 (0.42)	C (B)	0.57 (0.38)	C (B)	0.67 (0.43)	C (B)
NBT	0.30 (0.60)	B (B)	0.33 (0.69)	C (C)	0.36 (0.70)	C (C)	0.34 (0.71)	B (C)	0.40 (0.74)	C (C)	0.35 (0.73)	B (C)	0.41 (0.76)	C (C)
NBR	0.04 (0.14)	A (B)	0.04 (0.15)	A (B)	0.04 (0.15)	A (B)	0.04 (0.15)	A (B)	0.04 (0.15)	A (B)	0.04 (0.15)	A (B)	0.04 (0.15)	A (B)
SBL	0.11 (0.31)	A (B)	0.13 (0.41)	A (B)	0.14 (0.43)	A (B)	0.14 (0.44)	A (B)	0.16 (0.48)	A (B)	0.14 (0.46)	A (B)	0.16 (0.50)	A (C)
SBTR	0.63 (0.38)	B (B)	0.69 (0.46)	B (B)	0.70 (0.48)	C (B)	0.71 (0.48)	B (B)	0.74 (0.51)	C (B)	0.73 (0.49)	C (B)	0.76 (0.52)	C (B)
Overall	**0.58 (0.60)**	**C (C)**	**0.63 (0.68)**	**C (C)**	**0.65 (0.70)**	**C (C)**	**0.66 (0.71)**	**C (C)**	**0.68 (0.73)**	**C (C)**	**0.67 (0.72)**	**C (C)**	**0.70 (0.75)**	**C (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

8.4.1.2 Highway 50 / George Bolton Parkway

The Highway 50 / George Bolton Parkway intersection currently operates under traffic signal control with cycle lengths of 120 seconds during both the weekday morning and afternoon peak hours, respectively. Analysis results are summarized in **Table 23**.

Under existing conditions, the intersection operates under capacity during the weekday morning and afternoon peak hours with overall v/c ratios of 0.48 and 0.59, respectively.

As previously discussed in **Section 2.1.2**, the George Bolton Parkway extension from Highway 50 to Albion Vaughan Road was incorporated into the analysis for future scenarios.

In order to accommodate the traffic volumes following the construction of the extension, the traffic signal timings were optimized (with the cycle length maintained) in both the weekday morning and afternoon peak hours. The recommended traffic signal timing plans are attached in **Appendix I** with the Synchro worksheets.

Under all future conditions with the George Bolton Parkway extension, the intersection continues to operate under capacity with overall v/c ratios of 0.97 and 1.00 or better during the weekday morning and afternoon peak hours, respectively. In the weekday afternoon peak hour, despite the overall v/c ratio of 1.00, all individual movements are expected to operate under capacity.

Based on the foregoing, no other improvements or mitigation measures are recommended at this intersection.

TABLE 23 HIGHWAY 50 / GEORGE BOLTON PARKWAY TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.31 (0.67)	E (E)	0.49 (0.83)	D (E)	0.53 (0.86)	E (E)	0.50 (0.83)	E (E)	0.56 (0.90)	E (E)	0.49 (0.83)	D (E)	0.56 (0.90)	E (E)
EBTR	0.05 (0.08)	D (D)	0.26 (0.21)	D (D)	0.28 (0.43)	D (D)	0.26 (0.21)	D (D)	0.34 (0.58)	D (D)	0.26 (0.21)	D (D)	0.34 (0.58)	D (D)
WBL[3]	Lane does not exist.		0.58 (0.51)	D (D)	0.76 (0.76)	D (D)	0.59 (0.51)	D (D)	0.90 (0.99)	E (F)	0.58 (0.51)	D (D)	0.90 (0.99)	E (F)
WBLTR[2] / WBTR[3]	0.00 (0.00)	D (A)	0.63 (0.26)	D (D)	0.64 (0.28)	D (C)	0.64 (0.26)	D (D)	0.65 (0.30)	D (D)	0.63 (0.26)	D (D)	0.65 (0.30)	D (D)
NBL	0.25 (0.17)	A (A)	0.90 (0.55)	E (C)	0.90 (0.57)	E (C)	0.92 (0.58)	E (C)	0.90 (0.61)	E (C)	0.92 (0.59)	E (C)	0.90 (0.62)	E (C)
NBTR[2] / NBT[3]	0.26 (0.55)	A (A)	0.37 (0.78)	B (C)	0.40 (0.86)	B (C)	0.39 (0.82)	B (C)	0.44 (0.97)	B (D)	0.40 (0.84)	B (C)	0.45 (0.99)	B (D)
NBR[3]	Lane does not exist.		0.10 (0.22)	A (C)	0.10 (0.22)	B (C)	0.10 (0.22)	B (C)	0.10 (0.24)	B (C)	0.10 (0.22)	B (C)	0.10 (0.24)	B (C)
SBL	0.00 (0.00)	A (A)	0.08 (0.34)	B (B)	0.13 (0.59)	B (C)	0.09 (0.38)	B (C)	0.16 (0.66)	B (D)	0.09 (0.38)	B (C)	0.16 (0.66)	B (D)
SBT	0.51 (0.39)	A (A)	0.83 (0.63)	C (C)	0.89 (0.65)	C (C)	0.87 (0.65)	C (C)	0.97 (0.69)	D (C)	0.90 (0.67)	C (C)	0.99 (0.71)	D (C)
SBR	0.06 (0.06)	A (A)	0.14 (0.09)	A (B)	0.17 (0.10)	A (B)	0.14 (0.09)	A (B)	0.18 (0.11)	A (B)	0.14 (0.09)	A (B)	0.18 (0.11)	A (B)
Overall	**0.48 (0.59)**	**A (B)**	**0.87 (0.76)**	**C (C)**	**0.90 (0.84)**	**C (C)**	**0.88 (0.79)**	**C (C)**	**0.96 (0.98)**	**D (D)**	**0.88 (0.81)**	**C (C)**	**0.97 (1.00)**	**D (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. These lane groups reflect the existing lane configuration.
3. These lane groups reflect the future lane configuration, and have been incorporated into the Synchro model based on the preferred design of the Highway 50 / George Bolton Parkway intersection illustrated in Appendix P of the EA.

8.4.1.3 Highway 50 / Parr Boulevard

The Highway 50 / Parr Boulevard intersection currently operates under traffic signal control with cycle lengths of 120 seconds during both the weekday morning and afternoon peak hours, respectively. The existing cycle length and timing splits were maintained in all analysis scenarios. Analysis results are summarized in **Table 24**.

Under existing conditions, the intersection operates under capacity during the weekday morning and afternoon peak hours with overall v/c ratios of 0.45 and 0.54, respectively.

Under all future conditions, the intersection continues to operate under capacity with overall v/c ratios of 0.70 and 0.82 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no improvements or mitigation measures are recommended at this intersection.

TABLE 24 HIGHWAY 50 / PARR BOULEVARD TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)	0.48 (0.65)	E (E)
EBTR	0.04 (0.07)	D (D)	0.06 (0.14)	D (D)	0.06 (0.16)	D (D)	0.06 (0.16)	D (D)	0.06 (0.19)	D (D)	0.06 (0.17)	D (D)	0.06 (0.20)	D (D)
NBL	0.31 (0.17)	A (A)	0.46 (0.29)	A (A)	0.50 (0.31)	A (A)	0.50 (0.30)	A (A)	0.51 (0.34)	B (A)	0.46 (0.31)	B (A)	0.52 (0.35)	C (A)
NBTR	0.30 (0.51)	A (A)	0.44 (0.70)	A (A)	0.46 (0.74)	A (A)	0.46 (0.73)	A (A)	0.48 (0.80)	A (B)	0.47 (0.74)	A (A)	0.49 (0.82)	A (B)
SBT	0.46 (0.43)	A (A)	0.60 (0.58)	B (B)	0.65 (0.61)	B (B)	0.62 (0.60)	A (B)	0.74 (0.66)	B (A)	0.67 (0.61)	B (B)	0.75 (0.67)	B (A)
SBR	0.08 (0.03)	A (A)	0.08 (0.03)	A (C)	0.08 (0.03)	A (B)	0.08 (0.03)	A (B)	0.09 (0.03)	A (A)	0.09 (0.03)	A (B)	0.09 (0.03)	A (A)
Overall	**0.45 (0.54)**	**A (B)**	**0.57 (0.71)**	**A (B)**	**0.61 (0.75)**	**A (B)**	**0.59 (0.74)**	**A (B)**	**0.68 (0.80)**	**A (B)**	**0.62 (0.75)**	**A (B)**	**0.70 (0.82)**	**B (B)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

8.4.1.4 Highway 50 / Albion Vaughan Road / Mayfield Road

The Highway 50 / Albion Vaughan Road / Mayfield Road intersection currently operates under traffic signal control with cycle lengths of 160 seconds during both the weekday morning and afternoon peak hours, respectively. Analysis results are summarized in **Table 25**.

Under existing conditions, the intersection operates under capacity during the weekday morning and afternoon peak hours with overall v/c ratios of 0.86 and 0.67, respectively.

Traffic signal timings were optimized in the weekday morning peak hour (cycle lengths maintained). The recommended traffic signal timing plans are attached in **Appendix I** with the Synchro worksheets.

Under all future conditions, the intersection continues to operate under capacity with overall v/c ratios of 1.00 and 0.92 or better during the weekday morning and afternoon peak hours, respectively. In the weekday morning peak hour, despite the overall v/c ratio of 1.00, all individual movements are expected to operate under capacity.

As the Highway 50 / Albion Vaughan Road / Mayfield Road intersection approaches capacity, drivers are able to use alternative routes to reduce travel time delays and congestion. For example, the westbound left-turn (exhibiting capacity concerns even during existing conditions) currently serves a large majority of the traffic volumes from the north along Albion Vaughan Road. However, as modelled in this study, the planned George Bolton Parkway extension will serve as a viable alternative to accessing Highway 50 north of Mayfield Road.

In addition to the use of alternative routes, the composition of traffic within the proximate road network may also evolve as the intersection approaches capacity. Eventually, the corridors may serve more local traffic (i.e. the traffic relating to developments along Highway 50) rather than pass-through or longer-distance traffic that will be able to use alternate routes further away from the study area road network.

It is also noteworthy that the Simpson Road Environmental Assessment traffic study (completed by Paradigm in November 2012) had recommended a six lane cross-section along Highway 50 through the Mayfield Road intersection, in addition to dual westbound left-turn lanes along Mayfield Road at Highway 50[(4)]. However, traffic conditions at the intersection and on the proximate traffic network should be monitored by the Town and Region prior to the further consideration of such improvements, especially given that the over capacity conditions will likely only impact the weekday morning peak hours as the analysis results suggest.

Based on the foregoing, no other mitigation measures or improvements, aside from traffic signal timing optimization, are recommended at the intersection.

[4] The assumed improvements are summarized under Section 5.1 “Assumed Traffic Operational Improvements” and in Figure 5.1 (page 33, 35) in the Simpson Road EA’s traffic study dated November 2012 by Paradigm Transportation Solutions Ltd.

TABLE 25 HIGHWAY 50 / ALBION VAUGHAN ROAD / MAYFIELD ROAD TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.43 (0.37)	D (D)	0.35 (0.37)	D (D)	0.38 (0.46)	D (D)	0.35 (0.37)	D (D)	0.44 (0.55)	D (D)	0.35 (0.37)	D (D)	0.44 (0.55)	D (D)
EBT	0.51 (0.78)	E (E)	0.46 (0.78)	E (E)	0.45 (0.78)	E (E)	0.46 (0.78)	E (E)	0.43 (0.78)	E (E)	0.45 (0.78)	E (E)	0.43 (0.78)	E (E)
EBR	0.16 (0.10)	E (E)	0.89 (0.16)	F (E)	0.91 (0.16)	F (E)	0.90 (0.16)	F (E)	0.92 (0.16)	F (E)	0.90 (0.16)	F (E)	0.92 (0.16)	F (E)
WBL	0.96 (0.70)	E (D)	0.83 (0.63)	E (D)	0.91 (0.67)	E (E)	0.85 (0.63)	E (D)	0.98 (0.73)	F (E)	0.86 (0.63)	E (D)	0.98 (0.73)	F (E)
WBT[2] / WBTR[3]	0.80 (0.37)	E (E)	0.50 (0.24)	D (E)	0.52 (0.26)	E (E)	0.52 (0.24)	E (E)	0.54 (0.28)	E (E)	0.53 (0.24)	E (E)	0.54 (0.28)	E (E)
WBR[2]	0.01 (0.02)	D (D)	Future lane configurations assume a shared westbound through-right lane.											
NBL	0.75 (0.71)	F (F)	0.84 (0.72)	F (F)	0.86 (0.72)	F (F)	0.84 (0.72)	F (F)	0.88 (0.72)	F (F)	0.85 (0.72)	F (F)	0.88 (0.72)	F (F)
NBT	0.47 (0.59)	C (C)	0.69 (0.83)	C (C)	0.70 (0.87)	C (C)	0.70 (0.87)	C (C)	0.72 (0.94)	C (D)	0.71 (0.89)	C (C)	0.74 (0.96)	C (D)
NBR	0.11 (0.41)	B (B)	0.11 (0.47)	B (C)	0.12 (0.51)	B (C)	0.11 (0.48)	B (C)	0.13 (0.53)	B (C)	0.11 (0.49)	B (C)	0.13 (0.54)	B (C)
SBL	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)	0.26 (0.23)	F (E)
SBT	0.78 (0.59)	D (C)	0.87 (0.84)	D (D)	0.91 (0.88)	D (D)	0.90 (0.87)	D (D)	0.97 (0.93)	E (D)	0.92 (0.89)	D (D)	0.99 (0.95)	E (D)
SBR	0.06 (0.08)	C (C)	0.06 (0.08)	C (C)	0.09 (0.10)	C (C)	0.06 (0.08)	C (C)	0.13 (0.14)	C (C)	0.06 (0.08)	C (C)	0.13 (0.14)	C (C)
Overall	**0.86 (0.67)**	**D (C)**	**0.88 (0.81)**	**D (D)**	**0.93 (0.84)**	**D (D)**	**0.91 (0.83)**	**D (D)**	**0.99 (0.90)**	**D (D)**	**0.92 (0.85)**	**D (D)**	**1.00 (0.92)**	**E (D)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour)
2. These lane groups reflect the existing lane configuration.
3. These lane groups reflect the future lane configuration.

8.4.1.5 Future Traffic Signal at Albion Vaughan Road / Industrial Road / George Bolton Parkway

The Albion Vaughan Road / Industrial Road intersection currently operates under “STOP” control. Existing conditions analysis results are summarized in **Section 8.4.2** in **Table 26**.

As previously discussed in **Section 2.1.2**, the Albion Vaughan Road corridor is scheduled to be widened from 2 to 4 lanes from Mayfield Road to King Street. This upgrade has been incorporated into the analysis for future scenarios. Furthermore, it is recommended that a traffic signal be considered at this intersection once the George Bolton Parkway extension is complete. The extension is expected to draw significant local and non-local traffic volumes, as discussed in detail in Appendix D of the George Bolton Parkway EA. The recommended traffic signal timing plans are attached in **Appendix I** with the Synchro worksheets.

Under all future conditions, the intersection continues to operate under capacity with overall v/c ratios of 0.55 and 0.47 or better during the weekday morning and afternoon peak hours, respectively.

Based on the foregoing, no further improvements or mitigation measures are recommended at this intersection.

TABLE 26 FUTURE TRAFFIC SIGNAL AT ALBION VAUGHAN ROAD / INDUSTRIAL ROAD/ GEORGE BOLTON PARKWAY TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
EBL	Intersection is currently under "STOP" control.		0.77 (0.79)	E (D)	0.77 (0.79)	E (D)	0.77 (0.79)	E (D)	0.78 (0.79)	E (D)	0.77 (0.79)	E (D)	0.78 (0.79)	E (D)
EBR			0.02 (0.06)	D (C)	0.04 (0.07)	D (C)	0.02 (0.06)	D (D)	0.05 (0.08)	D (C)	0.02 (0.06)	D (D)	0.05 (0.08)	D (C)
NBL			0.09 (0.09)	A (B)	0.11 (0.15)	A (B)	0.09 (0.09)	A (B)	0.12 (0.18)	A (B)	0.10 (0.10)	A (B)	0.12 (0.18)	A (B)
NBT			0.09 (0.34)	A (B)	0.09 (0.34)	A (B)	0.05 (0.19)	A (B)	0.05 (0.20)	A (B)	0.05 (0.20)	A (B)	0.05 (0.20)	A (B)
SBT			0.14 (0.11)	A (B)	0.15 (0.12)	A (B)	0.09 (0.07)	A (B)	0.09 (0.07)	A (B)	0.09 (0.07)	A (B)	0.09 (0.07)	A (B)
SBR			0.46 (0.24)	A (B)	0.46 (0.27)	A (B)	0.46 (0.24)	A (B)	0.47 (0.29)	B (B)	0.46 (0.24)	A (B)	0.47 (0.29)	B (B)
Overall			**0.52 (0.49)**	**B (C)**	**0.54 (0.50)**	**B (C)**	**0.52 (0.43)**	**B (C)**	**0.55 (0.47)**	**B (C)**	**0.52 (0.43)**	**B (C)**	**0.55 (0.47)**	**B (C)**

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The lane configuration of the Future Albion Vaughan Road / Industrial Road (George Bolton Parkway Extension) intersection adopted in the Synchro model is based on the preferred design illustrated in Appendix P of the EA.

8.4.2 Unsignalized Intersections

Table 27 summarizes the capacity analysis results for unsignalized intersections in the study area.

All movements operate acceptably at LOS D or better. No mitigation measures or improvements are recommended for any unsignalized intersection in the study area.

TABLE 27 UNSIGNALIZED INTERSECTIONS TRAFFIC OPERATIONS

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Highway 50 / Industrial Road														
WBLR / WBR	C (C)	18.2 (23.8)	B (B)	10.4 (10.8)	B (B)	10.4 (11.7)	B (B)	10.4 (11.2)	B (B)	10.5 (13.2)	B (B)	10.4 (11.5)	B (B)	10.5 (13.3)
SBL	A (C)	9.6 (15.8)	Intersection to become right-in / right-out (RIRO).											
Albion Vaughan Road / Commercial Road														
EBLR	C (C)	18.3 (22.9)	Intersection to be removed and Commercial Road to become cul-de-sac near Albion Vaughan Road.											
NBTL	A (A)	1.3 (0.5)												
Albion Vaughan Road / Industrial Road														
EBLR	B (C)	14.6 (16.7)	Intersection to be signalized.											
NBTL	A (A)	1.7 (0.8)												
Albion Vaughan Road / Kirby Road														
WBLR	B (B)	11.2 (14.4)	A (B)	9.8 (11.6)	A (B)	9.9 (12.0)	A (B)	9.6 (10.7)	A (B)	9.7 (11.0)	A (B)	9.6 (10.7)	A (B)	9.7 (11.1)
SBTL	A (A)	1.3 (1.4)	A (A)	2.1 (1.8)	A (A)	1.9 (1.7)	A (A)	3.6 (3.5)	A (A)	3.3 (3.2)	A (A)	3.5 (3.4)	A (A)	3.2 (3.1)
George Bolton Parkway Extension / Industrial Road														
EBTL	Intersection does not exist.		A (A)	1.2 (1.2)	A (A)	1.9 (2.6)	A (A)	1.2 (1.2)	A (A)	2.4 (3.5)	A (A)	1.2 (1.2)	A (A)	2.4 (3.5)
SBLR			B (B)	12.9 (13.0)	C (C)	17.3 (16.6)	B (B)	12.9 (13.0)	D (C)	26.0 (22.5)	B (B)	12.9 (13.0)	D (C)	26.0 (22.5)

Movement	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Highway 50 / Site Access														
WBL	Intersection does not exist.				C (D)	15.8 (31.2)	Intersection does not exist.		C (E)	17.6 (39.5)	Intersection does not exist.		C (E)	17.9 (43.5)
WBR					B (B)	10.5 (11.4)			B (B)	10.9 (12.9)			B (B)	10.9 (13.1)
SBL					A (C)	9.8 (16.6)			B (C)	10.1 (20.5)			B (C)	10.2 (21.9)
Industrial Road / Site Access														
EBTL	Intersection does not exist.				A (A)	2.8 (4.2)	Intersection does not exist.		A (A)	3.8 (5.3)	Intersection does not exist.		A (A)	3.8 (5.3)
SBLR					A (B)	10.0 (11.7)			B (C)	11.6 (15.4)			B (C)	11.6 (15.4)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. All delays are in seconds (s).

8.5 QUEUING ANALYSIS

For signalized intersections, the Synchro analysis provides results for two operational measures related to queuing and defines those measures as follows:

1) Mean (or 50th) percentile queue is defined as the maximum queue length during a typical cycle and has a 50% probability of being observed across the total number of cycles in the hour.
2) 95th percentile queue is defined as having a 5% probability of being observed over the total number of cycles in the hour.

For the site access points, the Synchro analysis only provides results for 95th percentile queues.

The following sections summarize the queue results for key storage lanes at the study area intersections.

8.5.1 Signalized Intersection Queuing

8.5.1.1 Highway 50 / McEwan Drive

The storage lengths and queuing results for the movements at the Highway 50 / McEwan Drive intersection are summarized in **Table 28**.

The typical (or 50th percentile) queues at the intersection are contained within the provided storage lengths. Any queues that exceed storage lengths can be contained within adjacent lane groups (i.e. the through lanes). Site-related impacts (i.e. the difference in queue lengths between future background and future total conditions in any horizon year) are minimal on most movements and represent approximately up to 3 car-lengths (i.e. 7.5 m).

TABLE 28 HIGHWAY 50 / MCEWAN DRIVE QUEUING

Movement (storage)	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
EBL (70m)	14.9 (46.7)	23.7 (68.6)	15.8 (53.4)	25.0 (83.2)	15.8 (53.4)	25.0 (80.5)	16.5 (53.4)	25.0 (79.8)	16.5 (57.7)	25.0 (79.0)	16.5 (54.8)	25.0 (79.8)	16.5 (58.0)	25.0 (78.9)
EBTR	5.4 (14.8)	14.4 (30.3)	5.4 (15.2)	14.7 (31.8)	5.4 (15.2)	14.8 (32.1)	5.6 (15.2)	14.7 (31.8)	5.6 (18.2)	14.8 (34.4)	5.6 (15.6)	14.7 (31.8)	5.6 (18.7)	14.8 (34.8)
WBL (75m)	9.9 (24.2)	17.9 (35.8)	9.9 (24.2)	17.9 (35.9)	9.9 (24.2)	17.9 (35.9)	9.9 (24.2)	17.9 (35.9)	9.9 (24.2)	17.9 (35.9)	9.9 (24.2)	17.9 (35.9)	9.9 (24.2)	17.9 (35.9)
WBT	24.0 (25.6)	34.8 (43.3)	25.2 (27.0)	36.2 (43.4)	25.2 (27.0)	36.2 (43.4)	25.2 (27.0)	36.2 (43.4)	24.9 (27.0)	36.2 (43.0)	24.9 (27.0)	36.2 (43.4)	24.9 (26.8)	36.2 (43.0)
WBR (75m)	0.0 (5.8)	0.0 (32.8)	0.0 (11.4)	0.0 (38.4)	0.0 (11.4)	0.0 (38.4)	0.0 (11.4)	0.0 (38.4)	0.0 (10.5)	0.0 (37.0)	0.0 (11.1)	0.0 (38.1)	0.0 (10.7)	0.0 (37.4)
NBL (25m)	8.7 (9.1)	22.8 (17.1)	16.3 (10.8)	36.7 (18.0)	17.7 (11.9)	40.6 (19.6)	14.5 (10.8)	37.6 (18.0)	15.7 (9.7)	44.7 (20.0)	13.4 (10.1)	37.8 (18.0)	16.8 (9.5)	46.5 (20.0)
NBT	38.6 (120.9)	64.8 (158.8)	73.6 (154.2)	101.4 (191.2)	79.8 (162.6)	111.1 (202.8)	56.7 (168.2)	106.4 (209.5)	76.8 (159.3)	123.9 (235.9)	56.8 (168.1)	111.9 (220.5)	80.8 (165.2)	127.5 (248.7)
NBR (70m)	0.2 (7.0)	2.9 (20.1)	1.1 (9.4)	7.6 (22.9)	1.0 (9.8)	9.1 (23.7)	0.2 (10.1)	9.2 (24.0)	0.6 (9.4)	8.7 (25.5)	0.2 (10.0)	10.0 (24.5)	0.6 (9.6)	8.7 (26.1)
SBL (95m)	3.7 (7.6)	11.3 (14.6)	4.1 (9.6)	12.0 (16.2)	4.0 (9.6)	12.0 (16.3)	3.6 (9.6)	12.0 (16.2)	3.5 (7.8)	12.0 (20.1)	3.5 (9.0)	12.0 (17.2)	3.5 (7.7)	12.0 (22.5)
SBTR	99.8 (62.5)	173.4 (85.5)	118.0 (82.6)	211.2 (103.7)	123.6 (89.4)	216.6 (113.2)	117.3 (89.4)	230.5 (111.8)	126.6 (85.1)	237.6 (127.4)	122.1 (88.9)	241.7 (116.4)	132.8 (87.6)	248.6 (134.6)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

8.5.1.2 Highway 50 / George Bolton Parkway

The storage lengths and queuing results for the movements at the Highway 50 / George Bolton Parkway intersection are summarized in **Table 29**.

Most of the typical (or 50th percentile) queues at the intersection are contained within the provided storage lengths, with the exception of the following movements:

- Westbound left turn
- Northbound left turn

Even under future background conditions, the queue for this movement exceeds the provided storage. However, any queues that exceed storage lengths can be contained within adjacent lane groups (i.e. the through lanes). Traffic operations along the George Bolton Parkway extension (between Highway 50 and Albion Vaughan Road) should be monitored as travel flows continue to evolve after its construction to determine if additional mitigation measures (such as signal timing optimization) would be required.

TABLE 29 HIGHWAY 50 / GEORGE BOLTON PARKWAY QUEUING

Movement (storage)	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
EBL (105m)	6.0 (29.9)	15.2 (48.2)	12.0 (44.7)	24.6 (77.6)	13.2 (48.3)	26.3 (87.8)	12.0 (44.9)	24.7 (77.6)	14.4 (51.4)	28.0 (94.4)	12.0 (44.9)	24.6 (77.6)	14.4 (51.4)	28.0 (94.4)
EBTR	0.0 (0.0)	0.0 (0.0)	5.3 (4.5)	23.7 (26.8)	6.5 (22.9)	25.3 (51.7)	5.4 (4.5)	23.7 (26.8)	8.8 (39.0)	28.2 (70.3)	5.3 (4.5)	23.6 (26.8)	8.8 (39.0)	28.2 (70.3)
WBL[3] (30m)	Lane does not exist.		43.6 (26.8)	63.7 (47.9)	63.6 (41.2)	88.7 (69.8)	43.8 (27.1)	63.7 (47.9)	79.5 (50.6)	110.0 (103.5)	43.6 (27.1)	63.3 (47.9)	79.6 (50.7)	110.0 (103.5)
WBLTR[2] / WBTR[3]	0.0 (0.0)	0.0 (0.0)	70.5 (28.4)	96.3 (50.1)	76.0 (31.1)	104.3 (53.2)	70.7 (28.8)	96.3 (50.1)	80.6 (34.2)	109.0 (56.8)	70.5 (28.8)	95.8 (50.1)	80.6 (34.2)	109.0 (56.8)
NBL (40m)	1.9 (2.6)	4.5 (6.8)	55.5 (8.1)	88.3 (28.1)	57.3 (10.0)	86.2 (28.4)	57.4 (9.4)	85.9 (29.8)	53.9 (14.3)	87.4 (27.3)	56.1 (10.0)	86.2 (29.7)	52.8 (15.9)	87.4 (27.4)
NBTR[2] / NBT[3]	15.5 (60.2)	23.0 (71.6)	44.1 (165.7)	66.9 (129.0)	50.3 (184.7)	83.7 (174.0)	46.7 (178.0)	80.2 (159.6)	56.7 (156.4)	96.4 (273.5)	49.2 (186.8)	86.8 (178.6)	58.8 (190.3)	100.8 (285.1)
NBR[3] (100m)	Lane does not exist.		0.0 (1.4)	8.6 (22.6)	0.0 (0.0)	13.0 (27.7)	0.0 (0.0)	12.1 (26.1)	0.0 (4.2)	14.0 (30.7)	0.0 (0.0)	13.2 (28.2)	0.0 (6.5)	14.4 (30.6)
SBL (25m)	0.0 (0.0)	0.0 (0.0)	1.7 (4.7)	3.9 (10.2)	2.7 (7.3)	6.1 (20.3)	1.6 (4.6)	3.7 (10.2)	3.2 (9.4)	7.5 (34.5)	1.6 (4.6)	3.8 (10.2)	3.2 (9.4)	7.1 (34.5)
SBT	28.0 (48.1)	54.9 (74.8)	151.0 (103.7)	253.0 (136.7)	161.4 (106.7)	263.5 (138.6)	162.7 (109.5)	271.2 (146.7)	179.7 (115.5)	291.6 (149.7)	171.5 (114.0)	284.7 (152.5)	188.0 (120.1)	302.1 (155.3)
SBR (45m)	0.2 (0.3)	1.0 (7.1)	3.4 (1.3)	4.1 (12.9)	2.7 (2.7)	4.4 (15.0)	1.4 (1.3)	3.9 (12.9)	2.1 (3.3)	4.6 (16.0)	1.0 (1.3)	3.9 (12.9)	2.0 (3.3)	4.6 (16.0)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. These lane groups reflect the existing lane configuration.
3. These lane groups reflect the future lane configuration, and have been incorporated into the Synchro model based on the preferred design of the Highway 50 / George Bolton Parkway intersection illustrated in Appendix P of the EA.

8.5.1.3 Highway 50 / Parr Boulevard

The storage lengths and queuing results for the movements at the Highway 50 / Parr Boulevard intersection are summarized in **Table 30**.

The typical (or 50th percentile) queues at the intersection are contained within the provided storage lengths. Any queues that exceed storage lengths can be contained within adjacent lane groups (i.e. the through lanes).

TABLE 30 HIGHWAY 50 / PARR BOULEVARD QUEUING

Movement (storage)	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
EBL (75m)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)	10.8 (27.5)	22.8 (45.5)
EBTR	0.0 (0.0)	0.0 (0.0)	0.0 (2.0)	0.0 (20.2)	0.0 (3.1)	1.8 (21.5)	0.0 (2.9)	1.1 (21.3)	0.0 (4.5)	3.6 (23.1)	0.0 (3.3)	1.8 (21.8)	0.0 (4.9)	3.9 (23.6)
NBL (30m)	3.8 (2.4)	8.8 (6.7)	5.6 (2.9)	11.9 (7.7)	5.6 (2.9)	20.2 (7.7)	5.6 (2.9)	16.1 (7.7)	8.1 (2.9)	32.4 (7.7)	5.6 (2.9)	22.4 (7.7)	10.4 (2.9)	34.7 (7.7)
NBTR	20.7 (57.4)	32.9 (89.9)	37.3 (103.0)	57.7 (161.0)	39.2 (117.8)	60.5 (184.5)	39.2 (113.1)	60.5 (176.8)	42.5 (144.3)	65.6 (227.3)	40.4 (119.2)	62.5 (186.9)	43.9 (152.5)	67.6 (240.7)
SBT	32.2 (35.3)	72.7 (50.6)	67.8 (148.6)	67.2 (99.3)	74.6 (132.1)	67.9 (108.6)	66.6 (134.1)	60.3 (100.5)	59.2 (75.0)	82.5 (125.1)	60.0 (126.6)	65.4 (105.0)	53.4 (77.0)	83.4 (129.3)
SBR (35m)	1.7 (0.0)	14.4 (2.5)	3.0 (2.3)	1.5 (2.8)	2.8 (1.2)	1.3 (0.7)	2.7 (1.5)	1.1 (2.8)	1.5 (0.0)	0.9 (1.0)	2.0 (1.1)	1.0 (3.0)	1.5 (0.0)	0.8 (1.2)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).

8.5.1.4 Highway 50 / Albion Vaughan Road / Mayfield Road

The storage lengths and queuing results for the movements at the Highway 50 / Albion Vaughan Road / Mayfield Road intersection are summarized in **Table 31**.

Most of the typical (or 50th percentile) queues at the intersection are contained within the provided storage lengths, with the exception of the westbound left-turn movement. Even under future background conditions, the queue for this movement exceeds the provided storage by up to 8 car-lengths. However, any queues that exceed storage lengths can be contained within the adjacent westbound through lane group.

As previously discussed, the Simpson Road Environmental Assessment traffic study (completed by Paradigm in November 2012) had recommended a six lane cross-section along Highway 50 through the Mayfield Road intersection, in addition to dual westbound left-turn lanes along Mayfield Road at Highway 50. However, traffic conditions at the intersection and on the proximate traffic network should be monitored by the Town and Region prior to the further consideration of such improvements, especially given that the over capacity conditions will likely only impact the weekday morning peak hours as the analysis results suggest.

TABLE 31 HIGHWAY 50 / ALBION VAUGHAN ROAD / MAYFIELD ROAD QUEUING

Movement (storage)	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
EBL (80m)	20.5 (31.1)	31.6 (46.7)	20.6 (31.7)	34.5 (46.7)	22.9 (43.0)	37.5 (60.4)	20.7 (31.7)	34.5 (46.7)	26.2 (53.3)	42.6 (72.5)	20.6 (31.7)	34.5 (46.7)	26.2 (53.3)	42.6 (72.5)
EBT	37.5 (68.6)	51.9 (94.1)	34.3 (68.6)	54.4 (94.1)	33.8 (68.6)	54.4 (94.1)	34.1 (68.6)	54.4 (94.1)	33.4 (68.6)	54.4 (94.1)	34.0 (68.6)	54.4 (94.1)	33.4 (68.6)	54.4 (94.1)
EBR (90m)(2)	0.0 (0.0)	20.9 (16.2)	38.6 (0.0)	91.3 (23.4)	40.8 (0.0)	95.3 (23.4)	39.6 (0.0)	93.0 (23.4)	42.7 (0.0)	98.7 (23.4)	39.9 (0.0)	93.6 (23.4)	42.7 (0.0)	98.7 (23.4)
WBL (65m)(3)	131.6 (48.1)	184.9 (67.9)	93.9 (40.3)	125.4 (57.3)	103.4 (44.6)	145.6 (62.7)	94.3 (40.3)	125.4 (57.3)	108.8 (49.1)	163.0 (67.9)	94.0 (40.3)	125.4 (57.3)	108.8 (49.1)	162.8 (67.9)
WBT[2] / WBTR[3]	119.6 (31.0)	149.4 (50.9)	58.3 (17.3)	76.5 (27.5)	58.3 (17.8)	76.5 (28.2)	58.5 (17.3)	76.5 (27.5)	58.1 (18.2)	76.5 (28.2)	58.4 (17.3)	76.5 (27.5)	58.1 (18.2)	76.5 (28.2)
WBR[2] (65m)(2)	0.0 (0.0)	0.0 (0.0)	Future lane configurations assume a shared westbound through-right lane.											
NBL (125m)	33.6 (31.0)	77.7 (50.4)	48.5 (35.7)	100.9 (56.6)	49.1 (35.7)	100.9 (56.6)	48.8 (35.7)	100.9 (56.6)	52.4 (35.7)	100.9 (56.6)	48.9 (35.7)	100.9 (56.6)	52.4 (35.7)	100.9 (56.6)
NBT	80.2 (112.9)	135.1 (183.4)	150.5 (201.0)	224.6 (349.9)	157.8 (219.2)	232.7 (376.9)	157.1 (220.4)	235.7 (378.4)	171.9 (256.6)	247.2 (425.1)	162.8 (232.4)	242.8 (394.8)	177.1 (270.7)	254.5 (441.2)
NBR (130m)	0.0 (0.0)	14.6 (20.4)	0.0 (18.2)	13.2 (69.8)	0.0 (23.3)	13.6 (82.4)	0.0 (21.7)	13.2 (76.7)	0.0 (32.1)	13.6 (97.6)	0.0 (24.3)	13.2 (80.8)	0.0 (34.3)	13.6 (101.3)
SBL (35m)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)	1.6 (3.2)	6.5 (10.4)
SBT	168.2 (129.0)	201.9 (178.5)	206.2 (218.5)	235.3 (321.3)	220.9 (233.3)	255.2 (341.4)	220.9 (233.3)	255.2 (341.4)	254.4 (255.9)	308.0 (370.2)	231.7 (241.5)	280.3 (352.0)	279.6 (265.1)	321.5 (381.2)
SBR (115m)	0.0 (0.0)	8.7 (11.0)	0.0 (0.0)	4.1 (11.3)	1.1 (2.1)	14.0 (18.2)	0.0 (0.0)	4.1 (11.3)	5.7 (6.7)	20.3 (25.9)	0.0 (0.0)	4.1 (11.3)	6.3 (6.7)	21.0 (25.9)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. These lane groups reflect the existing lane configuration.
3. These lane groups reflect the future lane configuration.

8.5.1.5 Future Traffic Signal at Albion Vaughan Road / George Bolton Parkway

The storage lengths and queuing results for the movements at the future traffic signal at Albion Vaughan Road / George Bolton Parkway intersection are summarized in **Table 32**.

Most of the typical (or 50th percentile) queues at the intersection are contained within the provided storage lengths, with the exception of the eastbound left-turn movement. Even under future background conditions, the queue for this movement exceeds the provided storage by up to 12 car-lengths. However, any queues that exceed storage lengths can be contained within the adjacent eastbound through lane group. Traffic operations along the George Bolton Parkway extension (between Highway 50 and Albion Vaughan Road) should be monitored as travel flows continue to evolve after its construction to determine if additional mitigation measures (such as traffic signal timing optimization) would be required.

TABLE 32 FUTURE TRAFFIC SIGNAL AT ALBION VAUGHAN ROAD /INDUSTRIAL ROAD/GEORGE BOLTON PARKWAY QUEUING

Movement (storage)	Existing		2029 Horizon Year				2036 Horizon Year				2041 Horizon Year			
			Future Background		Future Total		Future Background		Future Total		Future Background		Future Total	
	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
EBL (40m)	Intersection is currently under "STOP" control.		46.5 (91.2)	75.1 (114.2)	51.6 (94.7)	79.4 (121.0)	48.8 (89.3)	78.2 (127.5)	61.8 (110.6)	81.5 (129.6)	52.2 (90.0)	79.0 (127.4)	61.4 (110.9)	81.8 (129.4)
EBR			0.1 (0.0)	7.3 (8.9)	0.2 (0.1)	10.8 (9.1)	0.1 (0.3)	7.7 (9.1)	0.9 (1.4)	12.0 (8.0)	0.2 (0.7)	7.8 (8.8)	0.9 (1.4)	12.0 (7.9)
NBL (100m)			4.6 (5.7)	12.2 (15.3)	5.5 (9.3)	14.1 (22.5)	4.6 (5.7)	12.2 (15.3)	6.2 (11.2)	15.6 (26.5)	4.6 (5.7)	12.2 (15.3)	6.2 (11.3)	15.6 (26.6)
NBT			7.5 (44.3)	17.1 (80.6)	7.7 (45.5)	17.5 (82.4)	4.0 (22.8)	8.8 (39.4)	4.2 (23.6)	9.4 (40.8)	4.1 (23.8)	9.2 (40.7)	4.4 (24.6)	9.7 (42.3)
SBT			13.9 (11.9)	28.5 (26.3)	14.3 (12.3)	29.1 (26.9)	7.8 (6.6)	15.3 (14.0)	8.4 (6.8)	16.3 (14.5)	8.5 (7.1)	16.3 (14.8)	9.1 (7.4)	17.4 (15.4)
SBR (60m)			0.0 (0.0)	13.7 (16.2)	0.0 (0.0)	14.2 (17.2)	0.0 (0.0)	13.7 (16.2)	0.0 (0.0)	14.7 (17.9)	0.0 (0.0)	13.7 (16.2)	0.0 (0.0)	14.7 (17.9)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The lane configuration of the Future Albion Vaughan Road / Industrial Road (George Bolton Parkway Extension) intersection adopted in the Synchro model is based on the preferred design illustrated in Appendix P of the EA.

8.5.2 Site Access Queuing

The storage lengths and queuing results for the movements at the site access points are summarized in **Table 33**. All site access queues are accommodated within the provided storage lengths.

TABLE 33 SITE ACCESS QUEUING

Movement (storage)	2029 Horizon Year	2036 Horizon Year	2041 Horizon Year
Highway 50 / Site Access			
WBL **(35m)**	2.5 (4.2)	5.4 (8.6)	5.5 (9.4)
WBR **(35m)**	2.7 (3.0)	4.9 (5.5)	4.9 (5.6)
SBL **(50m)**	0.5 (3.4)	0.9 (6.5)	0.9 (7.1)
Industrial Road / Site Access			
EBTL	0.2 (1.1)	0.4 (1.9)	0.4 (1.9)
SBLR **(25m)**	5.8 (5.5)	13.3 (14.4)	13.3 (14.4)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. All queues are 95th percentile values since Synchro does not provide 50th percentile values for unsignalized intersections.

9.0 PROPOSED SITE ACCESS

A key element of the development concept plan is the creation of a driveway through the middle of the site that connects to Highway 50 in the west and at Industrial Road in the southeast. The only two points of access proposed for the site are at each end of the driveway at Highway 50 and at Industrial Road. Since all of the existing access points to the properties will be closed, the consolidation of the existing driveways, particularly along Highway 50, will increase the level of safety for all road users.

The proposed points of access at the site driveway are described in more detail as follows:

9.1 HIGHWAY 50 & SITE DRIVEWAY

As discussed with the Region of Peel, this study considered the following 4 different access scenarios for the proposed intersection at Highway 50 with the main site driveway.

- Scenario 1: Full access (signalized)
- Scenario 2: Full access (unsignalized)
- Scenario 3: Left-in/right-in/right-out (unsignalized)
- Scenario 4: Right-in/right-out (unsignalized)

Although a full access with a traffic signal at Highway 50 is desirable from a development perspective, as shown in **Table 34**, the traffic signal warrant analysis based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 7) showed that the intersection only meets **33% of the 150%** requirement at full build-out, hence a traffic signal is not warranted.

In addition, an existing full access on the west side of Highway 50 (Tim Horton's driveway) is less than 30 m from the proposed site driveway. Without access modifications at the "Tim Horton's" driveway, a traffic signal in proximity could create safety concerns. As it is not practical at this stage to shift the location of the site driveway to align with the "Tim Horton's" driveway, a new traffic signal at the site driveway is not being proposed at this time.

Furthermore, as discussed in **Section 8.4.2**, the delays with respect to drivers entering and exiting the Highway 50 site driveway are projected to be acceptable and in the order of 44 seconds or better in all future scenarios (i.e. LOS E or better).

TABLE 34 TRAFFIC SIGNAL WARRANTS – HIGHWAY 50 & SITE DRIVEWAY AT FULL BUILD-OUT

Justification	Description	Minimum Requirement (2 or more lanes) [Restricted Flow]		Compliance		
				Sectional		Entire % (Warranted ≥150%)
		Base	"T"	Actual Traffic Volumes	% of Required	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	900	900	1708	190%	**33%**
	B(1). Vehicle volume, along minor streets (average hour)	170	255	84	33%	
2. Delay to Cross Traffic	A. Vehicle volume, major street (average hour)	900	900	1625	181%	
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	75[5]	75	25	33%	

Notes:
1. For "T" intersections, the base required values should be increased by 50% for case 1B.
2. For future intersections, the warrant should be met with 150% (as opposed to 100% for an existing intersection with an 8-hour count estimate).
3. Average hourly volumes were derived based on the formula presented in the OTM Book 12.
   AHV = (weekday morning peak hour volumes + weekday afternoon peak hour volumes) ÷ 4
4. Relevant OTM excerpts are provided in **Appendix J**.
5. There are errors within the OTM excerpts (confirmed in discussions with MTO staff): (1) the 50% increase due to "T" intersections only applies to Justification 1B, and (2) Justification 2B has a requirement value of 75, not 170, under restricted flow in 2 or more lanes

As a result of the detailed traffic analysis that confirmed traffic volumes, delays and queuing at Highway 50 and the site access, a full unsignalized access (t-intersection) is being proposed at Highway 50 and the site driveway. The conceptual design of the proposed access is illustrated in **Figure 28.** The proposed lane configuration includes a dedicated left-turn lane and a right-turn lane.

As shown in **Table 35**, the Region of Peel Road Characterization Study was reviewed to confirm the desired minimum spacing between the site driveway and the nearby driveways and intersections on the east side of Highway 50.

With the elimination of all other driveways along the site frontage, on the north side of the proposed site driveway, the nearest access is an existing right-in/right-out commercial driveway at a distance of approximately 105 m. This meets the minimum requirement of 100 m established in the Region of Peel Road Characterization Study (full access to right-in/right out).

On the south side of the proposed site driveway, the nearest access is an existing driveway for a small commercial business at a distance of approximately 90 m. Although this spacing does not meet the minimum requirement established in the Region of Peel Road Characterization Study, it is not expected to create operational or safety concerns due to the low traffic volumes generated at the commercial driveway.

On the south side of the proposed site driveway, the distance to Industrial Road is 200 m. Since Industrial Road is planned to become a right-in/right-out when the George Bolton Parkway is extended, this spacing meets the minimum requirement of 100 m established in the Region of Peel Road Characterization Study (full access to right-in/right out).

As the George Bolton Parkway is 370 m away from the proposed site driveway, the distance is slightly less than the 450 m required in the Region of Peel Road Characterization Study. As the analysis completed for this study demonstrated that there are no queuing concerns between these two intersections, even with the future extension of the George Bolton Parkway, it is not expected that this spacing would pose operational or safety concerns.

TABLE 35 PROPOSED INTERSECTION SPACING

Distance from Full Access at Site Driveway to:	Peel Road Characterization Study Minimum Spacing (m)	Proposed Spacing (m)
Nearest commercial driveway north of site driveway (Right-in/right-out)	100	105
Nearest commercial driveway south of site driveway[1] (Full access)	450	90[1]
Industrial Road (future right in/right-out with George Bolton Parkway Extension)	100	200
George Bolton Parkway (Future access)	450	370

Notes:
1. This driveway services a small commercial business that generates low volumes of traffic.

Due to COVID, staff were unable to undertake field studies at this time to confirm the sight distance at this proposed access. However, based on a review of the aerial photos for the area, sight distance at the proposed access is deemed to be more than adequate since Highway 50 in the area has limited to no horizontal or vertical curvature.

9.2 INDUSTRIAL ROAD & SITE DRIVEWAY

As a result of the detailed traffic analysis that confirmed the traffic volumes, delays and queuing at Industrial Road and the site access, a full unsignalized access (t-intersection) is being proposed at Industrial Road and the site driveway. The conceptual design of the proposed access is illustrated in **Figure 29.** The proposed lane configuration includes a shared left/right lane.

Due to COVID, staff were unable to undertake field studies at this time to confirm the sight distance at this proposed access. A comprehensive sight distance review was however completed utilizing aerial photos. Sight distances were evaluated in accordance with Transportation Association of Canada (TAC) guidelines for both stopping sight distance and turning sight distance, using a conservative design speed of 60 km/h (10 km/h over the posted speed limit).

As shown in **Table 36**, the minimum stopping sight distance for vehicles turning left into the site driveway from Industrial Road, exceeds the minimum requirement. Due to the presence of a sharp curve, the turning sight distance requirements are however not met for vehicles turning left or right from the site driveway to Industrial Road.

A further review of the context of Industrial Road supports consideration for a design speed of 30 km/h in the vicinity of the curve for the following reasons:

- There are plans for the full access at Industrial Road and Highway 50 to be changed to a right-in/right-out only when the George Bolton Parkway is extended. This ensures that traffic volumes in the future will remain low on Industrial Road.

- The 2041 traffic analysis confirmed there will be approximately only 85 and 250 vehicles in the morning and afternoon peak hours respectively, travelling westbound from the curve on Industrial Road towards the site driveway. The majority of these westbound vehicles on Industrial Road will be turning right into the site driveway, so will most likely be travelling at a reduced speed.

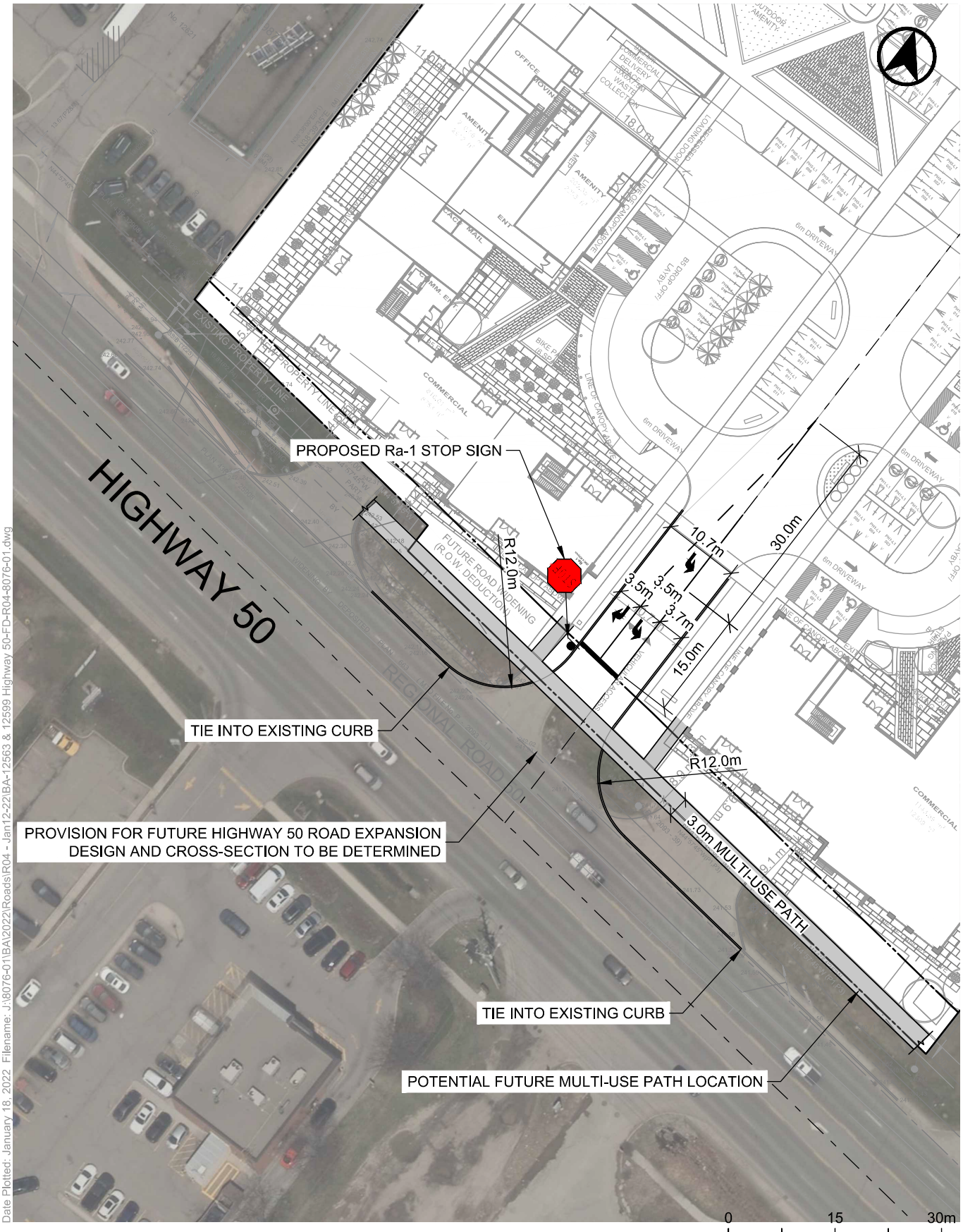
- The presence of a sharp curve typically results in significantly reduced vehicle operating speeds.

To increase the level of safety in the vicinity of the site driveway, it is proposed that the existing curve ahead warning sign on Industrial Road be replaced with an oversized curve ahead sign that includes an advisory speed tab of 30 km/h (as per *Ontario Traffic Manual Book 6 – Warning Signs*), in addition to an amber flashing beacon.

TABLE 36 SIGHT DISTANCE (INDUSTRIAL ROAD AT SITE DRIVEWAY)

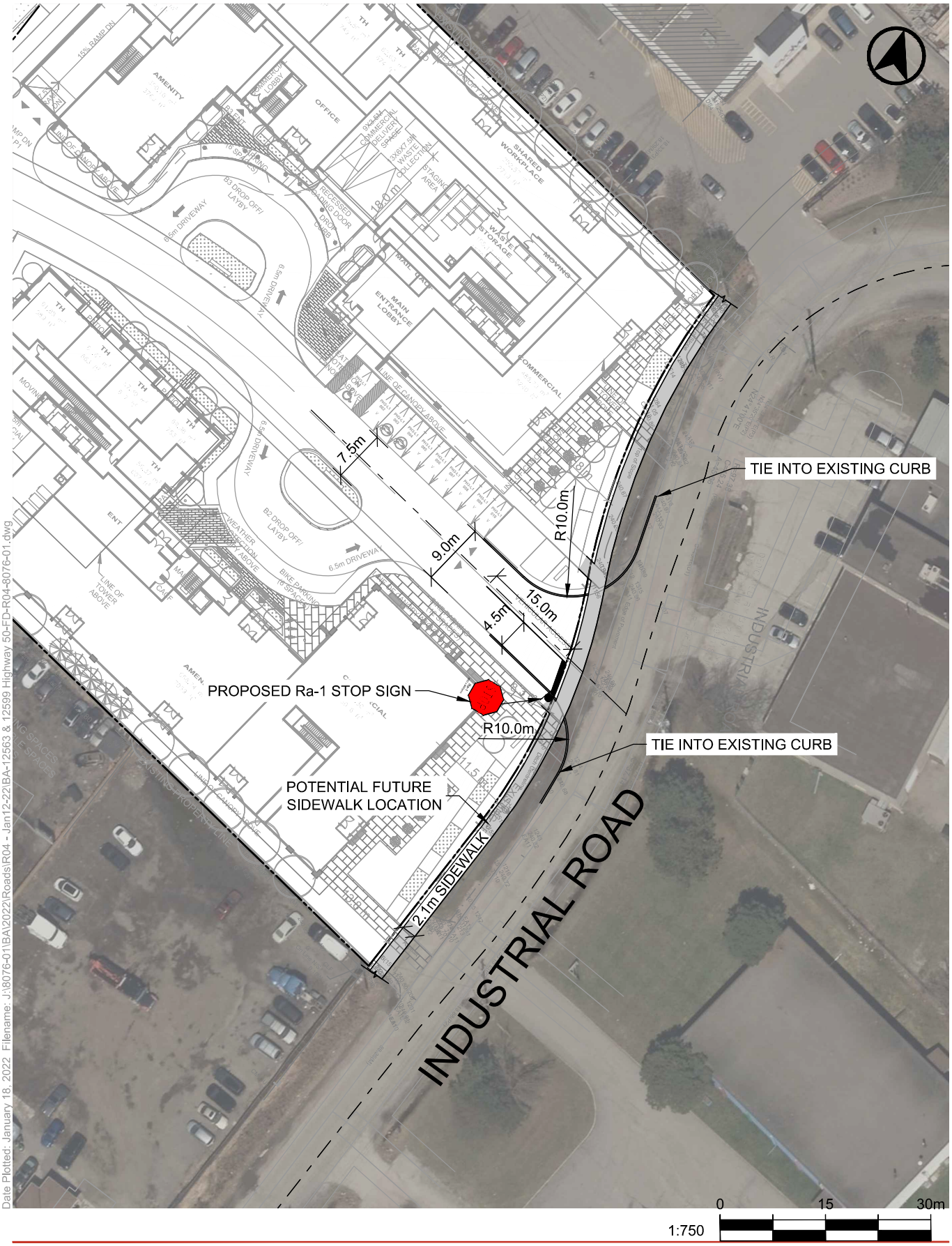
Movement	TAC Minimum Requirement (metres)	Available Sight Distance (metres)
Stopping Sight Distance (Design Speed of 60 km/h)		
Left turn from Industrial Road to Site Driveway[1]	85	>85
Turning Sight Distance (Design Speed of 60 km/h at Curve)		
Left-turn from Site Driveway to Industrial Road (stop condition)[2]	130	78
Right-turn from Site Driveway to Industrial Road (stop condition)[3]	110	78
Turning Sight Distance (Design Speed of 30 km/h at Curve)		
Left-turn from Site Driveway to Industrial Road (stop condition)[2]	65	78
Right-turn from Site Driveway to Industrial Road (stop condition)[3]	55	78

Notes:
1. Transportation Association of Canada (TAC) Manual, Table 2.5.2.
2. Transportation Association of Canada (TAC) Manual, Case B1; Table 9.9.4
3. Transportation Association of Canada (TAC) Manual, Case B2; Table 9.9.6



Date Plotted: January 18, 2022 Filename: J:\8076-01\BA\2022\Roads\R04 - Jan12-22\BA-12563 & 12599 Highway 50-FD-R04-8076-01.dwg

FIGURE 28 PROPOSED ACCESS CONFIGURATION AT HIGHWAY 50 & SITE DRIVEWAY



Date Plotted: January 18, 2022 Filename: J:\8076-01\BA\2022\Roads\R04 - Jan12-22\BA-12563 & 12599 Highway 50-FD-R04-8076-01.dwg

FIGURE 29 PROPOSED ACCESS CONFIGURATION AT INDUSTRIAL ROAD & SITE DRIVEWAY

10.0 SUMMARY AND CONCLUSIONS

BA Group was retained by 12599 Hwy 50 Ltd. to provide transportation consulting services related to a proposed mixed-use development on a site municipally known as 12563 and 12599 Highway 50 in the Town of Caledon in the Region of Peel. The site is located on the east side of Highway 50, north of Industrial Road. It is bounded by Highway 50 to the west, a commercial development to the north and commercial uses to the south and east.

The site is currently designated as Bolton Highway Commercial (CHB) in the Town of Bolton Zoning By-law and is currently occupied by a small commercial plaza (Northpoint Plaza) that includes restaurants and a variety of commercial spaces, in addition to a variety of motor vehicle maintenance, repair and storage facilities.

The development concept plan includes the eventual demolition of all existing buildings at 12563 and 12599 Highway 50 and the construction of 5 mixed-use buildings with a total of 2,238 residential units and 3,179 m^2 of retail. A key element of the development concept plan is the creation of a private driveway across the site that connects to a new unsignalized full access at Highway 50 and a new unsignalized full access at Industrial Road. Since all of the existing access points to the properties will be closed, the consolidation of these driveways, particularly along Highway 50, will increase the level of safety for all road users.

Key findings of the Transportation Considerations Report are summarized as follows:

Transportation Context

- The Town of Caledon has plans to begin work to extend the George Bolton Parkway from Highway 50 to Albion Vaughan Road in 2023. A planned new stop-controlled intersection at Industrial Road and the George Bolton Parkway will provide a key roadway connection for the site.

- The Town of Caledon has retained Voyago to provide local bus service in the Bolton area. The Bolton Line operates during weekday peak periods (Monday to Friday, 6:00 am to 9:30 am and 3:00 pm to 6:30 pm), with stops throughout the downtown Bolton core and the industrial zone. The nearest Bolton Line stops to the site are located at the intersection of Highway 50 & George Bolton Parkway and at Highway 50 & McEwan Drive. The walking time to either of these stops would be approximately 5 minutes.

- Inter-regional transit is provided by GO Transit with the operation of one bus route in Caledon. It should be noted that GO Transit is only operating one route in the study area due to COVID conditions. Once typical travel patterns return, it is possible that additional GO Transit routes will once again be available in the Bolton area. The current schedule only provides southbound service during the morning peak period and northbound service during the afternoon peak period.

- There is a carpool lot located on the southwest corner of the Mayfield Road and Highway 50 intersection approximately 2 km from the site (25 minute walk). The carpool lot provides free 24/7 parking for drivers, a passenger pick-up/drop-off area and bike racks. The lot is serviced by the

Bolton GO Transit bus route, which provides service to and from the Malton GO Station, with connections to Union Station, Brampton's ZUM network and York Region Transit.

- The proposed site includes sidewalks along both sides of the site driveway that connect to the east side of Highway 50 and the north side of Industrial Road. These sidewalks will improve permeability for pedestrians in the area.

- The plan to extend the George Bolton Parkway includes a 3.0 m wide in-boulevard multi-use pathway on both sides of the road that will provide new facilities in the area for pedestrians and cyclists. In addition, a review of long-term plans in the Peel Region Sustainable Transportation Strategy identified that a cycle track is track proposed for Highway 50 from Mayfield Road to just north of the CN rail line (2023 – 2031).

Vehicle Parking Considerations

- The site is subject to the Town of Caledon Zoning By-law for parking considerations. Application of this By-law results in a minimum total parking requirement for the site of 4,082 spaces, inclusive of 3,359 resident spaces and 723 non-resident spaces (562 resident visitor spaces and 161 retail spaces).

- The minimum proposed parking supply for the site is based on a ratio of 1.0 spaces per unit for resident parking and 0.25 spaces per unit for residential visitor parking. It is proposed that the retail parking demand be shared with the resident visitor parking supply.

- The current architectural plans for the site illustrate a total parking supply of 2,806 spaces, inclusive of 2,244 resident spaces and 562 non-resident spaces. This supply represents an additional 6 spaces beyond what is required with the proposed parking rates.

- The parking supply includes 93 at-grade spaces and 2,713 spaces located in a 3-level below-grade parking facility.

Bicycle Parking Considerations

- Although the Town of Caledon Zoning By-law does not include a requirement for bicycle parking, in order to encourage sustainable transportation, bicycle parking on the site is being proposed. The current architectural drawings provide a total of 816 parking spaces for bicycles, including 52 spaces at-grade for visitors and 764 stacked spaces for residents, below-grade on P1.

- Based on the development proposal that includes a total 2,238 residential units, the proposed bicycle parking supply aligns with a ratio of 0.34 long-term bicycle parking spaces per unit and 0.023 short-term bicycle spaces per unit, for a total bicycle parking supply rate of 0.36 spaces per unit.

- The proposed bicycle parking supply is reasonable based on the development statistics and the surrounding transportation context. It is also deemed to be a practical amount of bicycle parking

based on the available space within the buildings. The proposed bicycle parking supply will meet the practical needs of the site.

Loading Considerations

- As the proposed development would be serviced by the Region of Peel for residential garbage collection, the requirements of the Region's Waste Collection Design Standards have been applied for the residential components of the site. As per the Town of Caledon Zoning By-law, the retail components of the site would require a private waste collection service.

- In accordance with the Region's Waste Collection Design Standards, the residential waste collection loading space (1 per building) will be a minimum of at 6.0 m wide and 15.0 m long with a 7.5 m height clearance. It is proposed that the loading space designated for residential waste collection be shared with residential deliveries.

- In accordance with the Town of Caledon Zoning By-law, waste collection for the retail components of the site must be serviced by a private contractor. The size of the loading space is dependent on the retail use. The retail uses for the site are unknown at this time hence the size of the loading spaces will range from 9.0 to 14.0 m in length with a width of 3.5 metres and will meet the minimum requirements of the Town of Caledon Zoning By-law. One retail waste collection loading space per building will be provided. It is proposed that the loading space designated for private waste collection be shared with retail deliveries.

Transportation Demand Management Framework

- The Transportation Demand Management (TDM) framework strives to reduce automobile use as a part of the design and construction of the development, as well as after construction, as an on-going strategy by supporting and promoting the use of non-auto transportation modes.

- Proposed TDM strategies for the site include a reduced vehicle parking supply, bicycle parking, sidewalks along the site driveway, unbundled parking, tele-work and conference facilities, provision of Presto cards to new residents and programs to inform residents of available travel options.

Traffic Operations Analysis

- Phase 1 (Buildings 1, 2 and 3) is expected to generate 390 and 545 vehicle trips during the weekday morning and afternoon peak hours, respectively. The full build-out of the site (Buildings 1, 2, 3, 4 and 5) anticipates in the order of 675 and 895 vehicle trips during the weekday morning and afternoon peak hours, respectively.

- All movements at signalized intersections in the study area are expected to operate under capacity under future total conditions with the consideration of the George Bolton Parkway Extension and relevant road improvements. No mitigation measures or improvements are recommended, with the exception of traffic signal timing optimization at Highway 50 / George Bolton Parkway (due to the future extension) and the Highway 50 / Albion Vaughan Road / Mayfield Road intersection.

- All movements at unsignalized intersections in the study area, including the site access points, are expected to operate acceptably at LOS D or better. No mitigation measures or improvements are recommended.

- Most of the typical (or 50th percentile) queues at the study area intersections are contained within the provided storage lengths, with some exceptions. However, all queues that exceed provided storage lengths can be accommodated by adjacent through lane groups. Traffic operations along the George Bolton Parkway extension and at the Highway 50 / Albion Vaughan Road / Mayfield Road intersection should be monitored as travel flows continue to evolve to determine if additional mitigation measures would be required.

Proposed Site Access

- As a result of the detailed traffic analysis that confirmed traffic volumes, delays and queuing at Highway 50 and the site access, a full unsignalized access is being proposed at Highway 50 and the site driveway. The proposed lane configuration at the site driveway includes a dedicated left-turn lane and a right-turn lane.

- Although a full access with a traffic signal at Highway 50 is desirable from a development perspective, the traffic signal warrant analysis based on the Ontario Traffic Manual (OTM) Book 12 methodology (Justification 7) showed that the intersection only meets 33% of the 150% requirement at full build-out, hence a traffic signal is not warranted.

- As a result of the detailed traffic analysis that confirmed the traffic volumes, delays and queuing at Industrial Road and the site access, a full unsignalized access is being proposed at Industrial Drive at the site driveway. The proposed lane configuration at the site driveway includes a shared left/right lane.

- At the Industrial Road intersection with the site driveway, with a 60 km/h design speed (10 km/h over posted), the minimum TAC requirements for turning sight distance are not met due to a horizontal curve on Industrial Road. A further review of the context of Industrial Road supports consideration for a design speed of 30 km/h in the vicinity of the curve.

- To increase the level of safety in the vicinity of the site driveway, it is proposed that the existing curve ahead warning sign on Industrial Road be replaced with an oversized curve ahead sign that includes an advisory speed tab of 30 km/h, in addition to an amber flashing beacon.

Based on the foregoing, the proposed development can be accommodated on the future transportation network.

Appendix A
Reduced Scale Architectural Drawings

OVERALL_SITE PLAN

Scale: 1 : 500

1 A110

PARKING TAG LEGEND:

PHASE NUMBER — LEVEL NUMBER

PARKING TYPE — PARKING NUMBER

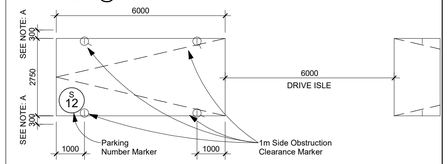
Example: PH1-L1 / 100 / R

R — RESIDENT PARKING SPACE

V — VISITOR/COMMERCIAL PARKING SPACE

TYPICAL PARKING SPACE:

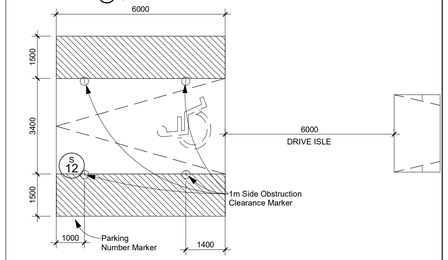
Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

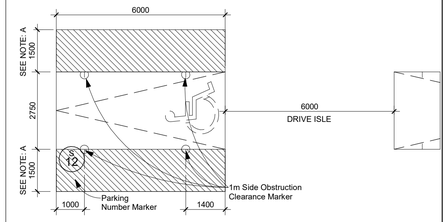
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



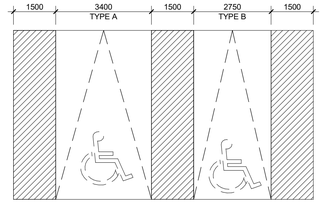
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:

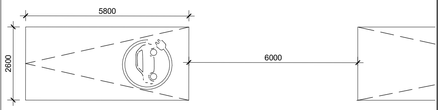


NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE A & B:

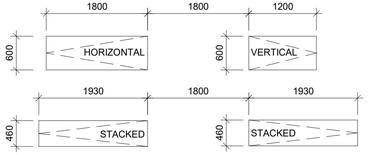


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



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8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

SITE PLAN

DATE: Feb. 26, 2021	SCALE: As indicated
DRAWN BY: EM/EH	CHECKED BY: EM/GR
PROJECT NUMBER: S20023	DRAWING NUMBER: A110

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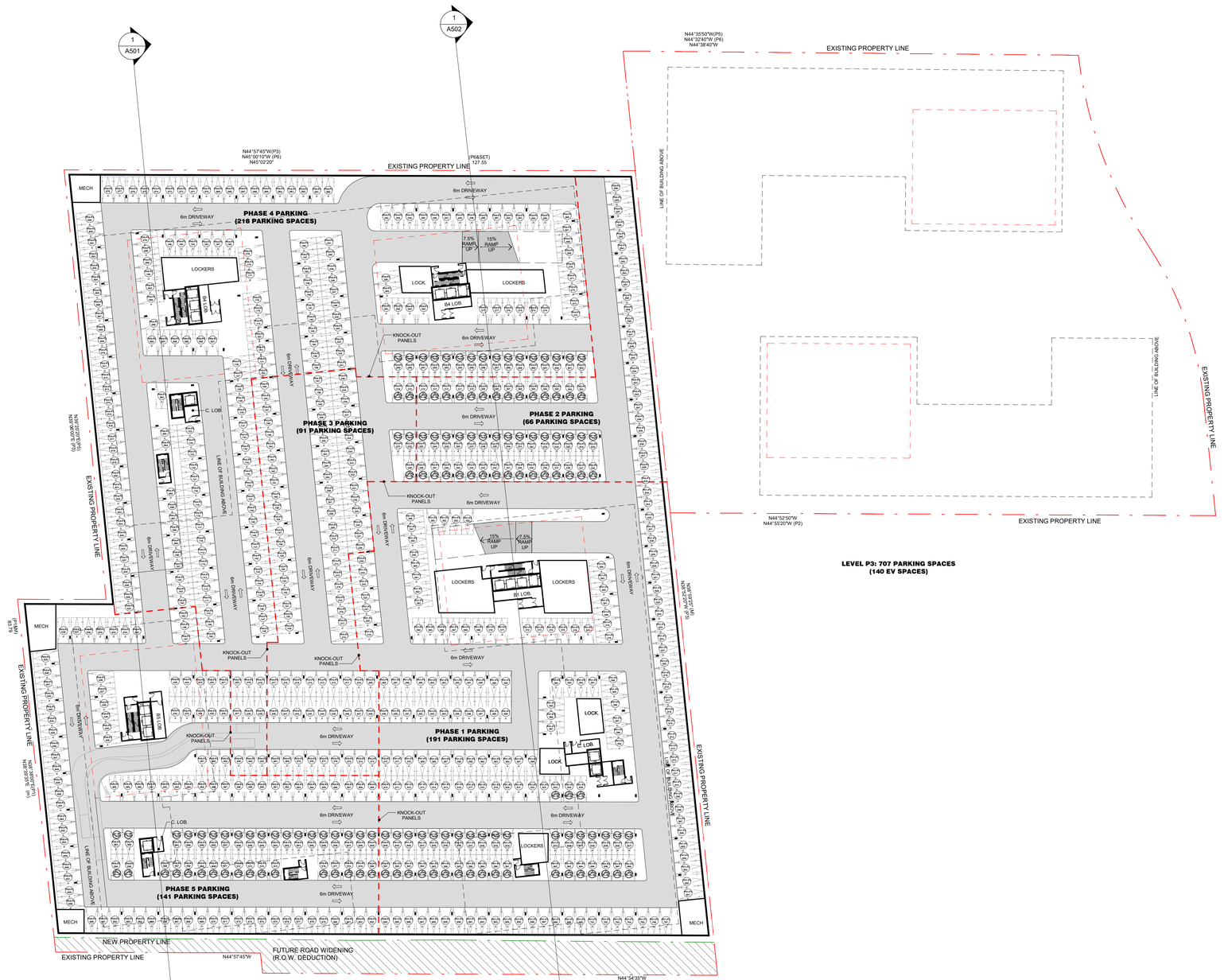

OVERALL- LEVEL P3 FLOOR PLAN

1 / A201

Scale: 1 : 500

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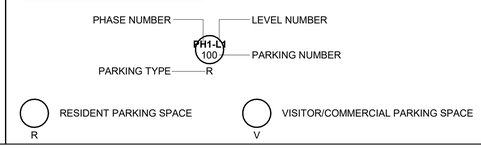

TYPICAL PARKING SPACE:

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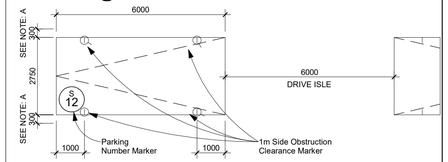
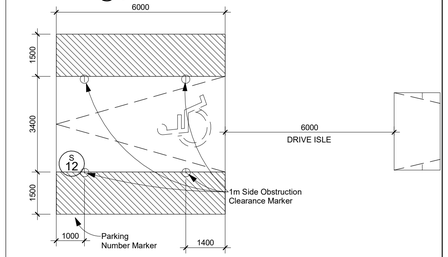


NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH
WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

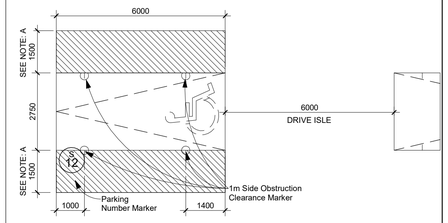
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



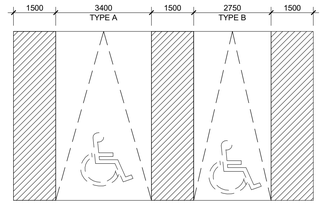
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH
WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:

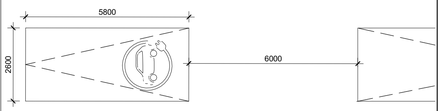


NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH
WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE A & B:

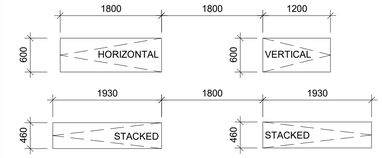


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



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ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P3 FLOOR PLAN

DATE:	Feb. 11, 2022	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A201

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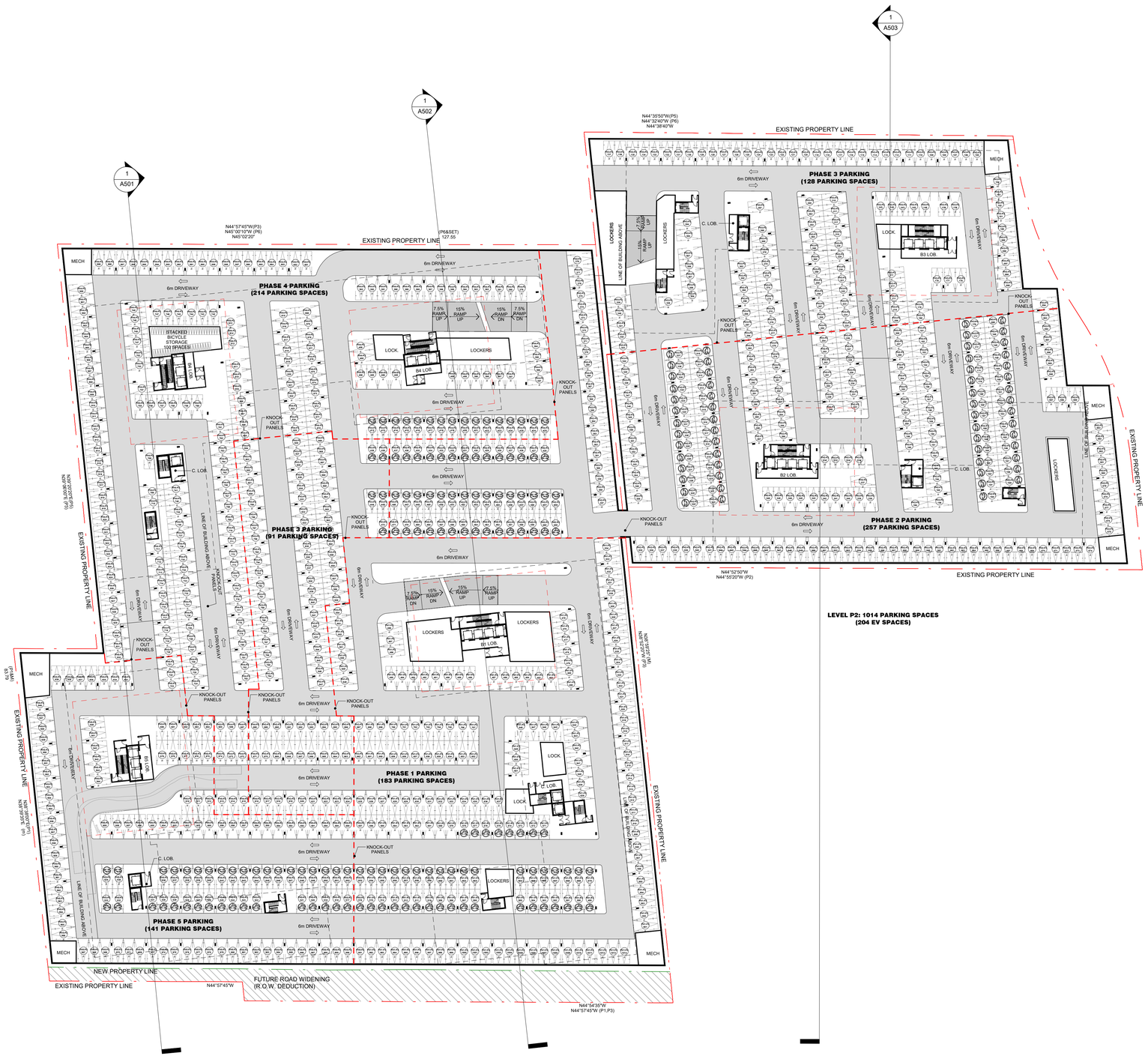

OVERALL- LEVEL P2 FLOOR PLAN (1 / A202)

Scale: 1 : 500

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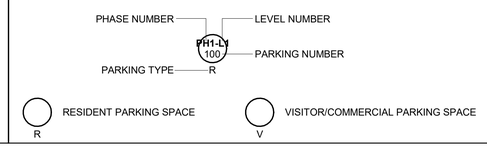
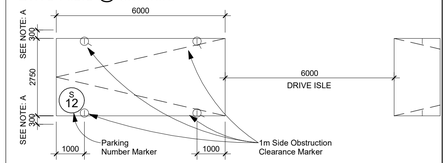


TYPICAL PARKING SPACE:

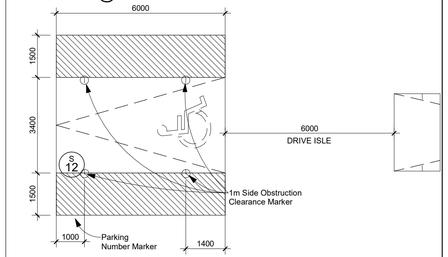
Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

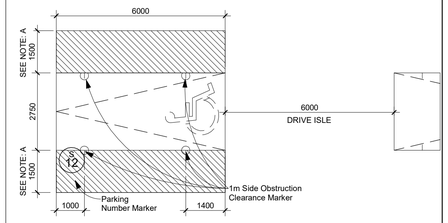
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



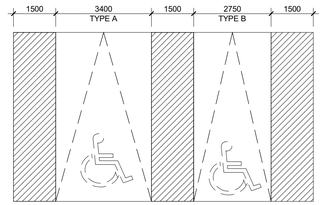
NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:

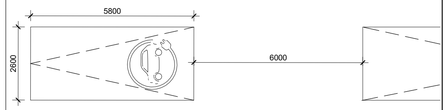


NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE A & B:

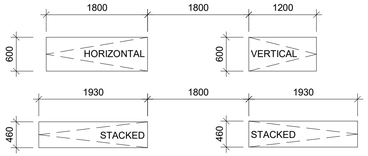


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



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ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P2 FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A202

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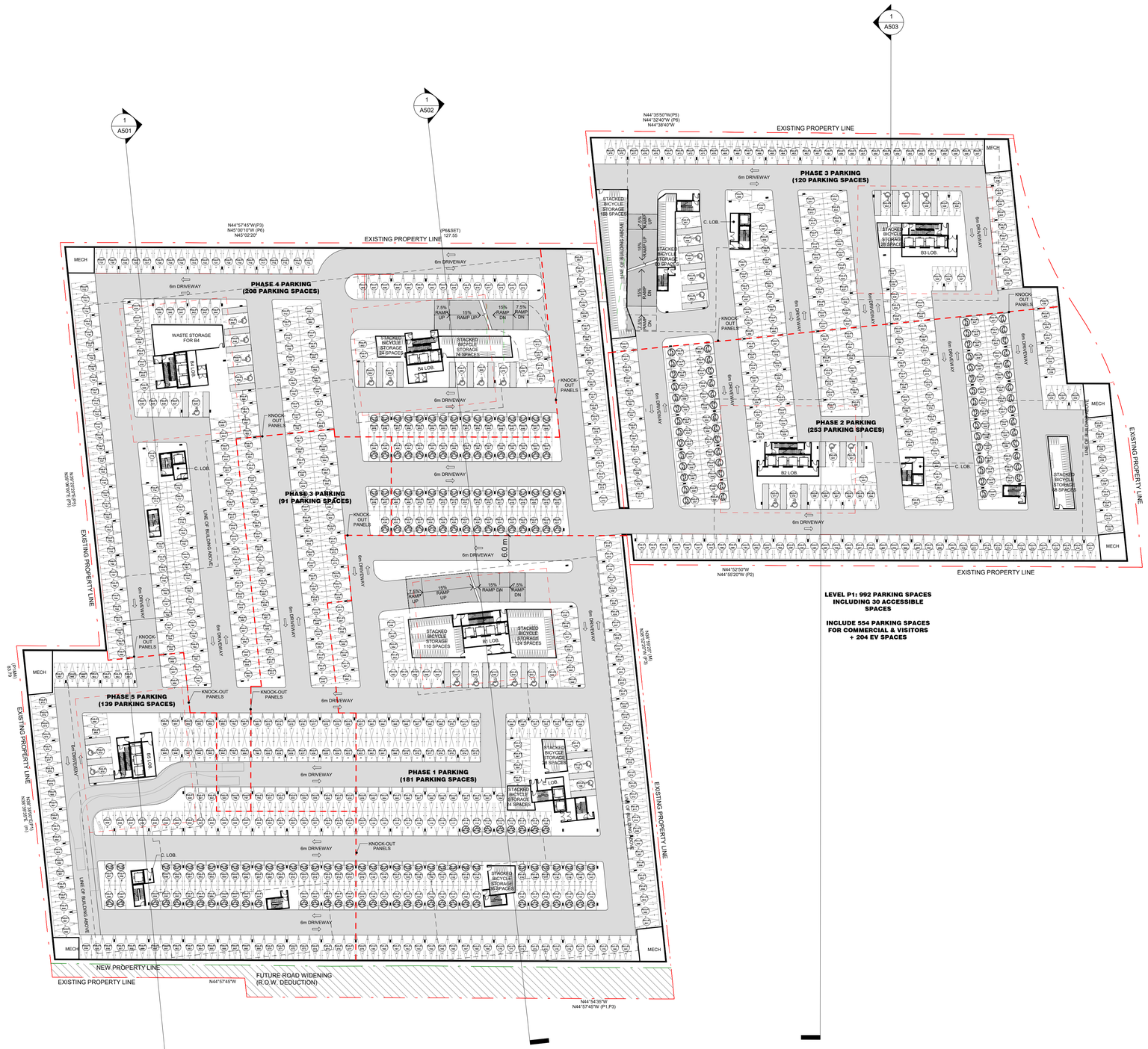


LEVEL P1: 992 PARKING SPACES INCLUDING 30 ACCESSIBLE SPACES

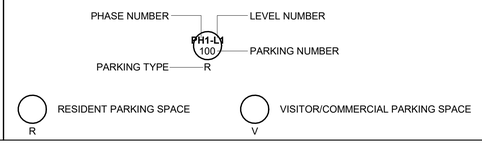
INCLUDE 554 PARKING SPACES FOR COMMERCIAL & VISITORS + 204 EV SPACES

OVERALL_LEVEL P1 FLOOR PLAN

Scale: 1 : 500

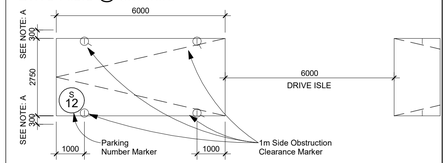
1 / A203

PARKING TAG LEGEND:



TYPICAL PARKING SPACE:

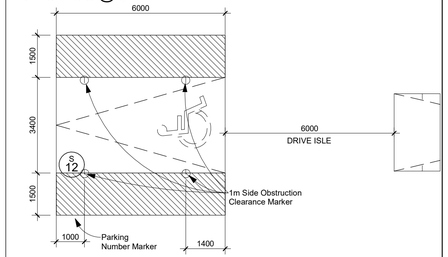
Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

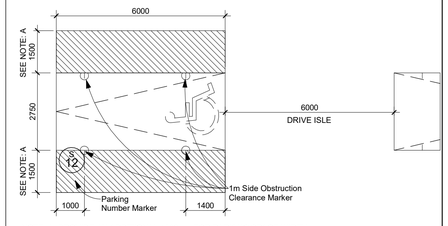
BARRIER-FREE PARKING SPACE TYPE A:

Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 1500mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

BARRIER-FREE PARKING SPACE TYPE B:



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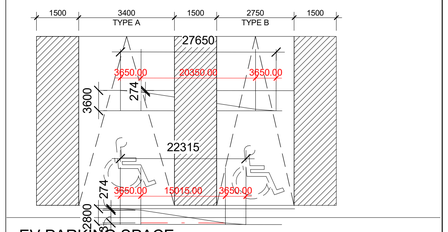
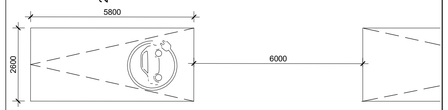
BARRIER-FREE PARKING SPACE TYPE A & B:

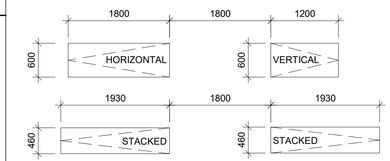


EV PARKING SPACE



TYPICAL BICYCLE PARKING SPACE:

WALKWAY:	MINIMUM 1800mm
VERTICAL PARKING SPACE:	1200mm (L) x 600mm (W)
HORIZTONAL PARKING SPACE:	1800mm (L) x 600mm (W)
STACKED PARKING SPACE:	1930mm (L) x 460mm (W)



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PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:

12599 Hwy 50 Ltd.

PROJECT:

MIXED USE DEVELOPMENT

12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:

LEVEL P1 FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A203

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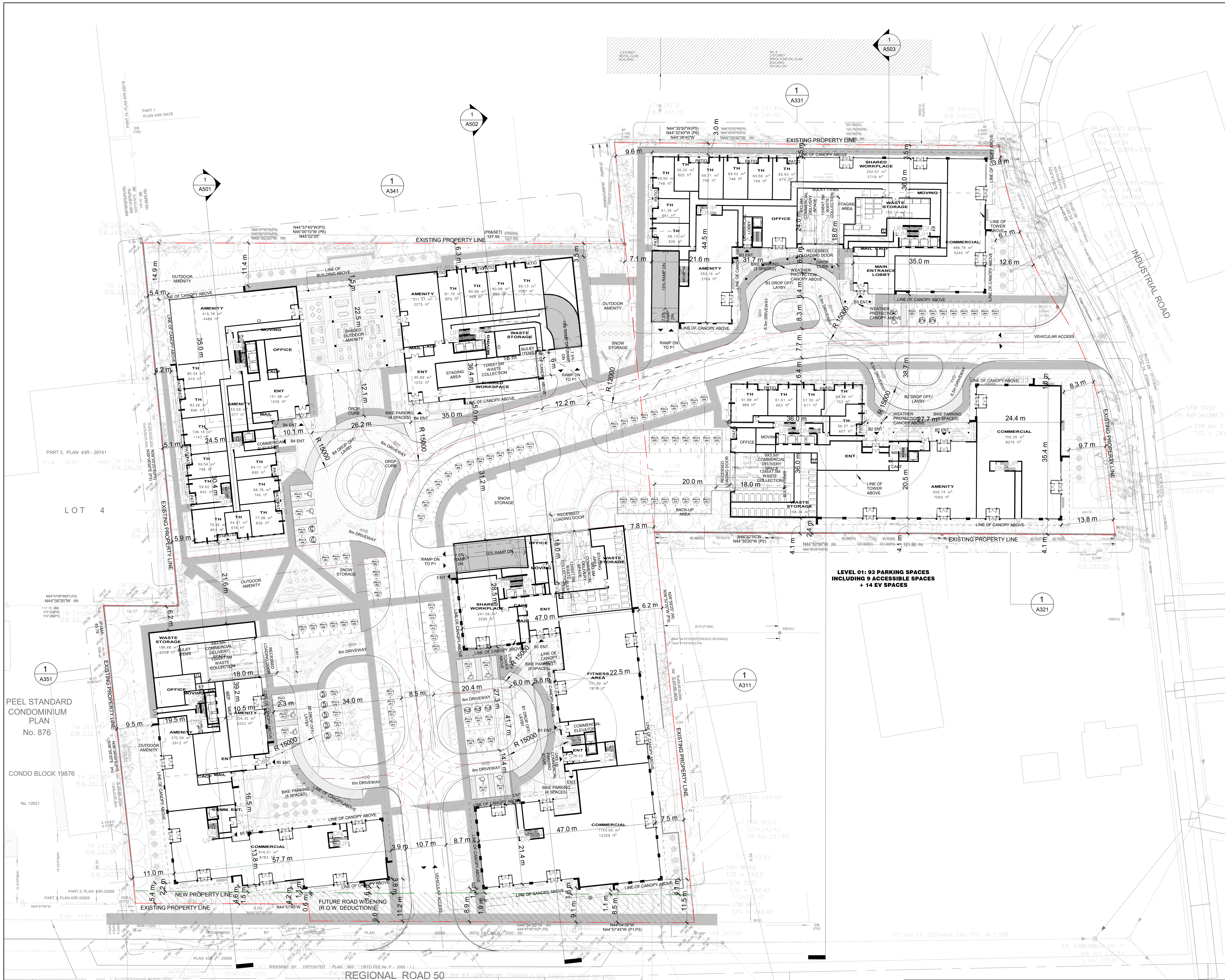


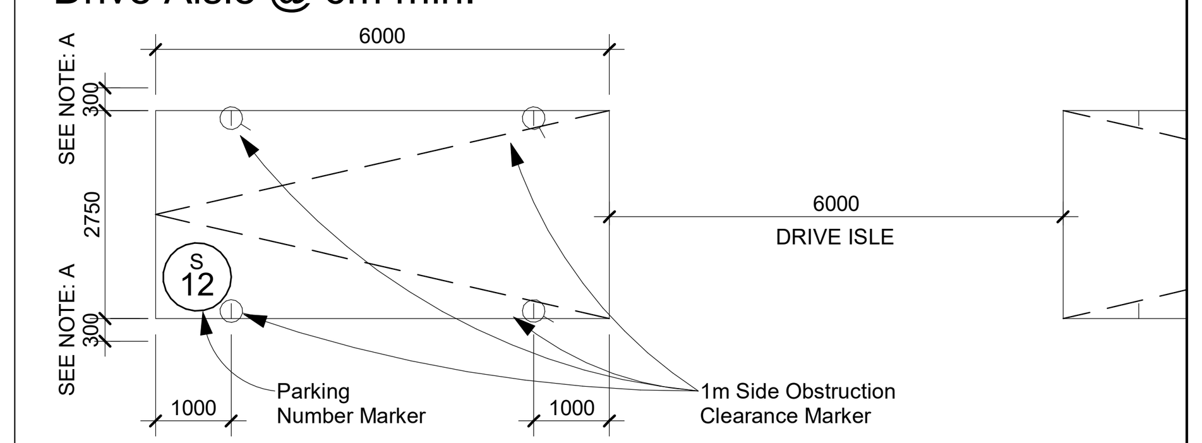
OVERALL_LEVEL 01_FLOOR PLAN

1 / A301

Scale: 1 : 500

TYPICAL PARKING SPACE:

Drive Aisle @ 6m min.



