



Proposed Mixed-Use Residential Development

Traffic Impact Study
89-95 Dundas Street West
Mississauga, Ontario

On behalf of Mississauga II LP





Executive Summary

- GHD Limited (GHD) was retained to prepare a Traffic Impact Study (TIS) for the proposed mixed-use high rise residential development with ground level retail located in the City of Mississauga. The proposed development is located on the northeast corner of Dundas Street and Novar Road.
- The purpose of this report is to determine the site related traffic assignment to the local Cooksville road network and traffic-related impacts on the nearby intersections during the weekday a.m. and p.m. peak hours.
- Future background traffic and transportation network conditions were derived for a 2021 and 2031 traffic conditions and therefore included analyses with the future Hurontario-Main Light Rail Transit (LRT) impact on Hurontario Street.
- The proposed development is expected to generate a total of 98 new two-way vehicle trips during the a.m. peak hour consisting of 25 inbound and 73 outbound trips. During the p.m. peak hour, the development is expected to generate a total of 160 new two-way vehicle trips during consisting of 91 inbound and 69 outbound trips.
- Updated traffic counts are being completed for the study intersections including the intersections with Novar Road for which no data is currently available and will be provided along with analysis of existing conditions in an updated report for City review.
- All remaining study intersections are expected to have generally good operational characteristics in both weekday peak hours under the future background 2021 planning horizon. Reserve capacity is available during the weekday a.m. and p.m. peak hours to accommodate the proposed site traffic. The incremental impact of the added site traffic is minor under the 2021 total traffic conditions with the overall intersection v/c ratio increasing only slightly. Operating characteristics of signalized intersections were improved by optimizing the signal timings where appropriate. Signal timings were once again optimized under the 2031 horizon year to improve overall intersection operations, while some intersection movements are expected to operate at or near capacity, no geometric improvements are recommended at the study intersections.
- There are no recommended improvements at the study intersections to accommodate the proposed development.
- Parking for the site is being provided at a rate of 0.90 spaces per unit for one bedroom units and 1.0 spaces per unit for two bedroom units. Visitor parking is supplied at a rate of 0.15 spaces per unit. The total parking supply for the site is 432 parking spaces including two car share spaces.
- Bicycle parking is provided with 332 long term resident spaces located in the underground garage and 15 short term visitor spaces located at grade.
- A TDM plan that proposes a mix of hard and soft measures to meet the objectives and targets to reduce vehicular demand and encourage passenger, transit, cycling, and walking has been completed and is contained in this report.

We trust that this satisfies your requirements, but do not hesitate to contact the undersigned if you have any questions.



Respectfully submitted,

GHD



William Maria, P. Eng.
Senior Project Manager

A handwritten signature in black ink that reads "harpal". A small dot is placed to the right of the signature.

Dhaval Harpal, Dipl. T.
Transportation Planner



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1. Introduction

1.1 Retainer and Objective

GHD Limited (GHD) was retained to prepare a Traffic Impact Study (TIS) in support of the proposed mixed-use residential condominium development located in the City of Mississauga. The proposed development is located on the north side of Dundas Street east of Novar Road, as shown in **Figure 1**.

The following key issues are addressed by this study:

- Establish baseline future background traffic conditions for the build-out year of 2021 and 2031 consistent with the traffic study completed for the development across the street at 90 Dundas Street West;
- Apply Institute of Transportation Engineers' (ITE) Trip Generation data to estimate traffic generation for the subject site, distribute the development traffic to the adjacent road network and determine the future impacts in the context of all local transportation modes;
- Review the site plan in the context of operational/geometric issues, and provide recommendations on how to address any deficiencies (if any are revealed).
- Complete a site access and circulation review for the site plan including AutoTurn assessment for passenger vehicles, delivery vehicles and waste collection.

1.2 Study Team

The GHD team involved in the preparation of this study are:

- William Maria, P. Eng., Senior Project Manager
- Dhaval Harpal, Dipl. T., Transportation Planner



Figure 1 Site Location

2. Site Characteristics

2.1 Study Area

The following intersections were included in the study area:

- Confederation Parkway and Agnes Street
- Confederation Parkway and Dundas Street West;
- Hurontario Street and Agnes Street;
- Hurontario Street and Dundas Street West;
- Dundas Street West and Novar Road;
- Agnes Street and Novar Road; and
- Novar Road and site access.

2.2 Site Plan

The proposed site plan, provided by Studio JCI, dated October 7, 2019 as shown in **Figure 2**, consists of the following:

- A 16-story mixed-use residential development consisting of 405 residential units
- A total of 5,490 m² of at-grade retail GFA
- A total of 432 parking spaces provided at grade and in four levels of underground parking
- A total of 347 bicycle parking spaces consisting of 332 long-term and 15 short-term spaces

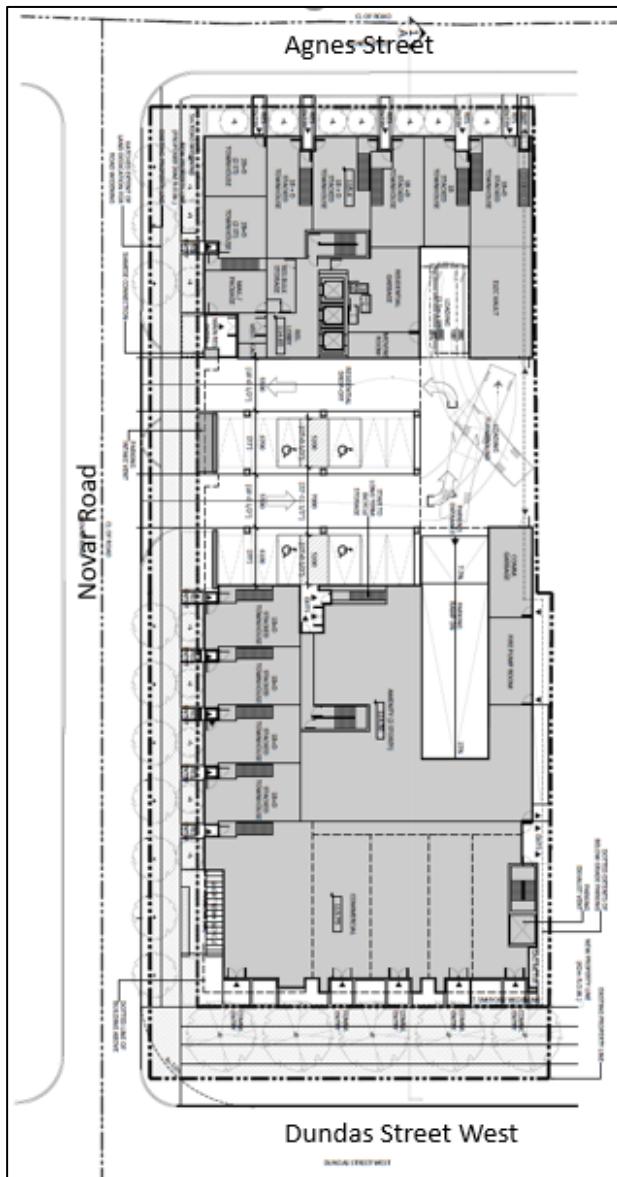


Figure 2 Site Plan

Access for the surface parking spaces, loading space and underground parking ramp is from Novar Road.