NOTE: A- PROVIDE AN ADDITIONAL 300mm FOR PARKING SPACE WIDTH WHEN OBSTRUCTIONS OCCUR BETWEEN THE FRONT AND REAR 1000mm

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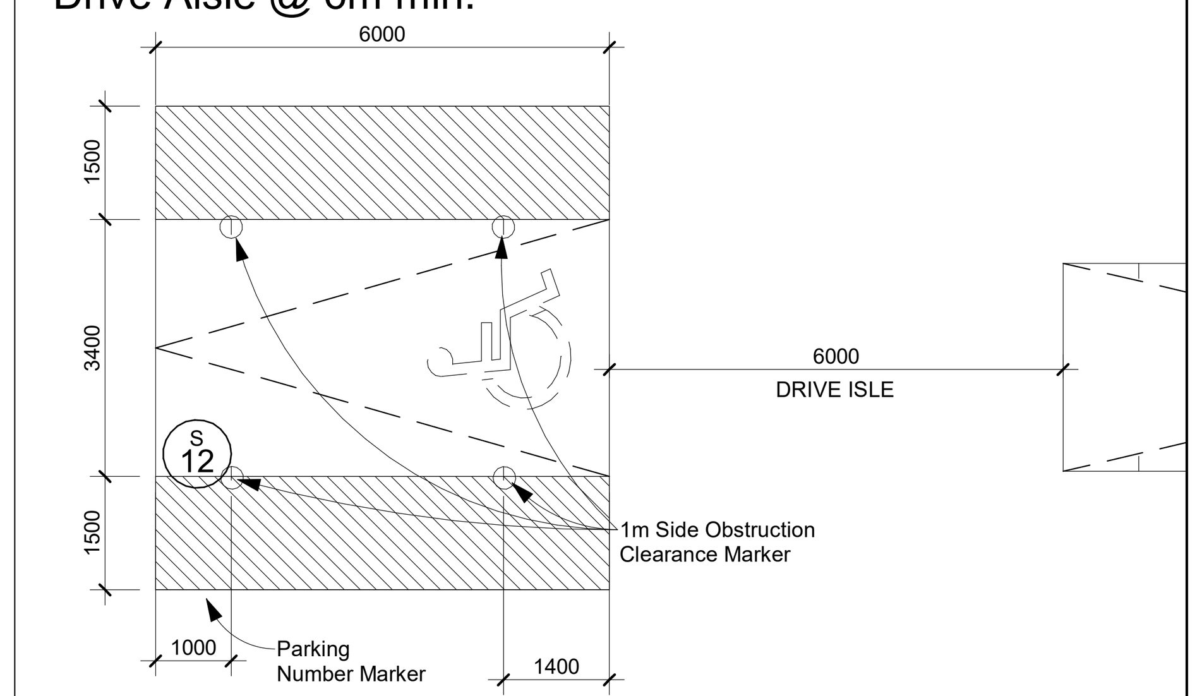

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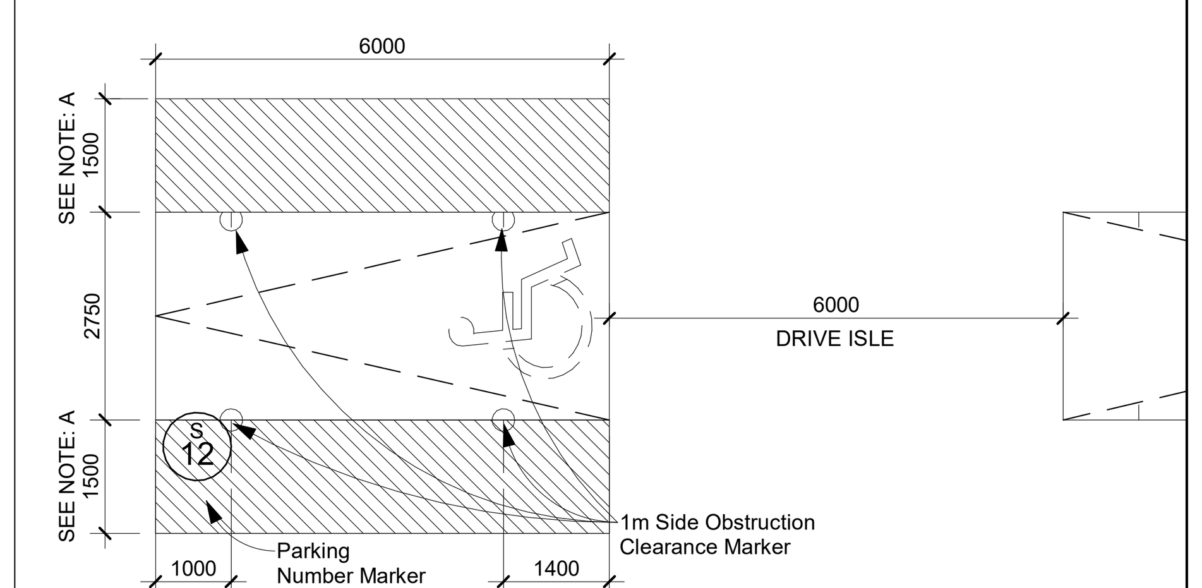
BARRIER-FREE PARKING SPACE TYPE B:



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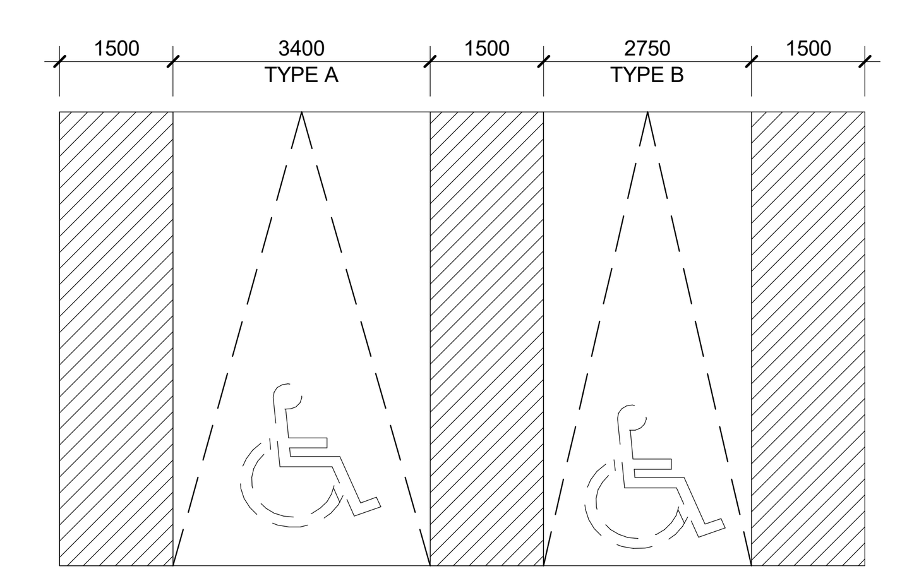
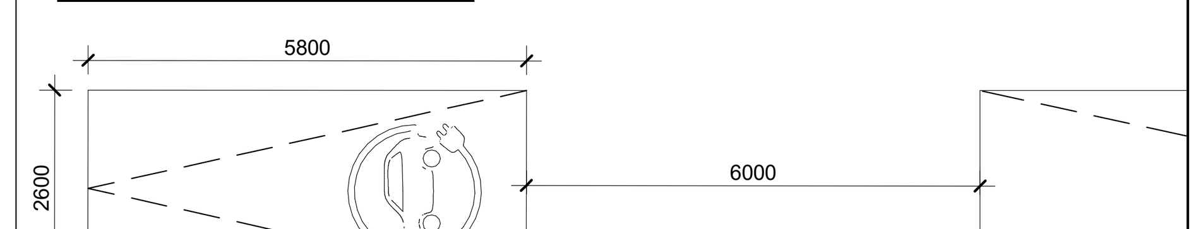


EV PARKING SPACE



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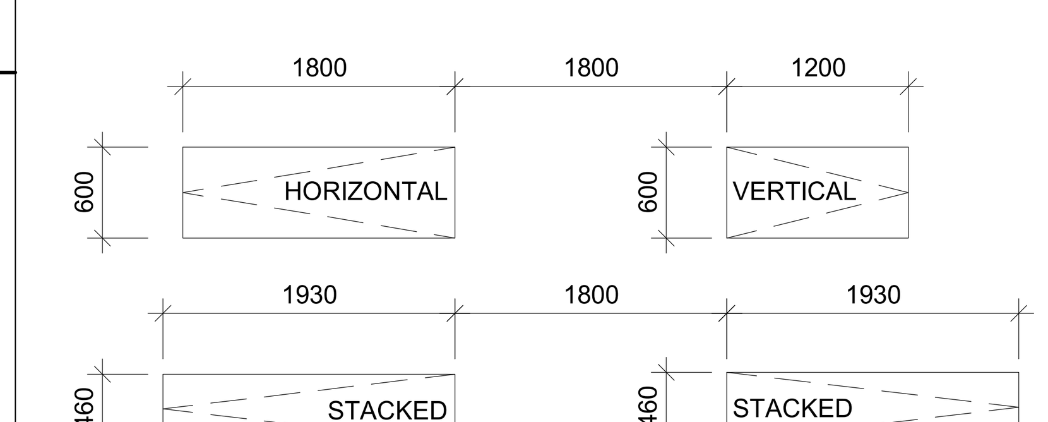

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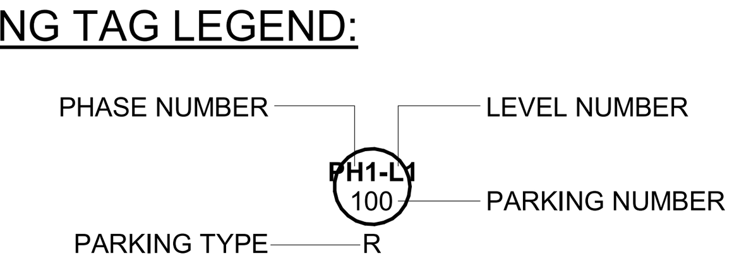

RESIDENT PARKING SPACE (R)

VISITOR/COMMERCIAL PARKING SPACE (V)

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PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:
12599 Hwy 50 Ltd.

PROJECT:
MIXED USE DEVELOPMENT
12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:
LEVEL 1 - OVERALL FLOOR PLAN

DATE:	Feb. 26, 2021	SCALE:	As indicated
DRAWN BY:	EM/EH	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A301

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MIXED-USE DEVELOPMENT - 12563&12599 HWY 50

Bolton, Ontario

Project Statistics

January 5, 2022 — Project No. S20023

1.0 Site Area

	Hectare	acres	sq.m.	sq.ft
Survey Site Area	3.61	8.92	36,091.00	388,480
Potential HWY 50 Road Widening	0.09	0.22	904.00	9,731
Total Site Area	**3.52**	**8.69**	**35,187.00**	**378,750**

2.0 GFA

(excludes storage, parking, stairwell, elevator, trash chute, trash room, storage for mechanical & electrical equipments)

2.1 Commercial GFA

	floors	sq.m.	sq.m.	sq.ft
B1 Level 1	1 x	*1,144.00*	1,144.00	12,314
B2 Level 1	1 x	*748.00*	748.00	8,051
B3 Level 1	1 x	*507.00*	507.00	5,457
B4 Level 1	1 x	*0.00*	0.00	0
B5 Level 1	1 x	780.00	780.00	8,396
Total GFA			**3,179.00**	**34,218**

2.2 Building 1 Residential GFA

	floors	sq.m.	sq.m.	sq.ft
Level 1	1 x	1,206.00	1,206.00	12,981
Level 2	1 x	2,862.11	2,862.11	30,807
Levels 3 to 4	2 x	3,000.00	6,000.00	64,583
Levels 5 to 7	3 x	2,693.22	8,079.66	86,969
Levels 8 to 9	2 x	1,893.22	3,786.44	40,757
Levels 10 to 27	18 x	700.00	12,600.00	135,625
Levels 28 to 29	2 x	590.00	1,180.00	12,701
Total GFA			**35,714.21**	**384,423**

2.3 Building 2 Residential GFA

	floors	sq.m.	sq.m.	sq.ft
Level 1	1 x	1,303.00	1,303.00	14,025
Level 2	1 x	2,309.57	2,309.57	24,860
Levels 3 to 4	2 x	2,450.57	4,901.14	52,755
Levels 5 to 9	5 x	1,981.36	9,906.80	106,636
Levels 10 to 27	18 x	700.00	12,600.00	135,625
Levels 28 to 29	2 x	590.00	1,180.00	12,701
Total GFA			**32,200.51**	**346,602**

2.4 Building 3 Residential GFA

	floors	sq.m.	sq.m.	sq.ft
Level 1	1 x	1,643.70	1,643.70	17,693
Level 2	1 x	2,430.05	2,430.05	26,157
Levels 3 to 4	2 x	2,587.05	5,174.10	55,694
Levels 5 to 9	5 x	2,225.56	11,127.80	119,779
Levels 10 to 25	16 x	700.00	11,200.00	120,556
Levels 26 to 27	2 x	590.00	1,180.00	12,701
Total GFA			**32,755.65**	**352,589**

2.5 Building 4 Residential GFA

	floors	sq.m.	sq.m.	sq.ft
Level 1	1 x	2,623.15	2,623.15	28,235
Level 2	1 x	2,809.00	2,809.00	30,236
Levels 3 to 4	2 x	3,066.00	6,132.00	66,004
Levels 5 to 9	5 x	2,984.09	14,920.45	160,602
Levels 10 to 23	14 x	1,400.00	19,600.00	210,973
Levels 24 to 25	2 x	1,290.00	2,580.00	27,771
Total GFA			**48,664.60**	**523,821**

2.6 Building 5 Residential GFA

	floors	sq.m.	sq.m.	sq.ft
Level 1	1 x	776.26	776.26	8,356
Level 2	1 x	1,713.97	1,713.97	18,449
Levels 3 to 5	3 x	1,831.76	5,495.28	59,151
Levels 6 to 7	2 x	1,648.76	3,297.52	35,494
Levels 8 to 9	2 x	1,183.76	2,367.52	25,484
Levels 10 to 21	12 x	700.00	8,400.00	90,417
Levels 22 to 23	2 x	590.00	1,180.00	12,701
Total GFA			**23,230.55**	**250,052**

Total GFA	+ *Site Area*	*FSI*
175,744.52 sq.m.	36,091.00 sq.m.	**4.87**

4.0 Units Count

Proposed Units

*(*15% of suites to be fully accessible)*

4.1

Building 1 units	floors	1BR	1BR+D	2BR	2BR+D	3BR	TH	Units
Level 2	1 x	1	10	14	7	4	0	36
Levels 3 to 4	2 x	1	12	16	4	5	0	76
Levels 5 to 7	3 x	6	14	3	9	3	0	105
Levels 8 to 9	2 x	5	10	7	2	1	0	50
Level 10	1 x	1	2	3	0	0	0	6
Levels 11 to 27	17 x	1	3	3	3	0	0	170
Levels 28 to 29	2 x	2	0	5	1	0	0	16
Total Units		53	149	133	99	25	0	**459**

4.2

Building 2 units	floors	1BR	1BR+D	2BR	2BR+D	3BR	TH	Units
Level 2	1 x	0	3	11	7	1	5	27
Levels 3 to 4	2 x	0	3	11	10	5	0	58
Levels 5 to 9	5 x	3	16	8	0	2	0	145
Level 10	1 x	0	3	2	0	0	0	5
Levels 11 to 27	17 x	2	4	4	0	0	0	170
Levels 28 to 29	2 x	0	2	6	0	0	0	16
Total Units		49	164	155	27	21	5	**421**

4.3

Building 3 units	floors	1BR	1BR+D	2BR	2BR+D	3BR	TH	Units
Level 2	1 x	3	4	7	3	6	8	31
Levels 3 to 4	2 x	3	7	15	4	5	0	68
Levels 5 to 9	5 x	4	12	9	2	3	0	150
Level 10	1 x	1	0	4	1	0	0	6
Levels 11 to 25	15 x	1	3	6	0	0	0	150
Levels 26 to 27	2 x	2	0	6	0	0	0	16
Total Units		49	123	188	22	31	8	**421**

4.4

Building 4 units	floors	1BR	1BR+D	2BR	2BR+D	3BR	TH	Units
Level 2	1 x	3	9	5	2	5	14	38
Levels 3 to 4	2 x	7	11	14	9	0	0	82
Levels 5 to 9	5 x	8	17	13	3	1	0	210
Level 10	1 x	3	1	6	0	0	0	10
Levels 11 to 23	13 x	4	4	12	0	0	0	260
Levels 24 to 25	2 x	0	4	12	0	0	0	32
Total Units		112	177	284	35	10	14	**632**

4.5

Building 5 units	floors	1BR	1BR+D	2BR	2BR+D	3BR	TH	Units
Level 2	1 x	8	2	6	0	3	0	19
Levels 3 to 5	3 x	8	4	8	0	4	0	72
Levels 6 to 7	2 x	1	10	8	0	4	0	46
Levels 8 to 9	2 x	5	5	4	1	1	0	32
Levels 10 to 21	12 x	2	2	6	0	0	0	120
Levels 22 to 23	2 x	0	2	6	0	0	0	16
Total Units		68	72	138	2	25	0	**305**
Total Units Provided for B1,B2,B3,B4 & B5		331	685	898	185	112	27	**2,238**
		15%	*31%*	*40%*	*8%*	*5%*	*1%*	*100%*

5.0 Amenity Area

	sq.m.	Total Units	sq.m.	sq.f.
5.1 Proposed Indoor Amenity	2	2,238	4,476	48,179

	sq.m.	Total Units		sq.m.	sq.f.
5.2 Proposed Outdoor Amenity	4	2,238	Outdoor Amenity @ level 1	611	6,577
			Rooftop Amenity @ level 10 & 8	7,464	80,336
5.3 **Total Proposed Amenity**				**12,551**	**135,092**

6.0 Vehicular Parking

B1 Proposed Parking Demand

6.1A	ratio	units	Parking Spaces
Required Residential	1.00	x 459	459
Proposed Visitor/Commercials	0.25	x 459	115
Commercial	shared parking with visitors		0
Total Proposed Demand for B1			**574**

B1 Proposed Parking Supply

6.1B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	28	28
Level P1	94	87	181
Level P2	183	0	183
Level P3	191	0	191
Total Proposed Supply for B1	**468**	**115**	**583**

B1 Accessible Parking Supply

6.1C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	2	2	4
Level P1	3	4	7
Total Proposed Supply for B1	**5**	**6**	**11**

B2 Proposed Parking Demand

6.2A	ratio	units	Parking Spaces
Required Residential	1.00	x 421	421
Proposed Visitor/Commercials	0.25	x 421	106
Commercial	shared parking with visitors		0
Total Proposed Demand for B2			**527**

B2 Proposed Parking Supply

6.2B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	26	26
Level P1	173	80	253
Level P2	257	0	257
Level P3	66	0	66
Total Proposed Supply for B2	**496**	**106**	**602**

B2 Accessible Parking Supply

6.2C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	0	0
Level P1	2	2	4
Total Accessible Supply for B2	**2**	**2**	**4**

B3 Proposed Parking Demand

6.3A	ratio	units	Parking Spaces
Required Residential	1.00	x 421	421
Proposed Visitor/Commercials	0.25	x 421	106
Commercial	shared parking with visitors		0
Total Proposed Demand for B3			**527**

B3 Proposed Parking Supply

6.3B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	10	10
Level P1	115	96	211
Level P2	219	0	219
Level P3	91	0	91
Total Proposed Supply for B3	**425**	**106**	**531**

B3 Accessible Parking Supply

6.3C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	1	0	1
Level P1	2	5	7
Total Accessible Supply for B3	**3**	**5**	**8**

B4 Proposed Parking Demand

6.4A	ratio	units	Parking Spaces
Required Residential	1.00	x 632	632
Proposed Visitor/Commercials	0.25	x 632	158
Commercial	shared parking with visitors		0
Total Proposed Demand for B4			**790**

B4 Proposed Parking Supply

6.4B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	7	7
Level P1	57	151	208
Level P2	214	0	214
Level P3	218	0	218
Total Proposed Supply for B4	**489**	**158**	**647**

B4 Proposed Accessible Parking Supply

6.4C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	1	1	2
Level P1	6	4	10
Total Accessible Supply for B4	**7**	**5**	**12**

B5 Proposed Parking Demand

6.5A	ratio	units	Parking Spaces
Required Residential	1.00	x 305	305
Proposed Visitor/Commercials	0.25	x 305	77
Commercial	shared parking with visitors		0
Total Proposed Demand for B5			**382**

B5 Proposed Parking Supply

6.5B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	22	22
Level P1	84	55	139
Level P2	141	0	141
Level P3	141	0	141
Total Proposed Supply for B5	**366**	**77**	**443**

B5 Proposed Accessible Parking Supply

6.5C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	1	1	2
Level P1	1	1	2
Total Accessible Supply for B5	**2**	**2**	**4**

Total Proposed Parking Demand for the Development

6.6A	ratio	units	Parking Spaces
Required Residential	1.00	x 2,238	2,238
Proposed Visitor/Commercials	0.25	x 2,238	562
Commercial	shared parking with visitors		0
Total Development Required Supply			**2,800**

Total Net Parking Spaces Provided

6.6B	Residential	Visitor	Parking Spaces
Level 1 (Commercial & Visitors Parking)	0	93	93
Level P1	523	469	992
Level P2	1,014	0	1,014
Level P3	707	0	707
Total Net Parking Spaces	**2,244**	**562**	**2,806**

Total Net Accessible Parking Spaces Provided

6.6C	A-Access	B-Access	Parking Spaces
Level 1 (Commercial & Visitors Parking)	5	4	9
Level P1	14	16	30
Total Net Parking Spaces	**19**	**20**	**39**

6.6D	
Parking Supply - Proposed Demand	**6**

Proposed EV Parking

6.7	ratio	Parking Spaces	Parking Spaces
Required Residential	0.20	x 2,806	561
Total Proposed EV spaces			**561**

7.0 Bicycle Parking

	Residential	Visitor	Parking Spaces
Level 1 (short term bicycle parking)	0	52	52
Level P1 (long term stacked bicycle parking)	764	0	764
Total Proposed Bicycle Parking			**816**

7.0 Lot Coverage

	sq.m	sq.ft	%
Proposed Building Coverage	15,080.00	162,320	42%
Proposed Inner Roads	7,480.00	80,514	21%
Landscape Coverage	13,531.00	145,646	37%
Site Area	**36,091.00**	**388,480**	**100%**

PROJECT STATISTICS 2 A102

OBC Matrix 2 - Site Plan Approval

SRN ARCHITECTS INC.
8395 JANE ST. SUITE 202 VAUGHAN, ON, L4K 5Y2
T.905.417.5515 Ext.426 F. 905.417.5517

Name of Project: *MIXED USE DEVELOPMENT*

Location: 12563 & 12599 HWY 50, BOLTON - ONTARIO

Seal must be signed to be valid

The Ontario Building Code 2012
Containing the Building Code Act and O. Reg 332/12 in effect Jan 1, 2014

Data Matrix Part 3
High Rise Residential Buildings

Item		OBC Reference
1	Project Description: MIXED USE DEVELOPMENT	1.1.2.
2	Major Occupancy(s): *Group C - Residential occupancies* *Group E - Mercantile occupancies* *Group F3 - Medium hazard industrial occupancies (Storage Garage)*	3.1.2.1.(1)
3	**Subsidiary Occupancy(s)** *Group A2 – Assembly occupancies (Amenity Areas)*	3.1.2.1.(1)
4	**Building Area (m^2)** **15,180.3 m^2** B1 3,324.3 m^2 B2 2,699.5 m^2 B3 2,964.7 m^2 B4 4,005.8 m^2 B5 2,186.0 m^2	1.4.1.2.
5	**Gross Area (m^2)** **175,745 m^2** B1 36,858 m^2 B2 32,949 m^2 B3 33,263 m^2 B4 48,665 m^2 B5 24,011 m^2	1.4.1.2.
6	Number of Storeys: Above grade / Below grade B1 32 / 29 / 3 B2 31 / 29 / 2 B3 29 / 27 / 2 B4 28 / 25 / 3 B5 26 / 23 / 3	1.4.1.2. & 3.2.1.1.
7	Number of streets/Fire Fighter Access: 5	3.2.2.10. & 3.2.5.
8	Building Classification: Group C - Residential occupancies Group E - Mercantile occupancies Group F3 - Medium hazard industrial occupancies (Storage Garage)	3.2.2.42. 3.2.2.57. 3.2.2.73
9	Sprinkler System Proposed — 3.2.2.20. - 83 ■ Required ☐ Not Required Proposed: ■ entire building ☐ selected compartments ☐ selected floor areas ☐ basement ☐ in lieu of roof rating ☐ none	3.2.1.5. 3.2.2.17.
10	Standpipe required: Yes	3.2.9.
11	Fire Alarm required: Yes	3.2.4.
12	Water Service/Supply is Adequate: Yes	3.2.5.7.
13	High Building: Yes	3.2.6.
14	Construction Restrictions: Non-combustible required	3.2.2.20. - 83.
15	Barrier Free Design: Yes	3.8
16	Required Fire Resistance Rating (FRR)	3.2.2.20. - 83. & 3.2.1.4.

Horizontal Assemblies FRR (Hours)		Listed Design No. or Description (SG-2)
Floors		Refer to AB Schedule
Roof		Refer to AB Schedule
Mezzanine	n/a	Refer to AB Schedule
FRR of Supporting Members		**Listed Design No. or Description (SG-2)**
Floors		Refer to AB Schedule
Roof		Refer to AB Schedule
Mezzanine	n/a	Refer to AB Schedule

17	Interior Fire Separation Requirements	Fire-Resistance Rating	3.3.
	Exit stairs shafts	2 hours	3.4.4.1.(1)
	Elevator shafts	1.5 hours	3.5.3.1.(1)
	Firefighter's Elevator Shaft	2 hours	3.5.3.1.(1)
	Garabage Chute Shaft	2* hours	3.6.3.3.(2)
	Garabage Chute intake room	1 hours	3.6.3.3.(5)
	Electrical Closet	1 hours	3.6.2.1.(5)
	Electrical Closet with Life Safety Circuits/Equipement	2 hours	
	Emergency Generator Room	2 hours	3.2.7.8.(3)
	Central Alarm & Control Facility	2 hours	3.2.7.8.(3)
	Garage Level Elevator Lobby Vestibules (Measure 'N')	2 hours	3.2.6
	Vertical Service Spaces	1.5 hours	3.5.3.1.(1)
	Residential Public Corridor	1 hours	3.3.1.4.(1)
	Garage to any other occupancy (including storage room)	1.5 hours	3.3.5.6.(1)
	Residential to assembly occupancy	1 hours	3.1.3.1.(1)
	Garbage Room	2** hours	3.6.3.3.(9)
	Service Room - No Fuel Fired Equipment	1 hours	3.6.2.1.(3)
	Service Room - with Fuel Fired Equipment	2 hours	3.6.2.1.(1)
	Storage Locker Room	1.5** hours	3.3.4.3.(2)
	Transformer Room	3 hours	3.6.2.8.(1)
	Residential Suite-to-Suite	1 hours	3.3.4.2.(1)
	Janitor Rooms	1 hours	3.3.1.20.(1)
	Electrical Equipment Vault	3 hours	3.6.2.8.(1)
	* without closures at outlet into discharge room (1 hour otherwise)		
	** Sprinklered		

18	Spatial Separation	3.2.3.
	Refer to elevation drawings for spatial separation requirements	
	Construction of Exterior	
	Refer to AB Schedule	

19	Barrier-free Design	3.8.
	In a Group C major occupancy apartment building, not less than 10% of all residential suites shall be provided with a barrier-free path of travel from the suite entrance door to, (a) the doorway to at least one bedroom at the same level, and (b) the doorway to at least one bathroom, (i) having an area not less than 4.5 m2 at the same level, and (ii) conforming to Sentence 9.6.3.3.(1).	3.8.2.1.(4)

OBC MATRIX 3 A102

Zone Standard	Requirements RM (Proposed Zone)	Proposed RM-XX Zone Requirements	Proposed Stats
Lot Area (Min)	925 sqm.	35,100	35,187
Lot Frontage (Min)	30m	30m	108m
Lot Coverage (Max)	20%	42%	42%
Front Yard (Highway 50)	8m	1.1m	1.1m
Exterior Side Yard (Industrial Road)	9m	3.8m	3.8m
Rear Yard (Min)	7.5m	3.0m	3.0m
Interior Side Yard (Min)	7.5m	4.1m	4.1m
Building Height (Max)	12.2m	92m	92m
Landscaping Area (Min)	45%	37%	37%
Privacy Yard	1/habitable room 5m depth	N/A	N/A
Play Facility	1/lot	N/A	N/A
Parking Space Setback (Min)	6m	4.1m above grade and 1m for an underground garage	4.1m above grade and 1m for an underground garage
Parking and Loading			
Building, Apartment	1.5/dwelling unit + 0.25 for for visitor/dwelling	1 space/dwelling units +0.25 for visitor/dwelling	1 space/dwelling units +0.25 for visitor/dwelling
Commercial Uses	1/20sqm of net floor area	To be shared with residential visitor parking	To be shared with residential visitor parking
Barrier Free	11 accessible spaces + 1% total number of spaces	39 spaces	39 Spaces
Parking Space Size (Min)	2.75m x 6m above grade 2.6m x 5.8m in parking garage	2.75m x 6m for all	2.75m x 6m for all
Loading Space	N/A	Residential: 1 per building Commercial: 1 per building Mixed-use building: 1 per building	1 per building

ZONING MATRIX 1 A102

THESE DRAWINGS ARE NOT TO BE SCALED:
ALL DIMENSIONS MUST BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES MUST BE REPORTED DIRECTLY TO SRN ARCHITECTS INC.

ADDITIONAL NOTES:

THE DRAWING, AS AN INSTRUMENT OF SERVICE, IS PROVIDED BY AND IS THE PROPERTY OF SRN ARCHITECTS INC. THE CONTRACTOR MUST VERIFY AND ACCEPT RESPONSIBILITY FOR ALL DIMENSIONS AND CONDITIONS ON SITE AND MUST NOTIFY SRN ARCHITECTS INC. OF ANY VARIATIONS FROM THE SUPPLIED INFORMATION. SRN ARCHITECTS INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF SURVEY, STRUCTURAL, MECHANICAL, ELECTRICAL, ETC. ENGINEERING INFORMATION SHOWN ON THIS DRAWING REFER TO APPROPRIATE ENGINEERS DRAWINGS BEFORE PROCEEDING WITH ANY WORK. CONSTRUCTION MUST CONFORM TO ALL APPLICABLE CODES AND REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION (UNDERTAKEN OTHERWISE NOTED). NO INVESTIGATION HAS BEEN OR REPORTED ON BY THIS OFFICE IN REGARDS TO THE ENVIRONMENTAL CONDITION OF THIS SITE.

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NO:	DATE:	REVISION COMMENT:

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1. ERRORS, OMISSIONS, INCOMPLETENESS DUE TO LOSS OF INFORMATION IN WHOLE OR PART WHEN INFORMATION IS TRANSFERRED.

2. TRANSMISSIONS OF ANY VIRUS OR DAMAGE TO RECEIVING ELECTRONIC SYSTEM WHEN INFORMATION IS TRANSFERRED

SRN ARCHITECTS
8395 JANE ST, SUITE 202
VAUGHAN, ONTARIO. L4K 5Y2
PHONE: 905.417.5515 FAX: 905.417.5517

STAMP:

CLIENT:
12599 Hwy 50 Ltd.

PROJECT:
MIXED USE DEVELOPMENT
12563 & 12599 HWY 50
BOLTON - ONTARIO

DRAWING TITLE:
PROJECT STATISTICS - OBC MATRIX & ZONING MATRIX

DATE:	Feb. 11, 2022	SCALE:	
DRAWN BY:	EM/FK	CHECKED BY:	EM/GR
PROJECT NUMBER:	S20023	DRAWING NUMBER:	A102

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Appendix B
Submitted Terms of Reference

Memorandum

TO:

Rosalie Shan
Technical Analyst
Traffic Development and Permits
Region of Peel
10 Peel Centre Drive Suite B, 4th Floor
Brampton, ON L6T 4B9
905 791-7800 Ext. 7999
e-mail: Rosalie.shan@peelregion.ca

FROM:	**PROJECT:**	**DATE:**
Deanna Green, P.Eng.	8076-01 Proposed Multi-Use Redevelopment	December 18, 2020

SUBJECT: Traffic Impact Study Terms of Reference - 12563 &12599 Highway 50, Bolton, Proposed Multi-Use Development

1.0 INTRODUCTION

BA Group has been retained by SRN Architects Incorporated to provide transportation consulting services related to the proposed development of a site municipally known as 12563 & 12599 Highway 50 in the community of Bolton within the Town of Caledon, in the Region of Peel (herein referred to as "the site").

As requested by the Region of Peel, this letter outlines the proposed Terms of Reference for the Traffic Impact Study (TIS) that is being prepared as part of the **Official Plan and Zoning By-law Amendment (ZBA) application** and subsequent **Site Plan Application** being submitted to the Region of Peel and the Town of Caledon.

2.0 PROPOSED DEVELOPMENT

The draft development concept plan includes 5 mixed-use buildings with an approximate total of 2200 residential units and 3200 m^2 Gross Floor Area (GFA) of retail. Although the phasing is still being confirmed, the site will most likely be developed in phases over a 15-year period with proposed build-out by 2035.

The primary points of access to the site are proposed to be provided via a driveway that connects to Highway 50 in the west and Industrial Road in the southeast.

The TIS will include consideration for the Region of Peel's Road Characterization Study (2013) as well as the planned extension of the George Bolton Parkway and will evaluate the following 4 scenarios for the proposed site driveway at Highway 50:

1. Full access (signalized)
2. Full access (unsignalized)
3. Left-in/right-in/right-out (unsignalized)
4. Right-in/right-out (unsignalized)

The traffic impact study will be completed in accordance with the Region of Peel's *Traffic Impact Study Guidelines* (from Region of Peel website) as outlined in the following sections.

2.1.1 Full Description

The study will provide a full description of the proposed development and will include the following:

- Municipal address;
- Existing land uses that are permitted and use provisions in an Official Plan Amendment, Zoning By-law, etc.;
- Proposed land uses;
- Floor space, including a summary of each type of use and number of residential units;
- Anticipated date of occupancy;
- Approximate hour of operation (retail uses);
- Planned phasing of the development;
- Nearby Regional of Peel, Town of Caledon and City of Vaughan intersections and access to adjacent developments, including type of control (signalized or unsignalized);
- Number of lanes, width and configuration:
- The requirements for auxiliary turn lanes will be reviewed;
- Adequate spacing will be considered between access points in accordance with the Region of Peel's current Controlled Access By-law, as amended and the Region of Peel's Road Characterization Study (2013). All design standards will be in accordance with those outlined in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads and the Ministry of Transportation, Ontario (MTO) Geometric Design Standards for Ontario Highways;
- When determining the location of accesses, consideration will be provided in relation to how the accesses will affect the surrounding road network, area residents and area businesses. All proposed site access points on Region of Peel and Town of Caledon roads (no proposed accesses on City of Vaughan roads) will be evaluated for capacity, safety and adequacy of queue storage capacity;

- Nearby transit facilities/stops;
- Bike paths;
- A combination of maps and other documentation, which will identify all relevant information.

2.1.2 Traffic Volume Analysis

Based on direction from staff at the Region of Peel, Town of Caledon and City of Vaughan, the traffic analysis will include the following intersections:

- Highway 50 & Industrial Road (Region of Peel)
- Highway 50 & McEwan Drive (Region of Peel)
- Highway 50 & site driveway (Region of Peel)
- Industrial Road & site driveway (Town of Caledon)
- Albion Vaughan Road & Industrial Road (Town of Caledon)
- Albion Vaughan Road & Commercial Road (Town of Caledon)
- Albion Vaughan Road & Kirby Road (City of Vaughan)

As a result of the planned extension to the George Bolton Parkway, the analysis will also consider the following future intersections:

- George Bolton Parkway & Highway 50
- George Bolton Parkway & Industrial Road
- George Bolton Parkway & Albion Vaughan Road

The Region of Peel, Town of Caledon and City of Vaughan were contacted regarding current traffic counts for intersections in the study area. All three municipalities confirmed that in-house traffic counts were not available. The TIS will be therefore utilize the traffic counts summarized in **Table 1** for the analysis. All traffic data collection undertaken includes pedestrians, cyclists, buses and cars on a typical weekday during typical morning and afternoon peak periods.

TABLE 1 SUMMARY OF TRAFFIC COUNTS

Intersection	Date of Count	Source
Highway 50 & Industrial Road	May 8, 2019 November 25, 2020	Spectrum
Highway 50 & McEwan Drive	June 22, 2017 November 25, 2020	Spectrum
Albion Vaughan Road & Industrial Road	November 25, 2020	Spectrum
Albion Vaughan Road & Commercial Road	November 25, 2020	Spectrum
Albion Vaughan Road & Kirby Road	November 25, 2020	Spectrum
Highway 50 & George Bolton Parkway	March 20, 2018	Spectrum
Highway 50 & Mayfield Road	October 8, 2019	Spectrum
Highway 50 & Parr Boulevard	October 2, 2019	Spectrum

Given the current COVID-19 conditions, it is recognized that the November 2020 traffic counts may not be representative. For this reason, the November 2020 traffic counts will be calibrated and balanced utilizing traffic counts from pre-COVID conditions. It is important to note that traffic counts can be updated in the future, once stable transportation conditions return. In the meantime, the analysis will utilize conservative allowances for pre-COVID existing conditions.

Although the phasing is still being confirmed, the site will most likely be developed in phases over a 15-year period with proposed build-out by 2035. As the retail component of the development only has a Gross Floor Area (GFA) of 3200 m^2, it is proposed that the analysis consider only the weekday morning and afternoon peak periods.

It is proposed that the traffic analysis includes the following scenarios:

- Existing conditions (2020);
- Future background conditions (2035) – 15-years for build-out with corridor growth and area background development traffic;
- Future total conditions (2035) – 15-years for build-out with site generated traffic;
- Future total conditions (2040) – 5-years beyond build-out with site generated traffic.

Additional scenarios may be evaluated when the phasing of the site has been confirmed.

As confirmed by Region of Peel staff, the TIS will utilize a 1.5% growth rate for 2016 to 2021 and a 1.0% growth rate for 2021 to 2031. As the horizon for the development extends beyond 2031, a 0.5% growth rate will be applied from 2031 to 2035. It is understood that the growth rates received from the Region have been estimated based on multiple sources, including the Peel Travel Demand forecasting model, ATR and land use/forecast data but as requested, professional judgment will be used when considering these growth rates.

Traffic signal timing parameters have been obtained from the Region of Peel for the intersection of Highway 50 & McEwan Drive and will be utilized in the analysis. The analysis will also ensure that appropriate traffic

signal timings for the analysis of future traffic signals, such as at Highway 50 & George Bolton Parkway and at the site driveway & Highway 50 (if determined that the proposed location is feasible), are included in the analysis.

Development Services Planning staff from the Town of Caledon have provided details on surrounding developments in the area that may affect traffic capacity in the planning horizon years. The following developments will be considered in the TIS:

Approved Site Plans:

- SP-17-023C – To construct a single storey daycare service 353m2 of Institutional development. (No TIS)
- SP-16-072C - To construct 3-storey medical building 2,206m2 if Institutional development. (TIS available)
- SP-15-040C, SP-16-066C, SP-19-052C – To construct commercial 5 buildings in 4 phases outlined by older site plan SP-14-045C. A total of 4,621m^2 of industrial and commercial development. (No TIS)

Ongoing Site Plans:

- SP-18-005C – To construct existing parking area for car dealership. (TIS available)
- SP-19-014C – To construct an industrial building 2,995m^2 of industrial development. (TIS available)
- SP-15-067C – To demolish existing building and rezone to permit commercial and office use proposed 1,130m2 of commercial development (TIS available).
- SP-14-069C – to construct 3 commercial buildings 2,657m2 of commercial development. (No TIS)

2.1.3 Trip Generation and Distribution

The trip distribution and trip generation analysis will include the following:

- Trip generation surveys from similar developments in the Region, which have similar operating characteristics as the proposed development, will be considered;
- The latest edition of the Institute of Transportation Engineers (ITE) trip generation rates will be utilized as a reference with the use of the greater of the average rate method or the fitted line equation;
- A table summarizing the trip generation findings; and
- Trip distribution assumptions will be supported by one or more of the following:
    - Transportation Tomorrow Survey
    - Origin-destination surveys
    - Comprehensive travel surveys
    - Existing/anticipated travel patterns
    - Output from the Region of Peel Travel Demand Forecasting Model
    - Market studies.

2.1.4 Capacity Analysis

Intersection capacity analysis will be completed using Synchro Version 9.0 and a combination of Highway Capacity Manual (HCM) 2000 and HCM 6 methodologies.

The following parameters will be applied to the analysis:

- Saturation flow rate of 1,900 vehicles per hour;
- 7 metre lane width on Regional roads; and
- 5 metre lane width on the intersecting street(s) and/or access(es)

The Synchro analysis will adhere to Peel Region's Guidelines for Using Synchro for other individual parameters.

The analysis will also include the identification of signalized intersections, unsignalized intersections and unsignalized accesses where:

- Volume/capacity (v/c) ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.90 or above;
- V/C ratios for exclusive movements that will exceed 1.00; and
- 95th percentile queue lengths for individual movements with confirmation of any queues that exceed available lane storage.

All intersections that are modelled as signalized intersections (other than existing signalized intersections) will be supported by an Ontario Traffic Manual (OTM) Book 12 traffic control signals warrant and each one will be included in the appendix of the TIS.

The horizon year in which a particular intersection is warranted for traffic control signals will be documented in the text of the TIS.

In the Synchro unsignalized intersection analysis, if an unacceptable LOS ("E" or higher) and v/c ratio results on the minor approach in existing conditions analysis, a gap study will be completed to establish an average value for gaps accepted (in seconds) to override the resultant value for the HCM-calculated critical gap in the signing window.

For horizon year analysis with an existing two-lane road, if the road is forecasted to be widened to four lanes by the respective horizon year, the analysis will override the resultant value for the HCM-calculated critical gap in the signing window by inputting recommended values for critical gap of left-turning and right-turning movements onto a four-lane road as identified in the Ministry of Transportation, Ontario (MTO) Geometric Design Standards for Ontario Highways.

2.1.5 Sight Distance Evaluation

The TIS will complete a review and analysis of the sight distance availability for all proposed accesses. The sight distance requirements will be determined based on the most current standards and guidelines used by the Region of Peel. Available sight distance will be taken from actual field measurements to ensure accurate conditions.

The sightlines will be assessed based on the Region of Peel's standard practice, eye height and object height of 1.05 metres and 0.38 metres above road surface, respectively. The assessment will adhere to the Region's requirement that the access meets the following sightline requirements:

- Stopping sight distance; and
- Turning sight distance.

Sight distances will be in accordance with the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads methodology. Folded full size and to scale drawings of the sightline analysis will be provided for review and comment.

2.1.6 Safety

Identification of potential safety or operational issues will be reviewed that are associated with:

- weaving
- merging
- corner clearances
- sight distances
- vehicle/pedestrian conflicts
- traffic infiltration
- access conflicts
- cyclist movements
- heavy truck movement conflicts

In addition, Regional Traffic Safety staff will be contacted to determine if there are any intersections within the study area with a significant collision history that should be further evaluated.

2.1.7 Functional Design

A functional design detailing a recommended access configuration and/or proposed intersection geometrics will be provided if requested by Regional staff.

2.1.8 Final Report

The structure of the final report will include the following:

- Site/development description
- Study area, including map
- Existing conditions (with an exhibit)
- Analysis periods
- Background, existing, future background and future total traffic demand (with an exhibit)

- Site generated traffic (with an exhibit)
- Improvement alternatives
- Traffic impacts for future background and total traffic with and without mitigation (tabular summaries)
- Access considerations
- Recommendations

The technical appendices will include the detailed analysis along with relevant data utilized in the study such as traffic counts and traffic signal timings.

One electronic copy and one hard copy, along with the supporting documentation, will be provided to Peel Region's Traffic Engineering section of Public Works.

2.1.9 Appendices

The appendices will include the following:

- Turning movement counts (including date counted) with breakdown of heavy vehicle counts;
- Signal timing plan(s) for signalized intersections;
- Synchro reports showing HCM 2000 results and queuing, as well as electronic Synchro files (CD copy or sent concurrently with the TIS via email).

From:	Shan, Rosalie
To:	Deanna Green
Cc:	Mark D. Jamieson; Hamdani, Hashim
Subject:	RE: Terms of Reference for TIS - Highway 50 Bolton
Date:	January 11, 2021 8:46:28 AM

Good morning Deanna,

Now I had the chance to review the proposed terms of reference and would like to provide the comments below

- Peel Region's Road Characterization Study and it's associated spacing requirement of the proposed access in relation to the nearby intersection shall be considered and referenced to in the TIS.
- Please contact Town of Caledon regarding the future plan of Hopcroft Road, that is directly opposing the subject site on Highway 50.

- George Bolton Parkway Extension shall be considered in the study. Please contact EA project manager for the details Shun H. Cheung (Shun.Cheung@caledon.ca).

The picture below is the proposed study area of the George Bolton Parkway Extension

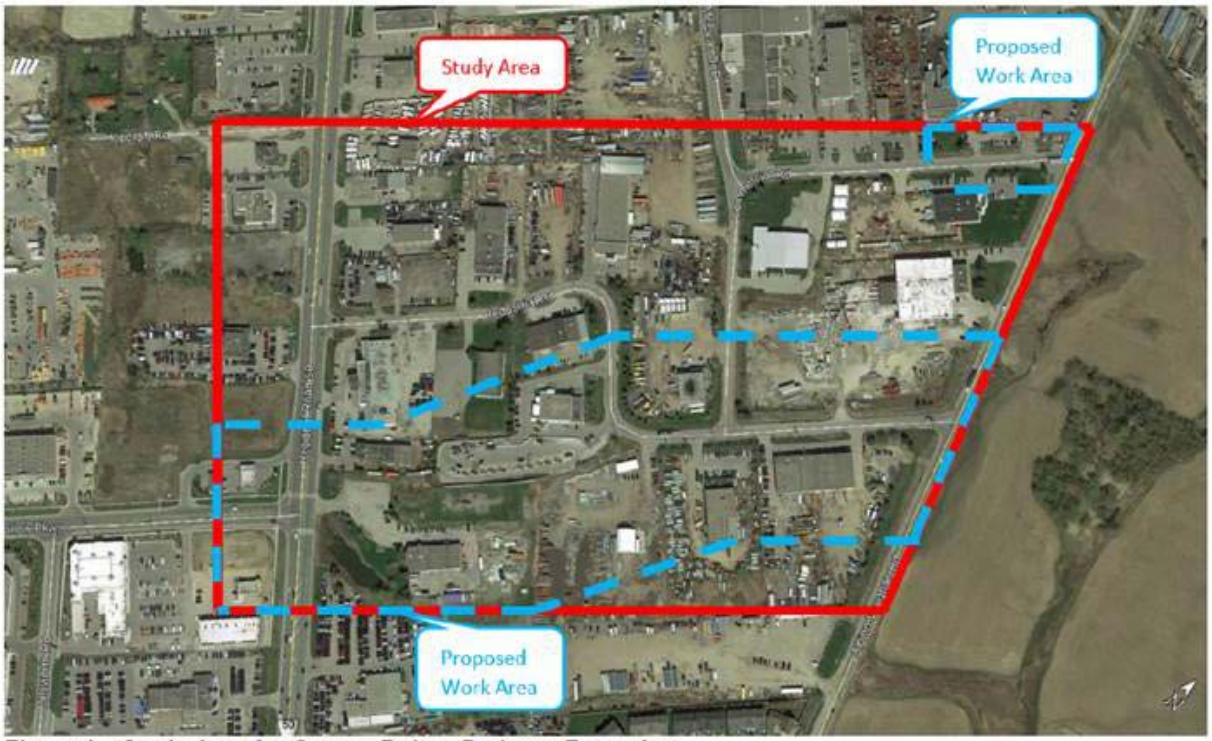


Figure 1 – Study Area for George Bolton Parkway Extension

- Please note in this section of Highway 50, the existing individual accesses are mostly grandfathered accesses, which means in most cases they do not meet Peel Region's spacing requirement as listed in the RCS. Through development application, these accesses will be evaluated and consolidate along this section of Highway 50. As so, this development shall also consider potential interconnections to the adjacent properties, with the purpose of eliminate the uncompiled accesses on Highway 50 and provide interconnection to major road via the subject lands when necessary.

Please let me know if you have any questions or need more information on this. Thank you.

Regards,
Rosalie Shan
Technical Analyst
Traffic Development & Permits
Region of Peel
10 Peel Centre Drive Suite B, 4th Floor
Brampton, ON L6T 4B9
905 791-7800 Ext. 7999

Region of Peel
working with you

From: Deanna Green <Deanna.Green@bagroup.com>
Sent: December 18, 2020 3:02 PM

To: Shan, Rosalie <rosalie.shan@peelregion.ca>
Cc: Carrick, Sean <sean.carrick@peelregion.ca>; Mark D. Jamieson <Jamieson@bagroup.com>
Subject: Terms of Reference for TIS - Highway 50 Bolton

Rosalie,

Thank you again for taking the time to meet with us this morning. It was great to meet you all and the discussion was most helpful.

Attached please find the proposed terms of reference for the Traffic Impact Study for the Highway 50 development in Bolton. If you have any questions please feel free to contact me directly.

We look forward to hearing from you.

Regards,

Deanna

Deanna Green, MSc.P.Eng.
Senior Transportation Engineer

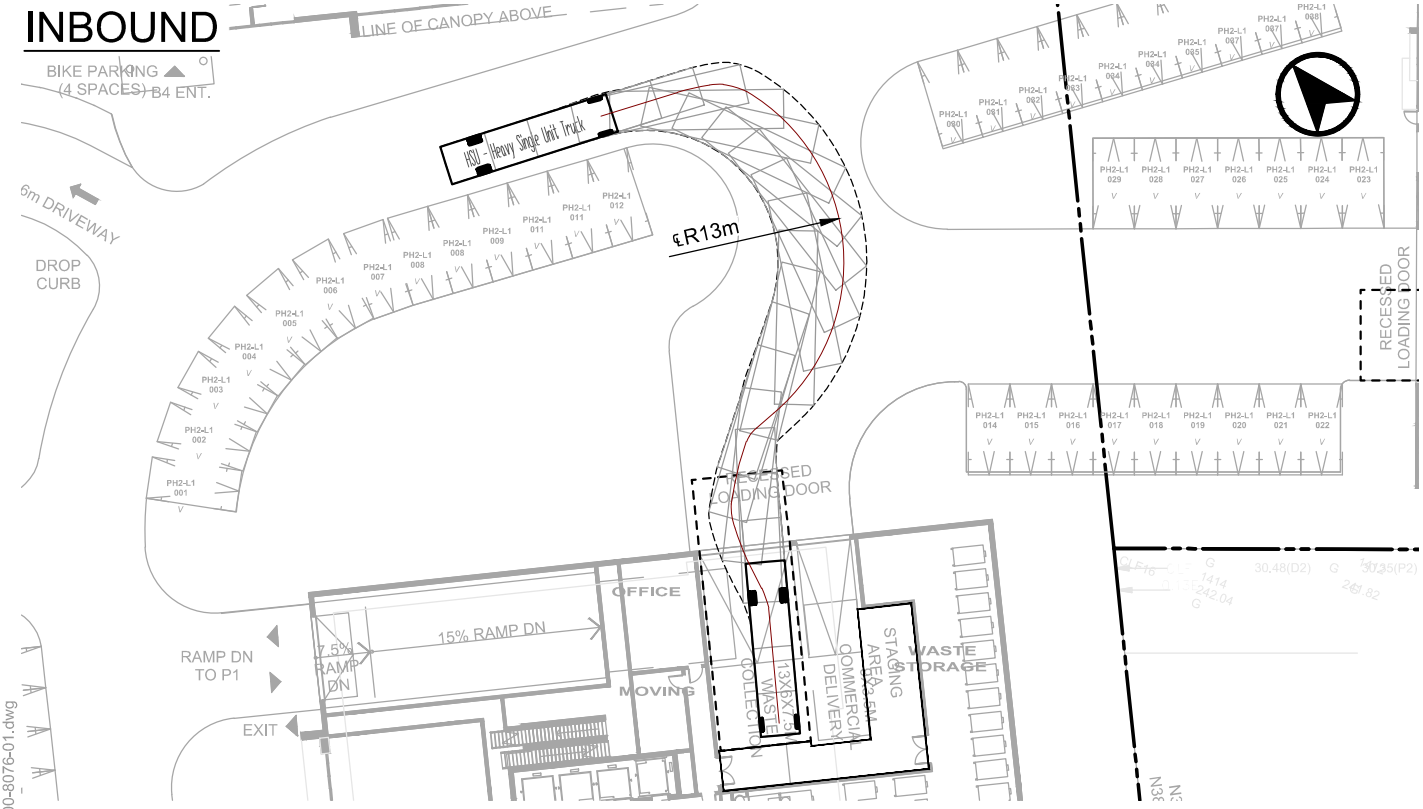
BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto, ON M4V 1K9

TEL 416 961 7110 x149
EMAIL Deanna.Green@bagroup.com

BA Consulting Group Ltd

Appendix C
Vehicle Manoeuvring Diagrams

INBOUND



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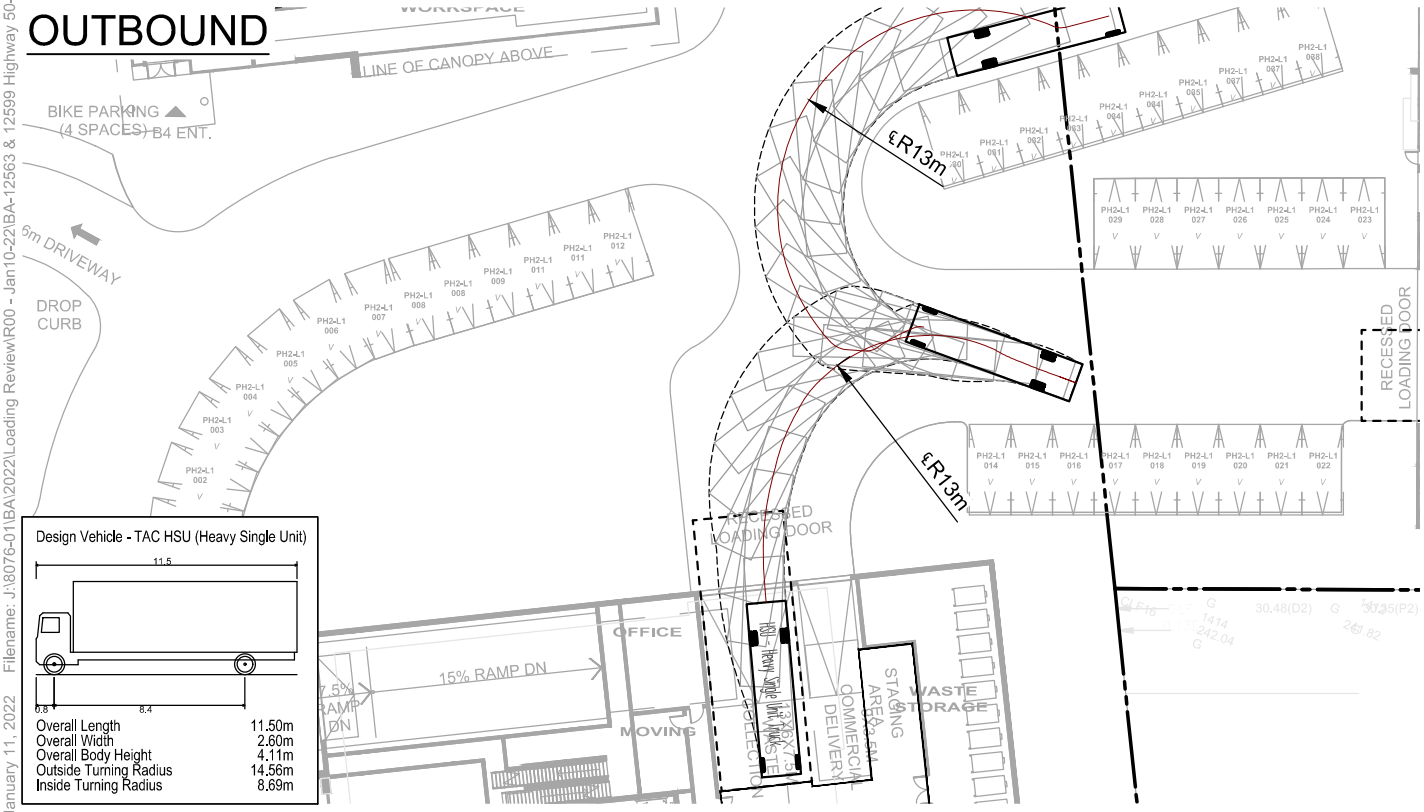

Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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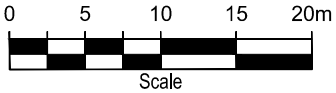


Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

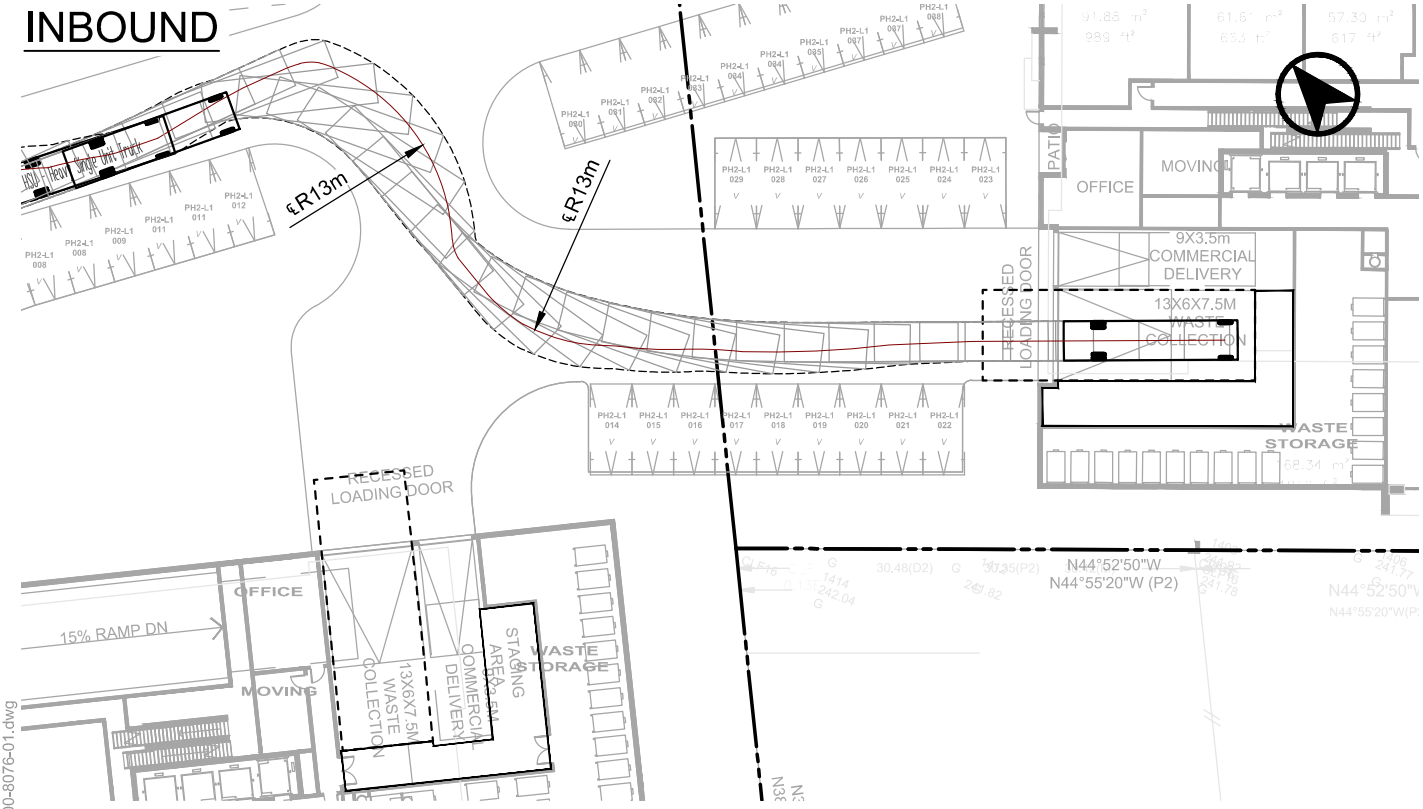
12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

BUILDING 1 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-01

INBOUND



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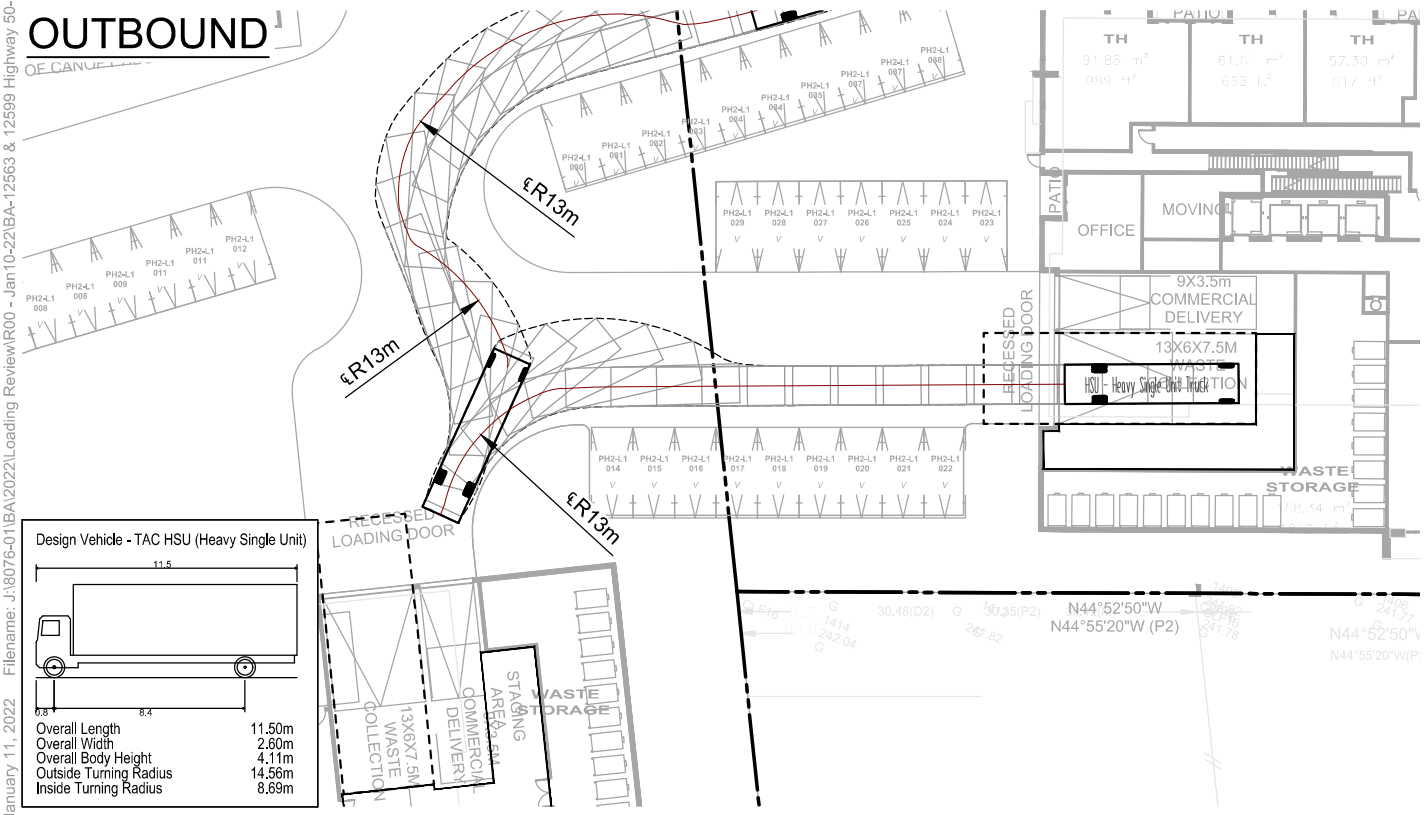

Design Vehicle - TAC HSU (Heavy Single Unit)

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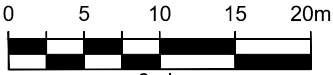

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 2 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-02

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

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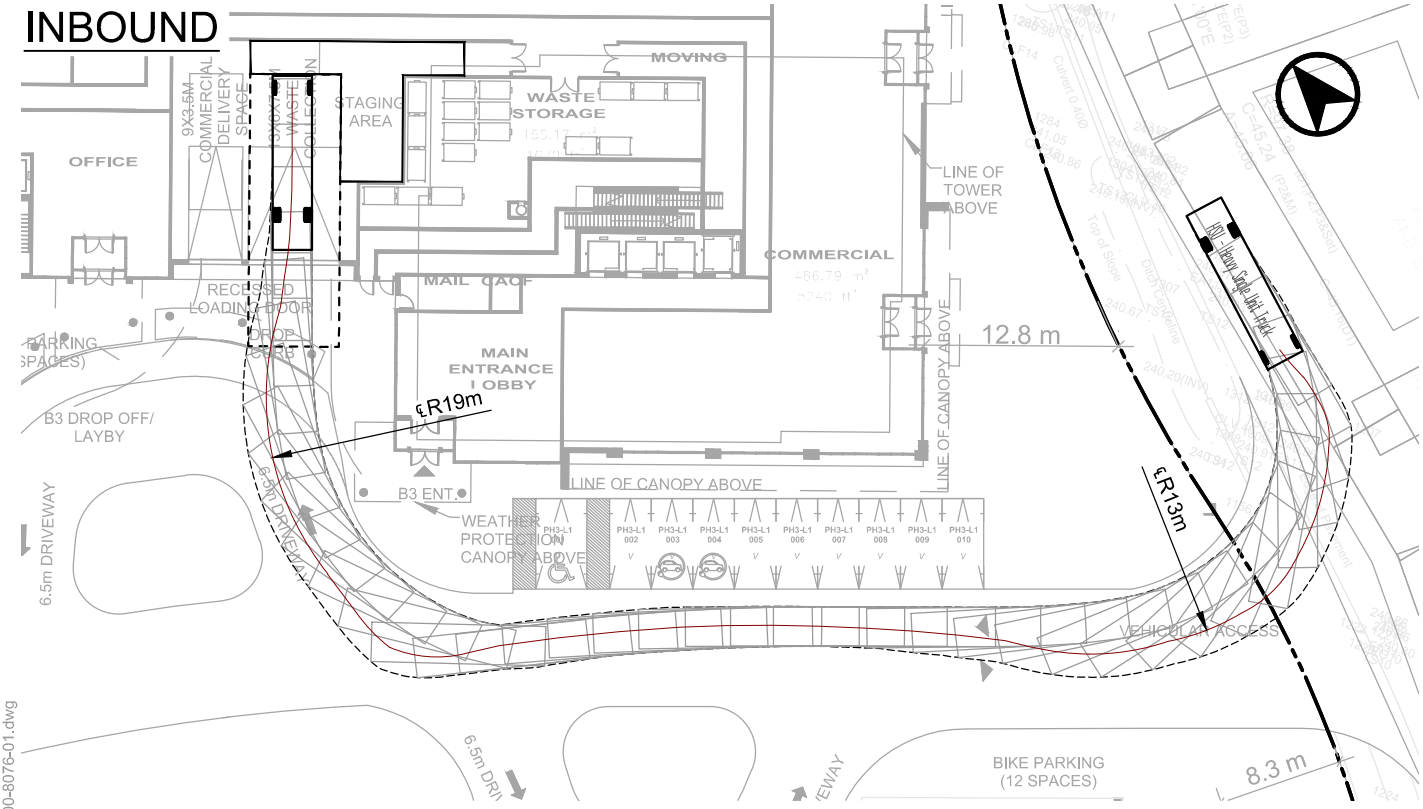

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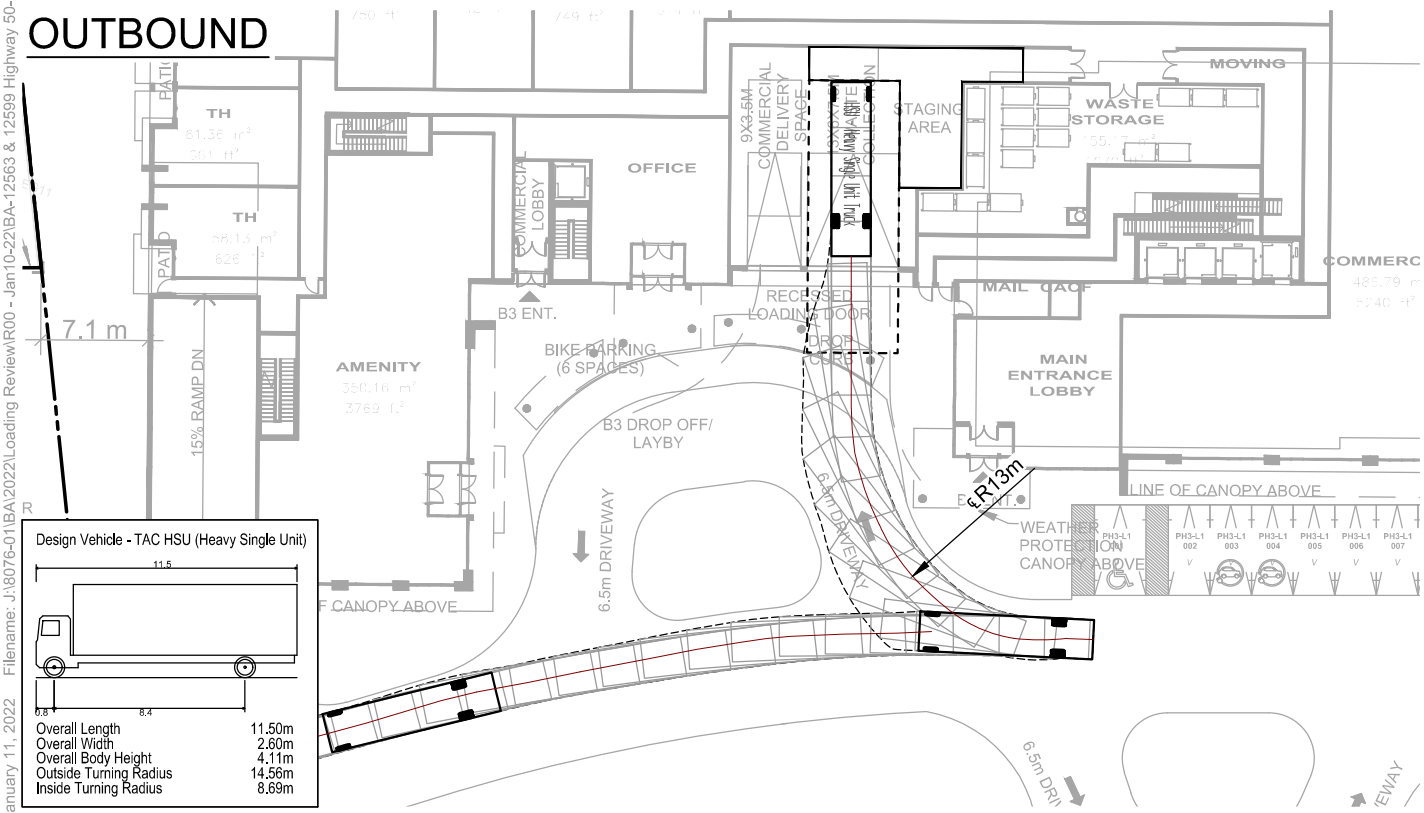

Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
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NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

BUILDING 3 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-03

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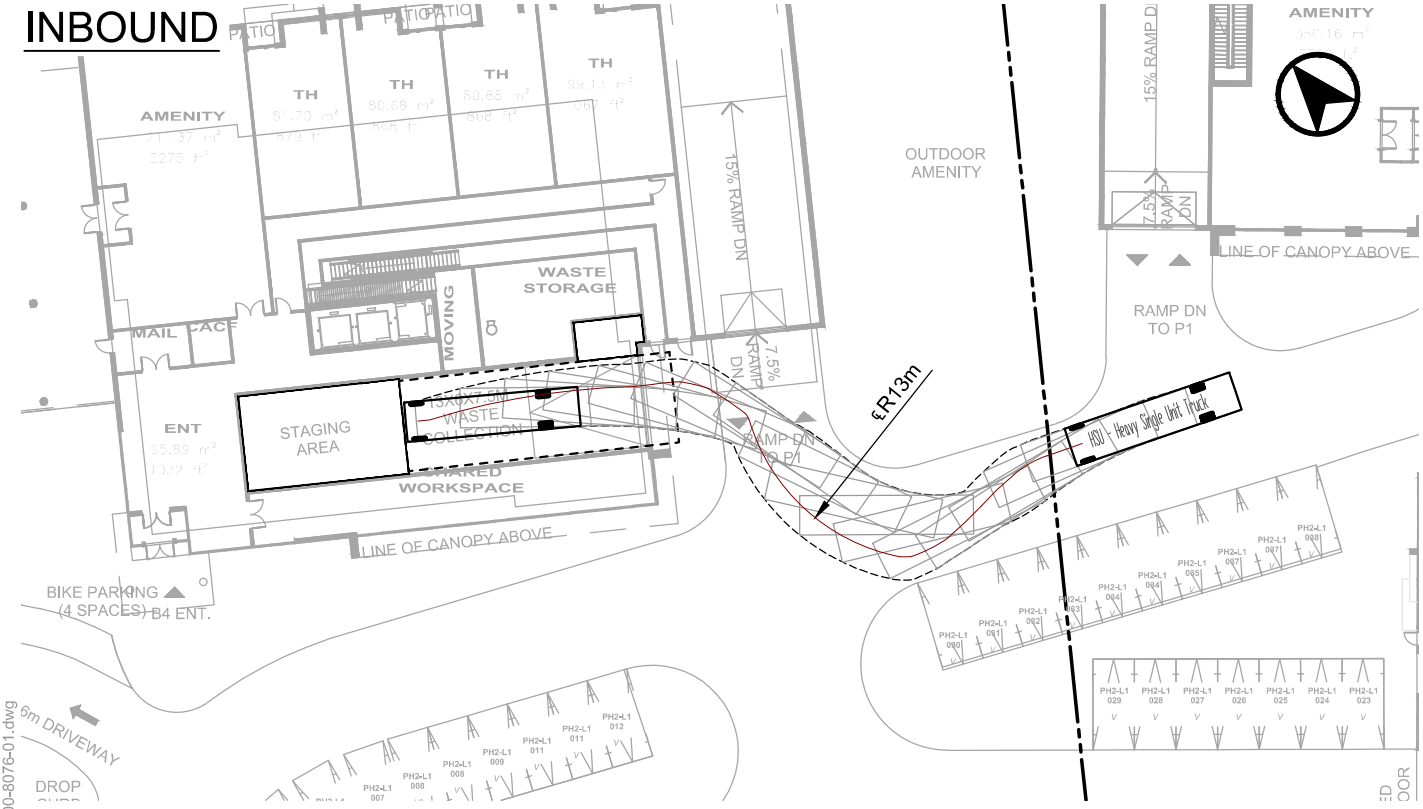

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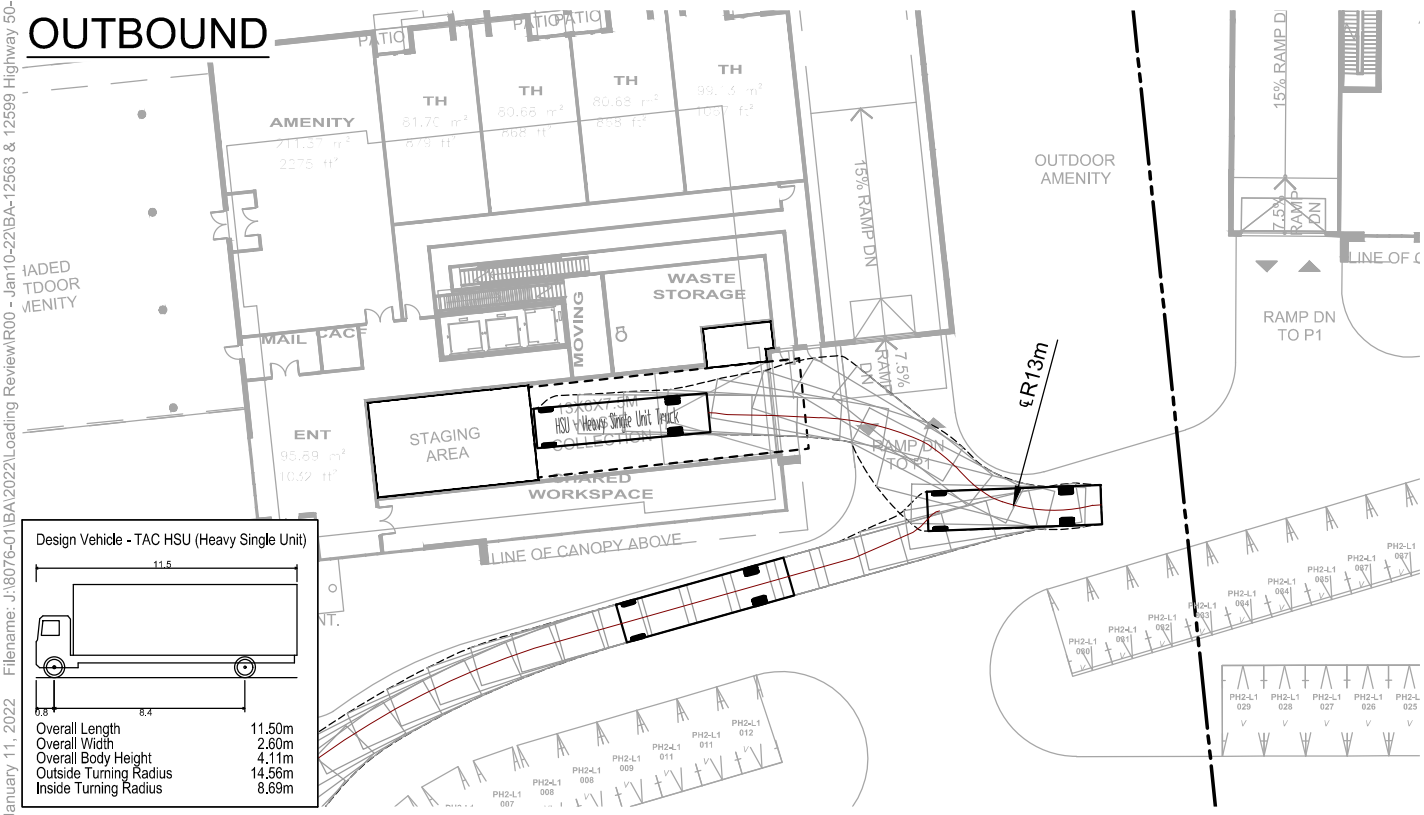

Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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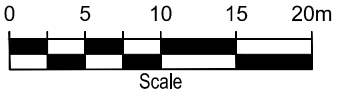


Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

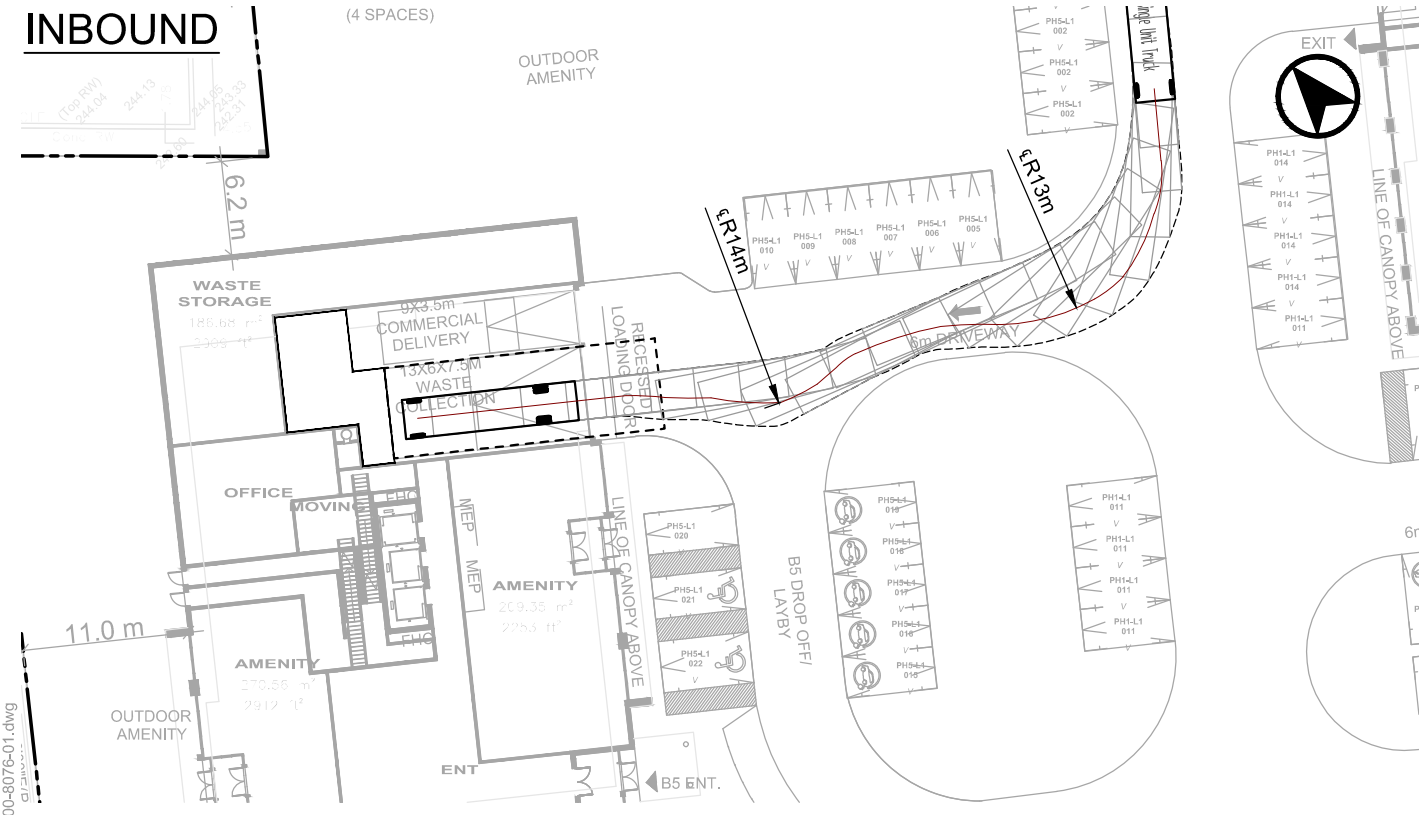
BA Group

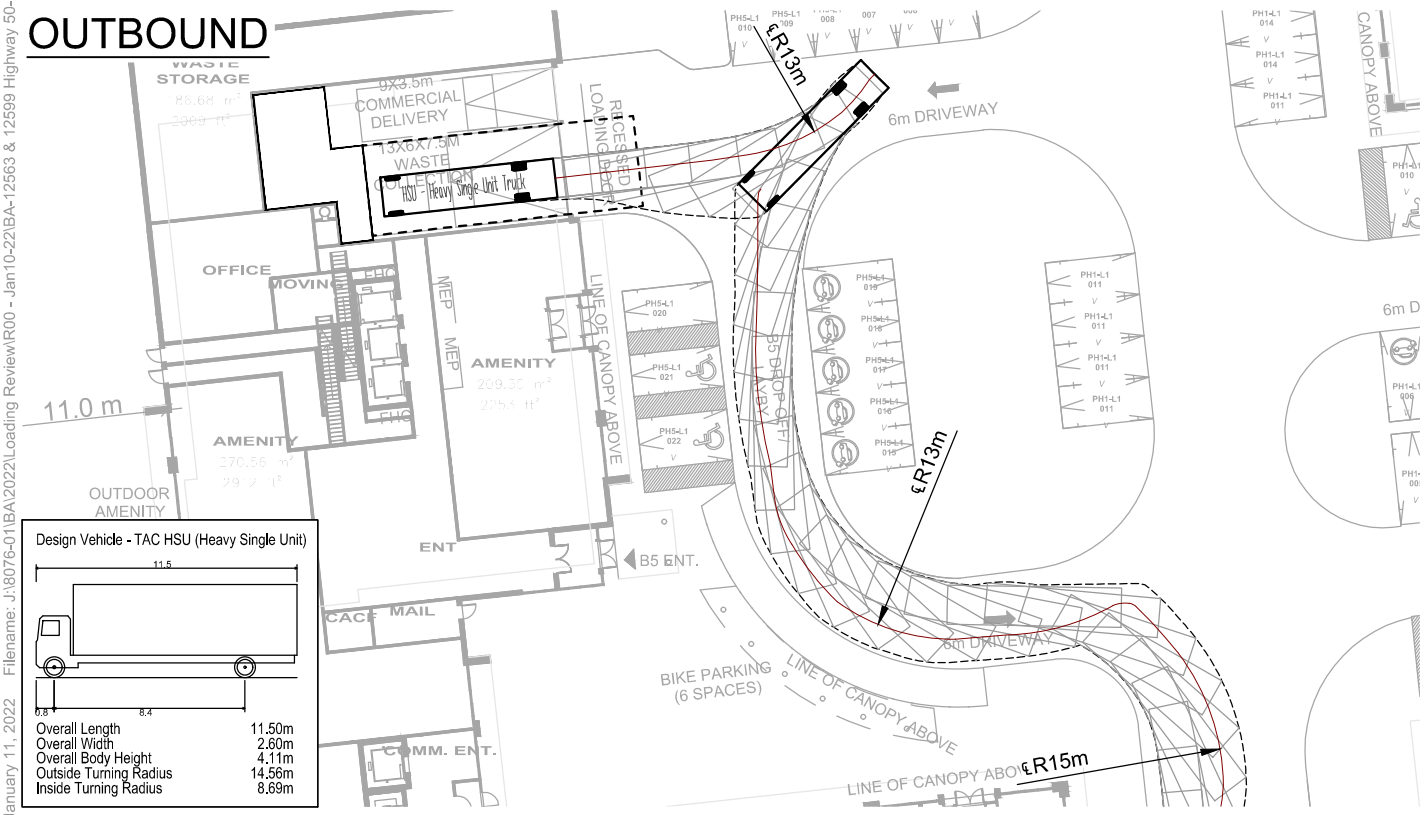
12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

BUILDING 4 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-04





Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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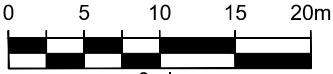

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 5 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-05

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

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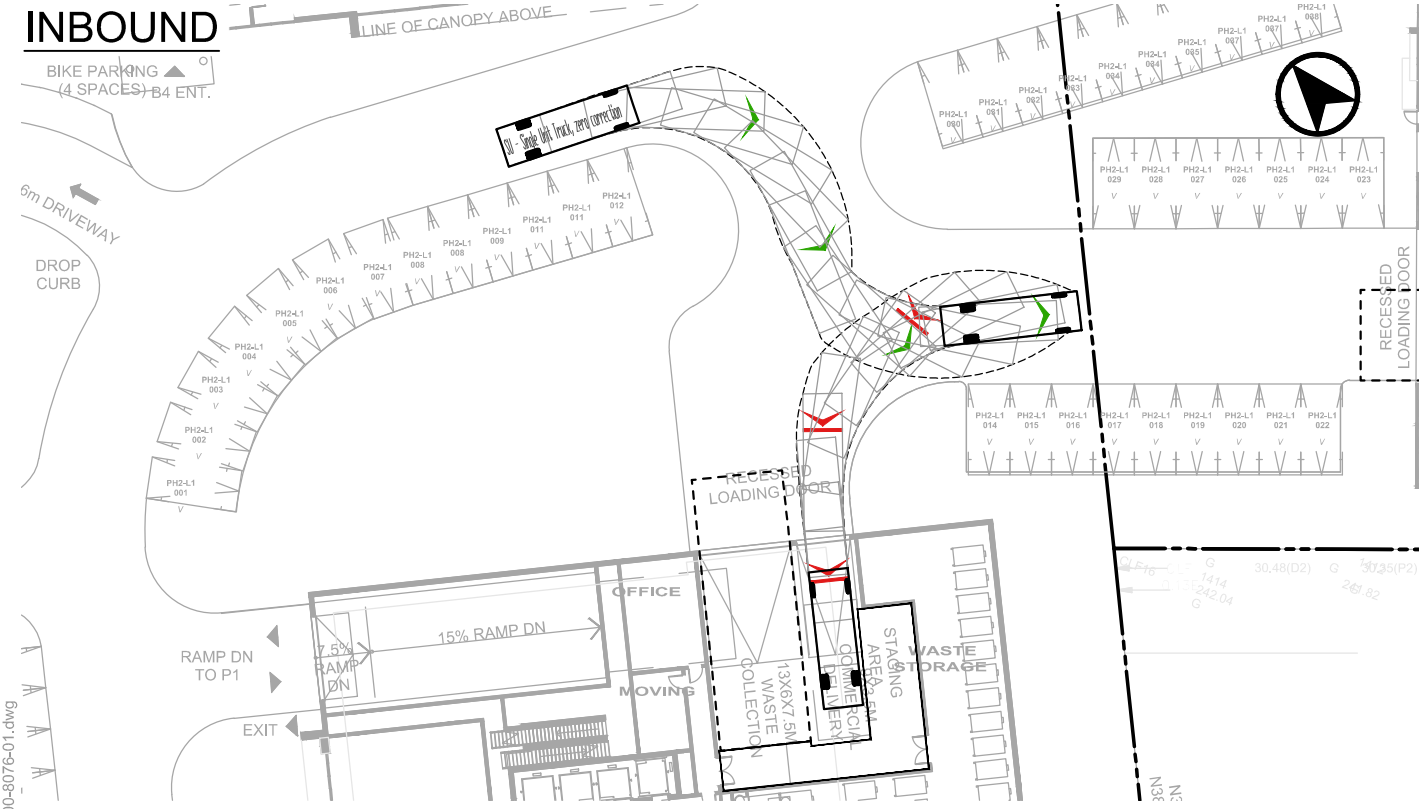

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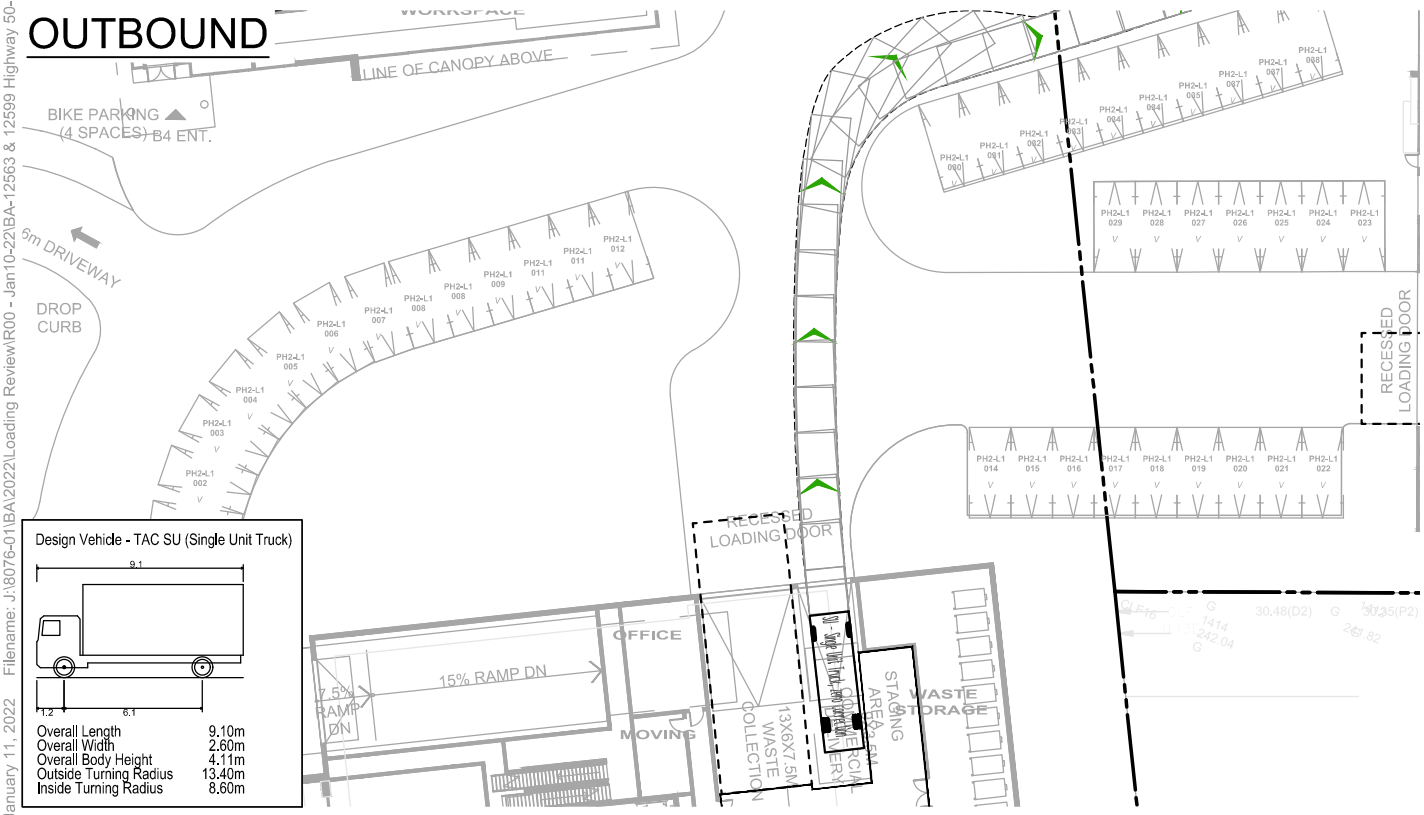

Design Vehicle - TAC SU (Single Unit Truck)

Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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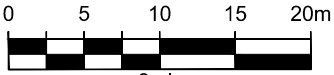

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 1 - DELIVERY SPACE
TAC SINGLE-UNIT VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-06

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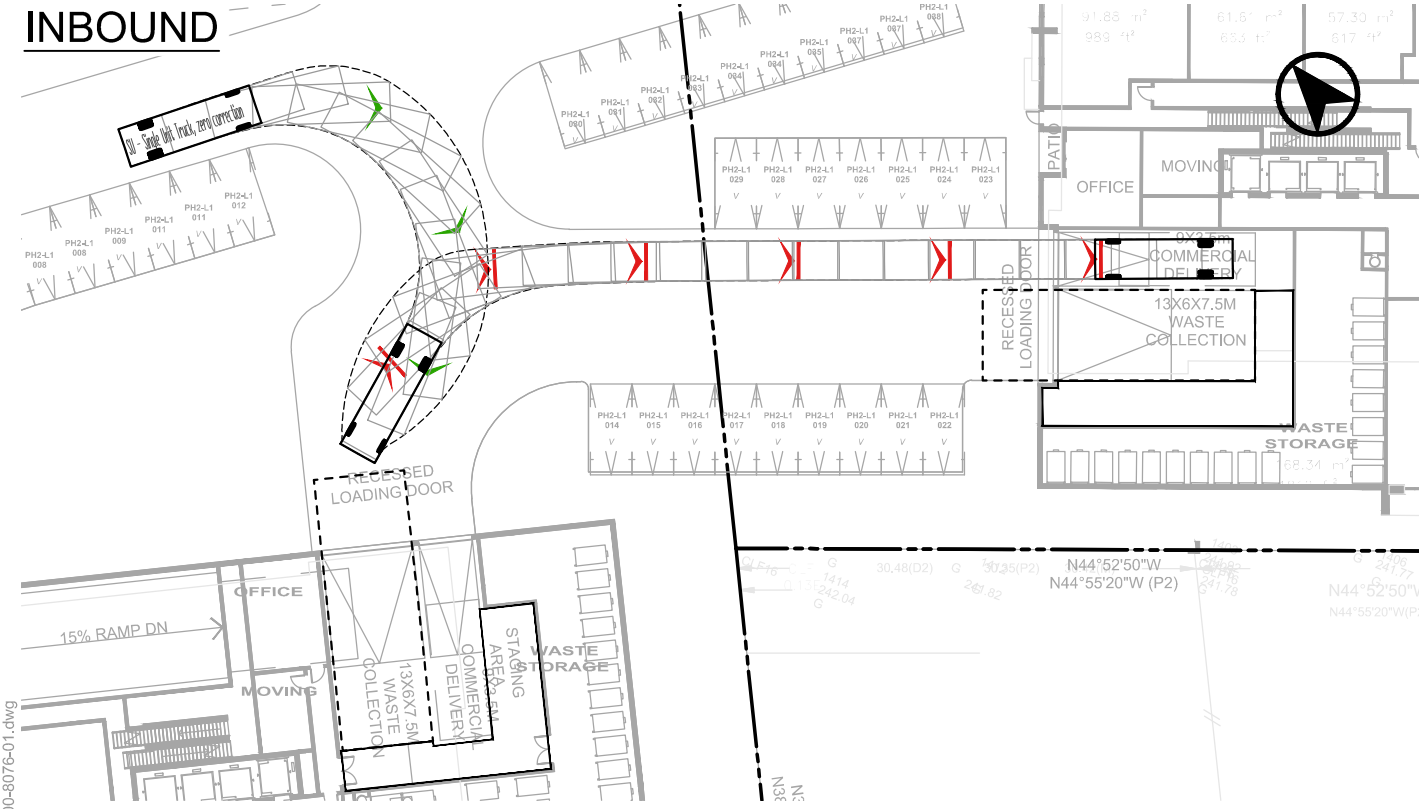