A front loader garbage truck (Peel Region standard), passenger vehicle (PTAC) and a medium single unit moving truck (MSU) were modelled for the turning paths to access the loading bay and underground ramps. All design vehicles can be accommodated by the proposed site plan as shown in the swept path figures in Appendix A.



3. Existing Conditions

3.1 Existing Road Network

All roads in the study area are under City of Mississauga jurisdiction with a posted speed limit of 50 km/h.

Dundas Street West is an east-west major arterial road. In the study area it has an existing five-lane cross section with a centre left turn lane.

Hurontario Street is a north-south major arterial road. In the study area it has an existing seven-lane cross section with a centre left turn lane. It will become a four-lane cross section when the LRT is built with north south capacity reduced from 3 to 2 lanes in each direction.

Confederation Parkway is a north-south major arterial road. In the study area it has an existing five-lane cross section with back-to-back centre left turn lanes.

Agnes Street is an east-west local residential road between Hurontario Street and Confederation Parkway. It will become right-in/out only at the east end when the LRT on Hurontario is completed.

3.2 Transit Services

Mi-Way Transit

Mississauga Transit currently operates routes 1, 19, 28, 91, 101(A), and 103 in the vicinity of the site. Routes 1 (Dundas) and 101(A) (Dundas Express), provide east-west service along the Dundas corridor south of the site. Routes 19 (Hurontario) and 103 (Hurontario Express) provide north-south service along the Hurontario corridor east of the site. Route 28 provides service on Confederation Parkway west of the site. Route 91 (Hillcrest) provide local service through the Cooksville GO Station north of the site. The site location is therefore centrally located and in close proximity to excellent Mi-Way transit service.

GO Transit

GO Transit operates both train and bus service at the Cooksville GO Station. There are currently 8 trains in each of the am and pm peak periods with service along the Milton line for downtown Toronto. GO Transit also operates a regular daily bus service through the Cooksville GO Station serving all stations on the Milton line as well as the Meadowvale Town Centre and the City Centre Transit Terminal.



Figure 3 Miway Transit Map

3.3 Bicycle Facilities

Within the study area on-street bicycle facilities are provided on Confederation Parkway.

3.4 Existing Traffic Data

This report does not provide an existing conditions assessment at this time for the study area intersections. Updated traffic data is being collected but was not available before the submission date. Once the data is available GHD will update this report to include this analysis.



4. Future Background Traffic

4.1 Study horizon years

The City of Mississauga requested future background and total traffic analyses for 2021 and 2031 planning horizons for the site at 90 Dundas Street West. With the planned opening of the LRT along Hurontario in 2021, the analyses contained in this report adopted future background conditions with the LRT impact on Hurontario Street in for both the 2021 and 2031 planning horizons and derived the future background traffic volumes from the 90 Dundas Street traffic study completed by GHD in September 2017.

4.2 Study area transportation network improvements

Cooksville Mobility Hub

The mobility network within Cooksville is planned for substantial expansion as shown in the appended existing and proposed non-automotive transportation network plans. Expansion plans include the road grid system with pedestrian sidewalks, on-street bicycle lanes, multi-use trails, LRT on Hurontario Street and higher-order transit on Dundas Street. This is expected to significantly decrease the reliance on the personal automobile for residents of Cooksville based on enhancing the connectivity and convenience of alternate transportation modes.

Hurontario-Main LRT

The LRT on Hurontario Street is expected to be introduced in 2021. It will result in the loss of one northbound and one southbound travel lane (from 3 to 2 lanes in each direction), restrict many unsignalized intersections to right-in/out only movements, and generally create urban density characteristics in nodes such as Cooksville, making it less attractive for vehicular traffic. Derivation of the future LRT impact on transit mode split and Hurontario corridor traffic volumes was based on data obtained directly from the City of Mississauga.

The Transportation Tomorrow Survey (TTS) data shows the existing transit mode split is approximately 28%. As a conservative analysis, the Cooksville Mobility Hub is assumed to achieve the same transit mode split post 2021 after the introduction of the LRT.

4.3 Future Road Network

The most significant ultimate improvement to the road network in close proximity to the site is the future extension of Cook Street from its existing terminus on the south side of the T.L. Kennedy Secondary School property to Hillcrest Avenue at the approximate location of the existing GO east driveway. This will provide a north-south vehicular, pedestrian and bicycle connection to the GO station.

The northerly connection of Cook Street to Hillcrest Avenue may become an essential component of the future road network as Cooksville redevelopment occurs along the north side of Dundas Street. Cook Street south of Agnes Street is on-way northbound only, Agnes Street at Hurontario Street is expected to provide only southbound access, while Agnes Street at Confederation Parkway would become the primary access intersection for the area, but remain unsignalized. The connection of Cook Street to Hillcrest Avenue would therefore provide a signalized outlet (at the GO east access intersection) for local traffic generated by future redevelopment in the area.



4.4 Redistribution of traffic

The LRT is expected to restrict Agnes Street at Hurontario Street to right-in/out only in 2021. Therefore the outbound north trips are expected to redistribute to Confederation Parkway and the inbound south trips are expected to utilize Confederation Parkway via King Street from Hurontario Street.

The LRT is also expected to restrict northbound left turns on Hurontario Street to Dundas Street. It is expected that with the closure of the northbound left turn lane on Hurontario Street to Dundas Street, it is not likely that 100% of drivers will use King Street as an alternate route. As a result drivers will adapt to existing travel patterns and use adjacent arterial roads such as Mavis Road and Confederation Parkway via Queensway West thus avoiding an additional left turn and limited capacity at King Street. As per the 90 Dundas Street Traffic Study, the westbound trips from Hurontario Street to Dundas Street have been redistributed as follows:

- 50% redistributed to Confederation Parkway via King Street;
- 25% redistributed to Confederation Parkway via Queensway West; and
- 25% redistributed to Mavis Road via Queensway West

4.5 Future background growth

Using the City's Strategic Travel Demand model and supporting traffic data, the City's Transportation Planning section provided growth rate forecasts on Hurontario Street, Dundas Street, Confederation Parkway and King Street. The rates from existing the 2021 represent a one-time reduction/addition (as projected), this mainly represents the changes in travel patterns as a result of the LRT implementation on Hurontario Street and road network changes in the study area. From 2021 to 2031 the rates represent a compounded annual growth rate.

The following growth rates were therefore applied to each of the 2021 and 2031 planning horizons.

Table 1 Growth rates

Street	2021				2031			
	AM Peak Hour		AM Peak Hour		AM Peak Hour		PM Peak Hour	
	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
Hurontario Street north of Dundas Street	-28.0%	-23.0%	-19.0%	-23.0%	0.5%	0.0%	1.0%	0.0%
Hurontario Street south of Dundas Street	-24.0%	-28.0%	-21.0%	-21.0%	0.5%	0.0%	1.0%	0.0%
Confederation Parkway	2.0%	1.0%	1.0%	1.0%	1.0%	0.5%	1.0%	0.5%
Dundas Street	-1.0%	3.0%	2.0%	1.0%	0.5%	1.0%	1.0%	0.5%
King Street	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



4.6 Future background developments

Future redevelopment within Cooksville is expected to be significant based on the growth projections from the Cooksville Mobility Hub, Master Plan Study of September 2011. This growth assumed linear growth from 2011 to 2031 and adopted 3.1 persons per household from the Mississauga 2006 Community Census (Statistics Canada).

The re-development potential and the proposed densities vary in different areas of Cooksville. The number of new residential units by 2021 in four local zones delineated by the Hurontario Street corridor are estimated at 399 in the southeast, 351 in the northeast, 672 in the south west, and 417 in the northwest (the location of the Cooksville GO Station). The number of new residential units in these same zones by 2031, assuming linear re-development growth, would be approximately 798 in the southeast, 702 in the northeast, 1247 in the south west, and 834 in the northwest.

Automobile driver trips from future Cooksville redevelopment in both 2021 and 2031 horizon years were distributed on the basis of the 2011 TTS 6:00-9:00 am peak period origins in the four Cooksville zones (3862, 3867, 3871 and 3872) to destinations in all other zones in the GTHA, using the major arterial roads within Cooksville. These trips were distributed predominantly north or south on Hurontario Street and Confederation Parkway, with a lesser component east and west on Dundas Street. The 2011 Transportation Tomorrow Survey (TTS) data, within the four Cooksville zones, shows the existing non-auto modal split is approximately 28%. As a conservative analysis, the Cooksville Mobility Hub is assumed to achieve the same transit model split applied to both the 2021 and 2031 planning horizons.

The following background developments within the study area have been identified and are assumed to be constructed within the 2021 planning horizon. They are also within the identified re-developable areas of Cooksville and in this context their total residential unit count has been removed from the Cooksville redevelopment total number of new residential units listed above. Their corresponding commercial GFA has been included and distributed to the road network accordingly.

- Higher Living Development Inc. – 334 residential units plus 3,231 sq.ft. commercial GFA located at 86-90 Dundas Street East (east of Jaguar Valley Drive);
- 71 Agnes Street - 264 residential units located at west of Cook Street.
- 45 Agnes Street – 268 residential units and 8,460 sq.ft of retail GFA located at east of Cook Street.
- 90-110 Dundas Street West -140 dwelling units and 16,146 sq.ft. of ground floor commercial area

Figures showing Cooksville 2021 and 2031 redevelopment traffic growth and the aforementioned background developments are appended in **Appendix B** from the 90 Dundas Street Study report.

The existing traffic plus the corridor growth, redistribution of traffic, and the future background developments were combined to produce the 2021 and 2031 background a.m. and p.m. peak hour traffic volumes. **Figure 5** summarizes the background traffic volumes at the 2021 planning horizon, and **Figure 6** summarizes the background traffic volumes at the 2031 planning horizon.