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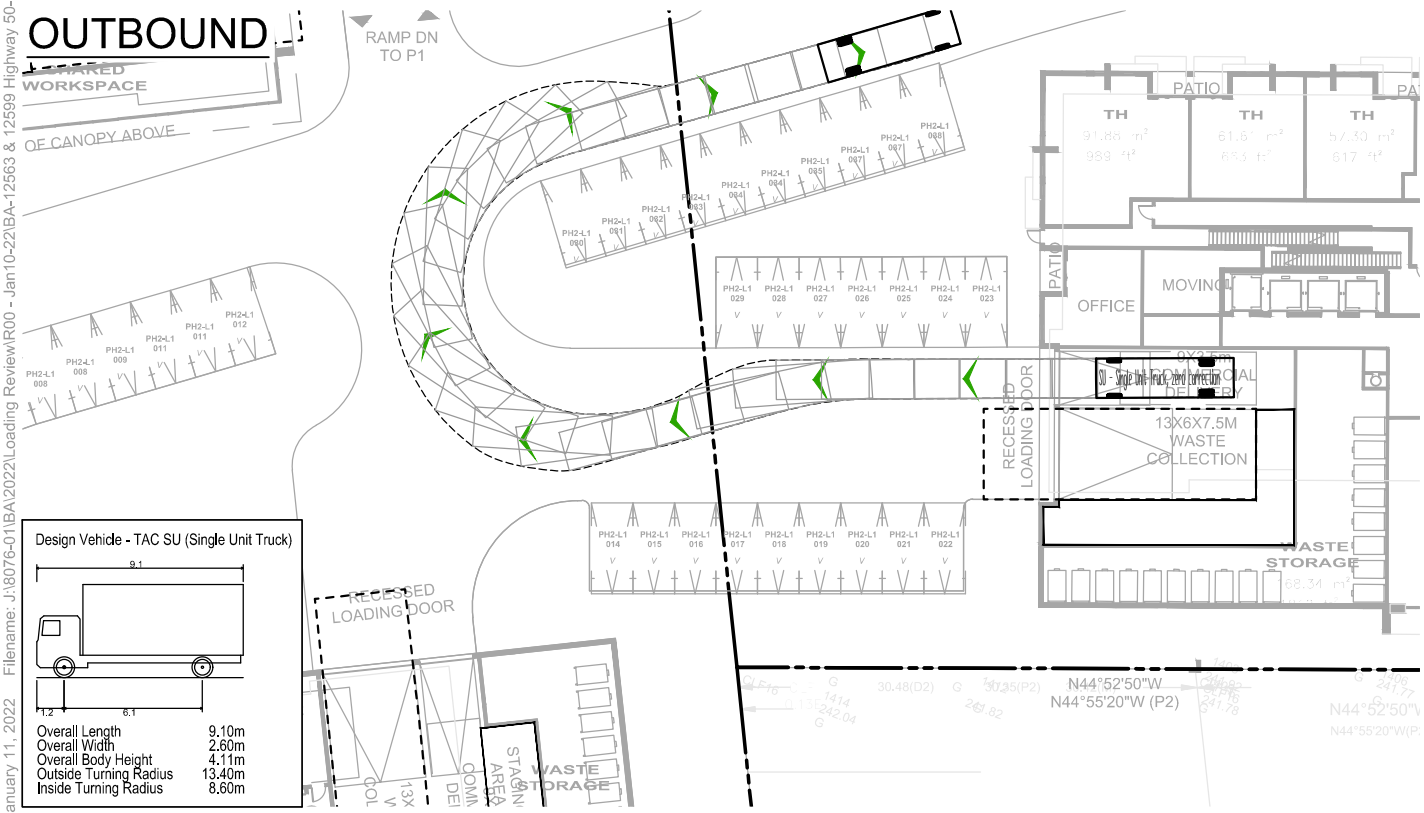

Design Vehicle - TAC SU (Single Unit Truck)

Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

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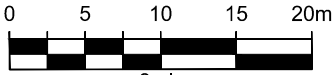

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 2 - DELIVERY SPACE
TAC SINGLE-UNIT VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-07

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

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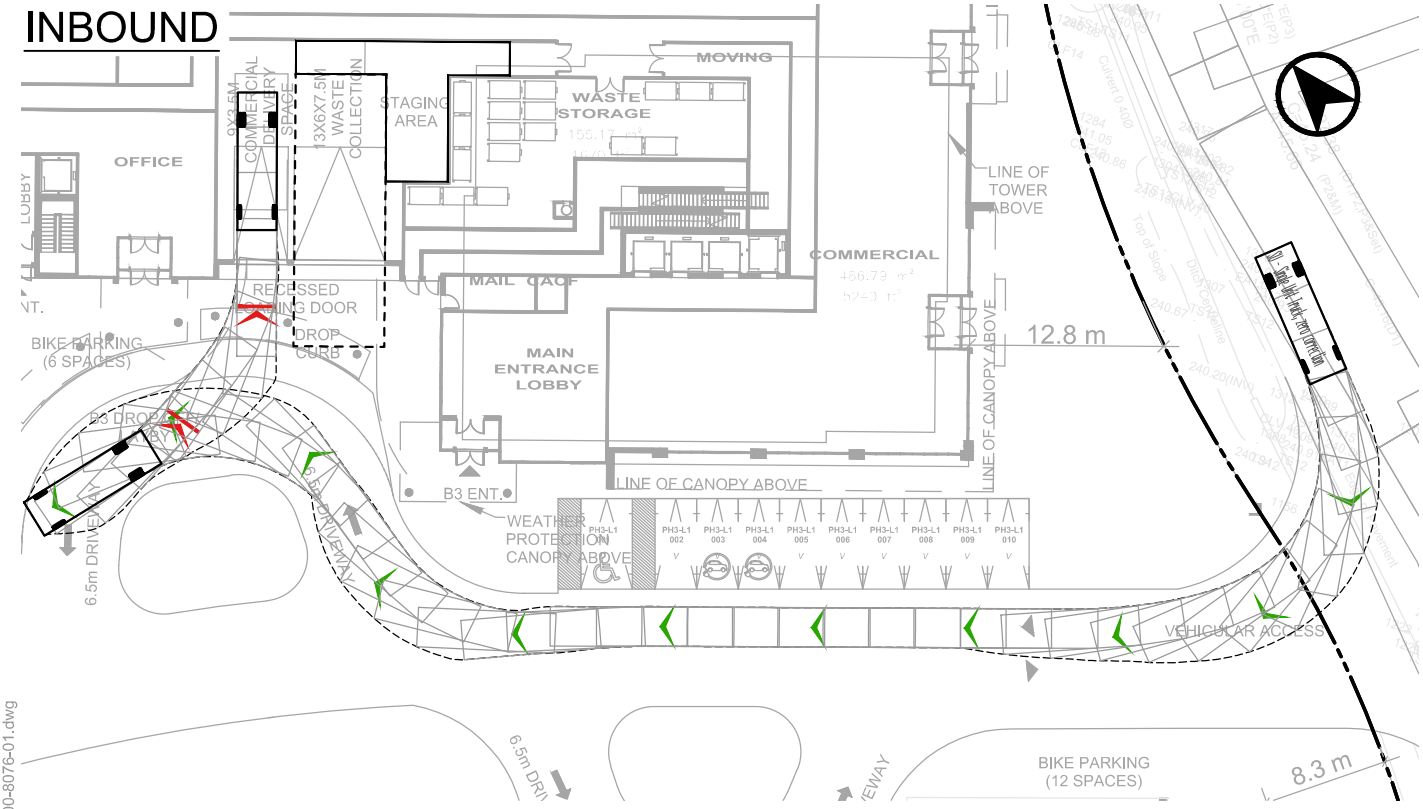

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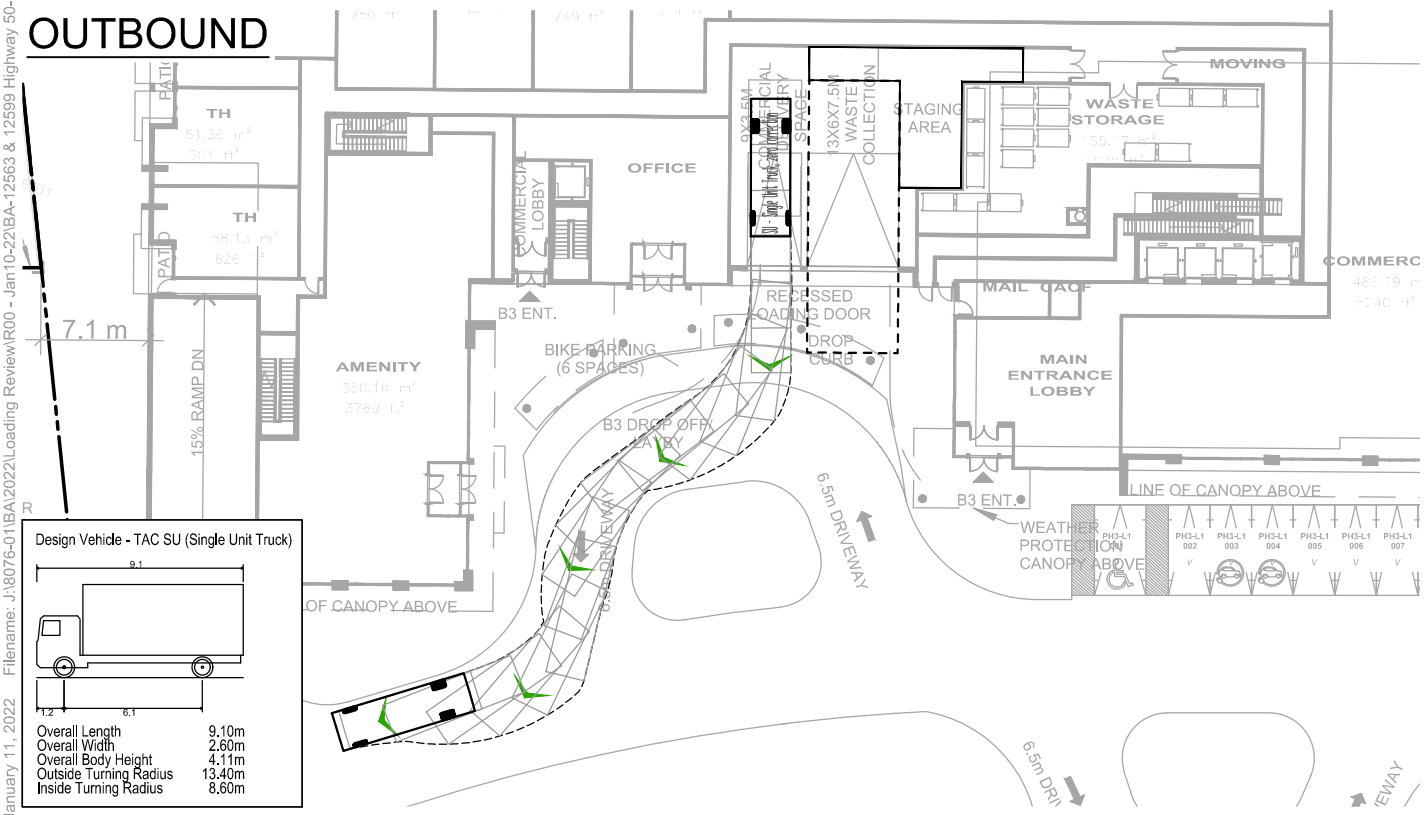

Design Vehicle - TAC SU (Single Unit Truck)

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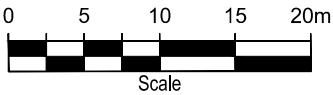


Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

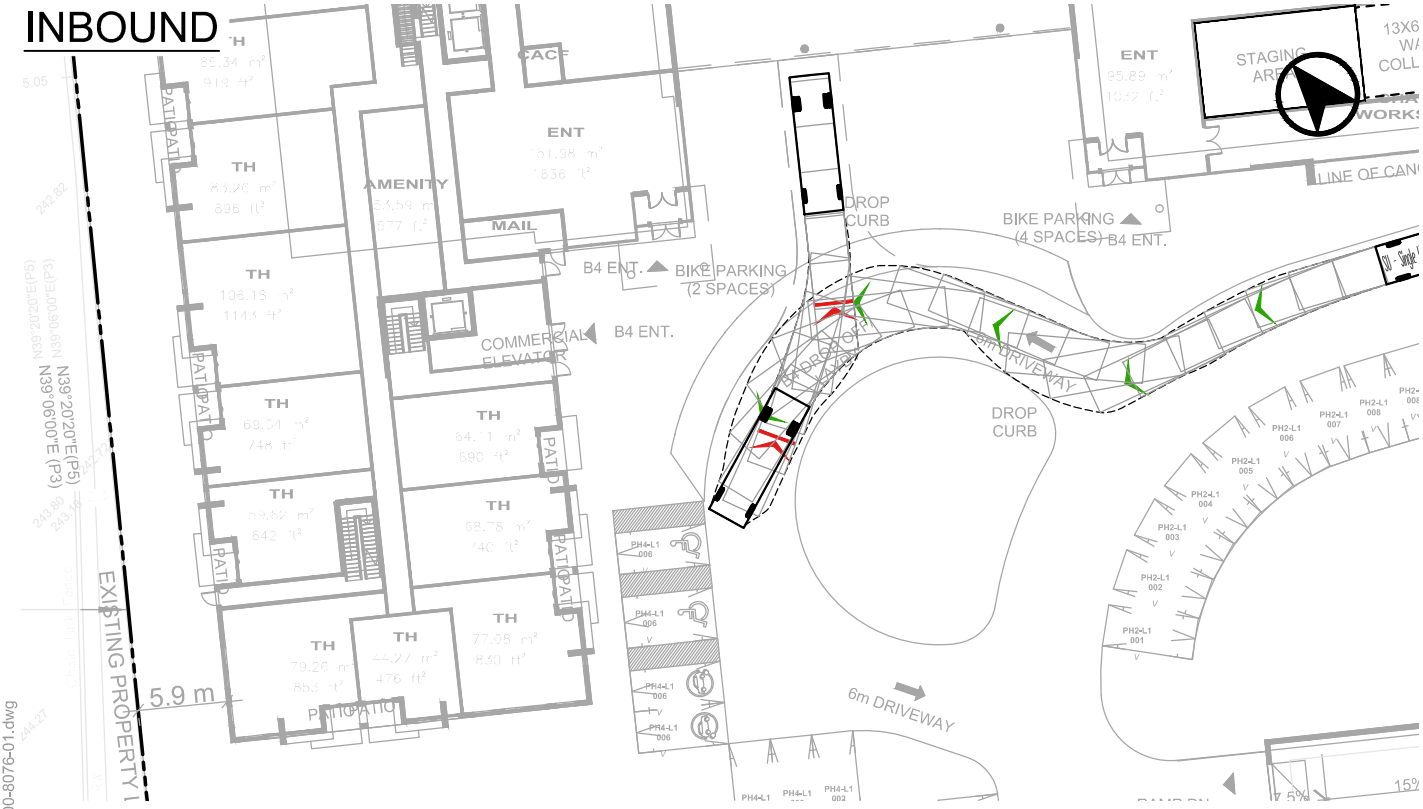
BA Group

12563 & 12599 HIGHWAY 50

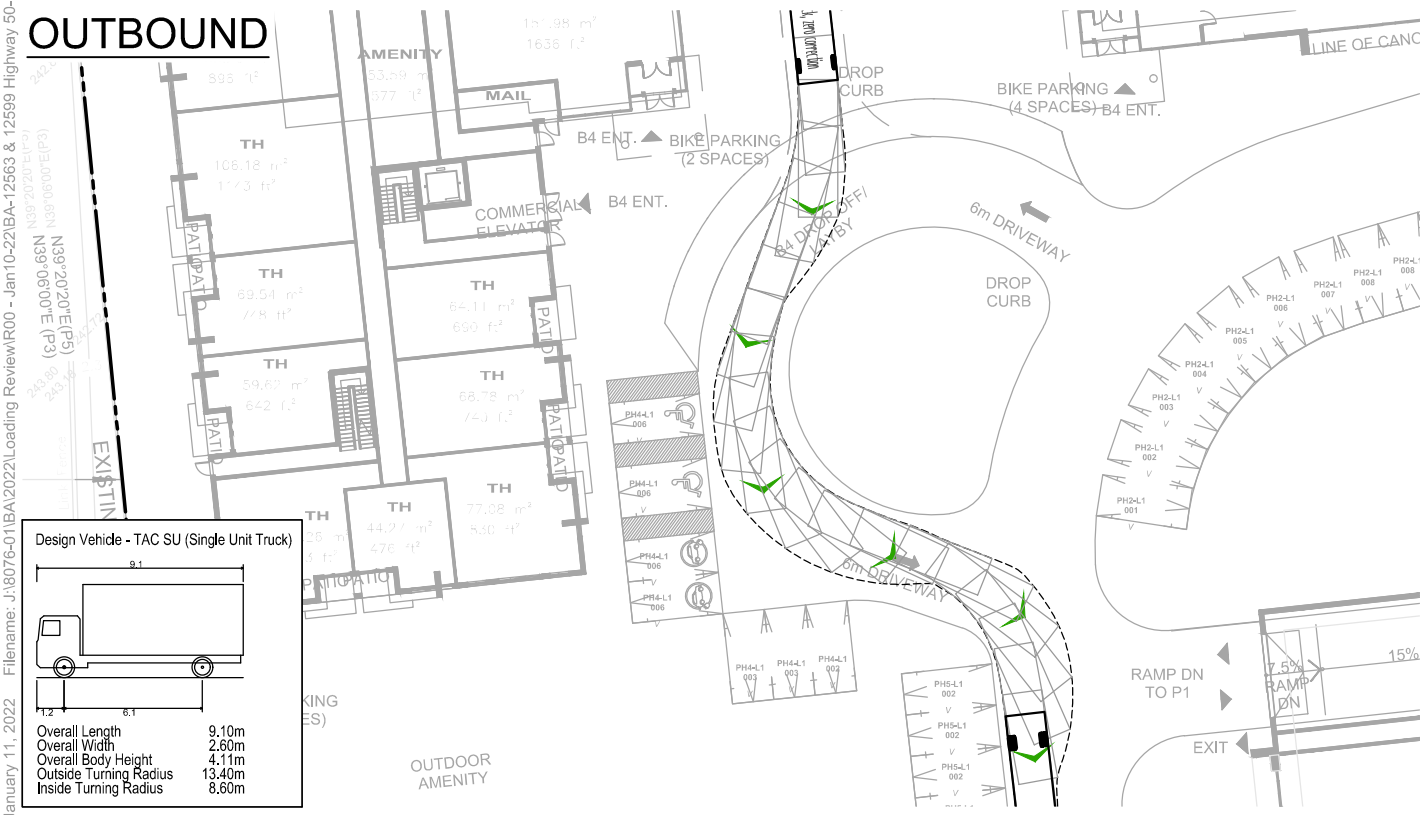
VEHICULAR MANOEUVRING DIAGRAM
BUILDING 3 - DELIVERY SPACE
TAC SINGLE-UNIT VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-08

INBOUND



OUTBOUND



Design Vehicle - TAC SU (Single Unit Truck)

Overall Length	9.10m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	13.40m
Inside Turning Radius	8.60m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

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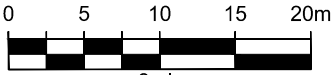


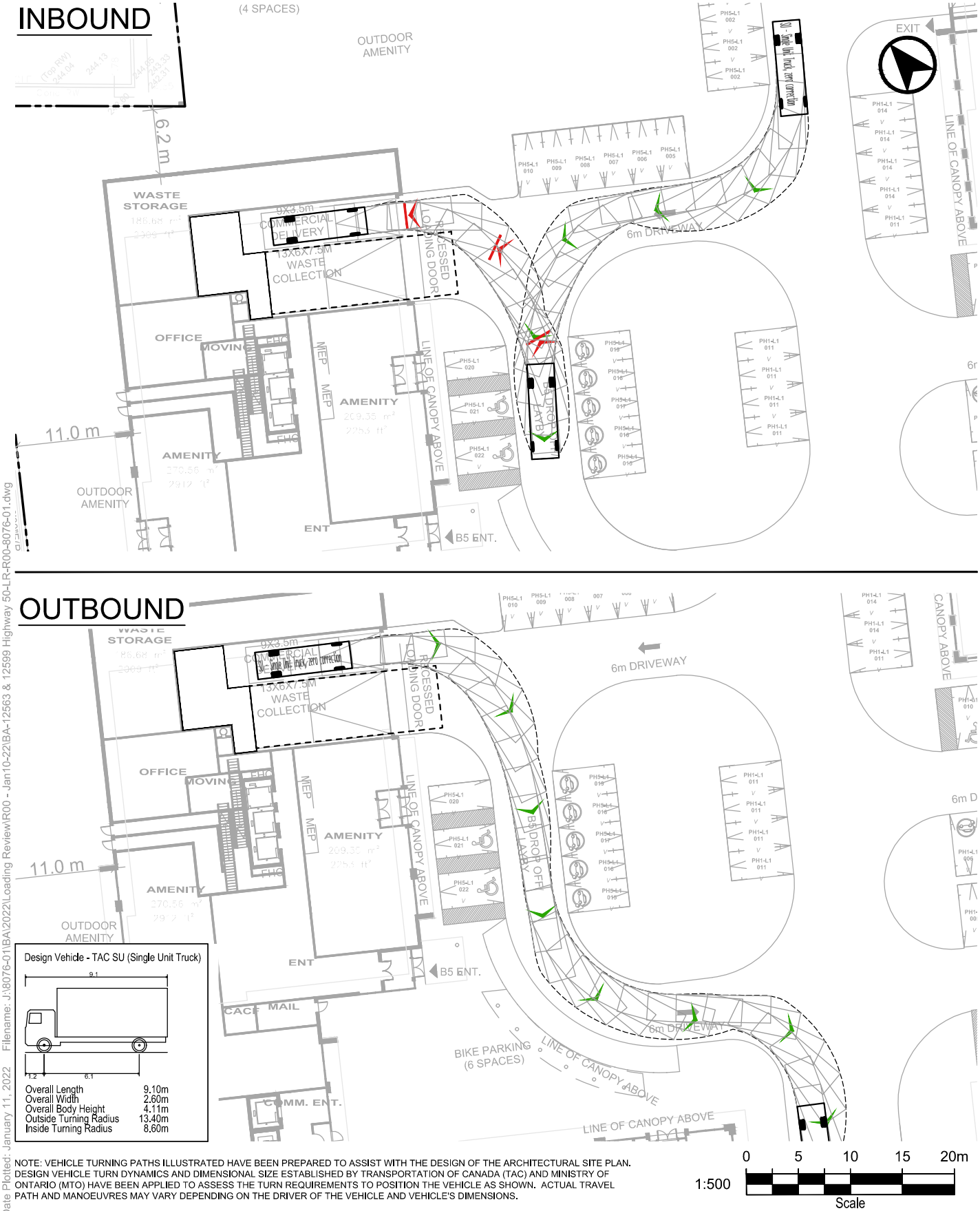
BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 4 - LOADING SPACE
TAC SINGLE-UNIT VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-09

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg



NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

Date Plotted: January 11, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50
VEHICULAR MANOEUVRING DIAGRAM
BUILDING 5 - DELIVERY SPACE
TAC SINGLE-UNIT VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-10

Appendix D
Turning Movement Counts

Spectrum

Turning Movement Count
Location Name: ALBION VAUGHAN RD & COMMERCIAL RD
Date: Wed, Nov 25, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (5 . ALBION VAUGHAN RD & COMMERCIAL RD)

Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach COMMERCIAL RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	31	129	0	0	160	27	4	0	0	31	3	6	0	0	9	200	
07:15:00	35	140	0	0	175	36	4	0	0	40	3	6	0	0	9	224	
07:30:00	30	155	0	0	185	36	3	0	0	39	1	7	0	0	8	232	
07:45:00	44	137	0	0	181	55	8	0	0	63	4	6	0	0	10	254	910
08:00:00	40	110	0	0	150	49	8	0	0	57	0	4	0	0	4	211	921
08:15:00	34	121	0	0	155	61	7	0	0	68	1	7	0	0	8	231	928
08:30:00	49	104	0	0	153	40	8	0	0	48	3	6	0	0	9	210	906
08:45:00	57	118	0	0	175	43	7	0	0	50	6	7	0	0	13	238	890
BREAK																	
16:00:00	35	59	0	0	94	145	6	0	0	151	3	31	0	0	34	279	
16:15:00	19	44	0	0	63	101	11	0	0	112	7	10	2	0	19	194	
16:30:00	25	68	0	0	93	176	7	0	0	183	16	26	0	0	42	318	
16:45:00	27	61	0	0	88	147	7	0	0	154	6	19	0	0	25	267	1058
17:00:00	26	56	0	0	82	165	2	0	0	167	11	30	0	0	41	290	1069
17:15:00	27	59	0	0	86	138	4	0	0	142	5	18	0	0	23	251	1126
17:30:00	29	62	0	0	91	146	2	0	0	148	4	18	0	0	22	261	1069
17:45:00	25	52	0	0	77	124	2	0	0	126	5	15	0	0	20	223	1025
Grand Total	533	1475	0	0	2008	1489	90	0	0	1579	78	216	2	0	296	**3883**	-
Approach%	26.5%	73.5%	0%		-	94.3%	5.7%	0%		-	26.4%	73%	0.7%		-	**-**	-
Totals %	13.7%	38%	0%		51.7%	38.3%	2.3%	0%		40.7%	2%	5.6%	0.1%		7.6%	**-**	-
Heavy	26	107	0		-	80	6	0		-	9	22	0		-	**-**	-
Heavy %	4.9%	7.3%	0%		-	5.4%	6.7%	0%		-	11.5%	10.2%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)

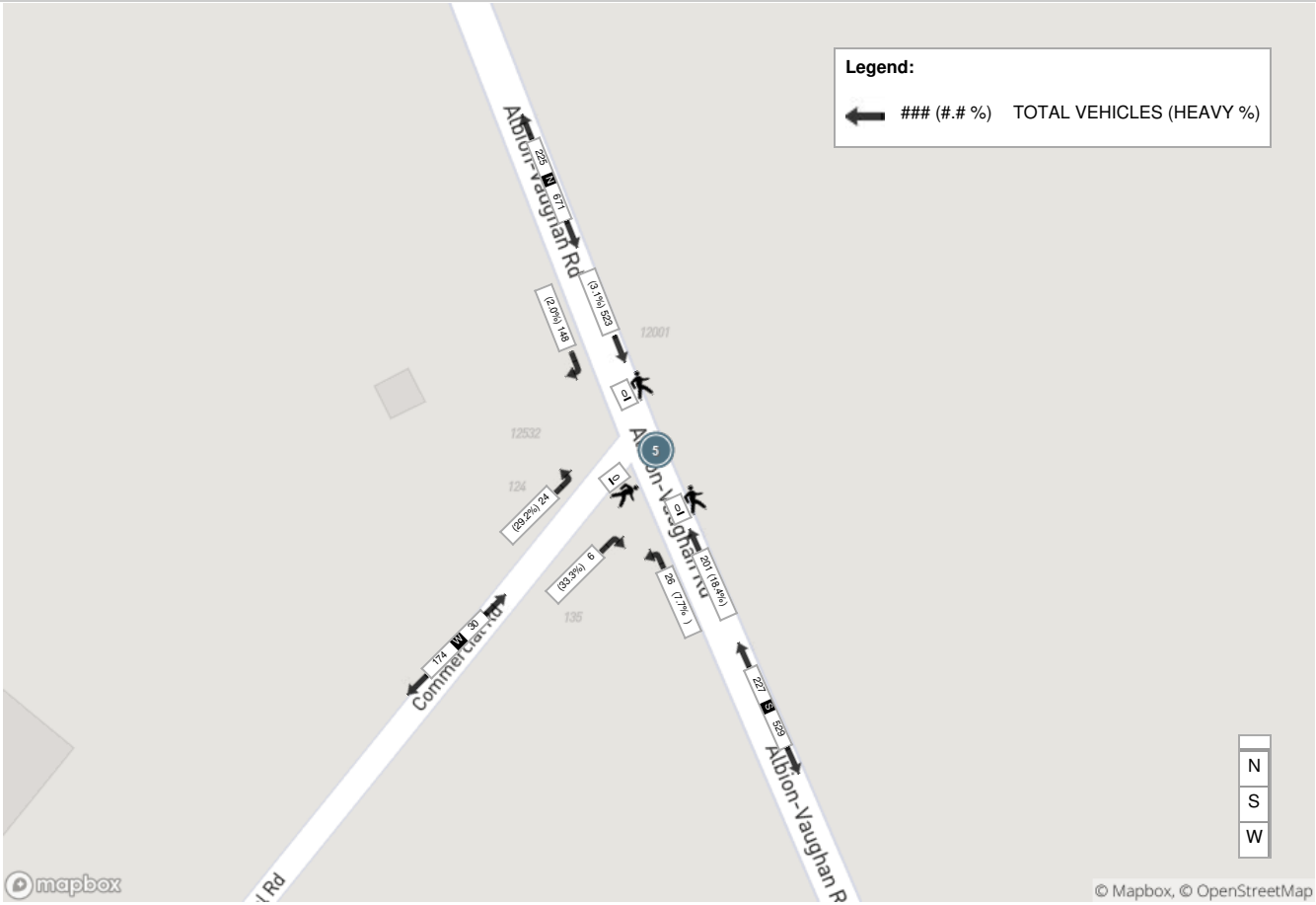
Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach COMMERCIAL RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
07:30:00	30	155	0	0	185	36	3	0	0	39	1	7	0	0	8	232
07:45:00	44	137	0	0	181	55	8	0	0	63	4	6	0	0	10	254
08:00:00	40	110	0	0	150	49	8	0	0	57	0	4	0	0	4	211
08:15:00	34	121	0	0	155	61	7	0	0	68	1	7	0	0	8	231
Grand Total	148	523	0	0	671	201	26	0	0	227	6	24	0	0	30	**928**
Approach%	22.1%	77.9%	0%		-	88.5%	11.5%	0%		-	20%	80%	0%		-	**-**
Totals %	15.9%	56.4%	0%		72.3%	21.7%	2.8%	0%		24.5%	0.6%	2.6%	0%		3.2%	**-**
PHF	0.84	0.84	0		0.91	0.82	0.81	0		0.83	0.38	0.86	0		0.75	**-**
Heavy	3	16	0		19	37	2	0		39	2	7	0		9	**-**
Heavy %	2%	3.1%	0%		2.8%	18.4%	7.7%	0%		17.2%	33.3%	29.2%	0%		30%	**-**
Lights	145	507	0		652	164	24	0		188	4	17	0		21	**-**
Lights %	98%	96.9%	0%		97.2%	81.6%	92.3%	0%		82.8%	66.7%	70.8%	0%		70%	**-**
Single-Unit Trucks	1	7	0		8	20	2	0		22	1	3	0		4	**-**
Single-Unit Trucks %	0.7%	1.3%	0%		1.2%	10%	7.7%	0%		9.7%	16.7%	12.5%	0%		13.3%	**-**
Buses	0	2	0		2	8	0	0		8	1	0	0		1	**-**
Buses %	0%	0.4%	0%		0.3%	4%	0%	0%		3.5%	16.7%	0%	0%		3.3%	**-**
Articulated Trucks	2	7	0		9	9	0	0		9	0	4	0		4	**-**
Articulated Trucks %	1.4%	1.3%	0%		1.3%	4.5%	0%	0%		4%	0%	16.7%	0%		13.3%	**-**

Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)

Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach COMMERCIAL RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
16:30:00	25	68	0	0	93	176	7	0	0	183	16	26	0	0	42	318
16:45:00	27	61	0	0	88	147	7	0	0	154	6	19	0	0	25	267
17:00:00	26	56	0	0	82	165	2	0	0	167	11	30	0	0	41	290
17:15:00	27	59	0	0	86	138	4	0	0	142	5	18	0	0	23	251
Grand Total	105	244	0	0	349	626	20	0	0	646	38	93	0	0	131	**1126**
Approach%	30.1%	69.9%	0%		-	96.9%	3.1%	0%		-	29%	71%	0%		-	**-**
Totals %	9.3%	21.7%	0%		31%	55.6%	1.8%	0%		57.4%	3.4%	8.3%	0%		11.6%	**-**
PHF	0.97	0.9	0		0.94	0.89	0.71	0		0.88	0.59	0.78	0		0.78	**-**
Heavy	7	31	0		38	15	3	0		18	1	3	0		4	**-**
Heavy %	6.7%	12.7%	0%		10.9%	2.4%	15%	0%		2.8%	2.6%	3.2%	0%		3.1%	**-**
Lights	98	213	0		311	611	17	0		628	37	90	0		127	**-**
Lights %	93.3%	87.3%	0%		89.1%	97.6%	85%	0%		97.2%	97.4%	96.8%	0%		96.9%	**-**
Single-Unit Trucks	5	10	0		15	11	2	0		13	1	3	0		4	**-**
Single-Unit Trucks %	4.8%	4.1%	0%		4.3%	1.8%	10%	0%		2%	2.6%	3.2%	0%		3.1%	**-**
Buses	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	2	21	0		23	4	1	0		5	0	0	0		0	**-**
Articulated Trucks %	1.9%	8.6%	0%		6.6%	0.6%	5%	0%		0.8%	0%	0%	0%		0%	**-**

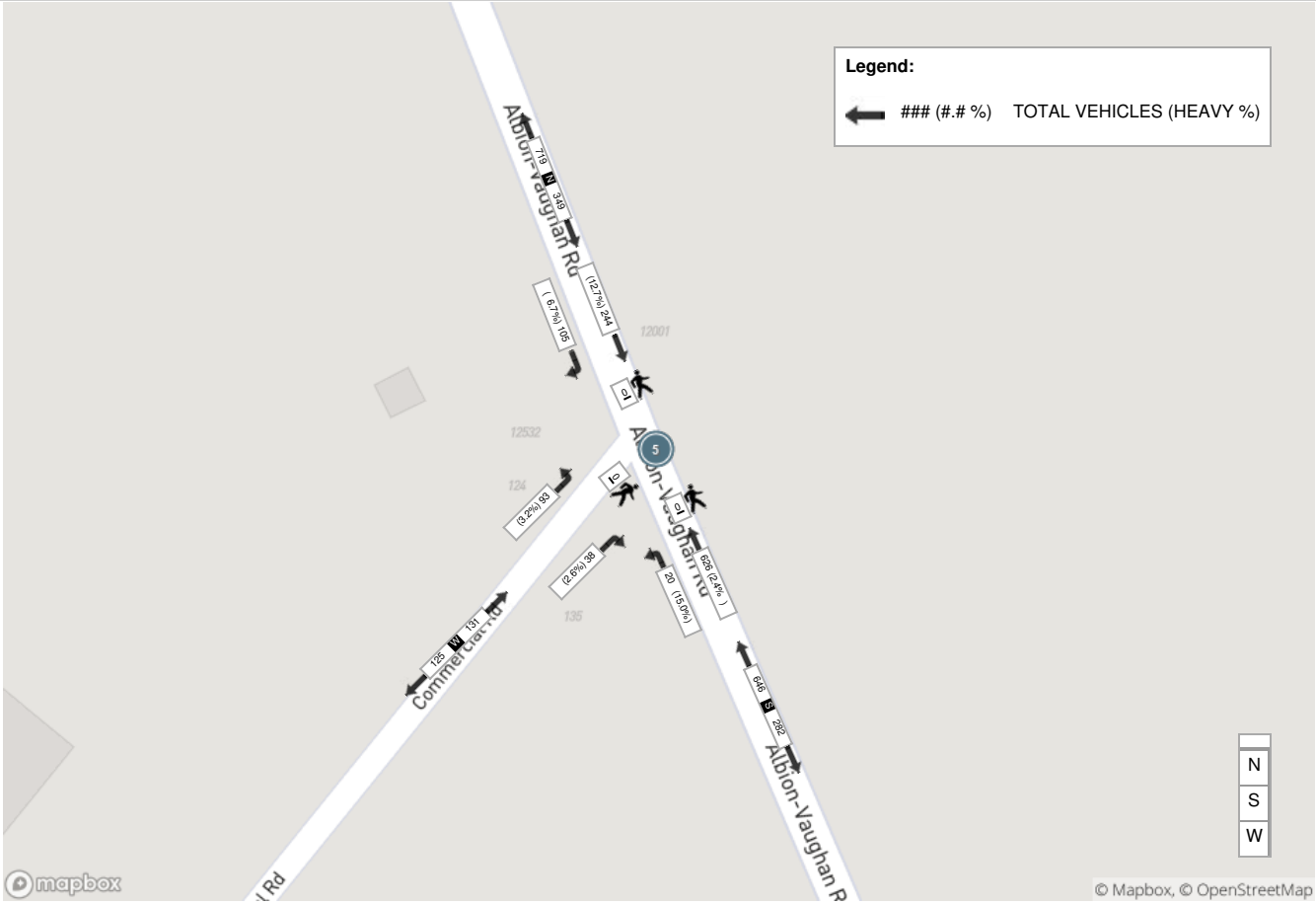
BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (4 . ALBION VAUGHAN RD & INDUSTRIAL RD)

Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach INDUSTRIAL RD					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	UTurn N:N	Peds N:	Approach Total	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	13	120	0	0	133	29	7	0	0	36	2	1	0	0	3	172	
07:15:00	14	124	0	0	138	39	6	0	0	45	3	4	0	0	7	190	
07:30:00	16	139	0	0	155	44	7	0	0	51	5	1	0	0	6	212	
07:45:00	18	123	0	0	141	53	11	0	0	64	3	4	0	0	7	212	786
08:00:00	13	101	0	0	114	53	13	0	0	66	2	3	0	0	5	185	799
08:15:00	19	108	0	0	127	63	7	0	0	70	8	6	0	0	14	211	820
08:30:00	13	92	0	0	105	43	7	0	0	50	6	5	0	0	11	166	774
08:45:00	24	102	0	0	126	41	8	0	0	49	10	8	0	0	18	193	755
BREAK																	
16:00:00	7	54	0	0	61	129	8	0	0	137	20	11	0	0	31	229	
16:15:00	8	46	0	0	54	125	5	0	0	130	9	9	0	0	18	202	
16:30:00	5	81	0	0	86	152	13	0	0	165	14	16	0	0	30	281	
16:45:00	8	59	0	0	67	145	12	0	0	157	15	5	0	0	20	244	956
17:00:00	5	63	0	0	68	152	3	0	0	155	15	17	0	0	32	255	982
17:15:00	2	60	0	0	62	127	5	0	0	132	11	16	0	0	27	221	1001
17:30:00	2	67	0	0	69	139	4	0	0	143	11	8	0	0	19	231	951
17:45:00	3	55	0	0	58	119	6	0	0	125	6	6	0	0	12	195	902
Grand Total	170	1394	0	0	1564	1453	122	0	0	1575	140	120	0	0	260	**3399**	-
Approach%	10.9%	89.1%	0%		-	92.3%	7.7%	0%		-	53.8%	46.2%	0%		-	**-**	-
Totals %	5%	41%	0%		46%	42.7%	3.6%	0%		46.3%	4.1%	3.5%	0%		7.6%	**-**	-
Heavy	8	109	0		-	77	27	0		-	12	11	0		-	**-**	-
Heavy %	4.7%	7.8%	0%		-	5.3%	22.1%	0%		-	8.6%	9.2%	0%		-	**-**	-
Bicycles	0	0	0		-	0	1	0		-	1	0	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0%	0.8%	0%		-	0.7%	0%	0%		-	**-**	-

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

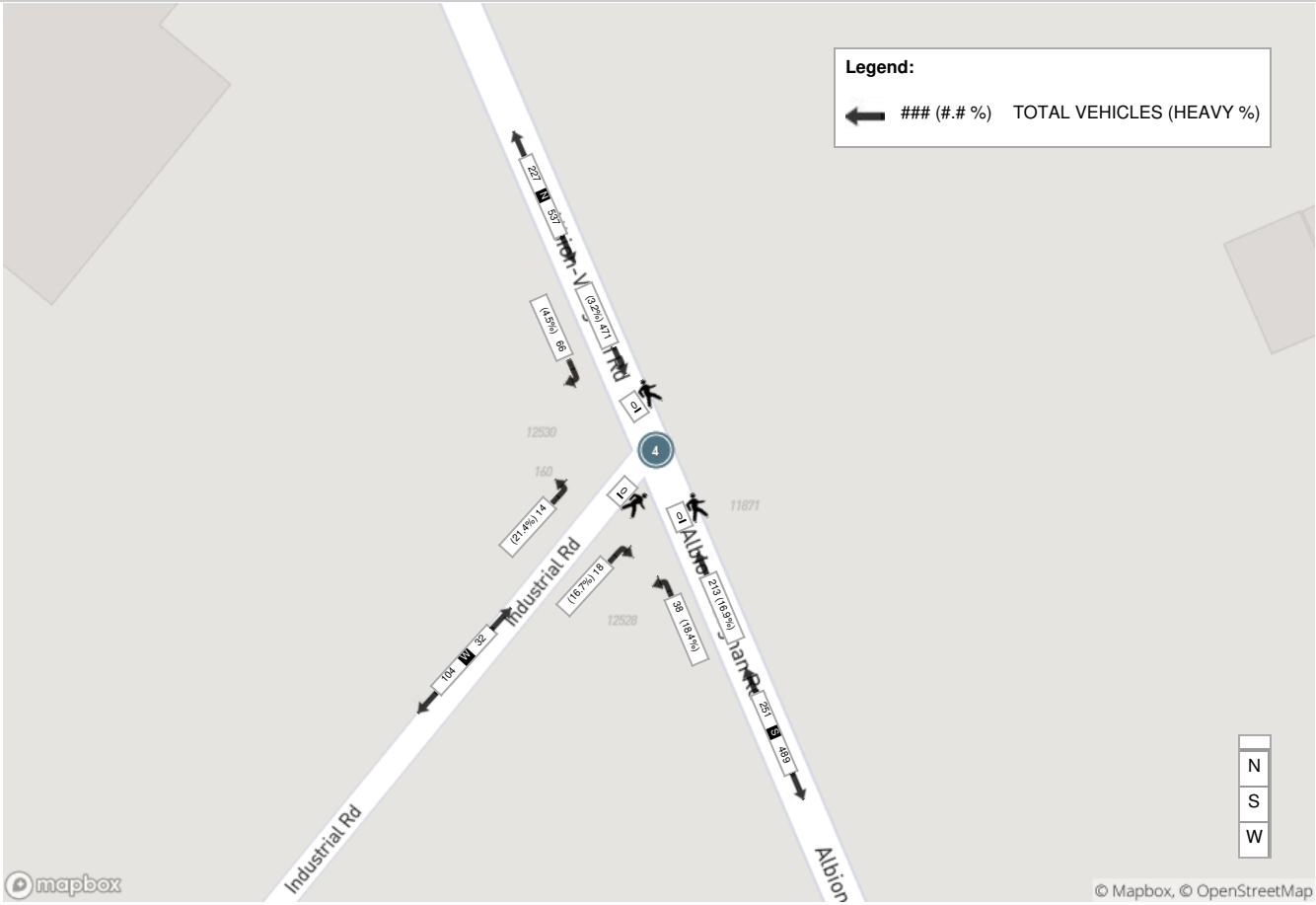
Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)

Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach INDUSTRIAL RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
07:30:00	16	139	0	0	155	44	7	0	0	51	5	1	0	0	6	212
07:45:00	18	123	0	0	141	53	11	0	0	64	3	4	0	0	7	212
08:00:00	13	101	0	0	114	53	13	0	0	66	2	3	0	0	5	185
08:15:00	19	108	0	0	127	63	7	0	0	70	8	6	0	0	14	211
Grand Total	66	471	0	0	537	213	38	0	0	251	18	14	0	0	32	**820**
Approach%	12.3%	87.7%	0%		-	84.9%	15.1%	0%		-	56.3%	43.8%	0%		-	**-**
Totals %	8%	57.4%	0%		65.5%	26%	4.6%	0%		30.6%	2.2%	1.7%	0%		3.9%	**-**
PHF	0.87	0.85	0		0.87	0.85	0.73	0		0.9	0.56	0.58	0		0.57	**-**
Heavy	3	15	0		18	36	7	0		43	3	3	0		6	**-**
Heavy %	4.5%	3.2%	0%		3.4%	16.9%	18.4%	0%		17.1%	16.7%	21.4%	0%		18.8%	**-**
Lights	63	456	0		519	177	31	0		208	15	11	0		26	**-**
Lights %	95.5%	96.8%	0%		96.6%	83.1%	81.6%	0%		82.9%	83.3%	78.6%	0%		81.3%	**-**
Single-Unit Trucks	1	7	0		8	19	5	0		24	1	3	0		4	**-**
Single-Unit Trucks %	1.5%	1.5%	0%		1.5%	8.9%	13.2%	0%		9.6%	5.6%	21.4%	0%		12.5%	**-**
Buses	0	3	0		3	8	0	0		8	2	0	0		2	**-**
Buses %	0%	0.6%	0%		0.6%	3.8%	0%	0%		3.2%	11.1%	0%	0%		6.3%	**-**
Articulated Trucks	2	5	0		7	9	2	0		11	0	0	0		0	**-**
Articulated Trucks %	3%	1.1%	0%		1.3%	4.2%	5.3%	0%		4.4%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		**-**

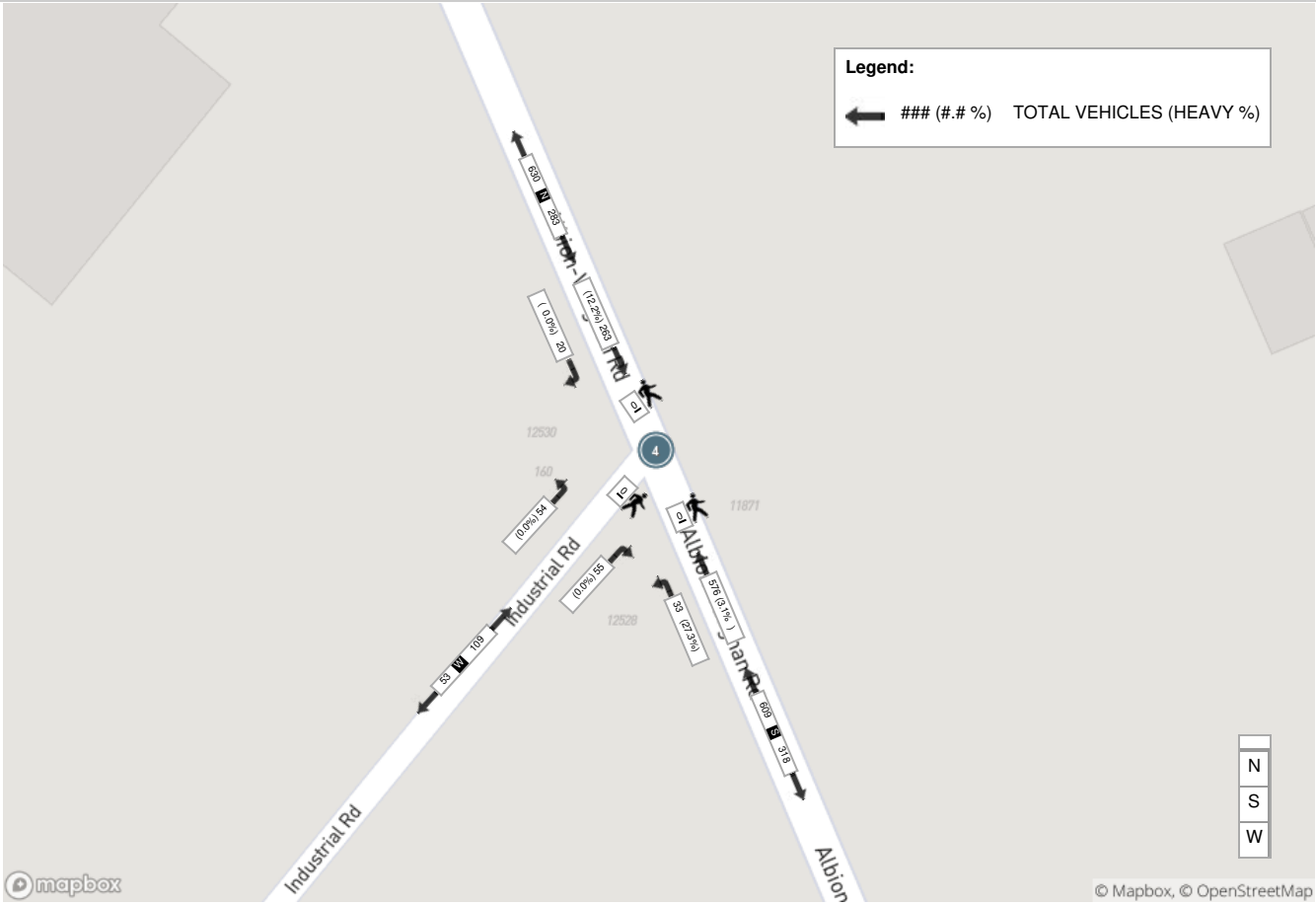
Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)

Start Time	N Approach ALBION VAUGHAN RD					S Approach ALBION VAUGHAN RD					W Approach INDUSTRIAL RD					Int. Total (15 min)
	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	
16:30:00	5	81	0	0	86	152	13	0	0	165	14	16	0	0	30	281
16:45:00	8	59	0	0	67	145	12	0	0	157	15	5	0	0	20	244
17:00:00	5	63	0	0	68	152	3	0	0	155	15	17	0	0	32	255
17:15:00	2	60	0	0	62	127	5	0	0	132	11	16	0	0	27	221
Grand Total	20	263	0	0	283	576	33	0	0	609	55	54	0	0	109	**1001**
Approach%	7.1%	92.9%	0%		-	94.6%	5.4%	0%		-	50.5%	49.5%	0%		-	**-**
Totals %	2%	26.3%	0%		28.3%	57.5%	3.3%	0%		60.8%	5.5%	5.4%	0%		10.9%	**-**
PHF	0.63	0.81	0		0.82	0.95	0.63	0		0.92	0.92	0.79	0		0.85	**-**
Heavy	0	32	0		32	18	9	0		27	0	0	0		0	**-**
Heavy %	0%	12.2%	0%		11.3%	3.1%	27.3%	0%		4.4%	0%	0%	0%		0%	**-**
Lights	20	231	0		251	558	24	0		582	55	54	0		109	**-**
Lights %	100%	87.8%	0%		88.7%	96.9%	72.7%	0%		95.6%	100%	100%	0%		100%	**-**
Single-Unit Trucks	0	11	0		11	13	5	0		18	0	0	0		0	**-**
Single-Unit Trucks %	0%	4.2%	0%		3.9%	2.3%	15.2%	0%		3%	0%	0%	0%		0%	**-**
Buses	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	21	0		21	5	4	0		9	0	0	0		0	**-**
Articulated Trucks %	0%	8%	0%		7.4%	0.9%	12.1%	0%		1.5%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		**-**

Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)



Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (3 . ALBION VAUGHAN RD & KIRBY RD)

Start Time	N Approach ALBION VAUGHAN RD					E Approach KIRBY RD					S Approach ALBION VAUGHAN RD					Int. Total (15 min)	Int. Total (1 hr)
	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	UTurn S:S	Peds S:	Approach Total		
07:00:00	119	10	0	0	129	0	0	0	0	0	0	36	0	0	36	165	
07:15:00	113	11	0	0	124	7	0	0	0	7	1	36	0	0	37	168	
07:30:00	126	15	0	0	141	7	0	0	0	7	2	43	0	0	45	193	
07:45:00	124	19	0	0	143	5	0	0	0	5	1	51	0	0	52	200	726
08:00:00	104	12	0	0	116	7	3	0	0	10	3	58	0	0	61	187	748
08:15:00	113	14	0	0	127	5	0	0	0	5	0	59	0	0	59	191	771
08:30:00	91	13	0	0	104	6	0	0	0	6	0	40	0	0	40	150	728
08:45:00	98	16	0	0	114	6	1	0	0	7	3	41	0	0	44	165	693
BREAK																	
16:00:00	71	8	0	0	79	9	0	0	0	9	2	138	0	0	140	228	
16:15:00	50	11	0	0	61	12	1	0	0	13	2	122	0	0	124	198	
16:30:00	78	12	0	0	90	21	0	0	0	21	0	143	0	0	143	254	
16:45:00	54	7	0	0	61	23	3	0	0	26	1	141	0	0	142	229	909
17:00:00	70	8	0	0	78	17	4	0	0	21	0	144	0	0	144	243	924
17:15:00	57	9	0	0	66	10	2	0	0	12	1	141	0	0	142	220	946
17:30:00	70	5	0	0	75	10	0	0	0	10	0	124	0	0	124	209	901
17:45:00	47	5	0	0	52	15	0	0	0	15	0	117	0	0	117	184	856
Grand Total	1385	175	0	0	1560	160	14	0	0	174	16	1434	0	0	1450	**3184**	-
Approach%	88.8%	11.2%	0%		-	92%	8%	0%		-	1.1%	98.9%	0%		-	**-**	-
Totals %	43.5%	5.5%	0%		49%	5%	0.4%	0%		5.5%	0.5%	45%	0%		45.5%	**-**	-
Heavy	114	10	0		-	11	4	0		-	2	93	0		-	**-**	-
Heavy %	8.2%	5.7%	0%		-	6.9%	28.6%	0%		-	12.5%	6.5%	0%		-	**-**	-
Bicycles	0	1	0		-	1	0	0		-	0	0	0		-	**-**	-
Bicycle %	0%	0.6%	0%		-	0.6%	0%	0%		-	0%	0%	0%		-	**-**	-

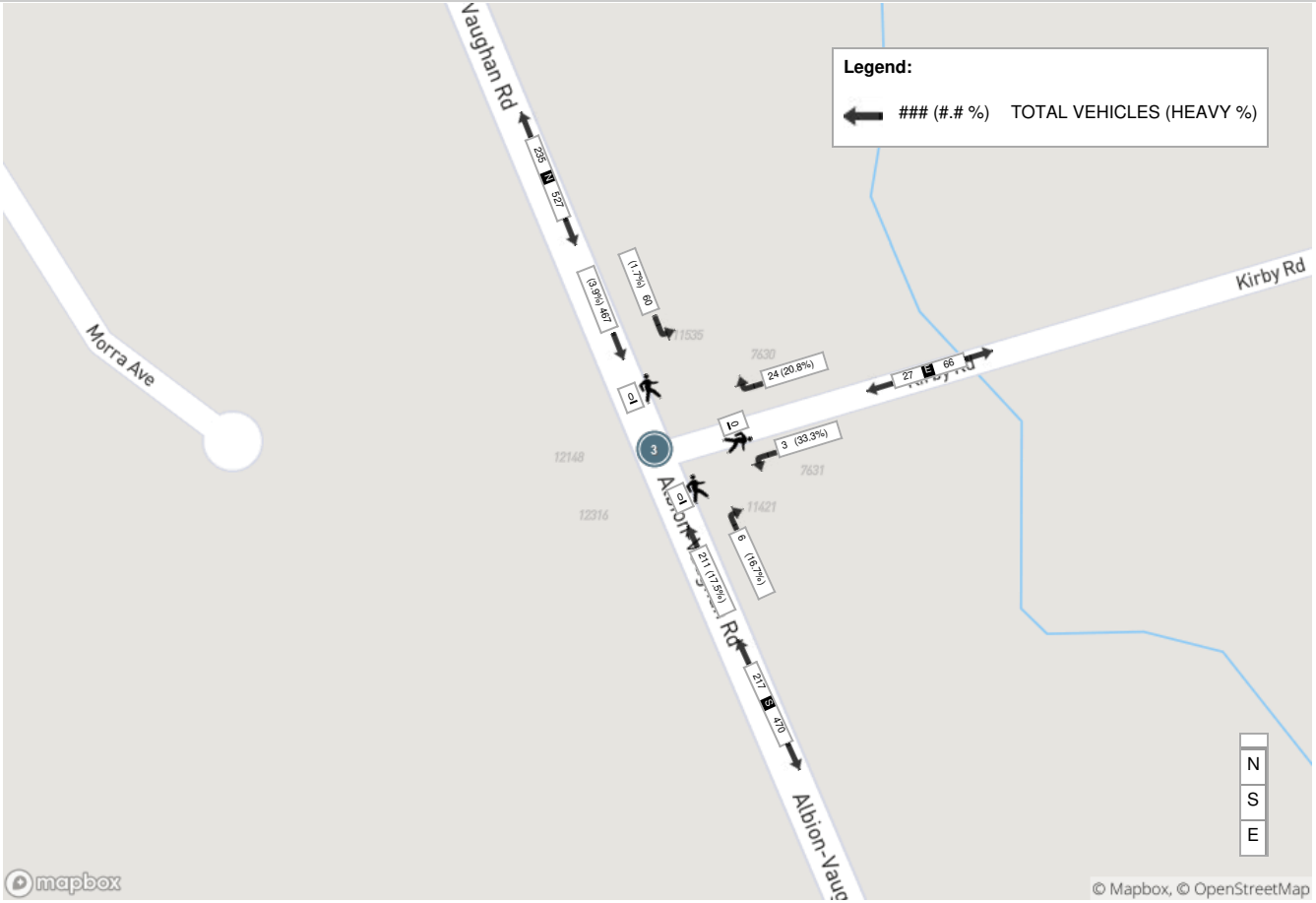
Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)

Start Time	N Approach ALBION VAUGHAN RD					E Approach KIRBY RD					S Approach ALBION VAUGHAN RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
07:30:00	126	15	0	0	141	7	0	0	0	7	2	43	0	0	45	193
07:45:00	124	19	0	0	143	5	0	0	0	5	1	51	0	0	52	200
08:00:00	104	12	0	0	116	7	3	0	0	10	3	58	0	0	61	187
08:15:00	113	14	0	0	127	5	0	0	0	5	0	59	0	0	59	191
Grand Total	467	60	0	0	527	24	3	0	0	27	6	211	0	0	217	**771**
Approach%	88.6%	11.4%	0%		-	88.9%	11.1%	0%		-	2.8%	97.2%	0%		-	**-**
Totals %	60.6%	7.8%	0%		68.4%	3.1%	0.4%	0%		3.5%	0.8%	27.4%	0%		28.1%	**-**
PHF	0.93	0.79	0		0.92	0.86	0.25	0		0.68	0.5	0.89	0		0.89	**-**
Heavy	18	1	0		19	5	1	0		6	1	37	0		38	**-**
Heavy %	3.9%	1.7%	0%		3.6%	20.8%	33.3%	0%		22.2%	16.7%	17.5%	0%		17.5%	**-**
Lights	449	59	0		508	19	2	0		21	5	174	0		179	**-**
Lights %	96.1%	98.3%	0%		96.4%	79.2%	66.7%	0%		77.8%	83.3%	82.5%	0%		82.5%	**-**
Single-Unit Trucks	9	1	0		10	5	1	0		6	1	19	0		20	**-**
Single-Unit Trucks %	1.9%	1.7%	0%		1.9%	20.8%	33.3%	0%		22.2%	16.7%	9%	0%		9.2%	**-**
Buses	3	0	0		3	0	0	0		0	0	7	0		7	**-**
Buses %	0.6%	0%	0%		0.6%	0%	0%	0%		0%	0%	3.3%	0%		3.2%	**-**
Articulated Trucks	6	0	0		6	0	0	0		0	0	11	0		11	**-**
Articulated Trucks %	1.3%	0%	0%		1.1%	0%	0%	0%		0%	0%	5.2%	0%		5.1%	**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		**-**

Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)

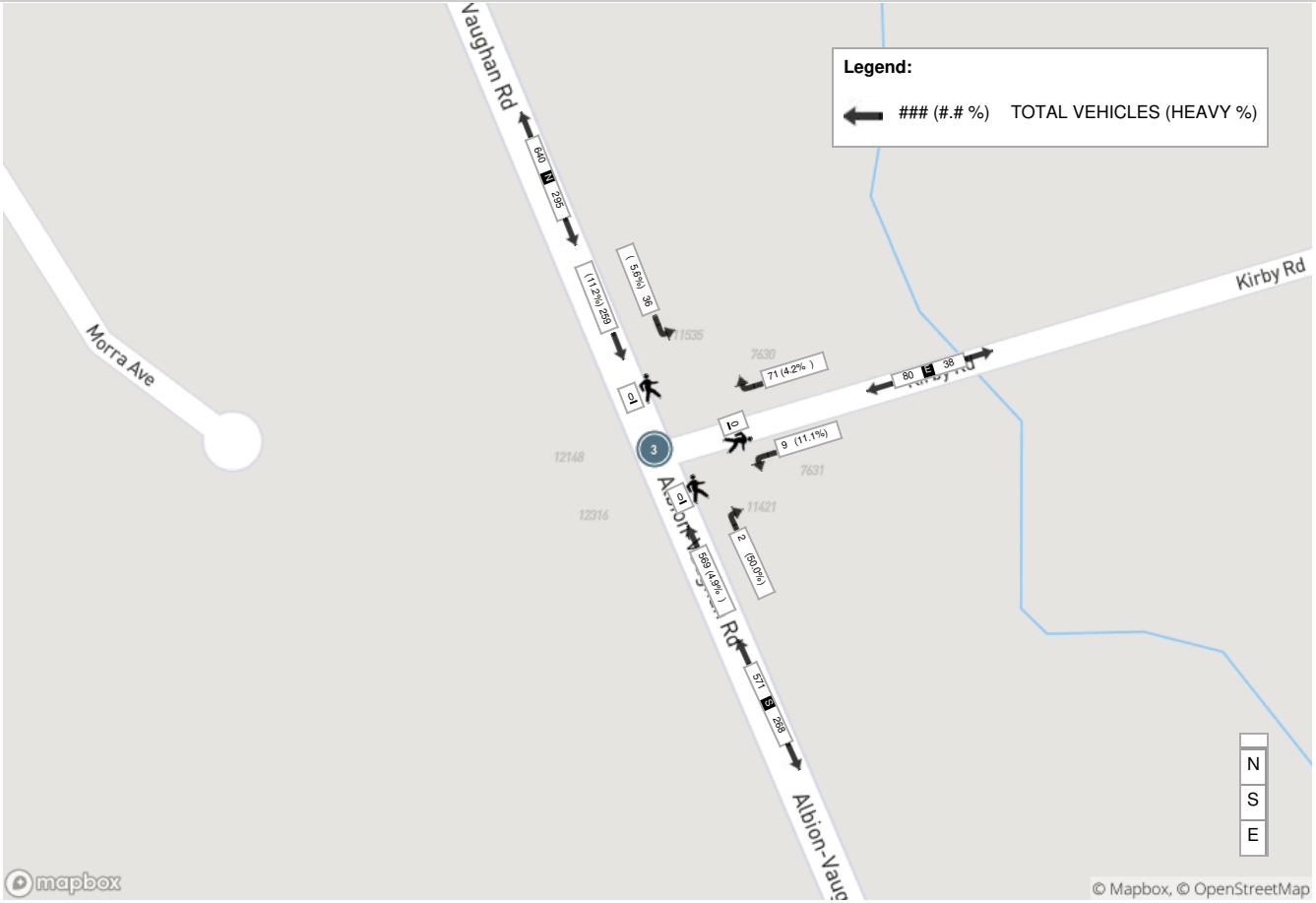
Start Time	N Approach ALBION VAUGHAN RD					E Approach KIRBY RD					S Approach ALBION VAUGHAN RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:30:00	78	12	0	0	90	21	0	0	0	21	0	143	0	0	143	254
16:45:00	54	7	0	0	61	23	3	0	0	26	1	141	0	0	142	229
17:00:00	70	8	0	0	78	17	4	0	0	21	0	144	0	0	144	243
17:15:00	57	9	0	0	66	10	2	0	0	12	1	141	0	0	142	220
Grand Total	259	36	0	0	295	71	9	0	0	80	2	569	0	0	571	**946**
Approach%	87.8%	12.2%	0%		-	88.8%	11.3%	0%		-	0.4%	99.6%	0%		-	**-**
Totals %	27.4%	3.8%	0%		31.2%	7.5%	1%	0%		8.5%	0.2%	60.1%	0%		60.4%	**-**
PHF	0.83	0.75	0		0.82	0.77	0.56	0		0.77	0.5	0.99	0		0.99	**-**
Heavy	29	2	0		31	3	1	0		4	1	28	0		29	**-**
Heavy %	11.2%	5.6%	0%		10.5%	4.2%	11.1%	0%		5%	50%	4.9%	0%		5.1%	**-**
Lights	230	34	0		264	68	8	0		76	1	541	0		542	**-**
Lights %	88.8%	94.4%	0%		89.5%	95.8%	88.9%	0%		95%	50%	95.1%	0%		94.9%	**-**
Single-Unit Trucks	9	2	0		11	3	1	0		4	1	16	0		17	**-**
Single-Unit Trucks %	3.5%	5.6%	0%		3.7%	4.2%	11.1%	0%		5%	50%	2.8%	0%		3%	**-**
Buses	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Articulated Trucks	20	0	0		20	0	0	0		0	0	12	0		12	**-**
Articulated Trucks %	7.7%	0%	0%		6.8%	0%	0%	0%		0%	0%	2.1%	0%		2.1%	**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		**-**

Peak Hour: 07:30 AM - 08:30 AM Weather: Light Rain (2.76 °C)



BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather: Mist (5.74 °C)



Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

Turning Movement Count (38 . HIGHWAY 50 & PARR BLVD) CustID: 05012559 MioID:

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
07:00:00	0	293	16	0	0	309	0	0	0	0	0	0	20	181	1	0	0	202	3	0	6	0	0	9	520
07:15:00	0	253	15	0	0	268	0	0	0	0	0	0	19	184	0	0	0	203	4	0	5	0	0	9	480
07:30:00	0	223	18	0	0	241	0	0	0	0	0	0	23	181	0	0	0	204	2	0	11	0	0	13	458
07:45:00	0	241	35	0	0	276	0	0	0	0	0	0	23	260	1	0	0	284	6	0	14	0	0	20	580
Hourly	0	1010	84	0	0	1094	0	0	0	0	0	0	85	806	2	0	0	893	15	0	36	0	0	51	2038
08:00:00	0	278	24	0	0	302	0	0	0	0	0	0	32	210	0	0	0	242	4	0	9	0	0	13	557
08:15:00	0	259	24	0	0	283	0	0	0	0	0	0	33	180	0	0	0	213	8	0	11	0	0	19	515
08:30:00	0	252	26	0	0	278	1	0	0	0	0	1	32	196	1	0	0	229	13	0	11	0	0	24	532
08:45:00	0	223	35	0	0	258	0	0	2	0	0	2	24	210	0	0	0	234	18	1	20	0	0	39	533
Hourly	0	1012	109	0	0	1121	1	0	2	0	0	3	121	796	1	0	0	918	43	1	51	0	0	95	2137
BREAK																									
11:00:00	0	176	16	0	0	192	1	0	0	0	0	1	19	176	2	0	0	197	14	1	12	0	0	27	417
11:15:00	1	206	19	0	0	226	0	0	3	0	0	3	22	151	0	0	0	173	18	0	14	0	0	32	434
11:30:00	0	197	16	0	0	213	0	0	0	0	0	0	19	173	1	0	0	193	14	0	11	0	1	25	431
11:45:00	1	191	18	0	0	210	1	0	1	0	0	2	8	178	1	0	0	187	31	1	14	1	0	47	446
Hourly	2	770	69	0	0	841	2	0	4	0	0	6	68	678	4	0	0	750	77	2	51	1	1	131	1728
12:00:00	0	176	31	0	0	207	0	0	2	0	0	2	18	156	1	0	0	175	38	0	14	0	0	52	436
12:15:00	1	182	18	0	0	201	0	0	0	0	0	0	18	216	0	0	0	234	31	0	17	0	0	48	483
12:30:00	0	188	30	1	0	219	0	0	1	0	0	1	18	237	1	0	0	256	19	0	10	0	0	29	505
12:45:00	0	179	26	1	0	206	0	0	0	0	0	0	17	185	0	0	0	202	20	0	15	0	0	35	443
Hourly	1	725	105	2	0	833	0	0	3	0	0	3	71	794	2	0	0	867	108	0	56	0	0	164	1867
13:00:00	2	181	33	0	0	216	0	0	2	0	0	2	21	202	0	0	0	223	24	0	18	0	0	42	483
13:15:00	1	201	20	0	0	222	0	0	1	0	0	1	14	233	0	0	0	247	20	0	16	0	0	36	506
13:30:00	0	181	14	0	0	195	0	0	1	0	0	1	15	213	0	0	0	228	23	0	14	0	0	37	461
13:45:00	0	182	25	0	0	207	1	0	0	0	0	1	14	235	1	0	0	250	15	0	16	0	0	31	489
Hourly	3	745	92	0	0	840	1	0	4	0	0	5	64	883	1	0	0	948	82	0	64	0	0	146	1939
BREAK																									
15:00:00	0	219	18	2	0	239	0	0	1	0	0	1	14	297	1	0	0	312	10	0	17	0	1	27	579
15:15:00	0	214	27	0	0	241	0	0	0	0	0	0	25	275	0	0	0	300	28	0	33	0	0	61	602
15:30:00	0	255	16	0	0	271	1	0	1	0	0	2	12	287	0	0	0	299	23	0	21	0	0	44	616
15:45:00	0	200	23	1	0	224	1	0	0	0	0	1	17	244	0	0	0	261	22	0	23	0	0	45	531
Hourly	0	888	84	3	0	975	2	0	2	0	0	4	68	1103	1	0	0	1172	83	0	94	0	1	177	2328
16:00:00	1	289	14	0	0	304	0	0	2	0	0	2	7	332	0	0	0	339	23	0	41	0	0	64	709
16:15:00	1	211	15	0	0	227	0	0	0	0	0	0	16	289	0	1	0	306	32	0	12	0	0	44	577
16:30:00	0	279	11	0	0	290	0	0	0	0	0	0	19	375	0	0	0	394	33	0	27	0	0	60	744
16:45:00	0	223	11	0	0	234	0	0	0	0	0	0	11	317	0	0	0	328	26	0	26	0	0	52	614
Hourly	2	1002	51	0	0	1055	0	0	2	0	0	2	53	1313	0	1	0	1367	114	0	106	0	0	220	2644
17:00:00	0	352	14	0	0	366	0	0	0	0	0	0	9	338	0	0	0	347	35	0	23	0	0	58	771
17:15:00	0	229	9	0	0	238	1	0	1	0	0	2	9	309	0	0	0	318	31	0	20	0	0	51	609
17:30:00	0	236	19	0	0	255	0	0	0	0	0	0	7	311	0	0	0	318	21	0	26	0	0	47	620
17:45:00	0	168	14	0	0	182	0	0	0	0	0	0	11	255	0	0	0	266	22	0	13	0	0	35	483
Hourly	0	985	56	0	0	1041	1	0	1	0	0	2	36	1213	0	0	0	1249	109	0	82	0	0	191	2483
Grand Total	8	7137	650	5	0	7800	7	0	18	0	0	25	566	7586	11	1	0	8164	631	3	540	1	2	1175	**17164**
Approach%	0.1%	91.5%	8.3%	0.1%		-	28%	0%	72%	0%		-	6.9%	92.9%	0.1%	0%		-	53.7%	0.3%	46%	0.1%		-	**-**
Totals %	0%	41.6%	3.8%	0%		45.4%	0%	0%	0.1%	0%		0.1%	3.3%	44.2%	0.1%	0%		47.6%	3.7%	0%	3.1%	0%		6.8%	**-**

Heavy	2	626	37	0	-	0	0	3	0	-	107	663	2	0	-	23	0	120	0	-	-
Heavy %	25%	8.8%	5.7%	0%	-	0%	0%	16.7%	0%	-	18.9%	8.7%	18.2%	0%	-	3.6%	0%	22.2%	0%	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 08:00 AM - 09:00 AM Weather: Light Rain (16.39 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
08:00:00	0	278	24	0	0	302	0	0	0	0	0	0	32	210	0	0	0	242	4	0	9	0	0	13	557
08:15:00	0	259	24	0	0	283	0	0	0	0	0	0	33	180	0	0	0	213	8	0	11	0	0	19	515
08:30:00	0	252	26	0	0	278	1	0	0	0	0	1	32	196	1	0	0	229	13	0	11	0	0	24	532
08:45:00	0	223	35	0	0	258	0	0	2	0	0	2	24	210	0	0	0	234	18	1	20	0	0	39	533
Grand Total	0	1012	109	0	0	1121	1	0	2	0	0	3	121	796	1	0	0	918	43	1	51	0	0	95	**2137**
Approach%	0%	90.3%	9.7%	0%		-	33.3%	0%	66.7%	0%		-	13.2%	86.7%	0.1%	0%		-	45.3%	1.1%	53.7%	0%		-	**-**
Totals %	0%	47.4%	5.1%	0%		52.5%	0%	0%	0.1%	0%		0.1%	5.7%	37.2%	0%	0%		43%	2%	0%	2.4%	0%		4.4%	**-**
PHF	0	0.91	0.78	0		0.93	0.25	0	0.25	0		0.38	0.92	0.95	0.25	0		0.95	0.6	0.25	0.64	0		0.61	**-**
Heavy	0	94	4	0		98	0	0	1	0		1	8	68	0	0		76	3	0	13	0		16	**-**
Heavy %	0%	9.3%	3.7%	0%		8.7%	0%	0%	50%	0%		33.3%	6.6%	8.5%	0%	0%		8.3%	7%	0%	25.5%	0%		16.8%	**-**
Lights	0	918	105	0		1023	1	0	1	0		2	113	728	1	0		842	40	1	38	0		79	**-**
Lights %	0%	90.7%	96.3%	0%		91.3%	100%	0%	50%	0%		66.7%	93.4%	91.5%	100%	0%		91.7%	93%	100%	74.5%	0%		83.2%	**-**
Single-Unit Trucks	0	47	2	0		49	0	0	1	0		1	5	38	0	0		43	1	0	5	0		6	**-**
Single-Unit Trucks %	0%	4.6%	1.8%	0%		4.4%	0%	0%	50%	0%		33.3%	4.1%	4.8%	0%	0%		4.7%	2.3%	0%	9.8%	0%		6.3%	**-**
Buses	0	6	0	0		6	0	0	0	0		0	0	5	0	0		5	1	0	0	0		1	**-**
Buses %	0%	0.6%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.5%	2.3%	0%	0%	0%		1.1%	**-**
Articulated Trucks	0	41	2	0		43	0	0	0	0		0	3	25	0	0		28	1	0	8	0		9	**-**
Articulated Trucks %	0%	4.1%	1.8%	0%		3.8%	0%	0%	0%	0%		0%	2.5%	3.1%	0%	0%		3.1%	2.3%	0%	15.7%	0%		9.5%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 01:00 PM - 02:00 PM Weather: Light Rain (15.56 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
13:00:00	2	181	33	0	0	216	0	0	2	0	0	2	21	202	0	0	0	223	24	0	18	0	0	42	483
13:15:00	1	201	20	0	0	222	0	0	1	0	0	1	14	233	0	0	0	247	20	0	16	0	0	36	506
13:30:00	0	181	14	0	0	195	0	0	1	0	0	1	15	213	0	0	0	228	23	0	14	0	0	37	461
13:45:00	0	182	25	0	0	207	1	0	0	0	0	1	14	235	1	0	0	250	15	0	16	0	0	31	489
Grand Total	3	745	92	0	0	840	1	0	4	0	0	5	64	883	1	0	0	948	82	0	64	0	0	146	**1939**
Approach%	0.4%	88.7%	11%	0%		-	20%	0%	80%	0%		-	6.8%	93.1%	0.1%	0%		-	56.2%	0%	43.8%	0%		-	**-**
Totals %	0.2%	38.4%	4.7%	0%		43.3%	0.1%	0%	0.2%	0%		0.3%	3.3%	45.5%	0.1%	0%		48.9%	4.2%	0%	3.3%	0%		7.5%	**-**
PHF	0.38	0.93	0.7	0		0.95	0.25	0	0.5	0		0.63	0.76	0.94	0.25	0		0.95	0.85	0	0.89	0		0.87	**-**
Heavy	1	86	2	0		89	0	0	1	0		1	15	106	0	0		121	3	0	23	0		26	**-**
Heavy %	33.3%	11.5%	2.2%	0%		10.6%	0%	0%	25%	0%		20%	23.4%	12%	0%	0%		12.8%	3.7%	0%	35.9%	0%		17.8%	**-**
Lights	2	659	90	0		751	1	0	3	0		4	49	777	1	0		827	79	0	41	0		120	**-**
Lights %	66.7%	88.5%	97.8%	0%		89.4%	100%	0%	75%	0%		80%	76.6%	88%	100%	0%		87.2%	96.3%	0%	64.1%	0%		82.2%	**-**
Single-Unit Trucks	1	45	1	0		47	0	0	1	0		1	7	55	0	0		62	1	0	6	0		7	**-**
Single-Unit Trucks %	33.3%	6%	1.1%	0%		5.6%	0%	0%	25%	0%		20%	10.9%	6.2%	0%	0%		6.5%	1.2%	0%	9.4%	0%		4.8%	**-**
Buses	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	1	0	0	0		1	**-**
Buses %	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	1.2%	0%	0%	0%		0.7%	**-**
Articulated Trucks	0	40	1	0		41	0	0	0	0		0	8	50	0	0		58	1	0	17	0		18	**-**
Articulated Trucks %	0%	5.4%	1.1%	0%		4.9%	0%	0%	0%	0%		0%	12.5%	5.7%	0%	0%		6.1%	1.2%	0%	26.6%	0%		12.3%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

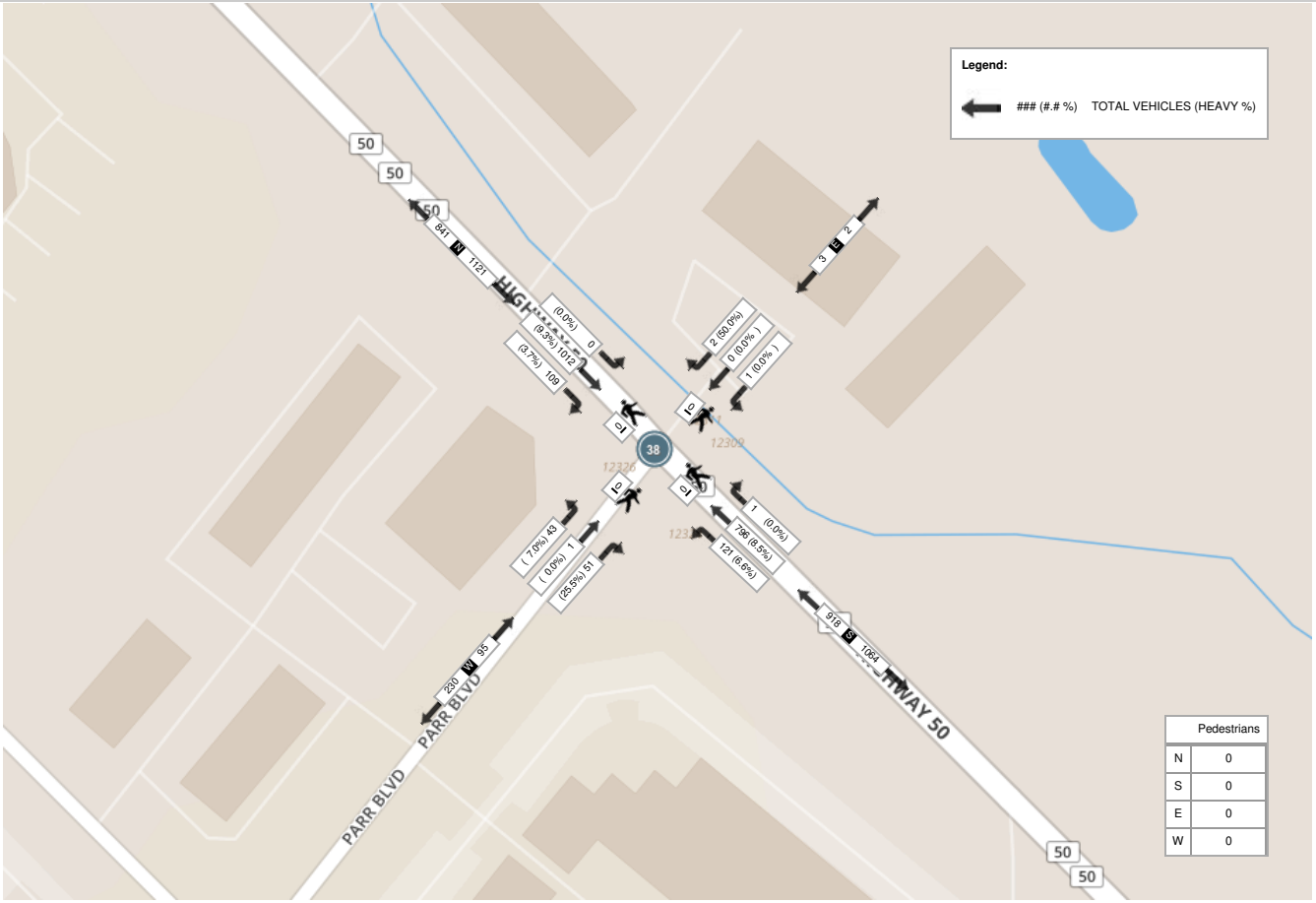
Peak Hour: 04:00 PM - 05:00 PM Weather: Light Rain (14.01 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
16:00:00	1	289	14	0	0	304	0	0	2	0	0	2	7	332	0	0	0	339	23	0	41	0	0	64	709
16:15:00	1	211	15	0	0	227	0	0	0	0	0	0	16	289	0	1	0	306	32	0	12	0	0	44	577
16:30:00	0	279	11	0	0	290	0	0	0	0	0	0	19	375	0	0	0	394	33	0	27	0	0	60	744
16:45:00	0	223	11	0	0	234	0	0	0	0	0	0	11	317	0	0	0	328	26	0	26	0	0	52	614
Grand Total	2	1002	51	0	0	1055	0	0	2	0	0	2	53	1313	0	1	0	1367	114	0	106	0	0	220	**2644**
Approach%	0.2%	95%	4.8%	0%		-	0%	0%	100%	0%		-	3.9%	96%	0%	0.1%		-	51.8%	0%	48.2%	0%		-	**-**
Totals %	0.1%	37.9%	1.9%	0%		39.9%	0%	0%	0.1%	0%		0.1%	2%	49.7%	0%	0%		51.7%	4.3%	0%	4%	0%		8.3%	**-**
PHF	0.5	0.87	0.85	0		0.87	0	0	0.25	0		0.25	0.7	0.88	0	0.25		0.87	0.86	0	0.65	0		0.86	**-**
Heavy	0	50	4	0		54	0	0	0	0		0	12	77	0	0		89	2	0	12	0		14	**-**
Heavy %	0%	5%	7.8%	0%		5.1%	0%	0%	0%	0%		0%	22.6%	5.9%	0%	0%		6.5%	1.8%	0%	11.3%	0%		6.4%	**-**
Lights	2	952	47	0		1001	0	0	2	0		2	41	1236	0	1		1278	112	0	94	0		206	**-**
Lights %	100%	95%	92.2%	0%		94.9%	0%	0%	100%	0%		100%	77.4%	94.1%	0%	100%		93.5%	98.2%	0%	88.7%	0%		93.6%	**-**
Single-Unit Trucks	0	27	1	0		28	0	0	0	0		0	4	45	0	0		49	2	0	7	0		9	**-**
Single-Unit Trucks %	0%	2.7%	2%	0%		2.7%	0%	0%	0%	0%		0%	7.5%	3.4%	0%	0%		3.6%	1.8%	0%	6.6%	0%		4.1%	**-**
Buses	0	4	2	0		6	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	**-**
Buses %	0%	0.4%	3.9%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	19	1	0		20	0	0	0	0		0	8	29	0	0		37	0	0	5	0		5	**-**
Articulated Trucks %	0%	1.9%	2%	0%		1.9%	0%	0%	0%	0%		0%	15.1%	2.2%	0%	0%		2.7%	0%	0%	4.7%	0%		2.3%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

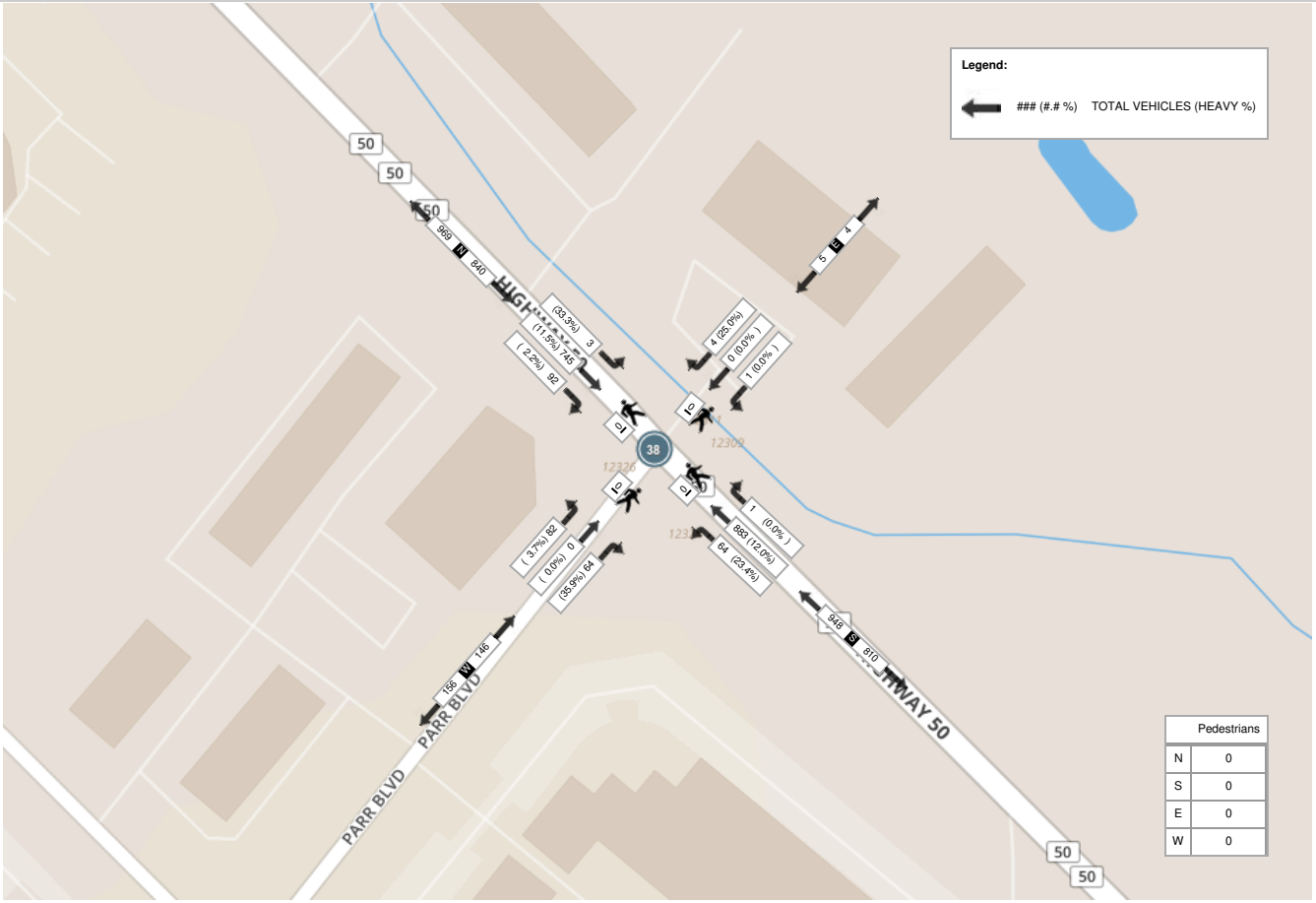
Peak Hour: 08:00 AM - 09:00 AM Weather: Light Rain (16.39 °C)



Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

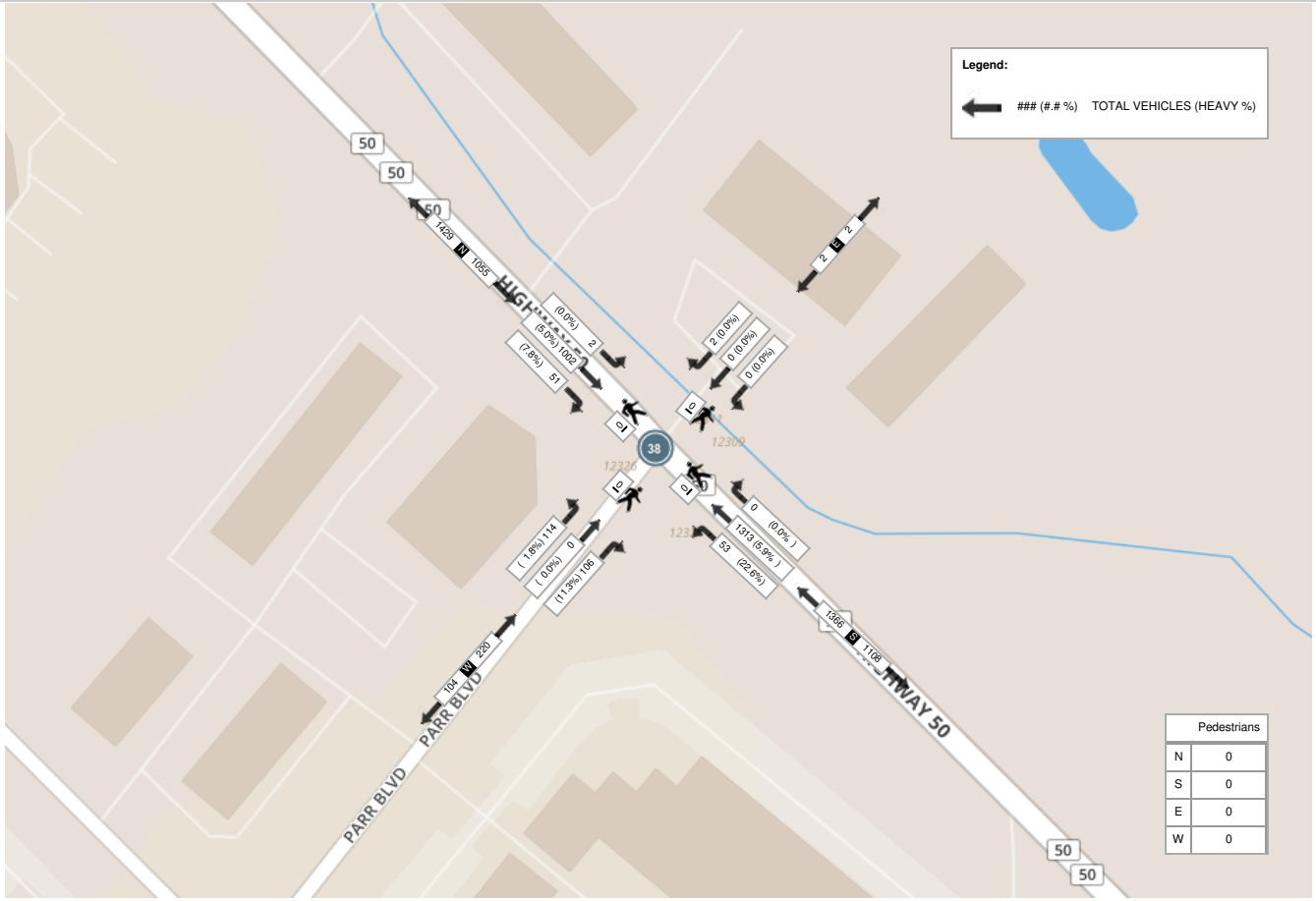
Peak Hour: 01:00 PM - 02:00 PM Weather: Light Rain (15.56 °C)



Spectrum

Turning Movement Count
Location Name: HIGHWAY 50 & PARR BLVD
Date: Wed, Oct 02, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 04:00 PM - 05:00 PM Weather: Light Rain (14.01 °C)



Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Turning Movement Count (47 . HWY 50 & GEORGE BOLTON PKWY) CustID: 05013164 MioID: 506039

Start Time	Southbound HWY 50						Westbound ACCESS						Northbound HWY 50						Eastbound GEORGE BOLTON PKWY						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
07:00:00	1	321	15	0	0	337	0	0	1	0	0	1	11	144	0	0	1	155	5	0	14	0	1	19	512
07:15:00	0	327	17	0	0	344	0	0	2	0	0	2	22	152	0	0	0	174	2	0	19	0	1	21	541
07:30:00	0	343	23	0	0	366	0	0	2	0	0	2	19	144	1	0	0	164	6	0	10	0	0	16	548
07:45:00	1	301	31	0	0	333	0	0	0	0	0	0	22	272	0	0	0	294	14	0	14	0	0	28	655
Hourly	2	1292	86	0	0	1380	0	0	5	0	0	5	74	712	1	0	1	787	27	0	57	0	2	84	2256
08:00:00	0	307	22	0	0	329	0	0	0	1	0	1	16	165	0	0	0	181	12	0	14	0	0	26	537
08:15:00	0	280	32	0	0	312	0	0	0	0	0	0	22	178	0	0	0	200	16	0	17	0	0	33	545
08:30:00	0	314	24	0	0	338	0	0	0	2	0	2	15	201	0	0	0	216	16	0	22	0	0	38	594
08:45:00	1	271	27	0	0	299	0	0	1	1	0	2	18	196	0	0	0	214	15	0	13	0	0	28	543
Hourly	1	1172	105	0	0	1278	0	0	1	4	0	5	71	740	0	0	0	811	59	0	66	0	0	125	2219
BREAK																									
11:00:00	0	193	17	0	0	210	0	1	0	0	0	1	16	175	0	0	0	191	21	1	24	0	0	46	448
11:15:00	0	194	18	0	0	212	0	0	1	0	0	1	10	155	0	0	0	165	14	0	15	0	1	29	407
11:30:00	0	216	29	0	0	245	1	0	0	0	0	1	12	189	0	0	0	201	23	0	15	0	0	38	485
11:45:00	1	194	22	0	0	217	0	0	1	0	0	1	17	199	0	0	0	216	26	0	9	0	0	35	469
Hourly	1	797	86	0	0	884	1	1	2	0	0	4	55	718	0	0	0	773	84	1	63	0	1	148	1809
12:00:00	1	192	37	0	1	230	0	0	1	0	0	1	11	210	0	0	0	221	27	0	21	0	0	48	500
12:15:00	1	176	32	0	0	209	0	0	0	0	0	0	16	199	0	0	0	215	26	0	11	0	1	37	461
12:30:00	0	186	35	0	0	221	0	0	0	0	0	0	15	211	0	0	0	226	31	0	20	0	0	51	498
12:45:00	1	178	37	0	1	216	0	0	1	0	1	1	12	192	0	0	0	204	30	0	16	0	0	46	467
Hourly	3	732	141	0	2	876	0	0	2	0	1	2	54	812	0	0	0	866	114	0	68	0	1	182	1926
13:00:00	1	219	29	0	0	249	0	0	1	0	0	1	14	218	0	0	0	232	28	0	13	0	0	41	523
13:15:00	1	203	26	0	0	230	0	0	1	0	0	1	17	212	0	0	0	229	25	0	22	0	0	47	507
13:30:00	0	171	28	0	0	199	0	0	0	0	0	0	16	215	0	1	0	232	15	0	12	0	0	27	458
13:45:00	0	189	27	1	0	217	0	0	0	0	0	0	12	243	0	0	0	255	9	0	11	0	0	20	492
Hourly	2	782	110	1	0	895	0	0	2	0	0	2	59	888	0	1	0	948	77	0	58	0	0	135	1980
BREAK																									
15:00:00	0	215	28	0	0	243	0	0	0	0	0	0	9	297	0	0	0	306	23	0	28	0	1	51	600
15:15:00	0	200	27	0	0	227	0	1	1	0	0	2	29	308	1	0	0	338	28	0	22	0	0	50	617
15:30:00	0	231	31	0	0	262	0	0	0	0	0	0	21	325	0	0	0	346	26	0	22	0	0	48	656
15:45:00	1	195	27	0	0	223	0	0	0	0	0	0	14	345	0	0	0	359	25	0	19	0	1	44	626
Hourly	1	841	113	0	0	955	0	1	1	0	0	2	73	1275	1	0	0	1349	102	0	91	0	2	193	2499
16:00:00	0	218	29	1	0	248	0	0	0	0	0	0	10	342	0	0	0	352	38	0	42	0	0	80	680
16:15:00	0	224	23	0	0	247	0	0	0	0	2	0	21	361	0	0	0	382	24	0	34	0	0	58	687
16:30:00	1	235	22	0	0	258	0	0	0	0	0	0	19	368	0	0	0	387	37	0	35	0	0	72	717
16:45:00	0	208	21	0	0	229	1	2	0	0	0	3	8	337	0	0	0	345	26	0	21	0	0	47	624
Hourly	1	885	95	1	0	982	1	2	0	0	2	3	58	1408	0	0	0	1466	125	0	132	0	0	257	2708
17:00:00	0	240	27	0	0	267	0	3	2	0	0	5	21	329	0	0	0	350	31	0	41	0	1	72	694
17:15:00	0	218	22	0	0	240	0	0	3	0	1	3	14	315	0	0	1	329	40	0	26	0	0	66	638
17:30:00	0	242	21	0	0	263	0	0	0	0	0	0	13	314	0	0	0	327	29	0	25	0	0	54	644
17:45:00	0	197	18	0	0	215	0	0	0	0	0	0	15	294	0	0	0	309	24	0	18	0	0	42	566
Hourly	0	897	88	0	0	985	0	3	5	0	1	8	63	1252	0	0	1	1315	124	0	110	0	1	234	2542
Grand Total	11	7398	824	2	2	8235	2	7	18	4	4	31	507	7805	2	1	2	8315	712	1	645	0	7	1358	**17939**
Approach%	0.1%	89.8%	10%	0%		-	6.5%	22.6%	58.1%	12.9%		-	6.1%	93.9%	0%	0%		-	52.4%	0.1%	47.5%	0%		-	**-**
Totals %	0.1%	41.2%	4.6%	0%		45.9%	0%	0%	0.1%	0%		0.2%	2.8%	43.5%	0%	0%		46.4%	4%	0%	3.6%	0%		7.6%	**-**