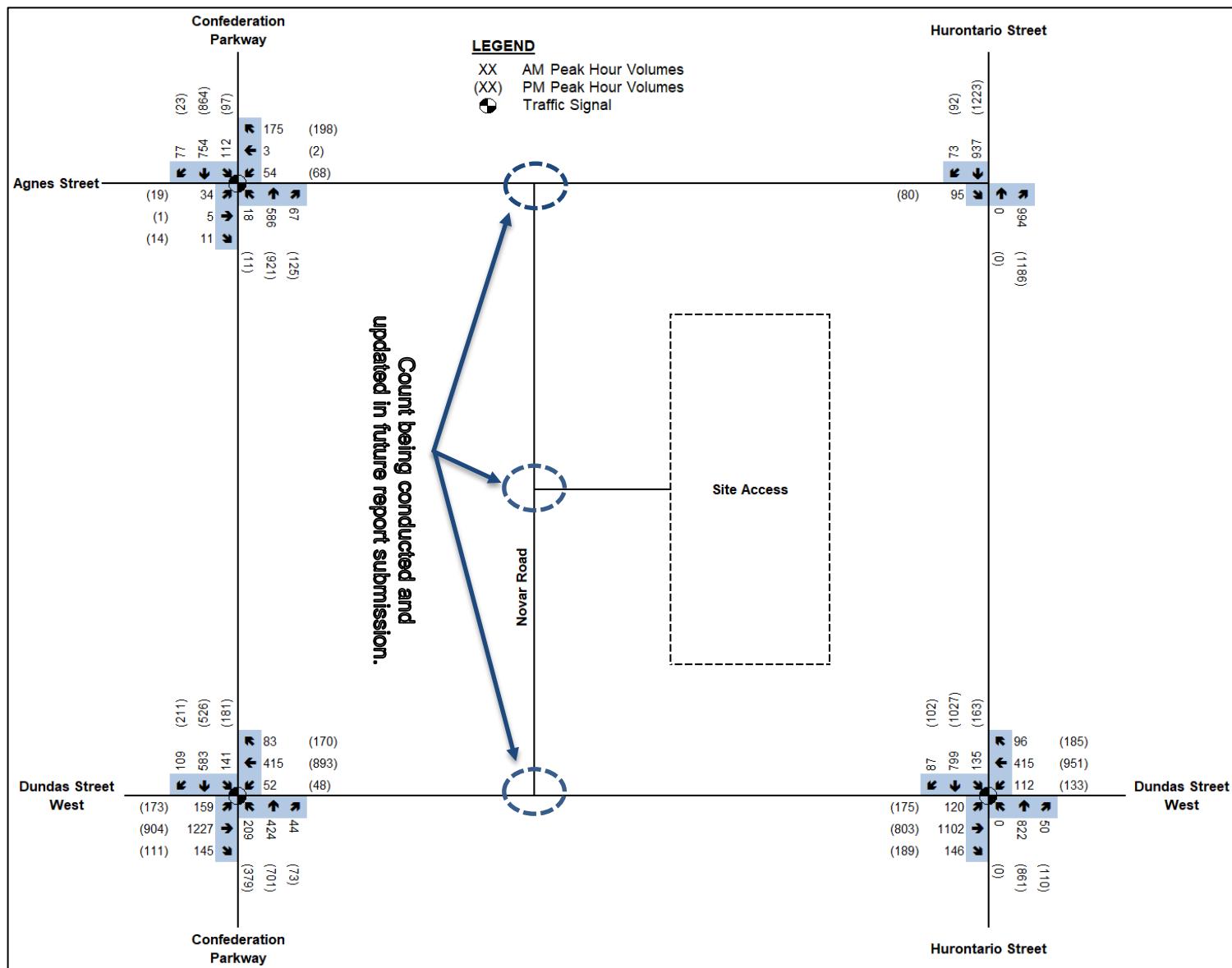


Figure 4 - 2021 Future Background Volumes

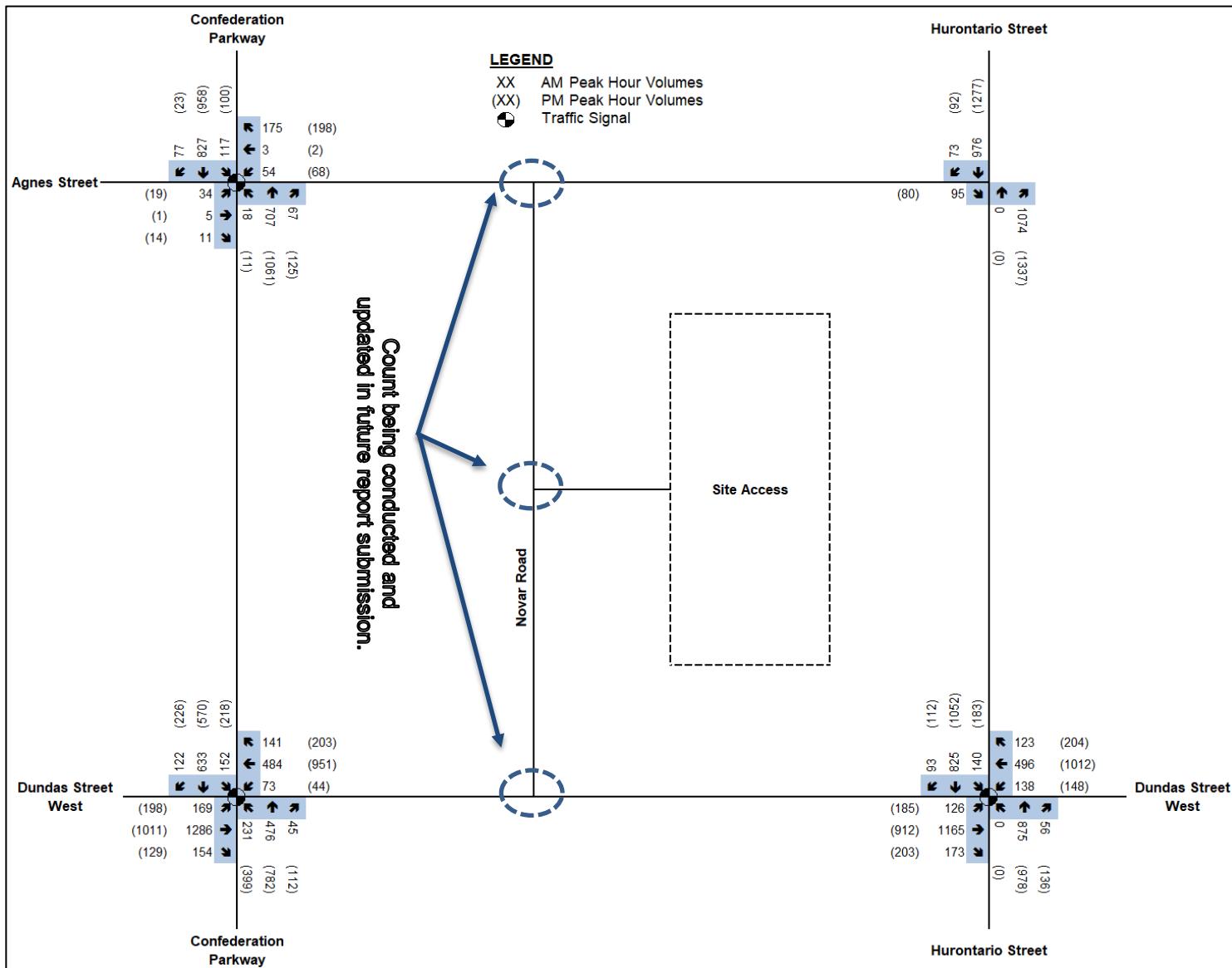


Figure 5 - 2031 Future Total Volumes



5. Trip Generation

Site traffic generated by the proposed development for the weekday a.m. and p.m. peak hours were estimated by applying the trip rates published by the ITE Trip Generation Manual, 10th Edition. Trip generation for the residential units used Land Use Code 222 (Multifamily Housing – High-Rise), retail space used Land Use Code 820 (Shopping Centre). The results of this trip generation analysis are presented in **Table 2**.

Retail developments typically generate new primary trips on the adjacent road network, and pass-by trips at the site access from trips that are already on the adjacent roads. Since access to the site is not provided from a major traffic contributor but instead is onto Novar Road, it is expected that this site will not generate a large number of pass-by trips. As a result, as a conservative measure, site trips from the retail uses was not reduced to account for pass-by traffic.

The Transportation Tomorrow Survey (TTS) data shows the existing non-auto modal split is approximately 29% (GTA Zone 3867). As a conservative analysis, the subject site is assumed to achieve the same transit model split applied to both the 2021 and 2031 planning horizons despite the introduction of the Hurontario LRT line.

For the purpose of this analysis, a comparison of the trip generation using the average rate and fitted-curve equation were compared and the worse case scenario carried forward for analysis for both the a.m. and p.m. peak hours.

Table 2 Estimated Site Traffic

Land Use	Units	Parameters	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (High-Rise)	405 units	Trip Rate	0.05	0.18	0.23	0.16	0.11	0.27
		Trip Ratio	24%	76%	-	61%	39%	-
		Gross Trips	22	71	93	66	42	108
Shopping Centre	5.49 x 1000 GFA	Trip Rate	0.55	0.36	0.91	4.55	4.92	9.47
		Trip Ratio	62%	38%	-	48%	52%	-
		Gross Trips	3	2	5	25	27	52
Total Primary Trips			25	73	98	91	69	160

As summarized in the table above, the proposed development is expected to generate a total of 98 new two-way vehicle trips during the a.m. peak hour consisting of 25 inbound and 73 outbound trips.

During the p.m. peak hour, the development is expected to generate a total of 160 new two-way vehicle trips during consisting of 91 inbound and 69 outbound trips.

5.1 Site Distribution and Assignment

The distribution of site traffic was derived from the Transportation Tomorrow Survey (TTS) summary data for all trips between 6:00 and 9:00 am in the four zones representing the Cooksville area of Mississauga. The origin zones are 3862, 3867, 3871 and 372 and the destination zones are all other GTHA zones. The resulting distribution was locally adapted based on existing traffic patterns in the



vicinity of the site. **Table 3** summarizes the proportion of residential site trips distributed under the future conditions by direction of approach and departure. Because the LRT is expected to restrict Agnes Street at Hurontario Street to right-in/out only in 2021, the outbound north trips are expected to utilize Confederation Parkway and inbound trips from the south are expected to utilize Dundas Street.

Table 3 Site trip distribution

To/From Agnes Street	via	Inbound/Outbound Distribution (%)
North	Hurontario Street	22%
	Confederation Parkway	23%
South	Hurontario Street	19%
	Confederation Parkway	19%
East	Dundas Street	3%
West	Dundas Street	14%
Total		100%

The proportions of commercial site trips were evenly distributed to the study area road network, which were split 25% north and 25% south on Hurontario Street and Confederation Parkway and 25% east and west on Dundas Street. The distribution again made an allowance for turning restrictions along Hurontario Street.

The estimated site trips generated by the proposed development assigned to the adjacent road network for the weekday am and pm peak hours are shown in **Figure 7** (residential) and **Figure 8** (commercial).

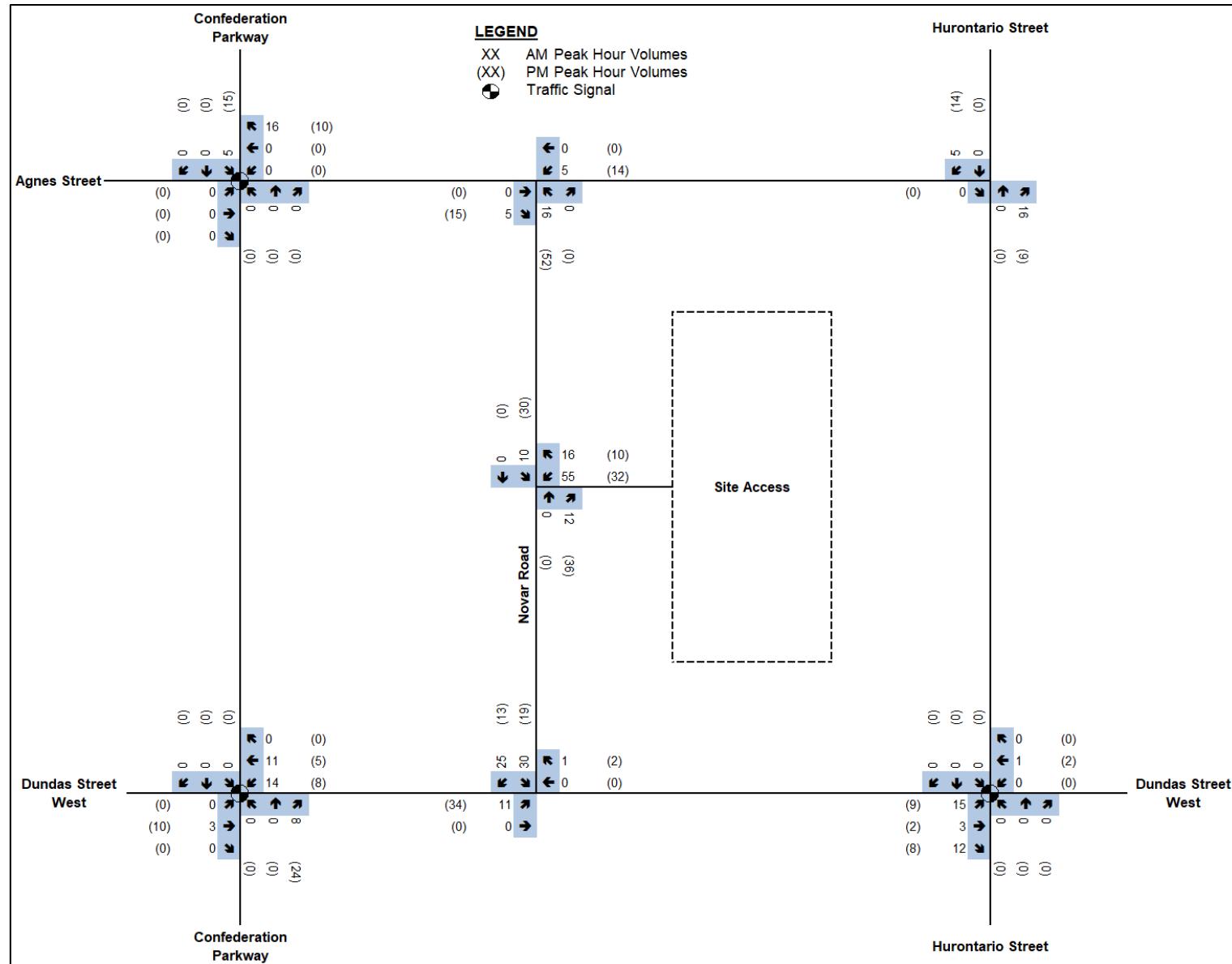


Figure 6 - Estimated Residential Site Trips

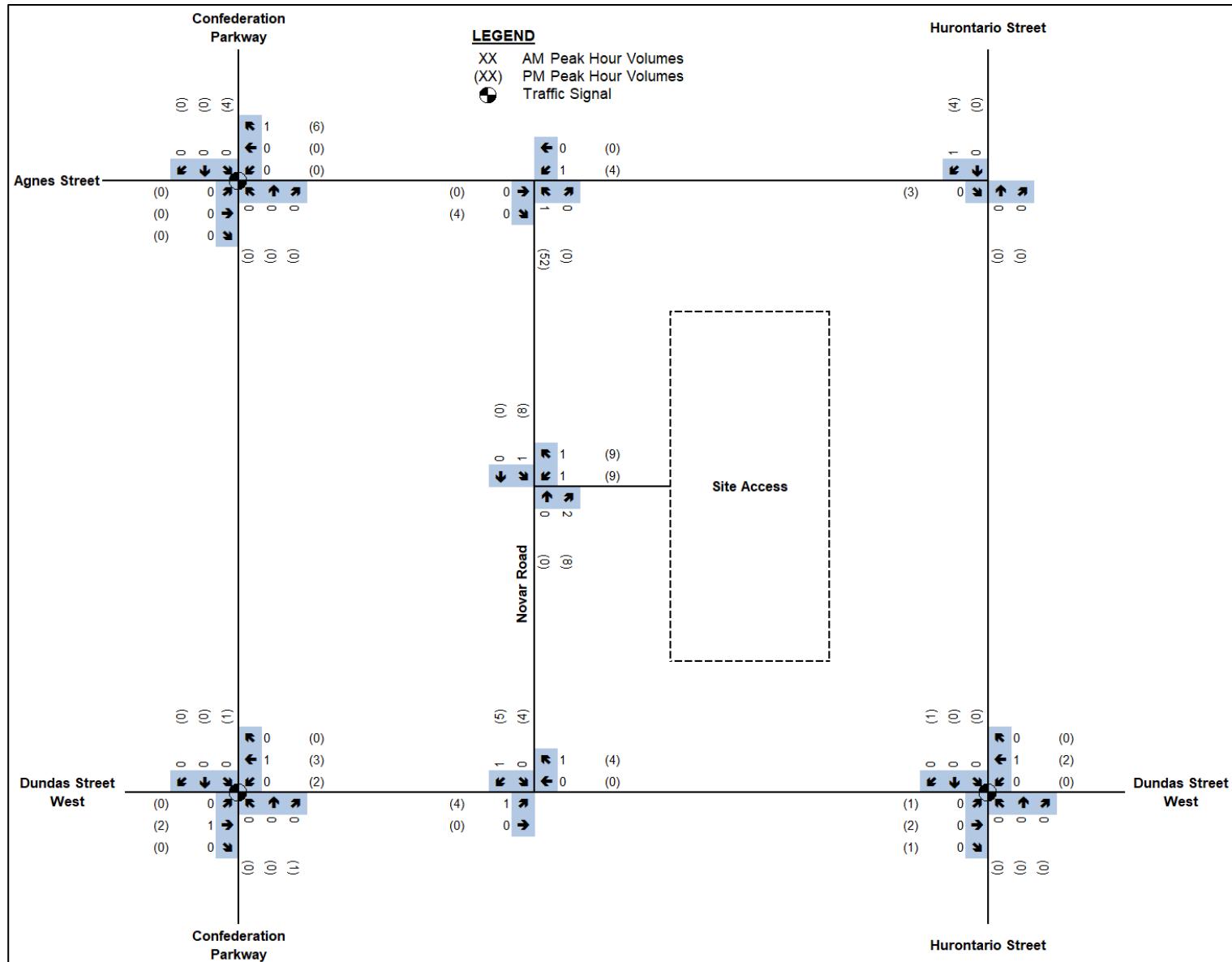


Figure 7 - Estimated Retail Site Trips



6. Future Total Traffic

The future total traffic conditions in the weekday peak study hours for each of the 2021 and 2031 planning horizons were derived by combining the projected future background traffic with the corresponding estimates of the site generated traffic. The future background traffic conditions are after the opening of the LRT on Hurontario Street in 2021.