Heavy	0	552	26	0	-	0	0	0	0	-	113	509	0	0	-	26	0	108	0	-	-
Heavy %	0%	7.5%	3.2%	0%	-	0%	0%	0%	0%	-	22.3%	6.5%	0%	0%	-	3.7%	0%	16.7%	0%	-	-
Bicycles	0	0	1	0	-	0	0	0	0	-	0	1	0	0	-	0	0	0	0	-	-
Bicycle %	0%	0%	0.1%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	-

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 07:00 AM - 08:00 AM Weather: Clear (-6.4 °C)

Start Time	Southbound HWY 50						Westbound ACCESS						Northbound HWY 50						Eastbound GEORGE BOLTON PKWY						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
07:00:00	1	321	15	0	0	337	0	0	1	0	0	1	11	144	0	0	1	155	5	0	14	0	1	19	512
07:15:00	0	327	17	0	0	344	0	0	2	0	0	2	22	152	0	0	0	174	2	0	19	0	1	21	541
07:30:00	0	343	23	0	0	366	0	0	2	0	0	2	19	144	1	0	0	164	6	0	10	0	0	16	548
07:45:00	1	301	31	0	0	333	0	0	0	0	0	0	22	272	0	0	0	294	14	0	14	0	0	28	655
Grand Total	2	1292	86	0	0	1380	0	0	5	0	0	5	74	712	1	0	1	787	27	0	57	0	2	84	**2256**
Approach%	0.1%	93.6%	6.2%	0%		-	0%	0%	100%	0%		-	9.4%	90.5%	0.1%	0%		-	32.1%	0%	67.9%	0%		-	**-**
Totals %	0.1%	57.3%	3.8%	0%		61.2%	0%	0%	0.2%	0%		0.2%	3.3%	31.6%	0%	0%		34.9%	1.2%	0%	2.5%	0%		3.7%	**-**
PHF	0.5	0.94	0.69	0		0.94	0	0	0.63	0		0.63	0.84	0.65	0.25	0		0.67	0.48	0	0.75	0		0.75	**-**
Heavy	0	76	0	0		76	0	0	0	0		0	8	53	0	0		61	1	0	23	0		24	**-**
Heavy %	0%	5.9%	0%	0%		5.5%	0%	0%	0%	0%		0%	10.8%	7.4%	0%	0%		7.8%	3.7%	0%	40.4%	0%		28.6%	**-**
Lights	2	1216	86	0		1304	0	0	5	0		5	66	659	1	0		726	26	0	34	0		60	**-**
Lights %	100%	94.1%	100%	0%		94.5%	0%	0%	100%	0%		100%	89.2%	92.6%	100%	0%		92.2%	96.3%	0%	59.6%	0%		71.4%	**-**
Single-Unit Trucks	0	32	0	0		32	0	0	0	0		0	3	26	0	0		29	1	0	13	0		14	**-**
Single-Unit Trucks %	0%	2.5%	0%	0%		2.3%	0%	0%	0%	0%		0%	4.1%	3.7%	0%	0%		3.7%	3.7%	0%	22.8%	0%		16.7%	**-**
Buses	0	8	0	0		8	0	0	0	0		0	0	11	0	0		11	0	0	0	0		0	**-**
Buses %	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	1.5%	0%	0%		1.4%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	36	0	0		36	0	0	0	0		0	5	16	0	0		21	0	0	10	0		10	**-**
Articulated Trucks %	0%	2.8%	0%	0%		2.6%	0%	0%	0%	0%		0%	6.8%	2.2%	0%	0%		2.7%	0%	0%	17.5%	0%		11.9%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	33.3%		-	-	-	-	66.7%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 01:00 PM - 02:00 PM Weather: Partly Cloudy (-2 °C)

Start Time	Southbound HWY 50						Westbound ACCESS						Northbound HWY 50						Eastbound GEORGE BOLTON PKWY						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
13:00:00	1	219	29	0	0	249	0	0	1	0	0	1	14	218	0	0	0	232	28	0	13	0	0	41	523
13:15:00	1	203	26	0	0	230	0	0	1	0	0	1	17	212	0	0	0	229	25	0	22	0	0	47	507
13:30:00	0	171	28	0	0	199	0	0	0	0	0	0	16	215	0	1	0	232	15	0	12	0	0	27	458
13:45:00	0	189	27	1	0	217	0	0	0	0	0	0	12	243	0	0	0	255	9	0	11	0	0	20	492
Grand Total	2	782	110	1	0	895	0	0	2	0	0	2	59	888	0	1	0	948	77	0	58	0	0	135	**1980**
Approach%	0.2%	87.4%	12.3%	0.1%		-	0%	0%	100%	0%		-	6.2%	93.7%	0%	0.1%		-	57%	0%	43%	0%		-	**-**
Totals %	0.1%	39.5%	5.6%	0.1%		45.2%	0%	0%	0.1%	0%		0.1%	3%	44.8%	0%	0.1%		47.9%	3.9%	0%	2.9%	0%		6.8%	**-**
PHF	0.5	0.89	0.95	0.25		0.9	0	0	0.5	0		0.5	0.87	0.91	0	0.25		0.93	0.69	0	0.66	0		0.72	**-**
Heavy	0	86	6	0		92	0	0	0	0		0	18	66	0	0		84	4	0	17	0		21	**-**
Heavy %	0%	11%	5.5%	0%		10.3%	0%	0%	0%	0%		0%	30.5%	7.4%	0%	0%		8.9%	5.2%	0%	29.3%	0%		15.6%	**-**
Lights	2	696	104	1		803	0	0	2	0		2	41	822	0	1		864	73	0	41	0		114	**-**
Lights %	100%	89%	94.5%	100%		89.7%	0%	0%	100%	0%		100%	69.5%	92.6%	0%	100%		91.1%	94.8%	0%	70.7%	0%		84.4%	**-**
Single-Unit Trucks	0	43	4	0		47	0	0	0	0		0	9	39	0	0		48	2	0	8	0		10	**-**
Single-Unit Trucks %	0%	5.5%	3.6%	0%		5.3%	0%	0%	0%	0%		0%	15.3%	4.4%	0%	0%		5.1%	2.6%	0%	13.8%	0%		7.4%	**-**
Buses	0	3	0	0		3	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	**-**
Buses %	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	40	2	0		42	0	0	0	0		0	9	25	0	0		34	2	0	9	0		11	**-**
Articulated Trucks %	0%	5.1%	1.8%	0%		4.7%	0%	0%	0%	0%		0%	15.3%	2.8%	0%	0%		3.6%	2.6%	0%	15.5%	0%		8.1%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 04:00 PM - 05:00 PM Weather: Clear (1.4 °C)

Start Time	Southbound HWY 50						Westbound ACCESS						Northbound HWY 50						Eastbound GEORGE BOLTON PKWY						Int. Total (15 min)
	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	Left	Thru	Right	U-Turn	Peds	Approach Total	
16:00:00	0	218	29	1	0	248	0	0	0	0	0	0	10	342	0	0	0	352	38	0	42	0	0	80	680
16:15:00	0	224	23	0	0	247	0	0	0	0	2	0	21	361	0	0	0	382	24	0	34	0	0	58	687
16:30:00	1	235	22	0	0	258	0	0	0	0	0	0	19	368	0	0	0	387	37	0	35	0	0	72	717
16:45:00	0	208	21	0	0	229	1	2	0	0	0	3	8	337	0	0	0	345	26	0	21	0	0	47	624
Grand Total	1	885	95	1	0	982	1	2	0	0	2	3	58	1408	0	0	0	1466	125	0	132	0	0	257	**2708**
Approach%	0.1%	90.1%	9.7%	0.1%		-	33.3%	66.7%	0%	0%		-	4%	96%	0%	0%		-	48.6%	0%	51.4%	0%		-	**-**
Totals %	0%	32.7%	3.5%	0%		36.3%	0%	0.1%	0%	0%		0.1%	2.1%	52%	0%	0%		54.1%	4.6%	0%	4.9%	0%		9.5%	**-**
PHF	0.25	0.94	0.82	0.25		0.95	0.25	0.25	0	0		0.25	0.69	0.96	0	0		0.95	0.82	0	0.79	0		0.8	**-**
Heavy	0	46	5	0		51	0	0	0	0		0	16	67	0	0		83	3	0	5	0		8	**-**
Heavy %	0%	5.2%	5.3%	0%		5.2%	0%	0%	0%	0%		0%	27.6%	4.8%	0%	0%		5.7%	2.4%	0%	3.8%	0%		3.1%	**-**
Lights	1	839	90	1		931	1	2	0	0		3	42	1341	0	0		1383	122	0	127	0		249	**-**
Lights %	100%	94.8%	94.7%	100%		94.8%	100%	100%	0%	0%		100%	72.4%	95.2%	0%	0%		94.3%	97.6%	0%	96.2%	0%		96.9%	**-**
Single-Unit Trucks	0	38	4	0		42	0	0	0	0		0	12	34	0	0		46	3	0	1	0		4	**-**
Single-Unit Trucks %	0%	4.3%	4.2%	0%		4.3%	0%	0%	0%	0%		0%	20.7%	2.4%	0%	0%		3.1%	2.4%	0%	0.8%	0%		1.6%	**-**
Buses	0	4	0	0		4	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	**-**
Buses %	0%	0.5%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	4	1	0		5	0	0	0	0		0	4	28	0	0		32	0	0	4	0		4	**-**
Articulated Trucks %	0%	0.5%	1.1%	0%		0.5%	0%	0%	0%	0%		0%	6.9%	2%	0%	0%		2.2%	0%	0%	3%	0%		1.6%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 07:00 AM - 08:00 AM Weather: Clear (-6.4 °C)

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 01:00 PM - 02:00 PM Weather: Partly Cloudy (-2 °C)

Spectrum

Turning Movement Count
Location Name: HWY 50 & GEORGE BOLTON PKWY
Date: Tue, Mar 20, 2018 Deployment Lead: Patrick Filopoulos

Peak Hour: 04:00 PM - 05:00 PM Weather: Clear (1.4 °C)

Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Turning Movement Count (22 . HWY 50 & INDUSTRIAL RD) CustID: 05013323 MioID: 653649

Start Time	N Approach HWY 50					E Approach INDUSTRIAL RD					S Approach HWY 50					Int. Total (15 min)	Int. Total (1 hr)
	Left N:E	Thru N:S	U-Turn N:N	Peds N:	Approach Total	Left E:S	Right E:N	U-Turn E:E	Peds E:	Approach Total	Thru S:N	Right S:E	U-Turn S:S	Peds S:	Approach Total		
07:00:00	7	345	0	0	352	8	6	0	0	14	147	4	0	0	151	517	
07:15:00	4	379	0	0	383	10	5	0	0	15	179	7	0	0	186	584	
07:30:00	7	333	0	0	340	13	8	0	0	21	186	9	0	0	195	556	
07:45:00	5	355	0	0	360	13	8	0	0	21	249	5	0	0	254	635	2292
08:00:00	11	349	0	0	360	11	8	0	0	19	217	4	0	0	221	600	2375
08:15:00	8	298	0	0	306	9	7	0	0	16	190	8	0	0	198	520	2311
08:30:00	11	316	0	0	327	7	9	0	0	16	205	6	0	0	211	554	2309
08:45:00	21	330	0	0	351	9	12	0	0	21	220	4	0	0	224	596	2270
BREAK																	
11:00:00	13	224	0	0	237	13	11	0	0	24	211	10	0	0	221	482	
11:15:00	11	221	0	0	232	11	22	0	0	33	227	13	0	1	240	505	
11:30:00	13	239	0	0	252	3	25	0	0	28	199	8	0	0	207	487	
11:45:00	13	224	0	0	237	12	18	0	0	30	244	11	0	0	255	522	1996
12:00:00	16	239	0	0	255	6	17	0	0	23	242	15	0	0	257	535	2049
12:15:00	20	263	0	0	283	4	24	0	0	28	265	10	0	0	275	586	2130
12:30:00	18	229	0	0	247	7	22	0	0	29	266	9	0	0	275	551	2194
12:45:00	12	252	0	0	264	9	24	0	0	33	219	11	0	2	230	527	2199
13:00:00	16	270	0	0	286	5	17	0	0	22	248	14	0	0	262	570	2234
13:15:00	11	224	0	0	235	9	21	0	0	30	262	8	0	0	270	535	2183
13:30:00	19	222	0	0	241	11	16	0	0	27	232	12	0	0	244	512	2144
13:45:00	13	248	0	0	261	5	13	0	0	18	235	9	0	0	244	523	2140
BREAK																	
15:00:00	11	252	0	0	263	9	17	0	0	26	296	18	0	0	314	603	
15:15:00	7	230	0	0	237	6	20	0	0	26	322	19	0	0	341	604	
15:30:00	14	294	0	0	308	11	14	0	0	25	337	13	0	0	350	683	
15:45:00	10	223	0	0	233	5	17	0	0	22	364	19	0	0	383	638	2528
16:00:00	8	299	0	0	307	22	25	0	0	47	387	14	0	0	401	755	2680
16:15:00	15	260	0	0	275	2	16	0	0	18	331	18	0	0	349	642	2718
16:30:00	7	273	0	0	280	9	31	0	0	40	416	8	0	1	424	744	2779
16:45:00	18	279	0	0	297	6	24	1	0	31	360	16	0	0	376	704	2845
17:00:00	8	314	0	0	322	9	15	0	0	24	421	19	0	0	440	786	2876
17:15:00	13	251	0	0	264	5	9	0	2	14	385	14	0	0	399	677	2911
17:30:00	9	239	0	0	248	3	12	0	1	15	330	10	0	1	340	603	2770

17:45:00	7	227	0	0	234	7	10	0	0	17	371	6	0	0	377	628	2694
Grand Total	376	8701	0	0	9077	269	503	1	3	773	8763	351	0	5	9114	**18964**	-
Approach%	4.1%	95.9%	0%		-	34.8%	65.1%	0.1%		-	96.1%	3.9%	0%		-	**-**	-
Totals %	2%	45.9%	0%		47.9%	1.4%	2.7%	0%		4.1%	46.2%	1.9%	0%		48.1%	**-**	-
Heavy	16	657	0		-	27	28	0		-	598	61	0		-	**-**	-
Heavy %	4.3%	7.6%	0%		-	10%	5.6%	0%		-	6.8%	17.4%	0%		-	**-**	-
Bicycles	0	2	0		-	0	0	0		-	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0%	0%	0%		-	**-**	-

Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 07:15 AM - 08:15 AM Weather: Broken Clouds (4.4 °C)

Start Time	N Approach HWY 50					E Approach INDUSTRIAL RD					S Approach HWY 50					Int. Total (15 min)
	Left	Thru	U-Turn	Peds	Approach Total	Left	Right	U-Turn	Peds	Approach Total	Thru	Right	U-Turn	Peds	Approach Total	
07:15:00	4	379	0	0	383	10	5	0	0	15	179	7	0	0	186	584
07:30:00	7	333	0	0	340	13	8	0	0	21	186	9	0	0	195	556
07:45:00	5	355	0	0	360	13	8	0	0	21	249	5	0	0	254	635
08:00:00	11	349	0	0	360	11	8	0	0	19	217	4	0	0	221	600
Grand Total	27	1416	0	0	1443	47	29	0	0	76	831	25	0	0	856	**2375**
Approach%	1.9%	98.1%	0%		-	61.8%	38.2%	0%		-	97.1%	2.9%	0%		-	**-**
Totals %	1.1%	59.6%	0%		60.8%	2%	1.2%	0%		3.2%	35%	1.1%	0%		36%	**-**
PHF	0.61	0.93	0		0.94	0.9	0.91	0		0.9	0.83	0.69	0		0.84	**-**
Heavy	0	111	0		111	5	6	0		11	63	4	0		67	**-**
Heavy %	0%	7.8%	0%		7.7%	10.6%	20.7%	0%		14.5%	7.6%	16%	0%		7.8%	**-**
Lights	27	1305	0		1332	42	23	0		65	768	21	0		789	**-**
Lights %	100%	92.2%	0%		92.3%	89.4%	79.3%	0%		85.5%	92.4%	84%	0%		92.2%	**-**
Single-Unit Trucks	0	51	0		51	2	4	0		6	40	2	0		42	**-**
Single-Unit Trucks %	0%	3.6%	0%		3.5%	4.3%	13.8%	0%		7.9%	4.8%	8%	0%		4.9%	**-**
Buses	0	9	0		9	0	1	0		1	4	0	0		4	**-**
Buses %	0%	0.6%	0%		0.6%	0%	3.4%	0%		1.3%	0.5%	0%	0%		0.5%	**-**
Articulated Trucks	0	51	0		51	3	1	0		4	19	2	0		21	**-**
Articulated Trucks %	0%	3.6%	0%		3.5%	6.4%	3.4%	0%		5.3%	2.3%	8%	0%		2.5%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 12:15 PM - 01:15 PM Weather: Scattered Clouds (9.84 °C)

Start Time	N Approach HWY 50					E Approach INDUSTRIAL RD					S Approach HWY 50					Int. Total (15 min)
	Left	Thru	U-Turn	Peds	Approach Total	Left	Right	U-Turn	Peds	Approach Total	Thru	Right	U-Turn	Peds	Approach Total	
12:15:00	20	263	0	0	283	4	24	0	0	28	265	10	0	0	275	586
12:30:00	18	229	0	0	247	7	22	0	0	29	266	9	0	0	275	551
12:45:00	12	252	0	0	264	9	24	0	0	33	219	11	0	2	230	527
13:00:00	16	270	0	0	286	5	17	0	0	22	248	14	0	0	262	570
Grand Total	66	1014	0	0	1080	25	87	0	0	112	998	44	0	2	1042	**2234**
Approach%	6.1%	93.9%	0%		-	22.3%	77.7%	0%		-	95.8%	4.2%	0%		-	**-**
Totals %	3%	45.4%	0%		48.3%	1.1%	3.9%	0%		5%	44.7%	2%	0%		46.6%	**-**
PHF	0.83	0.94	0		0.94	0.69	0.91	0		0.85	0.94	0.79	0		0.95	**-**
Heavy	4	83	0		87	1	5	0		6	83	7	0		90	**-**
Heavy %	6.1%	8.2%	0%		8.1%	4%	5.7%	0%		5.4%	8.3%	15.9%	0%		8.6%	**-**
Lights	62	931	0		993	24	82	0		106	915	37	0		952	**-**
Lights %	93.9%	91.8%	0%		91.9%	96%	94.3%	0%		94.6%	91.7%	84.1%	0%		91.4%	**-**
Single-Unit Trucks	4	41	0		45	1	5	0		6	45	3	0		48	**-**
Single-Unit Trucks %	6.1%	4%	0%		4.2%	4%	5.7%	0%		5.4%	4.5%	6.8%	0%		4.6%	**-**
Buses	0	3	0		3	0	0	0		0	5	1	0		6	**-**
Buses %	0%	0.3%	0%		0.3%	0%	0%	0%		0%	0.5%	2.3%	0%		0.6%	**-**
Articulated Trucks	0	39	0		39	0	0	0		0	33	3	0		36	**-**
Articulated Trucks %	0%	3.8%	0%		3.6%	0%	0%	0%		0%	3.3%	6.8%	0%		3.5%	**-**
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	0%		-	-	-	100%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

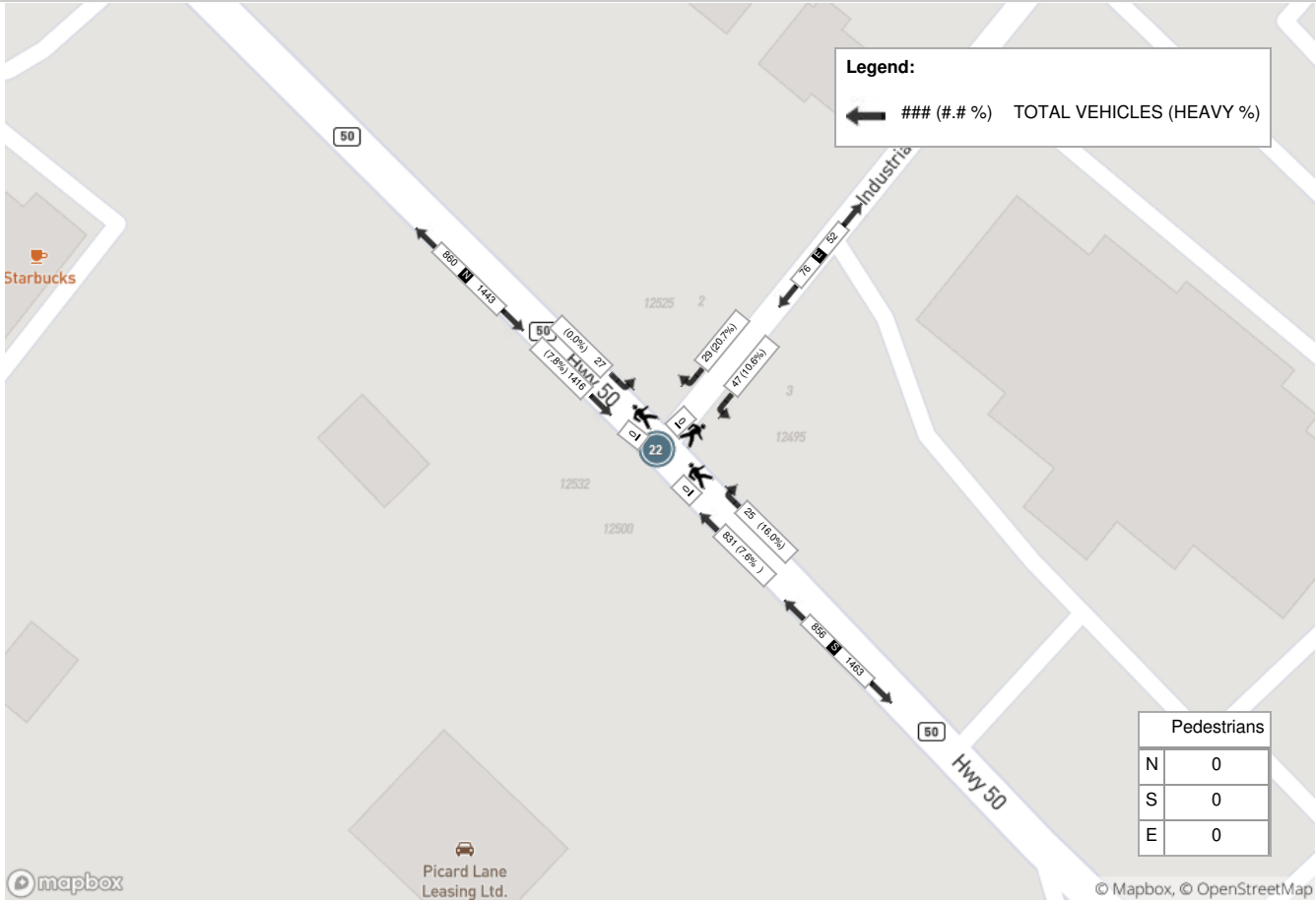
Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 04:30 PM - 05:30 PM Weather: Broken Clouds (10.63 °C)

Start Time	N Approach HWY 50					E Approach INDUSTRIAL RD					S Approach HWY 50					Int. Total (15 min)
	Left	Thru	U-Turn	Peds	Approach Total	Left	Right	U-Turn	Peds	Approach Total	Thru	Right	U-Turn	Peds	Approach Total	
16:30:00	7	273	0	0	280	9	31	0	0	40	416	8	0	1	424	744
16:45:00	18	279	0	0	297	6	24	1	0	31	360	16	0	0	376	704
17:00:00	8	314	0	0	322	9	15	0	0	24	421	19	0	0	440	786
17:15:00	13	251	0	0	264	5	9	0	2	14	385	14	0	0	399	677
Grand Total	46	1117	0	0	1163	29	79	1	2	109	1582	57	0	1	1639	**2911**
Approach%	4%	96%	0%		-	26.6%	72.5%	0.9%		-	96.5%	3.5%	0%		-	**-**
Totals %	1.6%	38.4%	0%		40%	1%	2.7%	0%		3.7%	54.3%	2%	0%		56.3%	**-**
PHF	0.64	0.89	0		0.9	0.81	0.64	0.25		0.68	0.94	0.75	0		0.93	**-**
Heavy	4	54	0		58	4	3	0		7	74	10	0		84	**-**
Heavy %	8.7%	4.8%	0%		5%	13.8%	3.8%	0%		6.4%	4.7%	17.5%	0%		5.1%	**-**
Lights	42	1063	0		1105	25	76	1		102	1508	47	0		1555	**-**
Lights %	91.3%	95.2%	0%		95%	86.2%	96.2%	100%		93.6%	95.3%	82.5%	0%		94.9%	**-**
Single-Unit Trucks	3	30	0		33	2	1	0		3	39	6	0		45	**-**
Single-Unit Trucks %	6.5%	2.7%	0%		2.8%	6.9%	1.3%	0%		2.8%	2.5%	10.5%	0%		2.7%	**-**
Buses	1	1	0		2	0	1	0		1	6	1	0		7	**-**
Buses %	2.2%	0.1%	0%		0.2%	0%	1.3%	0%		0.9%	0.4%	1.8%	0%		0.4%	**-**
Articulated Trucks	0	23	0		23	2	1	0		3	29	3	0		32	**-**
Articulated Trucks %	0%	2.1%	0%		2%	6.9%	1.3%	0%		2.8%	1.8%	5.3%	0%		2%	**-**
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	0%		-	-	-	66.7%		-	-	-	33.3%		**-**
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Peak Hour: 07:15 AM - 08:15 AM Weather: Broken Clouds (4.4 °C)

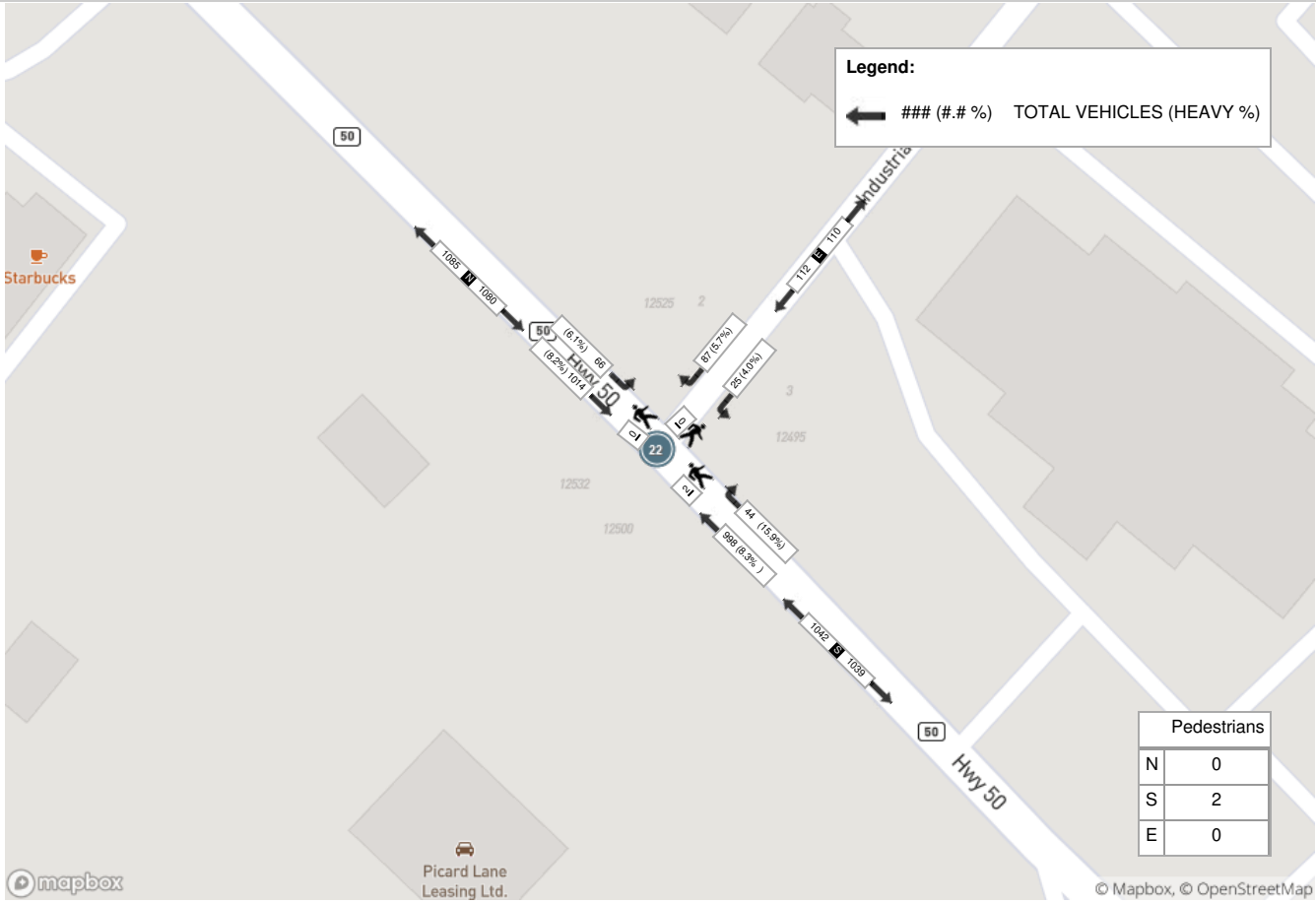


	Pedestrians
N	0
S	0
E	0

Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 12:15 PM - 01:15 PM Weather: Scattered Clouds (9.84 °C)

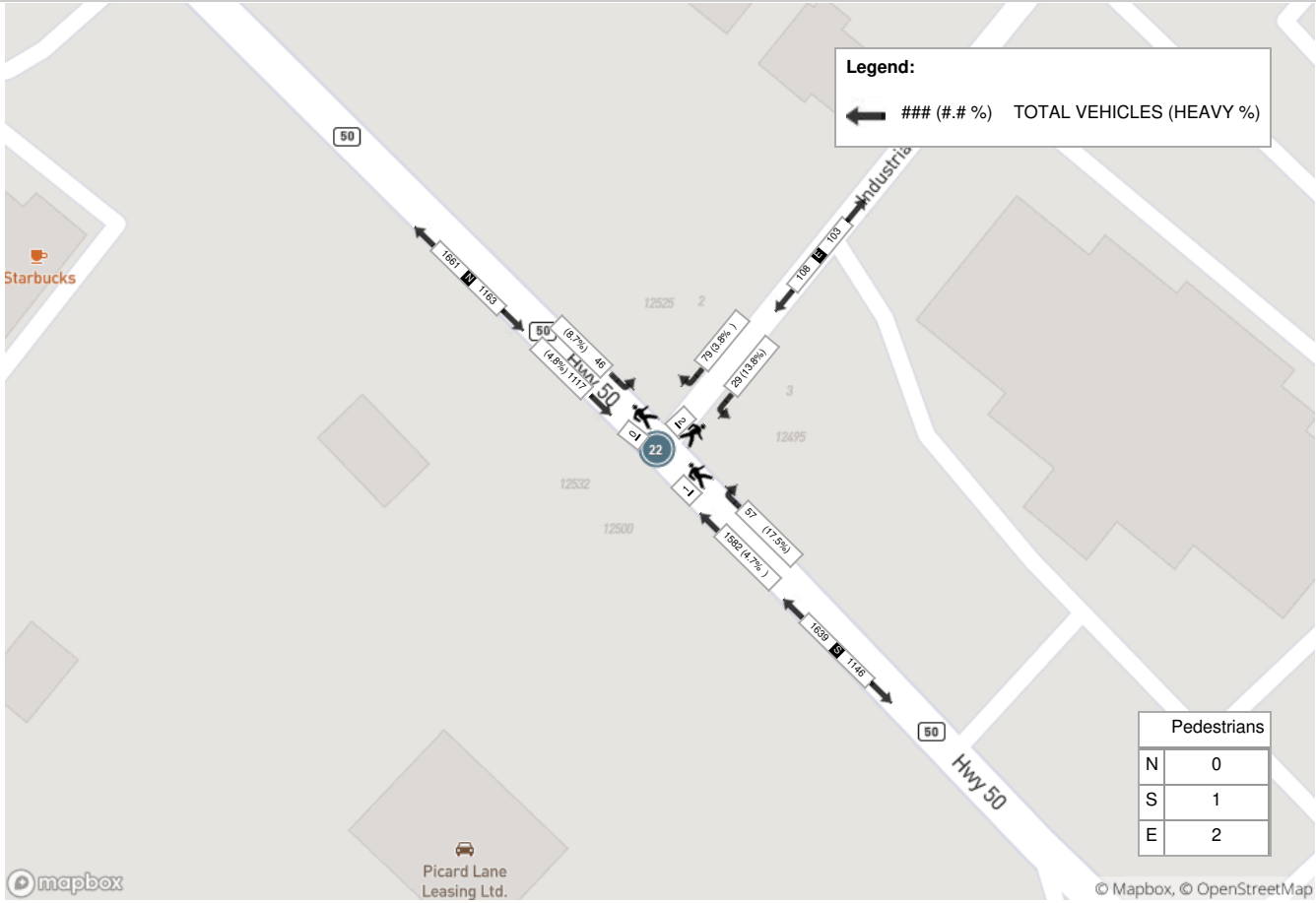


	Pedestrians
N	0
S	2
E	0

Spectrum

Turning Movement Count
Location Name: HWY 50 & INDUSTRIAL RD
Date: Wed, May 08, 2019 Deployment Lead: Patrick Filopoulos

Peak Hour: 04:30 PM - 05:30 PM Weather: Broken Clouds (10.63 °C)



Pedestrians	
N	0
S	1
E	2

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Turning Movement Count (5 . HWY 50 & MAYFIELD RD) CustID: 01400000 MioID:

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
07:00:00	1	246	14	0	0	261	114	88	1	0	0	203	29	162	42	0	0	233	20	31	32	0	0	83	780
07:15:00	1	319	30	0	0	350	102	85	3	0	0	190	18	196	41	0	0	255	17	25	37	0	0	79	874
07:30:00	0	233	19	0	0	252	115	113	5	0	0	233	26	187	33	0	0	246	24	35	27	0	0	86	817
07:45:00	4	261	24	0	0	289	118	82	6	0	0	206	32	278	45	0	0	355	27	26	47	0	0	100	950
Hourly	6	1059	87	0	0	1152	449	368	15	0	0	832	105	823	161	0	0	1089	88	117	143	0	0	348	3421
08:00:00	3	283	33	0	0	319	115	66	10	0	0	191	17	226	55	0	0	298	24	30	29	0	0	83	891
08:15:00	4	231	18	0	0	253	119	60	9	0	0	188	31	232	38	0	0	301	27	29	30	0	0	86	828
08:30:00	2	252	23	0	0	277	100	44	7	0	0	151	29	221	54	0	0	304	32	34	21	0	0	87	819
08:45:00	6	255	21	0	0	282	116	41	7	0	0	164	22	237	36	0	0	295	33	30	33	0	1	96	837
Hourly	15	1021	95	0	0	1131	450	211	33	0	0	694	99	916	183	0	0	1198	116	123	113	0	1	352	3375
BREAK																									
11:00:00	5	198	22	0	0	225	99	14	8	0	0	121	25	162	41	0	0	228	23	17	32	0	0	72	646
11:15:00	6	187	26	0	0	219	68	19	9	0	0	96	30	153	39	0	0	222	30	13	31	0	0	74	611
11:30:00	7	169	21	0	0	197	56	19	8	0	0	83	43	185	57	0	0	285	18	23	39	0	0	80	645
11:45:00	6	179	26	0	0	211	47	19	7	0	0	73	26	172	37	0	0	235	21	26	43	0	0	90	609
Hourly	24	733	95	0	0	852	270	71	32	0	0	373	124	672	174	0	0	970	92	79	145	0	0	316	2511
12:00:00	4	167	25	0	0	196	58	25	6	0	0	89	29	190	55	0	0	274	20	11	30	0	1	61	620
12:15:00	3	186	25	0	0	214	56	11	4	0	0	71	34	158	53	0	0	245	28	22	39	0	0	89	619
12:30:00	4	166	24	0	0	194	35	19	13	0	0	67	37	201	35	0	0	273	25	18	27	0	0	70	604
12:45:00	9	163	25	0	0	197	39	23	8	0	0	70	35	180	58	0	0	273	27	20	38	0	0	85	625
Hourly	20	682	99	0	0	801	188	78	31	0	0	297	135	729	201	0	0	1065	100	71	134	0	1	305	2468
13:00:00	8	177	24	0	0	209	51	26	6	0	0	83	21	197	63	0	0	281	28	16	31	0	0	75	648
13:15:00	3	153	22	0	0	178	71	18	8	0	0	97	28	193	51	0	0	272	25	14	34	0	0	73	620
13:30:00	10	192	23	0	0	225	36	20	6	0	0	62	25	182	54	0	0	261	15	18	28	0	0	61	609
13:45:00	9	142	21	0	0	172	55	15	9	0	0	79	26	178	51	0	0	255	40	23	24	0	0	87	593
Hourly	30	664	90	0	0	784	213	79	29	0	0	321	100	750	219	0	0	1069	108	71	117	0	0	296	2470
BREAK																									
15:00:00	4	169	22	0	0	195	50	26	5	0	0	81	37	254	107	0	0	398	35	32	40	0	0	107	781
15:15:00	4	218	41	0	0	263	55	29	9	0	0	93	35	269	102	0	0	406	24	21	43	0	0	88	850
15:30:00	4	207	35	0	0	246	56	40	1	0	0	97	31	276	117	0	0	424	45	42	30	0	0	117	884
15:45:00	2	186	29	0	0	217	60	22	4	0	0	86	34	288	140	0	0	462	27	30	33	0	0	90	855
Hourly	14	780	127	0	0	921	221	117	19	0	0	357	137	1087	466	0	0	1690	131	125	146	0	0	402	3370
16:00:00	4	281	39	0	0	324	51	30	6	0	0	87	20	256	124	0	0	400	35	45	20	0	0	100	911
16:15:00	6	217	19	0	0	242	45	36	13	0	0	94	21	281	116	0	0	418	24	51	35	0	0	110	864
16:30:00	8	272	38	0	0	318	47	30	8	0	0	85	25	273	142	0	0	440	28	53	40	0	0	121	964
16:45:00	4	251	37	0	0	292	57	33	5	0	0	95	17	312	131	0	0	460	29	53	30	0	0	112	959
Hourly	22	1021	133	0	0	1176	200	129	32	0	0	361	83	1122	513	0	0	1718	116	202	125	0	0	443	3698
17:00:00	1	292	42	0	0	335	52	28	9	0	0	89	26	285	131	0	0	442	36	64	22	0	0	122	988
17:15:00	2	259	27	0	0	288	44	25	8	0	0	77	25	265	165	0	0	455	25	58	25	0	0	108	928
17:30:00	4	211	32	0	0	247	46	29	2	0	0	77	15	285	165	0	0	465	27	34	26	0	0	87	876
17:45:00	2	213	21	0	0	236	45	24	5	0	0	74	27	310	144	0	0	481	35	52	32	0	0	119	910
Hourly	9	975	122	0	0	1106	187	106	24	0	0	317	93	1145	605	0	0	1843	123	208	105	0	0	436	3702
Grand Total	140	6935	848	0	0	7923	2178	1159	215	0	0	3552	876	7244	2522	0	0	10642	874	996	1028	0	2	2898	**25015**
Approach%	1.8%	87.5%	10.7%	0%		-	61.3%	32.6%	6.1%	0%		-	8.2%	68.1%	23.7%	0%		-	30.2%	34.4%	35.5%	0%		-	**-**
Totals %	0.6%	27.7%	3.4%	0%		31.7%	8.7%	4.6%	0.9%	0%		14.2%	3.5%	29%	10.1%	0%		42.5%	3.5%	4%	4.1%	0%		11.6%	**-**

Heavy	25	704	75	0	-	196	226	28	0	-	574	680	341	0	-	74	200	693	0	-	-
Heavy %	17.9%	10.2%	8.8%	0%	-	9%	19.5%	13%	0%	-	65.5%	9.4%	13.5%	0%	-	8.5%	20.1%	67.4%	0%	-	-
Bicycles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycle %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 07:00 AM - 08:00 AM Weather: Mist (5.43 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
07:00:00	1	246	14	0	0	261	114	88	1	0	0	203	29	162	42	0	0	233	20	31	32	0	0	83	780
07:15:00	1	319	30	0	0	350	102	85	3	0	0	190	18	196	41	0	0	255	17	25	37	0	0	79	874
07:30:00	0	233	19	0	0	252	115	113	5	0	0	233	26	187	33	0	0	246	24	35	27	0	0	86	817
07:45:00	4	261	24	0	0	289	118	82	6	0	0	206	32	278	45	0	0	355	27	26	47	0	0	100	950
Grand Total	6	1059	87	0	0	1152	449	368	15	0	0	832	105	823	161	0	0	1089	88	117	143	0	0	348	**3421**
Approach%	0.5%	91.9%	7.6%	0%		-	54%	44.2%	1.8%	0%		-	9.6%	75.6%	14.8%	0%		-	25.3%	33.6%	41.1%	0%		-	**-**
Totals %	0.2%	31%	2.5%	0%		33.7%	13.1%	10.8%	0.4%	0%		24.3%	3.1%	24.1%	4.7%	0%		31.8%	2.6%	3.4%	4.2%	0%		10.2%	**-**
PHF	0.38	0.83	0.73	0		0.82	0.95	0.81	0.63	0		0.89	0.82	0.74	0.89	0		0.77	0.81	0.84	0.76	0		0.87	**-**
Heavy	1	108	7	0		116	26	34	2	0		62	55	65	24	0		144	11	29	103	0		143	**-**
Heavy %	16.7%	10.2%	8%	0%		10.1%	5.8%	9.2%	13.3%	0%		7.5%	52.4%	7.9%	14.9%	0%		13.2%	12.5%	24.8%	72%	0%		41.1%	**-**
Lights	5	951	80	0		1036	423	334	13	0		770	50	758	137	0		945	77	88	40	0		205	**-**
Lights %	83.3%	89.8%	92%	0%		89.9%	94.2%	90.8%	86.7%	0%		92.5%	47.6%	92.1%	85.1%	0%		86.8%	87.5%	75.2%	28%	0%		58.9%	**-**
Single-Unit Trucks	1	52	4	0		57	12	14	1	0		27	30	34	15	0		79	5	11	41	0		57	**-**
Single-Unit Trucks %	16.7%	4.9%	4.6%	0%		4.9%	2.7%	3.8%	6.7%	0%		3.2%	28.6%	4.1%	9.3%	0%		7.3%	5.7%	9.4%	28.7%	0%		16.4%	**-**
Buses	0	2	3	0		5	3	6	0	0		9	1	2	1	0		4	4	8	0	0		12	**-**
Buses %	0%	0.2%	3.4%	0%		0.4%	0.7%	1.6%	0%	0%		1.1%	1%	0.2%	0.6%	0%		0.4%	4.5%	6.8%	0%	0%		3.4%	**-**
Articulated Trucks	0	54	0	0		54	11	14	1	0		26	24	29	8	0		61	2	10	62	0		74	**-**
Articulated Trucks %	0%	5.1%	0%	0%		4.7%	2.4%	3.8%	6.7%	0%		3.1%	22.9%	3.5%	5%	0%		5.6%	2.3%	8.5%	43.4%	0%		21.3%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 11:00 AM - 12:00 PM Weather: Few Clouds (13.99 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
11:00:00	5	198	22	0	0	225	99	14	8	0	0	121	25	162	41	0	0	228	23	17	32	0	0	72	646
11:15:00	6	187	26	0	0	219	68	19	9	0	0	96	30	153	39	0	0	222	30	13	31	0	0	74	611
11:30:00	7	169	21	0	0	197	56	19	8	0	0	83	43	185	57	0	0	285	18	23	39	0	0	80	645
11:45:00	6	179	26	0	0	211	47	19	7	0	0	73	26	172	37	0	0	235	21	26	43	0	0	90	609
Grand Total	24	733	95	0	0	852	270	71	32	0	0	373	124	672	174	0	0	970	92	79	145	0	0	316	**2511**
Approach%	2.8%	86%	11.2%	0%		-	72.4%	19%	8.6%	0%		-	12.8%	69.3%	17.9%	0%		-	29.1%	25%	45.9%	0%		-	**-**
Totals %	1%	29.2%	3.8%	0%		33.9%	10.8%	2.8%	1.3%	0%		14.9%	4.9%	26.8%	6.9%	0%		38.6%	3.7%	3.1%	5.8%	0%		12.6%	**-**
PHF	0.86	0.93	0.91	0		0.95	0.68	0.93	0.89	0		0.77	0.72	0.91	0.76	0		0.85	0.77	0.76	0.84	0		0.88	**-**
Heavy	4	121	12	0		137	31	23	4	0		58	89	88	47	0		224	5	20	104	0		129	**-**
Heavy %	16.7%	16.5%	12.6%	0%		16.1%	11.5%	32.4%	12.5%	0%		15.5%	71.8%	13.1%	27%	0%		23.1%	5.4%	25.3%	71.7%	0%		40.8%	**-**
Lights	20	612	83	0		715	239	48	28	0		315	35	584	127	0		746	87	59	41	0		187	**-**
Lights %	83.3%	83.5%	87.4%	0%		83.9%	88.5%	67.6%	87.5%	0%		84.5%	28.2%	86.9%	73%	0%		76.9%	94.6%	74.7%	28.3%	0%		59.2%	**-**
Single-Unit Trucks	3	59	6	0		68	18	12	3	0		33	39	52	22	0		113	2	7	41	0		50	**-**
Single-Unit Trucks %	12.5%	8%	6.3%	0%		8%	6.7%	16.9%	9.4%	0%		8.8%	31.5%	7.7%	12.6%	0%		11.6%	2.2%	8.9%	28.3%	0%		15.8%	**-**
Buses	0	3	0	0		3	0	0	0	0		0	0	0	0	0		0	0	0	1	0		1	**-**
Buses %	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0.7%	0%		0.3%	**-**
Articulated Trucks	1	59	6	0		66	13	11	1	0		25	50	36	25	0		111	3	13	62	0		78	**-**
Articulated Trucks %	4.2%	8%	6.3%	0%		7.7%	4.8%	15.5%	3.1%	0%		6.7%	40.3%	5.4%	14.4%	0%		11.4%	3.3%	16.5%	42.8%	0%		24.7%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 05:00 PM - 06:00 PM Weather: Few Clouds (17.07 °C)

Start Time	Southbound						Westbound						Northbound						Eastbound						Int. Total (15 min)
	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	Left	Thru	Right	UTurn	Peds	Approach Total	
17:00:00	1	292	42	0	0	335	52	28	9	0	0	89	26	285	131	0	0	442	36	64	22	0	0	122	988
17:15:00	2	259	27	0	0	288	44	25	8	0	0	77	25	265	165	0	0	455	25	58	25	0	0	108	928
17:30:00	4	211	32	0	0	247	46	29	2	0	0	77	15	285	165	0	0	465	27	34	26	0	0	87	876
17:45:00	2	213	21	0	0	236	45	24	5	0	0	74	27	310	144	0	0	481	35	52	32	0	0	119	910
Grand Total	9	975	122	0	0	1106	187	106	24	0	0	317	93	1145	605	0	0	1843	123	208	105	0	0	436	**3702**
Approach%	0.8%	88.2%	11%	0%		-	59%	33.4%	7.6%	0%		-	5%	62.1%	32.8%	0%		-	28.2%	47.7%	24.1%	0%		-	**-**
Totals %	0.2%	26.3%	3.3%	0%		29.9%	5.1%	2.9%	0.6%	0%		8.6%	2.5%	30.9%	16.3%	0%		49.8%	3.3%	5.6%	2.8%	0%		11.8%	**-**
PHF	0.56	0.83	0.73	0		0.83	0.9	0.91	0.67	0		0.89	0.86	0.92	0.92	0		0.96	0.85	0.81	0.82	0		0.89	**-**
Heavy	0	44	6	0		50	21	22	3	0		46	57	76	43	0		176	8	24	56	0		88	**-**
Heavy %	0%	4.5%	4.9%	0%		4.5%	11.2%	20.8%	12.5%	0%		14.5%	61.3%	6.6%	7.1%	0%		9.5%	6.5%	11.5%	53.3%	0%		20.2%	**-**
Lights	9	931	116	0		1056	166	84	21	0		271	36	1069	562	0		1667	115	184	49	0		348	**-**
Lights %	100%	95.5%	95.1%	0%		95.5%	88.8%	79.2%	87.5%	0%		85.5%	38.7%	93.4%	92.9%	0%		90.5%	93.5%	88.5%	46.7%	0%		79.8%	**-**
Single-Unit Trucks	0	27	1	0		28	15	7	3	0		25	25	40	17	0		82	2	12	22	0		36	**-**
Single-Unit Trucks %	0%	2.8%	0.8%	0%		2.5%	8%	6.6%	12.5%	0%		7.9%	26.9%	3.5%	2.8%	0%		4.4%	1.6%	5.8%	21%	0%		8.3%	**-**
Buses	0	1	0	0		1	1	0	0	0		1	1	0	0	0		1	1	0	0	0		1	**-**
Buses %	0%	0.1%	0%	0%		0.1%	0.5%	0%	0%	0%		0.3%	1.1%	0%	0%	0%		0.1%	0.8%	0%	0%	0%		0.2%	**-**
Articulated Trucks	0	16	5	0		21	5	15	0	0		20	31	36	26	0		93	5	12	34	0		51	**-**
Articulated Trucks %	0%	1.6%	4.1%	0%		1.9%	2.7%	14.2%	0%	0%		6.3%	33.3%	3.1%	4.3%	0%		5%	4.1%	5.8%	32.4%	0%		11.7%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 07:00 AM - 08:00 AM Weather: Mist (5.43 °C)

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 11:00 AM - 12:00 PM Weather: Few Clouds (13.99 °C)

Spectrum

Turning Movement Count
Location Name: HWY 50 & MAYFIELD RD
Date: Tue, Oct 08, 2019 Deployment Lead: David Chu

Peak Hour: 05:00 PM - 06:00 PM **Weather: Few Clouds (17.07 °C)**

Spectrum

Turning Movement Count
Location Name: HWY 50 & MCEWAN DR
Date: Wed, Nov 25, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Turning Movement Count (1 . HWY 50 & MCEWAN DR) CustID: 05013808 MioID:

Start Time	N Approach HWY 50						E Approach MCEWAN DR E						S Approach HWY 50						W Approach MCEWAN DR W						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
07:00:00	31	178	10	0	0	219	4	19	12	0	0	35	7	77	14	0	0	98	22	7	6	0	0	35	387	
07:15:00	25	239	9	0	0	273	6	15	25	0	2	46	12	94	16	0	3	122	27	9	9	0	0	45	486	
07:30:00	26	198	5	0	0	229	9	20	15	0	0	44	9	129	23	0	1	161	27	6	13	0	0	46	480	
07:45:00	18	208	18	0	0	244	11	18	23	0	0	52	15	156	27	0	0	198	24	7	11	0	0	42	536	1889
08:00:00	27	194	12	1	0	234	10	21	26	0	0	57	13	119	36	0	0	168	29	10	18	0	1	57	516	2018
08:15:00	35	177	12	0	0	224	13	22	17	0	0	52	18	128	17	0	0	163	22	14	14	0	1	50	489	2021
08:30:00	32	202	8	0	0	242	15	28	21	0	0	64	12	94	26	0	2	132	26	9	17	0	0	52	490	2031
08:45:00	41	189	21	0	1	251	8	28	18	0	0	54	24	126	28	0	1	178	27	14	26	0	0	67	550	2045
BREAK																										
16:00:00	23	163	24	0	0	210	69	30	55	0	1	154	41	240	25	0	4	306	41	44	55	0	0	140	810	
16:15:00	9	167	27	0	0	203	63	18	40	0	1	121	37	238	24	0	1	299	43	30	49	0	0	122	745	
16:30:00	29	155	13	0	0	197	52	28	45	0	0	125	49	248	28	0	0	325	48	25	54	0	1	127	774	
16:45:00	16	180	21	0	0	217	38	23	29	0	0	90	39	247	21	1	0	308	36	22	39	0	2	97	712	3041
17:00:00	12	160	23	0	0	195	71	20	52	0	0	143	61	262	27	0	0	350	52	29	51	0	0	132	820	3051
17:15:00	12	137	18	0	1	167	50	22	40	0	0	112	42	226	23	0	0	291	28	20	34	0	0	82	652	2958
17:30:00	18	114	19	0	0	151	41	21	26	0	0	88	33	200	25	2	0	260	29	21	35	0	1	85	584	2768
17:45:00	19	112	16	0	1	147	29	13	44	0	0	86	32	240	21	1	1	294	27	9	32	0	0	68	595	2651
Grand Total	373	2773	256	1	3	3403	489	346	488	0	4	1323	444	2824	381	4	13	3653	508	276	463	0	6	1247	**9626**	-
Approach%	11%	81.5%	7.5%	0%		-	37%	26.2%	36.9%	0%		-	12.2%	77.3%	10.4%	0.1%		-	40.7%	22.1%	37.1%	0%		-	**-**	-
Totals %	3.9%	28.8%	2.7%	0%		35.4%	5.1%	3.6%	5.1%	0%		13.7%	4.6%	29.3%	4%	0%		37.9%	5.3%	2.9%	4.8%	0%		13%	**-**	-
Heavy	9	137	10	0		-	11	23	26	0		-	19	129	79	0		-	91	20	7	0		-	**-**	-
Heavy %	2.4%	4.9%	3.9%	0%		-	2.2%	6.6%	5.3%	0%		-	4.3%	4.6%	20.7%	0%		-	17.9%	7.2%	1.5%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: HWY 50 & MCEWAN DR
Date: Wed, Nov 25, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 08:00 AM - 09:00 AM Weather: Light Rain (2.76 °C)

Start Time	N Approach HWY 50						E Approach MCEWAN DR E						S Approach HWY 50						W Approach MCEWAN DR W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
08:00:00	27	194	12	1	0	234	10	21	26	0	0	57	13	119	36	0	0	168	29	10	18	0	1	57	516
08:15:00	35	177	12	0	0	224	13	22	17	0	0	52	18	128	17	0	0	163	22	14	14	0	1	50	489
08:30:00	32	202	8	0	0	242	15	28	21	0	0	64	12	94	26	0	2	132	26	9	17	0	0	52	490
08:45:00	41	189	21	0	1	251	8	28	18	0	0	54	24	126	28	0	1	178	27	14	26	0	0	67	550
Grand Total	135	762	53	1	1	951	46	99	82	0	0	227	67	467	107	0	3	641	104	47	75	0	2	226	**2045**
Approach%	14.2%	80.1%	5.6%	0.1%		-	20.3%	43.6%	36.1%	0%		-	10.5%	72.9%	16.7%	0%		-	46%	20.8%	33.2%	0%		-	**-**
Totals %	6.6%	37.3%	2.6%	0%		46.5%	2.2%	4.8%	4%	0%		11.1%	3.3%	22.8%	5.2%	0%		31.3%	5.1%	2.3%	3.7%	0%		11.1%	**-**
PHF	0.82	0.94	0.63	0.25		0.95	0.77	0.88	0.79	0		0.89	0.7	0.91	0.74	0		0.9	0.9	0.84	0.72	0		0.84	**-**
Heavy	6	46	5	0		57	2	6	6	0		14	7	36	19	0		62	35	6	3	0		44	**-**
Heavy %	4.4%	6%	9.4%	0%		6%	4.3%	6.1%	7.3%	0%		6.2%	10.4%	7.7%	17.8%	0%		9.7%	33.7%	12.8%	4%	0%		19.5%	**-**
Lights	129	716	48	1		894	44	93	76	0		213	60	431	88	0		579	69	41	72	0		182	**-**
Lights %	95.6%	94%	90.6%	100%		94%	95.7%	93.9%	92.7%	0%		93.8%	89.6%	92.3%	82.2%	0%		90.3%	66.3%	87.2%	96%	0%		80.5%	**-**
Single-Unit Trucks	4	19	3	0		26	1	3	2	0		6	5	16	10	0		31	17	2	1	0		20	**-**
Single-Unit Trucks %	3%	2.5%	5.7%	0%		2.7%	2.2%	3%	2.4%	0%		2.6%	7.5%	3.4%	9.3%	0%		4.8%	16.3%	4.3%	1.3%	0%		8.8%	**-**
Buses	2	8	2	0		12	0	0	0	0		0	0	6	0	0		6	0	1	1	0		2	**-**
Buses %	1.5%	1%	3.8%	0%		1.3%	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		0.9%	0%	2.1%	1.3%	0%		0.9%	**-**
Articulated Trucks	0	19	0	0		19	1	3	4	0		8	2	14	9	0		25	18	3	1	0		22	**-**
Articulated Trucks %	0%	2.5%	0%	0%		2%	2.2%	3%	4.9%	0%		3.5%	3%	3%	8.4%	0%		3.9%	17.3%	6.4%	1.3%	0%		9.7%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	16.7%		-	-	-	-	0%		-	-	-	-	50%		-	-	-	-	33.3%		**-**

Spectrum

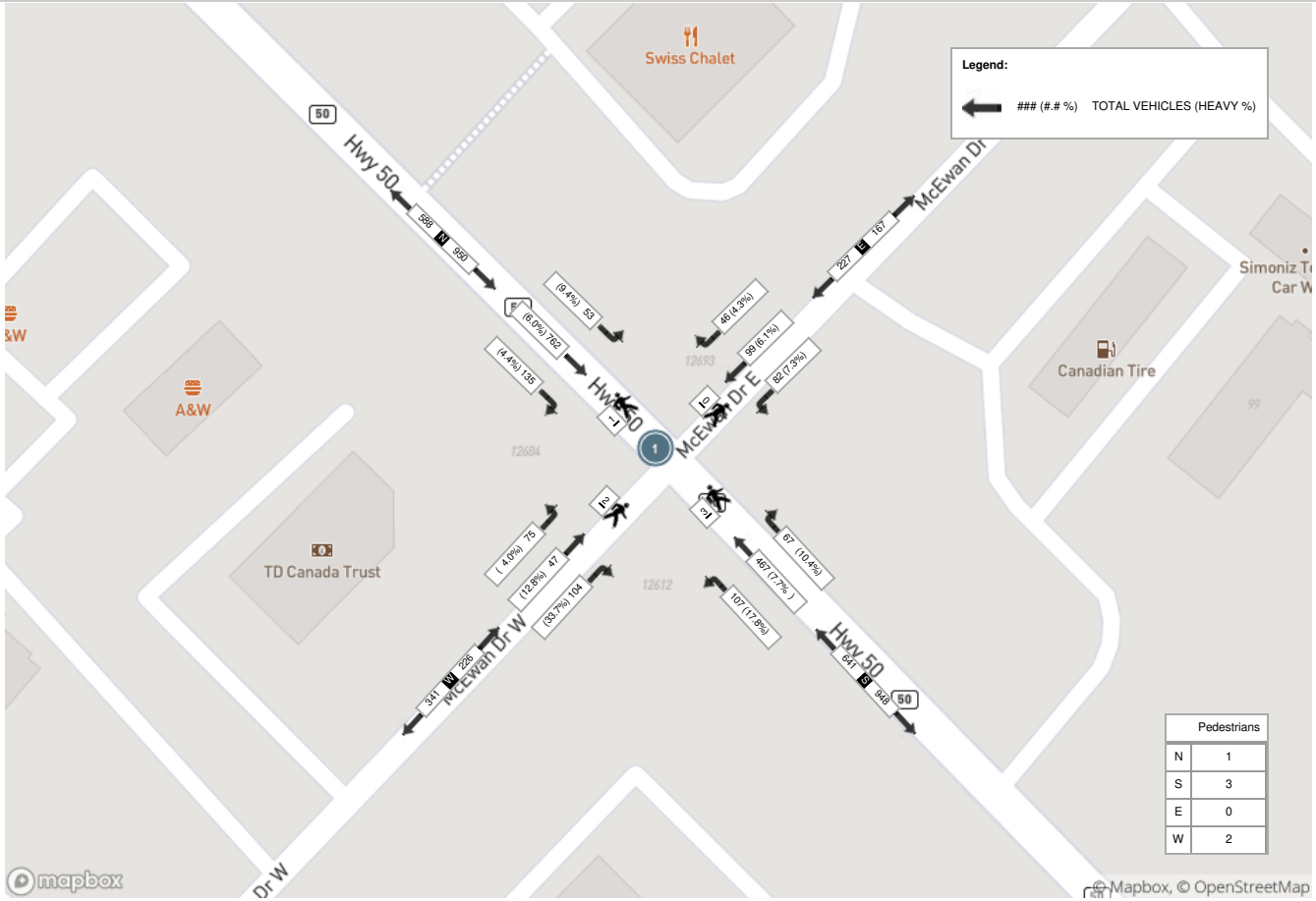
Turning Movement Count
Location Name: HWY 50 & MCEWAN DR
Date: Wed, Nov 25, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather: Mist (5.74 °C)

Start Time	N Approach HWY 50						E Approach MCEWAN DR E						S Approach HWY 50						W Approach MCEWAN DR W						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	9	167	27	0	0	203	63	18	40	0	1	121	37	238	24	0	1	299	43	30	49	0	0	122	745
16:30:00	29	155	13	0	0	197	52	28	45	0	0	125	49	248	28	0	0	325	48	25	54	0	1	127	774
16:45:00	16	180	21	0	0	217	38	23	29	0	0	90	39	247	21	1	0	308	36	22	39	0	2	97	712
17:00:00	12	160	23	0	0	195	71	20	52	0	0	143	61	262	27	0	0	350	52	29	51	0	0	132	820
Grand Total	66	662	84	0	0	812	224	89	166	0	1	479	186	995	100	1	1	1282	179	106	193	0	3	478	**3051**
Approach%	8.1%	81.5%	10.3%	0%		-	46.8%	18.6%	34.7%	0%		-	14.5%	77.6%	7.8%	0.1%		-	37.4%	22.2%	40.4%	0%		-	**-**
Totals %	2.2%	21.7%	2.8%	0%		26.6%	7.3%	2.9%	5.4%	0%		15.7%	6.1%	32.6%	3.3%	0%		42%	5.9%	3.5%	6.3%	0%		15.7%	**-**
PHF	0.57	0.92	0.78	0		0.94	0.79	0.79	0.8	0		0.84	0.76	0.95	0.89	0.25		0.92	0.86	0.88	0.89	0		0.91	**-**
Heavy	1	20	0	0		21	4	5	4	0		13	5	31	24	0		60	13	5	1	0		19	**-**
Heavy %	1.5%	3%	0%	0%		2.6%	1.8%	5.6%	2.4%	0%		2.7%	2.7%	3.1%	24%	0%		4.7%	7.3%	4.7%	0.5%	0%		4%	**-**
Lights	65	642	84	0		791	220	84	162	0		466	181	964	76	1		1222	166	101	192	0		459	**-**
Lights %	98.5%	97%	100%	0%		97.4%	98.2%	94.4%	97.6%	0%		97.3%	97.3%	96.9%	76%	100%		95.3%	92.7%	95.3%	99.5%	0%		96%	**-**
Single-Unit Trucks	1	9	0	0		10	3	2	1	0		6	2	16	13	0		31	6	4	1	0		11	**-**
Single-Unit Trucks %	1.5%	1.4%	0%	0%		1.2%	1.3%	2.2%	0.6%	0%		1.3%	1.1%	1.6%	13%	0%		2.4%	3.4%	3.8%	0.5%	0%		2.3%	**-**
Buses	0	2	0	0		2	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	**-**
Buses %	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	9	0	0		9	1	3	3	0		7	3	14	11	0		28	7	1	0	0		8	**-**
Articulated Trucks %	0%	1.4%	0%	0%		1.1%	0.4%	3.4%	1.8%	0%		1.5%	1.6%	1.4%	11%	0%		2.2%	3.9%	0.9%	0%	0%		1.7%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	20%		-	-	-	-	20%		-	-	-	-	60%		**-**

Peak Hour: 08:00 AM - 09:00 AM **Weather: Light Rain (2.76 °C)**

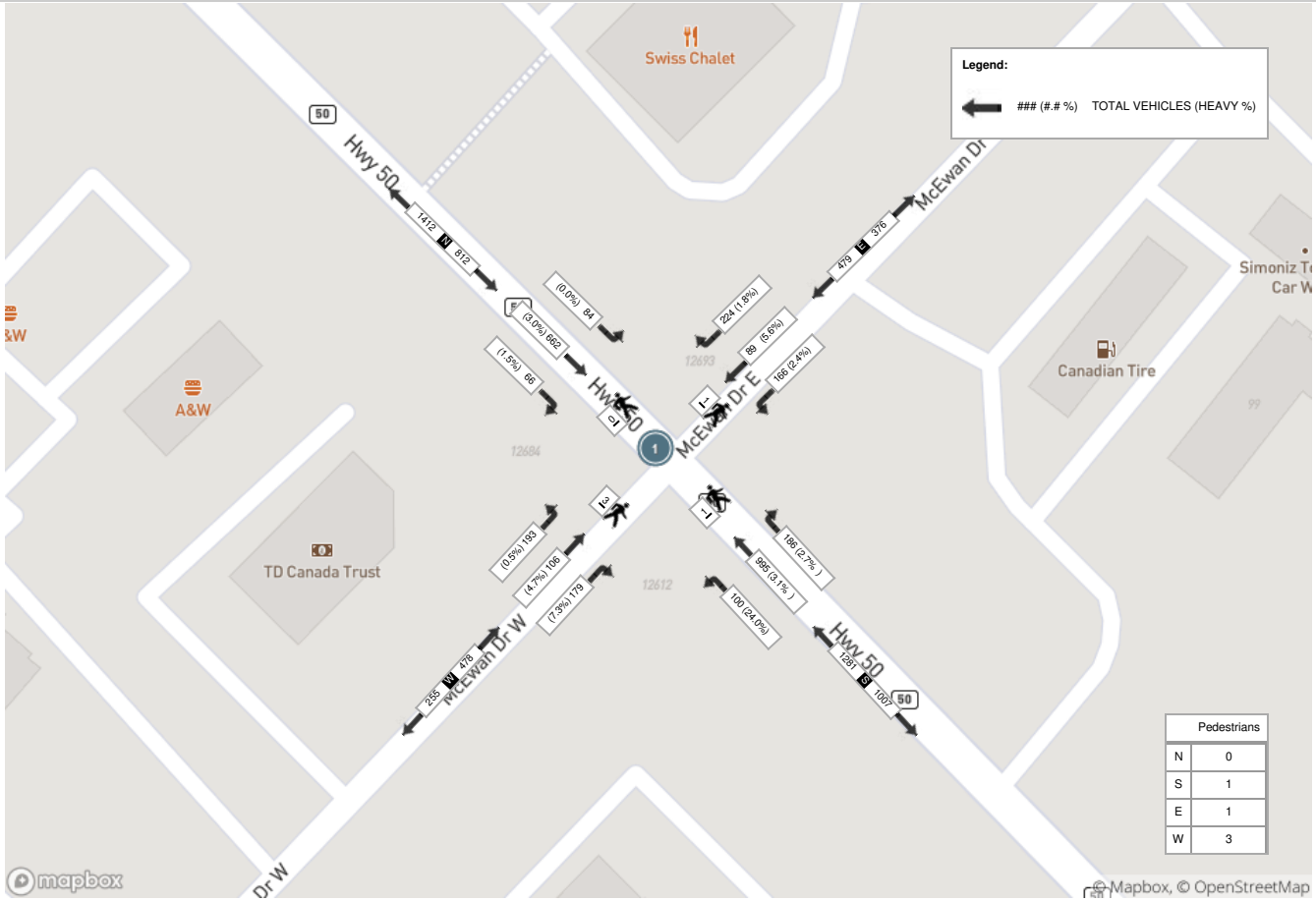


Spectrum

Turning Movement Count
Location Name: HWY 50 & MCEWAN DR
Date: Wed, Nov 25, 2020 Deployment Lead: Theo Daglis

BA Group
300 45 ST. CLAIR AVE W
TORONTO ONTARIO, M4V 1K9
CANADA

Peak Hour: 04:15 PM - 05:15 PM **Weather: Mist (5.74 °C)**



Appendix E
George Bolton Extension Traffic Redistribution

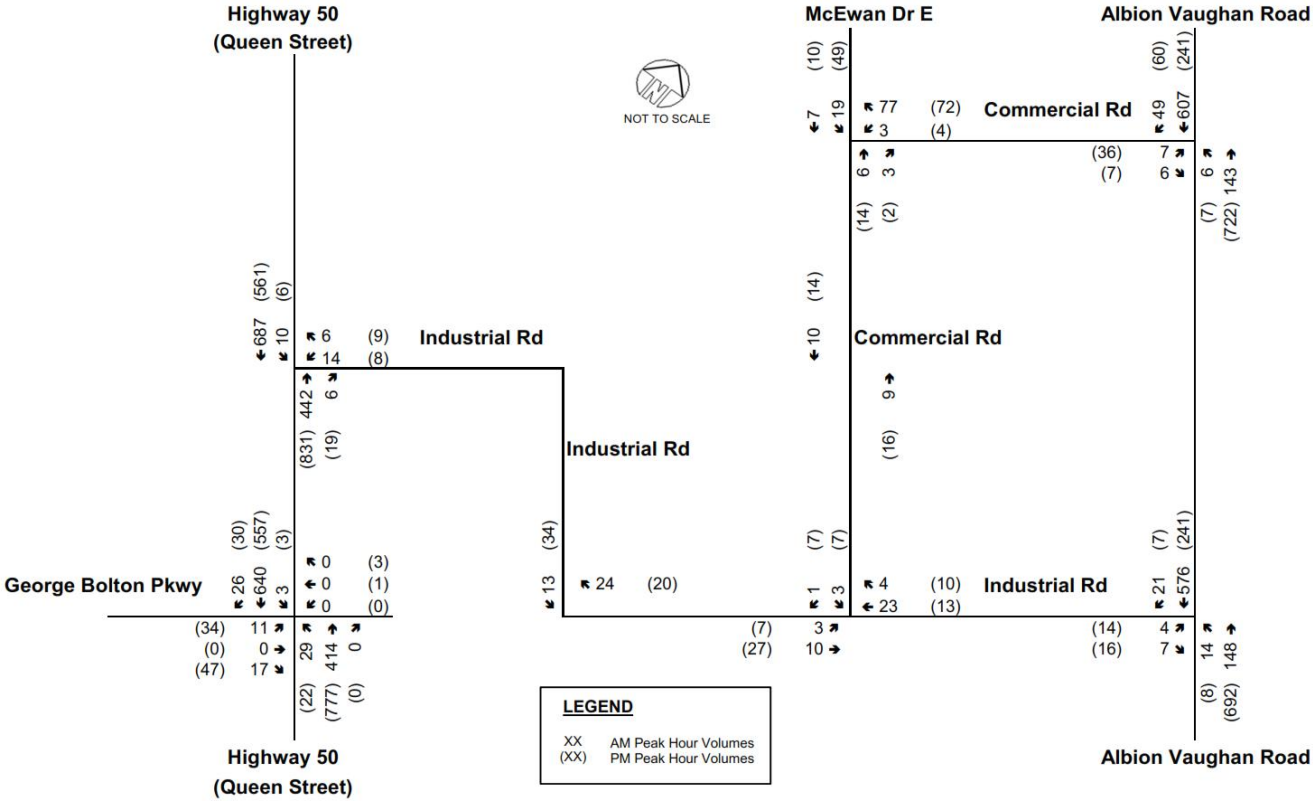


Figure 3 Future 2031 Traffic Volumes due to Background Growth

2.2.2 Future Development Traffic

Traffic generated by the following development within the study area was considered based on consultation with Town staff:

- A residential development located in the southwest quadrant of Albion Vaughan Road and Industrial Road consisting of 162 townhouse units, 31 single family units, plus a 110-unit senior's development.

"Traffic Impact Study - Update, Bolton Gateway Developments Inc., Special Residential Area" conducted by C. F. Crozier & Associates Inc., as revised July 2013, provided the estimated development traffic (Fig. 7). An excerpt of the report is attached in Appendix C.

2.2.3 Truck Traffic Volumes Diverted to George Bolton Parkway Extension

As part of community considerations regarding downtown Bolton revitalization, the 2015 Bolton Transportation Master Plan suggested that through truck movements be restricted in the downtown core. Through an analysis of various routing alternatives, the BTMP determined that the most likely alternative for the east / west trucks would be the route consisting of King Street – Coleraine Drive – Mayfield Road – Albion Vaughan Road and returning to King Street. The assumed truck routes is illustrated in Figure 11 of the BTMP and is provided here in Appendix D.

With the completion of George Bolton Parkway, trucks will divert to the shorter route (approximately 2.6 km shorter) consisting of King Street – Coleraine Drive – George Bolton Parkway – Albion Vaughan Road – King Street.

This study uses the re-routed truck volumes on Mayfield Road (BTMP's Figure 11) to estimate the potential re-routed truck volumes to George Bolton Parkway. The resultant potential truck volumes diverted to George Bolton Parkway extension are illustrated in Figure 4.

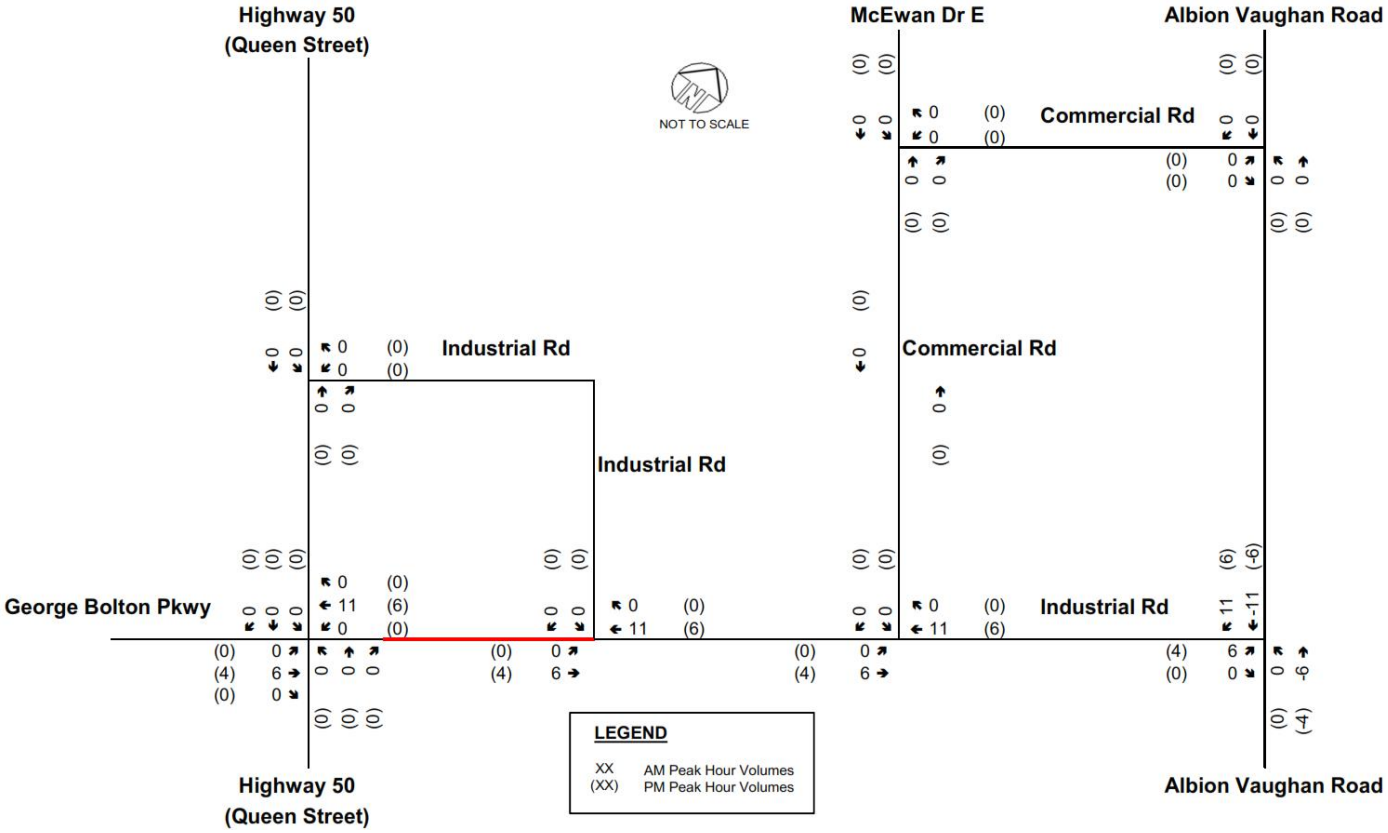


Figure 4 Truck Traffic Volumes Diverted to George Bolton Parkway Extension

2.2.4 Existing Traffic Volumes Diverted to George Bolton Parkway Extension

To estimate the potential of existing (car) traffic volumes diverted to George Bolton Parkway extension, the following analysis steps were taken:

- Existing traffic volumes for the greater area of Bolton were reviewed from the 2015 Bolton Transportation Master Plan Study (BTMP's Figure 17) and attached in Appendix D.
- There are several sources of traffic that enter the network. These include volumes coming into Bolton along eastbound Mayfield Drive, along south / northbound Highway 50, Coleraine Drive and Albion Vaughan Road, and trips coming in along east/westbound King Street / Harvest Moon Drive.
- Depending on their location of origin, they will either travel north-eastbound or south-westbound to exit the Bolton area.

- Only these volumes that are coming in from outside Bolton (referred to as external trips) and going out of Bolton have been considered as potential diverted volumes.
- Any potential route that may be re-routed to George Bolton Parkway extension was identified.
- Along the potential routes, the volumes that entered the network were distributed throughout the network:
  - When an external trip volume meets an intersection while traveling through Bolton, they have three movements to take, left-turn, through or right-turn.
  - The volumes were distributed to the movements by applying turning movement ratios derived from the TMC data.
- Therefore, an external trip will enter the network from a source, travel along one of the potential routes through Bolton. Some trips are destined to stay in Bolton and these are not considered. Through trips that exit the network will be the actual volume that travels through Bolton, and are assumed to comprise the future diverted trips to the George Bolton Parkway extension.

Based on the above analysis of the existing TMC data in the greater area of Bolton, the potential existing (car) traffic volumes diverted to George Bolton Parkway extension are illustrated in Figure 5. The detail analysis sheets are is provided in Appendix D.

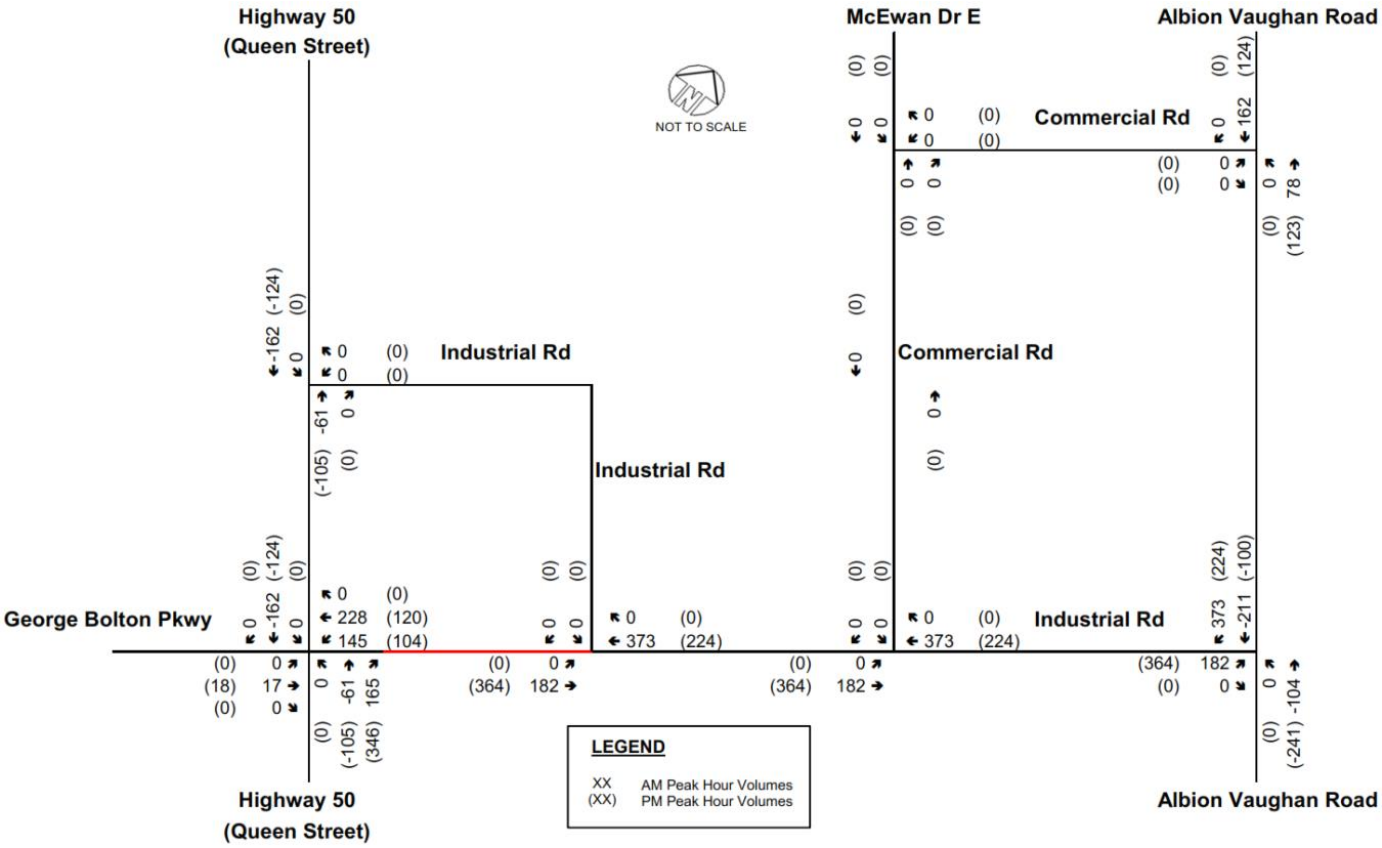
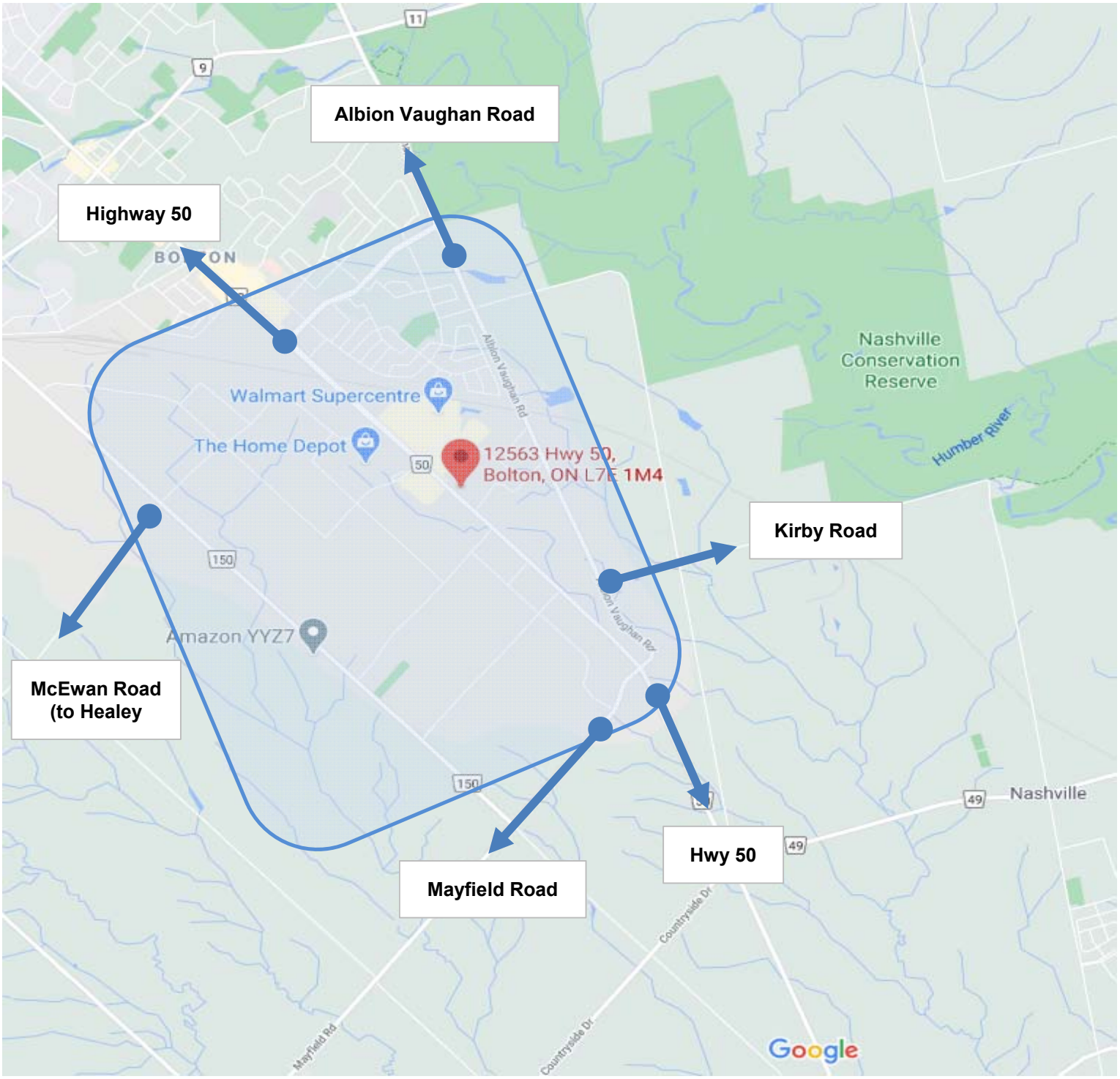


Figure 5 Existing Traffic Volumes Diverted to George Bolton Parkway Extension

Appendix F
Transportation Tomorrow Survey Data


Albion Vaughan Road
Highway 50
McEwan Road
(to Healey
Kirby Road
Hwy 50
Mayfield Road
Walmart Supercentre
The Home Depot
12563 Hwy 50,
Bolton, ON L7E 1M4
Amazon YYZ7
Nashville
Conservation
Reserve
Humber River
Nashville
Google

Wed Jan 13 2021 12:20:39 GMT-0500 (Eastern Standard Time) - Run Time: 2461ms

Cross Tabulation Query Form - Trip - 2016 v1.1

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

Filters:
(Start time of trip - start_time In 600-859
and
Trip purpose of origin - purp_orig In H
and
2006 GTA zone of origin - gta06_orig In 3190 3192
and
Primary travel mode of trip - mode_prime In D M P T U)

Trip 2016
Table:

	3190	3192	**TOTAL**
PD 1 of Toronto	73	44	**117**
PD 3 of Toronto	63	17	**80**
PD 4 of Toronto	41	21	**62**
PD 7 of Toronto	0	42	**42**
PD 8 of Toronto	78	61	**139**
PD 9 of Toronto	57	144	**201**
PD 10 of Toronto	107	29	**136**
PD 12 of Toronto	0	15	**15**
PD 13 of Toronto	46	0	**46**
PD 16 of Toronto	0	15	**15**
Newmarket	0	64	**64**
Aurora	22	20	**42**
Richmond Hill	10	40	**50**
Markham	23	51	**74**
King	0	64	**64**
Vaughan	368	388	**756**
Caledon	445	772	**1217**
Brampton	112	202	**314**
Mississauga	152	345	**497**
Halton Hills	0	18	**18**
Burlington	0	20	**20**
Orangeville	20	17	**37**
Barrie	0	21	**21**
Bradford-West Gwillimbury	0	84	**84**
Mono	0	30	**30**
External	0	15	**15**

Wed Jan 13 2021 12:38:45 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: 2006 GTA zone of origin - gta06_orig

Filters:
(Start time of trip - start_time In 600-859
and
Trip purpose of origin - purp_orig In H
and
2006 GTA zone of origin - gta06_orig In 3190 3192
and
Primary travel mode of trip - mode_prime In D M P T U
and
Planning district of destination - pd_dest In 33 34)

Trip 2016
Table:

	3190	3192	**TOTAL**
2002	20	0	**20**
2020	20	0	**20**
2022	0	41	**41**
2023	0	43	**43**
2027	25	0	**25**
2031	0	12	**12**
2039	0	15	**15**
2040	20	0	**20**
2058	0	39	**39**
2060	68	0	**68**
2062	25	0	**25**
2067	22	0	**22**
2069	0	21	**21**
2070	0	16	**16**
2071	9	0	**9**
2072	24	0	**24**
2081	66	0	**66**
2082	8	0	**8**
2084	0	16	**16**
2091	0	39	**39**
2092	0	24	**24**
2104	0	34	**34**
2105	29	0	**29**
2111	25	21	**46**
2113	8	0	**8**
2114	0	35	**35**
2132	0	20	**20**
2133	0	12	**12**
3003	53	56	**109**
3017	0	21	**21**
3190	191	32	**223**
3191	61	275	**336**
3192	25	114	**139**
3193	114	196	**310**
3194	0	62	**62**
3196	0	15	**15**

Wed Jan 13 2021 12:22:10 GMT-0500 (Eastern Standard Time) - Run Time: 2442ms

Cross Tabulation Query Form - Trip - 2016 v1.1

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

Filters:
(Start time of trip - start_time In 1500-1759
and
Trip purpose of destination - purp_dest In H
and
2006 GTA zone of destination - gta06_dest In 3190 3192
and
Primary travel mode of trip - mode_prime In D M P T U)

Trip 2016
Table:

	3190	3192	TOTAL
PD 1 of Toronto	0	74	**74**
PD 3 of Toronto	27	0	**27**
PD 4 of Toronto	41	0	**41**
PD 5 of Toronto	0	15	**15**
PD 7 of Toronto	0	42	**42**
PD 8 of Toronto	78	46	**124**
PD 9 of Toronto	63	68	**131**
PD 10 of Toronto	134	58	**192**
PD 12 of Toronto	0	42	**42**
PD 13 of Toronto	46	0	**46**
East Gwillimbury	43	0	**43**
Aurora	22	20	**42**
Richmond Hill	10	40	**50**
Markham	23	0	**23**
King	0	37	**37**
Vaughan	288	297	**585**
Caledon	205	863	**1068**
Brampton	50	234	**284**
Mississauga	138	289	**427**
Cambridge	0	9	**9**
Barrie	0	21	**21**
Innisfil	0	72	**72**
Bradford-West Gwillimbury	0	84	**84**
Mono	0	30	**30**
External	0	15	**15**

Wed Jan 13 2021 12:30:43 GMT-0500 (Eastern Standard Time) - Run Time: 2360ms

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:
(Start time of trip - start_time In 1500-1759
and
Trip purpose of destination - purp_dest In H
and
2006 GTA zone of destination - gta06_dest In 3190 3192
and
Primary travel mode of trip - mode_prime In D M P T U
and
Planning district of origin - pd_orig In 33 34)

Trip 2016
Table:

	3190	3192	TOTAL
2002	20	0	**20**
2005	0	34	**34**
2015	21	0	**21**
2020	20	0	**20**
2027	25	0	**25**
2040	20	19	**39**
2058	0	39	**39**
2060	57	0	**57**
2062	25	21	**46**
2067	22	0	**22**
2070	0	16	**16**
2081	16	0	**16**
2082	8	0	**8**
2084	0	16	**16**
2091	0	39	**39**
2092	0	24	**24**
2104	0	34	**34**
2105	29	0	**29**
2111	25	21	**46**
2131	0	12	**12**
2132	0	20	**20**
3017	0	21	**21**
3190	77	156	**233**
3191	35	177	**212**
3192	33	287	**320**
3193	58	157	**215**
3194	0	50	**50**
3196	0	15	**15**

AM	RESIDENTIAL VEHICLE TRIP DISTRIBUTION
Outbound	Traffic Volume Allocation
2021-02-05	

Zone	Trips	%	NORTH Hwy 50	NORTH Albion Vaughan Road	SOUTH Hwy 50	WEST McEwan Drive (to Healey Road)	WEST Mayfield Road	TOTAL
PD 1 of Toronto	117	3%			100%			100.00%
PD 3 of Toronto	80	2%			100%			100.00%
PD 4 of Toronto	62	1%			100%			100.00%
PD 7 of Toronto	42	1%			100%			100.00%
PD 8 of Toronto	139	3%			100%			100.00%
PD 9 of Toronto	201	5%			100%			100.00%
PD 10 of Toronto	136	3%			100%			100.00%
PD 12 of Toronto	15	0%			100%			100.00%
PD 13 of Toronto	46	1%			100%			100.00%
PD 16 of Toronto	15	0%			100%			100.00%
Newmarket	64	2%	30%	70%				100.00%
Aurora	42	1%	50%	50%				100.00%
Richmond Hill	50	1%	15%	35%	50%			100.00%
Markham	74	2%		10%	90%			100.00%
King	64	2%	15%	50%	35%			100.00%
Brampton	314	8%			25%	10%	65%	100.00%
Mississauga	497	12%			25%	10%	65%	100.00%
Halton Hills	18	0%				50%	50%	100.00%
Burlington	20	0%			100%			100.00%
Orangeville	37	1%	90%	10%				100.00%
Barrie	21	1%	10%	90%				100.00%
Bradford-West Gwillimbury	84	2%	10%	90%				100.00%
Mono	30	1%	90%	10%				100.00%
External	15	0%	20%	20%	20%	20%	20%	100.00%
2002	20	0%			100%			100.00%
2020	20	0%			100%			100.00%
2022	41	1%			100%			100.00%
2023	43	1%			100%			100.00%
2027	25	1%			100%			100.00%
2031	12	0%			100%			100.00%
2039	15	0%			100%			100.00%
2040	20	0%			100%			100.00%
2058	39	1%			100%			100.00%
2060	68	2%			100%			100.00%
2062	25	1%			100%			100.00%
2067	22	1%			100%			100.00%
2069	21	1%			100%			100.00%
2070	16	0%			100%			100.00%
2071	9	0%			100%			100.00%
2072	24	1%			100%			100.00%
2081	66	2%			100%			100.00%
2082	8	0%			100%			100.00%
2084	16	0%			100%			100.00%
2091	39	1%			100%			100.00%
2092	24	1%			100%			100.00%
2104	34	1%			100%			100.00%
2105	29	1%			100%			100.00%
2111	46	1%			100%			100.00%
2113	8	0%			100%			100.00%
2114	35	1%			100%			100.00%
2132	20	0%			100%			100.00%
2133	12	0%			100%			100.00%
3003	109	3%	50%	50%				100.00%
3017	21	1%				50%	50%	100.00%
3190	223	5%	50%	50%				100.00%
3191	336	8%	50%	50%				100.00%
3192	139	3%	25%		25%	25%	25%	100.00%
3193	310	7%	50%	50%				100.00%
3194	62	1%	50%			50%		100.00%
3196	15	0%				50%	50%	100.00%
	4155	100%						