Figure 8 summarizes the future total traffic volumes at the 2021 planning horizon, and **Figure 9** summarizes the future total traffic volumes at the 2031 planning horizon.

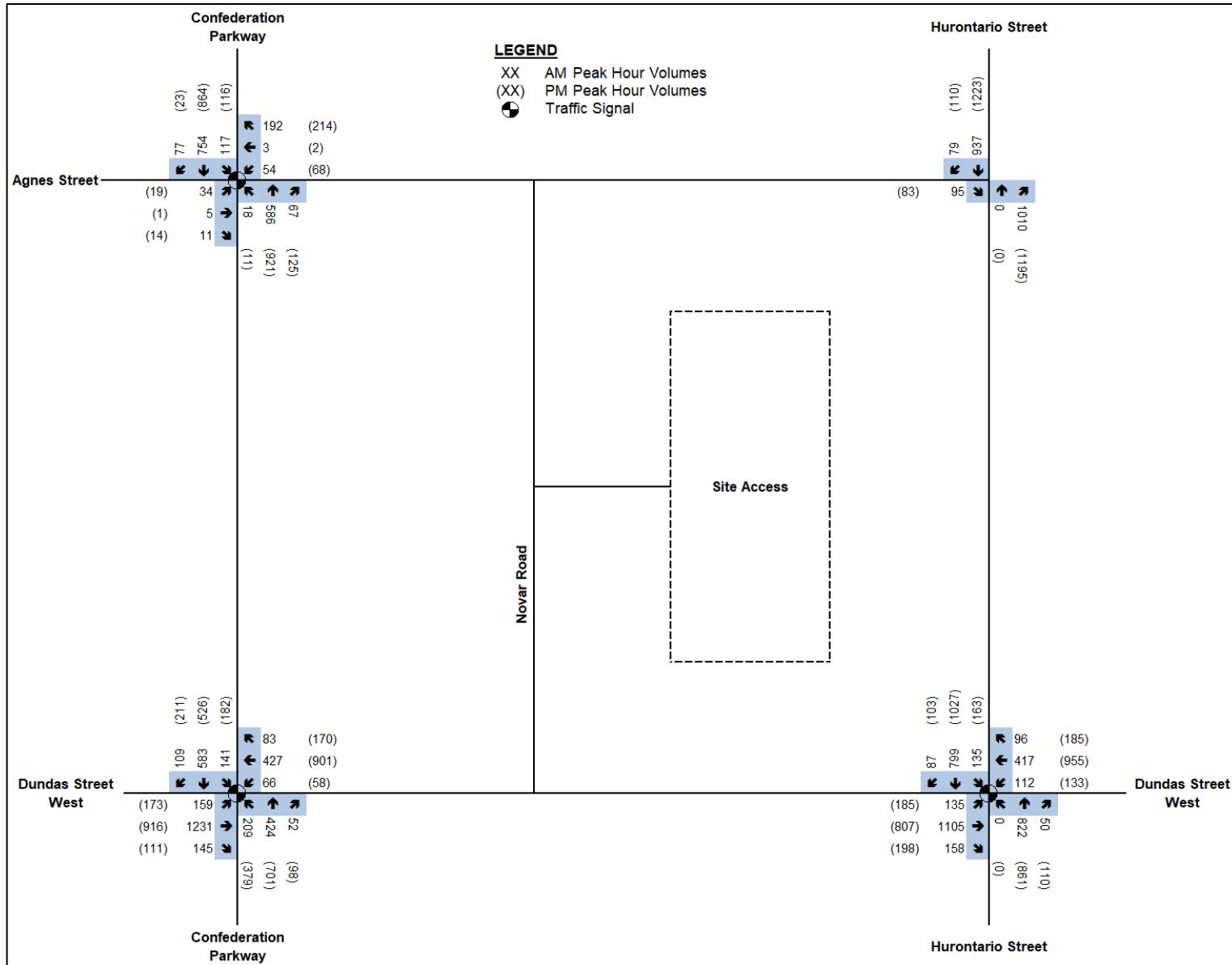


Figure 8 - 2021 Future Total Volumes

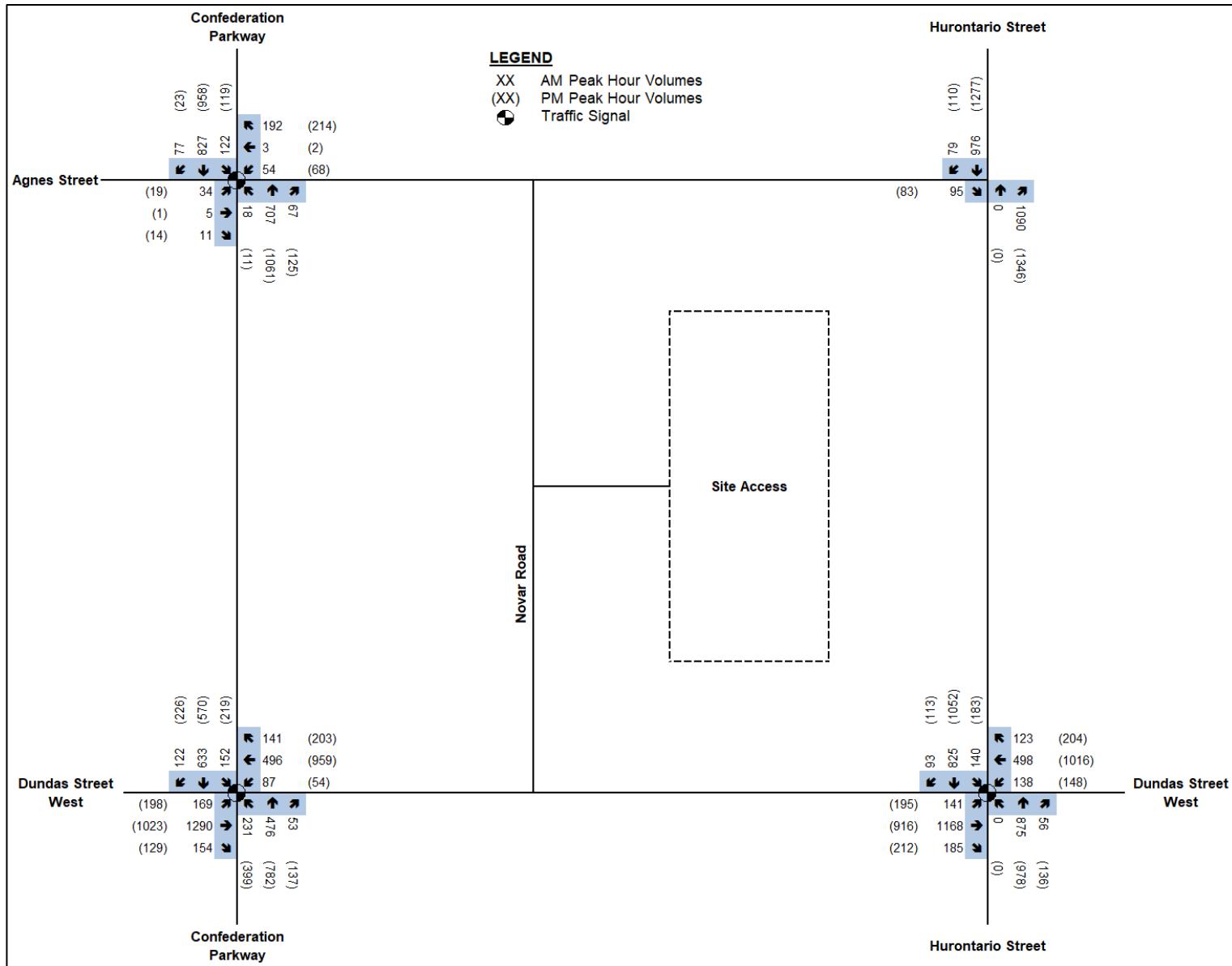


Figure 9 - 2031 Future Total Volumes



7. Capacity Analysis

7.1 Intersection capacity analysis

The capacity analysis identifies how well the intersections and driveways are operating. The analysis contained within this report utilized the Highway Capacity Manual (HCM) 2000 procedure within the Synchro Version 10 Software package. The reported intersection volume-to-capacity ratios (v/c) are a measure of the saturation volume for each turning movement, while the levels-of-service (LOS) are a measure of the average delay for each turning movement. Queuing characteristics are reported as the predicted 95th percentile queue for each turning movement. Both pedestrian crossing volumes and heavy vehicle proportions are included in the analyses. The pedestrian volumes under the future conditions were assumed to have grown by 2% per year to each of the planning horizons. This also accounted for any pedestrians that would have been generated by the proposed development.

In accordance with City of Mississauga Terms of Reference for Transportation Impact Studies, the analysis includes identification and required modifications and improvements (if any) at intersections where the addition of background growth or background growth plus site-generated traffic/transit volumes causes the following:

- Unsignalized: Level of service (LOS), based on average delay per vehicle, on individual movements exceed LOS 'E'
- Unsignalized: The estimated maximum queue length for an individual movement exceeds the available queue storage
- Signalized: v/c ratios for overall intersection operations, through movements or shared through/turning movements increase to 0.85 or above
- Signalized: v/c ratios for exclusive movements increase to 0.90 or above
- Signalized: Queues for an individual movement are projected to exceed available turning lane storage

The following tables summarize the HCM capacity results for the study intersections during the weekday a.m. and p.m. peak hours under future background (2021) and future total (2021 and 2031) traffic conditions. The detailed calculation sheets are provided in Appendix C.

7.2 Hurontario Street at Dundas Street

Capacity analyses during the weekday a.m. and p.m. peak hours is summarized in **Table 4** from detailed Synchro reports attached in the appendix.