Route Split Totals

NORTH Hwy 50	NORTH Albion Vaughan Road	SOUTH Hwy 50	WEST McEwan Drive (to Healey Road)	WEST Mayfield Road	TOTAL
0.00%	0.00%	2.82%	0.00%	0.00%	2.8%
0.00%	0.00%	1.93%	0.00%	0.00%	1.9%
0.00%	0.00%	1.49%	0.00%	0.00%	1.5%
0.00%	0.00%	1.01%	0.00%	0.00%	1.0%
0.00%	0.00%	3.35%	0.00%	0.00%	3.3%
0.00%	0.00%	4.84%	0.00%	0.00%	4.8%
0.00%	0.00%	3.27%	0.00%	0.00%	3.3%
0.00%	0.00%	0.36%	0.00%	0.00%	0.4%
0.00%	0.00%	1.11%	0.00%	0.00%	1.1%
0.00%	0.00%	0.36%	0.00%	0.00%	0.4%
0.46%	1.08%	0.00%	0.00%	0.00%	1.5%
0.51%	0.51%	0.00%	0.00%	0.00%	1.0%
0.18%	0.42%	0.60%	0.00%	0.00%	1.2%
0.00%	0.18%	1.60%	0.00%	0.00%	1.8%
0.23%	0.77%	0.54%	0.00%	0.00%	1.5%
0.00%	0.00%	1.89%	0.76%	4.91%	7.6%
0.00%	0.00%	2.99%	1.20%	7.77%	12.0%
0.00%	0.00%	0.00%	0.22%	0.22%	0.4%
0.00%	0.00%	0.48%	0.00%	0.00%	0.5%
0.80%	0.09%	0.00%	0.00%	0.00%	0.9%
0.05%	0.45%	0.00%	0.00%	0.00%	0.5%
0.20%	1.82%	0.00%	0.00%	0.00%	2.0%
0.65%	0.07%	0.00%	0.00%	0.00%	0.7%
0.07%	0.07%	0.07%	0.07%	0.07%	0.4%
0.00%	0.00%	0.48%	0.00%	0.00%	0.5%
0.00%	0.00%	0.48%	0.00%	0.00%	0.5%
0.00%	0.00%	0.99%	0.00%	0.00%	1.0%
0.00%	0.00%	1.03%	0.00%	0.00%	1.0%
0.00%	0.00%	0.60%	0.00%	0.00%	0.6%
0.00%	0.00%	0.29%	0.00%	0.00%	0.3%
0.00%	0.00%	0.36%	0.00%	0.00%	0.4%
0.00%	0.00%	0.48%	0.00%	0.00%	0.5%
0.00%	0.00%	0.94%	0.00%	0.00%	0.9%
0.00%	0.00%	1.64%	0.00%	0.00%	1.6%
0.00%	0.00%	0.60%	0.00%	0.00%	0.6%
0.00%	0.00%	0.53%	0.00%	0.00%	0.5%
0.00%	0.00%	0.51%	0.00%	0.00%	0.5%
0.00%	0.00%	0.39%	0.00%	0.00%	0.4%
0.00%	0.00%	0.22%	0.00%	0.00%	0.2%
0.00%	0.00%	0.58%	0.00%	0.00%	0.6%
0.00%	0.00%	1.59%	0.00%	0.00%	1.6%
0.00%	0.00%	0.19%	0.00%	0.00%	0.2%
0.00%	0.00%	0.39%	0.00%	0.00%	0.4%
0.00%	0.00%	0.94%	0.00%	0.00%	0.9%
0.00%	0.00%	0.58%	0.00%	0.00%	0.6%
0.00%	0.00%	0.82%	0.00%	0.00%	0.8%
0.00%	0.00%	0.70%	0.00%	0.00%	0.7%
0.00%	0.00%	1.11%	0.00%	0.00%	1.1%
0.00%	0.00%	0.19%	0.00%	0.00%	0.2%
0.00%	0.00%	0.84%	0.00%	0.00%	0.8%
0.00%	0.00%	0.48%	0.00%	0.00%	0.5%
0.00%	0.00%	0.29%	0.00%	0.00%	0.3%
1.31%	1.31%	0.00%	0.00%	0.00%	2.6%
0.00%	0.00%	0.00%	0.25%	0.25%	0.5%
2.68%	2.68%	0.00%	0.00%	0.00%	5.4%
4.04%	4.04%	0.00%	0.00%	0.00%	8.1%
0.84%	0.00%	0.84%	0.84%	0.84%	3.3%
3.73%	3.73%	0.00%	0.00%	0.00%	7.5%
0.75%	0.00%	0.00%	0.75%	0.00%	1.5%
0.00%	0.00%	0.00%	0.18%	0.18%	0.4%
16.5%	**17.2%**	**47.8%**	**4.3%**	**14.2%**	100%

15.00%	**15.00%**	**50.00%**	**5.00%**	**15.00%**	100%

*NORTH: used edited splits given site's proximity to Hwy 50 over Albion Vaughan

PM	RESIDENTIAL VEHICLE TRIP DISTRIBUTION
Inbound	Traffic Volume Allocation
2021-02-05	

Zone	Trips	%	NORTH Hwy 50	NORTH Albion Vaughan Road	SOUTH Hwy 50	WEST McEwan Drive (to Healey Road)	WEST Mayfield Road	TOTAL
PD 1 of Toronto	74	2%			100%			100.00%
PD 3 of Toronto	27	1%			100%			100.00%
PD 4 of Toronto	41	1%			100%			100.00%
PD 5 of Toronto	15	0%			100%			100.00%
PD 7 of Toronto	42	1%			100%			100.00%
PD 8 of Toronto	124	4%			100%			100.00%
PD 9 of Toronto	131	4%			100%			100.00%
PD 10 of Toronto	192	5%			100%			100.00%
PD 12 of Toronto	42	1%			100%			100.00%
PD 13 of Toronto	46	1%			100%			100.00%
East Gwillimbury	43	1%	50%	50%				100.00%
Aurora	42	1%	50%	50%				100.00%
Richmond Hill	50	1%	15%	35%	50%			100.00%
Markham	23	1%		10%	90%			100.00%
King	37	1%	15%	50%	35%			100.00%
Brampton	284	8%			25%	10%	65%	100.00%
Mississauga	427	12%			25%	10%	65%	100.00%
Cambridge	9	0%			50%	20%	30%	100.00%
Barrie	21	1%	10%	90%				100.00%
Innisfil	72	2%	10%	90%				100.00%
Bradford-West Gwillimbury	84	2%	10%	90%				100.00%
Mono	30	1%	90%	10%				100.00%
External	15	0%	20%	20%	20%	20%	20%	100.00%
2002	20	1%			100%			100.00%
2005	34	1%			100%			100.00%
2015	21	1%			100%			100.00%
2020	20	1%			100%			100.00%
2027	25	1%			100%			100.00%
2040	39	1%			100%			100.00%
2058	39	1%			100%			100.00%
2060	57	2%			100%			100.00%
2062	46	1%			100%			100.00%
2067	22	1%			100%			100.00%
2070	16	0%			100%			100.00%
2081	16	0%			100%			100.00%
2082	8	0%			100%			100.00%
2084	16	0%			100%			100.00%
2091	39	1%			100%			100.00%
2092	24	1%			100%			100.00%
2104	34	1%			100%			100.00%
2105	29	1%			100%			100.00%
2111	46	1%			100%			100.00%
2131	12	0%			100%			100.00%
2132	20	1%			100%			100.00%
3017	21	1%				50%	50%	100.00%
3190	233	7%	50%	50%				100.00%
3191	212	6%	50%	50%				100.00%
3192	320	9%	25%		25%	25%	25%	100.00%
3193	215	6%	50%	50%				100.00%
3194	50	1%	50%			50%		100.00%
3196	15	0%				50%	50%	100.00%
	3520	100%						

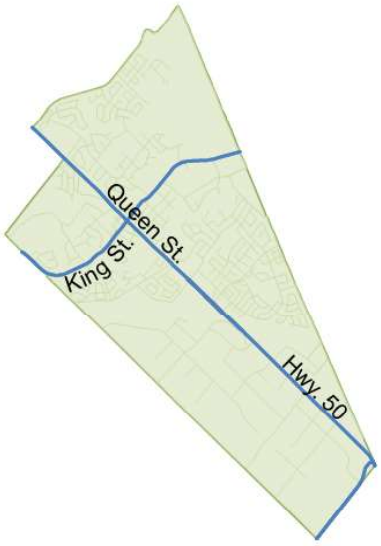
Route Split Totals

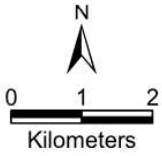
NORTH Hwy 50	NORTH Albion Vaughan Road	SOUTH Hwy 50	WEST McEwan Drive (to Healey Road)	WEST Mayfield Road	TOTAL
0.00%	0.00%	2.10%	0.00%	0.00%	2.1%
0.00%	0.00%	0.77%	0.00%	0.00%	0.8%
0.00%	0.00%	1.16%	0.00%	0.00%	1.2%
0.00%	0.00%	0.43%	0.00%	0.00%	0.4%
0.00%	0.00%	1.19%	0.00%	0.00%	1.2%
0.00%	0.00%	3.52%	0.00%	0.00%	3.5%
0.00%	0.00%	3.72%	0.00%	0.00%	3.7%
0.00%	0.00%	5.45%	0.00%	0.00%	5.5%
0.00%	0.00%	1.19%	0.00%	0.00%	1.2%
0.00%	0.00%	1.31%	0.00%	0.00%	1.3%
0.61%	0.61%	0.00%	0.00%	0.00%	1.2%
0.60%	0.60%	0.00%	0.00%	0.00%	1.2%
0.21%	0.50%	0.71%	0.00%	0.00%	1.4%
0.00%	0.07%	0.59%	0.00%	0.00%	0.7%
0.16%	0.53%	0.37%	0.00%	0.00%	1.1%
0.00%	0.00%	2.02%	0.81%	5.24%	8.1%
0.00%	0.00%	3.03%	1.21%	7.88%	12.1%
0.00%	0.00%	0.13%	0.05%	0.08%	0.3%
0.06%	0.54%	0.00%	0.00%	0.00%	0.6%
0.20%	1.84%	0.00%	0.00%	0.00%	2.0%
0.24%	2.15%	0.00%	0.00%	0.00%	2.4%
0.77%	0.09%	0.00%	0.00%	0.00%	0.9%
0.09%	0.09%	0.09%	0.09%	0.09%	0.4%
0.00%	0.00%	0.57%	0.00%	0.00%	0.6%
0.00%	0.00%	0.97%	0.00%	0.00%	1.0%
0.00%	0.00%	0.60%	0.00%	0.00%	0.6%
0.00%	0.00%	0.57%	0.00%	0.00%	0.6%
0.00%	0.00%	0.71%	0.00%	0.00%	0.7%
0.00%	0.00%	1.11%	0.00%	0.00%	1.1%
0.00%	0.00%	1.11%	0.00%	0.00%	1.1%
0.00%	0.00%	1.62%	0.00%	0.00%	1.6%
0.00%	0.00%	1.31%	0.00%	0.00%	1.3%
0.00%	0.00%	0.63%	0.00%	0.00%	0.6%
0.00%	0.00%	0.45%	0.00%	0.00%	0.5%
0.00%	0.00%	0.45%	0.00%	0.00%	0.5%
0.00%	0.00%	0.23%	0.00%	0.00%	0.2%
0.00%	0.00%	0.45%	0.00%	0.00%	0.5%
0.00%	0.00%	1.11%	0.00%	0.00%	1.1%
0.00%	0.00%	0.68%	0.00%	0.00%	0.7%
0.00%	0.00%	0.97%	0.00%	0.00%	1.0%
0.00%	0.00%	0.82%	0.00%	0.00%	0.8%
0.00%	0.00%	1.31%	0.00%	0.00%	1.3%
0.00%	0.00%	0.34%	0.00%	0.00%	0.3%
0.00%	0.00%	0.57%	0.00%	0.00%	0.6%
0.00%	0.00%	0.00%	0.30%	0.30%	0.6%
3.31%	3.31%	0.00%	0.00%	0.00%	6.6%
3.01%	3.01%	0.00%	0.00%	0.00%	6.0%
2.27%	0.00%	2.27%	2.27%	2.27%	9.1%
3.05%	3.05%	0.00%	0.00%	0.00%	6.1%
0.71%	0.00%	0.00%	0.71%	0.00%	1.4%
0.00%	0.00%	0.00%	0.21%	0.21%	0.4%
15.3%	**16.4%**	**46.6%**	**5.7%**	**16.1%**	100%

15.00%	**15.00%**	**50.00%**	**5.00%**	**15.00%**	100%

*NORTH: used edited splits given site's proximity to Hwy 50 over Albion Vaughan

TOWN OF CALEDON
WARD 5





WARD 5

HOUSEHOLD CHARACTERISTICS

Households	Dwelling Type			Household Size					Number of Available Vehicles					Household Averages				
	House	Townhouse	Apartment	1	2	3	4	5+	0	1	2	3	4+	Persons	Workers	Drivers	Vehicles	Trips/Day
7,300	85%	8%	7%	13%	26%	20%	28%	13%	2%	21%	51%	16%	10%	3.1	1.8	2.2	2.2	6.1

POPULATION CHARACTERISTICS

Population	Age							Daily Trips per Person (age 11+)	Daily Work Trips per Worker	Population	Employment Type			Student	Licensed	Transit Pass
	0-10	11-15	16-25	26-45	46-64	65+	Median				Full Time	Part Time	At Home			
										Male						
										11,200	51%	6%	2%	25%	73%	4%
										Female						
22,300	12%	8%	15%	24%	29%	11%	40.3	2.3	0.72	11,200	37%	13%	5%	24%	72%	5%

TRIPS MADE BY RESIDENTS OF TOWN OF CALEDON - WARD 5

Time Period	Trips	% 24hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			HB-W	HB-S	HB-D	N-HB	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6-9 AM	11,800	26.7%	54%	23%	17%	6%	72%	11%	1%	1%	7%	9%	18.3	4.1	32.7	37.9
24 Hrs	44,200		37%	14%	36%	14%	74%	14%	1%	1%	6%	5%	15.2	9.5	31.2	37.9

TRIPS MADE TO TOWN OF CALEDON - WARD 5 - BY RESIDENTS OF THE TTS AREA

Time Period	Trips	% 24 hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			Work	School	Home	Other	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6-9 AM	12,500	27.1%	63%	20%	4%	13%	74%	9%	*	*	5%	12%	14.2	2.8	*	*
24 Hrs	46,100		26%	6%	41%	26%	76%	13%	0%	0%	5%	6%	11.7	4.8	12.7	37.6

CITY OF BARRIE

HOUSEHOLD CHARACTERISTICS

Households		Dwelling Type			Household Size					Number of Available Vehicles					Household Averages				
		House	Townhouse	Apartment	1	2	3	4	5+	0	1	2	3	4+	Persons	Workers	Drivers	Vehicles	Trips/Day
2016 TTS	52,500	64%	11%	25%	23%	32%	18%	17%	10%	7%	36%	41%	12%	4%	2.6	1.5	1.9	1.7	5.5
2011 TTS	50,600	74%	10%	16%	18%	36%	19%	19%	8%	7%	38%	44%	9%	2%	2.7	1.4	1.8	1.6	5.7
2006 TTS	46,500	79%	7%	13%	19%	34%	19%	19%	9%	8%	37%	46%	7%	2%	2.7	1.5	1.8	1.6	6.2
1996 TTS	28,600	70%	7%	24%	20%	36%	17%	16%	10%	10%	42%	40%	6%	2%	2.6	1.3	1.7	1.5	5.9
1986 TTS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

POPULATION CHARACTERISTICS

Population		Age							Daily Trips per Person (age 11+)	Daily Work Trips per Worker	Population		Employment Type			Student	Licensed	Transit Pass
		0-10	11-15	16-25	26-45	46-64	65+	Median					Full Time	Part Time	At Home			
											Male	67,000	46%	8%	4%	22%	71%	6%
												65,800	44%	6%	4%	23%	69%	4%
												59,900	46%	5%	4%	23%	69%	3%
												36,700	45%	6%	2%	23%	68%	2%
												n/a	n/a	n/a	n/a	n/a	n/a	n/a
2016 TTS	138,000	13%	7%	13%	28%	26%	13%	38.7	2.4	0.72	Female	71,100	33%	13%	4%	21%	70%	6%
2011 TTS	135,800	14%	7%	12%	31%	24%	12%	37.1	2.5	0.71		70,000	30%	12%	4%	20%	67%	6%
2006 TTS	124,700	15%	8%	11%	31%	22%	13%	37.9	2.7	0.74		64,700	30%	13%	4%	22%	65%	4%
1996 TTS	75,300	19%	7%	13%	35%	16%	10%	32.8	2.7	0.78		38,600	26%	14%	2%	24%	62%	2%
1986 TTS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a

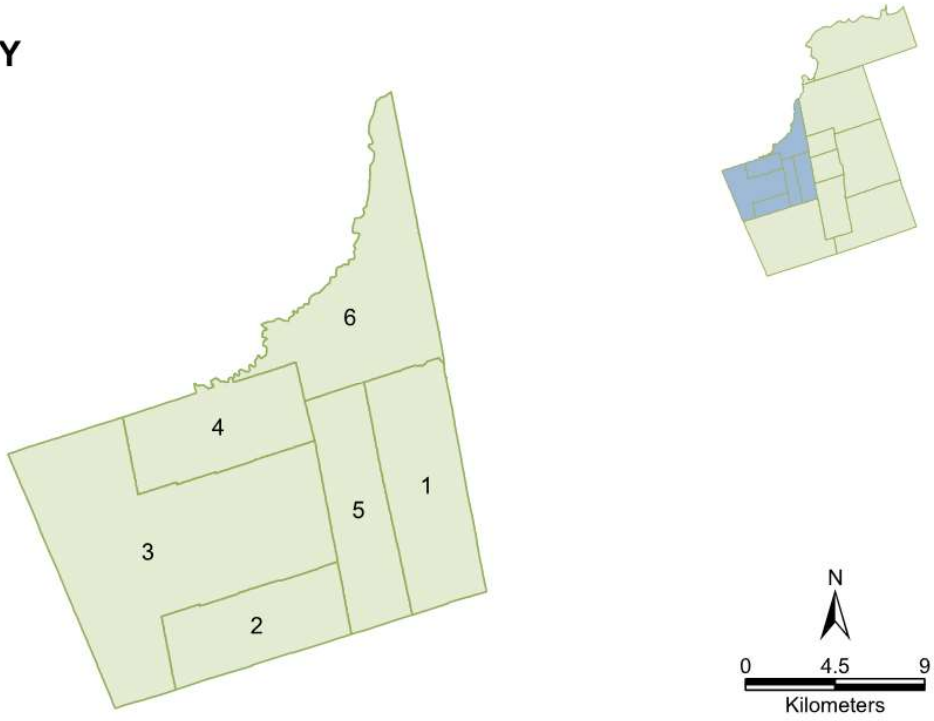
TRIPS MADE BY RESIDENTS OF BARRIE

Time Period	Trips	% 24hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			HB-W	HB-S	HB-D	N-HB	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6:00-8:59 AM	65,400	22.6%	49%	19%	23%	9%	71%	11%	2%	1%	9%	7%	5.3	3.3	4.9	80.7
	62,200	21.4%	43%	21%	24%	11%	70%	12%	3%	0%	9%	7%	4.7	2.6	3.7	80.8
	60,700	21.2%	43%	21%	23%	13%	68%	14%	3%	*	9%	6%	4.6	3.2	3.9	*
	31,700	18.9%	53%	23%	17%	7%	68%	14%	3%	*	11%	5%	16.4	11.7	39.1	*
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
24 Hrs	289,800		32%	9%	43%	16%	73%	14%	2%	1%	6%	3%	4.5	3.9	4.6	82.1
	290,500		29%	10%	44%	17%	72%	17%	3%	0%	5%	3%	4.1	3.5	3.8	80.8
	286,900		29%	10%	42%	19%	72%	17%	3%	*	5%	3%	3.9	3.4	3.4	*
	168,100		30%	11%	42%	17%	71%	18%	3%	*	6%	2%	12.6	10.3	47.3	*
	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

TRIPS MADE TO BARRIE BY RESIDENTS OF THE TTS AREA

Time Period	Trips	% 24 hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			Work	School	Home	Other	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6:00-8:59 AM	72,200	22.6%	51%	23%	6%	20%	71%	11%	2%	0%	8%	9%	5.9	4.0	4.9	*
	69,000	21.7%	43%	26%	7%	24%	69%	12%	2%	*	8%	9%	5.2	3.2	3.5	*
	63,600	20.3%	43%	27%	6%	24%	65%	14%	2%	*	8%	10%	4.5	3.2	3.4	*
	33,700	18.8%	48%	31%	5%	16%	64%	14%	2%	*	10%	11%	7.2	2.3	47.8	*
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
24 Hrs	319,400		19%	6%	38%	37%	74%	15%	2%	0%	6%	4%	4.7	4.1	4.6	82.1
	317,400		14%	7%	38%	41%	71%	17%	2%	0%	5%	4%	4.3	3.8	3.7	80.8
	313,000		13%	6%	37%	44%	71%	18%	2%	*	5%	4%	3.9	3.6	3.3	*
	179,800		14%	7%	39%	40%	70%	19%	2%	*	5%	3%	10.6	8.9	53.5	*
	n/a		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

KING CITY



KING CITY

HOUSEHOLD CHARACTERISTICS

Households	Dwelling Type			Household Size					Number of Available Vehicles					Household Averages				
	House	Townhouse	Apartment	1	2	3	4	5+	0	1	2	3	4+	Persons	Workers	Drivers	Vehicles	Trips/Day
8,100	90%	4%	5%	15%	30%	17%	23%	14%	1%	17%	44%	22%	15%	3.0	1.9	2.3	2.5	6.1

POPULATION CHARACTERISTICS

Population	Age							Daily Trips per Person (age 11+)	Daily Work Trips per Worker	Population	Employment Type			Student	Licensed	Transit Pass
	0-10	11-15	16-25	26-45	46-64	65+	Median				Full Time	Part Time	At Home			
										Male						
										12,200	48%	5%	7%	23%	76%	8%
										Female						
24,400	13%	6%	14%	22%	30%	14%	43.0	2.3	0.71	12,100	31%	16%	6%	22%	74%	6%

TRIPS MADE BY RESIDENTS OF KING CITY

Time Period	Trips	% 24hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			HB-W	HB-S	HB-D	N-HB	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6-9 AM	11,300	22.8%	56%	23%	16%	5%	72%	7%	1%	4%	2%	15%	17.1	8.3	32.7	34.1
24 Hrs	49,300		36%	12%	39%	14%	78%	11%	1%	2%	2%	7%	14.2	8.3	21.8	34.1

TRIPS MADE TO KING CITY BY RESIDENTS OF THE TTS AREA

Time Period	Trips	% 24 hr	Trip Purpose				Mode of Travel						Median Trip Length (km)			
			Work	School	Home	Other	Driver	Pass.	Transit	GO Train	Walk & Cycle	Other	Driver	Pass.	Transit	GO Train
6-9 AM	10,100	23.6%	40%	38%	5%	18%	67%	12%	3%	*	2%	16%	13.6	7.4	21.1	*
24 Hrs	42,700		16%	11%	50%	23%	74%	13%	2%	1%	2%	8%	12.9	10.1	21.1	34.1

Appendix G
Preferred George Bolton Extension Drawing

ALTERNATIVE DESIGN CONCEPT 1

MULTI-USE PATHWAY ON BOTH SIDES

Closure of intersection at Albion Vaughan Road and Commercial Road to accommodate the future rail/road grade separation on Albion Vaughan Road

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- GRADING LIMITS
- BACK OF CURB
- BOTTOM OF GUTTER
- EDGE OF PAVEMENT
- CENTRE LINE OF THE ROAD
- MEDIAN LEFT TURN LANE
- MULTI-USE PATHWAY
- CONCRETE SIDEWALK

GEORGE BOLTON PARKWAY
TYPICAL SECTION - ALTERNATIVE DESIGN 1

TOWN OF CALEDON

SCHEDULE 'C' CLASS EA - GEORGE BOLTON PARKWAY EXTENSION

0 10 20 30 40 50m
SCALE 1:1000 AT ORIGINAL SIZE

date: DEC 2017
job no: 11115459
drawing: 001

GHD

PREFERRED DESIGN SOLUTION - ALTERNATIVE DESIGN CONCEPT 1

www.ghd.com

Cad File No: G:\11115459 Bolton Pkwy Ext. Schc Class EA\08 Highway Engineering\Drawings\Civil\Preferred Alt_ 7-MULTIUSE NORTH & SOUTH.dwg

Plot Date: 15 December 2017 - 10:45 AM Plotted by: Zivan Miljkovic

Appendix H
Existing Traffic Signal Timing Plans

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**December 18, 2015**		**Prepared Date:**	**September 14, 2017**
Database Rev	**6**		**Completed By:**	**JA**
Timing Card / Field rev	**-**		**Checked By:**	**RC**

Location:	**Highway 50 and George Bolton Parkway**								
							TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	**Direction**	**Vehicle Minimum (sec.)**	**Pedestrian Minimum (sec.)**		**Amber (sec.)**	**All Red (sec.)**	**AM MAX**	**OFF MAX**	**PM MAX**
			WALK	**FDWALK**					
1	**NB P.P. LT Arrow - Highway 50**	5.0			3.0		10.0	10.0	10.0
2	**SB Green - Highway 50**	12.0	8.0	13.0	4.0	2.3	75.0	65.0	75.0
3									
4	**WB Green - George Bolton Parkway**	8.0	8.0	18.0	4.0	2.6	35.0	35.0	35.0
5									
6	**NB Green - Highway 50**	12.0	8.0	13.0	4.0	2.3	85.0	75.0	85.0
7									
8	**EB Green - George Bolton Parkway**	8.0	8.0	18.0	4.0	2.6	35.0	35.0	35.0

System Control	Yes
Local Control	No
Semi-Actuated Mode	Yes

TIME (M-F)	**PEAK**	**CYCLE LENGTH (sec.)**	**OFFSET (sec.)**
06:00-09:00	**AM**	**120**	**113**
9:00 - 15:00	**OFF**	**110**	**73**
15:00 - 19:00	**PM**	**120**	**116**

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**December 18, 2015**		**Prepared Date:**	**September 14, 2017**
Database Rev	**6**		**Completed By:**	**JA**
Timing Card / Field rev	**-**		**Checked By:**	**RC**

Location: **Highway 50 and Parr Boulevard**

Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.)		Amber (sec.)	All Red (sec.)	TIME PERIOD (sec.) (Green+Amber+All Red)		
			WALK	FDWALK			AM MAX	OFF MAX	PM MAX
1	NB P.P. LT Arrow - Highway 50	5.0			3.0		10.0	10.0	10.0
2	SB Green - Highway 50	12.0	8.0	16.0	4.0	2.1	71.0	61.0	71.0
3									
4	WB Green - Private Entrance	8.0	8.0	19.0	4.0	2.9	39.0	39.0	39.0
5									
6	NB Green - Highway 50	12.0	8.0	16.0	4.0	2.1	81.0	71.0	81.0
7									
8	EB Green - Parr Boulevard	8.0	8.0	19.0	4.0	2.9	39.0	39.0	39.0

System Control	Yes
Local Control	No
Semi-Actuated Mode	Yes

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:00	**AM**	**120**	**8**
9:00 - 15:00	**OFF**	**110**	**105**
15:00 - 19:00	**PM**	**120**	**3**

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	March 24, 2014		Prepared Date:	June 11, 2014
Database Rev	8		Completed By:	RC
Timing Card / Field rev	-		Checked By:	SL

Location:	Mayfield Road at Highway 50						TIME PERIOD (sec.) (Green+Amber+All Red)		
Phase #	Direction	Vehicle Minimum (sec.)	Pedestrian Minimum (sec.)		Amber (sec.)	All Red (sec.)	AM MAX	OFF MAX	PM MAX
			WALK	FDWALK					
1	Highway 50 - NB PP LT Arrow	5.0			3.0		10.0	9.0	9.0
2	Highway 50 - N/S	20.0	8.0	18.0	4.6	2.0	60.0	48.0	66.0
3	Mayfield Road - WB PP LT Arrow	5.0			3.0		20.0	9.0	10.0
4	Mayfield Road - E/W	12.0	8.0	19.0	4.6	2.0	30.0	34.0	35.0

System Control	Yes
Local Control	No
Semi-Actuated Mode	No (Fully)

TIME (M-F)	PEAK	CYCLE LENGTH (sec.)	OFFSET (sec.)
06:00-09:00	AM	120	37
Other	OFF	100	7
15:30-19:00	PM	120	72

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**December 1, 2020**		**Prepared Date**	**December 1, 2020**
Database Rev	**iNET**		**Completed By**	**JP**
Timing Card / Field rev	**-**		**Checked By**	**SJ**

Location — **Highway 50 at McEwan Drive**

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	OFF SPLITS	PM SPLITS
1	Highway 50 - NB PP LT	5	0	0	3	0	15	15	18
2	Highway 50 - SB	8	8	20	4	2.6	59	43	65
3	McEwan Drive - EB PP LT	5	0	0	3	0	8	16	15
4	McEwan Drive - WB	8	8	20	4	3	38	36	42
5	Highway 50 - SB PP LT	5	0	0	3	0	8	10	13
6	Highway 50 - NB	8	8	20	4	2.6	66	48	70
7	McEwan Drive - WB PROT. LT	8	0	0	3	2	16	16	20
8	McEwan Drive - EB	8	8	20	4	3	30	36	37

System Control
Yes

Semi-Actuated Mode
Yes

TIME (M-F)	PEAK	CYCLE LENGTH (s)	OFFSET (s)
06:00 - 09:00	AM	120	71
09:00 - 15:00	OFF	110	55
15:00 - 20:00	PM	140	72

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	**2020**		**Prepared Date**	**January 28, 2021**
Database Rev	**20**		**Completed By**	**JP**
Timing Card / Field rev	**-**		**Checked By**	**BL**

Location — **Mayfield Road at Highway 50**

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	OFF SPLITS	PM SPLITS
1	Highway 50 - NB PROT LT	10	0	0	3.0	2.0	20	25	25
2	Highway 50 - SB	20	8	23	4.2	2.1	70	65	65
3	Mayfield Road - WB PP LT	10	0	0	3.0	0.0	25	25	20
4	Mayfield Road - EB	12	8	25	4.0	2.5	45	45	50
5	Highway 50 - SB PROT LT	10	0	0	3	2	15	15	15
6	Highway 50 - NB	20	8	23	4.2	2.1	75	75	75
7	Mayfield Road - EB PP LT	5	0	0	3.0	0.0	15	25	25
8	Mayfield Road - WB	12	8	25	4.0	2.5	55	45	45

System Control
Yes

Semi-Actuated Mode
No (Fully)

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

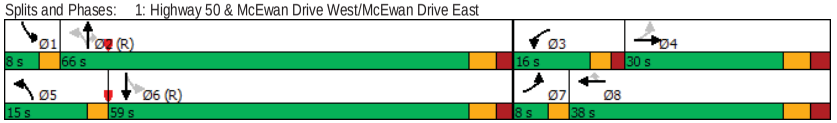
Appendix I
Synchro Worksheets and Proposed Traffic Signal Timings

Existing Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	75	45	80	100	45	105	620	65	55	1120
Future Volume (vph)	75	45	80	100	45	105	620	65	55	1120
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	23.8	13.0	8.8	14.9	14.9	84.9	74.8	74.8	80.4	70.7
Actuated g/C Ratio	0.20	0.11	0.07	0.12	0.12	0.71	0.62	0.62	0.67	0.59
v/c Ratio	0.27	0.41	0.34	0.44	0.15	0.41	0.29	0.07	0.10	0.63
Control Delay	36.4	19.4	56.5	52.6	1.1	13.6	12.5	2.4	8.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	19.4	56.5	52.6	1.1	13.6	12.5	2.4	8.1	20.3
LOS	D	B	E	D	A	B	B	A	A	C
Approach Delay		25.0		43.7			11.8			19.7
Approach LOS		C		D			B			B

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 75.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	150	80	100	45	105	620	65	55	1255
v/c Ratio	0.27	0.41	0.34	0.44	0.15	0.41	0.29	0.07	0.10	0.63
Control Delay	36.4	19.4	56.5	52.6	1.1	13.6	12.5	2.4	8.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	19.4	56.5	52.6	1.1	13.6	12.5	2.4	8.1	20.3
Queue Length 50th (m)	14.9	5.4	9.9	24.0	0.0	8.7	38.6	0.2	3.7	99.8
Queue Length 95th (m)	23.7	14.4	17.9	34.8	0.0	22.8	64.8	2.9	11.3	173.4
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	279	574	296	468	482	294	2125	956	526	2005
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.26	0.27	0.21	0.09	0.36	0.29	0.07	0.10	0.63

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	45	105	80	100	45	105	620	65	55	1120	135
Future Volume (vph)	75	45	105	80	100	45	105	620	65	55	1120	135
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2545		3236	1812	1536	1526	3411	1452	1638	3395	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.14	1.00	1.00	0.42	1.00	
Satd. Flow (perm)	1251	2545		3236	1812	1536	231	3411	1452	716	3395	
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)	75	45	105	80	100	45	105	620	65	55	1120	135
RTOR Reduction (vph)	0	94	0	0	0	39	0	0	25	0	6	0
Lane Group Flow (vph)	75	56	0	80	100	6	105	620	40	55	1249	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	19.9	13.0		7.2	15.3	15.3	81.2	73.2	73.2	74.7	69.7	
Effective Green, g (s)	19.9	13.0		7.2	15.3	15.3	81.2	73.2	73.2	74.7	69.7	
Actuated g/C Ratio	0.17	0.11		0.06	0.13	0.13	0.68	0.61	0.61	0.62	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	234	275		194	231	195	248	2080	885	484	1971	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.03	0.18		0.00	c0.37	
v/s Ratio Perm	0.03					0.00	0.26		0.03	0.07		
v/c Ratio	0.32	0.20		0.41	0.43	0.03	0.42	0.30	0.04	0.11	0.63	
Uniform Delay, d1	43.7	48.8		54.4	48.3	45.8	10.6	11.2	9.4	8.8	16.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.21	0.97	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.4		1.4	1.3	0.1	1.2	0.4	0.1	0.1	1.6	
Delay (s)	44.5	49.2		55.8	49.6	45.9	14.0	11.1	9.5	9.0	18.2	
Level of Service	D	D		E	D	D	B	B	A	A	B	
Approach Delay (s)		47.6			51.1			11.4			17.9	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	30	855	25	25	1455
Future Volume (Veh/h)	45	30	855	25	25	1455
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)	45	30	855	25	25	1455
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.96	0.96			0.96	
vC, conflicting volume	1645	440			880	
vC1, stage 1 conf vol	868					
vC2, stage 2 conf vol	778					
vCu, unblocked vol	1592	340			797	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	84	95			97	
cM capacity (veh/h)	274	583			802	

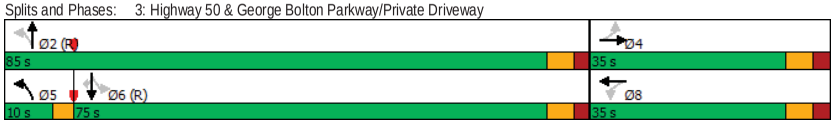
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	75	570	310	25	728	728
Volume Left	45	0	0	25	0	0
Volume Right	30	0	25	0	0	0
cSH	348	1700	1700	802	1700	1700
Volume to Capacity	0.22	0.34	0.18	0.03	0.43	0.43
Queue Length 95th (m)	6.5	0.0	0.0	0.8	0.0	0.0
Control Delay (s)	18.2	0.0	0.0	9.6	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	18.2	0.0		0.2		
Approach LOS	C					

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		51.2%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBT	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	25	0	0	75	740	1350	85
Future Volume (vph)	25	0	0	75	740	1350	85
Turn Type	Perm	NA	NA	pm+pt	NA	NA	Perm
Protected Phases		4	8	5	2	6	
Permitted Phases	4			2			6
Detector Phase	4	4	8	5	2	6	6
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	5.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	32.6	8.0	27.3	27.3	27.3
Total Split (s)	35.0	35.0	35.0	10.0	85.0	75.0	75.0
Total Split (%)	29.2%	29.2%	29.2%	8.3%	70.8%	62.5%	62.5%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	2.6	0.0	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6	3.0	6.3	6.3	6.3
Lead/Lag				Lead		Lag	Lag
Lead-Lag Optimize?				Yes		Yes	Yes
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min
Act Effct Green (s)	8.7	8.7	8.7	104.6	102.6	94.9	94.9
Actuated g/C Ratio	0.07	0.07	0.07	0.87	0.86	0.79	0.79
v/c Ratio	0.25	0.25	0.01	0.23	0.25	0.49	0.07
Control Delay	58.7	2.8	0.0	3.5	2.3	4.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	2.8	0.0	3.5	2.3	4.1	1.5
LOS	E	A	A	A	A	A	A
Approach Delay		20.3			2.4	3.9	
Approach LOS		C			A	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 113 (94%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 3.9		Intersection LOS: A	
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/Private Driveway



Lane Group	EBL	EBT	WBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	25	55	5	75	740	1350	85
v/c Ratio	0.25	0.25	0.01	0.23	0.25	0.49	0.07
Control Delay	58.7	2.8	0.0	3.5	2.3	4.1	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	2.8	0.0	3.5	2.3	4.1	1.5
Queue Length 50th (m)	6.0	0.0	0.0	1.9	15.5	28.0	0.2
Queue Length 95th (m)	15.2	0.0	0.0	4.5	23.0	54.9	m1.0
Internal Link Dist (m)		155.6	50.7		578.5	135.9	
Turn Bay Length (m)	105.0			40.0			45.0
Base Capacity (vph)	325	385	584	331	2916	2750	1276
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.14	0.01	0.23	0.25	0.49	0.07

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	0	55	0	0	5	75	740	0	0	1350	85
Future Volume (vph)	25	0	55	0	0	5	75	740	0	0	1350	85
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)	6.6	6.6			6.6		3.0	6.3			6.3	6.3
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95			0.95	1.00
Frt	1.00	0.85			0.86		1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1733	1166			1662		1623	3411			3476	1597
Flt Permitted	0.75	1.00			1.00		0.17	1.00			1.00	1.00
Satd. Flow (perm)	1376	1166			1662		290	3411			3476	1597
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)	25	0	55	0	0	5	75	740	0	0	1350	85
RTOR Reduction (vph)	0	52	0	0	5	0	0	0	0	0	0	14
Lane Group Flow (vph)	25	3	0	0	0	0	75	740	0	0	1350	71
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA			NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	7.1	7.1			7.1		100.0	100.0			91.7	91.7
Effective Green, g (s)	7.1	7.1			7.1		100.0	100.0			91.7	91.7
Actuated g/C Ratio	0.06	0.06			0.06		0.83	0.83			0.76	0.76
Clearance Time (s)	6.6	6.6			6.6		3.0	6.3			6.3	6.3
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	81	68			98		300	2842			2656	1220
v/s Ratio Prot		0.00			0.00		0.01	c0.22			c0.39	
v/s Ratio Perm	c0.02						0.20					0.04
v/c Ratio	0.31	0.05			0.00		0.25	0.26			0.51	0.06
Uniform Delay, d1	54.1	53.3			53.1		3.0	2.1			5.5	3.5
Progression Factor	1.00	1.00			1.00		1.25	0.94			0.59	0.76
Incremental Delay, d2	2.2	0.3			0.0		0.4	0.2			0.6	0.1
Delay (s)	56.3	53.6			53.1		4.1	2.2			3.8	2.7
Level of Service	E	D			D		A	A			A	A
Approach Delay (s)		54.4			53.1			2.4			3.8	
Approach LOS		D			D			A			A	

Intersection Summary					
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		15.9	
Intersection Capacity Utilization	63.6%	ICU Level of Service		B	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	5	25	205	535	150
Future Volume (Veh/h)	25	5	25	205	535	150
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)	25	5	25	205	535	150
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	865	610	685			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	865	610	685			
tC, single (s)	6.7	6.5	4.2			
tC, 2 stage (s)						
tF (s)	3.8	3.6	2.3			
p0 queue free %	91	99	97			
cM capacity (veh/h)	283	442	885			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	230	685
Volume Left	25	25	0
Volume Right	5	0	150
cSH	301	885	1700
Volume to Capacity	0.10	0.03	0.40
Queue Length 95th (m)	2.6	0.7	0.0
Control Delay (s)	18.3	1.3	0.0
Lane LOS	C	A	
Approach Delay (s)	18.3	1.3	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		47.3%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	20	40	220	475	65
Future Volume (Veh/h)	15	20	40	220	475	65
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)	15	20	40	220	475	65
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	808	508	540			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	508	540			
tC, single (s)	6.6	6.4	4.3			
tC, 2 stage (s)						
tF (s)	3.7	3.4	2.4			
p0 queue free %	95	96	96			
cM capacity (veh/h)	312	538	953			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	260	540
Volume Left	15	40	0
Volume Right	20	0	65
cSH	411	953	1700
Volume to Capacity	0.09	0.04	0.32
Queue Length 95th (m)	2.2	1.1	0.0
Control Delay (s)	14.6	1.7	0.0
Lane LOS	B	A	
Approach Delay (s)	14.6	1.7	0.0
Approach LOS	B		

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		55.6%	ICU Level of Service	B
Analysis Period (min)		15		

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	120	820	1140	110	
Future Volume (vph)	45	0	120	820	1140	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	90.0	90.0	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.75	0.75	
v/c Ratio	0.41	0.19	0.30	0.29	0.45	0.09	
Control Delay	62.4	1.6	3.8	3.0	7.0	3.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	1.6	3.8	3.0	7.0	3.9	
LOS	E	A	A	A	A	A	
Approach Delay		30.4		3.1	6.8		
Approach LOS		C		A	A		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 6.2		Intersection LOS: A	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	50	120	820	1140	110
v/c Ratio	0.41	0.19	0.30	0.29	0.45	0.09
Control Delay	62.4	1.6	3.8	3.0	7.0	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	1.6	3.8	3.0	7.0	3.9
Queue Length 50th (m)	10.8	0.0	3.8	20.7	32.2	1.7
Queue Length 95th (m)	22.8	0.0	8.8	32.9	72.7	14.4
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)	75.0		30.0			35.0
Base Capacity (vph)	355	470	407	2849	2510	1178
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.11	0.29	0.29	0.45	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	50	0	0	0	120	820	0	0	1140	110
Future Volume (vph)	45	0	50	0	0	0	120	820	0	0	1140	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.21	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					381	3380			3349	1551
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)	45	0	50	0	0	0	120	820	0	0	1140	110
RTOR Reduction (vph)	0	47	0	0	0	0	0	0	0	0	0	17
Lane Group Flow (vph)	45	4	0	0	0	0	120	820	0	0	1140	93
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			88.6	88.6
Effective Green, g (s)	8.4	8.4					98.6	98.6			88.6	88.6
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.74	0.74
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					389	2777			2472	1145
v/s Ratio Prot		0.00					0.02	c0.24			c0.34	
v/s Ratio Perm	c0.03						0.24					0.06
v/c Ratio	0.48	0.04					0.31	0.30			0.46	0.08
Uniform Delay, d1	53.7	52.0					3.0	2.5			6.2	4.4
Progression Factor	1.00	1.00					1.00	1.00			0.96	1.43
Incremental Delay, d2	3.9	0.2					0.5	0.3			0.6	0.1
Delay (s)	57.6	52.2					3.4	2.8			6.6	6.4
Level of Service	E	D					A	A			A	A
Approach Delay (s)		54.8			0.0			2.9			6.5	
Approach LOS		D			A			A			A	

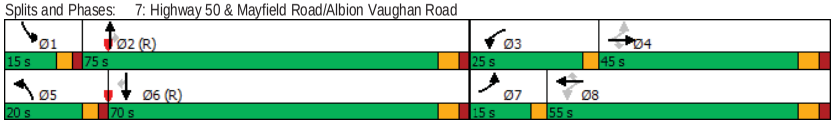
Intersection Summary				
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	115	145	450	370	15	105	850	160	5	1090	85
Future Volume (vph)	90	115	145	450	370	15	105	850	160	5	1090	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	15.0	45.0	45.0	25.0	55.0	55.0	20.0	75.0	75.0	15.0	70.0	70.0
Total Split (%)	9.4%	28.1%	28.1%	15.6%	34.4%	34.4%	12.5%	46.9%	46.9%	9.4%	43.8%	43.8%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	2.0	2.1	2.1	2.0	2.1	2.1
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	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	37.6	23.3	23.3	59.4	42.2	42.2	19.2	88.3	88.3	10.0	67.0	67.0
Actuated g/C Ratio	0.24	0.15	0.15	0.37	0.26	0.26	0.12	0.55	0.55	0.06	0.42	0.42
v/c Ratio	0.40	0.51	0.56	0.91	0.80	0.03	0.74	0.45	0.19	0.05	0.78	0.13
Control Delay	39.1	68.5	15.8	68.4	68.2	0.1	96.7	24.0	3.8	72.0	46.0	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	39.1	68.5	15.8	68.4	68.2	0.1	96.7	24.0	3.8	72.0	46.0	4.0
LOS	D	E	B	E	E	A	F	C	A	E	D	A
Approach Delay		39.1			67.1			28.0			43.1	
Approach LOS		D			E			C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 43.6		Intersection LOS: D	
Intersection Capacity Utilization 91.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	115	145	450	370	15	105	850	160	5	1090	85
v/c Ratio	0.40	0.51	0.56	0.91	0.80	0.03	0.74	0.45	0.19	0.05	0.78	0.13
Control Delay	39.1	68.5	15.8	68.4	68.2	0.1	96.7	24.0	3.8	72.0	46.0	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	39.1	68.5	15.8	68.4	68.2	0.1	96.7	24.0	3.8	72.0	46.0	4.0
Queue Length 50th (m)	20.5	37.5	0.0	131.6	119.6	0.0	33.6	80.2	0.0	1.6	168.2	0.0
Queue Length 95th (m)	31.6	51.9	20.9	#184.9	149.4	0.0	#77.7	135.1	14.6	6.5	201.9	8.7
Internal Link Dist (m)		101.2			63.5			173.0			177.0	
Turn Bay Length (m)	80.0		90.0			65.0	125.0		130.0	35.0		115.0
Base Capacity (vph)	238	372	333	492	534	481	141	1881	844	96	1392	678
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	0.38	0.31	0.44	0.91	0.69	0.03	0.74	0.45	0.19	0.05	0.78	0.13

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	115	145	450	370	15	105	850	160	5	1090	85
Future Volume (vph)	90	115	145	450	370	15	105	850	160	5	1090	85
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	5.0	6.3	6.3	5.0	6.3	6.3
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)	1594	1549	929	1700	1762	1413	1174	3411	1401	1539	3318	1479
Flt Permitted	0.42	1.00	1.00	0.53	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	707	1549	929	953	1762	1413	1174	3411	1401	1539	3318	1479
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)	90	115	145	450	370	15	105	850	160	5	1090	85
RTOR Reduction (vph)	0	0	124	0	0	11	0	0	76	0	0	49
Lane Group Flow (vph)	90	115	21	450	370	4	105	850	84	5	1090	36
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	34.2	23.4	23.4	56.0	42.2	42.2	19.2	84.2	84.2	2.0	67.0	67.0
Effective Green, g (s)	34.2	23.4	23.4	56.0	42.2	42.2	19.2	84.2	84.2	2.0	67.0	67.0
Actuated g/C Ratio	0.21	0.15	0.15	0.35	0.26	0.26	0.12	0.53	0.53	0.01	0.42	0.42
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	210	226	135	471	464	372	140	1795	737	19	1389	619
v/s Ratio Prot	0.03	0.07		c0.18	0.21		c0.09	0.25		0.00	c0.33	
v/s Ratio Perm	0.06		0.02	c0.16		0.00			0.06			0.02
v/c Ratio	0.43	0.51	0.16	0.96	0.80	0.01	0.75	0.47	0.11	0.26	0.78	0.06
Uniform Delay, d1	52.5	63.0	59.7	47.7	54.9	43.5	68.1	23.9	19.1	78.3	40.3	27.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	1.8	0.5	30.1	9.2	0.0	20.0	0.9	0.3	7.3	4.5	0.2
Delay (s)	53.9	64.8	60.2	77.8	64.1	43.5	88.1	24.8	19.4	85.6	44.8	27.9
Level of Service	D	E	E	E	E	D	F	C	B	F	D	C
Approach Delay (s)		60.1			71.2			30.0			43.7	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	215	5	60	470
Future Volume (Veh/h)	5	25	215	5	60	470
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)	5	25	215	5	60	470
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	808	218			220	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	808	218			220	
tC, single (s)	6.7	6.4			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	98	97			96	
cM capacity (veh/h)	298	779			1355	

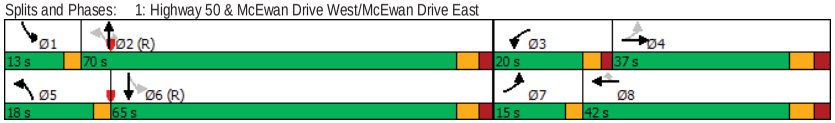
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	220	530
Volume Left	5	0	60
Volume Right	25	5	0
cSH	614	1700	1355
Volume to Capacity	0.05	0.13	0.04
Queue Length 95th (m)	1.2	0.0	1.1
Control Delay (s)	11.2	0.0	1.3
Lane LOS	B		A
Approach Delay (s)	11.2	0.0	1.3
Approach LOS	B		

Intersection Summary				
Average Delay			1.3	
Intersection Capacity Utilization			53.0%	ICU Level of Service A
Analysis Period (min)			15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	195	105	165	90	225	100	1260	185	85	720
Future Volume (vph)	195	105	165	90	225	100	1260	185	85	720
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	35.8	15.5	12.1	12.3	12.3	95.0	82.6	82.6	93.8	82.0
Actuated g/C Ratio	0.26	0.11	0.09	0.09	0.09	0.68	0.59	0.59	0.67	0.59
v/c Ratio	0.54	0.57	0.56	0.56	0.69	0.27	0.60	0.19	0.31	0.38
Control Delay	47.9	25.6	68.6	74.1	22.2	9.7	20.9	5.7	10.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	25.6	68.6	74.1	22.2	9.7	20.9	5.7	10.7	17.0
LOS	D	C	E	E	C	A	C	A	B	B
Approach Delay		34.7		47.9			18.4			16.4
Approach LOS		C		D			B			B

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 95		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.69		
Intersection Signal Delay: 24.4	Intersection LOS: C	
Intersection Capacity Utilization 75.0%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	195	285	165	90	225	100	1260	185	85	785
v/c Ratio	0.54	0.57	0.56	0.56	0.69	0.27	0.60	0.19	0.31	0.38
Control Delay	47.9	25.6	68.6	74.1	22.2	9.7	20.9	5.7	10.7	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	25.6	68.6	74.1	22.2	9.7	20.9	5.7	10.7	17.0
Queue Length 50th (m)	46.7	14.8	24.2	25.6	5.8	9.1	120.9	7.0	7.6	62.5
Queue Length 95th (m)	68.6	30.3	35.8	43.3	32.8	17.1	158.8	20.1	14.6	85.5
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	359	809	365	457	548	426	2089	976	301	2051
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.35	0.45	0.20	0.41	0.23	0.60	0.19	0.28	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	105	180	165	90	225	100	1260	185	85	720	65
Future Volume (vph)	195	105	180	165	90	225	100	1260	185	85	720	65
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3120		3395	1830	1581	1438	3544	1566	1785	3496	
Flt Permitted	0.56	1.00		0.95	1.00	1.00	0.31	1.00	1.00	0.15	1.00	
Satd. Flow (perm)	1055	3120		3395	1830	1581	463	3544	1566	282	3496	
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)	195	105	180	165	90	225	100	1260	185	85	720	65
RTOR Reduction (vph)	0	160	0	0	0	186	0	0	53	0	3	0
Lane Group Flow (vph)	195	125	0	165	90	39	100	1260	132	85	782	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	32.6	15.5		12.1	12.3	12.3	91.4	82.5	82.5	90.2	81.9	
Effective Green, g (s)	32.6	15.5		12.1	12.3	12.3	91.4	82.5	82.5	90.2	81.9	
Actuated g/C Ratio	0.23	0.11		0.09	0.09	0.09	0.65	0.59	0.59	0.64	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	335	345		293	160	138	364	2088	922	270	2045	
v/s Ratio Prot	c0.07	0.04		0.05	0.05		c0.02	c0.36		c0.02	0.22	
v/s Ratio Perm	c0.06					0.02	0.16		0.08	0.18		
v/c Ratio	0.58	0.36		0.56	0.56	0.28	0.27	0.60	0.14	0.31	0.38	
Uniform Delay, d1	46.3	57.7		61.4	61.3	59.7	9.6	18.3	12.9	12.4	15.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.7		2.5	4.5	1.1	0.4	1.3	0.3	0.7	0.5	
Delay (s)	48.9	58.3		63.9	65.7	60.8	10.0	19.6	13.2	13.1	16.1	
Level of Service	D	E		E	E	E	B	B	B	B	B	
Approach Delay (s)		54.5			62.8			18.2			15.8	
Approach LOS		D			E			B			B	

Intersection Summary				
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	75.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	80	1625	55	45	1150
Future Volume (Veh/h)	30	80	1625	55	45	1150
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)	30	80	1625	55	45	1150
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.81	0.81			0.81	
vC, conflicting volume	2318	840			1680	
vC1, stage 1 conf vol	1652					
vC2, stage 2 conf vol	665					
vCu, unblocked vol	2160	343			1376	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	78	85			88	
cM capacity (veh/h)	139	529			377	

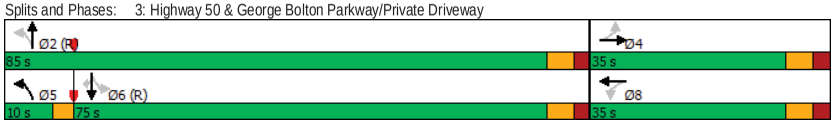
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	110	1083	597	45	575	575
Volume Left	30	0	0	45	0	0
Volume Right	80	0	55	0	0	0
cSH	300	1700	1700	377	1700	1700
Volume to Capacity	0.37	0.64	0.35	0.12	0.34	0.34
Queue Length 95th (m)	13.0	0.0	0.0	3.2	0.0	0.0
Control Delay (s)	23.8	0.0	0.0	15.8	0.0	0.0
Lane LOS	C			C		
Approach Delay (s)	23.8	0.0		0.6		
Approach LOS	C					

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		59.9%	ICU Level of Service	B
Analysis Period (min)		15		

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	125	0	60	1475	925	95	
Future Volume (vph)	125	0	60	1475	925	95	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	32.6	32.6	8.0	27.3	27.3	27.3	32.6
Total Split (s)	35.0	35.0	10.0	85.0	75.0	75.0	35.0
Total Split (%)	29.2%	29.2%	8.3%	70.8%	62.5%	62.5%	29%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.3	2.3	2.3	2.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.6	6.6	3.0	6.3	6.3	6.3	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	16.0	16.0	94.4	91.1	83.0	83.0	
Actuated g/C Ratio	0.13	0.13	0.79	0.76	0.69	0.69	
v/c Ratio	0.67	0.33	0.16	0.55	0.38	0.09	
Control Delay	66.2	2.1	4.2	6.2	9.4	2.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	66.2	2.1	4.2	6.2	9.4	2.2	
LOS	E	A	A	A	A	A	
Approach Delay		33.5		6.2	8.7		
Approach LOS		C		A	A		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 116 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/Private Driveway



Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	125	130	60	1475	925	95
v/c Ratio	0.67	0.33	0.16	0.55	0.38	0.09
Control Delay	66.2	2.1	4.2	6.2	9.4	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.2	2.1	4.2	6.2	9.4	2.2
Queue Length 50th (m)	29.9	0.0	2.6	60.2	48.1	0.3
Queue Length 95th (m)	48.2	0.0	6.8	71.6	74.8	7.1
Internal Link Dist (m)		155.6		578.5	135.9	
Turn Bay Length (m)	105.0		40.0			45.0
Base Capacity (vph)	329	541	374	2663	2404	1080
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.16	0.55	0.38	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	0	130	0	0	0	60	1475	0	0	925	95
Future Volume (vph)	125	0	130	0	0	0	60	1475	0	0	925	95
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)	6.6	6.6					3.0	6.3			6.3	6.3
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1750	1585					1405	3510			3476	1521
Flt Permitted	0.76	1.00					0.27	1.00			1.00	1.00
Satd. Flow (perm)	1395	1585					400	3510			3476	1521
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)	125	0	130	0	0	0	60	1475	0	0	925	95
RTOR Reduction (vph)	0	113	0	0	0	0	0	0	0	0	0	28
Lane Group Flow (vph)	125	17	0	0	0	0	60	1475	0	0	925	67
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	16.0	16.0					91.1	91.1			82.5	82.5
Effective Green, g (s)	16.0	16.0					91.1	91.1			82.5	82.5
Actuated g/C Ratio	0.13	0.13					0.76	0.76			0.69	0.69
Clearance Time (s)	6.6	6.6					3.0	6.3			6.3	6.3
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	186	211					350	2664			2389	1045
v/s Ratio Prot		0.01					0.01	c0.42			0.27	
v/s Ratio Perm	c0.09						0.12					0.04
v/c Ratio	0.67	0.08					0.17	0.55			0.39	0.06
Uniform Delay, d1	49.5	45.6					4.2	6.0			8.0	6.1
Progression Factor	1.00	1.00					0.93	0.82			1.00	1.00
Incremental Delay, d2	9.2	0.2					0.2	0.7			0.5	0.1
Delay (s)	58.7	45.7					4.1	5.7			8.5	6.2
Level of Service	E	D					A	A			A	A
Approach Delay (s)		52.1			0.0			5.6			8.3	
Approach LOS		D			A			A			A	

Intersection Summary					
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.59				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		15.9	
Intersection Capacity Utilization	68.7%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	40	20	635	250	105
Future Volume (Veh/h)	95	40	20	635	250	105
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)	95	40	20	635	250	105
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	978	302	355			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	978	302	355			
tC, single (s)	6.4	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.3			
p0 queue free %	65	95	98			
cM capacity (veh/h)	272	737	1135			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	135	655	355
Volume Left	95	20	0
Volume Right	40	0	105
cSH	334	1135	1700
Volume to Capacity	0.40	0.02	0.21
Queue Length 95th (m)	15.1	0.4	0.0
Control Delay (s)	22.9	0.5	0.0
Lane LOS	C	A	
Approach Delay (s)	22.9	0.5	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		3.0		
Intersection Capacity Utilization		63.9%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	55	35	585	270	20
Future Volume (Veh/h)	55	55	35	585	270	20
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)	55	55	35	585	270	20
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	935	280	290			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	935	280	290			
tC, single (s)	6.4	6.2	4.4			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	81	93	97			
cM capacity (veh/h)	288	764	1142			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	110	620	290
Volume Left	55	35	0
Volume Right	55	0	20
cSH	418	1142	1700
Volume to Capacity	0.26	0.03	0.17
Queue Length 95th (m)	8.3	0.8	0.0
Control Delay (s)	16.7	0.8	0.0
Lane LOS	C	A	
Approach Delay (s)	16.7	0.8	0.0
Approach LOS	C		

Intersection Summary				
Average Delay		2.3		
Intersection Capacity Utilization		64.6%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	55	1355	1030	50	
Future Volume (vph)	115	0	55	1355	1030	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	84.0	84.0	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.30	0.16	0.51	0.42	0.05	
Control Delay	65.9	2.2	4.4	6.7	7.4	1.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	2.2	4.4	6.7	7.4	1.3	
LOS	E	A	A	A	A	A	
Approach Delay		35.5		6.6	7.1		
Approach LOS		D		A	A		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	105	55	1355	1030	50
v/c Ratio	0.65	0.30	0.16	0.51	0.42	0.05
Control Delay	65.9	2.2	4.4	6.7	7.4	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	2.2	4.4	6.7	7.4	1.3
Queue Length 50th (m)	27.5	0.0	2.4	57.4	35.3	0.0
Queue Length 95th (m)	45.5	0.0	6.7	89.9	50.6	2.5
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)	75.0		30.0			35.0
Base Capacity (vph)	376	529	354	2660	2433	1063
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.20	0.16	0.51	0.42	0.05

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	105	0	0	0	55	1355	0	0	1030	50
Future Volume (vph)	115	0	105	0	0	0	55	1355	0	0	1030	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.24	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					366	3476			3476	1493
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)	115	0	105	0	0	0	55	1355	0	0	1030	50
RTOR Reduction (vph)	0	92	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	13	0	0	0	0	55	1355	0	0	1030	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			83.4	83.4
Effective Green, g (s)	15.1	15.1					91.9	91.9			83.4	83.4
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.70	0.70
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					330	2662			2415	1037
v/s Ratio Prot		0.01					0.01	c0.39			0.30	
v/s Ratio Perm	c0.08						0.12					0.02
v/c Ratio	0.65	0.07					0.17	0.51			0.43	0.03
Uniform Delay, d1	49.9	46.3					4.2	5.4			7.9	5.7
Progression Factor	1.00	1.00					1.00	1.00			0.79	0.81
Incremental Delay, d2	8.0	0.2					0.2	0.7			0.5	0.1
Delay (s)	57.9	46.4					4.4	6.1			6.8	4.7
Level of Service	E	D					A	A			A	A
Approach Delay (s)		52.4			0.0			6.0			6.7	
Approach LOS		D			A			A			A	

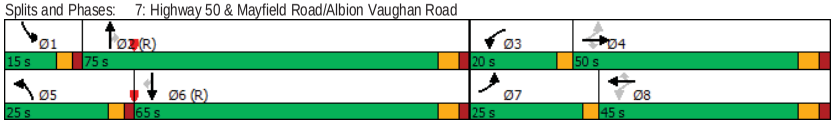
Intersection Summary				
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	210	105	185	105	25	95	1180	605	10	1005	120
Future Volume (vph)	125	210	105	185	105	25	95	1180	605	10	1005	120
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.5	2.0	2.1	2.1	2.0	2.1	2.1
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	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.6	24.9	24.9	47.9	28.2	28.2	19.3	95.8	95.8	10.0	77.5	77.5
Actuated g/C Ratio	0.27	0.16	0.16	0.30	0.18	0.18	0.12	0.60	0.60	0.06	0.48	0.48
v/c Ratio	0.34	0.78	0.41	0.68	0.37	0.07	0.71	0.57	0.53	0.09	0.59	0.15
Control Delay	42.8	84.1	12.7	55.7	61.0	0.4	94.1	23.4	3.4	72.8	34.0	3.8
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	42.8	84.1	12.7	55.7	61.0	0.4	94.1	23.4	3.4	72.8	34.0	3.8
LOS	D	F	B	E	E	A	F	C	A	E	C	A
Approach Delay		55.3			53.1			20.6			31.1	
Approach LOS		E			D			C			C	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 30.5		Intersection LOS: C	
Intersection Capacity Utilization 80.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	210	105	185	105	25	95	1180	605	10	1005	120
v/c Ratio	0.34	0.78	0.41	0.68	0.37	0.07	0.71	0.57	0.53	0.09	0.59	0.15
Control Delay	42.8	84.1	12.7	55.7	61.0	0.4	94.1	23.4	3.4	72.8	34.0	3.8
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	42.8	84.1	12.7	55.7	61.0	0.4	94.1	23.4	3.4	72.8	34.0	3.8
Queue Length 50th (m)	31.1	68.6	0.0	48.1	31.0	0.0	31.0	112.9	0.0	3.2	129.0	0.0
Queue Length 95th (m)	46.7	94.1	16.2	67.9	50.9	0.0	50.4	183.4	20.4	10.4	178.5	11.0
Internal Link Dist (m)		101.2			63.5			173.0			177.0	
Turn Bay Length (m)	80.0		90.0			65.0	125.0		130.0	35.0		115.0
Base Capacity (vph)	432	470	364	279	385	443	152	2062	1136	111	1700	812
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	0.29	0.45	0.29	0.66	0.27	0.06	0.63	0.57	0.53	0.09	0.59	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	210	105	185	105	25	95	1180	605	10	1005	120
Future Volume (vph)	125	210	105	185	105	25	95	1180	605	10	1005	120
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	5.0	6.3	6.3	5.0	6.3	6.3
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	1731	1044	1608	1601	1426	1109	3444	1493	1785	3510	1536
Flt Permitted	0.69	1.00	1.00	0.30	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1222	1731	1044	515	1601	1426	1109	3444	1493	1785	3510	1536
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)	125	210	105	185	105	25	95	1180	605	10	1005	120
RTOR Reduction (vph)	0	0	89	0	0	21	0	0	254	0	0	62
Lane Group Flow (vph)	125	210	16	185	105	4	95	1180	351	10	1005	58
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	39.1	24.9	24.9	45.4	28.2	28.2	19.3	92.8	92.8	4.0	77.5	77.5
Effective Green, g (s)	39.1	24.9	24.9	45.4	28.2	28.2	19.3	92.8	92.8	4.0	77.5	77.5
Actuated g/C Ratio	0.24	0.16	0.16	0.28	0.18	0.18	0.12	0.58	0.58	0.02	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	339	269	162	265	282	251	133	1997	865	44	1700	744
v/s Ratio Prot	0.03	c0.12		c0.08	0.07		c0.09	c0.34		0.01	0.29	
v/s Ratio Perm	0.06		0.02	0.12		0.00			0.24			0.04
v/c Ratio	0.37	0.78	0.10	0.70	0.37	0.02	0.71	0.59	0.41	0.23	0.59	0.08
Uniform Delay, d1	49.3	64.9	57.9	47.2	58.1	54.5	67.7	21.5	18.5	76.5	29.8	22.1
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	0.7	13.6	0.3	7.8	0.8	0.0	16.6	1.3	1.4	2.6	1.5	0.2
Delay (s)	50.0	78.6	58.2	54.9	58.9	54.5	84.3	22.8	19.9	79.1	31.3	22.3
Level of Service	D	E	E	D	E	D	F	C	B	E	C	C
Approach Delay (s)		65.6			56.2			24.9			30.8	
Approach LOS		E			E			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	80.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	580	0	35	265
Future Volume (Veh/h)	10	70	580	0	35	265
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	70	580	0	35	265
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	915	580			580	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	915	580			580	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	96	86			96	
cM capacity (veh/h)	281	510			979	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	580	300
Volume Left	10	0	35
Volume Right	70	0	0
cSH	463	1700	979
Volume to Capacity	0.17	0.34	0.04
Queue Length 95th (m)	4.9	0.0	0.9
Control Delay (s)	14.4	0.0	1.4
Lane LOS	B		A
Approach Delay (s)	14.4	0.0	1.4
Approach LOS	B		

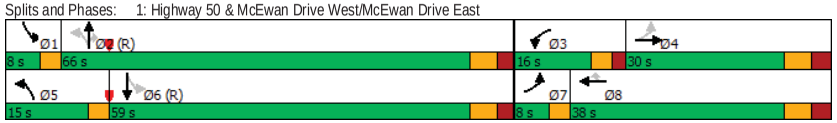
Intersection Summary				
Average Delay		1.6		
Intersection Capacity Utilization		54.9%	ICU Level of Service	A
Analysis Period (min)		15		

2029
Future Background Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	120	684	65	60	1218
Future Volume (vph)	80	45	80	105	50	120	684	65	60	1218
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	22.0	12.3	8.8	15.4	15.4	85.9	75.4	75.4	80.5	70.8
Actuated g/C Ratio	0.18	0.10	0.07	0.13	0.13	0.72	0.63	0.63	0.67	0.59
v/c Ratio	0.31	0.44	0.34	0.45	0.17	0.51	0.32	0.07	0.12	0.68
Control Delay	38.8	19.5	56.5	52.2	1.2	23.7	24.5	5.1	7.9	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	19.5	56.5	52.2	1.2	23.7	24.5	5.1	7.9	21.5
LOS	D	B	E	D	A	C	C	A	A	C
Approach Delay		25.9		42.8			22.9			20.9
Approach LOS		C		D			C			C

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 95		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.68		
Intersection Signal Delay: 23.8	Intersection LOS: C	
Intersection Capacity Utilization 79.7%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	160	80	105	50	120	684	65	60	1363
v/c Ratio	0.31	0.44	0.34	0.45	0.17	0.51	0.32	0.07	0.12	0.68
Control Delay	38.8	19.5	56.5	52.2	1.2	23.7	24.5	5.1	7.9	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	19.5	56.5	52.2	1.2	23.7	24.5	5.1	7.9	21.5
Queue Length 50th (m)	15.8	5.4	9.9	25.2	0.0	16.3	73.6	1.1	4.1	118.0
Queue Length 95th (m)	25.0	14.7	17.9	36.2	0.0	36.7	101.4	7.6	12.0	#211.2
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	256	579	296	468	482	269	2143	962	497	2007
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.28	0.27	0.22	0.10	0.45	0.32	0.07	0.12	0.68

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	115	80	105	50	120	684	65	60	1218	145
Future Volume (vph)	80	45	115	80	105	50	120	684	65	60	1218	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2529		3236	1812	1536	1526	3411	1452	1638	3395	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.12	1.00	1.00	0.39	1.00	
Satd. Flow (perm)	1245	2529		3236	1812	1536	190	3411	1452	667	3395	
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)	80	45	115	80	105	50	120	684	65	60	1218	145
RTOR Reduction (vph)	0	103	0	0	0	43	0	0	25	0	5	0
Lane Group Flow (vph)	80	57	0	80	105	7	120	684	40	60	1358	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	18.0	12.3		7.2	15.8	15.8	81.9	73.9	73.9	74.8	69.8	
Effective Green, g (s)	18.0	12.3		7.2	15.8	15.8	81.9	73.9	73.9	74.8	69.8	
Actuated g/C Ratio	0.15	0.10		0.06	0.13	0.13	0.68	0.62	0.62	0.62	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	209	259		194	238	202	230	2100	894	456	1974	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.04	0.20		0.01	c0.40	
v/s Ratio Perm	0.04					0.00	0.32		0.03	0.08		
v/c Ratio	0.38	0.22		0.41	0.44	0.03	0.52	0.33	0.04	0.13	0.69	
Uniform Delay, d1	45.5	49.4		54.4	48.0	45.4	12.4	11.1	9.1	8.8	17.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	2.16	1.93	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.4		1.4	1.3	0.1	2.1	0.4	0.1	0.1	2.0	
Delay (s)	46.6	49.9		55.8	49.3	45.5	28.9	21.8	9.2	9.0	19.5	
Level of Service	D	D		E	D	D	C	C	A	A	B	
Approach Delay (s)		48.8			50.7			21.8			19.0	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	30	934	25	0	1568
Future Volume (Veh/h)	0	30	934	25	0	1568
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	30	934	25	0	1568
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.89	0.89			0.89	
vC, conflicting volume	1730	480			959	
vC1, stage 1 conf vol	946					
vC2, stage 2 conf vol	784					
vCu, unblocked vol	1577	174			712	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	280	700			800	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	623	336	784	784
Volume Left	0	0	0	0	0
Volume Right	30	0	25	0	0
cSH	700	1700	1700	1700	1700
Volume to Capacity	0.04	0.37	0.20	0.46	0.46
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.4	0.0		0.0	
Approach LOS	B				

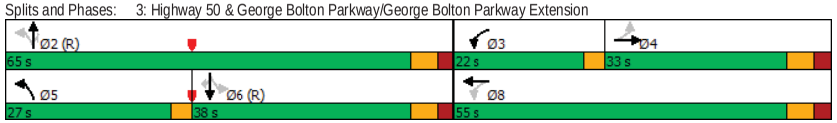
Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	46.7%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	50	23	215	314	270	794	165	25	1328	150
Future Volume (vph)	50	23	215	314	270	794	165	25	1328	150
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	11.8	11.8	34.6	31.0	79.4	76.1	76.1	55.5	55.5	55.5
Actuated g/C Ratio	0.10	0.10	0.29	0.26	0.66	0.63	0.63	0.46	0.46	0.46
v/c Ratio	0.49	0.56	0.54	0.63	0.89	0.37	0.15	0.08	0.83	0.19
Control Delay	66.4	24.9	39.7	45.4	66.4	11.3	1.8	16.3	27.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	24.9	39.7	45.4	66.4	11.3	1.8	16.3	27.9	5.2
LOS	E	C	D	D	E	B	A	B	C	A
Approach Delay		37.3		43.1		22.2			25.4	
Approach LOS		D		D		C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 27.6 — Intersection LOS: C
Intersection Capacity Utilization 94.4% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	118	215	314	270	794	165	25	1328	150
v/c Ratio	0.49	0.56	0.54	0.63	0.89	0.37	0.15	0.08	0.83	0.19
Control Delay	66.4	24.9	39.7	45.4	66.4	11.3	1.8	16.3	27.9	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.4	24.9	39.7	45.4	66.4	11.3	1.8	16.3	27.9	5.2
Queue Length 50th (m)	12.0	5.3	43.6	70.5	55.5	44.1	0.0	1.7	151.0	3.4
Queue Length 95th (m)	24.6	23.7	63.7	96.3	88.3	66.9	8.6	m3.9	#253.0	m4.1
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	228	355	418	774	391	2162	1072	304	1607	785
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.33	0.51	0.41	0.69	0.37	0.15	0.08	0.83	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	23	95	215	314	0	270	794	165	25	1328	150
Future Volume (vph)	50	23	95	215	314	0	270	794	165	25	1328	150
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1278		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.57	1.00		0.50	1.00		0.07	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1039	1278		935	1921		126	3411	1597	660	3476	1597
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)	50	23	95	215	314	0	270	794	165	25	1328	150
RTOR Reduction (vph)	0	86	0	0	0	0	0	0	60	0	0	47
Lane Group Flow (vph)	50	32	0	215	314	0	270	794	105	25	1328	103
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.8	11.8		31.0	31.0		76.1	76.1	76.1	55.5	55.5	55.5
Effective Green, g (s)	11.8	11.8		31.0	31.0		76.1	76.1	76.1	55.5	55.5	55.5
Actuated g/C Ratio	0.10	0.10		0.26	0.26		0.63	0.63	0.63	0.46	0.46	0.46
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	102	125		368	496		299	2163	1012	305	1607	738
v/s Ratio Prot		0.03		0.08	c0.16		c0.13	0.23			0.38	
v/s Ratio Perm	0.05			0.07			c0.44		0.07	0.04		0.06
v/c Ratio	0.49	0.26		0.58	0.63		0.90	0.37	0.10	0.08	0.83	0.14
Uniform Delay, d1	51.3	50.1		37.3	39.5		36.1	10.5	8.6	18.0	28.1	18.5
Progression Factor	1.00	1.00		1.05	1.04		1.25	0.96	0.88	0.63	0.72	0.42
Incremental Delay, d2	3.7	1.1		2.1	2.4		26.9	0.4	0.2	0.4	4.2	0.3
Delay (s)	54.9	51.2		41.4	43.3		71.9	10.4	7.8	11.8	24.5	8.1
Level of Service	D	D		D	D		E	B	A	B	C	A
Approach Delay (s)		52.3			42.5			23.6			22.6	
Approach LOS		D			D			C			C	

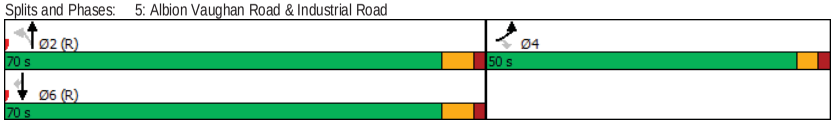
Intersection Summary				
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	94.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	105	188	699
Future Volume (vph)	228	25	65	105	188	699
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.77	0.08	0.09	0.09	0.14	0.54
Control Delay	60.0	13.4	7.5	7.1	7.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	13.4	7.5	7.1	7.2	2.4
LOS	E	B	A	A	A	A
Approach Delay	55.4			7.3	3.4	
Approach LOS	E			A	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	228	25	65	105	188	699
v/c Ratio	0.77	0.08	0.09	0.09	0.14	0.54
Control Delay	60.0	13.4	7.5	7.1	7.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	13.4	7.5	7.1	7.2	2.4
Queue Length 50th (m)	46.5	0.1	4.6	7.5	13.9	0.0
Queue Length 95th (m)	75.1	7.3	12.2	17.1	28.5	13.7
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	532	713	1161	1307	1285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.05	0.09	0.09	0.14	0.54

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	105	188	699
Future Volume (vph)	228	25	65	105	188	699
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	1656	1865	1536
Flt Permitted	0.95	1.00	0.64	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	1018	1656	1865	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	228	25	65	105	188	699
RTOR Reduction (vph)	0	20	0	0	0	209
Lane Group Flow (vph)	228	5	65	105	188	490
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	24.3	24.3	84.1	84.1	84.1	84.1
Effective Green, g (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	278	713	1160	1307	1076
v/s Ratio Prot	c0.15			0.06	0.10	
v/s Ratio Perm		0.00	0.06			c0.32
v/c Ratio	0.77	0.02	0.09	0.09	0.14	0.46
Uniform Delay, d1	45.2	38.3	5.7	5.7	6.0	7.9
Progression Factor	0.97	1.06	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.0	0.3	0.2	0.2	1.4
Delay (s)	55.0	40.7	6.0	5.9	6.2	9.3
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.6			5.9	8.6	
Approach LOS	D			A	A	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1234	1373	110	
Future Volume (vph)	45	0	170	1234	1373	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	83.7	83.7	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.70	0.70	
v/c Ratio	0.41	0.32	0.45	0.43	0.59	0.10	
Control Delay	62.4	3.5	5.9	3.8	11.7	3.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	3.5	5.9	3.8	11.7	3.3	
LOS	E	A	A	A	B	A	
Approach Delay		25.6		4.0	11.1		
Approach LOS		C		A	B		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 8.4 — Intersection LOS: A
Intersection Capacity Utilization 68.2% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1234	1373	110
v/c Ratio	0.41	0.32	0.45	0.43	0.59	0.10
Control Delay	62.4	3.5	5.9	3.8	11.7	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	3.5	5.9	3.8	11.7	3.3
Queue Length 50th (m)	10.8	0.0	5.6	37.3	67.8	3.0
Queue Length 95th (m)	22.8	0.0	11.9	57.7	67.2	m1.5
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	450	379	2849	2336	1101
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.45	0.43	0.59	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1234	0	0	1373	110
Future Volume (vph)	45	0	75	0	0	0	170	1234	0	0	1373	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.15	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					259	3380			3349	1551
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)	45	0	75	0	0	0	170	1234	0	0	1373	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	45	5	0	0	0	0	170	1234	0	0	1373	90
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			82.4	82.4
Effective Green, g (s)	8.4	8.4					98.6	98.6			82.4	82.4
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					369	2777			2299	1065
v/s Ratio Prot		0.00					c0.05	0.37			c0.41	
v/s Ratio Perm	c0.03						0.33					0.06
v/c Ratio	0.48	0.06					0.46	0.44			0.60	0.08
Uniform Delay, d1	53.7	52.1					6.1	3.0			10.0	6.3
Progression Factor	1.00	1.00					1.00	1.00			1.01	0.82
Incremental Delay, d2	3.9	0.3					0.9	0.5			0.7	0.1
Delay (s)	57.6	52.4					7.0	3.5			10.8	5.2
Level of Service	E	D					A	A			B	A
Approach Delay (s)		54.3			0.0			3.9			10.4	
Approach LOS		D			A			A			B	

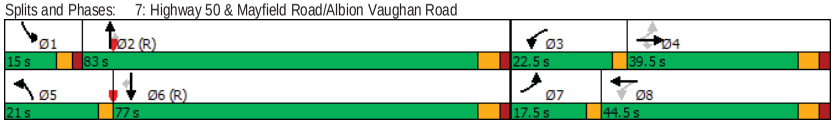
Intersection Summary				
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	68.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	90	115	270	350	370	145	1314	160	5	1348	85
Future Volume (vph)	90	115	270	350	370	145	1314	160	5	1348	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	40.7	25.8	25.8	54.5	36.6	22.4	93.2	93.2	10.0	70.8	70.8
Actuated g/C Ratio	0.25	0.16	0.16	0.34	0.23	0.14	0.58	0.58	0.06	0.44	0.44
v/c Ratio	0.33	0.46	0.94	0.78	0.51	0.84	0.66	0.18	0.05	0.87	0.12
Control Delay	39.4	64.9	65.7	57.0	55.7	101.8	26.5	3.3	72.0	48.4	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	64.9	65.7	57.0	55.7	101.8	26.5	3.3	72.0	48.4	1.6
LOS	D	E	E	E	E	F	C	A	E	D	A
Approach Delay		60.5			56.3		31.0			45.7	
Approach LOS		E			E		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 43.6		Intersection LOS: D	
Intersection Capacity Utilization 92.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	115	270	350	385	145	1314	160	5	1348	85
v/c Ratio	0.33	0.46	0.94	0.78	0.51	0.84	0.66	0.18	0.05	0.87	0.12
Control Delay	39.4	64.9	65.7	57.0	55.7	101.8	26.5	3.3	72.0	48.4	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	64.9	65.7	57.0	55.7	101.8	26.5	3.3	72.0	48.4	1.6
Queue Length 50th (m)	20.6	34.3	38.6	93.9	58.3	48.5	150.5	0.0	1.6	206.2	0.0
Queue Length 95th (m)	34.5	54.4	#91.3	125.4	76.5	#100.9	224.6	13.2	6.5	235.3	4.1
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0					125.0		130.0	35.0		115.0
Base Capacity (vph)	305	319	320	446	804	173	1986	882	96	1578	733
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.36	0.84	0.78	0.48	0.84	0.66	0.18	0.05	0.85	0.12

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	115	270	350	370	15	145	1314	160	5	1348	85
Future Volume (vph)	90	115	270	350	370	15	145	1314	160	5	1348	85
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.52	1.00	1.00	0.55	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	879	1549	929	982	3324		1236	3411	1401	1539	3493	1479
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)	90	115	270	350	370	15	145	1314	160	5	1348	85
RTOR Reduction (vph)	0	0	137	0	2	0	0	0	71	0	0	47
Lane Group Flow (vph)	90	115	133	350	383	0	145	1314	89	5	1348	38
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	37.2	25.8	25.8	51.0	36.6		22.4	89.2	89.2	2.0	70.8	70.8
Effective Green, g (s)	37.2	25.8	25.8	51.0	36.6		22.4	89.2	89.2	2.0	70.8	70.8
Actuated g/C Ratio	0.23	0.16	0.16	0.32	0.23		0.14	0.56	0.56	0.01	0.44	0.44
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255	249	149	424	760		173	1901	781	19	1545	654
v/s Ratio Prot	0.03	0.07		c0.11	0.12		c0.12	0.39		0.00	c0.39	
v/s Ratio Perm	0.06		0.14	c0.15					0.06			0.03
v/c Ratio	0.35	0.46	0.89	0.83	0.50		0.84	0.69	0.11	0.26	0.87	0.06
Uniform Delay, d1	49.9	60.8	65.8	47.3	53.8		67.0	25.5	16.7	78.3	40.5	25.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.4	43.9	12.4	0.5		28.3	2.1	0.3	7.3	7.1	0.2
Delay (s)	50.8	62.2	109.6	59.7	54.3		95.3	27.6	17.0	85.6	47.6	25.7
Level of Service	D	E	F	E	D		F	C	B	F	D	C
Approach Delay (s)		87.0			56.9			32.6			46.4	
Approach LOS		F			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	92.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	125	5	60	188
Future Volume (Veh/h)	5	25	125	5	60	188
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)	5	25	125	5	60	188
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	436	128			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	436	128			130	
tC, single (s)	6.7	6.4			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	502	877			1462	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	130	248
Volume Left	5	0	60
Volume Right	25	5	0
cSH	780	1700	1462
Volume to Capacity	0.04	0.08	0.04
Queue Length 95th (m)	1.0	0.0	1.0
Control Delay (s)	9.8	0.0	2.1
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	2.1
Approach LOS	A		

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		33.4%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	188	484	75	50	45
Future Volume (Veh/h)	25	188	484	75	50	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	188	484	75	50	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	559				760	522
vC1, stage 1 conf vol					522	
vC2, stage 2 conf vol					238	
vCu, unblocked vol	559				760	522
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	92
cM capacity (veh/h)	1022				548	559

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	213	559	95
Volume Left	25	0	50
Volume Right	0	75	45
cSH	1022	1700	553
Volume to Capacity	0.02	0.33	0.17
Queue Length 95th (m)	0.6	0.0	4.9
Control Delay (s)	1.2	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	12.9
Approach LOS			B

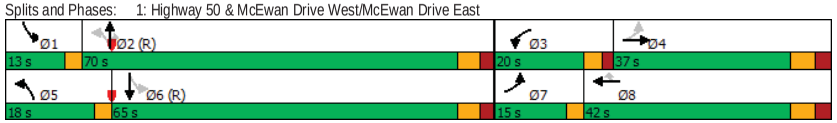
Intersection Summary				
Average Delay		1.7		
Intersection Capacity Utilization		43.1%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	110	1395	185	100	851
Future Volume (vph)	225	110	165	95	230	110	1395	185	100	851
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	35.8	16.4	12.0	13.4	13.4	92.9	80.1	80.1	94.2	80.7
Actuated g/C Ratio	0.26	0.12	0.09	0.10	0.10	0.66	0.57	0.57	0.67	0.58
v/c Ratio	0.63	0.57	0.57	0.55	0.71	0.34	0.69	0.20	0.40	0.46
Control Delay	52.0	24.9	69.0	70.9	26.0	11.0	24.5	6.9	12.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	24.9	69.0	70.9	26.0	11.0	24.5	6.9	12.7	18.6
LOS	D	C	E	E	C	B	C	A	B	B
Approach Delay		36.4		49.2			21.7			18.0
Approach LOS		D		D			C			B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 26.4 — Intersection LOS: C
Intersection Capacity Utilization 81.2% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	305	165	95	230	110	1395	185	100	926
v/c Ratio	0.63	0.57	0.57	0.55	0.71	0.34	0.69	0.20	0.40	0.46
Control Delay	52.0	24.9	69.0	70.9	26.0	11.0	24.5	6.9	12.7	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	24.9	69.0	70.9	26.0	11.0	24.5	6.9	12.7	18.6
Queue Length 50th (m)	53.4	15.2	24.2	27.0	11.4	10.8	154.2	9.4	9.6	82.6
Queue Length 95th (m)	#83.2	31.8	35.9	43.4	38.4	18.0	191.2	22.9	16.2	103.7
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	359	820	363	457	537	375	2027	944	261	2020
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.37	0.45	0.21	0.43	0.29	0.69	0.20	0.38	0.46

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	195	165	95	230	110	1395	185	100	851	75
Future Volume (vph)	225	110	195	165	95	230	110	1395	185	100	851	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3116		3395	1830	1581	1439	3544	1566	1785	3497	
Flt Permitted	0.57	1.00		0.95	1.00	1.00	0.25	1.00	1.00	0.11	1.00	
Satd. Flow (perm)	1063	3116		3395	1830	1581	381	3544	1566	203	3497	
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)	225	110	195	165	95	230	110	1395	185	100	851	75
RTOR Reduction (vph)	0	172	0	0	0	171	0	0	49	0	3	0
Lane Group Flow (vph)	225	133	0	165	95	59	110	1395	136	100	923	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	33.5	16.5		12.0	13.4	13.4	89.2	80.0	80.0	90.6	80.7	
Effective Green, g (s)	33.5	16.5		12.0	13.4	13.4	89.2	80.0	80.0	90.6	80.7	
Actuated g/C Ratio	0.24	0.12		0.09	0.10	0.10	0.64	0.57	0.57	0.65	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	342	367		291	175	151	312	2025	894	243	2015	
v/s Ratio Prot	c0.08	0.04		0.05	0.05		0.02	c0.39		c0.03	0.26	
v/s Ratio Perm	c0.08					0.04	0.20		0.09	0.24		
v/c Ratio	0.66	0.36		0.57	0.54	0.39	0.35	0.69	0.15	0.41	0.46	
Uniform Delay, d1	46.4	56.9		61.5	60.4	59.5	11.0	21.2	14.1	15.4	17.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.5	0.6		2.5	3.4	1.7	0.7	1.9	0.4	1.1	0.8	
Delay (s)	50.9	57.5		64.0	63.8	61.1	11.7	23.1	14.4	16.6	17.8	
Level of Service	D	E		E	E	E	B	C	B	B	B	
Approach Delay (s)		54.7			62.6			21.4			17.7	
Approach LOS		D			E			C			B	

Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	81.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	80	1770	55	0	1396
Future Volume (Veh/h)	0	80	1770	55	0	1396
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	80	1770	55	0	1396
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.64	0.64			0.64	
vC, conflicting volume	2496	912			1825	
vC1, stage 1 conf vol	1798					
vC2, stage 2 conf vol	698					
vCu, unblocked vol	2218	0			1178	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	89			100	
cM capacity (veh/h)	144	697			358	

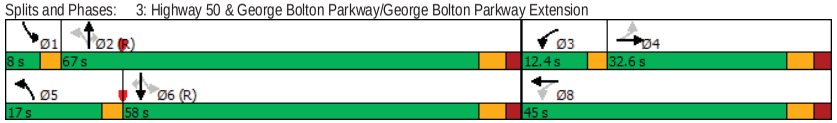
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	1180	645	698	698
Volume Left	0	0	0	0	0
Volume Right	80	0	55	0	0
cSH	697	1700	1700	1700	1700
Volume to Capacity	0.11	0.69	0.38	0.41	0.41
Queue Length 95th (m)	3.1	0.0	0.0	0.0	0.0
Control Delay (s)	10.8	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.8	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	62.3%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	190	22	144	146	135	1555	346	50	1061	125
Future Volume (vph)	190	22	144	146	135	1555	346	50	1061	125
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.5	22.5	38.6	35.0	75.4	65.2	65.2	67.6	58.7	58.7
Actuated g/C Ratio	0.19	0.19	0.32	0.29	0.63	0.54	0.54	0.56	0.49	0.49
v/c Ratio	0.83	0.50	0.47	0.26	0.54	0.77	0.34	0.30	0.62	0.16
Control Delay	75.0	11.0	38.1	36.1	19.3	22.0	3.1	15.2	25.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	11.0	38.1	36.1	19.3	22.0	3.1	15.2	25.9	4.9
LOS	E	B	D	D	B	C	A	B	C	A
Approach Delay		39.5		37.1		18.6			23.3	
Approach LOS		D		D		B			C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.83		
Intersection Signal Delay: 23.6	Intersection LOS: C	
Intersection Capacity Utilization 87.0%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	190	237	144	146	135	1555	346	50	1061	125
v/c Ratio	0.83	0.50	0.47	0.26	0.54	0.77	0.34	0.30	0.62	0.16
Control Delay	75.0	11.0	38.1	36.1	19.3	22.0	3.1	15.2	25.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.0	11.0	38.1	36.1	19.3	22.0	3.1	15.2	25.9	4.9
Queue Length 50th (m)	44.7	4.5	26.8	28.4	8.1	165.7	1.4	4.7	103.7	1.3
Queue Length 95th (m)	#77.6	26.8	47.9	50.1	m28.1	129.0	22.6	10.2	136.7	12.9
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	264	518	307	614	287	2011	1027	167	1699	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.46	0.47	0.24	0.47	0.77	0.34	0.30	0.62	0.16

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	22	215	144	146	0	135	1555	346	50	1061	125
Future Volume (vph)	190	22	215	144	146	0	135	1555	346	50	1061	125
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1616		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.66	1.00		0.34	1.00		0.16	1.00	1.00	0.09	1.00	1.00
Satd. Flow (perm)	1223	1616		645	1921		242	3694	1597	164	3476	1521
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)	190	22	215	144	146	0	135	1555	346	50	1061	125
RTOR Reduction (vph)	0	175	0	0	0	0	0	0	160	0	0	59
Lane Group Flow (vph)	190	62	0	144	146	0	135	1555	186	50	1061	66
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	22.5	22.5		35.0	35.0		72.1	64.6	64.6	63.1	58.6	58.6
Effective Green, g (s)	22.5	22.5		35.0	35.0		72.1	64.6	64.6	63.1	58.6	58.6
Actuated g/C Ratio	0.19	0.19		0.29	0.29		0.60	0.54	0.54	0.53	0.49	0.49
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	229	303		285	560		247	1988	859	147	1697	742
v/s Ratio Prot		0.04		c0.04	0.08		c0.05	c0.42		0.01	0.31	
v/s Ratio Perm	c0.16			0.11			0.28		0.12	0.17		0.04
v/c Ratio	0.83	0.21		0.51	0.26		0.55	0.78	0.22	0.34	0.63	0.09
Uniform Delay, d1	46.9	41.2		33.2	32.6		14.3	22.1	14.5	18.2	22.6	16.4
Progression Factor	1.00	1.00		1.13	1.10		1.31	0.84	1.41	1.00	1.00	1.00
Incremental Delay, d2	21.3	0.3		1.4	0.2		1.9	2.4	0.4	1.4	1.8	0.2
Delay (s)	68.2	41.5		39.0	36.2		20.6	21.0	20.8	19.6	24.4	16.7
Level of Service	E	D		D	D		C	C	C	B	C	B
Approach Delay (s)		53.4			37.6			21.0			23.4	
Approach LOS		D			D			C			C	

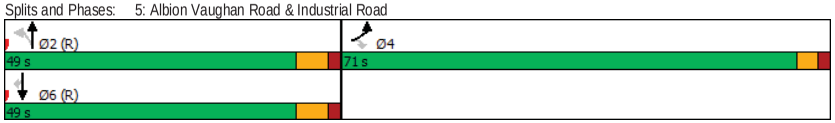
Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	365	114	385
Future Volume (vph)	448	95	55	365	114	385
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
v/c Ratio	0.79	0.17	0.09	0.34	0.11	0.35
Control Delay	43.8	4.8	14.3	15.6	13.5	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	4.8	14.3	15.6	13.5	2.6
LOS	D	A	B	B	B	A
Approach Delay	36.9			15.4	5.1	
Approach LOS	D			B	A	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.79		
Intersection Signal Delay: 19.9	Intersection LOS: B	
Intersection Capacity Utilization 53.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	448	95	55	365	114	385
v/c Ratio	0.79	0.17	0.09	0.34	0.11	0.35
Control Delay	43.8	4.8	14.3	15.6	13.5	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	4.8	14.3	15.6	13.5	2.6
Queue Length 50th (m)	91.2	0.0	5.7	44.3	11.9	0.0
Queue Length 95th (m)	114.2	8.9	15.3	80.6	26.3	16.2
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	921	591	1089	1001	1092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.10	0.09	0.34	0.11	0.35

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	365	114	385
Future Volume (vph)	448	95	55	365	114	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	1865	1715	1597
Flt Permitted	0.95	1.00	0.68	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	1011	1865	1715	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	448	95	55	365	114	385
RTOR Reduction (vph)	0	65	0	0	0	160
Lane Group Flow (vph)	448	30	55	365	114	225
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	38.3	38.3	70.1	70.1	70.1	70.1
Effective Green, g (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	569	509	590	1089	1001	932
v/s Ratio Prot	c0.25			c0.20	0.07	
v/s Ratio Perm		0.02	0.05			0.14
v/c Ratio	0.79	0.06	0.09	0.34	0.11	0.24
Uniform Delay, d1	37.1	28.4	11.0	12.9	11.1	12.1
Progression Factor	0.93	0.92	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.0	0.3	0.8	0.2	0.6
Delay (s)	41.4	26.1	11.3	13.7	11.3	12.7
Level of Service	D	C	B	B	B	B
Approach Delay (s)	38.7			13.4	12.4	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	1856	1395	50	
Future Volume (vph)	115	0	65	1856	1395	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.8	83.8	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.48	0.27	0.70	0.58	0.05	
Control Delay	65.9	14.2	6.1	9.6	17.3	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	14.2	6.1	9.6	17.3	5.6	
LOS	E	B	A	A	B	A	
Approach Delay		37.1		9.4	16.9		
Approach LOS		D		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	1856	1395	50
v/c Ratio	0.65	0.48	0.27	0.70	0.58	0.05
Control Delay	65.9	14.2	6.1	9.6	17.3	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	14.2	6.1	9.6	17.3	5.6
Queue Length 50th (m)	27.5	2.0	2.9	103.0	148.6	2.3
Queue Length 95th (m)	45.5	20.2	7.7	161.0	99.3	m2.8
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	493	250	2660	2426	1061
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.29	0.26	0.70	0.58	0.05

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	1856	0	0	1395	50
Future Volume (vph)	115	0	145	0	0	0	65	1856	0	0	1395	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.14	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					220	3476			3476	1493
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)	115	0	145	0	0	0	65	1856	0	0	1395	50
RTOR Reduction (vph)	0	119	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	26	0	0	0	0	65	1856	0	0	1395	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			83.2	83.2
Effective Green, g (s)	15.1	15.1					91.9	91.9			83.2	83.2
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					227	2662			2410	1035
v/s Ratio Prot		0.02					0.01	c0.53			0.40	
v/s Ratio Perm	c0.08						0.20					0.02
v/c Ratio	0.65	0.14					0.29	0.70			0.58	0.03
Uniform Delay, d1	49.9	46.7					6.1	7.1			9.4	5.8
Progression Factor	1.00	1.00					1.00	1.00			1.56	3.58
Incremental Delay, d2	8.0	0.4					0.7	1.5			0.8	0.0
Delay (s)	57.9	47.0					6.8	8.6			15.5	20.7
Level of Service	E	D					A	A			B	C
Approach Delay (s)		51.8			0.0			8.5			15.7	
Approach LOS		D			A			A			B	