The overall vehicular capacity of this intersection will ultimately be less when the Hurontario LRT is built. Under the future 2021 and 2031 conditions, Hurontario Street will be reduced to two northbound and southbound travel lanes, while the northbound and southbound left turns would operate on protected phases only. The existing left turn storage lengths are 30 metres, eastbound and westbound, 45 metres northbound and 65 metres southbound. The available eastbound, westbound and northbound left turn storage length is however potentially longer because they transition into two-way left turn lanes. While the existing northbound and southbound left turn lane storage lengths were



adopted under the future 2031 conditions, rebuilding Hurontario Street for the LRT is expected to accommodate the future queuing characteristics

Table 4 - Capacity analyses Hurontario Street at Dundas Street

Traffic Condition	Movement v/c (LOS) delay in seconds, 95 th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Future Background 2021	<u>Overall: 0.69 (D)</u> EBL: 0.37 (C) 27s, 38m EBT: 0.82 (D) 47s, 188m EBR: 0.25 (D) 42s, 41m WBL: 0.59 (C) 34s, 33m WBTR: 0.38 (C) 30s, 63m NBTR: 0.64 (D) 37s, 127m SBL: 0.54 (C) 27s, 34m SBTR: 0.56 (C) 28s, 115m	<u>Overall: 0.80 (D)</u> EBL: 0.79 (D) 40s, 65m EBT: 0.59 (D) 38s, 127m EBR: 0.39 (D) 38s, 57m WBL: 0.47 (C) 27s, 31m WBTR: 0.90 (D) 52s, 185m NBTR: 0.76 (D) 43s, 150m SBL: 0.73 (D) 35s, 49m SBTR: 0.72 (C) 34s, 158m
Future Total 2021	<u>Overall: 0.70 (D)</u> EBL: 0.35 (C) 23s, 38m EBT: 0.85 (D) 49s, 191m EBR: 0.29 (D) 37s, 46m WBL: 0.56 (C) 33s, 33m WBTR: 0.43 (C) 34s, 69m NBTR: 0.64 (D) 38s, 128m SBL: 0.50 (C) 25s, 33m SBTR: 0.55 (C) 28s, 111m	<u>Overall: 0.81 (D)</u> EBL: 0.79 (D) 39s, 65m EBT: 0.57 (D) 39s, 128m EBR: 0.40 (D) 36s, 59m WBL: 0.47 (C) 27s, 31m WBTR: 0.91 (D) 52s, 188m NBTR: 0.79 (D) 46s, 154m SBL: 0.73 (D) 40s, 51m SBTR: 0.73 (C) 35s, 160m
Future Total 2031	<u>Overall: 0.74 (D)</u> EBL: 0.42 (C) 26s, 37m EBT: 0.86 (D) 49s, 198m EBR: 0.38 (D) 38s, 56m WBL: 0.68 (D) 38s, 43m WBTR: 0.47 (C) 32s, 80m NBTR: 0.68 (D) 38s, 136m SBL: 0.65 (C) 33s, 35m SBTR: 0.60 (C) 30s, 120m	<u>Overall: 0.91 (D)</u> EBL: 0.91 (E) 57s, 75m EBT: 0.69 (D) 41s, 153m EBR: 0.48 (D) 38s, 59m WBL: 0.56 (C) 29s, 35m WBTR: 0.97 (E) 62s, 220m NBTR: 0.90 (D) 53s, 186m SBL: 0.91 (E) 76s, 78m SBTR: 0.74 (C) 35s, 163m

Under future background traffic conditions in 2021, the introduction of the Hurontario LRT and subsequent changes to traffic volumes results in only a slight change to overall v/c ratios and LOS under the future background 2021 traffic conditions. The reserve intersection reserve capacity remains significant during the weekday peak hours. The only movement approaching critical levels is the westbound through right movement with 0.90 v/c ratio during the p.m. peak hour.