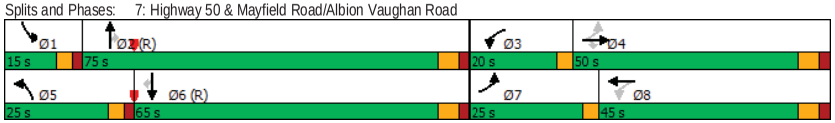
Intersection Summary				
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	125	210	170	155	105	110	1691	605	10	1410	120
Future Volume (vph)	125	210	170	155	105	110	1691	605	10	1410	120
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	24.9	24.9	45.5	26.2	22.2	97.6	97.6	10.0	76.4	76.4
Actuated g/C Ratio	0.27	0.16	0.16	0.28	0.16	0.14	0.61	0.61	0.06	0.48	0.48
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.81	0.55	0.09	0.84	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	30.2	7.1	72.8	43.5	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	30.2	7.1	72.8	43.5	4.0
LOS	D	F	B	D	D	F	C	A	E	D	A
Approach Delay		50.7			51.8		27.1			40.6	
Approach LOS		D			D		C			D	

Intersection Summary
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 35.5 Intersection LOS: D
Intersection Capacity Utilization 92.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	210	170	155	130	110	1691	605	10	1410	120
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.81	0.55	0.09	0.84	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	30.2	7.1	72.8	43.5	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	30.2	7.1	72.8	43.5	4.0
Queue Length 50th (m)	31.7	68.6	0.0	40.3	17.3	35.7	201.0	18.2	3.2	218.5	0.0
Queue Length 95th (m)	46.7	94.1	23.4	57.3	27.5	56.6	#349.9	69.8	10.4	#321.3	11.3
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0					125.0		130.0	35.0		115.0
Base Capacity (vph)	417	470	407	268	732	163	2100	1091	111	1676	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.45	0.42	0.58	0.18	0.67	0.81	0.55	0.09	0.84	0.15

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	210	170	155	105	25	110	1691	605	10	1410	120
Future Volume (vph)	125	210	170	155	105	25	110	1691	605	10	1410	120
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.67	1.00	1.00	0.32	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1187	1731	1044	549	2992		1109	3444	1493	1785	3510	1536
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)	125	210	170	155	105	25	110	1691	605	10	1410	120
RTOR Reduction (vph)	0	0	144	0	14	0	0	0	189	0	0	63
Lane Group Flow (vph)	125	210	26	155	116	0	110	1691	416	10	1410	57
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Effective Green, g (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Actuated g/C Ratio	0.25	0.16	0.16	0.26	0.16		0.14	0.59	0.59	0.02	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	269	162	247	489		153	2036	882	44	1676	733
v/s Ratio Prot	0.03	c0.12		c0.06	0.04		c0.10	c0.49		0.01	0.40	
v/s Ratio Perm	0.06		0.03	0.10					0.28			0.04
v/c Ratio	0.37	0.78	0.16	0.63	0.24		0.72	0.83	0.47	0.23	0.84	0.08
Uniform Delay, d1	49.2	64.9	58.5	48.8	58.2		65.9	26.3	18.5	76.5	36.5	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	13.6	0.5	4.9	0.3		14.9	4.1	1.8	2.6	5.3	0.2
Delay (s)	49.9	78.6	59.0	53.7	58.5		80.8	30.4	20.3	79.1	41.8	22.9
Level of Service	D	E	E	D	E		F	C	C	E	D	C
Approach Delay (s)		64.9			55.9			30.2			40.6	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	92.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	380	0	35	149
Future Volume (Veh/h)	10	70	380	0	35	149
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	70	380	0	35	149
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	599	380			380	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	599	380			380	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	98	89			97	
cM capacity (veh/h)	436	663			1162	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	380	184
Volume Left	10	0	35
Volume Right	70	0	0
cSH	622	1700	1162
Volume to Capacity	0.13	0.22	0.03
Queue Length 95th (m)	3.5	0.0	0.7
Control Delay (s)	11.6	0.0	1.8
Lane LOS	B		A
Approach Delay (s)	11.6	0.0	1.8
Approach LOS	B		

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		44.7%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	373	260	110	100	30
Future Volume (Veh/h)	45	373	260	110	100	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	45	373	260	110	100	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	370				778	315
vC1, stage 1 conf vol					315	
vC2, stage 2 conf vol					463	
vCu, unblocked vol	370				778	315
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				82	96
cM capacity (veh/h)	1200				546	730

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	370	130
Volume Left	45	0	100
Volume Right	0	110	30
cSH	1200	1700	580
Volume to Capacity	0.04	0.22	0.22
Queue Length 95th (m)	0.9	0.0	6.8
Control Delay (s)	1.2	0.0	13.0
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	13.0
Approach LOS			B

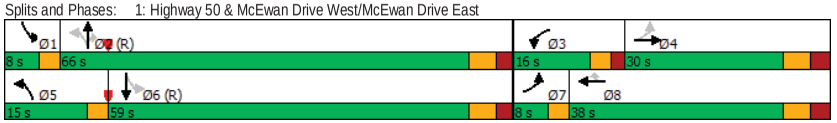
Intersection Summary				
Average Delay		2.4		
Intersection Capacity Utilization		59.9%	ICU Level of Service	B
Analysis Period (min)		15		

2029
Future Total Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	135	754	65	60	1238
Future Volume (vph)	80	45	80	105	50	135	754	65	60	1238
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	21.9	12.3	8.8	15.4	15.4	86.2	75.5	75.5	79.8	70.1
Actuated g/C Ratio	0.18	0.10	0.07	0.13	0.13	0.72	0.63	0.63	0.66	0.58
v/c Ratio	0.31	0.45	0.34	0.45	0.17	0.57	0.35	0.07	0.13	0.70
Control Delay	38.8	19.2	56.5	52.2	1.2	26.0	24.8	5.4	8.0	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	19.2	56.5	52.2	1.2	26.0	24.8	5.4	8.0	22.3
LOS	D	B	E	D	A	C	C	A	A	C
Approach Delay		25.6		42.8			23.6			21.7
Approach LOS		C		D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 24.4	Intersection LOS: C
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	165	80	105	50	135	754	65	60	1383
v/c Ratio	0.31	0.45	0.34	0.45	0.17	0.57	0.35	0.07	0.13	0.70
Control Delay	38.8	19.2	56.5	52.2	1.2	26.0	24.8	5.4	8.0	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	19.2	56.5	52.2	1.2	26.0	24.8	5.4	8.0	22.3
Queue Length 50th (m)	15.8	5.4	9.9	25.2	0.0	17.7	79.8	1.0	4.0	123.6
Queue Length 95th (m)	25.0	14.8	17.9	36.2	0.0	40.6	111.1	9.1	12.0	#216.6
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	254	582	296	468	482	264	2145	963	461	1988
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.28	0.27	0.22	0.10	0.51	0.35	0.07	0.13	0.70

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	120	80	105	50	135	754	65	60	1238	145
Future Volume (vph)	80	45	120	80	105	50	135	754	65	60	1238	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2521		3236	1812	1536	1526	3411	1452	1638	3396	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.11	1.00	1.00	0.36	1.00	
Satd. Flow (perm)	1245	2521		3236	1812	1536	179	3411	1452	615	3396	
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)	80	45	120	80	105	50	135	754	65	60	1238	145
RTOR Reduction (vph)	0	108	0	0	0	43	0	0	25	0	6	0
Lane Group Flow (vph)	80	57	0	80	105	7	135	754	40	60	1377	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	18.0	12.3		7.2	15.8	15.8	81.9	73.9	73.9	74.1	69.1	
Effective Green, g (s)	18.0	12.3		7.2	15.8	15.8	81.9	73.9	73.9	74.1	69.1	
Actuated g/C Ratio	0.15	0.10		0.06	0.13	0.13	0.68	0.62	0.62	0.62	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	209	258		194	238	202	232	2100	894	422	1955	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.05	0.22		0.01	c0.41	
v/s Ratio Perm	0.04					0.00	0.35		0.03	0.08		
v/c Ratio	0.38	0.22		0.41	0.44	0.03	0.58	0.36	0.04	0.14	0.70	
Uniform Delay, d1	45.5	49.5		54.4	48.0	45.4	13.6	11.4	9.1	9.1	18.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.78	1.91	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.4		1.4	1.3	0.1	3.6	0.5	0.1	0.2	2.2	
Delay (s)	46.6	49.9		55.8	49.3	45.5	27.8	22.2	9.2	9.3	20.3	
Level of Service	D	D		E	D	D	C	C	A	A	C	
Approach Delay (s)		48.8			50.7			22.1			19.9	
Approach LOS		D			D			C			B	

Intersection Summary

HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	45	964	40	0	1613
Future Volume (Veh/h)	0	45	964	40	0	1613
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	45	964	40	0	1613
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1790	502			1004	
vC1, stage 1 conf vol	984					
vC2, stage 2 conf vol	806					
vCu, unblocked vol	1621	152			724	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	94			100	
cM capacity (veh/h)	272	713			779	

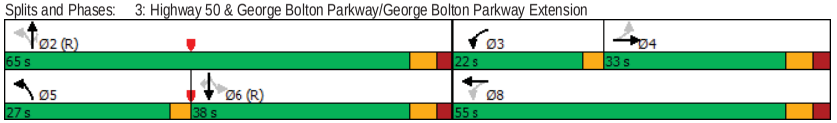
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	45	643	361	806	806
Volume Left	0	0	0	0	0
Volume Right	45	0	40	0	0
cSH	713	1700	1700	1700	1700
Volume to Capacity	0.06	0.38	0.21	0.47	0.47
Queue Length 95th (m)	1.6	0.0	0.0	0.0	0.0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.4	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		47.9%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	55	28	305	344	270	834	165	35	1348	165
Future Volume (vph)	55	28	305	344	270	834	165	35	1348	165
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	12.3	12.3	37.2	33.6	76.8	73.5	73.5	52.6	52.6	52.6
Actuated g/C Ratio	0.10	0.10	0.31	0.28	0.64	0.61	0.61	0.44	0.44	0.44
v/c Ratio	0.53	0.56	0.71	0.64	0.89	0.40	0.16	0.13	0.89	0.22
Control Delay	68.3	25.4	44.2	44.0	65.4	13.7	2.9	17.8	32.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	25.4	44.2	44.0	65.4	13.7	2.9	17.8	32.3	6.2
LOS	E	C	D	D	E	B	A	B	C	A
Approach Delay		38.7		44.1		23.3			29.2	
Approach LOS		D		D		C			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 30.2		Intersection LOS: C	
Intersection Capacity Utilization 96.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	55	123	305	344	270	834	165	35	1348	165
v/c Ratio	0.53	0.56	0.71	0.64	0.89	0.40	0.16	0.13	0.89	0.22
Control Delay	68.3	25.4	44.2	44.0	65.4	13.7	2.9	17.8	32.3	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	25.4	44.2	44.0	65.4	13.7	2.9	17.8	32.3	6.2
Queue Length 50th (m)	13.2	6.5	63.6	76.0	57.3	50.3	0.0	2.7	161.4	2.7
Queue Length 95th (m)	26.3	25.3	88.7	104.3	86.2	83.7	13.0	m6.1	#263.5	m4.4
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	222	359	436	774	387	2089	1042	278	1523	749
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.34	0.70	0.44	0.70	0.40	0.16	0.13	0.89	0.22

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	28	95	305	344	0	270	834	165	35	1348	165
Future Volume (vph)	55	28	95	305	344	0	270	834	165	35	1348	165
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1298		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.55	1.00		0.49	1.00		0.07	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1011	1298		916	1921		123	3411	1597	635	3476	1597
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)	55	28	95	305	344	0	270	834	165	35	1348	165
RTOR Reduction (vph)	0	85	0	0	0	0	0	0	64	0	0	49
Lane Group Flow (vph)	55	38	0	305	344	0	270	834	101	35	1348	116
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	12.3	12.3		33.6	33.6		73.5	73.5	73.5	52.6	52.6	52.6
Effective Green, g (s)	12.3	12.3		33.6	33.6		73.5	73.5	73.5	52.6	52.6	52.6
Actuated g/C Ratio	0.10	0.10		0.28	0.28		0.61	0.61	0.61	0.44	0.44	0.44
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	103	133		403	537		299	2089	978	278	1523	700
v/s Ratio Prot		0.03		c0.12	0.18		c0.13	0.24			0.39	
v/s Ratio Perm	0.05			c0.10			c0.42		0.06	0.06		0.07
v/c Ratio	0.53	0.28		0.76	0.64		0.90	0.40	0.10	0.13	0.89	0.17
Uniform Delay, d1	51.1	49.8		37.2	37.9		36.9	11.9	9.6	20.0	30.9	20.4
Progression Factor	1.00	1.00		1.05	1.03		1.18	1.04	1.41	0.64	0.72	0.44
Incremental Delay, d2	5.2	1.2		7.5	2.5		26.7	0.5	0.2	0.8	6.8	0.4
Delay (s)	56.4	51.0		46.5	41.6		70.4	12.9	13.8	13.6	29.1	9.4
Level of Service	E	D		D	D		E	B	B	B	C	A
Approach Delay (s)		52.6			43.9			25.3			26.7	
Approach LOS		D			D			C			C	

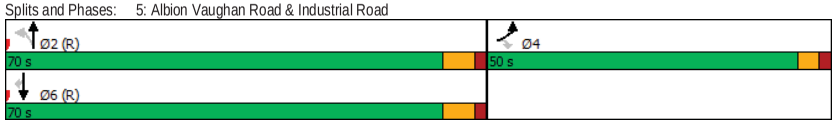
Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	96.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	238	55	75	105	188	714
Future Volume (vph)	238	55	75	105	188	714
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	25.1	25.1	83.3	83.3	83.3	83.3
Actuated g/C Ratio	0.21	0.21	0.69	0.69	0.69	0.69
v/c Ratio	0.77	0.17	0.11	0.09	0.15	0.56
Control Delay	60.6	10.9	7.9	7.4	7.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	10.9	7.9	7.4	7.5	2.5
LOS	E	B	A	A	A	A
Approach Delay	51.2			7.6	3.5	
Approach LOS	D			A	A	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.77		
Intersection Signal Delay: 14.2	Intersection LOS: B	
Intersection Capacity Utilization 61.0%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	238	55	75	105	188	714
v/c Ratio	0.77	0.17	0.11	0.09	0.15	0.56
Control Delay	60.6	10.9	7.9	7.4	7.5	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	10.9	7.9	7.4	7.5	2.5
Queue Length 50th (m)	51.6	0.2	5.5	7.7	14.3	0.0
Queue Length 95th (m)	79.4	10.8	14.1	17.5	29.1	14.2
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	550	706	1150	1295	1284
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.10	0.11	0.09	0.15	0.56

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	238	55	75	105	188	714
Future Volume (vph)	238	55	75	105	188	714
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	1656	1865	1536
Flt Permitted	0.95	1.00	0.64	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	1018	1656	1865	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	238	55	75	105	188	714
RTOR Reduction (vph)	0	43	0	0	0	218
Lane Group Flow (vph)	238	12	75	105	188	496
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	25.1	25.1	83.3	83.3	83.3	83.3
Effective Green, g (s)	25.1	25.1	83.3	83.3	83.3	83.3
Actuated g/C Ratio	0.21	0.21	0.69	0.69	0.69	0.69
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	308	288	706	1149	1294	1066
v/s Ratio Prot	c0.16			0.06	0.10	
v/s Ratio Perm		0.01	0.07			c0.32
v/c Ratio	0.77	0.04	0.11	0.09	0.15	0.46
Uniform Delay, d1	44.8	37.8	6.1	6.0	6.2	8.3
Progression Factor	0.99	1.12	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.4	0.1	0.3	0.2	0.2	1.5
Delay (s)	55.8	42.4	6.4	6.1	6.5	9.7
Level of Service	E	D	A	A	A	A
Approach Delay (s)	53.3			6.2	9.1	
Approach LOS	D			A	A	

Intersection Summary				
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1274	1483	110	
Future Volume (vph)	45	0	170	1274	1483	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	83.7	83.7	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.70	0.70	
v/c Ratio	0.41	0.33	0.49	0.45	0.63	0.10	
Control Delay	62.4	4.6	9.1	3.9	11.0	3.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	4.6	9.1	3.9	11.0	3.0	
LOS	E	A	A	A	B	A	
Approach Delay		26.3		4.5	10.5		
Approach LOS		C		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1274	1483	110
v/c Ratio	0.41	0.33	0.49	0.45	0.63	0.10
Control Delay	62.4	4.6	9.1	3.9	11.0	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	4.6	9.1	3.9	11.0	3.0
Queue Length 50th (m)	10.8	0.0	5.6	39.2	74.6	2.8
Queue Length 95th (m)	22.8	1.8	20.2	60.5	67.9	m1.3
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	444	348	2849	2336	1101
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.49	0.45	0.63	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1274	0	0	1483	110
Future Volume (vph)	45	0	75	0	0	0	170	1274	0	0	1483	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.12	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					219	3380			3349	1551
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)	45	0	75	0	0	0	170	1274	0	0	1483	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	20
Lane Group Flow (vph)	45	5	0	0	0	0	170	1274	0	0	1483	90
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			82.4	82.4
Effective Green, g (s)	8.4	8.4					98.6	98.6			82.4	82.4
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					341	2777			2299	1065
v/s Ratio Prot		0.00					c0.05	0.38			c0.44	
v/s Ratio Perm	c0.03						0.36					0.06
v/c Ratio	0.48	0.06					0.50	0.46			0.65	0.08
Uniform Delay, d1	53.7	52.1					8.1	3.1			10.6	6.3
Progression Factor	1.00	1.00					1.00	1.00			0.88	0.75
Incremental Delay, d2	3.9	0.3					1.1	0.5			0.8	0.1
Delay (s)	57.6	52.4					9.3	3.6			10.1	4.8
Level of Service	E	D					A	A			B	A
Approach Delay (s)		54.3			0.0			4.3			9.7	
Approach LOS		D			A			A			A	

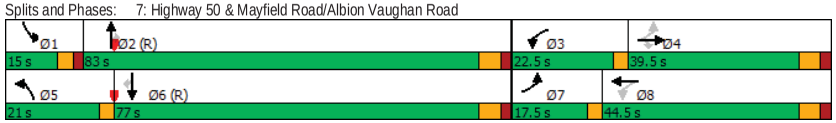
Intersection Summary						
HCM 2000 Control Delay		8.9	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio		0.61				
Actuated Cycle Length (s)		120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization		71.2%	ICU Level of Service		C	
Analysis Period (min)		15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	100	115	270	380	370	145	1344	170	5	1418	125
Future Volume (vph)	100	115	270	380	370	145	1344	170	5	1418	125
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.1	26.6	26.6	54.1	35.6	22.0	93.6	93.6	10.0	71.6	71.6
Actuated g/C Ratio	0.26	0.17	0.17	0.34	0.22	0.14	0.58	0.58	0.06	0.45	0.45
v/c Ratio	0.35	0.45	0.95	0.86	0.52	0.85	0.67	0.19	0.05	0.91	0.17
Control Delay	40.1	63.9	68.8	65.4	56.7	105.0	26.7	3.2	72.0	50.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	63.9	68.8	65.4	56.7	105.0	26.7	3.2	72.0	50.9	5.3
LOS	D	E	E	E	E	F	C	A	E	D	A
Approach Delay		61.7			61.0		31.1			47.3	
Approach LOS		E			E		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 45.2		Intersection LOS: D	
Intersection Capacity Utilization 95.9%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	100	115	270	380	385	145	1344	170	5	1418	125
v/c Ratio	0.35	0.45	0.95	0.86	0.52	0.85	0.67	0.19	0.05	0.91	0.17
Control Delay	40.1	63.9	68.8	65.4	56.7	105.0	26.7	3.2	72.0	50.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	63.9	68.8	65.4	56.7	105.0	26.7	3.2	72.0	50.9	5.3
Queue Length 50th (m)	22.9	33.8	40.8	103.4	58.3	49.1	157.8	0.0	1.6	220.9	1.1
Queue Length 95th (m)	37.5	54.4	#95.3	#145.6	76.5	#100.9	232.7	13.6	6.5	255.2	14.0
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0					125.0		130.0	35.0		115.0
Base Capacity (vph)	307	319	315	440	796	170	1995	890	96	1567	729
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.36	0.86	0.86	0.48	0.85	0.67	0.19	0.05	0.90	0.17

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	115	270	380	370	15	145	1344	170	5	1418	125
Future Volume (vph)	100	115	270	380	370	15	145	1344	170	5	1418	125
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.52	1.00	1.00	0.55	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	870	1549	929	991	3324		1236	3411	1401	1539	3493	1479
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)	100	115	270	380	370	15	145	1344	170	5	1418	125
RTOR Reduction (vph)	0	0	130	0	2	0	0	0	75	0	0	66
Lane Group Flow (vph)	100	115	140	380	383	0	145	1344	95	5	1418	59
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	38.6	26.6	26.6	50.6	35.6		22.0	89.6	89.6	2.0	71.6	71.6
Effective Green, g (s)	38.6	26.6	26.6	50.6	35.6		22.0	89.6	89.6	2.0	71.6	71.6
Actuated g/C Ratio	0.24	0.17	0.17	0.32	0.22		0.14	0.56	0.56	0.01	0.45	0.45
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	264	257	154	418	739		169	1910	784	19	1563	661
v/s Ratio Prot	0.03	0.07		c0.12	0.12		c0.12	0.39		0.00	c0.41	
v/s Ratio Perm	0.06		0.15	c0.17					0.07			0.04
v/c Ratio	0.38	0.45	0.91	0.91	0.52		0.86	0.70	0.12	0.26	0.91	0.09
Uniform Delay, d1	49.1	60.1	65.5	49.8	54.7		67.5	25.6	16.6	78.3	41.1	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	1.2	46.1	23.1	0.6		32.4	2.2	0.3	7.3	9.2	0.3
Delay (s)	50.1	61.3	111.6	72.9	55.3		99.9	27.8	16.9	85.6	50.3	25.7
Level of Service	D	E	F	E	E		F	C	B	F	D	C
Approach Delay (s)		87.0			64.0			33.0			48.5	
Approach LOS		F			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	95.9%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	135	5	60	218
Future Volume (Veh/h)	5	25	135	5	60	218
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)	5	25	135	5	60	218
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	476	138			140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	476	138			140	
tC, single (s)	6.7	6.4			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	475	865			1449	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	30	140	278
Volume Left	5	0	60
Volume Right	25	5	0
cSH	761	1700	1449
Volume to Capacity	0.04	0.08	0.04
Queue Length 95th (m)	1.0	0.0	1.0
Control Delay (s)	9.9	0.0	1.9
Lane LOS	A		A
Approach Delay (s)	9.9	0.0	1.9
Approach LOS	A		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	35.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	75	974	35	15	1598
Future Volume (Veh/h)	35	75	974	35	15	1598
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)	35	75	974	35	15	1598
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.78	0.89			0.89	
vC, conflicting volume	1820	504			1009	
vC1, stage 1 conf vol	992					
vC2, stage 2 conf vol	829					
vCu, unblocked vol	836	194			761	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	90			98	
cM capacity (veh/h)	369	730			765	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	35	75	649	360	15	799	799
Volume Left	35	0	0	0	15	0	0
Volume Right	0	75	0	35	0	0	0
cSH	369	730	1700	1700	765	1700	1700
Volume to Capacity	0.09	0.10	0.38	0.21	0.02	0.47	0.47
Queue Length 95th (m)	2.5	2.7	0.0	0.0	0.5	0.0	0.0
Control Delay (s)	15.8	10.5	0.0	0.0	9.8	0.0	0.0
Lane LOS	C	B			A		
Approach Delay (s)	12.2		0.0		0.1		
Approach LOS	B						

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	54.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	25	30	40	160	15
Future Volume (Veh/h)	15	25	30	40	160	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	15	25	30	40	160	15
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	70				105	50
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70				105	50
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				82	99
cM capacity (veh/h)	1544				889	1024

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	40	70	175
Volume Left	15	0	160
Volume Right	0	40	15
cSH	1544	1700	899
Volume to Capacity	0.01	0.04	0.19
Queue Length 95th (m)	0.2	0.0	5.8
Control Delay (s)	2.8	0.0	10.0
Lane LOS	A		A
Approach Delay (s)	2.8	0.0	10.0
Approach LOS			A

Intersection Summary				
Average Delay	6.5			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	188	484	100	90	165
Future Volume (Veh/h)	40	188	484	100	90	165
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	40	188	484	100	90	165
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	584				802	534
vC1, stage 1 conf vol					534	
vC2, stage 2 conf vol					268	
vCu, unblocked vol	584				802	534
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				83	70
cM capacity (veh/h)	1001				532	550

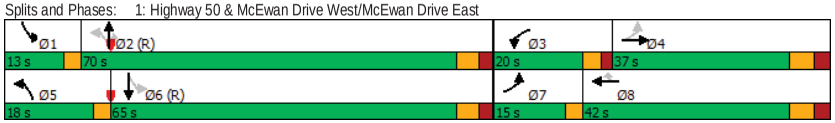
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	228	584	255
Volume Left	40	0	90
Volume Right	0	100	165
cSH	1001	1700	543
Volume to Capacity	0.04	0.34	0.47
Queue Length 95th (m)	1.0	0.0	19.9
Control Delay (s)	1.9	0.0	17.3
Lane LOS	A		C
Approach Delay (s)	1.9	0.0	17.3
Approach LOS			C

Intersection Summary			
Average Delay		4.5	
Intersection Capacity Utilization		66.0%	ICU Level of Service C
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	120	1445	185	100	901
Future Volume (vph)	225	110	165	95	230	120	1445	185	100	901
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	34.6	15.7	12.0	13.4	13.4	94.2	81.0	81.0	94.4	81.1
Actuated g/C Ratio	0.25	0.11	0.09	0.10	0.10	0.67	0.58	0.58	0.67	0.58
v/c Ratio	0.64	0.60	0.57	0.54	0.71	0.38	0.70	0.19	0.42	0.48
Control Delay	53.5	25.0	69.0	70.8	26.0	11.4	24.4	6.9	13.1	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	25.0	69.0	70.8	26.0	11.4	24.4	6.9	13.1	18.8
LOS	D	C	E	E	C	B	C	A	B	B
Approach Delay		36.8		49.1			21.7			18.3
Approach LOS		D		D			C			B

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 26.3	Intersection LOS: C	
Intersection Capacity Utilization 82.6%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	320	165	95	230	120	1445	185	100	976
v/c Ratio	0.64	0.60	0.57	0.54	0.71	0.38	0.70	0.19	0.42	0.48
Control Delay	53.5	25.0	69.0	70.8	26.0	11.4	24.4	6.9	13.1	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	25.0	69.0	70.8	26.0	11.4	24.4	6.9	13.1	18.8
Queue Length 50th (m)	53.4	15.2	24.2	27.0	11.4	11.9	162.6	9.8	9.6	89.4
Queue Length 95th (m)	#80.5	32.1	35.9	43.4	38.4	19.6	202.8	23.7	16.3	113.2
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	352	830	363	457	537	360	2050	952	252	2028
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.39	0.45	0.21	0.43	0.33	0.70	0.19	0.40	0.48

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	210	165	95	230	120	1445	185	100	901	75
Future Volume (vph)	225	110	210	165	95	230	120	1445	185	100	901	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3105		3395	1830	1581	1439	3544	1566	1785	3499	
Flt Permitted	0.59	1.00		0.95	1.00	1.00	0.23	1.00	1.00	0.10	1.00	
Satd. Flow (perm)	1111	3105		3395	1830	1581	352	3544	1566	189	3499	
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)	225	110	210	165	95	230	120	1445	185	100	901	75
RTOR Reduction (vph)	0	186	0	0	0	171	0	0	47	0	3	0
Lane Group Flow (vph)	225	134	0	165	95	59	120	1445	138	100	973	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	32.0	15.7		12.0	13.4	13.4	90.6	81.0	81.0	90.8	81.1	
Effective Green, g (s)	32.0	15.7		12.0	13.4	13.4	90.6	81.0	81.0	90.8	81.1	
Actuated g/C Ratio	0.23	0.11		0.09	0.10	0.10	0.65	0.58	0.58	0.65	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	332	348		291	175	151	302	2050	906	233	2026	
v/s Ratio Prot	c0.08	0.04		0.05	0.05		0.03	c0.41		c0.03	0.28	
v/s Ratio Perm	c0.08					0.04	0.23		0.09	0.25		
v/c Ratio	0.68	0.38		0.57	0.54	0.39	0.40	0.70	0.15	0.43	0.48	
Uniform Delay, d1	47.7	57.7		61.5	60.4	59.5	10.9	21.0	13.6	15.9	17.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.4	0.7		2.5	3.4	1.7	0.9	2.1	0.4	1.3	0.8	
Delay (s)	53.1	58.4		64.0	63.8	61.1	11.8	23.1	14.0	17.2	18.0	
Level of Service	D	E		E	E	E	B	C	B	B	B	
Approach Delay (s)		56.2			62.6			21.3			17.9	
Approach LOS		E			E			C			B	

Intersection Summary

HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	90	1840	115	0	1441
Future Volume (Veh/h)	0	90	1840	115	0	1441
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	90	1840	115	0	1441
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.58	0.58			0.58	
vC, conflicting volume	2618	978			1955	
vC1, stage 1 conf vol	1898					
vC2, stage 2 conf vol	720					
vCu, unblocked vol	2345	0			1208	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	86			100	
cM capacity (veh/h)	135	631			315	

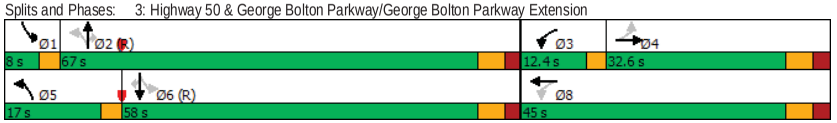
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	90	1227	728	720	720
Volume Left	0	0	0	0	0
Volume Right	90	0	115	0	0
cSH	631	1700	1700	1700	1700
Volume to Capacity	0.14	0.72	0.43	0.42	0.42
Queue Length 95th (m)	4.0	0.0	0.0	0.0	0.0
Control Delay (s)	11.7	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.7	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		66.8%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	205	52	214	161	135	1670	346	75	1071	135
Future Volume (vph)	205	52	214	161	135	1670	346	75	1071	135
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	23.6	23.6	40.2	36.6	73.7	63.8	63.8	65.8	57.0	57.0
Actuated g/C Ratio	0.20	0.20	0.34	0.30	0.61	0.53	0.53	0.55	0.48	0.48
v/c Ratio	0.86	0.59	0.72	0.28	0.56	0.85	0.34	0.51	0.65	0.17
Control Delay	78.9	22.8	48.8	35.5	21.5	25.4	3.6	27.0	27.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	22.8	48.8	35.5	21.5	25.4	3.6	27.0	27.2	5.7
LOS	E	C	D	D	C	C	A	C	C	A
Approach Delay		47.2		43.1		21.7			24.9	
Approach LOS		D		D		C			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 27.3		Intersection LOS: C	
Intersection Capacity Utilization 95.6%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	205	267	214	161	135	1670	346	75	1071	135
v/c Ratio	0.86	0.59	0.72	0.28	0.56	0.85	0.34	0.51	0.65	0.17
Control Delay	78.9	22.8	48.8	35.5	21.5	25.4	3.6	27.0	27.2	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	22.8	48.8	35.5	21.5	25.4	3.6	27.0	27.2	5.7
Queue Length 50th (m)	48.3	22.9	41.2	31.1	10.0	184.7	0.0	7.3	106.7	2.7
Queue Length 95th (m)	#87.8	51.7	#69.8	53.2	m28.4	174.0	27.7	#20.3	138.6	15.0
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	261	481	298	614	276	1967	1009	148	1650	782
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.56	0.72	0.26	0.49	0.85	0.34	0.51	0.65	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	52	215	214	161	0	135	1670	346	75	1071	135
Future Volume (vph)	205	52	215	214	161	0	135	1670	346	75	1071	135
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1649		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.66	1.00		0.30	1.00		0.15	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1207	1649		563	1921		227	3694	1597	132	3476	1521
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)	205	52	215	214	161	0	135	1670	346	75	1071	135
RTOR Reduction (vph)	0	127	0	0	0	0	0	0	161	0	0	60
Lane Group Flow (vph)	205	140	0	214	161	0	135	1670	185	75	1071	75
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	23.6	23.6		36.6	36.6		70.5	63.1	63.1	61.3	56.9	56.9
Effective Green, g (s)	23.6	23.6		36.6	36.6		70.5	63.1	63.1	61.3	56.9	56.9
Actuated g/C Ratio	0.20	0.20		0.31	0.31		0.59	0.53	0.53	0.51	0.47	0.47
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	237	324		281	585		237	1942	839	128	1648	721
v/s Ratio Prot		0.08		c0.06	0.08		c0.05	c0.45		0.02	0.31	
v/s Ratio Perm	c0.17			0.17			0.28		0.12	0.28		0.05
v/c Ratio	0.86	0.43		0.76	0.28		0.57	0.86	0.22	0.59	0.65	0.10
Uniform Delay, d1	46.7	42.3		34.4	31.6		15.4	24.6	15.3	22.0	24.0	17.4
Progression Factor	1.00	1.00		1.13	1.10		1.43	0.85	1.58	1.00	1.00	1.00
Incremental Delay, d2	26.3	0.9		11.3	0.3		2.2	3.8	0.4	6.7	2.0	0.3
Delay (s)	73.0	43.2		50.0	34.9		24.2	24.8	24.6	28.7	26.0	17.7
Level of Service	E	D		D	C		C	C	C	C	C	B
Approach Delay (s)		56.2			43.5			24.7			25.3	
Approach LOS		E			D			C			C	

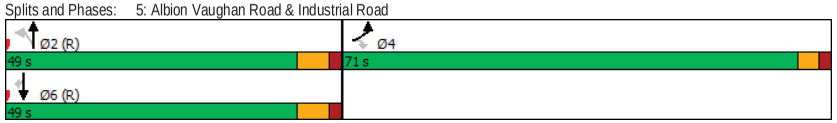
Intersection Summary				
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	95.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	463	110	85	365	114	430
Future Volume (vph)	463	110	85	365	114	430
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	39.5	39.5	68.9	68.9	68.9	68.9
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
v/c Ratio	0.79	0.18	0.15	0.34	0.12	0.39
Control Delay	44.1	4.8	15.2	16.3	14.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	4.8	15.2	16.3	14.1	2.7
LOS	D	A	B	B	B	A
Approach Delay	36.6			16.1	5.1	
Approach LOS	D			B	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 19.8		Intersection LOS: B	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	463	110	85	365	114	430
v/c Ratio	0.79	0.18	0.15	0.34	0.12	0.39
Control Delay	44.1	4.8	15.2	16.3	14.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	4.8	15.2	16.3	14.1	2.7
Queue Length 50th (m)	94.7	0.1	9.3	45.5	12.3	0.0
Queue Length 95th (m)	121.0	9.1	22.5	82.4	26.9	17.2
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	927	581	1070	984	1100
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.12	0.15	0.34	0.12	0.39

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	463	110	85	365	114	430
Future Volume (vph)	463	110	85	365	114	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	1865	1715	1597
Flt Permitted	0.95	1.00	0.68	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	1011	1865	1715	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	463	110	85	365	114	430
RTOR Reduction (vph)	0	74	0	0	0	183
Lane Group Flow (vph)	463	36	85	365	114	247
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	39.5	39.5	68.9	68.9	68.9	68.9
Effective Green, g (s)	39.5	39.5	68.9	68.9	68.9	68.9
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	587	525	580	1070	984	916
v/s Ratio Prot	c0.26			c0.20	0.07	
v/s Ratio Perm		0.02	0.08			0.15
v/c Ratio	0.79	0.07	0.15	0.34	0.12	0.27
Uniform Delay, d1	36.5	27.6	11.9	13.5	11.7	12.9
Progression Factor	0.96	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	0.1	0.5	0.9	0.2	0.7
Delay (s)	41.8	28.1	12.4	14.4	11.9	13.6
Level of Service	D	C	B	B	B	B
Approach Delay (s)	39.2			14.0	13.2	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	1971	1475	50	
Future Volume (vph)	115	0	65	1971	1475	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.4	83.4	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.48	0.28	0.74	0.61	0.05	
Control Delay	65.9	15.4	6.6	10.6	15.3	3.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	15.4	6.6	10.6	15.3	3.4	
LOS	E	B	A	B	B	A	
Approach Delay		37.7		10.5	14.9		
Approach LOS		D		B	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	1971	1475	50
v/c Ratio	0.65	0.48	0.28	0.74	0.61	0.05
Control Delay	65.9	15.4	6.6	10.6	15.3	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	15.4	6.6	10.6	15.3	3.4
Queue Length 50th (m)	27.5	3.1	2.9	117.8	132.1	1.2
Queue Length 95th (m)	45.5	21.5	7.7	184.5	108.6	m0.7
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	489	234	2660	2416	1057
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.28	0.74	0.61	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	1971	0	0	1475	50
Future Volume (vph)	115	0	145	0	0	0	65	1971	0	0	1475	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.13	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					194	3476			3476	1493
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)	115	0	145	0	0	0	65	1971	0	0	1475	50
RTOR Reduction (vph)	0	115	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	30	0	0	0	0	65	1971	0	0	1475	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			82.9	82.9
Effective Green, g (s)	15.1	15.1					91.9	91.9			82.9	82.9
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					212	2662			2401	1031
v/s Ratio Prot		0.02					0.02	c0.57			0.42	
v/s Ratio Perm	c0.08						0.22					0.02
v/c Ratio	0.65	0.16					0.31	0.74			0.61	0.03
Uniform Delay, d1	49.9	46.8					6.9	7.6			10.0	5.9
Progression Factor	1.00	1.00					1.00	1.00			1.27	2.05
Incremental Delay, d2	8.0	0.4					0.8	1.9			0.9	0.0
Delay (s)	57.9	47.2					7.7	9.5			13.6	12.1
Level of Service	E	D					A	A			B	B
Approach Delay (s)		52.0			0.0			9.4			13.6	
Approach LOS		D			A			A			B	

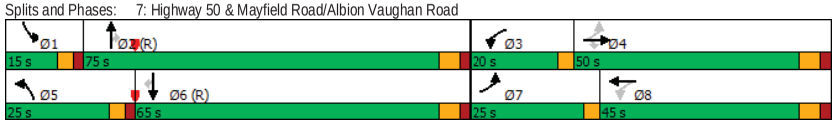
Intersection Summary				
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	165	210	170	170	105	110	1766	635	10	1465	145
Future Volume (vph)	165	210	170	170	105	110	1766	635	10	1465	145
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	45.3	24.9	24.9	43.3	23.7	22.2	97.2	97.2	10.0	76.0	76.0
Actuated g/C Ratio	0.28	0.16	0.16	0.27	0.15	0.14	0.61	0.61	0.06	0.48	0.48
v/c Ratio	0.43	0.78	0.56	0.64	0.29	0.72	0.84	0.58	0.09	0.88	0.18
Control Delay	46.2	84.1	14.4	54.8	53.3	90.0	32.1	8.1	72.8	46.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	84.1	14.4	54.8	53.3	90.0	32.1	8.1	72.8	46.0	6.4
LOS	D	F	B	D	D	F	C	A	E	D	A
Approach Delay		50.9			54.2		28.6			42.6	
Approach LOS		D			D		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 37.1		Intersection LOS: D	
Intersection Capacity Utilization 95.8%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	165	210	170	170	130	110	1766	635	10	1465	145
v/c Ratio	0.43	0.78	0.56	0.64	0.29	0.72	0.84	0.58	0.09	0.88	0.18
Control Delay	46.2	84.1	14.4	54.8	53.3	90.0	32.1	8.1	72.8	46.0	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	84.1	14.4	54.8	53.3	90.0	32.1	8.1	72.8	46.0	6.4
Queue Length 50th (m)	43.0	68.6	0.0	44.6	17.8	35.7	219.2	23.3	3.2	233.3	2.1
Queue Length 95th (m)	60.4	94.1	23.4	62.7	28.2	56.6	#376.9	82.4	10.4	#341.4	18.2
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0					125.0		130.0	35.0		115.0
Base Capacity (vph)	411	470	407	272	732	163	2091	1089	111	1667	799
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.45	0.42	0.63	0.18	0.67	0.84	0.58	0.09	0.88	0.18

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	210	170	170	105	25	110	1766	635	10	1465	145
Future Volume (vph)	165	210	170	170	105	25	110	1766	635	10	1465	145
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.64	1.00	1.00	0.36	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1130	1731	1044	607	2992		1109	3444	1493	1785	3510	1536
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)	165	210	170	170	105	25	110	1766	635	10	1465	145
RTOR Reduction (vph)	0	0	144	0	14	0	0	0	192	0	0	70
Lane Group Flow (vph)	165	210	26	170	116	0	110	1766	443	10	1465	75
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	42.3	24.9	24.9	39.9	23.7		22.2	94.1	94.1	4.0	75.9	75.9
Effective Green, g (s)	42.3	24.9	24.9	39.9	23.7		22.2	94.1	94.1	4.0	75.9	75.9
Actuated g/C Ratio	0.26	0.16	0.16	0.25	0.15		0.14	0.59	0.59	0.02	0.47	0.47
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	358	269	162	252	443		153	2025	878	44	1665	728
v/s Ratio Prot	c0.05	c0.12		c0.07	0.04		c0.10	c0.51		0.01	0.42	
v/s Ratio Perm	0.07		0.03	0.10					0.30			0.05
v/c Ratio	0.46	0.78	0.16	0.67	0.26		0.72	0.87	0.51	0.23	0.88	0.10
Uniform Delay, d1	48.0	64.9	58.5	50.8	60.4		65.9	27.9	19.3	76.5	37.9	23.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	13.6	0.5	7.0	0.3		14.9	5.5	2.1	2.6	7.0	0.3
Delay (s)	48.9	78.6	59.0	57.7	60.7		80.8	33.4	21.4	79.1	44.9	23.5
Level of Service	D	E	E	E	E		F	C	C	E	D	C
Approach Delay (s)		63.5			59.0			32.4			43.2	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	95.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	410	0	35	164
Future Volume (Veh/h)	10	70	410	0	35	164
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	70	410	0	35	164
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	644	410			410	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	644	410			410	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	98	89			97	
cM capacity (veh/h)	410	637			1133	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	80	410	199
Volume Left	10	0	35
Volume Right	70	0	0
cSH	596	1700	1133
Volume to Capacity	0.13	0.24	0.03
Queue Length 95th (m)	3.7	0.0	0.8
Control Delay (s)	12.0	0.0	1.7
Lane LOS	B		A
Approach Delay (s)	12.0	0.0	1.7
Approach LOS	B		

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	47.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	70	1840	90	45	1361
Future Volume (Veh/h)	25	70	1840	90	45	1361
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)	25	70	1840	90	45	1361
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.65	0.58			0.58	
vC, conflicting volume	2656	965			1930	
vC1, stage 1 conf vol	1885					
vC2, stage 2 conf vol	770					
vCu, unblocked vol	1443	0			1152	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	89			87	
cM capacity (veh/h)	162	631			355	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	25	70	1227	703	45	680	680
Volume Left	25	0	0	0	45	0	0
Volume Right	0	70	0	90	0	0	0
cSH	162	631	1700	1700	355	1700	1700
Volume to Capacity	0.15	0.11	0.72	0.41	0.13	0.40	0.40
Queue Length 95th (m)	4.2	3.0	0.0	0.0	3.4	0.0	0.0
Control Delay (s)	31.2	11.4	0.0	0.0	16.6	0.0	0.0
Lane LOS	D	B			C		
Approach Delay (s)	16.6		0.0		0.5		
Approach LOS	C						

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	64.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	55	80	130	115	10
Future Volume (Veh/h)	60	55	80	130	115	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	60	55	80	130	115	10
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	210				320	145
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210				320	145
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				82	99
cM capacity (veh/h)	1373				648	908

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	115	210	125
Volume Left	60	0	115
Volume Right	0	130	10
cSH	1373	1700	663
Volume to Capacity	0.04	0.12	0.19
Queue Length 95th (m)	1.1	0.0	5.5
Control Delay (s)	4.2	0.0	11.7
Lane LOS	A		B
Approach Delay (s)	4.2	0.0	11.7
Approach LOS			B

Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	373	260	185	130	115
Future Volume (Veh/h)	100	373	260	185	130	115
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	100	373	260	185	130	115
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	445				926	352
vC1, stage 1 conf vol					352	
vC2, stage 2 conf vol					573	
vCu, unblocked vol	445				926	352
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	91				72	83
cM capacity (veh/h)	1126				466	696

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	473	445	245
Volume Left	100	0	130
Volume Right	0	185	115
cSH	1126	1700	552
Volume to Capacity	0.09	0.26	0.44
Queue Length 95th (m)	2.3	0.0	18.1
Control Delay (s)	2.6	0.0	16.6
Lane LOS	A		C
Approach Delay (s)	2.6	0.0	16.6
Approach LOS			C

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		

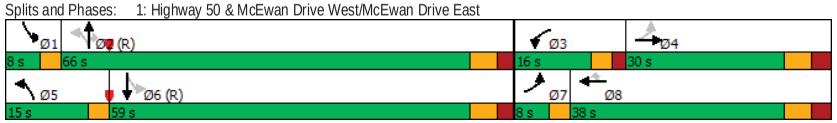
2036
Future Background Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	120	724	65	60	1288
Future Volume (vph)	80	45	80	105	50	120	724	65	60	1288
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	20.6	11.6	8.8	15.4	15.4	86.6	76.2	76.2	81.3	71.6
Actuated g/C Ratio	0.17	0.10	0.07	0.13	0.13	0.72	0.64	0.64	0.68	0.60
v/c Ratio	0.34	0.46	0.34	0.45	0.17	0.54	0.33	0.07	0.12	0.71
Control Delay	40.0	20.1	56.5	52.2	1.2	25.5	22.1	5.3	7.7	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	20.1	56.5	52.2	1.2	25.5	22.1	5.3	7.7	21.8
LOS	D	C	E	D	A	C	C	A	A	C
Approach Delay		26.8		42.8			21.4			21.2
Approach LOS		C		D			C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 23.5 — Intersection LOS: C
Intersection Capacity Utilization 81.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	160	80	105	50	120	724	65	60	1433
v/c Ratio	0.34	0.46	0.34	0.45	0.17	0.54	0.33	0.07	0.12	0.71
Control Delay	40.0	20.1	56.5	52.2	1.2	25.5	22.1	5.3	7.7	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	20.1	56.5	52.2	1.2	25.5	22.1	5.3	7.7	21.8
Queue Length 50th (m)	16.5	5.6	9.9	25.2	0.0	14.5	56.7	0.2	3.6	117.3
Queue Length 95th (m)	25.0	14.7	17.9	36.2	0.0	37.6	106.4	9.2	12.0	#230.5
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	238	579	296	468	482	258	2164	971	480	2031
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.28	0.27	0.22	0.10	0.47	0.33	0.07	0.13	0.71

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	115	80	105	50	120	724	65	60	1288	145
Future Volume (vph)	80	45	115	80	105	50	120	724	65	60	1288	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2529		3236	1812	1536	1526	3411	1452	1638	3398	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.10	1.00	1.00	0.37	1.00	
Satd. Flow (perm)	1245	2529		3236	1812	1536	168	3411	1452	634	3398	
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)	80	45	115	80	105	50	120	724	65	60	1288	145
RTOR Reduction (vph)	0	104	0	0	0	43	0	0	25	0	5	0
Lane Group Flow (vph)	80	56	0	80	105	7	120	724	40	60	1428	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	16.6	11.6		7.2	15.8	15.8	82.6	74.6	74.6	75.6	70.6	
Effective Green, g (s)	16.6	11.6		7.2	15.8	15.8	82.6	74.6	74.6	75.6	70.6	
Actuated g/C Ratio	0.14	0.10		0.06	0.13	0.13	0.69	0.62	0.62	0.63	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	191	244		194	238	202	217	2120	902	441	1999	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.04	0.21		0.01	c0.42	
v/s Ratio Perm	0.04					0.00	0.34		0.03	0.08		
v/c Ratio	0.42	0.23		0.41	0.44	0.03	0.55	0.34	0.04	0.14	0.71	
Uniform Delay, d1	46.7	50.1		54.4	48.0	45.4	13.5	10.9	8.8	8.5	17.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.93	1.77	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.5		1.4	1.3	0.1	2.9	0.4	0.1	0.1	2.2	
Delay (s)	48.2	50.6		55.8	49.3	45.5	28.9	19.7	8.9	8.7	19.7	
Level of Service	D	D		E	D	D	C	B	A	A	B	
Approach Delay (s)		49.8			50.7			20.1			19.3	
Approach LOS		D			D			C			B	

Intersection Summary				
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	30	974	25	0	1638
Future Volume (Veh/h)	0	30	974	25	0	1638
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	30	974	25	0	1638
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1806	500			999	
vC1, stage 1 conf vol	986					
vC2, stage 2 conf vol	819					
vCu, unblocked vol	1649	173			737	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	267	696			776	

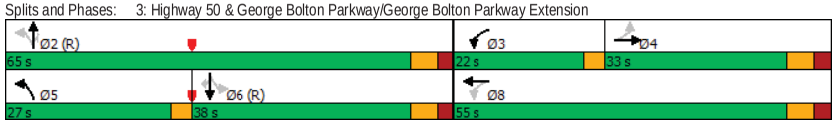
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	649	350	819	819
Volume Left	0	0	0	0	0
Volume Right	30	0	25	0	0
cSH	696	1700	1700	1700	1700
Volume to Capacity	0.04	0.38	0.21	0.48	0.48
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.4	0.0		0.0	
Approach LOS	B				

Intersection Summary					
Average Delay		0.1			
Intersection Capacity Utilization		48.6%	ICU Level of Service		A
Analysis Period (min)		15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	50	23	215	314	270	834	165	25	1398	150
Future Volume (vph)	50	23	215	314	270	834	165	25	1398	150
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	11.6	11.6	34.5	30.9	79.5	76.2	76.2	55.7	55.7	55.7
Actuated g/C Ratio	0.10	0.10	0.29	0.26	0.66	0.64	0.64	0.46	0.46	0.46
v/c Ratio	0.50	0.56	0.54	0.64	0.91	0.38	0.15	0.09	0.87	0.19
Control Delay	67.1	25.3	39.9	45.7	68.7	12.4	2.6	16.2	28.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	25.3	39.9	45.7	68.7	12.4	2.6	16.2	28.7	4.8
LOS	E	C	D	D	E	B	A	B	C	A
Approach Delay		37.7		43.3		23.1			26.2	
Approach LOS		D		D		C			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.91			
Intersection Signal Delay: 28.2		Intersection LOS: C	
Intersection Capacity Utilization 96.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	118	215	314	270	834	165	25	1398	150
v/c Ratio	0.50	0.56	0.54	0.64	0.91	0.38	0.15	0.09	0.87	0.19
Control Delay	67.1	25.3	39.9	45.7	68.7	12.4	2.6	16.2	28.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	25.3	39.9	45.7	68.7	12.4	2.6	16.2	28.7	4.8
Queue Length 50th (m)	12.0	5.4	43.8	70.7	57.4	46.7	0.0	1.6	162.7	1.4
Queue Length 95th (m)	24.7	23.7	63.7	96.3	85.9	80.2	12.1	m3.7	#271.2	m3.9
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	228	355	417	774	387	2167	1074	294	1613	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.33	0.52	0.41	0.70	0.38	0.15	0.09	0.87	0.19

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	23	95	215	314	0	270	834	165	25	1398	150
Future Volume (vph)	50	23	95	215	314	0	270	834	165	25	1398	150
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1278		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.57	1.00		0.50	1.00		0.07	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1039	1278		932	1921		116	3411	1597	635	3476	1597
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)	50	23	95	215	314	0	270	834	165	25	1398	150
RTOR Reduction (vph)	0	86	0	0	0	0	0	0	60	0	0	47
Lane Group Flow (vph)	50	32	0	215	314	0	270	834	105	25	1398	103
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.7	11.7		30.9	30.9		76.2	76.2	76.2	55.7	55.7	55.7
Effective Green, g (s)	11.7	11.7		30.9	30.9		76.2	76.2	76.2	55.7	55.7	55.7
Actuated g/C Ratio	0.10	0.10		0.26	0.26		0.64	0.64	0.64	0.46	0.46	0.46
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	101	124		367	494		293	2165	1014	294	1613	741
v/s Ratio Prot		0.03		0.08	c0.16		c0.13	0.24			0.40	
v/s Ratio Perm	0.05			0.07			c0.45		0.07	0.04		0.06
v/c Ratio	0.50	0.26		0.59	0.64		0.92	0.39	0.10	0.09	0.87	0.14
Uniform Delay, d1	51.3	50.1		37.4	39.6		37.6	10.6	8.6	17.9	28.8	18.4
Progression Factor	1.00	1.00		1.05	1.04		1.16	1.03	1.35	0.63	0.68	0.39
Incremental Delay, d2	3.8	1.1		2.2	2.4		30.8	0.5	0.2	0.5	5.4	0.3
Delay (s)	55.1	51.3		41.5	43.4		74.5	11.4	11.7	11.8	25.1	7.5
Level of Service	E	D		D	D		E	B	B	B	C	A
Approach Delay (s)		52.4			42.6			24.9			23.2	
Approach LOS		D			D			C			C	

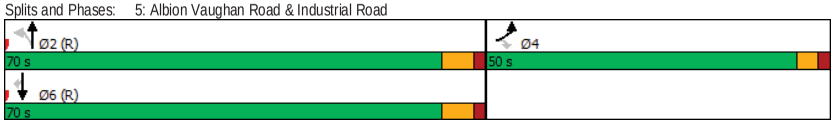
Intersection Summary				
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	96.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	110	213	699
Future Volume (vph)	228	25	65	110	213	699
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.77	0.08	0.09	0.05	0.09	0.54
Control Delay	61.7	14.6	7.6	6.7	6.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	14.6	7.6	6.7	6.6	2.4
LOS	E	B	A	A	A	A
Approach Delay	57.1			7.0	3.4	
Approach LOS	E			A	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	228	25	65	110	213	699
v/c Ratio	0.77	0.08	0.09	0.05	0.09	0.54
Control Delay	61.7	14.6	7.6	6.7	6.6	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.7	14.6	7.6	6.7	6.6	2.4
Queue Length 50th (m)	48.8	0.1	4.6	4.0	7.8	0.0
Queue Length 95th (m)	78.2	7.7	12.2	8.8	15.3	13.7
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	532	689	2206	2484	1285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.05	0.09	0.05	0.09	0.54

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	110	213	699
Future Volume (vph)	228	25	65	110	213	699
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	3147	3544	1536
Flt Permitted	0.95	1.00	0.62	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	985	3147	3544	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	228	25	65	110	213	699
RTOR Reduction (vph)	0	20	0	0	0	209
Lane Group Flow (vph)	228	5	65	110	213	490
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	24.3	24.3	84.1	84.1	84.1	84.1
Effective Green, g (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	278	690	2205	2483	1076
v/s Ratio Prot	c0.15			0.03	0.06	
v/s Ratio Perm		0.00	0.07			c0.32
v/c Ratio	0.77	0.02	0.09	0.05	0.09	0.46
Uniform Delay, d1	45.2	38.3	5.7	5.6	5.7	7.9
Progression Factor	1.01	1.16	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.0	0.3	0.0	0.1	1.4
Delay (s)	56.8	44.5	6.0	5.6	5.8	9.3
Level of Service	E	D	A	A	A	A
Approach Delay (s)	55.6			5.8	8.5	
Approach LOS	E			A	A	

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1274	1443	110	
Future Volume (vph)	45	0	170	1274	1443	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	84.9	84.9	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.71	0.71	
v/c Ratio	0.41	0.32	0.49	0.45	0.61	0.10	
Control Delay	62.4	4.1	8.0	3.9	10.8	2.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	4.1	8.0	3.9	10.8	2.9	
LOS	E	A	A	A	B	A	
Approach Delay		26.0		4.4	10.3		
Approach LOS		C		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 8.1		Intersection LOS: A	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1274	1443	110
v/c Ratio	0.41	0.32	0.49	0.45	0.61	0.10
Control Delay	62.4	4.1	8.0	3.9	10.8	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	4.1	8.0	3.9	10.8	2.9
Queue Length 50th (m)	10.8	0.0	5.6	39.2	66.6	2.7
Queue Length 95th (m)	22.8	1.1	16.1	60.5	60.3	m1.1
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	446	349	2849	2369	1115
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.49	0.45	0.61	0.10

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1274	0	0	1443	110
Future Volume (vph)	45	0	75	0	0	0	170	1274	0	0	1443	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.13	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					237	3380			3349	1551
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)	45	0	75	0	0	0	170	1274	0	0	1443	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	19
Lane Group Flow (vph)	45	5	0	0	0	0	170	1274	0	0	1443	91
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			83.6	83.6
Effective Green, g (s)	8.4	8.4					98.6	98.6			83.6	83.6
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.70	0.70
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					339	2777			2333	1080
v/s Ratio Prot		0.00					c0.05	0.38			c0.43	
v/s Ratio Perm	c0.03						0.36					0.06
v/c Ratio	0.48	0.06					0.50	0.46			0.62	0.08
Uniform Delay, d1	53.7	52.1					6.9	3.1			9.7	5.9
Progression Factor	1.00	1.00					1.00	1.00			0.93	0.73
Incremental Delay, d2	3.9	0.3					1.2	0.5			0.7	0.1
Delay (s)	57.6	52.4					8.1	3.6			9.8	4.4
Level of Service	E	D					A	A			A	A
Approach Delay (s)		54.3			0.0			4.1			9.4	
Approach LOS		D			A			A			A	

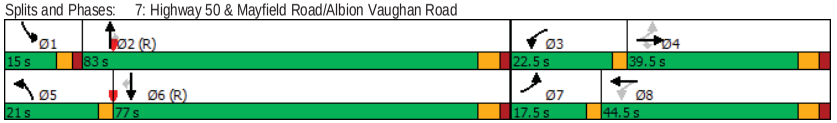
Intersection Summary				
HCM 2000 Control Delay	8.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	90	115	270	350	370	145	1354	160	5	1418	85
Future Volume (vph)	90	115	270	350	370	145	1354	160	5	1418	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	41.1	26.1	26.1	53.3	35.3	22.3	94.4	94.4	10.0	72.1	72.1
Actuated g/C Ratio	0.26	0.16	0.16	0.33	0.22	0.14	0.59	0.59	0.06	0.45	0.45
v/c Ratio	0.33	0.46	0.95	0.81	0.52	0.84	0.67	0.18	0.05	0.90	0.12
Control Delay	39.8	64.5	67.0	60.0	56.9	103.0	26.4	3.2	72.0	50.0	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	64.5	67.0	60.0	56.9	103.0	26.4	3.2	72.0	50.0	1.6
LOS	D	E	E	E	E	F	C	A	E	D	A
Approach Delay		61.2			58.4		30.9			47.3	
Approach LOS		E			E		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 44.5		Intersection LOS: D	
Intersection Capacity Utilization 94.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	115	270	350	385	145	1354	160	5	1418	85
v/c Ratio	0.33	0.46	0.95	0.81	0.52	0.84	0.67	0.18	0.05	0.90	0.12
Control Delay	39.8	64.5	67.0	60.0	56.9	103.0	26.4	3.2	72.0	50.0	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	64.5	67.0	60.0	56.9	103.0	26.4	3.2	72.0	50.0	1.6
Queue Length 50th (m)	20.7	34.1	39.6	94.3	58.5	48.8	157.1	0.0	1.6	220.9	0.0
Queue Length 95th (m)	34.5	54.4	#93.0	125.4	76.5	#100.9	235.7	13.2	6.5	255.2	4.1
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	306	319	318	432	797	172	2012	891	96	1579	733
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.36	0.85	0.81	0.48	0.84	0.67	0.18	0.05	0.90	0.12

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	115	270	350	370	15	145	1354	160	5	1418	85
Future Volume (vph)	90	115	270	350	370	15	145	1354	160	5	1418	85
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.52	1.00	1.00	0.55	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	875	1549	929	985	3324		1236	3411	1401	1539	3493	1479
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)	90	115	270	350	370	15	145	1354	160	5	1418	85
RTOR Reduction (vph)	0	0	134	0	2	0	0	0	70	0	0	47
Lane Group Flow (vph)	90	115	136	350	383	0	145	1354	90	5	1418	38
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	37.6	26.1	26.1	49.8	35.3		22.3	90.4	90.4	2.0	72.1	72.1
Effective Green, g (s)	37.6	26.1	26.1	49.8	35.3		22.3	90.4	90.4	2.0	72.1	72.1
Actuated g/C Ratio	0.24	0.16	0.16	0.31	0.22		0.14	0.57	0.57	0.01	0.45	0.45
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	257	252	151	410	733		172	1927	791	19	1574	666
v/s Ratio Prot	0.03	0.07		c0.11	0.12		c0.12	0.40		0.00	c0.41	
v/s Ratio Perm	0.06		0.15	c0.15					0.06			0.03
v/c Ratio	0.35	0.46	0.90	0.85	0.52		0.84	0.70	0.11	0.26	0.90	0.06
Uniform Delay, d1	49.6	60.5	65.7	48.9	54.9		67.1	25.1	16.2	78.3	40.6	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.3	45.3	15.7	0.7		29.5	2.2	0.3	7.3	8.7	0.2
Delay (s)	50.4	61.8	111.0	64.6	55.6		96.6	27.3	16.5	85.6	49.3	25.0
Level of Service	D	E	F	E	E		F	C	B	F	D	C
Approach Delay (s)		87.6			59.9			32.3			48.1	
Approach LOS		F			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	48.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	94.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	130	5	60	213
Future Volume (Veh/h)	5	25	130	5	60	213
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)	5	25	130	5	60	213
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	359	68			135	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	359	68			135	
tC, single (s)	7.5	7.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	515	927			1454	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	87	48	131	142
Volume Left	5	0	0	60	0
Volume Right	25	0	5	0	0
cSH	818	1700	1700	1454	1700
Volume to Capacity	0.04	0.05	0.03	0.04	0.08
Queue Length 95th (m)	0.9	0.0	0.0	1.0	0.0
Control Delay (s)	9.6	0.0	0.0	3.6	0.0
Lane LOS	A			A	
Approach Delay (s)	9.6	0.0		1.8	
Approach LOS	A				

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	24.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	188	484	75	50	45
Future Volume (Veh/h)	25	188	484	75	50	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	188	484	75	50	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	559				760	522
vC1, stage 1 conf vol					522	
vC2, stage 2 conf vol					238	
vCu, unblocked vol	559				760	522
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	92
cM capacity (veh/h)	1022				548	559

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	213	559	95
Volume Left	25	0	50
Volume Right	0	75	45
cSH	1022	1700	553
Volume to Capacity	0.02	0.33	0.17
Queue Length 95th (m)	0.6	0.0	4.9
Control Delay (s)	1.2	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	12.9
Approach LOS			B

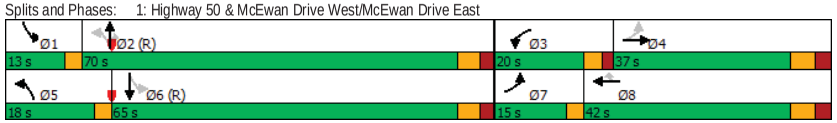
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	43.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	110	1475	185	100	906
Future Volume (vph)	225	110	165	95	230	110	1475	185	100	906
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	33.5	15.3	12.0	13.6	13.6	94.2	81.5	81.5	95.2	82.0
Actuated g/C Ratio	0.24	0.11	0.09	0.10	0.10	0.67	0.58	0.58	0.68	0.59
v/c Ratio	0.65	0.59	0.57	0.54	0.71	0.36	0.72	0.19	0.43	0.48
Control Delay	54.8	26.2	69.0	70.0	25.5	10.8	24.5	6.9	13.2	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	26.2	69.0	70.0	25.5	10.8	24.5	6.9	13.2	18.2
LOS	D	C	E	E	C	B	C	A	B	B
Approach Delay		38.4		48.8			21.8			17.7
Approach LOS		D		D			C			B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 26.3 — Intersection LOS: C
Intersection Capacity Utilization 83.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	305	165	95	230	110	1475	185	100	981
v/c Ratio	0.65	0.59	0.57	0.54	0.71	0.36	0.72	0.19	0.43	0.48
Control Delay	54.8	26.2	69.0	70.0	25.5	10.8	24.5	6.9	13.2	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	26.2	69.0	70.0	25.5	10.8	24.5	6.9	13.2	18.2
Queue Length 50th (m)	53.4	15.2	24.2	27.0	11.4	10.8	168.2	10.1	9.6	89.4
Queue Length 95th (m)	79.8	31.8	35.9	43.4	38.4	18.0	209.5	24.0	16.2	111.8
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	347	820	363	457	537	363	2062	957	247	2053
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.37	0.45	0.21	0.43	0.30	0.72	0.19	0.40	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	195	165	95	230	110	1475	185	100	906	75
Future Volume (vph)	225	110	195	165	95	230	110	1475	185	100	906	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3116		3395	1830	1581	1439	3544	1566	1785	3500	
Flt Permitted	0.62	1.00		0.95	1.00	1.00	0.23	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1158	3116		3395	1830	1581	354	3544	1566	178	3500	
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)	225	110	195	165	95	230	110	1475	185	100	906	75
RTOR Reduction (vph)	0	174	0	0	0	171	0	0	46	0	3	0
Lane Group Flow (vph)	225	131	0	165	95	59	110	1475	139	100	978	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	31.0	15.3		12.0	13.6	13.6	90.6	81.5	81.5	91.6	82.0	
Effective Green, g (s)	31.0	15.3		12.0	13.6	13.6	90.6	81.5	81.5	91.6	82.0	
Actuated g/C Ratio	0.22	0.11		0.09	0.10	0.10	0.65	0.58	0.58	0.65	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	326	340		291	177	153	299	2063	911	226	2050	
v/s Ratio Prot	c0.08	0.04		0.05	0.05		0.02	c0.42		c0.03	0.28	
v/s Ratio Perm	c0.08					0.04	0.21		0.09	0.26		
v/c Ratio	0.69	0.39		0.57	0.54	0.39	0.37	0.71	0.15	0.44	0.48	
Uniform Delay, d1	48.6	58.0		61.5	60.2	59.3	10.7	20.9	13.4	16.3	16.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.2	0.7		2.5	3.1	1.6	0.8	2.2	0.4	1.4	0.8	
Delay (s)	54.7	58.7		64.0	63.3	60.9	11.5	23.1	13.8	17.7	17.5	
Level of Service	D	E		E	E	E	B	C	B	B	B	
Approach Delay (s)		57.0			62.4			21.4			17.5	
Approach LOS		E			E			C			B	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	80	1850	55	0	1451
Future Volume (Veh/h)	0	80	1850	55	0	1451
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	80	1850	55	0	1451
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.61	0.61			0.61	
vC, conflicting volume	2603	952			1905	
vC1, stage 1 conf vol	1878					
vC2, stage 2 conf vol	726					
vCu, unblocked vol	2351	0			1209	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	88			100	
cM capacity (veh/h)	132	661			330	

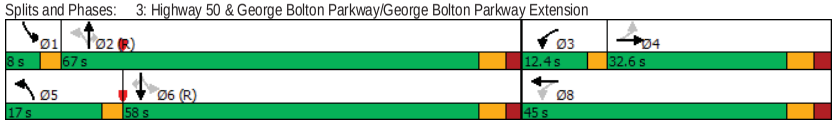
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	1233	672	726	726
Volume Left	0	0	0	0	0
Volume Right	80	0	55	0	0
cSH	661	1700	1700	1700	1700
Volume to Capacity	0.12	0.73	0.40	0.43	0.43
Queue Length 95th (m)	3.3	0.0	0.0	0.0	0.0
Control Delay (s)	11.2	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.2	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	190	22	144	146	135	1635	346	50	1116	125
Future Volume (vph)	190	22	144	146	135	1635	346	50	1116	125
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.4	22.4	38.3	34.7	75.6	65.4	65.4	68.0	59.0	59.0
Actuated g/C Ratio	0.19	0.19	0.32	0.29	0.63	0.54	0.54	0.57	0.49	0.49
v/c Ratio	0.84	0.50	0.48	0.26	0.56	0.81	0.34	0.33	0.65	0.16
Control Delay	75.9	11.0	40.0	37.9	22.4	23.3	3.3	16.6	26.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	11.0	40.0	37.9	22.4	23.3	3.3	16.6	26.4	4.9
LOS	E	B	D	D	C	C	A	B	C	A
Approach Delay		39.9		38.9		20.0			24.0	
Approach LOS		D		D		B			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 24.6		Intersection LOS: C	
Intersection Capacity Utilization 89.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	190	237	144	146	135	1635	346	50	1116	125
v/c Ratio	0.84	0.50	0.48	0.26	0.56	0.81	0.34	0.33	0.65	0.16
Control Delay	75.9	11.0	40.0	37.9	22.4	23.3	3.3	16.6	26.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	11.0	40.0	37.9	22.4	23.3	3.3	16.6	26.4	4.9
Queue Length 50th (m)	44.9	4.5	27.1	28.8	9.4	178.0	0.0	4.6	109.5	1.3
Queue Length 95th (m)	#77.6	26.8	47.9	50.1	m29.8	159.6	26.1	10.2	146.7	12.9
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	264	518	303	614	275	2013	1027	152	1708	806
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.46	0.48	0.24	0.49	0.81	0.34	0.33	0.65	0.16

Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	22	215	144	146	0	135	1635	346	50	1116	125
Future Volume (vph)	190	22	215	144	146	0	135	1635	346	50	1116	125
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1616		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.66	1.00		0.34	1.00		0.15	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1223	1616		642	1921		218	3694	1597	132	3476	1521
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)	190	22	215	144	146	0	135	1635	346	50	1116	125
RTOR Reduction (vph)	0	175	0	0	0	0	0	0	159	0	0	58
Lane Group Flow (vph)	190	62	0	144	146	0	135	1635	187	50	1116	67
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	22.4	22.4		34.7	34.7		72.4	64.8	64.8	63.6	59.0	59.0
Effective Green, g (s)	22.4	22.4		34.7	34.7		72.4	64.8	64.8	63.6	59.0	59.0
Actuated g/C Ratio	0.19	0.19		0.29	0.29		0.60	0.54	0.54	0.53	0.49	0.49
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	301		281	555		234	1994	862	133	1709	747
v/s Ratio Prot		0.04		c0.04	0.08		c0.05	c0.44		0.01	0.32	
v/s Ratio Perm	c0.16			0.11			0.30		0.12	0.18		0.04
v/c Ratio	0.83	0.21		0.51	0.26		0.58	0.82	0.22	0.38	0.65	0.09
Uniform Delay, d1	47.0	41.3		33.4	32.8		14.9	22.8	14.4	19.3	22.8	16.2
Progression Factor	1.00	1.00		1.19	1.15		1.55	0.85	1.58	1.00	1.00	1.00
Incremental Delay, d2	22.2	0.3		1.5	0.2		2.5	2.9	0.4	1.8	2.0	0.2
Delay (s)	69.2	41.6		41.2	38.0		25.6	22.2	23.1	21.1	24.8	16.4
Level of Service	E	D		D	D		C	C	C	C	C	B
Approach Delay (s)		53.9			39.6			22.6			23.8	
Approach LOS		D			D			C			C	

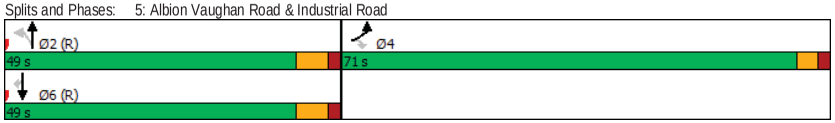
Intersection Summary				
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	89.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	395	124	385
Future Volume (vph)	448	95	55	395	124	385
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
v/c Ratio	0.79	0.17	0.09	0.19	0.07	0.35
Control Delay	46.2	6.5	14.3	13.3	12.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	6.5	14.3	13.3	12.8	2.6
LOS	D	A	B	B	B	A
Approach Delay	39.2			13.4	5.0	
Approach LOS	D			B	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	448	95	55	395	124	385
v/c Ratio	0.79	0.17	0.09	0.19	0.07	0.35
Control Delay	46.2	6.5	14.3	13.3	12.8	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	6.5	14.3	13.3	12.8	2.6
Queue Length 50th (m)	89.3	0.3	5.7	22.8	6.6	0.0
Queue Length 95th (m)	127.5	9.1	15.3	39.4	14.0	16.2
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	921	581	2069	1903	1092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.10	0.09	0.19	0.07	0.35

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	395	124	385
Future Volume (vph)	448	95	55	395	124	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	3544	3259	1597
Flt Permitted	0.95	1.00	0.67	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	996	3544	3259	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	448	95	55	395	124	385
RTOR Reduction (vph)	0	65	0	0	0	160
Lane Group Flow (vph)	448	30	55	395	124	225
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	38.3	38.3	70.1	70.1	70.1	70.1
Effective Green, g (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	569	509	581	2070	1903	932
v/s Ratio Prot	c0.25			0.11	0.04	
v/s Ratio Perm		0.02	0.06			c0.14
v/c Ratio	0.79	0.06	0.09	0.19	0.07	0.24
Uniform Delay, d1	37.1	28.4	11.0	11.7	10.8	12.1
Progression Factor	0.99	1.29	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.0	0.3	0.2	0.1	0.6
Delay (s)	43.9	36.7	11.3	11.9	10.9	12.7
Level of Service	D	D	B	B	B	B
Approach Delay (s)	42.6			11.8	12.2	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	51.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	1936	1450	50	
Future Volume (vph)	115	0	65	1936	1450	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.8	83.8	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.48	0.28	0.73	0.60	0.05	
Control Delay	65.9	15.2	6.5	10.3	16.1	4.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	15.2	6.5	10.3	16.1	4.7	
LOS	E	B	A	B	B	A	
Approach Delay		37.6		10.1	15.8		
Approach LOS		D		B	B		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.73		
Intersection Signal Delay: 14.3	Intersection LOS: B	
Intersection Capacity Utilization 73.8%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	1936	1450	50
v/c Ratio	0.65	0.48	0.28	0.73	0.60	0.05
Control Delay	65.9	15.2	6.5	10.3	16.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	15.2	6.5	10.3	16.1	4.7
Queue Length 50th (m)	27.5	2.9	2.9	113.1	134.1	1.5
Queue Length 95th (m)	45.5	21.3	7.7	176.8	100.5	m2.8
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	490	237	2660	2427	1061
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.27	0.73	0.60	0.05

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	1936	0	0	1450	50
Future Volume (vph)	115	0	145	0	0	0	65	1936	0	0	1450	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.13	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					203	3476			3476	1493
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)	115	0	145	0	0	0	65	1936	0	0	1450	50
RTOR Reduction (vph)	0	115	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	30	0	0	0	0	65	1936	0	0	1450	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			83.3	83.3
Effective Green, g (s)	15.1	15.1					91.9	91.9			83.3	83.3
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					214	2662			2412	1036
v/s Ratio Prot		0.02					0.01	c0.56			0.42	
v/s Ratio Perm	c0.08						0.22					0.02
v/c Ratio	0.65	0.16					0.30	0.73			0.60	0.03
Uniform Delay, d1	49.9	46.8					6.5	7.4			9.6	5.7
Progression Factor	1.00	1.00					1.00	1.00			1.41	3.07
Incremental Delay, d2	8.0	0.4					0.8	1.8			0.9	0.0
Delay (s)	57.9	47.2					7.3	9.2			14.5	17.7
Level of Service	E	D					A	A			B	B
Approach Delay (s)		51.9			0.0			9.1			14.6	
Approach LOS		D			A			A			B	

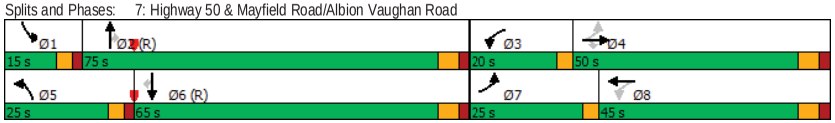
Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	125	210	170	155	105	110	1771	605	10	1465	120
Future Volume (vph)	125	210	170	155	105	110	1771	605	10	1465	120
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	24.9	24.9	45.5	26.2	22.2	97.6	97.6	10.0	76.4	76.4
Actuated g/C Ratio	0.27	0.16	0.16	0.28	0.16	0.14	0.61	0.61	0.06	0.48	0.48
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.84	0.56	0.09	0.87	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	31.9	7.8	72.8	45.4	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	31.9	7.8	72.8	45.4	4.0
LOS	D	F	B	D	D	F	C	A	E	D	A
Approach Delay		50.7			51.8		28.6			42.5	
Approach LOS		D			D		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 36.8		Intersection LOS: D	
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	210	170	155	130	110	1771	605	10	1465	120
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.84	0.56	0.09	0.87	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	31.9	7.8	72.8	45.4	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	31.9	7.8	72.8	45.4	4.0
Queue Length 50th (m)	31.7	68.6	0.0	40.3	17.3	35.7	220.4	21.7	3.2	233.3	0.0
Queue Length 95th (m)	46.7	94.1	23.4	57.3	27.5	56.6	#378.4	76.7	10.4	#341.4	11.3
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	417	470	407	268	732	163	2100	1083	111	1676	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.45	0.42	0.58	0.18	0.67	0.84	0.56	0.09	0.87	0.15

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	210	170	155	105	25	110	1771	605	10	1465	120
Future Volume (vph)	125	210	170	155	105	25	110	1771	605	10	1465	120
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.67	1.00	1.00	0.32	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1187	1731	1044	549	2992		1109	3444	1493	1785	3510	1536
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)	125	210	170	155	105	25	110	1771	605	10	1465	120
RTOR Reduction (vph)	0	0	144	0	14	0	0	0	181	0	0	63
Lane Group Flow (vph)	125	210	26	155	116	0	110	1771	424	10	1465	57
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Effective Green, g (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Actuated g/C Ratio	0.25	0.16	0.16	0.26	0.16		0.14	0.59	0.59	0.02	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	269	162	247	489		153	2036	882	44	1676	733
v/s Ratio Prot	0.03	c0.12		c0.06	0.04		c0.10	c0.51		0.01	0.42	
v/s Ratio Perm	0.06		0.03	0.10					0.28			0.04
v/c Ratio	0.37	0.78	0.16	0.63	0.24		0.72	0.87	0.48	0.23	0.87	0.08
Uniform Delay, d1	49.2	64.9	58.5	48.8	58.2		65.9	27.5	18.7	76.5	37.5	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	13.6	0.5	4.9	0.3		14.9	5.4	1.9	2.6	6.7	0.2
Delay (s)	49.9	78.6	59.0	53.7	58.5		80.8	32.9	20.6	79.1	44.2	22.9
Level of Service	D	E	E	D	E		F	C	C	E	D	C
Approach Delay (s)		64.9			55.9			32.0			42.8	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	95.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	410	0	35	159
Future Volume (Veh/h)	10	70	410	0	35	159
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	70	410	0	35	159
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	560	205			410	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	560	205			410	
tC, single (s)	7.0	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	98	91			97	
cM capacity (veh/h)	424	795			1124	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	273	137	88	106
Volume Left	10	0	0	35	0
Volume Right	70	0	0	0	0
cSH	717	1700	1700	1124	1700
Volume to Capacity	0.11	0.16	0.08	0.03	0.06
Queue Length 95th (m)	3.0	0.0	0.0	0.8	0.0
Control Delay (s)	10.7	0.0	0.0	3.5	0.0
Lane LOS	B			A	
Approach Delay (s)	10.7	0.0		1.6	
Approach LOS	B				

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	31.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	373	260	110	100	30
Future Volume (Veh/h)	45	373	260	110	100	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	45	373	260	110	100	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	370				778	315
vC1, stage 1 conf vol					315	
vC2, stage 2 conf vol					463	
vCu, unblocked vol	370				778	315
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				82	96
cM capacity (veh/h)	1200				546	730

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	370	130
Volume Left	45	0	100
Volume Right	0	110	30
cSH	1200	1700	580
Volume to Capacity	0.04	0.22	0.22
Queue Length 95th (m)	0.9	0.0	6.8
Control Delay (s)	1.2	0.0	13.0
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	13.0
Approach LOS			B

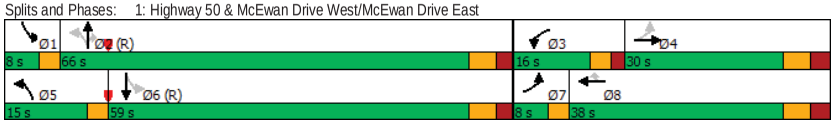
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			

2036
Future Total Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	145	849	65	60	1313
Future Volume (vph)	80	45	80	105	50	145	849	65	60	1313
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	20.2	11.5	8.8	15.7	15.7	87.1	76.2	76.2	80.0	70.3
Actuated g/C Ratio	0.17	0.10	0.07	0.13	0.13	0.73	0.64	0.64	0.67	0.59
v/c Ratio	0.34	0.48	0.34	0.44	0.17	0.63	0.39	0.07	0.14	0.73
Control Delay	40.2	19.6	56.5	51.8	1.2	30.3	23.8	5.3	8.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	19.6	56.5	51.8	1.2	30.3	23.8	5.3	8.0	23.2
LOS	D	B	E	D	A	C	C	A	A	C
Approach Delay		26.2		42.6			23.5			22.6
Approach LOS		C		D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 24.8	Intersection LOS: C
Intersection Capacity Utilization 83.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	170	80	105	50	145	849	65	60	1458
v/c Ratio	0.34	0.48	0.34	0.44	0.17	0.63	0.39	0.07	0.14	0.73
Control Delay	40.2	19.6	56.5	51.8	1.2	30.3	23.8	5.3	8.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	19.6	56.5	51.8	1.2	30.3	23.8	5.3	8.0	23.2
Queue Length 50th (m)	16.5	5.6	9.9	24.9	0.0	15.7	76.8	0.6	3.5	126.6
Queue Length 95th (m)	25.0	14.8	17.9	36.2	0.0	#44.7	123.9	8.7	12.0	#237.6
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	233	585	296	468	482	253	2167	971	421	1995
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.29	0.27	0.22	0.10	0.57	0.39	0.07	0.14	0.73

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	125	80	105	50	145	849	65	60	1313	145
Future Volume (vph)	80	45	125	80	105	50	145	849	65	60	1313	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2514		3236	1812	1536	1526	3411	1452	1638	3399	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.10	1.00	1.00	0.32	1.00	
Satd. Flow (perm)	1245	2514		3236	1812	1536	154	3411	1452	549	3399	
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)	80	45	125	80	105	50	145	849	65	60	1313	145
RTOR Reduction (vph)	0	113	0	0	0	43	0	0	25	0	5	0
Lane Group Flow (vph)	80	57	0	80	105	7	145	849	40	60	1453	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	16.2	11.5		7.2	16.0	16.0	82.7	74.7	74.7	74.3	69.3	
Effective Green, g (s)	16.2	11.5		7.2	16.0	16.0	82.7	74.7	74.7	74.3	69.3	
Actuated g/C Ratio	0.13	0.10		0.06	0.13	0.13	0.69	0.62	0.62	0.62	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	186	240		194	241	204	225	2123	903	385	1962	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.06	0.25		0.01	c0.43	
v/s Ratio Perm	0.04					0.00	0.39		0.03	0.09		
v/c Ratio	0.43	0.24		0.41	0.44	0.03	0.64	0.40	0.04	0.16	0.74	
Uniform Delay, d1	47.1	50.2		54.4	47.8	45.3	16.1	11.4	8.8	9.1	18.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.41	1.81	1.00	1.00	1.00	
Incremental Delay, d2	1.6	0.5		1.4	1.3	0.1	6.0	0.5	0.1	0.2	2.6	
Delay (s)	48.7	50.7		55.8	49.1	45.3	28.7	21.2	8.9	9.3	21.3	
Level of Service	D	D		E	D	D	C	C	A	A	C	
Approach Delay (s)		50.1			50.6			21.5			20.8	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	83.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	60	1024	50	0	1713
Future Volume (Veh/h)	0	60	1024	50	0	1713
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	60	1024	50	0	1713
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.86	0.86			0.86	
vC, conflicting volume	1906	537			1074	
vC1, stage 1 conf vol	1049					
vC2, stage 2 conf vol	856					
vCu, unblocked vol	1726	133			758	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	254	720			741	

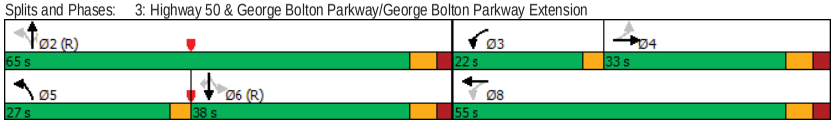
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	60	683	391	856	856
Volume Left	0	0	0	0	0
Volume Right	60	0	50	0	0
cSH	720	1700	1700	1700	1700
Volume to Capacity	0.08	0.40	0.23	0.50	0.50
Queue Length 95th (m)	2.2	0.0	0.0	0.0	0.0
Control Delay (s)	10.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.5	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		50.7%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	60	38	370	364	270	899	165	40	1433	175
Future Volume (vph)	60	38	370	364	270	899	165	40	1433	175
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	13.0	13.0	38.4	34.8	75.6	72.3	72.3	51.2	51.2	51.2
Actuated g/C Ratio	0.11	0.11	0.32	0.29	0.63	0.60	0.60	0.43	0.43	0.43
v/c Ratio	0.56	0.58	0.85	0.65	0.89	0.44	0.16	0.16	0.97	0.24
Control Delay	69.5	27.2	53.9	43.8	60.6	15.0	3.2	18.6	41.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.2	53.9	43.8	60.6	15.0	3.2	18.6	41.1	6.4
LOS	E	C	D	D	E	B	A	B	D	A
Approach Delay		40.3		48.9		22.8			36.9	
Approach LOS		D		D		C			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 34.5		Intersection LOS: C	
Intersection Capacity Utilization 100.3%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	133	370	364	270	899	165	40	1433	175
v/c Ratio	0.56	0.58	0.85	0.65	0.89	0.44	0.16	0.16	0.97	0.24
Control Delay	69.5	27.2	53.9	43.8	60.6	15.0	3.2	18.6	41.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.2	53.9	43.8	60.6	15.0	3.2	18.6	41.1	6.4
Queue Length 50th (m)	14.4	8.8	79.5	80.6	53.9	56.7	0.0	3.2	179.7	2.1
Queue Length 95th (m)	28.0	28.2	#110.0	109.0	87.4	96.4	14.0	m7.5	#291.6	m4.6
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	218	367	438	774	388	2054	1027	254	1484	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.36	0.84	0.47	0.70	0.44	0.16	0.16	0.97	0.24

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	38	95	370	364	0	270	899	165	40	1433	175
Future Volume (vph)	60	38	95	370	364	0	270	899	165	40	1433	175
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1334		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.54	1.00		0.46	1.00		0.07	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	993	1334		873	1921		126	3411	1597	595	3476	1597
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)	60	38	95	370	364	0	270	899	165	40	1433	175
RTOR Reduction (vph)	0	85	0	0	0	0	0	0	66	0	0	50
Lane Group Flow (vph)	60	48	0	370	364	0	270	899	99	40	1433	125
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.0	13.0		34.9	34.9		72.2	72.2	72.2	51.2	51.2	51.2
Effective Green, g (s)	13.0	13.0		34.9	34.9		72.2	72.2	72.2	51.2	51.2	51.2
Actuated g/C Ratio	0.11	0.11		0.29	0.29		0.60	0.60	0.60	0.43	0.43	0.43
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	144		412	558		300	2052	960	253	1483	681
v/s Ratio Prot		0.04		c0.14	0.19		c0.13	0.26			c0.41	
v/s Ratio Perm	0.06			c0.12			0.41		0.06	0.07		0.08
v/c Ratio	0.56	0.34		0.90	0.65		0.90	0.44	0.10	0.16	0.97	0.18
Uniform Delay, d1	50.8	49.5		38.2	37.2		37.3	12.9	10.2	21.1	33.6	21.4
Progression Factor	1.00	1.00		1.05	1.03		1.07	1.06	1.52	0.64	0.70	0.42
Incremental Delay, d2	6.6	1.4		20.8	2.6		26.0	0.6	0.2	1.1	14.6	0.5
Delay (s)	57.4	50.9		60.9	41.1		66.0	14.3	15.6	14.6	38.0	9.6
Level of Service	E	D		E	D		E	B	B	B	D	A
Approach Delay (s)		52.9			51.0			24.9			34.4	
Approach LOS		D			D			C			C	

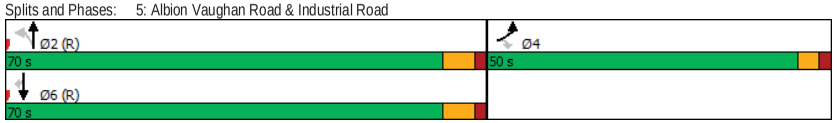
Intersection Summary				
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	100.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	253	75	80	110	213	724
Future Volume (vph)	253	75	80	110	213	724
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	26.3	26.3	82.1	82.1	82.1	82.1
Actuated g/C Ratio	0.22	0.22	0.68	0.68	0.68	0.68
v/c Ratio	0.78	0.21	0.12	0.05	0.09	0.57
Control Delay	61.8	10.1	8.6	7.5	7.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	10.1	8.6	7.5	7.4	2.6
LOS	E	B	A	A	A	A
Approach Delay	50.0			7.9	3.7	
Approach LOS	D			A	A	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green		
Natural Cycle: 65		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay: 14.7	Intersection LOS: B	
Intersection Capacity Utilization 61.7%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	253	75	80	110	213	724
v/c Ratio	0.78	0.21	0.12	0.05	0.09	0.57
Control Delay	61.8	10.1	8.6	7.5	7.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.8	10.1	8.6	7.5	7.4	2.6
Queue Length 50th (m)	61.8	0.9	6.2	4.2	8.4	0.0
Queue Length 95th (m)	81.5	12.0	15.6	9.4	16.3	14.7
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	563	672	2151	2423	1279
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.13	0.12	0.05	0.09	0.57

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	253	75	80	110	213	724
Future Volume (vph)	253	75	80	110	213	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	3147	3544	1536
Flt Permitted	0.95	1.00	0.62	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	985	3147	3544	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	253	75	80	110	213	724
RTOR Reduction (vph)	0	59	0	0	0	229
Lane Group Flow (vph)	253	16	80	110	213	495
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	26.3	26.3	82.1	82.1	82.1	82.1
Effective Green, g (s)	26.3	26.3	82.1	82.1	82.1	82.1
Actuated g/C Ratio	0.22	0.22	0.68	0.68	0.68	0.68
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	301	673	2153	2424	1050
v/s Ratio Prot	c0.17			0.03	0.06	
v/s Ratio Perm		0.01	0.08			c0.32
v/c Ratio	0.78	0.05	0.12	0.05	0.09	0.47
Uniform Delay, d1	44.2	37.0	6.5	6.2	6.4	8.8
Progression Factor	1.04	1.19	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.1	0.4	0.0	0.1	1.5
Delay (s)	57.6	44.2	6.9	6.2	6.4	10.4
Level of Service	E	D	A	A	A	B
Approach Delay (s)	54.5			6.5	9.5	
Approach LOS	D			A	A	

Intersection Summary				
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1339	1633	110	
Future Volume (vph)	45	0	170	1339	1633	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	81.0	81.0	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.68	0.68	
v/c Ratio	0.41	0.34	0.50	0.47	0.72	0.10	
Control Delay	62.4	5.9	16.0	4.0	11.8	2.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	5.9	16.0	4.0	11.8	2.2	
LOS	E	A	B	A	B	A	
Approach Delay		27.1		5.4	11.2		
Approach LOS		C		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 9.2		Intersection LOS: A	
Intersection Capacity Utilization 75.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1339	1633	110
v/c Ratio	0.41	0.34	0.50	0.47	0.72	0.10
Control Delay	62.4	5.9	16.0	4.0	11.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	5.9	16.0	4.0	11.8	2.2
Queue Length 50th (m)	10.8	0.0	8.1	42.5	59.2	1.5
Queue Length 95th (m)	22.8	3.6	32.4	65.6	m82.5	m0.9
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	438	338	2849	2259	1067
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.50	0.47	0.72	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1339	0	0	1633	110
Future Volume (vph)	45	0	75	0	0	0	170	1339	0	0	1633	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.09	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					159	3380			3349	1551
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)	45	0	75	0	0	0	170	1339	0	0	1633	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	21
Lane Group Flow (vph)	45	5	0	0	0	0	170	1339	0	0	1633	89
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			79.6	79.6
Effective Green, g (s)	8.4	8.4					98.6	98.6			79.6	79.6
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.66	0.66
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					333	2777			2221	1028
v/s Ratio Prot		0.00					c0.07	0.40			c0.49	
v/s Ratio Perm	c0.03						0.35					0.06
v/c Ratio	0.48	0.06					0.51	0.48			0.74	0.09
Uniform Delay, d1	53.7	52.1					16.0	3.2			13.3	7.2
Progression Factor	1.00	1.00					1.00	1.00			0.77	0.51
Incremental Delay, d2	3.9	0.3					1.3	0.6			0.9	0.1
Delay (s)	57.6	52.4					17.3	3.8			11.1	3.7
Level of Service	E	D					B	A			B	A
Approach Delay (s)		54.3			0.0			5.3			10.6	
Approach LOS		D			A			A			B	

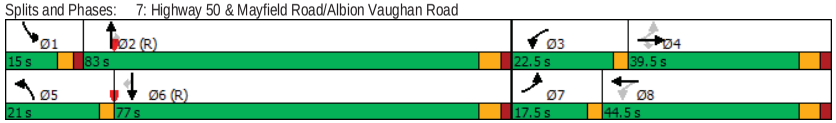
Intersection Summary					
HCM 2000 Control Delay	9.8	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	75.4%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	115	115	270	400	370	145	1394	175	5	1538	155
Future Volume (vph)	115	115	270	400	370	145	1394	175	5	1538	155
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.6	27.4	27.4	53.4	34.2	21.4	94.3	94.3	10.0	72.9	72.9
Actuated g/C Ratio	0.27	0.17	0.17	0.33	0.21	0.13	0.59	0.59	0.06	0.46	0.46
v/c Ratio	0.41	0.43	0.95	0.93	0.54	0.88	0.69	0.20	0.05	0.97	0.21
Control Delay	41.6	62.8	70.9	76.4	58.0	110.1	27.3	3.2	72.0	58.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	62.8	70.9	76.4	58.0	110.1	27.3	3.2	72.0	58.4	7.4
LOS	D	E	E	E	E	F	C	A	E	E	A
Approach Delay		62.3			67.3		31.9			53.8	
Approach LOS		E			E		C			D	

Intersection Summary		
Cycle Length: 160		
Actuated Cycle Length: 160		
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.97		
Intersection Signal Delay: 49.0	Intersection LOS: D	
Intersection Capacity Utilization 100.3%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	115	270	400	385	145	1394	175	5	1538	155
v/c Ratio	0.41	0.43	0.95	0.93	0.54	0.88	0.69	0.20	0.05	0.97	0.21
Control Delay	41.6	62.8	70.9	76.4	58.0	110.1	27.3	3.2	72.0	58.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	62.8	70.9	76.4	58.0	110.1	27.3	3.2	72.0	58.4	7.4
Queue Length 50th (m)	26.2	33.4	42.7	108.8	58.1	~52.4	171.9	0.0	1.6	254.4	5.7
Queue Length 95th (m)	42.6	54.4	#98.7	#163.0	76.5	#100.9	247.2	13.6	6.5	#308.0	20.3
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	297	319	310	429	795	165	2010	897	96	1591	741
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.36	0.87	0.93	0.48	0.88	0.69	0.20	0.05	0.97	0.21

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	115	270	400	370	15	145	1394	175	5	1538	155
Future Volume (vph)	115	115	270	400	370	15	145	1394	175	5	1538	155
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.47	1.00	1.00	0.56	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	794	1549	929	999	3324		1236	3411	1401	1539	3493	1479
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)	115	115	270	400	370	15	145	1394	175	5	1538	155
RTOR Reduction (vph)	0	0	124	0	2	0	0	0	76	0	0	68
Lane Group Flow (vph)	115	115	146	400	383	0	145	1394	99	5	1538	87
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	40.1	27.4	27.4	49.9	34.2		21.4	90.3	90.3	2.0	72.9	72.9
Effective Green, g (s)	40.1	27.4	27.4	49.9	34.2		21.4	90.3	90.3	2.0	72.9	72.9
Actuated g/C Ratio	0.25	0.17	0.17	0.31	0.21		0.13	0.56	0.56	0.01	0.46	0.46
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	262	265	159	407	710		165	1925	790	19	1591	673
v/s Ratio Prot	0.03	0.07		c0.12	0.12		c0.12	0.41		0.00	c0.44	
v/s Ratio Perm	0.08		0.16	c0.19					0.07			0.06
v/c Ratio	0.44	0.43	0.92	0.98	0.54		0.88	0.72	0.13	0.26	0.97	0.13
Uniform Delay, d1	48.4	59.4	65.2	52.2	55.9		68.0	25.7	16.3	78.3	42.4	25.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.1	47.1	39.8	0.8		37.2	2.4	0.3	7.3	15.9	0.4
Delay (s)	49.6	60.5	112.3	92.0	56.8		105.3	28.1	16.7	85.6	58.3	25.6
Level of Service	D	E	F	F	E		F	C	B	F	E	C
Approach Delay (s)		86.0			74.7			33.4			55.4	
Approach LOS		F			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	53.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	100.3%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	145	5	60	263
Future Volume (Veh/h)	5	25	145	5	60	263
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)	5	25	145	5	60	263
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	399	75			150	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	399	75			150	
tC, single (s)	7.5	7.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	484	916			1436	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	97	53	148	175
Volume Left	5	0	0	60	0
Volume Right	25	0	5	0	0
cSH	797	1700	1700	1436	1700
Volume to Capacity	0.04	0.06	0.03	0.04	0.10
Queue Length 95th (m)	0.9	0.0	0.0	1.0	0.0
Control Delay (s)	9.7	0.0	0.0	3.3	0.0
Lane LOS	A			A	
Approach Delay (s)	9.7	0.0		1.5	
Approach LOS	A				

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	26.5%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	65	125	1029	55	25	1668
Future Volume (Veh/h)	65	125	1029	55	25	1668
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)	65	125	1029	55	25	1668
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.76	0.87			0.87	
vC, conflicting volume	1940	542			1084	
vC1, stage 1 conf vol	1056					
vC2, stage 2 conf vol	884					
vCu, unblocked vol	829	177			800	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	83			97	
cM capacity (veh/h)	351	733			725	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	125	686	398	25	834	834
Volume Left	65	0	0	0	25	0	0
Volume Right	0	125	0	55	0	0	0
cSH	351	733	1700	1700	725	1700	1700
Volume to Capacity	0.19	0.17	0.40	0.23	0.03	0.49	0.49
Queue Length 95th (m)	5.4	4.9	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	17.6	10.9	0.0	0.0	10.1	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	13.2		0.0		0.1		
Approach LOS	B						

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	25	30	70	280	30
Future Volume (Veh/h)	25	25	30	70	280	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	25	30	70	280	30
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	100				140	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				140	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				67	97
cM capacity (veh/h)	1505				844	1005

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	50	100	310
Volume Left	25	0	280
Volume Right	0	70	30
cSH	1505	1700	857
Volume to Capacity	0.02	0.06	0.36
Queue Length 95th (m)	0.4	0.0	13.3
Control Delay (s)	3.8	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	3.8	0.0	11.6
Approach LOS			B

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	33.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	188	484	115	125	250
Future Volume (Veh/h)	55	188	484	115	125	250
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	188	484	115	125	250
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	599				840	542
vC1, stage 1 conf vol					542	
vC2, stage 2 conf vol					298	
vCu, unblocked vol	599				840	542
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				76	54
cM capacity (veh/h)	988				517	545

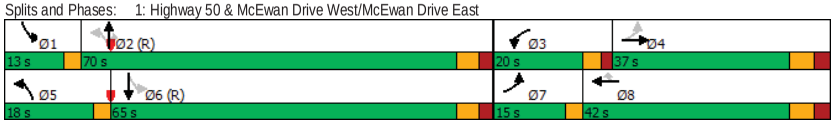
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	243	599	375
Volume Left	55	0	125
Volume Right	0	115	250
cSH	988	1700	535
Volume to Capacity	0.06	0.35	0.70
Queue Length 95th (m)	1.4	0.0	44.1
Control Delay (s)	2.4	0.0	26.0
Lane LOS	A		D
Approach Delay (s)	2.4	0.0	26.0
Approach LOS			D

Intersection Summary				
Average Delay		8.5		
Intersection Capacity Utilization		77.7%	ICU Level of Service	D
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	120	1565	185	100	976
Future Volume (vph)	225	110	165	95	230	120	1565	185	100	976
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	31.5	14.1	12.0	14.1	14.1	96.0	82.9	82.9	95.7	82.8
Actuated g/C Ratio	0.22	0.10	0.09	0.10	0.10	0.69	0.59	0.59	0.68	0.59
v/c Ratio	0.66	0.67	0.57	0.52	0.69	0.41	0.75	0.19	0.47	0.51
Control Delay	56.2	28.7	69.0	68.3	23.7	11.5	24.9	7.1	16.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	28.7	69.0	68.3	23.7	11.5	24.9	7.1	16.5	18.5
LOS	E	C	E	E	C	B	C	A	B	B
Approach Delay		39.7		47.6			22.2			18.3
Approach LOS		D		D			C			B

Intersection Summary			
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 26.6		Intersection LOS: C	
Intersection Capacity Utilization 85.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	335	165	95	230	120	1565	185	100	1051
v/c Ratio	0.66	0.67	0.57	0.52	0.69	0.41	0.75	0.19	0.47	0.51
Control Delay	56.2	28.7	69.0	68.3	23.7	11.5	24.9	7.1	16.5	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	28.7	69.0	68.3	23.7	11.5	24.9	7.1	16.5	18.5
Queue Length 50th (m)	57.7	18.2	24.2	27.0	10.5	9.7	159.3	9.4	7.8	85.1
Queue Length 95th (m)	79.0	34.4	35.9	43.0	37.0	20.0	235.9	25.5	20.1	127.4
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	342	829	363	457	539	344	2098	969	232	2072
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.40	0.45	0.21	0.43	0.35	0.75	0.19	0.43	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	225	165	95	230	120	1565	185	100	976	75
Future Volume (vph)	225	110	225	165	95	230	120	1565	185	100	976	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3096		3395	1830	1581	1439	3544	1566	1785	3503	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.21	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	1305	3096		3395	1830	1581	318	3544	1566	153	3503	
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)	225	110	225	165	95	230	120	1565	185	100	976	75
RTOR Reduction (vph)	0	191	0	0	0	173	0	0	42	0	3	0
Lane Group Flow (vph)	225	144	0	165	95	57	120	1565	143	100	1048	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	28.1	14.1		12.0	14.1	14.1	92.5	83.0	83.0	92.1	82.8	
Effective Green, g (s)	28.1	14.1		12.0	14.1	14.1	92.5	83.0	83.0	92.1	82.8	
Actuated g/C Ratio	0.20	0.10		0.09	0.10	0.10	0.66	0.59	0.59	0.66	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	309	311		291	184	159	286	2101	928	209	2071	
v/s Ratio Prot	c0.07	0.05		0.05	0.05		0.03	c0.44		c0.03	0.30	
v/s Ratio Perm	c0.07					0.04	0.25		0.09	0.28		
v/c Ratio	0.73	0.46		0.57	0.52	0.36	0.42	0.74	0.15	0.48	0.51	
Uniform Delay, d1	51.2	59.4		61.5	59.7	58.7	10.6	20.8	12.8	17.7	16.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.3	1.1		2.5	2.4	1.4	1.0	2.4	0.4	1.7	0.9	
Delay (s)	59.5	60.5		64.0	62.2	60.1	11.6	23.2	13.1	19.5	17.6	
Level of Service	E	E		E	E	E	B	C	B	B	B	
Approach Delay (s)		60.1			61.8			21.5			17.7	
Approach LOS		E			E			C			B	

Intersection Summary				
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	85.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	100	1985	150	0	1526
Future Volume (Veh/h)	0	100	1985	150	0	1526
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	100	1985	150	0	1526
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.50	0.50			0.50	
vC, conflicting volume	2823	1068			2135	
vC1, stage 1 conf vol	2060					
vC2, stage 2 conf vol	763					
vCu, unblocked vol	2646	0			1270	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	82			100	
cM capacity (veh/h)	115	541			256	

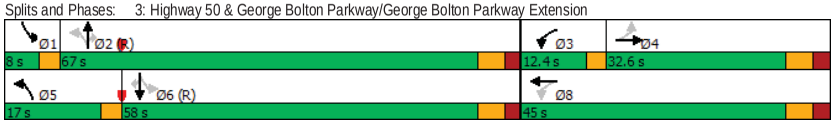
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	100	1323	812	763	763
Volume Left	0	0	0	0	0
Volume Right	100	0	150	0	0
cSH	541	1700	1700	1700	1700
Volume to Capacity	0.18	0.78	0.48	0.45	0.45
Queue Length 95th (m)	5.4	0.0	0.0	0.0	0.0
Control Delay (s)	13.2	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	13.2	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		72.5%	ICU Level of Service	C
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	215	72	259	176	135	1840	346	95	1131	140
Future Volume (vph)	215	72	259	176	135	1840	346	95	1131	140
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	24.2	24.2	40.2	36.6	73.2	61.9	61.9	65.8	56.9	56.9
Actuated g/C Ratio	0.20	0.20	0.34	0.30	0.61	0.52	0.52	0.55	0.47	0.47
v/c Ratio	0.90	0.67	0.93	0.30	0.59	0.97	0.36	0.64	0.69	0.18
Control Delay	83.5	34.3	76.5	36.5	24.5	37.0	5.7	37.6	28.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	34.3	76.5	36.5	24.5	37.0	5.7	37.6	28.2	6.0
LOS	F	C	E	D	C	D	A	D	C	A
Approach Delay		55.4		60.3		31.6			26.6	
Approach LOS		E		E		C			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 35.4		Intersection LOS: D	
Intersection Capacity Utilization 104.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	215	287	259	176	135	1840	346	95	1131	140
v/c Ratio	0.90	0.67	0.93	0.30	0.59	0.97	0.36	0.64	0.69	0.18
Control Delay	83.5	34.3	76.5	36.5	24.5	37.0	5.7	37.6	28.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	34.3	76.5	36.5	24.5	37.0	5.7	37.6	28.2	6.0
Queue Length 50th (m)	51.4	39.0	50.6	34.2	14.3	156.4	4.2	9.4	115.5	3.3
Queue Length 95th (m)	#94.4	70.3	#103.5	56.8	m27.3	#273.5	m30.7	#34.5	149.7	16.0
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	257	450	278	614	262	1904	973	149	1648	781
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.64	0.93	0.29	0.52	0.97	0.36	0.64	0.69	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	72	215	259	176	0	135	1840	346	95	1131	140
Future Volume (vph)	215	72	215	259	176	0	135	1840	346	95	1131	140
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1668		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.65	1.00		0.27	1.00		0.13	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1190	1668		509	1921		199	3694	1597	132	3476	1521
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)	215	72	215	259	176	0	135	1840	346	95	1131	140
RTOR Reduction (vph)	0	91	0	0	0	0	0	0	149	0	0	60
Lane Group Flow (vph)	215	196	0	259	176	0	135	1840	197	95	1131	80
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	24.2	24.2		36.6	36.6		70.5	61.9	61.9	62.5	56.9	56.9
Effective Green, g (s)	24.2	24.2		36.6	36.6		70.5	61.9	61.9	62.5	56.9	56.9
Actuated g/C Ratio	0.20	0.20		0.31	0.31		0.59	0.52	0.52	0.52	0.47	0.47
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	239	336		262	585		223	1905	823	145	1648	721
v/s Ratio Prot		0.12		c0.08	0.09		c0.05	c0.50		0.03	0.33	
v/s Ratio Perm	0.18			c0.22			0.30		0.12	0.31		0.05
v/c Ratio	0.90	0.58		0.99	0.30		0.61	0.97	0.24	0.66	0.69	0.11
Uniform Delay, d1	46.7	43.3		39.1	31.9		16.4	28.0	16.0	25.8	24.6	17.5
Progression Factor	1.00	1.00		1.12	1.11		1.49	0.92	1.80	1.00	1.00	1.00
Incremental Delay, d2	32.4	2.6		51.5	0.3		2.9	10.2	0.4	10.2	2.4	0.3
Delay (s)	79.1	45.9		95.2	35.7		27.3	36.1	29.3	36.0	26.9	17.8
Level of Service	E	D		F	D		C	D	C	D	C	B
Approach Delay (s)		60.1			71.1			34.6			26.6	
Approach LOS		E			E			C			C	

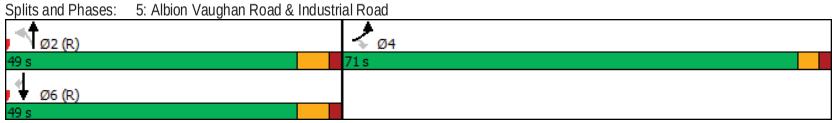
Intersection Summary				
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.98			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	104.9%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	468	125	100	395	124	460
Future Volume (vph)	468	125	100	395	124	460
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	40.0	40.0	68.4	68.4	68.4	68.4
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
v/c Ratio	0.79	0.20	0.18	0.20	0.07	0.42
Control Delay	46.2	4.7	15.8	14.2	13.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	4.7	15.8	14.2	13.6	2.8
LOS	D	A	B	B	B	A
Approach Delay	37.5			14.5	5.1	
Approach LOS	D			B	A	

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 19.4	Intersection LOS: B
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	468	125	100	395	124	460
v/c Ratio	0.79	0.20	0.18	0.20	0.07	0.42
Control Delay	46.2	4.7	15.8	14.2	13.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	4.7	15.8	14.2	13.6	2.8
Queue Length 50th (m)	110.6	1.4	11.2	23.6	6.8	0.0
Queue Length 95th (m)	129.6	m8.0	26.5	40.8	14.5	17.9
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	934	567	2020	1858	1108
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.13	0.18	0.20	0.07	0.42

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	468	125	100	395	124	460
Future Volume (vph)	468	125	100	395	124	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	3544	3259	1597
Flt Permitted	0.95	1.00	0.67	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	996	3544	3259	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	468	125	100	395	124	460
RTOR Reduction (vph)	0	83	0	0	0	198
Lane Group Flow (vph)	468	42	100	395	124	262
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	40.0	40.0	68.4	68.4	68.4	68.4
Effective Green, g (s)	40.0	40.0	68.4	68.4	68.4	68.4
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	595	532	567	2020	1857	910
v/s Ratio Prot	c0.26			0.11	0.04	
v/s Ratio Perm		0.03	0.10			c0.16
v/c Ratio	0.79	0.08	0.18	0.20	0.07	0.29
Uniform Delay, d1	36.1	27.4	12.3	12.5	11.5	13.3
Progression Factor	1.03	1.05	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1	0.7	0.2	0.1	0.8
Delay (s)	44.0	28.8	13.0	12.7	11.6	14.1
Level of Service	D	C	B	B	B	B
Approach Delay (s)	40.8			12.8	13.5	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	2141	1580	50	
Future Volume (vph)	115	0	65	2141	1580	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.4	83.4	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.49	0.32	0.80	0.65	0.05	
Control Delay	65.9	16.9	7.4	12.7	10.2	2.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	16.9	7.4	12.7	10.2	2.3	
LOS	E	B	A	B	B	A	
Approach Delay		38.5		12.5	10.0		
Approach LOS		D		B	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 13.2		Intersection LOS: B	
Intersection Capacity Utilization 79.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	2141	1580	50
v/c Ratio	0.65	0.49	0.32	0.80	0.65	0.05
Control Delay	65.9	16.9	7.4	12.7	10.2	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	16.9	7.4	12.7	10.2	2.3
Queue Length 50th (m)	27.5	4.5	2.9	144.3	75.0	0.0
Queue Length 95th (m)	45.5	23.1	7.7	227.3	m125.1	m1.0
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	485	212	2660	2416	1057
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.31	0.80	0.65	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	2141	0	0	1580	50
Future Volume (vph)	115	0	145	0	0	0	65	2141	0	0	1580	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.11	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					164	3476			3476	1493
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)	115	0	145	0	0	0	65	2141	0	0	1580	50
RTOR Reduction (vph)	0	109	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	36	0	0	0	0	65	2141	0	0	1580	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			82.9	82.9
Effective Green, g (s)	15.1	15.1					91.9	91.9			82.9	82.9
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					190	2662			2401	1031
v/s Ratio Prot		0.02					0.02	c0.62			0.45	
v/s Ratio Perm	c0.08						0.24					0.02
v/c Ratio	0.65	0.19					0.34	0.80			0.66	0.03
Uniform Delay, d1	49.9	47.0					8.1	8.6			10.5	5.9
Progression Factor	1.00	1.00					1.00	1.00			0.77	1.40
Incremental Delay, d2	8.0	0.5					1.1	2.7			1.0	0.0
Delay (s)	57.9	47.5					9.2	11.3			9.1	8.2
Level of Service	E	D					A	B			A	A
Approach Delay (s)		52.1			0.0			11.2			9.1	
Approach LOS		D			A			B			A	

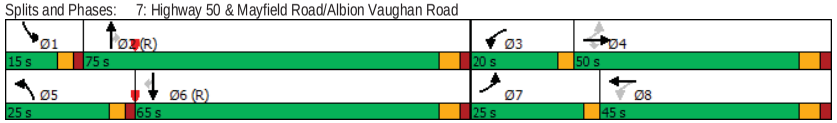
Intersection Summary						
HCM 2000 Control Delay		13.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio		0.80				
Actuated Cycle Length (s)		120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization		79.0%	ICU Level of Service		D	
Analysis Period (min)		15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	200	210	170	185	105	110	1901	650	10	1545	170
Future Volume (vph)	200	210	170	185	105	110	1901	650	10	1545	170
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	46.8	24.9	24.9	41.8	21.9	22.2	96.9	96.9	10.0	75.8	75.8
Actuated g/C Ratio	0.29	0.16	0.16	0.26	0.14	0.14	0.61	0.61	0.06	0.47	0.47
v/c Ratio	0.52	0.78	0.56	0.69	0.31	0.72	0.91	0.60	0.09	0.93	0.21
Control Delay	48.7	84.1	14.4	57.7	54.9	90.0	36.6	9.4	72.8	50.8	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	84.1	14.4	57.7	54.9	90.0	36.6	9.4	72.8	50.8	8.7
LOS	D	F	B	E	D	F	D	A	E	D	A
Approach Delay		51.5			56.6		32.2			46.8	
Approach LOS		D			E		C			D	

Intersection Summary		
Cycle Length: 160		
Actuated Cycle Length: 160		
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 40.5	Intersection LOS: D	
Intersection Capacity Utilization 100.4%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	210	170	185	130	110	1901	650	10	1545	170
v/c Ratio	0.52	0.78	0.56	0.69	0.31	0.72	0.91	0.60	0.09	0.93	0.21
Control Delay	48.7	84.1	14.4	57.7	54.9	90.0	36.6	9.4	72.8	50.8	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	84.1	14.4	57.7	54.9	90.0	36.6	9.4	72.8	50.8	8.7
Queue Length 50th (m)	53.3	68.6	0.0	49.1	18.2	35.7	256.6	32.1	3.2	255.9	6.7
Queue Length 95th (m)	72.5	94.1	23.4	67.9	28.2	56.6	#425.1	97.6	10.4	#370.2	25.9
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	399	470	407	275	732	163	2086	1078	111	1661	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.45	0.42	0.67	0.18	0.67	0.91	0.60	0.09	0.93	0.21

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	210	170	185	105	25	110	1901	650	10	1545	170
Future Volume (vph)	200	210	170	185	105	25	110	1901	650	10	1545	170
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.59	1.00	1.00	0.39	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1044	1731	1044	656	2992		1109	3444	1493	1785	3510	1536
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)	200	210	170	185	105	25	110	1901	650	10	1545	170
RTOR Reduction (vph)	0	0	144	0	15	0	0	0	183	0	0	70
Lane Group Flow (vph)	200	210	26	185	115	0	110	1901	467	10	1545	100
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	44.3	24.9	24.9	38.3	21.9		22.2	93.9	93.9	4.0	75.7	75.7
Effective Green, g (s)	44.3	24.9	24.9	38.3	21.9		22.2	93.9	93.9	4.0	75.7	75.7
Actuated g/C Ratio	0.28	0.16	0.16	0.24	0.14		0.14	0.59	0.59	0.02	0.47	0.47
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	366	269	162	254	409		153	2021	876	44	1660	726
v/s Ratio Prot	c0.07	c0.12		c0.07	0.04		c0.10	c0.55		0.01	0.44	
v/s Ratio Perm	0.08		0.03	0.10					0.31			0.07
v/c Ratio	0.55	0.78	0.16	0.73	0.28		0.72	0.94	0.53	0.23	0.93	0.14
Uniform Delay, d1	47.5	64.9	58.5	52.6	62.0		65.9	30.5	19.9	76.5	39.7	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	13.6	0.5	10.0	0.4		14.9	10.2	2.3	2.6	10.8	0.4
Delay (s)	49.2	78.6	59.0	62.5	62.4		80.8	40.7	22.2	79.1	50.5	24.2
Level of Service	D	E	E	E	E		F	D	C	E	D	C
Approach Delay (s)		62.7			62.5			37.8			48.1	
Approach LOS		E			E			D			D	

Intersection Summary				
HCM 2000 Control Delay	45.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	100.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	455	0	35	189
Future Volume (Veh/h)	10	70	455	0	35	189
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	70	455	0	35	189
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	620	228			455	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	620	228			455	
tC, single (s)	7.0	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	97	91			97	
cM capacity (veh/h)	387	769			1081	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	303	152	98	126
Volume Left	10	0	0	35	0
Volume Right	70	0	0	0	0
cSH	685	1700	1700	1081	1700
Volume to Capacity	0.12	0.18	0.09	0.03	0.07
Queue Length 95th (m)	3.2	0.0	0.0	0.8	0.0
Control Delay (s)	11.0	0.0	0.0	3.2	0.0
Lane LOS	B			A	
Approach Delay (s)	11.0	0.0		1.4	
Approach LOS	B				

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	33.7%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	105	1925	160	65	1431
Future Volume (Veh/h)	40	105	1925	160	65	1431
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)	40	105	1925	160	65	1431
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.60	0.51			0.51	
vC, conflicting volume	2850	1042			2085	
vC1, stage 1 conf vol	2005					
vC2, stage 2 conf vol	846					
vCu, unblocked vol	1520	0			1221	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	81			78	
cM capacity (veh/h)	143	561			297	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	105	1283	802	65	716	716
Volume Left	40	0	0	0	65	0	0
Volume Right	0	105	0	160	0	0	0
cSH	143	561	1700	1700	297	1700	1700
Volume to Capacity	0.28	0.19	0.75	0.47	0.22	0.42	0.42
Queue Length 95th (m)	8.6	5.5	0.0	0.0	6.5	0.0	0.0
Control Delay (s)	39.5	12.9	0.0	0.0	20.5	0.0	0.0
Lane LOS	E	B			C		
Approach Delay (s)	20.2		0.0		0.9		
Approach LOS	C						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	55	80	215	195	20
Future Volume (Veh/h)	95	55	80	215	195	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	95	55	80	215	195	20
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	295				432	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	295				432	188
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				64	98
cM capacity (veh/h)	1278				541	860

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	150	295	215
Volume Left	95	0	195
Volume Right	0	215	20
cSH	1278	1700	560
Volume to Capacity	0.07	0.17	0.38
Queue Length 95th (m)	1.9	0.0	14.4
Control Delay (s)	5.3	0.0	15.4
Lane LOS	A		C
Approach Delay (s)	5.3	0.0	15.4
Approach LOS			C

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	373	260	230	150	175
Future Volume (Veh/h)	140	373	260	230	150	175
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	140	373	260	230	150	175
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	490				1028	375
vC1, stage 1 conf vol					375	
vC2, stage 2 conf vol					653	
vCu, unblocked vol	490				1028	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	87				64	74
cM capacity (veh/h)	1084				414	676

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	513	490	325
Volume Left	140	0	150
Volume Right	0	230	175
cSH	1084	1700	523
Volume to Capacity	0.13	0.29	0.62
Queue Length 95th (m)	3.5	0.0	33.7
Control Delay (s)	3.5	0.0	22.5
Lane LOS	A		C
Approach Delay (s)	3.5	0.0	22.5
Approach LOS			C

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

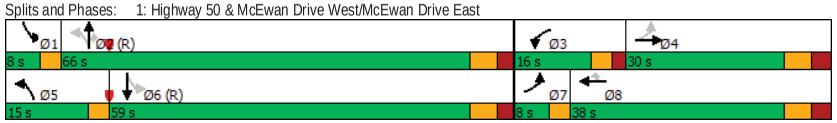
2041
Future Background Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	120	749	65	60	1328
Future Volume (vph)	80	45	80	105	50	120	749	65	60	1328
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	19.9	11.4	8.8	15.7	15.7	86.8	76.4	76.4	81.5	71.8
Actuated g/C Ratio	0.17	0.10	0.07	0.13	0.13	0.72	0.64	0.64	0.68	0.60
v/c Ratio	0.35	0.47	0.34	0.44	0.17	0.56	0.35	0.07	0.13	0.72
Control Delay	40.5	20.3	56.5	51.8	1.2	26.9	21.4	5.8	7.7	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	20.3	56.5	51.8	1.2	26.9	21.4	5.8	7.7	22.2
LOS	D	C	E	D	A	C	C	A	A	C
Approach Delay		27.1		42.6			21.0			21.6
Approach LOS		C		D			C			C

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 23.5 — Intersection LOS: C
Intersection Capacity Utilization 82.7% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	160	80	105	50	120	749	65	60	1473
v/c Ratio	0.35	0.47	0.34	0.44	0.17	0.56	0.35	0.07	0.13	0.72
Control Delay	40.5	20.3	56.5	51.8	1.2	26.9	21.4	5.8	7.7	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	20.3	56.5	51.8	1.2	26.9	21.4	5.8	7.7	22.2
Queue Length 50th (m)	16.5	5.6	9.9	24.9	0.0	13.4	56.8	0.2	3.5	122.1
Queue Length 95th (m)	25.0	14.7	17.9	36.2	0.0	37.8	111.9	10.0	12.0	#241.7
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	229	579	296	468	482	250	2171	973	469	2037
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.28	0.27	0.22	0.10	0.48	0.35	0.07	0.13	0.72

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	115	80	105	50	120	749	65	60	1328	145
Future Volume (vph)	80	45	115	80	105	50	120	749	65	60	1328	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2529		3236	1812	1536	1526	3411	1452	1638	3399	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.10	1.00	1.00	0.36	1.00	
Satd. Flow (perm)	1245	2529		3236	1812	1536	156	3411	1452	615	3399	
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)	80	45	115	80	105	50	120	749	65	60	1328	145
RTOR Reduction (vph)	0	104	0	0	0	43	0	0	24	0	5	0
Lane Group Flow (vph)	80	56	0	80	105	7	120	749	41	60	1468	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	15.9	11.4		7.2	16.1	16.1	82.8	74.8	74.8	75.8	70.8	
Effective Green, g (s)	15.9	11.4		7.2	16.1	16.1	82.8	74.8	74.8	75.8	70.8	
Actuated g/C Ratio	0.13	0.10		0.06	0.13	0.13	0.69	0.62	0.62	0.63	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	182	240		194	243	206	210	2126	905	431	2005	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.04	0.22		0.01	c0.43	
v/s Ratio Perm	0.04					0.00	0.35		0.03	0.08		
v/c Ratio	0.44	0.23		0.41	0.43	0.03	0.57	0.35	0.04	0.14	0.73	
Uniform Delay, d1	47.4	50.3		54.4	47.7	45.2	14.4	10.9	8.8	8.5	17.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.80	1.71	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.5		1.4	1.2	0.1	3.6	0.4	0.1	0.1	2.4	
Delay (s)	49.1	50.8		55.8	49.0	45.2	29.4	19.1	8.8	8.6	20.2	
Level of Service	D	D		E	D	D	C	B	A	A	C	
Approach Delay (s)		50.2			50.5			19.7			19.7	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	30	999	25	0	1678
Future Volume (Veh/h)	0	30	999	25	0	1678
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	30	999	25	0	1678
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1850	512			1024	
vC1, stage 1 conf vol	1012					
vC2, stage 2 conf vol	839					
vCu, unblocked vol	1692	169			751	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	96			100	
cM capacity (veh/h)	259	696			762	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	666	358	839	839
Volume Left	0	0	0	0	0
Volume Right	30	0	25	0	0
cSH	696	1700	1700	1700	1700
Volume to Capacity	0.04	0.39	0.21	0.49	0.49
Queue Length 95th (m)	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	10.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.4	0.0		0.0	
Approach LOS	B				

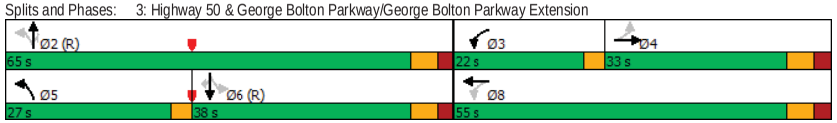
Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	49.7%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	50	23	215	314	270	859	165	25	1438	150
Future Volume (vph)	50	23	215	314	270	859	165	25	1438	150
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	11.9	11.9	34.7	31.1	79.3	76.0	76.0	55.4	55.4	55.4
Actuated g/C Ratio	0.10	0.10	0.29	0.26	0.66	0.63	0.63	0.46	0.46	0.46
v/c Ratio	0.49	0.56	0.54	0.63	0.91	0.40	0.15	0.09	0.90	0.19
Control Delay	65.7	24.7	39.5	45.3	66.7	13.0	2.9	16.6	30.6	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	24.7	39.5	45.3	66.7	13.0	2.9	16.6	30.6	4.7
LOS	E	C	D	D	E	B	A	B	C	A
Approach Delay		36.9		42.9		22.9			28.0	
Approach LOS		D		D		C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 28.8 — Intersection LOS: C
Intersection Capacity Utilization 97.5% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	50	118	215	314	270	859	165	25	1438	150
v/c Ratio	0.49	0.56	0.54	0.63	0.91	0.40	0.15	0.09	0.90	0.19
Control Delay	65.7	24.7	39.5	45.3	66.7	13.0	2.9	16.6	30.6	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	24.7	39.5	45.3	66.7	13.0	2.9	16.6	30.6	4.7
Queue Length 50th (m)	12.0	5.3	43.6	70.5	56.1	49.2	0.0	1.6	171.5	1.0
Queue Length 95th (m)	24.6	23.6	63.3	95.8	86.2	86.8	13.2	m3.8	#284.7	m3.9
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	228	355	420	774	387	2159	1071	286	1603	783
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.33	0.51	0.41	0.70	0.40	0.15	0.09	0.90	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	23	95	215	314	0	270	859	165	25	1438	150
Future Volume (vph)	50	23	95	215	314	0	270	859	165	25	1438	150
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.88		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1278		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.57	1.00		0.50	1.00		0.07	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	1039	1278		938	1921		117	3411	1597	619	3476	1597
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)	50	23	95	215	314	0	270	859	165	25	1438	150
RTOR Reduction (vph)	0	86	0	0	0	0	0	0	61	0	0	47
Lane Group Flow (vph)	50	32	0	215	314	0	270	859	105	25	1438	103
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	11.9	11.9		31.1	31.1		76.0	76.0	76.0	55.4	55.4	55.4
Effective Green, g (s)	11.9	11.9		31.1	31.1		76.0	76.0	76.0	55.4	55.4	55.4
Actuated g/C Ratio	0.10	0.10		0.26	0.26		0.63	0.63	0.63	0.46	0.46	0.46
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	103	126		370	497		294	2160	1011	285	1604	737
v/s Ratio Prot		0.03		0.08	c0.16		c0.13	0.25			0.41	
v/s Ratio Perm	0.05			0.07			c0.45		0.07	0.04		0.06
v/c Ratio	0.49	0.26		0.58	0.63		0.92	0.40	0.10	0.09	0.90	0.14
Uniform Delay, d1	51.2	50.0		37.3	39.4		37.8	10.8	8.6	18.1	29.7	18.6
Progression Factor	1.00	1.00		1.05	1.04		1.11	1.06	1.46	0.63	0.68	0.38
Incremental Delay, d2	3.6	1.1		2.1	2.4		29.7	0.5	0.2	0.5	6.8	0.3
Delay (s)	54.7	51.1		41.3	43.2		71.8	11.9	12.8	12.0	26.8	7.3
Level of Service	D	D		D	D		E	B	B	B	C	A
Approach Delay (s)		52.1			42.4			24.5			24.8	
Approach LOS		D			D			C			C	

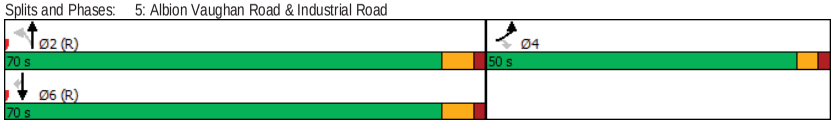
Intersection Summary				
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	97.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	115	228	699
Future Volume (vph)	228	25	65	115	228	699
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
v/c Ratio	0.77	0.08	0.10	0.05	0.09	0.54
Control Delay	63.6	15.8	7.6	6.7	6.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	15.8	7.6	6.7	6.7	2.4
LOS	E	B	A	A	A	A
Approach Delay	58.9			7.0	3.4	
Approach LOS	E			A	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	228	25	65	115	228	699
v/c Ratio	0.77	0.08	0.10	0.05	0.09	0.54
Control Delay	63.6	15.8	7.6	6.7	6.7	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.6	15.8	7.6	6.7	6.7	2.4
Queue Length 50th (m)	52.2	0.2	4.6	4.1	8.5	0.0
Queue Length 95th (m)	79.0	7.8	12.2	9.2	16.3	13.7
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	532	680	2206	2484	1285
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.05	0.10	0.05	0.09	0.54

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	228	25	65	115	228	699
Future Volume (vph)	228	25	65	115	228	699
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	3147	3544	1536
Flt Permitted	0.95	1.00	0.61	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	971	3147	3544	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	228	25	65	115	228	699
RTOR Reduction (vph)	0	20	0	0	0	209
Lane Group Flow (vph)	228	5	65	115	228	490
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	24.3	24.3	84.1	84.1	84.1	84.1
Effective Green, g (s)	24.3	24.3	84.1	84.1	84.1	84.1
Actuated g/C Ratio	0.20	0.20	0.70	0.70	0.70	0.70
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	298	278	680	2205	2483	1076
v/s Ratio Prot	c0.15			0.04	0.06	
v/s Ratio Perm		0.00	0.07			c0.32
v/c Ratio	0.77	0.02	0.10	0.05	0.09	0.46
Uniform Delay, d1	45.2	38.3	5.8	5.6	5.7	7.9
Progression Factor	1.05	1.27	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.0	0.3	0.0	0.1	1.4
Delay (s)	58.7	48.5	6.0	5.6	5.8	9.3
Level of Service	E	D	A	A	A	A
Approach Delay (s)	57.7			5.8	8.4	
Approach LOS	E			A	A	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1299	1483	110	
Future Volume (vph)	45	0	170	1299	1483	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	81.0	81.0	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.68	0.68	
v/c Ratio	0.41	0.33	0.45	0.46	0.66	0.10	
Control Delay	62.4	4.6	8.7	3.9	11.7	2.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	4.6	8.7	3.9	11.7	2.3	
LOS	E	A	A	A	B	A	
Approach Delay		26.3		4.5	11.0		
Approach LOS		C		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 71.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1299	1483	110
v/c Ratio	0.41	0.33	0.45	0.46	0.66	0.10
Control Delay	62.4	4.6	8.7	3.9	11.7	2.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	4.6	8.7	3.9	11.7	2.3
Queue Length 50th (m)	10.8	0.0	5.6	40.4	60.0	2.0
Queue Length 95th (m)	22.8	1.8	22.4	62.5	65.4	m1.0
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	444	374	2849	2259	1067
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.45	0.46	0.66	0.10

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1299	0	0	1483	110
Future Volume (vph)	45	0	75	0	0	0	170	1299	0	0	1483	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.12	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					207	3380			3349	1551
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)	45	0	75	0	0	0	170	1299	0	0	1483	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	21
Lane Group Flow (vph)	45	5	0	0	0	0	170	1299	0	0	1483	89
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			79.6	79.6
Effective Green, g (s)	8.4	8.4					98.6	98.6			79.6	79.6
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.66	0.66
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					367	2777			2221	1028
v/s Ratio Prot		0.00					0.06	c0.38			c0.44	
v/s Ratio Perm	c0.03						0.32					0.06
v/c Ratio	0.48	0.06					0.46	0.47			0.67	0.09
Uniform Delay, d1	53.7	52.1					9.2	3.1			12.2	7.2
Progression Factor	1.00	1.00					1.00	1.00			0.83	0.52
Incremental Delay, d2	3.9	0.3					0.9	0.6			0.9	0.1
Delay (s)	57.6	52.4					10.1	3.7			11.0	3.9
Level of Service	E	D					B	A			B	A
Approach Delay (s)		54.3			0.0			4.4			10.6	
Approach LOS		D			A			A			B	

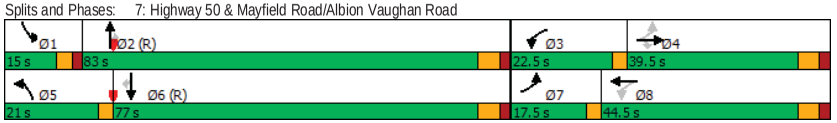
Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	90	115	270	350	370	145	1379	160	5	1458	85
Future Volume (vph)	90	115	270	350	370	145	1379	160	5	1458	85
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	41.2	26.2	26.2	53.0	35.0	22.2	94.7	94.7	10.0	72.5	72.5
Actuated g/C Ratio	0.26	0.16	0.16	0.33	0.22	0.14	0.59	0.59	0.06	0.45	0.45
v/c Ratio	0.33	0.45	0.95	0.82	0.53	0.85	0.68	0.18	0.05	0.92	0.12
Control Delay	40.0	64.3	67.5	61.1	57.3	103.4	26.6	3.2	72.0	51.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	64.3	67.5	61.1	57.3	103.4	26.6	3.2	72.0	51.9	1.6
LOS	D	E	E	E	E	F	C	A	E	D	A
Approach Delay		61.5			59.1		31.0			49.2	
Approach LOS		E			E		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 125			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 45.2		Intersection LOS: D	
Intersection Capacity Utilization 95.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	115	270	350	385	145	1379	160	5	1458	85
v/c Ratio	0.33	0.45	0.95	0.82	0.53	0.85	0.68	0.18	0.05	0.92	0.12
Control Delay	40.0	64.3	67.5	61.1	57.3	103.4	26.6	3.2	72.0	51.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	64.3	67.5	61.1	57.3	103.4	26.6	3.2	72.0	51.9	1.6
Queue Length 50th (m)	20.6	34.0	39.9	94.0	58.4	48.9	162.8	0.0	1.6	231.7	0.0
Queue Length 95th (m)	34.5	54.4	#93.6	125.4	76.5	#100.9	242.8	13.2	6.5	#280.3	4.1
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	303	319	317	428	798	171	2019	894	96	1583	735
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.36	0.85	0.82	0.48	0.85	0.68	0.18	0.05	0.92	0.12

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	115	270	350	370	15	145	1379	160	5	1458	85
Future Volume (vph)	90	115	270	350	370	15	145	1379	160	5	1458	85
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.51	1.00	1.00	0.55	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	857	1549	929	988	3324		1236	3411	1401	1539	3493	1479
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)	90	115	270	350	370	15	145	1379	160	5	1458	85
RTOR Reduction (vph)	0	0	133	0	2	0	0	0	69	0	0	46
Lane Group Flow (vph)	90	115	137	350	383	0	145	1379	91	5	1458	39
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	37.8	26.3	26.3	49.5	35.0		22.2	90.7	90.7	2.0	72.5	72.5
Effective Green, g (s)	37.8	26.3	26.3	49.5	35.0		22.2	90.7	90.7	2.0	72.5	72.5
Actuated g/C Ratio	0.24	0.16	0.16	0.31	0.22		0.14	0.57	0.57	0.01	0.45	0.45
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255	254	152	406	727		171	1933	794	19	1582	670
v/s Ratio Prot	0.03	0.07		c0.11	0.12		c0.12	0.40		0.00	c0.42	
v/s Ratio Perm	0.06		0.15	c0.16					0.06			0.03
v/c Ratio	0.35	0.45	0.90	0.86	0.53		0.85	0.71	0.11	0.26	0.92	0.06
Uniform Delay, d1	49.5	60.4	65.6	49.3	55.2		67.3	25.2	16.0	78.3	41.1	24.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	1.3	45.2	16.9	0.7		30.3	2.3	0.3	7.3	10.3	0.2
Delay (s)	50.3	61.6	110.8	66.2	55.9		97.5	27.5	16.3	85.6	51.4	24.7
Level of Service	D	E	F	E	E		F	C	B	F	D	C
Approach Delay (s)		87.5			60.8			32.4			50.1	
Approach LOS		F			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	95.4%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	135	5	60	228
Future Volume (Veh/h)	5	25	135	5	60	228
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)	5	25	135	5	60	228
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	372	70			140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	372	70			140	
tC, single (s)	7.5	7.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	505	923			1448	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	90	50	136	152
Volume Left	5	0	0	60	0
Volume Right	25	0	5	0	0
cSH	811	1700	1700	1448	1700
Volume to Capacity	0.04	0.05	0.03	0.04	0.09
Queue Length 95th (m)	0.9	0.0	0.0	1.0	0.0
Control Delay (s)	9.6	0.0	0.0	3.5	0.0
Lane LOS	A			A	
Approach Delay (s)	9.6	0.0		1.7	
Approach LOS	A				

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	188	484	75	50	45
Future Volume (Veh/h)	25	188	484	75	50	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	188	484	75	50	45
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	559				760	522
vC1, stage 1 conf vol					522	
vC2, stage 2 conf vol					238	
vCu, unblocked vol	559				760	522
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	92
cM capacity (veh/h)	1022				548	559

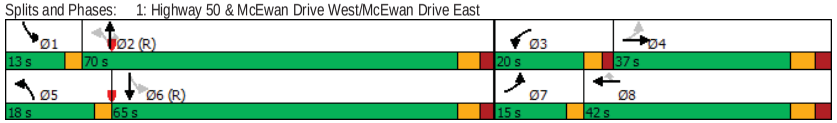
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	213	559	95
Volume Left	25	0	50
Volume Right	0	75	45
cSH	1022	1700	553
Volume to Capacity	0.02	0.33	0.17
Queue Length 95th (m)	0.6	0.0	4.9
Control Delay (s)	1.2	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	12.9
Approach LOS			B

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	43.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	110	1520	185	100	936
Future Volume (vph)	225	110	165	95	230	110	1520	185	100	936
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	32.9	14.8	12.0	13.7	13.7	94.8	82.1	82.1	95.6	82.5
Actuated g/C Ratio	0.24	0.11	0.09	0.10	0.10	0.68	0.59	0.59	0.68	0.59
v/c Ratio	0.65	0.61	0.57	0.53	0.71	0.37	0.73	0.19	0.45	0.49
Control Delay	55.4	26.7	69.0	69.6	25.0	10.9	24.6	7.0	14.4	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	26.7	69.0	69.6	25.0	10.9	24.6	7.0	14.4	18.1
LOS	E	C	E	E	C	B	C	A	B	B
Approach Delay		38.9		48.5			22.0			17.8
Approach LOS		D		D			C			B

Intersection Summary			
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	305	165	95	230	110	1520	185	100	1011
v/c Ratio	0.65	0.61	0.57	0.53	0.71	0.37	0.73	0.19	0.45	0.49
Control Delay	55.4	26.7	69.0	69.6	25.0	10.9	24.6	7.0	14.4	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	26.7	69.0	69.6	25.0	10.9	24.6	7.0	14.4	18.1
Queue Length 50th (m)	54.8	15.6	24.2	27.0	11.1	10.1	168.1	10.0	9.0	88.9
Queue Length 95th (m)	79.8	31.8	35.9	43.4	38.1	18.0	220.5	24.5	17.2	116.4
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	346	820	363	457	537	354	2078	962	238	2066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.37	0.45	0.21	0.43	0.31	0.73	0.19	0.42	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	195	165	95	230	110	1520	185	100	936	75
Future Volume (vph)	225	110	195	165	95	230	110	1520	185	100	936	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3116		3395	1830	1581	1439	3544	1566	1785	3501	
Flt Permitted	0.65	1.00		0.95	1.00	1.00	0.22	1.00	1.00	0.09	1.00	
Satd. Flow (perm)	1216	3116		3395	1830	1581	340	3544	1566	164	3501	
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)	225	110	195	165	95	230	110	1520	185	100	936	75
RTOR Reduction (vph)	0	174	0	0	0	171	0	0	44	0	3	0
Lane Group Flow (vph)	225	131	0	165	95	59	110	1520	141	100	1008	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	29.8	14.8		12.0	13.8	13.8	91.2	82.1	82.1	92.0	82.5	
Effective Green, g (s)	29.8	14.8		12.0	13.8	13.8	91.2	82.1	82.1	92.0	82.5	
Actuated g/C Ratio	0.21	0.11		0.09	0.10	0.10	0.65	0.59	0.59	0.66	0.59	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	319	329		291	180	155	292	2078	918	217	2063	
v/s Ratio Prot	c0.08	0.04		0.05	0.05		0.02	c0.43		c0.03	0.29	
v/s Ratio Perm	c0.07					0.04	0.22		0.09	0.27		
v/c Ratio	0.71	0.40		0.57	0.53	0.38	0.38	0.73	0.15	0.46	0.49	
Uniform Delay, d1	49.7	58.4		61.5	60.0	59.1	10.6	21.0	13.2	17.1	16.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.9	0.8		2.5	2.8	1.5	0.8	2.3	0.4	1.5	0.8	
Delay (s)	56.6	59.2		64.0	62.8	60.6	11.4	23.3	13.5	18.6	17.4	
Level of Service	E	E		E	E	E	B	C	B	B	B	
Approach Delay (s)		58.1			62.2			21.6			17.5	
Approach LOS		E			E			C			B	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	84.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	80	1895	55	0	1481
Future Volume (Veh/h)	0	80	1895	55	0	1481
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	80	1895	55	0	1481
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.59	0.59			0.59	
vC, conflicting volume	2663	975			1950	
vC1, stage 1 conf vol	1922					
vC2, stage 2 conf vol	740					
vCu, unblocked vol	2429	0			1221	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	87			100	
cM capacity (veh/h)	126	638			316	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	1263	687	740	740
Volume Left	0	0	0	0	0
Volume Right	80	0	55	0	0
cSH	638	1700	1700	1700	1700
Volume to Capacity	0.13	0.74	0.40	0.44	0.44
Queue Length 95th (m)	3.4	0.0	0.0	0.0	0.0
Control Delay (s)	11.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.5	0.0		0.0	
Approach LOS	B				

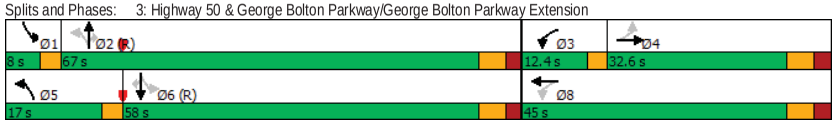
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	190	22	144	146	135	1680	346	50	1146	125
Future Volume (vph)	190	22	144	146	135	1680	346	50	1146	125
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	22.4	22.4	38.3	34.7	75.7	65.4	65.4	67.9	58.9	58.9
Actuated g/C Ratio	0.19	0.19	0.32	0.29	0.63	0.54	0.54	0.57	0.49	0.49
v/c Ratio	0.84	0.50	0.48	0.26	0.58	0.83	0.34	0.33	0.67	0.16
Control Delay	75.9	11.0	40.0	37.9	23.9	24.3	3.7	17.0	27.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	11.0	40.0	37.9	23.9	24.3	3.7	17.0	27.0	4.9
LOS	E	B	D	D	C	C	A	B	C	A
Approach Delay		39.9		39.0		21.0			24.5	
Approach LOS		D		D		C			C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 25.3 — Intersection LOS: C
Intersection Capacity Utilization 90.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	190	237	144	146	135	1680	346	50	1146	125
v/c Ratio	0.84	0.50	0.48	0.26	0.58	0.83	0.34	0.33	0.67	0.16
Control Delay	75.9	11.0	40.0	37.9	23.9	24.3	3.7	17.0	27.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.9	11.0	40.0	37.9	23.9	24.3	3.7	17.0	27.0	4.9
Queue Length 50th (m)	44.9	4.5	27.1	28.8	10.0	186.8	0.0	4.6	114.0	1.3
Queue Length 95th (m)	#77.6	26.8	47.9	50.1	m29.7	178.6	28.2	10.2	152.5	12.9
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	264	518	303	614	268	2014	1024	150	1706	805
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.46	0.48	0.24	0.50	0.83	0.34	0.33	0.67	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	22	215	144	146	0	135	1680	346	50	1146	125
Future Volume (vph)	190	22	215	144	146	0	135	1680	346	50	1146	125
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.86		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1616		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.66	1.00		0.34	1.00		0.14	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1223	1616		642	1921		204	3694	1597	128	3476	1521
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)	190	22	215	144	146	0	135	1680	346	50	1146	125
RTOR Reduction (vph)	0	175	0	0	0	0	0	0	155	0	0	59
Lane Group Flow (vph)	190	62	0	144	146	0	135	1680	191	50	1146	66
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	22.4	22.4		34.7	34.7		72.4	64.8	64.8	63.5	58.9	58.9
Effective Green, g (s)	22.4	22.4		34.7	34.7		72.4	64.8	64.8	63.5	58.9	58.9
Actuated g/C Ratio	0.19	0.19		0.29	0.29		0.60	0.54	0.54	0.53	0.49	0.49
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	301		281	555		228	1994	862	131	1706	746
v/s Ratio Prot		0.04		c0.04	0.08		c0.05	c0.45		0.01	0.33	
v/s Ratio Perm	c0.16			0.11			0.31		0.12	0.19		0.04
v/c Ratio	0.83	0.21		0.51	0.26		0.59	0.84	0.22	0.38	0.67	0.09
Uniform Delay, d1	47.0	41.3		33.4	32.8		15.4	23.3	14.4	20.1	23.2	16.3
Progression Factor	1.00	1.00		1.19	1.15		1.55	0.86	1.58	1.00	1.00	1.00
Incremental Delay, d2	22.2	0.3		1.5	0.2		2.9	3.2	0.4	1.9	2.1	0.2
Delay (s)	69.2	41.6		41.2	38.0		26.7	23.3	23.2	21.9	25.3	16.5
Level of Service	E	D		D	D		C	C	C	C	C	B
Approach Delay (s)		53.9			39.6			23.5			24.4	
Approach LOS		D			D			C			C	

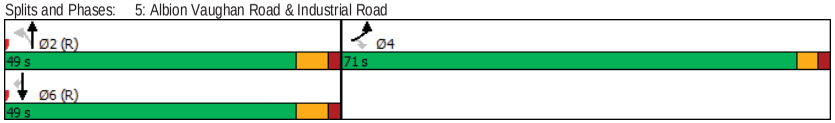
Intersection Summary				
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	90.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	410	134	385
Future Volume (vph)	448	95	55	410	134	385
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
v/c Ratio	0.79	0.17	0.10	0.20	0.07	0.35
Control Delay	46.6	6.6	14.3	13.4	12.7	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	6.6	14.3	13.4	12.7	2.6
LOS	D	A	B	B	B	A
Approach Delay	39.6			13.5	5.2	
Approach LOS	D			B	A	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 51.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	448	95	55	410	134	385
v/c Ratio	0.79	0.17	0.10	0.20	0.07	0.35
Control Delay	46.6	6.6	14.3	13.4	12.7	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	6.6	14.3	13.4	12.7	2.6
Queue Length 50th (m)	90.0	0.7	5.7	23.8	7.1	0.0
Queue Length 95th (m)	127.4	8.8	15.3	40.7	14.8	16.2
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	921	576	2069	1903	1092
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.10	0.10	0.20	0.07	0.35

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	448	95	55	410	134	385
Future Volume (vph)	448	95	55	410	134	385
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	3544	3259	1597
Flt Permitted	0.95	1.00	0.67	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	987	3544	3259	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	448	95	55	410	134	385
RTOR Reduction (vph)	0	65	0	0	0	160
Lane Group Flow (vph)	448	30	55	410	134	225
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	38.3	38.3	70.1	70.1	70.1	70.1
Effective Green, g (s)	38.3	38.3	70.1	70.1	70.1	70.1
Actuated g/C Ratio	0.32	0.32	0.58	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	569	509	576	2070	1903	932
v/s Ratio Prot	c0.25			0.12	0.04	
v/s Ratio Perm		0.02	0.06			c0.14
v/c Ratio	0.79	0.06	0.10	0.20	0.07	0.24
Uniform Delay, d1	37.1	28.4	11.0	11.7	10.8	12.1
Progression Factor	1.00	1.32	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.0	0.0	0.3	0.2	0.1	0.6
Delay (s)	44.3	37.5	11.3	11.9	10.9	12.7
Level of Service	D	D	B	B	B	B
Approach Delay (s)	43.1			11.9	12.2	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	1981	1480	50	
Future Volume (vph)	115	0	65	1981	1480	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.7	83.7	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.48	0.29	0.74	0.61	0.05	
Control Delay	65.9	15.7	6.7	10.7	15.8	4.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	15.7	6.7	10.7	15.8	4.5	
LOS	E	B	A	B	B	A	
Approach Delay		37.9		10.6	15.4		
Approach LOS		D		B	B		

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 14.4 — Intersection LOS: B
Intersection Capacity Utilization 74.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	1981	1480	50
v/c Ratio	0.65	0.48	0.29	0.74	0.61	0.05
Control Delay	65.9	15.7	6.7	10.7	15.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	15.7	6.7	10.7	15.8	4.5
Queue Length 50th (m)	27.5	3.3	2.9	119.2	126.6	1.1
Queue Length 95th (m)	45.5	21.8	7.7	186.9	105.0	m3.0
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	488	231	2660	2425	1060
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.28	0.74	0.61	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	1981	0	0	1480	50
Future Volume (vph)	115	0	145	0	0	0	65	1981	0	0	1480	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.13	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					194	3476			3476	1493
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)	115	0	145	0	0	0	65	1981	0	0	1480	50
RTOR Reduction (vph)	0	114	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	31	0	0	0	0	65	1981	0	0	1480	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			83.2	83.2
Effective Green, g (s)	15.1	15.1					91.9	91.9			83.2	83.2
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					208	2662			2410	1035
v/s Ratio Prot		0.02					0.01	c0.57			0.43	
v/s Ratio Perm	c0.08						0.22					0.02
v/c Ratio	0.65	0.17					0.31	0.74			0.61	0.03
Uniform Delay, d1	49.9	46.8					6.9	7.6			9.8	5.8
Progression Factor	1.00	1.00					1.00	1.00			1.34	2.86
Incremental Delay, d2	8.0	0.4					0.9	1.9			0.9	0.0
Delay (s)	57.9	47.3					7.7	9.6			14.1	16.6
Level of Service	E	D					A	A			B	B
Approach Delay (s)		52.0			0.0			9.5			14.2	
Approach LOS		D			A			A			B	

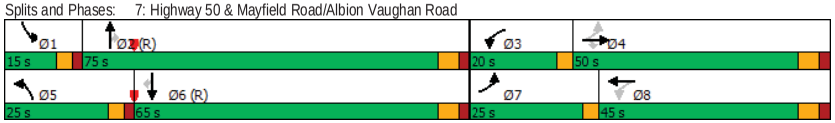
Intersection Summary				
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	125	210	170	155	105	110	1816	605	10	1495	120
Future Volume (vph)	125	210	170	155	105	110	1816	605	10	1495	120
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	42.7	24.9	24.9	45.5	26.2	22.2	97.6	97.6	10.0	76.4	76.4
Actuated g/C Ratio	0.27	0.16	0.16	0.28	0.16	0.14	0.61	0.61	0.06	0.48	0.48
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.86	0.56	0.09	0.89	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	33.0	8.2	72.8	46.7	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	33.0	8.2	72.8	46.7	4.0
LOS	D	F	B	D	D	F	C	A	E	D	A
Approach Delay		50.7			51.8		29.6			43.7	
Approach LOS		D			D		C			D	

Intersection Summary			
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 37.7		Intersection LOS: D	
Intersection Capacity Utilization 96.3%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	125	210	170	155	130	110	1816	605	10	1495	120
v/c Ratio	0.35	0.78	0.56	0.60	0.26	0.72	0.86	0.56	0.09	0.89	0.15
Control Delay	44.2	84.1	14.4	52.6	50.8	90.0	33.0	8.2	72.8	46.7	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
Total Delay	44.2	84.1	14.4	52.6	50.8	90.0	33.0	8.2	72.8	46.7	4.0
Queue Length 50th (m)	31.7	68.6	0.0	40.3	17.3	35.7	232.4	24.3	3.2	241.5	0.0
Queue Length 95th (m)	46.7	94.1	23.4	57.3	27.5	56.6	#394.8	80.8	10.4	#352.0	11.3
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	417	470	407	268	732	163	2100	1078	111	1676	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.45	0.42	0.58	0.18	0.67	0.86	0.56	0.09	0.89	0.15

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	210	170	155	105	25	110	1816	605	10	1495	120
Future Volume (vph)	125	210	170	155	105	25	110	1816	605	10	1495	120
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.67	1.00	1.00	0.32	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1187	1731	1044	549	2992		1109	3444	1493	1785	3510	1536
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)	125	210	170	155	105	25	110	1816	605	10	1495	120
RTOR Reduction (vph)	0	0	144	0	14	0	0	0	176	0	0	63
Lane Group Flow (vph)	125	210	26	155	116	0	110	1816	429	10	1495	57
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Effective Green, g (s)	39.3	24.9	24.9	41.9	26.2		22.2	94.6	94.6	4.0	76.4	76.4
Actuated g/C Ratio	0.25	0.16	0.16	0.26	0.16		0.14	0.59	0.59	0.02	0.48	0.48
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	336	269	162	247	489		153	2036	882	44	1676	733
v/s Ratio Prot	0.03	c0.12		c0.06	0.04		c0.10	c0.53		0.01	0.43	
v/s Ratio Perm	0.06		0.03	0.10					0.29			0.04
v/c Ratio	0.37	0.78	0.16	0.63	0.24		0.72	0.89	0.49	0.23	0.89	0.08
Uniform Delay, d1	49.2	64.9	58.5	48.8	58.2		65.9	28.3	18.8	76.5	38.0	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	13.6	0.5	4.9	0.3		14.9	6.4	1.9	2.6	7.7	0.2
Delay (s)	49.9	78.6	59.0	53.7	58.5		80.8	34.7	20.7	79.1	45.7	22.9
Level of Service	D	E	E	D	E		F	C	C	E	D	C
Approach Delay (s)		64.9			55.9			33.4			44.2	
Approach LOS		E			E			C			D	

Intersection Summary				
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	96.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	425	0	35	169
Future Volume (Veh/h)	10	70	425	0	35	169
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	70	425	0	35	169
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	580	212			425	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	580	212			425	
tC, single (s)	7.0	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	98	91			97	
cM capacity (veh/h)	411	787			1110	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	283	142	91	113
Volume Left	10	0	0	35	0
Volume Right	70	0	0	0	0
cSH	706	1700	1700	1110	1700
Volume to Capacity	0.11	0.17	0.08	0.03	0.07
Queue Length 95th (m)	3.1	0.0	0.0	0.8	0.0
Control Delay (s)	10.7	0.0	0.0	3.4	0.0
Lane LOS	B			A	
Approach Delay (s)	10.7	0.0		1.5	
Approach LOS	B				

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	32.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	373	260	110	100	30
Future Volume (Veh/h)	45	373	260	110	100	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	45	373	260	110	100	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	370				778	315
vC1, stage 1 conf vol					315	
vC2, stage 2 conf vol					463	
vCu, unblocked vol	370				778	315
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				82	96
cM capacity (veh/h)	1200				546	730

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	370	130
Volume Left	45	0	100
Volume Right	0	110	30
cSH	1200	1700	580
Volume to Capacity	0.04	0.22	0.22
Queue Length 95th (m)	0.9	0.0	6.8
Control Delay (s)	1.2	0.0	13.0
Lane LOS	A		B
Approach Delay (s)	1.2	0.0	13.0
Approach LOS			B

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	59.9%	ICU Level of Service	B	
Analysis Period (min)	15			

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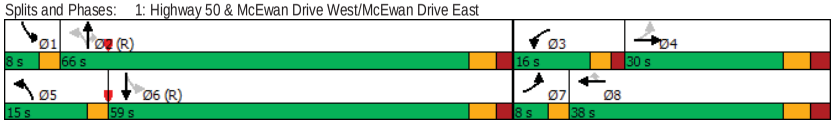
Future Total Traffic Conditions

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	45	80	105	50	145	874	65	60	1353
Future Volume (vph)	80	45	80	105	50	145	874	65	60	1353
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	8.0	30.0	16.0	38.0	38.0	15.0	66.0	66.0	8.0	59.0
Total Split (%)	6.7%	25.0%	13.3%	31.7%	31.7%	12.5%	55.0%	55.0%	6.7%	49.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	19.4	11.4	8.8	16.2	16.2	87.2	76.4	76.4	80.1	70.4
Actuated g/C Ratio	0.16	0.10	0.07	0.14	0.14	0.73	0.64	0.64	0.67	0.59
v/c Ratio	0.36	0.48	0.34	0.43	0.16	0.66	0.40	0.07	0.15	0.75
Control Delay	40.9	19.7	56.5	50.8	1.1	32.8	23.7	5.3	8.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	19.7	56.5	50.8	1.1	32.8	23.7	5.3	8.0	23.7
LOS	D	B	E	D	A	C	C	A	A	C
Approach Delay		26.5		42.2			23.8			23.1
Approach LOS		C		D			C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 71 (59%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 25.1	Intersection LOS: C
Intersection Capacity Utilization 84.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	80	170	80	105	50	145	874	65	60	1498
v/c Ratio	0.36	0.48	0.34	0.43	0.16	0.66	0.40	0.07	0.15	0.75
Control Delay	40.9	19.7	56.5	50.8	1.1	32.8	23.7	5.3	8.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	19.7	56.5	50.8	1.1	32.8	23.7	5.3	8.0	23.7
Queue Length 50th (m)	16.5	5.6	9.9	24.9	0.0	16.8	80.8	0.6	3.5	132.8
Queue Length 95th (m)	25.0	14.8	17.9	36.2	0.0	#46.5	127.5	8.7	12.0	#248.6
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	222	585	296	468	482	245	2171	973	410	1999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.29	0.27	0.22	0.10	0.59	0.40	0.07	0.15	0.75

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	45	125	80	105	50	145	874	65	60	1353	145
Future Volume (vph)	80	45	125	80	105	50	145	874	65	60	1353	145
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.89		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1716	2514		3236	1812	1536	1526	3411	1452	1638	3400	
Flt Permitted	0.69	1.00		0.95	1.00	1.00	0.09	1.00	1.00	0.31	1.00	
Satd. Flow (perm)	1245	2514		3236	1812	1536	141	3411	1452	531	3400	
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)	80	45	125	80	105	50	145	874	65	60	1353	145
RTOR Reduction (vph)	0	113	0	0	0	43	0	0	24	0	5	0
Lane Group Flow (vph)	80	57	0	80	105	7	145	874	41	60	1493	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	4%	12%	33%	7%	6%	4%	17%	7%	10%	9%	6%	4%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	15.4	11.4		7.2	16.6	16.6	82.8	74.8	74.8	74.5	69.5	
Effective Green, g (s)	15.4	11.4		7.2	16.6	16.6	82.8	74.8	74.8	74.5	69.5	
Actuated g/C Ratio	0.13	0.10		0.06	0.14	0.14	0.69	0.62	0.62	0.62	0.58	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	175	238		194	250	212	216	2126	905	375	1969	
v/s Ratio Prot	0.02	0.02		c0.02	c0.06		c0.06	0.26		0.01	c0.44	
v/s Ratio Perm	0.04					0.00	0.40		0.03	0.09		
v/c Ratio	0.46	0.24		0.41	0.42	0.03	0.67	0.41	0.04	0.16	0.76	
Uniform Delay, d1	47.9	50.3		54.4	47.3	44.8	18.1	11.4	8.8	9.0	18.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.31	1.80	1.00	1.00	1.00	
Incremental Delay, d2	1.9	0.5		1.4	1.1	0.1	7.6	0.6	0.1	0.2	2.8	
Delay (s)	49.8	50.8		55.8	48.4	44.8	31.2	21.1	8.8	9.2	21.7	
Level of Service	D	D		E	D	D	C	C	A	A	C	
Approach Delay (s)		50.5			50.2			21.7			21.3	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	21.6	
Intersection Capacity Utilization	84.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	60	1049	50	0	1753
Future Volume (Veh/h)	0	60	1049	50	0	1753
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	60	1049	50	0	1753
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.85	0.85			0.85	
vC, conflicting volume	1950	550			1099	
vC1, stage 1 conf vol	1074					
vC2, stage 2 conf vol	876					
vCu, unblocked vol	1770	128			772	
tC, single (s)	7.0	7.3			4.1	
tC, 2 stage (s)	6.0					
tF (s)	3.6	3.5			2.2	
p0 queue free %	100	92			100	
cM capacity (veh/h)	246	720			727	

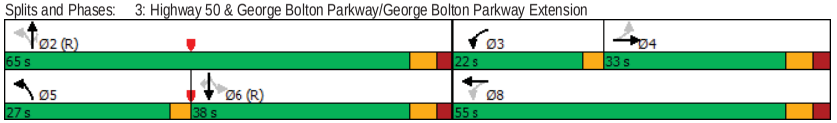
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	60	699	400	876	876
Volume Left	0	0	0	0	0
Volume Right	60	0	50	0	0
cSH	720	1700	1700	1700	1700
Volume to Capacity	0.08	0.41	0.24	0.52	0.52
Queue Length 95th (m)	2.2	0.0	0.0	0.0	0.0
Control Delay (s)	10.5	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	10.5	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		51.8%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	60	38	370	364	270	924	165	40	1473	175
Future Volume (vph)	60	38	370	364	270	924	165	40	1473	175
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	12.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	27.3	27.3	27.3
Total Split (s)	33.0	33.0	22.0	55.0	27.0	65.0	65.0	38.0	38.0	38.0
Total Split (%)	27.5%	27.5%	18.3%	45.8%	22.5%	54.2%	54.2%	31.7%	31.7%	31.7%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	2.3	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes			Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	13.0	13.0	38.4	34.8	75.6	72.3	72.3	51.2	51.2	51.2
Actuated g/C Ratio	0.11	0.11	0.32	0.29	0.63	0.60	0.60	0.43	0.43	0.43
v/c Ratio	0.56	0.58	0.85	0.65	0.89	0.45	0.16	0.16	0.99	0.24
Control Delay	69.5	27.2	53.9	43.8	59.9	15.3	3.2	18.6	45.9	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.2	53.9	43.8	59.9	15.3	3.2	18.6	45.9	6.2
LOS	E	C	D	D	E	B	A	B	D	A
Approach Delay		40.3		48.9		22.7			41.2	
Approach LOS		D		D		C			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 36.2		Intersection LOS: D	
Intersection Capacity Utilization 101.4%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	60	133	370	364	270	924	165	40	1473	175
v/c Ratio	0.56	0.58	0.85	0.65	0.89	0.45	0.16	0.16	0.99	0.24
Control Delay	69.5	27.2	53.9	43.8	59.9	15.3	3.2	18.6	45.9	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.5	27.2	53.9	43.8	59.9	15.3	3.2	18.6	45.9	6.2
Queue Length 50th (m)	14.4	8.8	79.6	80.6	52.8	58.8	0.0	3.2	188.0	2.0
Queue Length 95th (m)	28.0	28.2	#110.0	109.0	87.4	100.8	14.4	m7.1	#302.1	m4.6
Internal Link Dist (m)		155.6		266.0		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	218	367	438	774	388	2054	1027	248	1484	731
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.36	0.84	0.47	0.70	0.45	0.16	0.16	0.99	0.24

Intersection Summary

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

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	38	95	370	364	0	270	924	165	40	1473	175
Future Volume (vph)	60	38	95	370	364	0	270	924	165	40	1473	175
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1733	1334		1879	1921		1623	3411	1597	1785	3476	1597
Flt Permitted	0.54	1.00		0.46	1.00		0.07	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)	993	1334		873	1921		126	3411	1597	581	3476	1597
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)	60	38	95	370	364	0	270	924	165	40	1473	175
RTOR Reduction (vph)	0	85	0	0	0	0	0	0	66	0	0	50
Lane Group Flow (vph)	60	48	0	370	364	0	270	924	99	40	1473	125
Heavy Vehicles (%)	3%	0%	40%	0%	0%	0%	10%	7%	0%	0%	5%	0%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.0	13.0		34.9	34.9		72.2	72.2	72.2	51.2	51.2	51.2
Effective Green, g (s)	13.0	13.0		34.9	34.9		72.2	72.2	72.2	51.2	51.2	51.2
Actuated g/C Ratio	0.11	0.11		0.29	0.29		0.60	0.60	0.60	0.43	0.43	0.43
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	6.3	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	144		412	558		300	2052	960	247	1483	681
v/s Ratio Prot		0.04		c0.14	0.19		c0.13	0.27			c0.42	
v/s Ratio Perm	0.06			c0.12			0.41		0.06	0.07		0.08
v/c Ratio	0.56	0.34		0.90	0.65		0.90	0.45	0.10	0.16	0.99	0.18
Uniform Delay, d1	50.8	49.5		38.2	37.2		37.6	13.1	10.2	21.2	34.2	21.4
Progression Factor	1.00	1.00		1.05	1.03		1.05	1.06	1.55	0.63	0.68	0.41
Incremental Delay, d2	6.6	1.4		20.8	2.6		25.9	0.6	0.2	1.1	19.5	0.5
Delay (s)	57.4	50.9		60.9	41.1		65.4	14.5	16.0	14.5	42.8	9.2
Level of Service	E	D		E	D		E	B	B	B	D	A
Approach Delay (s)		52.9			51.1			24.8			38.6	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

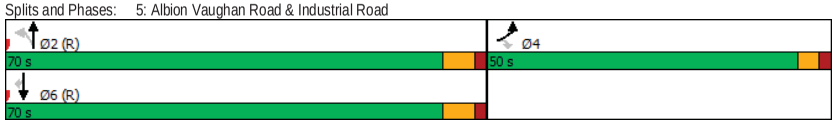
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	253	75	80	115	228	724
Future Volume (vph)	253	75	80	115	228	724
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	50.0	50.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	26.3	26.3	82.1	82.1	82.1	82.1
Actuated g/C Ratio	0.22	0.22	0.68	0.68	0.68	0.68
v/c Ratio	0.78	0.21	0.12	0.05	0.09	0.57
Control Delay	62.0	10.1	8.6	7.5	7.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	10.1	8.6	7.5	7.4	2.6
LOS	E	B	A	A	A	A
Approach Delay	50.1			7.9	3.8	
Approach LOS	D			A	A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.6 — Intersection LOS: B
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	253	75	80	115	228	724
v/c Ratio	0.78	0.21	0.12	0.05	0.09	0.57
Control Delay	62.0	10.1	8.6	7.5	7.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	10.1	8.6	7.5	7.4	2.6
Queue Length 50th (m)	61.4	0.9	6.2	4.4	9.1	0.0
Queue Length 95th (m)	81.8	12.0	15.6	9.7	17.4	14.7
Internal Link Dist (m)	249.6			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	553	563	664	2151	2423	1279
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.13	0.12	0.05	0.09	0.57

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	253	75	80	115	228	724
Future Volume (vph)	253	75	80	115	228	724
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1475	1377	1513	3147	3544	1536
Flt Permitted	0.95	1.00	0.61	1.00	1.00	1.00
Satd. Flow (perm)	1475	1377	971	3147	3544	1536
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	253	75	80	115	228	724
RTOR Reduction (vph)	0	59	0	0	0	229
Lane Group Flow (vph)	253	16	80	115	228	495
Heavy Vehicles (%)	21%	16%	18%	16%	3%	4%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	26.3	26.3	82.1	82.1	82.1	82.1
Effective Green, g (s)	26.3	26.3	82.1	82.1	82.1	82.1
Actuated g/C Ratio	0.22	0.22	0.68	0.68	0.68	0.68
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	323	301	664	2153	2424	1050
v/s Ratio Prot	c0.17			0.04	0.06	
v/s Ratio Perm		0.01	0.08			c0.32
v/c Ratio	0.78	0.05	0.12	0.05	0.09	0.47
Uniform Delay, d1	44.2	37.0	6.5	6.2	6.4	8.8
Progression Factor	1.04	1.20	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	0.1	0.4	0.0	0.1	1.5
Delay (s)	57.7	44.6	6.9	6.3	6.5	10.4
Level of Service	E	D	A	A	A	B
Approach Delay (s)	54.7			6.5	9.4	
Approach LOS	D			A	A	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	45	0	170	1364	1673	110	
Future Volume (vph)	45	0	170	1364	1673	110	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	10.0	10.0	103.0	101.2	81.0	81.0	
Actuated g/C Ratio	0.08	0.08	0.86	0.84	0.68	0.68	
v/c Ratio	0.41	0.34	0.52	0.48	0.74	0.10	
Control Delay	62.4	6.1	18.2	4.1	12.1	2.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	62.4	6.1	18.2	4.1	12.1	2.2	
LOS	E	A	B	A	B	A	
Approach Delay		27.2		5.7	11.5		
Approach LOS		C		A	B		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	45	75	170	1364	1673	110
v/c Ratio	0.41	0.34	0.52	0.48	0.74	0.10
Control Delay	62.4	6.1	18.2	4.1	12.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	6.1	18.2	4.1	12.1	2.2
Queue Length 50th (m)	10.8	0.0	10.4	43.9	53.4	1.5
Queue Length 95th (m)	22.8	3.9	34.7	67.6	m83.4	m0.8
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	355	437	330	2849	2259	1067
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.17	0.52	0.48	0.74	0.10

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	75	0	0	0	170	1364	0	0	1673	110
Future Volume (vph)	45	0	75	0	0	0	170	1364	0	0	1673	110
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1668	1306					1684	3380			3349	1551
Flt Permitted	0.76	1.00					0.08	1.00			1.00	1.00
Satd. Flow (perm)	1330	1306					147	3380			3349	1551
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)	45	0	75	0	0	0	170	1364	0	0	1673	110
RTOR Reduction (vph)	0	70	0	0	0	0	0	0	0	0	0	21
Lane Group Flow (vph)	45	5	0	0	0	0	170	1364	0	0	1673	89
Heavy Vehicles (%)	7%	0%	25%	0%	0%	50%	6%	8%	0%	0%	9%	3%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	8.4	8.4					98.6	98.6			79.6	79.6
Effective Green, g (s)	8.4	8.4					98.6	98.6			79.6	79.6
Actuated g/C Ratio	0.07	0.07					0.82	0.82			0.66	0.66
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	93	91					325	2777			2221	1028
v/s Ratio Prot		0.00					c0.07	0.40			c0.50	
v/s Ratio Perm	c0.03						0.36					0.06
v/c Ratio	0.48	0.06					0.52	0.49			0.75	0.09
Uniform Delay, d1	53.7	52.1					18.9	3.2			13.6	7.2
Progression Factor	1.00	1.00					1.00	1.00			0.77	0.49
Incremental Delay, d2	3.9	0.3					1.5	0.6			0.9	0.1
Delay (s)	57.6	52.4					20.4	3.8			11.3	3.6
Level of Service	E	D					C	A			B	A
Approach Delay (s)		54.3			0.0			5.7			10.9	
Approach LOS		D			A			A			B	

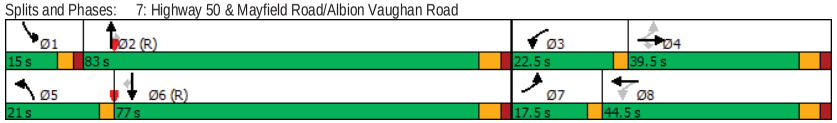
Intersection Summary					
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	76.5%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	115	115	270	400	370	145	1419	175	5	1578	155
Future Volume (vph)	115	115	270	400	370	145	1419	175	5	1578	155
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	13.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	17.5	39.5	39.5	22.5	44.5	21.0	83.0	83.0	15.0	77.0	77.0
Total Split (%)	10.9%	24.7%	24.7%	14.1%	27.8%	13.1%	51.9%	51.9%	9.4%	48.1%	48.1%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	0.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	3.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	43.7	27.5	27.5	53.5	34.3	21.4	94.2	94.2	10.0	72.8	72.8
Actuated g/C Ratio	0.27	0.17	0.17	0.33	0.21	0.13	0.59	0.59	0.06	0.46	0.46
v/c Ratio	0.41	0.43	0.95	0.93	0.54	0.88	0.71	0.20	0.05	0.99	0.21
Control Delay	41.5	62.7	70.4	75.9	57.8	110.6	27.8	3.2	72.0	63.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	62.7	70.4	75.9	57.8	110.6	27.8	3.2	72.0	63.9	7.8
LOS	D	E	E	E	E	F	C	A	E	E	A
Approach Delay		62.0			67.1		32.2			59.0	
Approach LOS		E			E		C			E	

Intersection Summary		
Cycle Length: 160		
Actuated Cycle Length: 160		
Offset: 27 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 50.8	Intersection LOS: D	
Intersection Capacity Utilization 101.4%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	115	270	400	385	145	1419	175	5	1578	155
v/c Ratio	0.41	0.43	0.95	0.93	0.54	0.88	0.71	0.20	0.05	0.99	0.21
Control Delay	41.5	62.7	70.4	75.9	57.8	110.6	27.8	3.2	72.0	63.9	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.5	62.7	70.4	75.9	57.8	110.6	27.8	3.2	72.0	63.9	7.8
Queue Length 50th (m)	26.2	33.4	42.7	108.8	58.1	~52.4	177.1	0.0	1.6	~279.6	6.3
Queue Length 95th (m)	42.6	54.4	#98.7	#162.8	76.5	#100.9	254.5	13.6	6.5	#321.5	21.0
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	298	319	310	430	795	165	2007	896	96	1589	739
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.36	0.87	0.93	0.48	0.88	0.71	0.20	0.05	0.99	0.21

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	115	270	400	370	15	145	1419	175	5	1578	155
Future Volume (vph)	115	115	270	400	370	15	145	1419	175	5	1578	155
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		3.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	*1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1594	1549	929	1789	3324		1236	3411	1401	1539	3493	1479
Flt Permitted	0.47	1.00	1.00	0.56	1.00		1.00	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	794	1549	929	1000	3324		1236	3411	1401	1539	3493	1479
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)	115	115	270	400	370	15	145	1419	175	5	1578	155
RTOR Reduction (vph)	0	0	124	0	2	0	0	0	76	0	0	66
Lane Group Flow (vph)	115	115	146	400	383	0	145	1419	99	5	1578	89
Heavy Vehicles (%)	12%	24%	72%	5%	9%	13%	52%	7%	14%	16%	10%	8%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	40.2	27.5	27.5	50.0	34.3		21.4	90.2	90.2	2.0	72.8	72.8
Effective Green, g (s)	40.2	27.5	27.5	50.0	34.3		21.4	90.2	90.2	2.0	72.8	72.8
Actuated g/C Ratio	0.25	0.17	0.17	0.31	0.21		0.13	0.56	0.56	0.01	0.45	0.45
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		3.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	262	266	159	408	712		165	1922	789	19	1589	672
v/s Ratio Prot	0.03	0.07		c0.12	0.12		c0.12	0.42		0.00	c0.45	
v/s Ratio Perm	0.08		0.16	c0.19					0.07			0.06
v/c Ratio	0.44	0.43	0.92	0.98	0.54		0.88	0.74	0.13	0.26	0.99	0.13
Uniform Delay, d1	48.4	59.3	65.1	52.1	55.8		68.0	26.1	16.4	78.3	43.3	25.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.1	47.2	39.2	0.8		37.2	2.6	0.3	7.3	21.0	0.4
Delay (s)	49.5	60.4	112.4	91.3	56.6		105.3	28.7	16.7	85.6	64.3	25.7
Level of Service	D	E	F	F	E		F	C	B	F	E	C
Approach Delay (s)		86.0			74.3			33.8			61.0	
Approach LOS		F			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	55.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	101.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	25	150	5	60	278
Future Volume (Veh/h)	5	25	150	5	60	278
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)	5	25	150	5	60	278
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	412	78			155	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	412	78			155	
tC, single (s)	7.5	7.3			4.1	
tC, 2 stage (s)						
tF (s)	3.8	3.5			2.2	
p0 queue free %	99	97			96	
cM capacity (veh/h)	474	913			1430	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	30	100	55	153	185
Volume Left	5	0	0	60	0
Volume Right	25	0	5	0	0
cSH	791	1700	1700	1430	1700
Volume to Capacity	0.04	0.06	0.03	0.04	0.11
Queue Length 95th (m)	0.9	0.0	0.0	1.1	0.0
Control Delay (s)	9.7	0.0	0.0	3.2	0.0
Lane LOS	A			A	
Approach Delay (s)	9.7	0.0		1.4	
Approach LOS	A				

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	27.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	65	125	1054	55	25	1708
Future Volume (Veh/h)	65	125	1054	55	25	1708
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)	65	125	1054	55	25	1708
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.74	0.86			0.86	
vC, conflicting volume	1986	554			1109	
vC1, stage 1 conf vol	1082					
vC2, stage 2 conf vol	904					
vCu, unblocked vol	812	170			812	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	83			96	
cM capacity (veh/h)	344	735			712	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	65	125	703	406	25	854	854
Volume Left	65	0	0	0	25	0	0
Volume Right	0	125	0	55	0	0	0
cSH	344	735	1700	1700	712	1700	1700
Volume to Capacity	0.19	0.17	0.41	0.24	0.04	0.50	0.50
Queue Length 95th (m)	5.5	4.9	0.0	0.0	0.9	0.0	0.0
Control Delay (s)	17.9	10.9	0.0	0.0	10.2	0.0	0.0
Lane LOS	C	B			B		
Approach Delay (s)	13.3		0.0		0.1		
Approach LOS	B						

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	57.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	25	30	70	280	30
Future Volume (Veh/h)	25	25	30	70	280	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	25	30	70	280	30
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	100				140	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				140	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				67	97
cM capacity (veh/h)	1505				844	1005

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	50	100	310
Volume Left	25	0	280
Volume Right	0	70	30
cSH	1505	1700	857
Volume to Capacity	0.02	0.06	0.36
Queue Length 95th (m)	0.4	0.0	13.3
Control Delay (s)	3.8	0.0	11.6
Lane LOS	A		B
Approach Delay (s)	3.8	0.0	11.6
Approach LOS			B

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	33.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	188	484	115	125	250
Future Volume (Veh/h)	55	188	484	115	125	250
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	55	188	484	115	125	250
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		290	274			
pX, platoon unblocked						
vC, conflicting volume	599				840	542
vC1, stage 1 conf vol					542	
vC2, stage 2 conf vol					298	
vCu, unblocked vol	599				840	542
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	94				76	54
cM capacity (veh/h)	988				517	545

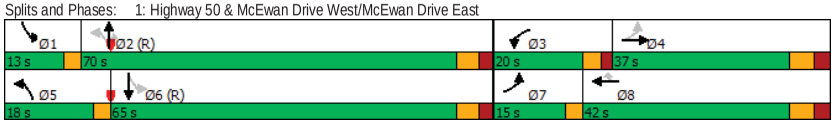
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	243	599	375
Volume Left	55	0	125
Volume Right	0	115	250
cSH	988	1700	535
Volume to Capacity	0.06	0.35	0.70
Queue Length 95th (m)	1.4	0.0	44.1
Control Delay (s)	2.4	0.0	26.0
Lane LOS	A		D
Approach Delay (s)	2.4	0.0	26.0
Approach LOS			D

Intersection Summary			
Average Delay		8.5	
Intersection Capacity Utilization		77.7%	ICU Level of Service D
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	225	110	165	95	230	120	1610	185	100	1006
Future Volume (vph)	225	110	165	95	230	120	1610	185	100	1006
Turn Type	pm+pt	NA	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	3	8		5	2		1	6
Permitted Phases	4				8	2		2	6	
Detector Phase	7	4	3	8	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	8.0	8.0	8.0	5.0	8.0	8.0	5.0	8.0
Minimum Split (s)	8.0	35.0	13.0	35.0	35.0	8.0	34.6	34.6	8.0	34.6
Total Split (s)	15.0	37.0	20.0	42.0	42.0	18.0	70.0	70.0	13.0	65.0
Total Split (%)	10.7%	26.4%	14.3%	30.0%	30.0%	12.9%	50.0%	50.0%	9.3%	46.4%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0
All-Red Time (s)	0.0	3.0	2.0	3.0	3.0	0.0	2.6	2.6	0.0	2.6
Lost Time Adjust (s)	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	7.0	5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Min	None	Min	Min	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	30.1	13.3	12.0	14.4	14.4	97.1	83.8	83.8	96.4	83.5
Actuated g/C Ratio	0.22	0.10	0.09	0.10	0.10	0.69	0.60	0.60	0.69	0.60
v/c Ratio	0.69	0.70	0.57	0.51	0.69	0.42	0.76	0.19	0.49	0.52
Control Delay	58.9	30.6	69.0	67.5	23.6	11.4	24.9	7.2	18.4	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	30.6	69.0	67.5	23.6	11.4	24.9	7.2	18.4	18.4
LOS	E	C	E	E	C	B	C	A	B	B
Approach Delay		42.0		47.4			22.4			18.4
Approach LOS		D		D			C			B

Intersection Summary			
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 72 (51%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 26.9		Intersection LOS: C	
Intersection Capacity Utilization 87.2%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 50 & McEwan Drive West/McEwan Drive East



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	225	335	165	95	230	120	1610	185	100	1081
v/c Ratio	0.69	0.70	0.57	0.51	0.69	0.42	0.76	0.19	0.49	0.52
Control Delay	58.9	30.6	69.0	67.5	23.6	11.4	24.9	7.2	18.4	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	30.6	69.0	67.5	23.6	11.4	24.9	7.2	18.4	18.4
Queue Length 50th (m)	58.0	18.7	24.2	26.8	10.7	9.5	165.2	9.6	7.7	87.6
Queue Length 95th (m)	78.9	34.8	35.9	43.0	37.4	20.0	248.7	26.1	22.5	134.6
Internal Link Dist (m)		94.4		98.9			286.6			215.1
Turn Bay Length (m)						25.0		70.0	95.0	
Base Capacity (vph)	324	827	363	457	538	338	2122	977	226	2093
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.41	0.45	0.21	0.43	0.36	0.76	0.19	0.44	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	110	225	165	95	230	120	1610	185	100	1006	75
Future Volume (vph)	225	110	225	165	95	230	120	1610	185	100	1006	75
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	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.90		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1785	3096		3395	1830	1581	1439	3544	1566	1785	3504	
Flt Permitted	0.70	1.00		0.95	1.00	1.00	0.20	1.00	1.00	0.08	1.00	
Satd. Flow (perm)	1307	3096		3395	1830	1581	306	3544	1566	141	3504	
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)	225	110	225	165	95	230	120	1610	185	100	1006	75
RTOR Reduction (vph)	0	189	0	0	0	171	0	0	40	0	3	0
Lane Group Flow (vph)	225	146	0	165	95	59	120	1610	145	100	1078	0
Confl. Peds. (#/hr)							5					5
Heavy Vehicles (%)	0%	4%	7%	2%	5%	1%	24%	3%	2%	0%	3%	1%
Turn Type	pm+pt	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4					8	2		2	6		
Actuated Green, G (s)	26.2	13.3		12.0	14.4	14.4	93.4	83.8	83.8	92.8	83.5	
Effective Green, g (s)	26.2	13.3		12.0	14.4	14.4	93.4	83.8	83.8	92.8	83.5	
Actuated g/C Ratio	0.19	0.10		0.09	0.10	0.10	0.67	0.60	0.60	0.66	0.60	
Clearance Time (s)	3.0	7.0		5.0	7.0	7.0	3.0	6.6	6.6	3.0	6.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	288	294		291	188	162	281	2121	937	202	2089	
v/s Ratio Prot	c0.07	0.05		0.05	0.05		0.03	c0.45		c0.03	0.31	
v/s Ratio Perm	c0.07					0.04	0.26		0.09	0.29		
v/c Ratio	0.78	0.50		0.57	0.51	0.36	0.43	0.76	0.15	0.50	0.52	
Uniform Delay, d1	53.1	60.2		61.5	59.4	58.5	10.5	20.7	12.4	18.5	16.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.9	1.3		2.5	2.1	1.4	1.0	2.6	0.4	1.9	0.9	
Delay (s)	65.9	61.5		64.0	61.6	59.9	11.5	23.3	12.8	20.4	17.4	
Level of Service	E	E		E	E	E	B	C	B	C	B	
Approach Delay (s)		63.3			61.6			21.5			17.6	
Approach LOS		E			E			C			B	

Intersection Summary					
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	21.6		
Intersection Capacity Utilization	87.2%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	100	2030	150	0	1556
Future Volume (Veh/h)	0	100	2030	150	0	1556
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	100	2030	150	0	1556
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			160			
pX, platoon unblocked	0.49	0.49			0.49	
vC, conflicting volume	2883	1090			2180	
vC1, stage 1 conf vol	2105					
vC2, stage 2 conf vol	778					
vCu, unblocked vol	2763	0			1337	
tC, single (s)	7.1	7.0			4.3	
tC, 2 stage (s)	6.1					
tF (s)	3.6	3.3			2.3	
p0 queue free %	100	81			100	
cM capacity (veh/h)	105	533			237	

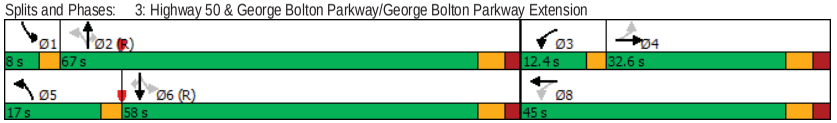
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	100	1353	827	778	778
Volume Left	0	0	0	0	0
Volume Right	100	0	150	0	0
cSH	533	1700	1700	1700	1700
Volume to Capacity	0.19	0.80	0.49	0.46	0.46
Queue Length 95th (m)	5.5	0.0	0.0	0.0	0.0
Control Delay (s)	13.3	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	13.3	0.0		0.0	
Approach LOS	B				

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		73.7%	ICU Level of Service	D
Analysis Period (min)		15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	215	72	259	176	135	1885	346	95	1161	140
Future Volume (vph)	215	72	259	176	135	1885	346	95	1161	140
Turn Type	Perm	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4	3	8	5	2		1	6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	4	4	3	8	5	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	8.0	8.0	5.0	8.0	5.0	12.0	12.0	5.0	12.0	12.0
Minimum Split (s)	32.6	32.6	8.0	32.6	8.0	27.3	27.3	8.0	27.3	27.3
Total Split (s)	32.6	32.6	12.4	45.0	17.0	67.0	67.0	8.0	58.0	58.0
Total Split (%)	27.2%	27.2%	10.3%	37.5%	14.2%	55.8%	55.8%	6.7%	48.3%	48.3%
Yellow Time (s)	4.0	4.0	3.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.6	2.6	0.0	2.6	0.0	2.3	2.3	0.0	2.3	2.3
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	3.0	6.6	3.0	6.3	6.3	3.0	6.3	6.3
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	24.2	24.2	40.2	36.6	73.2	61.9	61.9	65.6	56.8	56.8
Actuated g/C Ratio	0.20	0.20	0.34	0.30	0.61	0.52	0.52	0.55	0.47	0.47
v/c Ratio	0.90	0.67	0.93	0.30	0.61	0.99	0.36	0.64	0.71	0.18
Control Delay	83.5	34.3	76.5	36.5	26.3	41.4	6.1	37.7	28.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	34.3	76.5	36.5	26.3	41.4	6.1	37.7	28.9	6.0
LOS	F	C	E	D	C	D	A	D	C	A
Approach Delay		55.4		60.3		35.4			27.2	
Approach LOS		E		E		D			C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 37.4		Intersection LOS: D	
Intersection Capacity Utilization 106.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Highway 50 & George Bolton Parkway/George Bolton Parkway Extension



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	215	287	259	176	135	1885	346	95	1161	140
v/c Ratio	0.90	0.67	0.93	0.30	0.61	0.99	0.36	0.64	0.71	0.18
Control Delay	83.5	34.3	76.5	36.5	26.3	41.4	6.1	37.7	28.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.5	34.3	76.5	36.5	26.3	41.4	6.1	37.7	28.9	6.0
Queue Length 50th (m)	51.4	39.0	50.7	34.2	15.9	~190.3	6.5	9.4	120.1	3.3
Queue Length 95th (m)	#94.4	70.3	#103.5	56.8	m27.4	#285.1	m30.6	#34.5	155.3	16.0
Internal Link Dist (m)		155.6		254.8		578.5			135.9	
Turn Bay Length (m)			30.0		40.0		100.0	25.0		45.0
Base Capacity (vph)	257	450	278	614	256	1904	969	149	1644	779
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.64	0.93	0.29	0.53	0.99	0.36	0.64	0.71	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	72	215	259	176	0	135	1885	346	95	1161	140
Future Volume (vph)	215	72	215	259	176	0	135	1885	346	95	1161	140
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)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*1.00	1.00	1.00	0.95	1.00
Frt	1.00	0.89		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1750	1668		1879	1921		1405	3694	1597	1785	3476	1521
Flt Permitted	0.65	1.00		0.27	1.00		0.12	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1190	1668		509	1921		185	3694	1597	132	3476	1521
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)	215	72	215	259	176	0	135	1885	346	95	1161	140
RTOR Reduction (vph)	0	91	0	0	0	0	0	0	146	0	0	61
Lane Group Flow (vph)	215	196	0	259	176	0	135	1885	200	95	1161	79
Heavy Vehicles (%)	2%	0%	3%	0%	0%	0%	27%	4%	0%	0%	5%	5%
Turn Type	Perm	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	24.2	24.2		36.6	36.6		70.5	61.9	61.9	62.4	56.8	56.8
Effective Green, g (s)	24.2	24.2		36.6	36.6		70.5	61.9	61.9	62.4	56.8	56.8
Actuated g/C Ratio	0.20	0.20		0.31	0.31		0.59	0.52	0.52	0.52	0.47	0.47
Clearance Time (s)	6.6	6.6		3.0	6.6		3.0	6.3	6.3	3.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	239	336		262	585		217	1905	823	145	1645	719
v/s Ratio Prot		0.12		c0.08	0.09		c0.06	c0.51		0.03	0.33	
v/s Ratio Perm	0.18			c0.22			0.31		0.13	0.31		0.05
v/c Ratio	0.90	0.58		0.99	0.30		0.62	0.99	0.24	0.66	0.71	0.11
Uniform Delay, d1	46.7	43.3		39.1	31.9		17.0	28.7	16.1	26.7	25.0	17.6
Progression Factor	1.00	1.00		1.12	1.11		1.51	0.93	1.82	1.00	1.00	1.00
Incremental Delay, d2	32.4	2.6		51.5	0.3		3.4	13.8	0.4	10.2	2.6	0.3
Delay (s)	79.1	45.9		95.2	35.8		28.9	40.5	29.8	36.9	27.6	17.9
Level of Service	E	D		F	D		C	D	C	D	C	B
Approach Delay (s)		60.1			71.1			38.3			27.2	
Approach LOS		E			E			D			C	

Intersection Summary				
HCM 2000 Control Delay	40.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.9	
Intersection Capacity Utilization	106.2%	ICU Level of Service	G	
Analysis Period (min)	15			

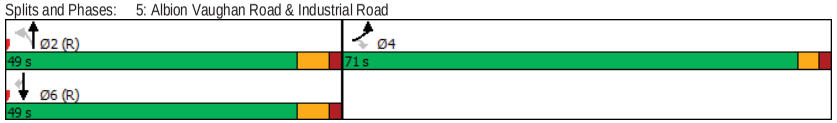
c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	468	125	100	410	134	460
Future Volume (vph)	468	125	100	410	134	460
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0	7.0
Minimum Split (s)	30.0	30.0	31.6	31.6	31.6	31.6
Total Split (s)	71.0	71.0	49.0	49.0	49.0	49.0
Total Split (%)	59.2%	59.2%	40.8%	40.8%	40.8%	40.8%
Yellow Time (s)	3.0	3.0	4.6	4.6	4.6	4.6
All-Red Time (s)	2.0	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
Total Lost Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	40.0	40.0	68.4	68.4	68.4	68.4
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
v/c Ratio	0.79	0.20	0.18	0.20	0.07	0.42
Control Delay	47.1	4.5	15.8	14.3	13.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	4.5	15.8	14.3	13.6	2.8
LOS	D	A	B	B	B	A
Approach Delay	38.1			14.6	5.2	
Approach LOS	D			B	A	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 19.5 — Intersection LOS: B
Intersection Capacity Utilization 52.8% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Albion Vaughan Road & Industrial Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	468	125	100	410	134	460
v/c Ratio	0.79	0.20	0.18	0.20	0.07	0.42
Control Delay	47.1	4.5	15.8	14.3	13.6	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	4.5	15.8	14.3	13.6	2.8
Queue Length 50th (m)	110.9	1.4	11.3	24.6	7.4	0.0
Queue Length 95th (m)	129.4	m7.9	26.6	42.3	15.4	17.9
Internal Link Dist (m)	260.9			885.8	227.6	
Turn Bay Length (m)	40.0		100.0			60.0
Base Capacity (vph)	981	934	562	2020	1858	1108
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.13	0.18	0.20	0.07	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	468	125	100	410	134	460
Future Volume (vph)	468	125	100	410	134	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.7	3.7	3.5
Total Lost time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1785	1597	1405	3544	3259	1597
Flt Permitted	0.95	1.00	0.67	1.00	1.00	1.00
Satd. Flow (perm)	1785	1597	987	3544	3259	1597
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	468	125	100	410	134	460
RTOR Reduction (vph)	0	83	0	0	0	198
Lane Group Flow (vph)	468	42	100	410	134	262
Heavy Vehicles (%)	0%	0%	27%	3%	12%	0%
Turn Type	Prot	Perm	Perm	NA	NA	Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	40.0	40.0	68.4	68.4	68.4	68.4
Effective Green, g (s)	40.0	40.0	68.4	68.4	68.4	68.4
Actuated g/C Ratio	0.33	0.33	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	6.6	6.6	6.6	6.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	595	532	562	2020	1857	910
v/s Ratio Prot	c0.26			0.12	0.04	
v/s Ratio Perm		0.03	0.10			c0.16
v/c Ratio	0.79	0.08	0.18	0.20	0.07	0.29
Uniform Delay, d1	36.1	27.4	12.3	12.5	11.6	13.3
Progression Factor	1.06	1.01	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.6	0.1	0.7	0.2	0.1	0.8
Delay (s)	44.8	27.6	13.0	12.8	11.6	14.1
Level of Service	D	C	B	B	B	B
Approach Delay (s)	41.2			12.8	13.5	
Approach LOS	D			B	B	

Intersection Summary				
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR	Ø8
Lane Configurations							
Traffic Volume (vph)	115	0	65	2186	1610	50	
Future Volume (vph)	115	0	65	2186	1610	50	
Turn Type	Perm	NA	pm+pt	NA	NA	Perm	
Protected Phases		4	5	2	6		8
Permitted Phases	4		2			6	
Detector Phase	4	4	5	2	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	5.0	12.0	12.0	12.0	8.0
Minimum Split (s)	33.9	33.9	8.0	30.1	30.1	30.1	33.9
Total Split (s)	39.0	39.0	10.0	81.0	71.0	71.0	39.0
Total Split (%)	32.5%	32.5%	8.3%	67.5%	59.2%	59.2%	33%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.9	2.9	0.0	2.1	2.1	2.1	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.9	6.9	3.0	6.1	6.1	6.1	
Lead/Lag			Lead		Lag	Lag	
Lead-Lag Optimize?			Yes		Yes	Yes	
Recall Mode	None	None	None	C-Min	C-Min	C-Min	None
Act Effct Green (s)	15.1	15.1	95.0	91.9	83.4	83.4	
Actuated g/C Ratio	0.13	0.13	0.79	0.77	0.70	0.70	
v/c Ratio	0.65	0.50	0.32	0.82	0.67	0.05	
Control Delay	65.9	17.4	7.7	13.4	10.9	2.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.9	17.4	7.7	13.4	10.9	2.6	
LOS	E	B	A	B	B	A	
Approach Delay		38.8		13.2	10.6		
Approach LOS		D		B	B		

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 3 (3%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 13.8	Intersection LOS: B	
Intersection Capacity Utilization 80.2%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 6: Highway 50 & Parr Boulevard/Private Driveway

Lane Group	EBL	EBT	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	115	145	65	2186	1610	50
v/c Ratio	0.65	0.50	0.32	0.82	0.67	0.05
Control Delay	65.9	17.4	7.7	13.4	10.9	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.9	17.4	7.7	13.4	10.9	2.6
Queue Length 50th (m)	27.5	4.9	2.9	152.5	77.0	0.0
Queue Length 95th (m)	45.5	23.6	7.7	240.7	m129.3	m1.2
Internal Link Dist (m)		172.7		520.2	578.5	
Turn Bay Length (m)			30.0			35.0
Base Capacity (vph)	376	483	207	2660	2416	1057
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.31	0.82	0.67	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	0	145	0	0	0	65	2186	0	0	1610	50
Future Volume (vph)	115	0	145	0	0	0	65	2186	0	0	1610	50
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)	6.9	6.9					3.0	6.1			6.1	6.1
Lane Util. Factor	1.00	1.00					1.00	0.95			0.95	1.00
Frt	1.00	0.85					1.00	1.00			1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00			1.00	1.00
Satd. Flow (prot)	1767	1471					1463	3476			3476	1493
Flt Permitted	0.76	1.00					0.10	1.00			1.00	1.00
Satd. Flow (perm)	1409	1471					156	3476			3476	1493
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)	115	0	145	0	0	0	65	2186	0	0	1610	50
RTOR Reduction (vph)	0	108	0	0	0	0	0	0	0	0	0	15
Lane Group Flow (vph)	115	37	0	0	0	0	65	2186	0	0	1610	35
Heavy Vehicles (%)	1%	0%	11%	0%	0%	0%	22%	5%	0%	0%	5%	7%
Turn Type	Perm	NA					pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.1	15.1					91.9	91.9			82.9	82.9
Effective Green, g (s)	15.1	15.1					91.9	91.9			82.9	82.9
Actuated g/C Ratio	0.13	0.13					0.77	0.77			0.69	0.69
Clearance Time (s)	6.9	6.9					3.0	6.1			6.1	6.1
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	177	185					184	2662			2401	1031
v/s Ratio Prot		0.03					0.02	c0.63			0.46	
v/s Ratio Perm	c0.08						0.25					0.02
v/c Ratio	0.65	0.20					0.35	0.82			0.67	0.03
Uniform Delay, d1	49.9	47.0					8.6	8.9			10.7	5.9
Progression Factor	1.00	1.00					1.00	1.00			0.81	1.57
Incremental Delay, d2	8.0	0.5					1.2	3.0			1.0	0.0
Delay (s)	57.9	47.6					9.7	11.9			9.6	9.3
Level of Service	E	D					A	B			A	A
Approach Delay (s)		52.2			0.0			11.8			9.6	
Approach LOS		D			A			B			A	

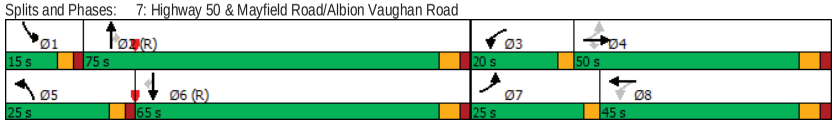
Intersection Summary					
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		16.0	
Intersection Capacity Utilization	80.2%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	200	210	170	185	105	110	1946	650	10	1575	170
Future Volume (vph)	200	210	170	185	105	110	1946	650	10	1575	170
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	5	2		1	6	
Permitted Phases	4		4	8				2			6
Detector Phase	7	4	4	3	8	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	12.0	12.0	10.0	12.0	10.0	20.0	20.0	10.0	20.0	20.0
Minimum Split (s)	8.0	39.5	39.5	13.0	39.5	15.0	37.3	37.3	15.0	37.3	37.3
Total Split (s)	25.0	50.0	50.0	20.0	45.0	25.0	75.0	75.0	15.0	65.0	65.0
Total Split (%)	15.6%	31.3%	31.3%	12.5%	28.1%	15.6%	46.9%	46.9%	9.4%	40.6%	40.6%
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	3.0	4.2	4.2	3.0	4.2	4.2
All-Red Time (s)	0.0	2.5	2.5	0.0	2.5	2.0	2.1	2.1	2.0	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.5	6.5	3.0	6.5	5.0	6.3	6.3	5.0	6.3	6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	46.8	24.9	24.9	41.8	21.9	22.2	96.9	96.9	10.0	75.8	75.8
Actuated g/C Ratio	0.29	0.16	0.16	0.26	0.14	0.14	0.61	0.61	0.06	0.47	0.47
v/c Ratio	0.52	0.78	0.56	0.69	0.31	0.72	0.93	0.61	0.09	0.95	0.21
Control Delay	48.7	84.1	14.4	57.7	54.9	90.0	38.8	9.8	72.8	53.1	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	84.1	14.4	57.7	54.9	90.0	38.8	9.8	72.8	53.1	8.7
LOS	D	F	B	E	D	F	D	A	E	D	A
Approach Delay		51.5			56.6		33.9			49.0	
Approach LOS		D			E		C			D	

Intersection Summary		
Cycle Length: 160		
Actuated Cycle Length: 160		
Offset: 72 (45%), Referenced to phase 2:NBT and 6:SBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 42.1	Intersection LOS: D	
Intersection Capacity Utilization 101.6%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 7: Highway 50 & Mayfield Road/Albion Vaughan Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	200	210	170	185	130	110	1946	650	10	1575	170
v/c Ratio	0.52	0.78	0.56	0.69	0.31	0.72	0.93	0.61	0.09	0.95	0.21
Control Delay	48.7	84.1	14.4	57.7	54.9	90.0	38.8	9.8	72.8	53.1	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	84.1	14.4	57.7	54.9	90.0	38.8	9.8	72.8	53.1	8.7
Queue Length 50th (m)	53.3	68.6	0.0	49.1	18.2	35.7	270.7	34.3	3.2	265.1	6.7
Queue Length 95th (m)	72.5	94.1	23.4	67.9	28.2	56.6	#441.2	101.3	10.4	#381.2	25.9
Internal Link Dist (m)		101.2			63.5		173.0			177.0	
Turn Bay Length (m)	80.0			65.0		125.0		130.0	35.0		115.0
Base Capacity (vph)	399	470	407	275	732	163	2086	1074	111	1661	797
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.45	0.42	0.67	0.18	0.67	0.93	0.61	0.09	0.95	0.21

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	210	170	185	105	25	110	1946	650	10	1575	170
Future Volume (vph)	200	210	170	185	105	25	110	1946	650	10	1575	170
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		5.0	6.3	6.3	5.0	6.3	6.3
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1684	1731	1044	1608	2992		1109	3444	1493	1785	3510	1536
Flt Permitted	0.59	1.00	1.00	0.39	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1044	1731	1044	656	2992		1109	3444	1493	1785	3510	1536
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)	200	210	170	185	105	25	110	1946	650	10	1575	170
RTOR Reduction (vph)	0	0	144	0	15	0	0	0	178	0	0	70
Lane Group Flow (vph)	200	210	26	185	115	0	110	1946	472	10	1575	100
Heavy Vehicles (%)	6%	11%	53%	11%	20%	12%	61%	6%	7%	0%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8					2			6
Actuated Green, G (s)	44.3	24.9	24.9	38.3	21.9		22.2	93.9	93.9	4.0	75.7	75.7
Effective Green, g (s)	44.3	24.9	24.9	38.3	21.9		22.2	93.9	93.9	4.0	75.7	75.7
Actuated g/C Ratio	0.28	0.16	0.16	0.24	0.14		0.14	0.59	0.59	0.02	0.47	0.47
Clearance Time (s)	3.0	6.5	6.5	3.0	6.5		5.0	6.3	6.3	5.0	6.3	6.3
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	366	269	162	254	409		153	2021	876	44	1660	726
v/s Ratio Prot	c0.07	c0.12		c0.07	0.04		c0.10	c0.57		0.01	0.45	
v/s Ratio Perm	0.08		0.03	0.10					0.32			0.07
v/c Ratio	0.55	0.78	0.16	0.73	0.28		0.72	0.96	0.54	0.23	0.95	0.14
Uniform Delay, d1	47.5	64.9	58.5	52.6	62.0		65.9	31.4	20.0	76.5	40.3	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	13.6	0.5	10.0	0.4		14.9	13.0	2.4	2.6	12.9	0.4
Delay (s)	49.2	78.6	59.0	62.5	62.4		80.8	44.4	22.3	79.1	53.2	24.2
Level of Service	D	E	E	E	E		F	D	C	E	D	C
Approach Delay (s)		62.7			62.5			40.6			50.5	
Approach LOS		E			E			D			D	

Intersection Summary				
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	20.8	
Intersection Capacity Utilization	101.6%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	70	470	0	35	199
Future Volume (Veh/h)	10	70	470	0	35	199
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	70	470	0	35	199
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	640	235			470	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	640	235			470	
tC, single (s)	7.0	7.0			4.2	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	97	91			97	
cM capacity (veh/h)	375	761			1067	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	80	313	157	101	133
Volume Left	10	0	0	35	0
Volume Right	70	0	0	0	0
cSH	674	1700	1700	1067	1700
Volume to Capacity	0.12	0.18	0.09	0.03	0.08
Queue Length 95th (m)	3.2	0.0	0.0	0.8	0.0
Control Delay (s)	11.1	0.0	0.0	3.1	0.0
Lane LOS	B			A	
Approach Delay (s)	11.1	0.0		1.4	
Approach LOS	B				

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	34.4%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	105	1970	160	65	1461
Future Volume (Veh/h)	40	105	1970	160	65	1461
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)	40	105	1970	160	65	1461
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLTL			TWLTL
Median storage veh)			2			2
Upstream signal (m)			331			311
pX, platoon unblocked	0.59	0.50			0.50	
vC, conflicting volume	2910	1065			2130	
vC1, stage 1 conf vol	2050					
vC2, stage 2 conf vol	860					
vCu, unblocked vol	1561	0			1277	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	81			77	
cM capacity (veh/h)	133	551			278	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	105	1313	817	65	730	730
Volume Left	40	0	0	0	65	0	0
Volume Right	0	105	0	160	0	0	0
cSH	133	551	1700	1700	278	1700	1700
Volume to Capacity	0.30	0.19	0.77	0.48	0.23	0.43	0.43
Queue Length 95th (m)	9.4	5.6	0.0	0.0	7.1	0.0	0.0
Control Delay (s)	43.5	13.1	0.0	0.0	21.9	0.0	0.0
Lane LOS	E	B			C		
Approach Delay (s)	21.5		0.0		0.9		
Approach LOS	C						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	55	80	215	195	20
Future Volume (Veh/h)	95	55	80	215	195	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	95	55	80	215	195	20
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	295				432	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	295				432	188
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				64	98
cM capacity (veh/h)	1278				541	860

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	150	295	215
Volume Left	95	0	195
Volume Right	0	215	20
cSH	1278	1700	560
Volume to Capacity	0.07	0.17	0.38
Queue Length 95th (m)	1.9	0.0	14.4
Control Delay (s)	5.3	0.0	15.4
Lane LOS	A		C
Approach Delay (s)	5.3	0.0	15.4
Approach LOS			C

Intersection Summary				
Average Delay	6.2			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	140	373	260	230	150	175
Future Volume (Veh/h)	140	373	260	230	150	175
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	140	373	260	230	150	175
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)		279	285			
pX, platoon unblocked						
vC, conflicting volume	490				1028	375
vC1, stage 1 conf vol					375	
vC2, stage 2 conf vol					653	
vCu, unblocked vol	490				1028	375
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	87				64	74
cM capacity (veh/h)	1084				414	676

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	513	490	325
Volume Left	140	0	150
Volume Right	0	230	175
cSH	1084	1700	523
Volume to Capacity	0.13	0.29	0.62
Queue Length 95th (m)	3.5	0.0	33.7
Control Delay (s)	3.5	0.0	22.5
Lane LOS	A		C
Approach Delay (s)	3.5	0.0	22.5
Approach LOS			C

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

Appendix J
OTM Book 12 Justification 7 Excerpt

e) Pedestrian Grade Separations In cases of very heavy pedestrian and traffic volumes, it may be economically viable to construct pedestrian bridges or tunnels.

4. The priority placed on implementing a new pedestrian crossing device should reflect the proximity and convenience of existing crossings; a higher priority should be placed on crossings where no reasonable alternatives exist within walking distance.

4.10 Justification 7 – Projected Volumes

In some cases, it is desired to determine the future need for traffic signals at an existing or planned intersection. There are two basic scenarios. The first is that the intersection may exist and all that is changing is the addition of one or more developments which will add traffic to the intersection. The second is a development which will require, or be associated with, the construction of one or more new legs at an existing intersection or a completely new intersection or roadway.

The prediction of future traffic demands is based on knowledge of growth in roadway usage, growth of local traffic generators and predicted traffic volumes, obtained from a traffic impact study, transportation planning study, environmental assessment or other similar evaluation. The preferred approach is that eight-hour volume projections are estimated as part of the engineering study and evaluated against Justifications 1, 2 or 3. It is incumbent upon the road authority to ensure that the calculation methodology is sound and is based on good data, so that there is a high level of confidence in the predicted traffic volumes.

For future development, especially where the intersection or road may not exist, eight-hour volumes may be difficult to obtain or predict with the necessary accuracy. If eight-hour volumes are unavailable or not considered to be of sufficient accuracy, Peak Hour Volumes (PHV) may be estimated as part of the transportation studies and reduced to Average Hourly Volumes (AHV) for comparison with traffic signal justifications for projected volumes.

Table 21 – Justification 7 – Projected Volumes

Justification	Description	Minimum Requirement 1 Lane Highways		Minimum Requirement 2 or more lanes		Compliance		
						Sectional		Entire %
		Free Flow	Restr. Flow	Free Flow	Restr. Flow	Numerical	%	
1. Minimum Vehicular Volume	A. Vehicle volume, all approaches (average hour)	480	720	600	900			
	B. Vehicle volume, along minor streets (average hour)	120	170	120	170			
2. Delay to cross traffic	A. Vehicle volume, major street (average hour)	480	720	600	900			
	B. Combined vehicle and pedestrian volume crossing artery from minor streets (average hour)	50	75	120	170			

*Note: For "T" intersections, these values should be increased by 50%.

The Average Hourly Volume for a typical day can be estimated from the Peak Hour Volumes using the following relationships:

$$AHV = \frac{PHV}{2} \quad \textbf{or} \quad AHV = \frac{amPHV + pmPHV}{4}$$

Alternately, the Average Hourly Volume for the eight highest hours of an average day can be estimated from Annual Average Daily Traffic (AADT) volume using the following relationship:

$$AHV = \frac{AADT}{16}$$

Where:

AHV = Average hourly volume

AADT = Annual average daily traffic

Analysis Using Eight-hour Volumes

If eight-hour projections are available, Justifications 1, 2 or 3 should be used. For the situation of an existing intersection with new development, Justifications 1 or 2 need to be met to 100%, or Justification 3 needs to be met to 80%.

For developments where new intersections or roadways are to be built, there is more uncertainty in the volume projections as the estimate requires projections of background traffic as well as development traffic. For this reason, where new intersection or roadway construction is required, Justifications 1 or 2 must be met to 120%.

Analysis Using Average Hour Volume

In the case that the volume estimates are based on the expansion of peak hour volumes or average daily traffic, the effect on Justifications 1 or 2 of the requirement to meet the warrant for each of eight hours would be lessened by averaging. As well, increased uncertainty is introduced by estimating from as little as one hour of traffic volume. For this reason, the thresholds are raised and, for traffic signals to be considered, Justification 7 as per Table 21 is used but with a 20% increase over the required volumes for an existing intersection and a 50% increase for a future intersection or roadway. For example, under restricted flow and two lanes, the AHV for Part 1A of Justification 7 must be met to 900 x 1.20 = 1080 vph.

Note that future volumes may include side street traffic attracted to the new traffic signal since the signal may provide a significant reduction in delay.

Table 22 – Future Development: Volume Expansion Required to Meet Justifications

Roadway Condition	Full Eight-hour Count Estimate Available		AHV Only Available
	Justification 1 or 2	Justification 3	Justification 7
Both Intersecting Roads Exist; Development is Future	100%	80%	120%
One Road, Both Roads and/or Intersection are Future; Development is Future	120%	N/A	150%

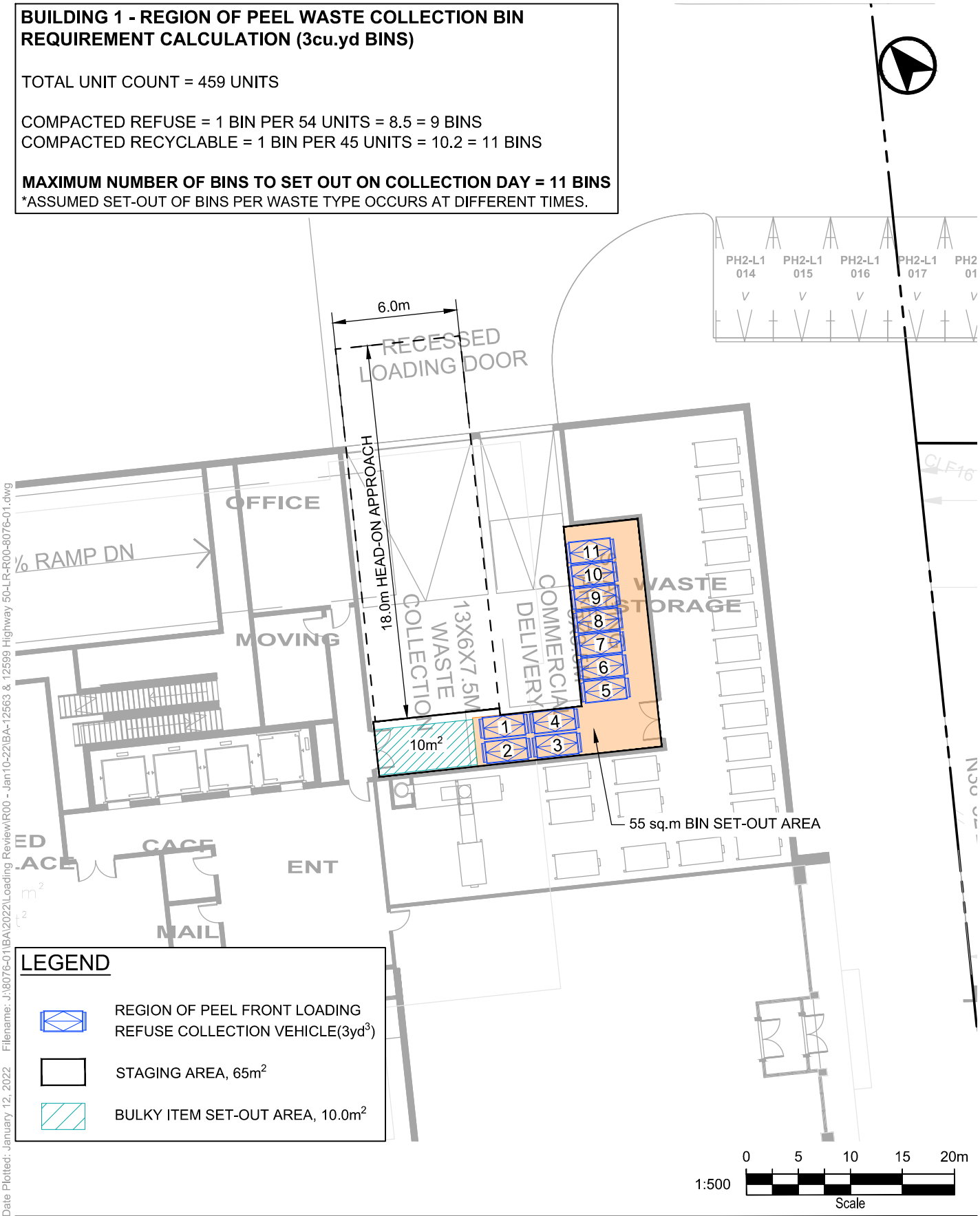
Appendix K
Waste Management Plan

BUILDING 1 - REGION OF PEEL WASTE COLLECTION BIN REQUIREMENT CALCULATION (3cu.yd BINS)

TOTAL UNIT COUNT = 459 UNITS

COMPACTED REFUSE = 1 BIN PER 54 UNITS = 8.5 = 9 BINS
COMPACTED RECYCLABLE = 1 BIN PER 45 UNITS = 10.2 = 11 BINS

MAXIMUM NUMBER OF BINS TO SET OUT ON COLLECTION DAY = 11 BINS
*ASSUMED SET-OUT OF BINS PER WASTE TYPE OCCURS AT DIFFERENT TIMES.



LEGEND

- REGION OF PEEL FRONT LOADING REFUSE COLLECTION VEHICLE(3yd³)
- STAGING AREA, 65m²
- BULKY ITEM SET-OUT AREA, 10.0m²

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50
WASTE COLLECTION STAGING AREA
BUILDING 1

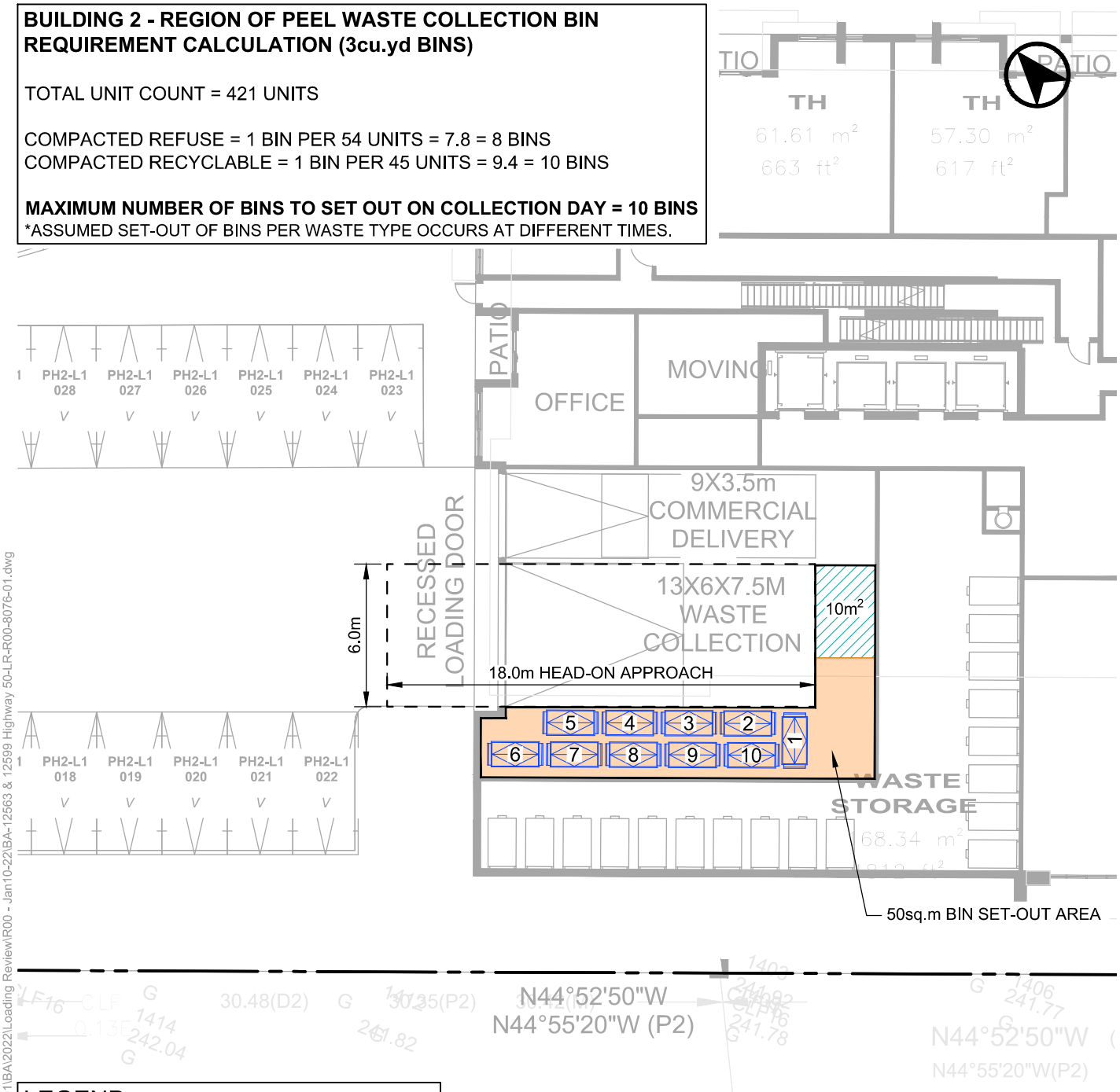
Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	SA-01

BUILDING 2 - REGION OF PEEL WASTE COLLECTION BIN REQUIREMENT CALCULATION (3cu.yd BINS)

TOTAL UNIT COUNT = 421 UNITS

COMPACTED REFUSE = 1 BIN PER 54 UNITS = 7.8 = 8 BINS
COMPACTED RECYCLABLE = 1 BIN PER 45 UNITS = 9.4 = 10 BINS

MAXIMUM NUMBER OF BINS TO SET OUT ON COLLECTION DAY = 10 BINS
*ASSUMED SET-OUT OF BINS PER WASTE TYPE OCCURS AT DIFFERENT TIMES.



LEGEND

- REGION OF PEEL FRONT LOADING REFUSE COLLECTION VEHICLE(3yd³)
- STAGING AREA, 60m²
- BULKY ITEM SET-OUT AREA, 10.0m²

1:500 Scale: 0, 5, 10, 15, 20m

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50
WASTE COLLECTION STAGING AREA
BUILDING 2

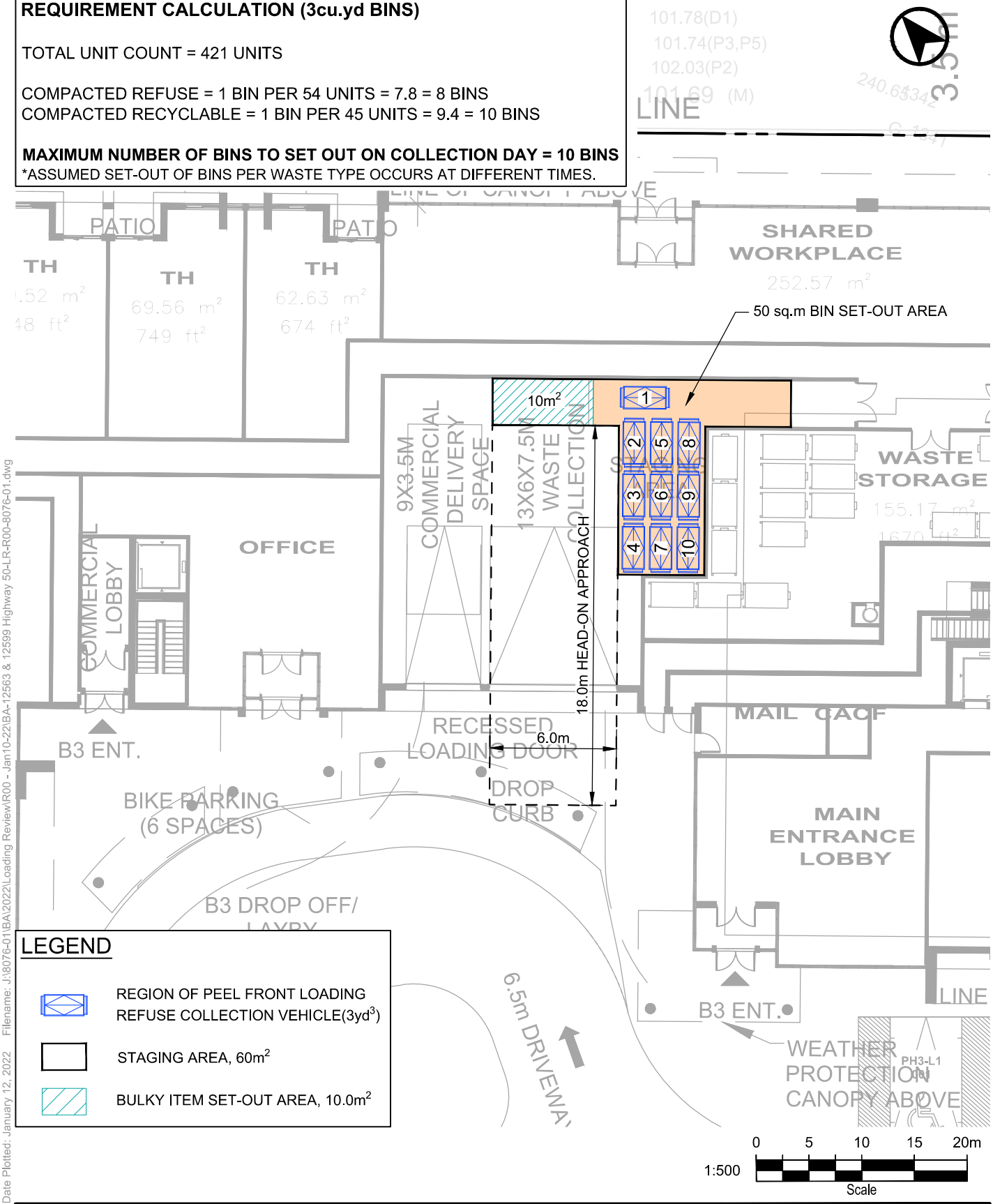
Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	SA-02

BUILDING 3 - REGION OF PEEL WASTE COLLECTION BIN REQUIREMENT CALCULATION (3cu.yd BINS)

TOTAL UNIT COUNT = 421 UNITS

COMPACTED REFUSE = 1 BIN PER 54 UNITS = 7.8 = 8 BINS
COMPACTED RECYCLABLE = 1 BIN PER 45 UNITS = 9.4 = 10 BINS

MAXIMUM NUMBER OF BINS TO SET OUT ON COLLECTION DAY = 10 BINS
*ASSUMED SET-OUT OF BINS PER WASTE TYPE OCCURS AT DIFFERENT TIMES.



LEGEND

- REGION OF PEEL FRONT LOADING REFUSE COLLECTION VEHICLE(3yd³)
- STAGING AREA, 60m²
- BULKY ITEM SET-OUT AREA, 10.0m²

1:500

0 5 10 15 20m

Scale

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50
WASTE COLLECTION STAGING AREA
BUILDING 3

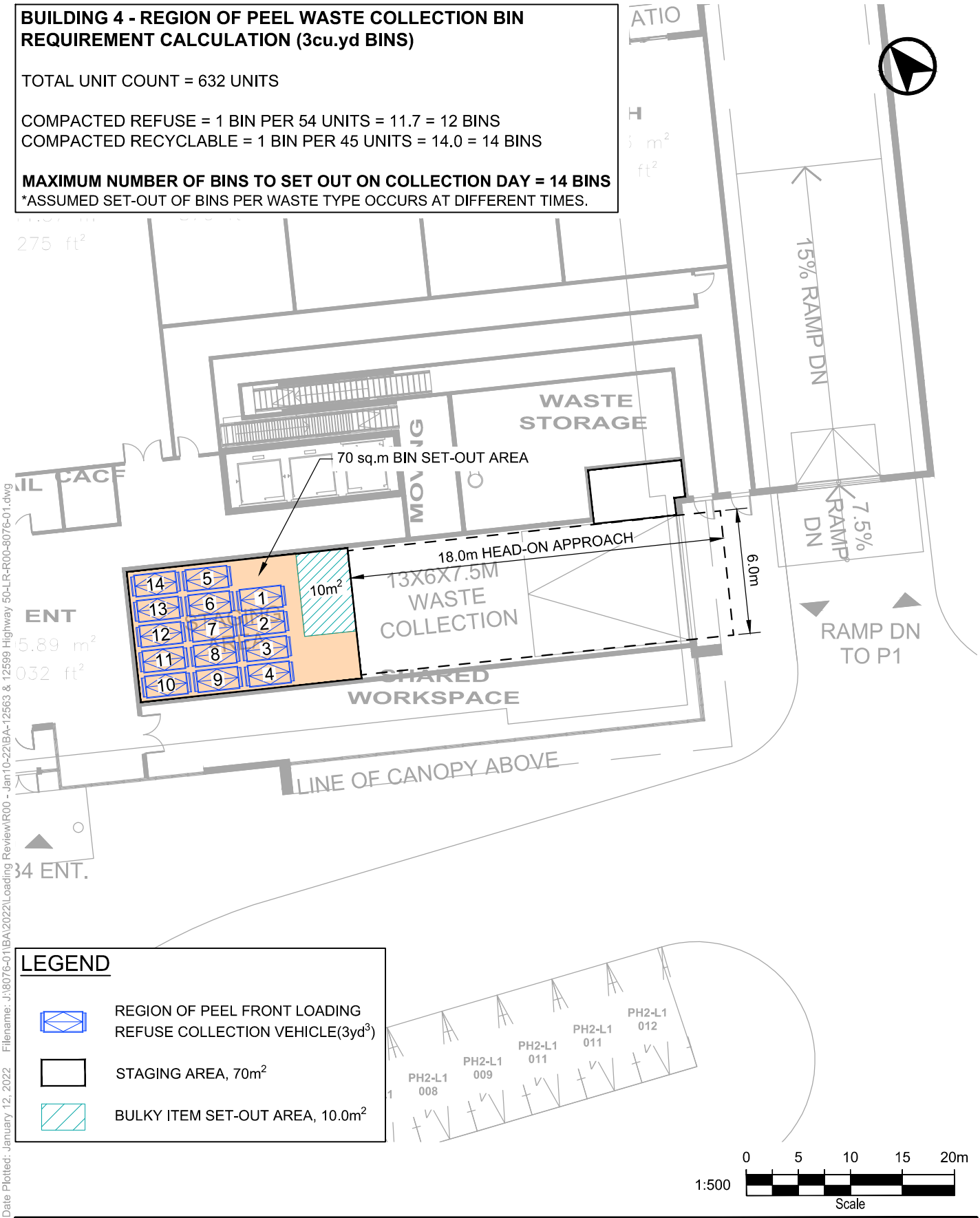
Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	SA-03

BUILDING 4 - REGION OF PEEL WASTE COLLECTION BIN REQUIREMENT CALCULATION (3cu.yd BINS)

TOTAL UNIT COUNT = 632 UNITS

COMPACTED REFUSE = 1 BIN PER 54 UNITS = 11.7 = 12 BINS
COMPACTED RECYCLABLE = 1 BIN PER 45 UNITS = 14.0 = 14 BINS

MAXIMUM NUMBER OF BINS TO SET OUT ON COLLECTION DAY = 14 BINS
*ASSUMED SET-OUT OF BINS PER WASTE TYPE OCCURS AT DIFFERENT TIMES.



LEGEND

- REGION OF PEEL FRONT LOADING REFUSE COLLECTION VEHICLE(3yd³)
- STAGING AREA, 70m²
- BULKY ITEM SET-OUT AREA, 10.0m²

1:500 Scale: 0 5 10 15 20m

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

12563 & 12599 HIGHWAY 50
WASTE COLLECTION STAGING AREA
BUILDING 4

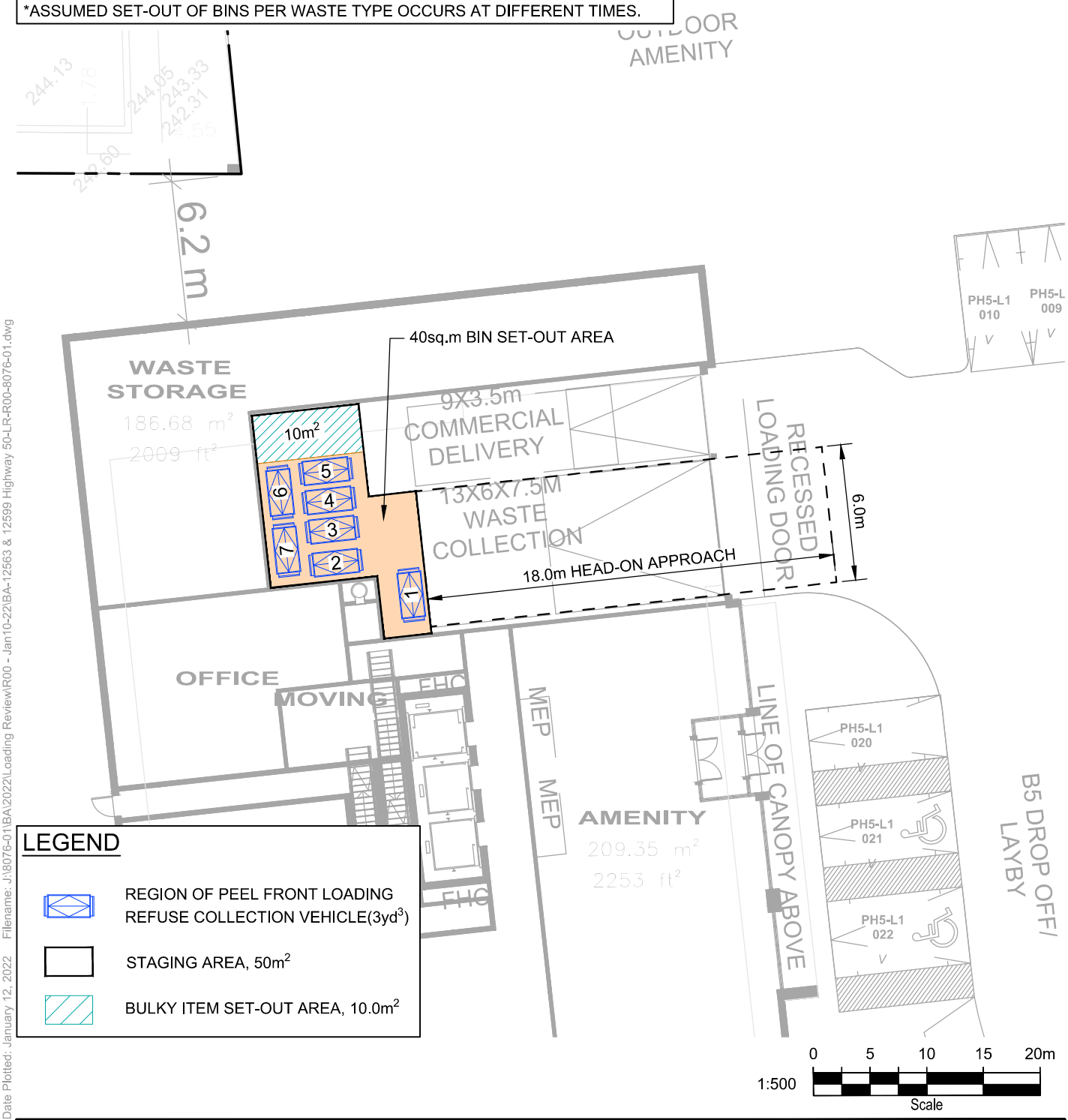
Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	SA-04

BUILDING 5 - REGION OF PEEL WASTE COLLECTION BIN REQUIREMENT CALCULATION (3cu.yd BINS)

TOTAL UNIT COUNT = 305 UNITS

COMPACTED REFUSE = 1 BIN PER 54 UNITS = 5.65 = 6 BINS
COMPACTED RECYCLABLE = 1 BIN PER 45 UNITS = 6.78 = 7 BINS

MAXIMUM NUMBER OF BINS TO SET OUT ON COLLECTION DAY = 7 BINS
*ASSUMED SET-OUT OF BINS PER WASTE TYPE OCCURS AT DIFFERENT TIMES.



LEGEND

- REGION OF PEEL FRONT LOADING REFUSE COLLECTION VEHICLE(3yd³)
- STAGING AREA, 50m²
- BULKY ITEM SET-OUT AREA, 10.0m²

1:500 Scale 0 5 10 15 20m

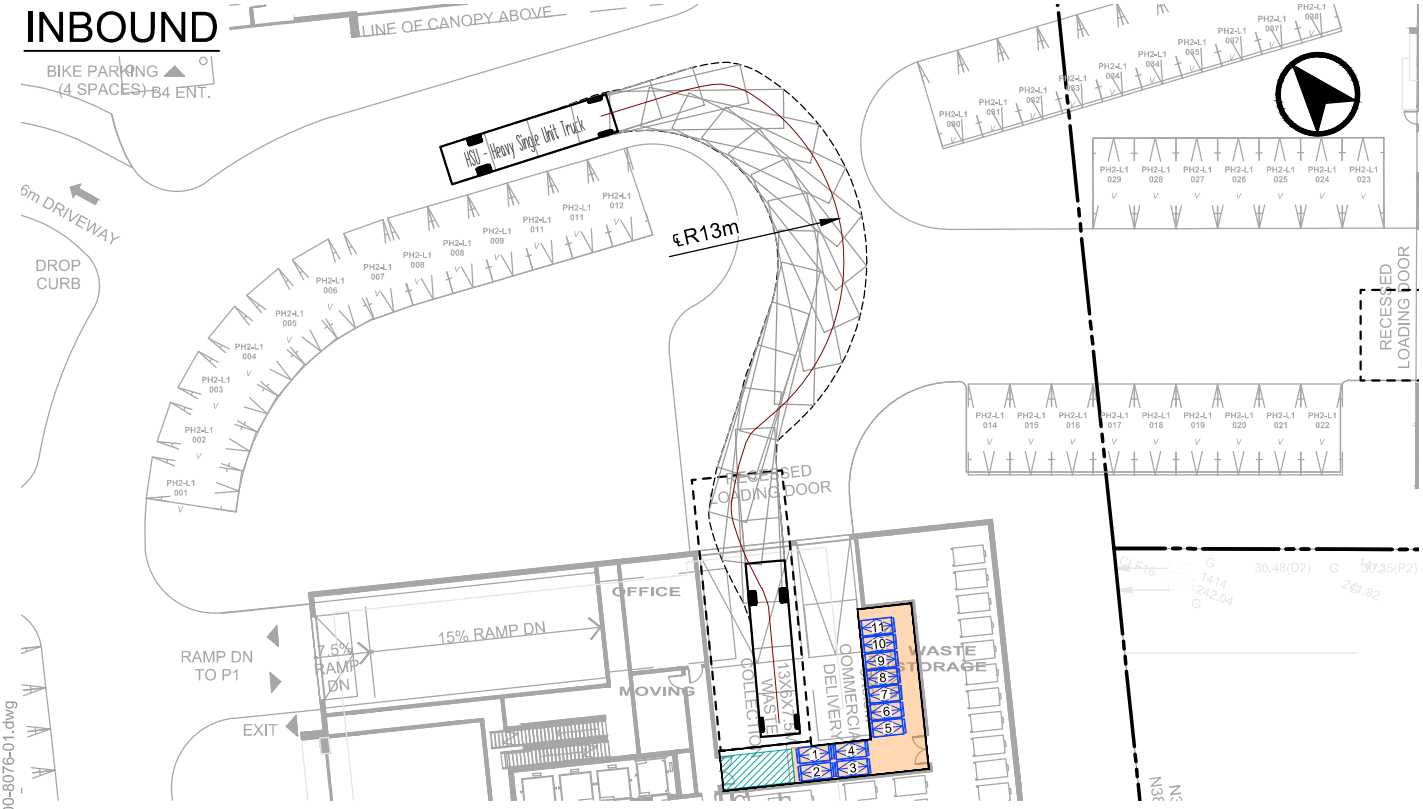
Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

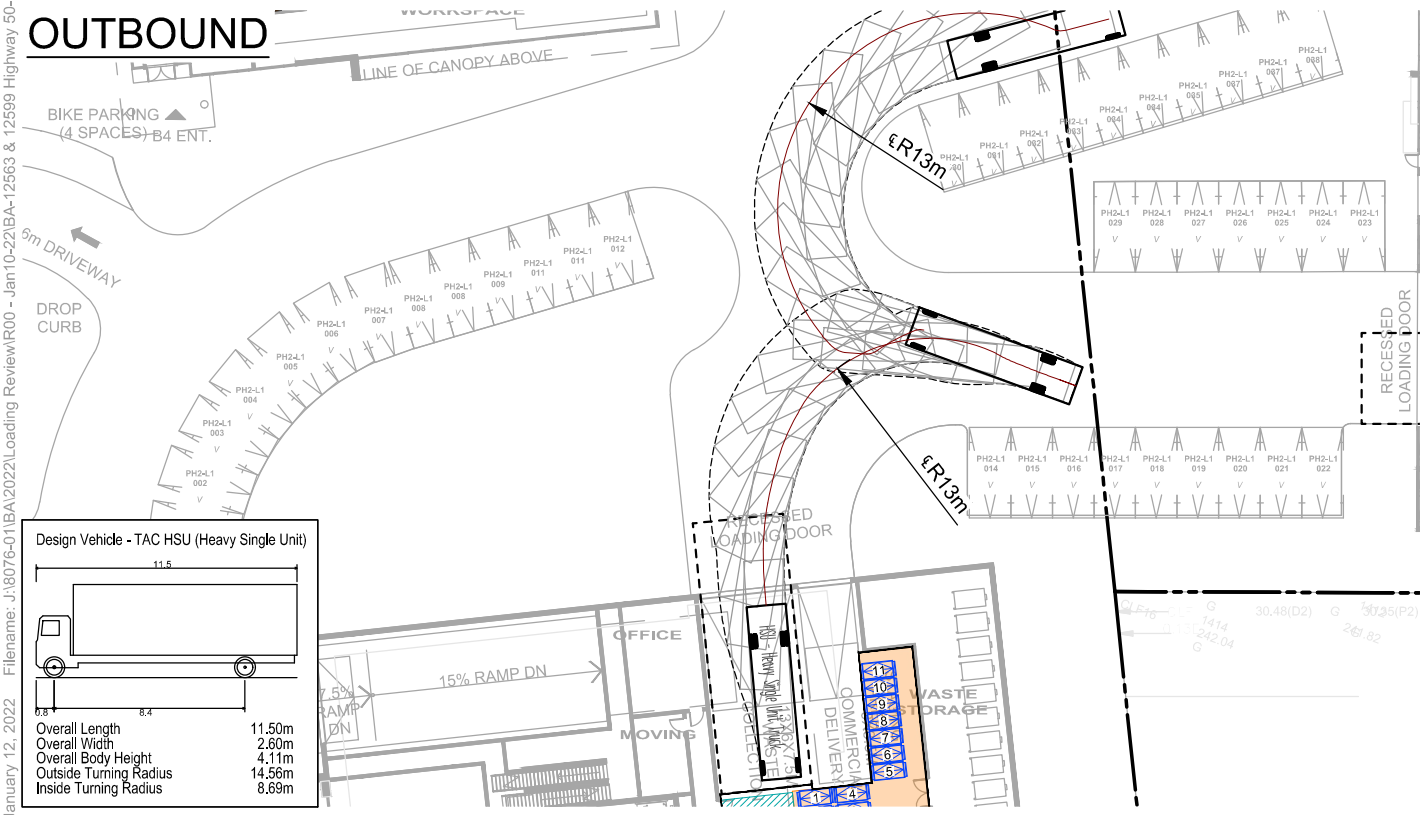
12563 & 12599 HIGHWAY 50
WASTE COLLECTION STAGING AREA
BUILDING 5

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	SA-05

INBOUND



OUTBOUND

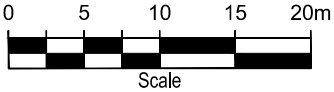


Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

1:500



Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

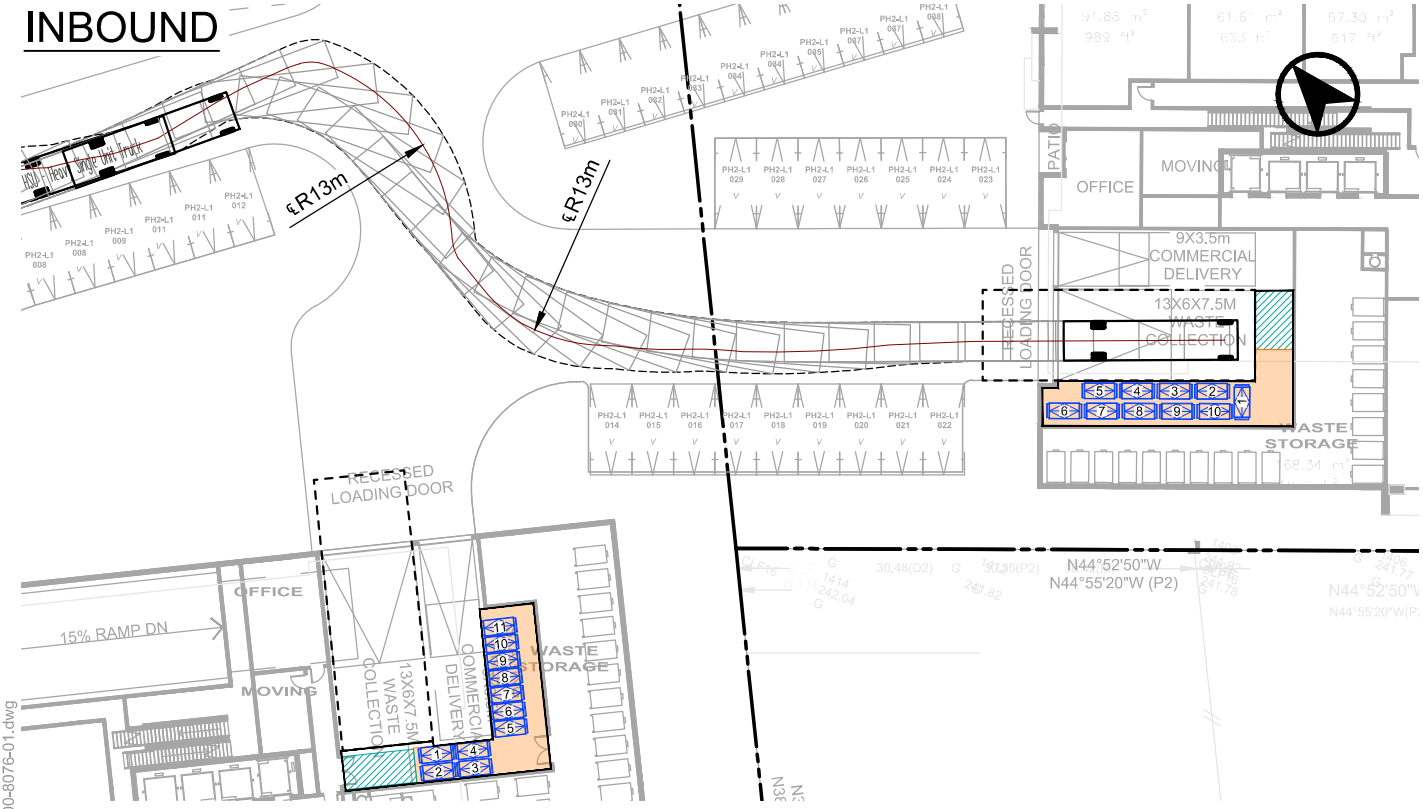
12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

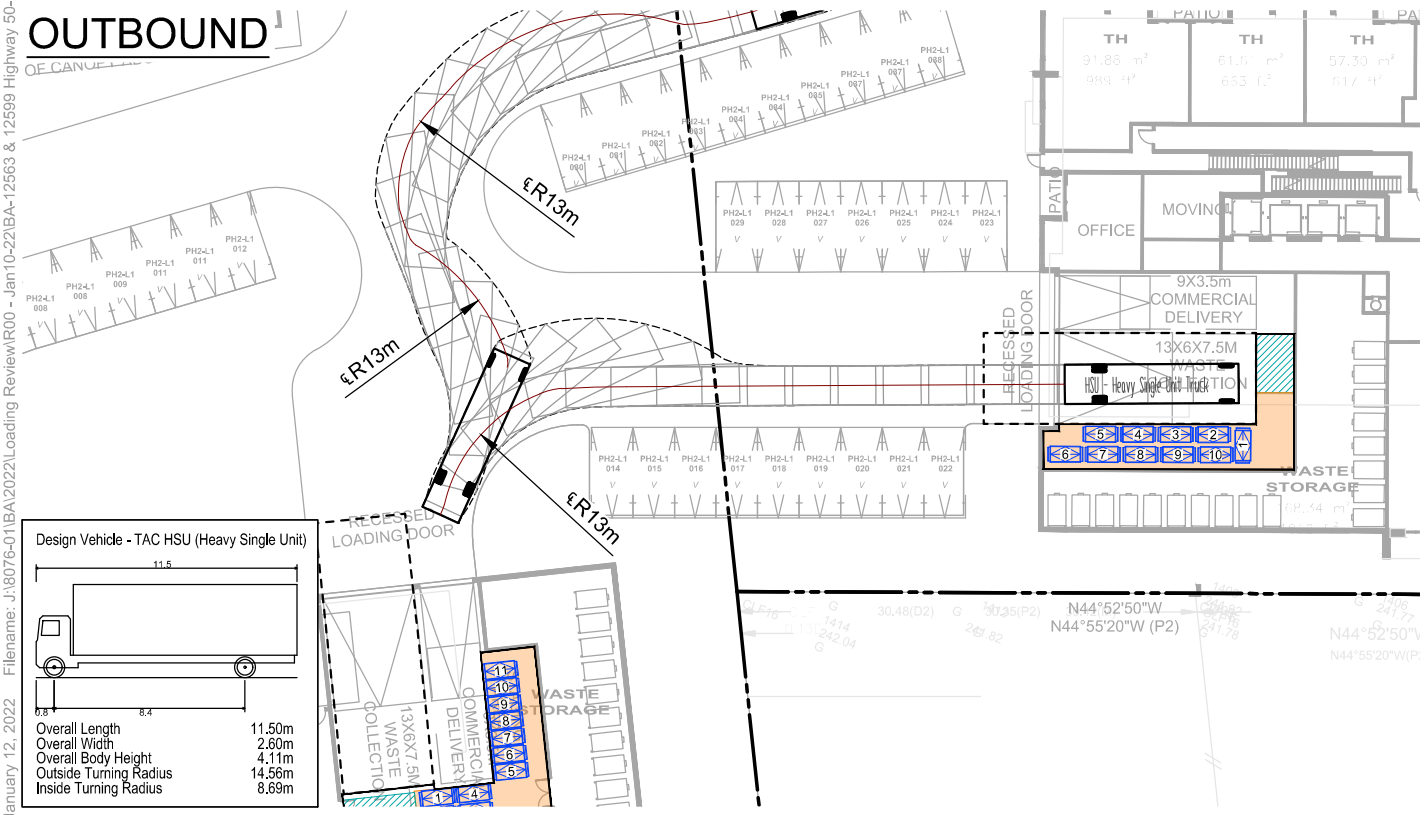
BUILDING 1 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-01

INBOUND



OUTBOUND



Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

1:500 Scale: 0 5 10 15 20m

BA Group

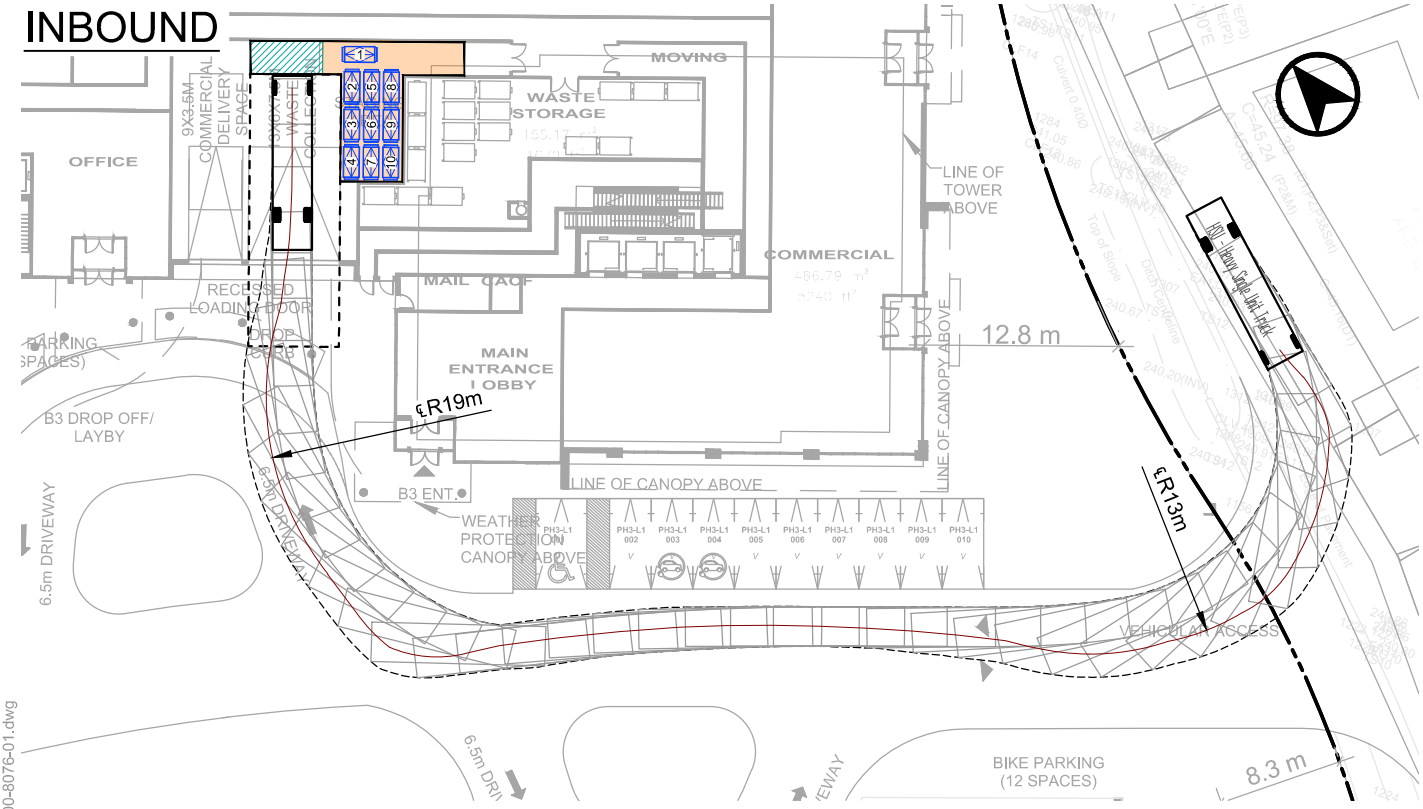
12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
BUILDING 2 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

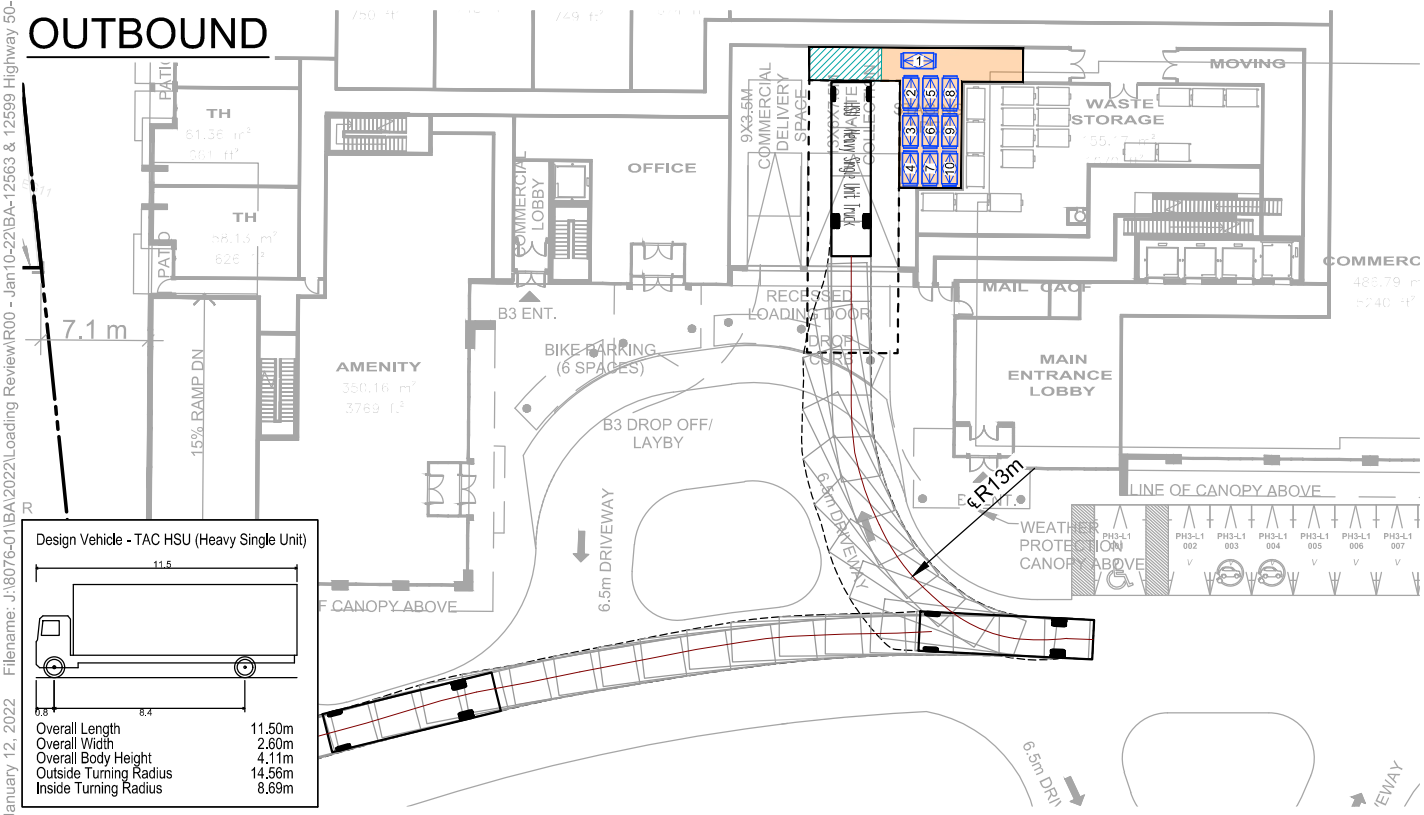
Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-02

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

INBOUND



OUTBOUND

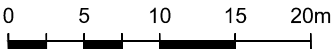


Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

1:500



Scale

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

BA Group

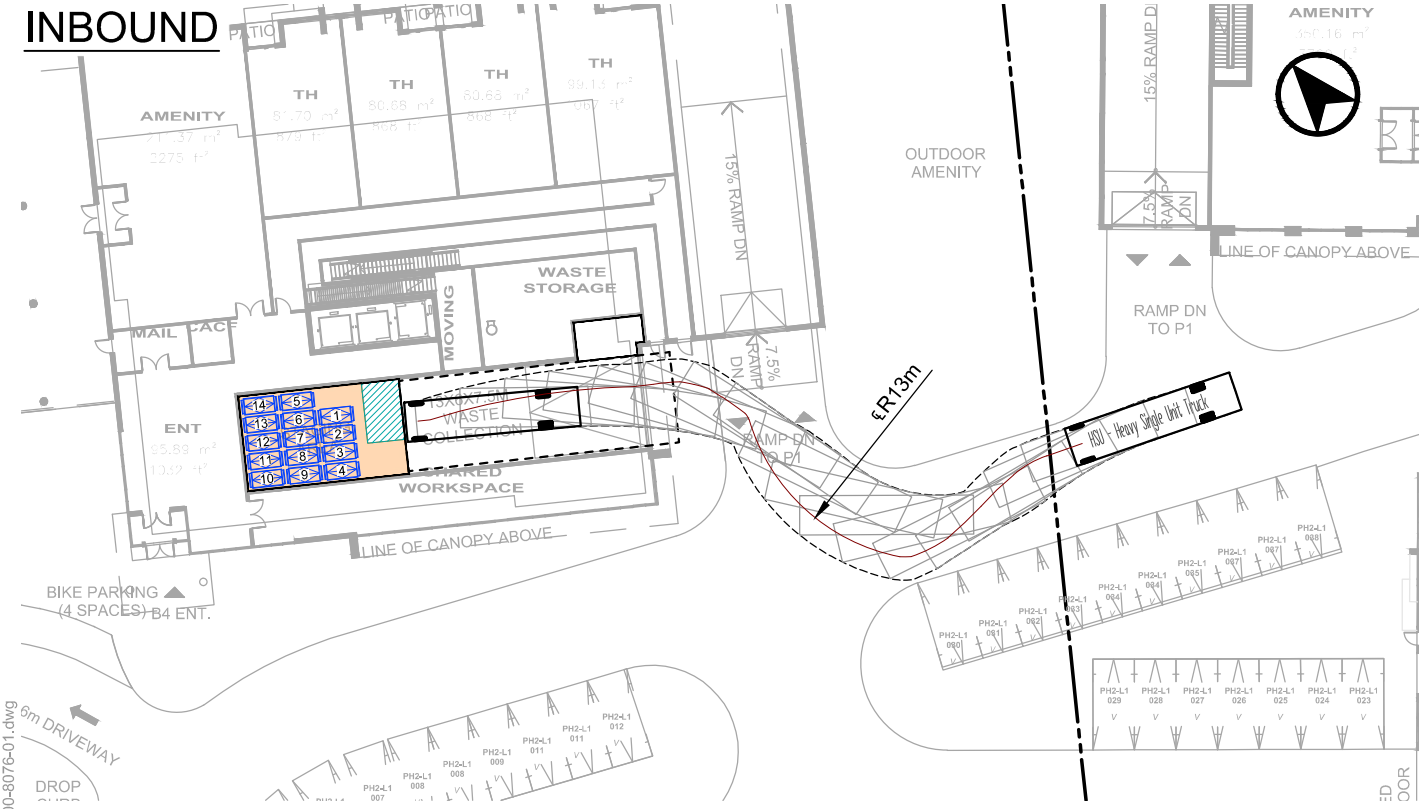
12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

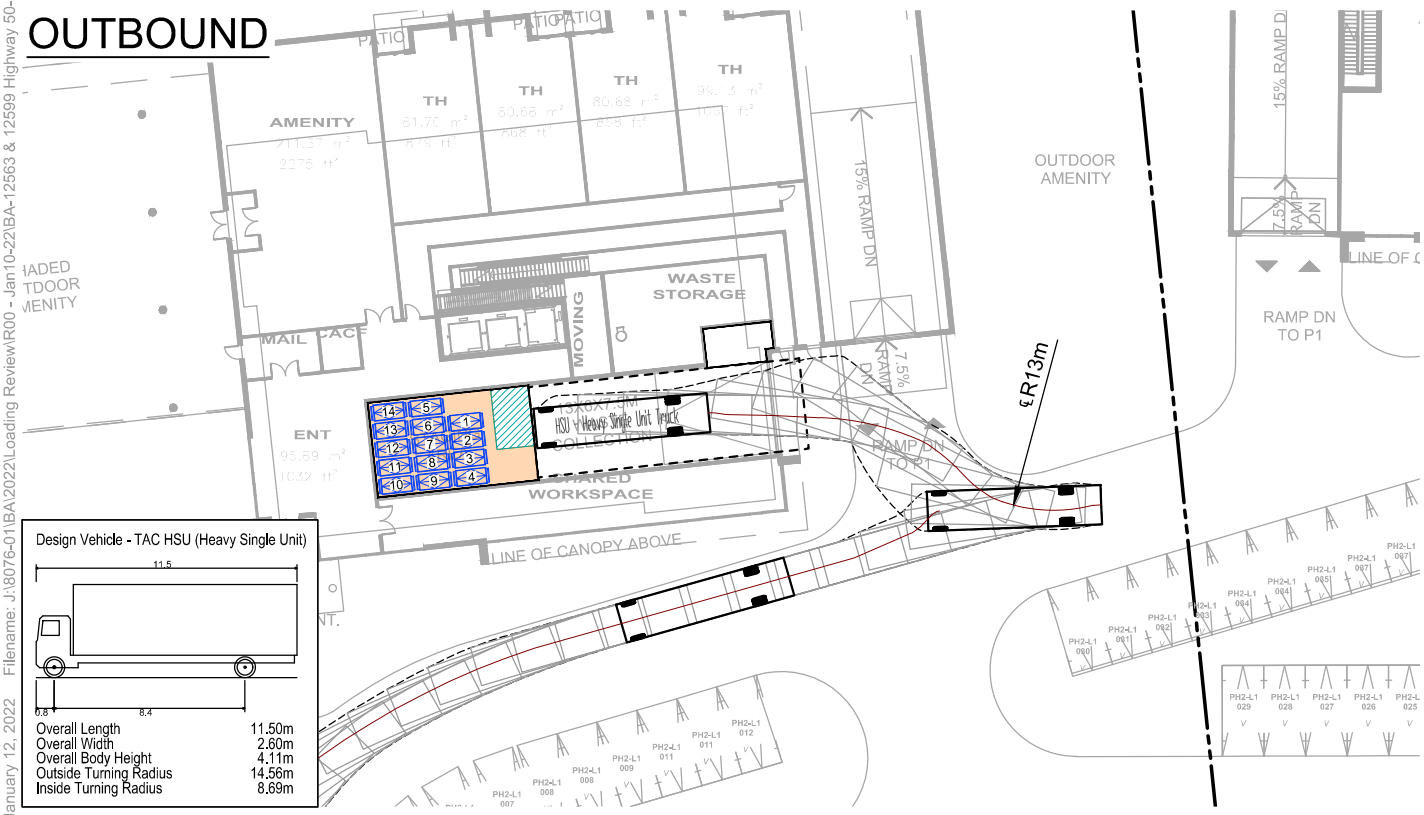
BUILDING 3 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-03

INBOUND



OUTBOUND

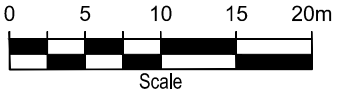


Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

1:500



Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

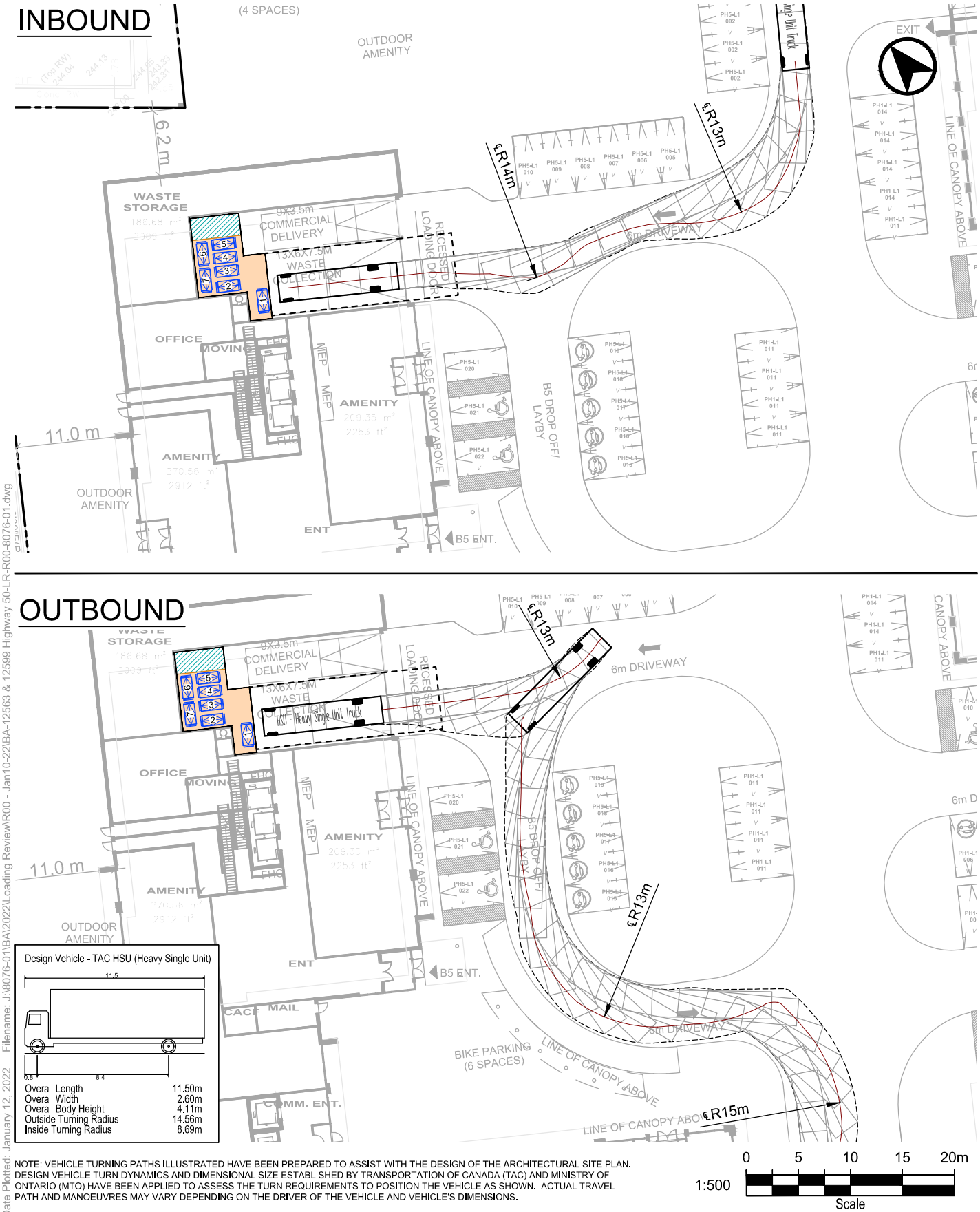
BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM

BUILDING 4 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-04



NOTE: VEHICLE TURNING PATHS ILLUSTRATED HAVE BEEN PREPARED TO ASSIST WITH THE DESIGN OF THE ARCHITECTURAL SITE PLAN. DESIGN VEHICLE TURN DYNAMICS AND DIMENSIONAL SIZE ESTABLISHED BY TRANSPORTATION OF CANADA (TAC) AND MINISTRY OF ONTARIO (MTO) HAVE BEEN APPLIED TO ASSESS THE TURN REQUIREMENTS TO POSITION THE VEHICLE AS SHOWN. ACTUAL TRAVEL PATH AND MANOEUVRES MAY VARY DEPENDING ON THE DRIVER OF THE VEHICLE AND VEHICLE'S DIMENSIONS.

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

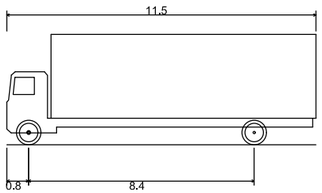
BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM BUILDING 5 - REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	--
Drawing No.	VMD-05

Design Vehicle - TAC HSU (Heavy Single Unit)



Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

BA Group

12563 & 12599 HIGHWAY 50

VEHICULAR MANOEUVRING DIAGRAM
REPRESENTATIVE REGION OF PEEL FRONT-LOADER VEHICLE
ALL WASTE COLLECTION POINTS

Project:	12563 & 12599 HWY 50
Project No.	8076-01
Date:	JANUARY 12, 2022
Revised:	–

Scale 1:1,000 (0 10 20 30 40 50m)

Drawing No. VMD-06

Date Plotted: January 12, 2022 Filename: J:\8076-01\BA\2022\Loading Review\R00 - Jan10-22\BA-12563 & 12599 Highway 50-LR-R00-8076-01.dwg

Appendix L
King City Zoning By-law

THE CORPORATION OF THE TOWNSHIP OF KING

BY-LAW NUMBER 2020-039

A BY-LAW TO AMEND ZONING BY-LAW NUMBER 2017-66, AS AMENDED

WHEREAS Zoning By-law Number 2017-66, being a By-law to regulate the use of land and the character, location and use of buildings and structures in the Township of King, was passed on the 26th day of June, 2017;

AND WHEREAS it is deemed necessary to further amend By-law Number 2017-66, as amended, to implement Official Plan Amendment No.96 to the King City Community Plan;

AND WHEREAS authority is granted pursuant to Section 34 of the *Planning Act*, R.S.O. 1990, Chapter P. 13, to the Council of the Corporation of the Township of King to exercise such powers;

NOW THEREFORE the Council of the Corporation of the Township of King **HEREBY ENACTS AS FOLLOWS:**

That Zoning By-law Number 2017-66, be amended as follows:

1) **THAT** the lands subject to this By-law consist of the lands described as Part N1/2 Lot 5, Concession 3 King, Part 1 of Registered Plan 65R-36607, Township of King, municipally known as 2075 King Road, as more particularly shown on Schedules "1" and "2" attached hereto.

2) **THAT** Schedules "1" and "2" attached hereto form a part of this By-law.

3) **THAT** for the subject lands shown on Schedules "1" and "2" attached hereto, Zoning By-law 2017-66 be amended as follows:

   a. Changing the zone symbol from "Core Area – King City – Exception Section 7.5.2.3 (CAK-3(H)) Zone" to "Core Area – King City – Exception Section 7.5.2.9 (CAK-9(H)) Zone" for those lands shown on Schedule "1" and Schedule "2" attached hereto.

4) **THAT** Section 7.5 of By-law Number 2017-66, as amended be further amended by adding the following subsection:

   7.5.2.9 Exception re: Part N1/2 Lot 5, Concession 3 King, Part 1 of Registered Plan 65R-36607 (2075 King Road)

   Notwithstanding the provisions of Section 2.2.10, Section 2.2.65, Section 2.2.120, Section 2.2.121(a)(b), Section 2.2.202, Section 3.3(b)(c), Section 3.12(b), Section 3.14(j), Section 3.26(a)(b)(e), Section 3.34(a)(v); Table 3.42.1(x), Table 4.1, Section 4.4.1(a), Section 4.5(a), Section 4.6.1(b), Section 4.6.4; Table 7.3a, the lands delineated as "Core Area – King City – Exception Section 7.5.2.9 (CAK-9(H)) Zone" on Schedule "2" of this By-law may be used in accordance with the following provisions:

   i. Private amenity areas consisting of patios, balconies and terraces may be permitted to be located in the front yard and/or exterior side yard;

   ii. Established Grade means with reference to a building or structure, the average level of proposed or finished ground adjoining a building at all exterior walls; but shall not include the finished ground associated with a driveway ramp adjoining a building for the purposes of access to an underground parking level(s) but rather shall be taken from the finished ground associated with the retaining wall supporting the driveway ramp;

iii. The centre point of the lot line that abuts a sight triangle shall be deemed to be the point of intersection of the front lot line and the exterior side lot line;

iv. A structure on the roof for the purposes of providing access to a roof top terrace shall not constitute as a Storey under the by-law;

v. The height requirements of this By-law shall not apply to elevator enclosures and rooftop mechanical equipment, provided it does not exceed 4.7 m in height;

vi. The front lot line shall be King Road;

vii. The definition of lot frontage shall not exclude a 0.3 m reserve from being considered as frontage on a street;

The minimum lot frontage shall be 110.0 m;

viii. Permitted uses shall include the uses permitted in the CAK Zone;

ix. Minimum sight triangle shall be 7.0 m x 7.0 m;

x. Minimum lot area shall be 0.95 hectares;

xi. The maximum permitted building height shall be the greater of 6 storeys or 23.0m;

xii. Maximum lot coverage shall be 70%;

xiii. The maximum floor space index shall be 2.50;

xiv. No other density requirements shall apply;

xv. A maximum of 284 units shall be permitted;

xvi. The minimum front yard shall be 2.0 m, except where abutting a 0.3 m reserve or sight triangle the minimum front yard shall be 0.0 m;

xvii. The minimum exterior side yard shall be 1.4 m, except where abutting a 0.3 m reserve or sight triangle the minimum exterior side yard shall be 0.0 m;

xviii. The minimum rear yard shall be 10.5 m;

xix. The minimum required step back for all storeys above the second storey shall be 0.0 m;

xx. A planting strip with a minimum width of 1.5m shall be required abutting the full length of the front lot line and exterior side lot line, except where such lot lines abut a sight triangle the minimum width shall be 0.0 m;

xxi. A planting strip with a minimum width of 3.0 m shall be required abutting the full length of the rear lot line. An opaque fence not less than 1.8m height shall also be required as part of the planting strip;

xxii. Driveways, walkways, patios, a porte cochere, portico or similar architectural components of buildings and structures shall be permitted to cross any planting strip;

xxiii. Porte cochere, portico or similar architectural components of buildings structures shall be permitted to project into any yard 0.0 m from any lot line;

xxiv. A minimum of 1.33 parking spaces per apartment dwelling unit shall be provided;

xxv. A minimum of 0.17 visitor parking spaces per dwelling unit shall be provided;

xxvi. The minimum width for underground parking spaces shall be 2.75m;

xxvii. A minimum of 1 loading space shall be required and shall be located within the building;

xxviii. Access to the loading space shall be by means of a one-way driveway at least 4.5 m in width;

xxix. A loading space shall be at least 3.6 m by 13.0 m with a minimum 4.6 m height clearance;

xxx. A minimum of 0.25 indoor bicycle parking spaces shall be provided for each apartment dwelling unit;

xxxi. A minimum of 2.0 m^2 of private amenity area shall be provided as a patio, balcony, or terrace for all apartment dwelling units;

xxxii. A minimum of 800.0 m^2 of the amenity area shall be required in a contiguous area that is located at grade;

xxxiii. A minimum of 1,000.0 m^2 of outdoor amenity area shall be provided in a contiguous area on the rooftop;

xxxiv. The minimum required barrier for all balconies above the third storey and facing the rear yard shall be 0.6 m in depth measured from the balcony edge and shall consist of a built-in planter which extends across the entire width of the balcony;

xxxv. A green or white roof shall be required where the roof is not used for mechanical purposes or as amenity area;

xxxvi. Each apartment dwelling unit shall have a hydro meter and water meter;

xxxvii. A minimum of 10% of parking spaces in the underground parking levels shall be provided for electrical vehicles and shall have access to a charging station;

xxxviii. Notwithstanding any other provisions of this By-law, a Holding Symbol denoted as an ”H” to the zone symbol for the Core Area - King City – Holding (CAK-9(H)) – Exception Section 7.5.2.9 zone, shall require that no person use any land, erect, alter or use any building or structures for any other purpose until such time as the Holding Symbol (H) is removed by an amendment to this By-law passed pursuant to Section 36 of the Planning Act, R.S.O. 1990, Chapter P.13, as amended; and,

xxxix. Council for the Municipality may amend this By-law to remove the (H) Holding symbol from all or parts of the lands to which are zoned with a (H) Holding symbol, to permit the development of the lands in accordance with the provisions of this By-law, at such time that the following provisions, as applicable to the relevant lands/uses, have been fulfilled:

a. That the Council of the Municipality has assigned water and sanitary servicing allocation to those uses that require allocation;

b. A site plan has been approved by the Municipality as a Site Plan Development Agreement respecting the development of the use of the lands has been executed between the owner(s) and encumbrance(s), if any, of the these lands and the Municipality, and that such Agreement is registered on the title of the lands;

c. A Phase 2 Environmental Site Assessment has been conducted, to the satisfaction of the Municipality;

d. A Remedial Action Plan has been completed. The Municipality shall be satisfied that any site remediation requirements and/or mitigation and/or monitoring measures, and clauses requiring the owner(s) to obtain a filed Record of Site Condition have been incorporated into the Site Plan Development Agreement referred to in (ii) above, as required by and to the satisfaction of the Municipality;

e. That written confirmation is obtained by the Township Engineer and/or appointed representatives that adequate water supply is available in the existing system to service domestic and fire flow demands required for the proposed development (per hydrant flow tests or system improvements); and,

f. That written confirmation is obtained by the Township Engineer and/or appointed representatives that adequate sanitary servicing capacity is available to service the development, based upon the completion and assessment of the 2020 Township Wastewater Servicing Plan, related protocols and required system improvements (if required).

5) **THAT** Schedule "A6" of Zoning By-law 2017-66 is hereby further amended by changing the zone symbol on the lands described in Section 3 above from "Core Area – King City – Exception Section 7.5.2.3 (CAK-3(H)) Zone" to "Core Area – King City – Exception Section 7.5.2.9 (CAK-9(H)) Zone" as illustrated on Schedule "1" and "2" attached hereto.

6) **THAT** this By-law shall come into force on the day it was passed where no notice of appeal has been filed with the Township Clerk in accordance with the requirements and within the time prescribed under Section 34 (19) of the Planning Act.

READ a **FIRST** and **SECOND** time this 10th day of August, 2020

READ a **THIRD** time and **FINALLY PASSED** this 10th day of August, 2020

_____

Steve Pellegrini
Mayor

_____

Kathryn Moyle
Director of Corporate Services
Township Clerk

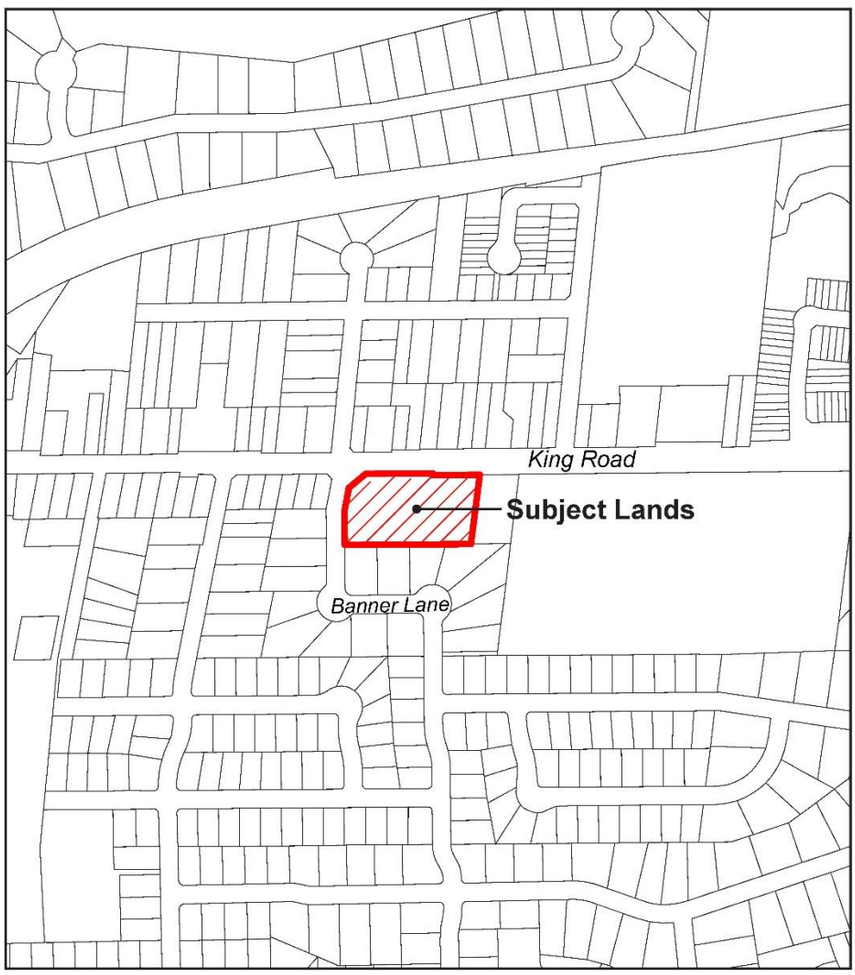
THIS IS SCHEDULE “1” TO BY-LAW NO. 2020-039

Part N1/2 Lot 5, Concession 3, Part 1, Registered Plan 65R-36607

(2075 King Road)

TOWNSHIP OF KING

REGIONAL MUNICIPALITY OF YORK



SUBJECT LANDS

"Core Area - King City - Exception Section 7.5.2.3 (CAK-3(H)) Zone" to "Core Area - King City - Exception Section 7.5.2.9 (CAK-9(H)) Zone"

Steve Pellegrini
Mayor

Kathryn Moyle
Director of Corporate Services
Township Clerk

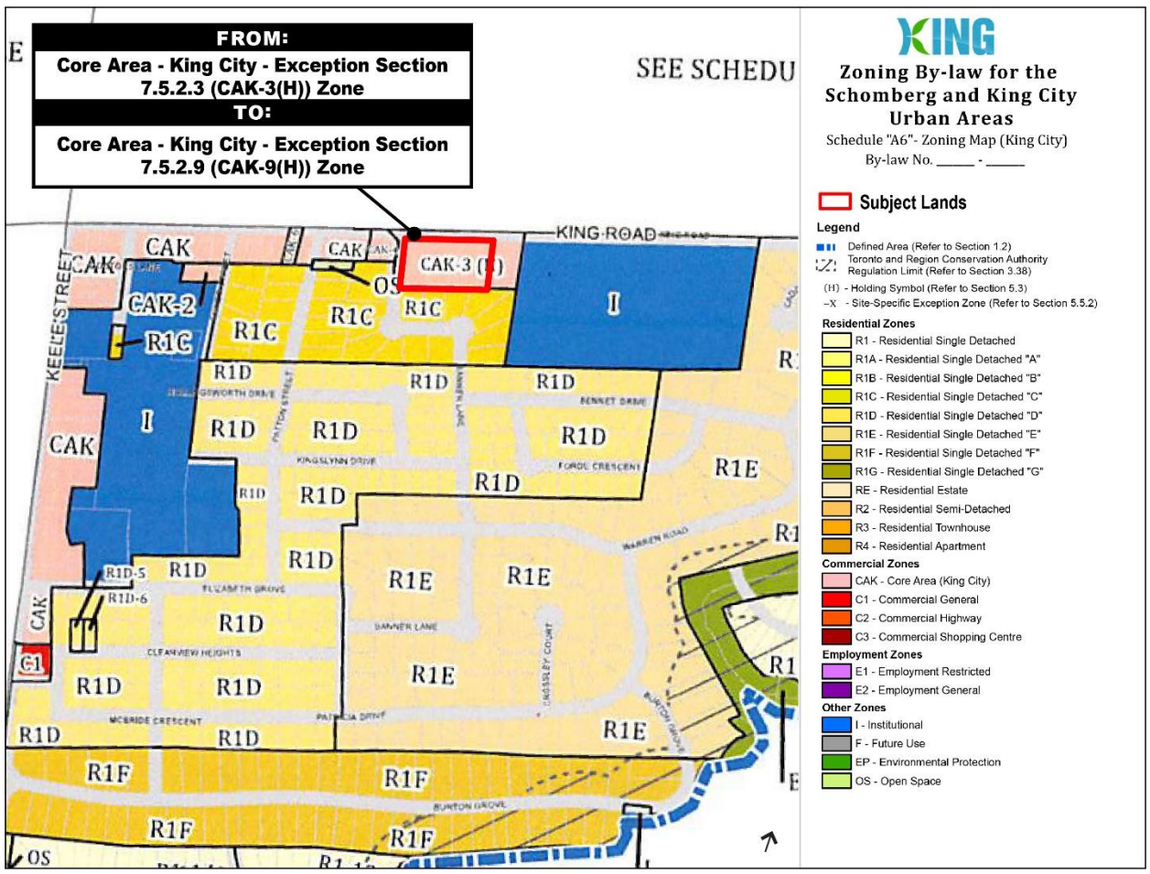
THIS IS SCHEDULE “2” TO BY-LAW NO. 2020-039

Part N1/2 Lot 5, Concession 3, Part 1, Registered Plan 65R-36607

(2075 King Road)

TOWNSHIP OF KING

REGIONAL MUNICIPALITY OF YORK



NOTE:

THIS SCHEDULE IS PART OF SCHEDULE “A6”
TO BY-LAW 2017-66, AS AMENDED, OF THE
TOWNSHIP OF KING, AND WILL BE REFERRED
TO AS MAP NUMBER CAK-9.

Steve Pellegrini
Mayor

Kathryn Moyle
Director of Corporate Services
Township Clerk