Under the future total 2021 traffic conditions the impact on intersection operations from the addition of site traffic is negligible. The a.m. peak hour operates with an overall v/c ratio of 0.70 and continue to have significant reserve capacity with the exception of the eastbound through movement which just approached critical levels with v/c ratio of 0.85 during the a.m. peak hour. The pm peak hour also shows negligible increase in overall v/c ratios (0.81, LOS D) with westbound critical through/right movement increasing slightly from a v/c ratio of 0.90 to 0.91.



The 2031 horizon year which includes continued corridor growth along Hurontario Street and Dundas Street, the reduction in overall intersection capacity becomes apparent, only marginally during the weekday a.m. peak hour with a v/c ratio of 0.74 and LOS D, but more significant during the weekday p.m. peak hour which increases to a v/c ratio of 0.91 and LOS D. The critical movements during the weekday p.m. peak hour include the eastbound left turn at 0.91, the westbound through/right at 0.97, the northbound through/right at 0.90, and the southbound left turn at 0.91.

If the overall Hurontario Street operational delay through this intersection during the p.m. peak period is perceived to be indicative of congestion, then regularly commuting drivers are expected to adapt. The obvious alternative choices are to use the LRT instead of driving, divert to Confederation Parkway or use the ring road system in Cooksville to by-pass the core area. As a result there are no recommended improvements at this intersection that are not addressed by driver behaviour once the future Hurontario LRT is constructed.

7.3 Confederation Parkway at Dundas Street

Capacity analyses during the weekday a.m. and p.m. peak hours is summarized in **Table 5** from detailed Synchro reports attached in the appendix.

Table 5 Capacity analyses Confederation Parkway at Dundas Street

Traffic Condition	Movement v/c (LOS) delay in seconds, 95 th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Future Background 2021	<u>Overall: 0.73 (D)</u> EBL: 0.35 (B) 14s, 31m EBTR: 0.71 (C) 21s, 166m WBL: 0.52 (D) 42s, 29m WBTR: 0.30 (C) 30s, 76m NBL: 0.74 (E) 68s, 60m NBTR: 0.35 (D) 36s, 62m SBL: 0.63 (C) 66s, 60m SBTR: 0.79 (E) 64s, 117m	<u>Overall: 0.79 (D)</u> EBL: 0.80 (D) 44s, 48m EBTR: 0.57 (C) 25s, 118m WBL: 0.27 (C) 26s, 15m WBTR: 0.68 (D) 37s, 174m NBL: 0.96 (E) 77s, 146m NBTR: 0.71 (D) 47s, 123m SBL: 0.63 (D) 40s, 47m SBTR: 0.95 (E) 76s, 142m
Future Total 2021	<u>Overall: 0.74 (D)</u> EBL: 0.34 (B) 15s, 29m EBTR: 0.69 (C) 23s, 158m WBL: 0.58 (E) 55s, 37m WBTR: 0.29 (C) 3s, 76m NBL: 0.83 (D) 55s, 76m NBTR: 0.38 (C) 35s, 66m SBL: 0.67 (E) 64s, 64m SBTR: 0.83 (E) 60s, 118m	<u>Overall: 0.79 (E)</u> EBL: 0.82 (C) 46s, 48m EBTR: 0.58 (B) 25s, 120m WBL: 0.33 (C) 30s, 18m WBTR: 0.68 (D) 38s, 175m NBL: 0.96 (F) 77s, 146m NBTR: 0.74 (D) 48s, 130m SBL: 0.65 (E) 41s, 47m SBTR: 0.95 (E) 76s, 142m



Future Total 2031	<p style="text-align: center;"><u>Overall: 0.84 (D)</u></p> <p>EBL: 0.40 (B) 15s, 30m EBTR: 0.70 (C) 22s, 165m WBL: 0.82 (F) 86s, 55m WBTR: 0.36 (C) 30s, 92m NBL: 1.00 (F) 97s, 100m NBTR: 0.44 (D) 37s, 75m SBL: 0.79 (E) 78s, 77m SBTR: 0.95 (E) 74s, 146m</p>	<p style="text-align: center;"><u>Overall: 0.87 (D)</u></p> <p>EBL: 0.97 (F) 86s, 80m EBTR: 0.65 (C) 27s, 141m WBL: 0.39 (C) 32s, 16m WBTR: 0.77 (D) 39s, 179m NBL: 1.03 (F) 96s, 163m NBTR: 0.85 (D) 51s, 151m SBL: 0.89 (E) 66s, 87m SBTR: 1.02 (F) 91s, 158m</p>
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Under the future background 2021 traffic conditions the overall intersection capacity generally operates well with only the northbound left movement showing critical with a v/c ratio of 0.96 and southbound through/ right movements showing critical with v/c ratios of 0.95 during the weekday pm peak hour.

The incremental impact of the added site traffic is negligible under the 2021 total traffic conditions with no changes to overall intersection v/c ratio and LOS (0.74, LOS D) during weekday a.m. peak hour. In the p.m. peak hour, the overall v/c ratio remains unchanged at 0.79 but the delays increase from LOS D to E. Furthermore, northbound left turn and southbound through/right movements still operate acceptably with a v/c ratio 0.96 and 0.95 respectively, which confirms that incremental impact of site is negligible.

With continued corridor growth to the 2031 horizon year, this intersection is expected to operate with overall v/c ratios of 0.84 with LOS D during the a.m. peak hour with critical movements identified in the northbound left turn (v/c 1.00, LOS F) and southbound through/right (v/c 0.95, LOS E). In the p.m. peak hour the overall intersection v/c ratios increase to 0.87 with LOS D with expected critical movements in the eastbound left (v/c 0.97, LOS F), northbound left (v/c 1.03, LOS F), northbound through/right (v/c 0.85, LOS E) and southbound through/right (v/c 1.02, LOS F).

Signal timings have been optimized where appropriate to improve intersection operations. Given the long term outlook for the 2031 horizon, movements shown to operate at elevated v/c ratios will require monitoring in the future to determine if growth continues to occur as assumed and if the intersection operation begin to deteriorate before recommendations could be made for intersection improvements.

There are no improvements recommended at this intersection to accommodate the proposed development.

7.4 Hurontario Street at Agnes Street

Capacity analyses during the weekday a.m. and p.m. peak hours is summarized in **Table 6** from detailed Synchro reports attached in the appendix.

Under the future in 2021 conditions the Hurontario LRT will restrict this intersection to right-in/out only.



Table 6 Capacity analyses Hurontario Street at Agnes Street

Traffic Condition	Movement v/c (LOS) delay in seconds, 95 th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Future Background 2021	EBR: 0.29 (C) 16s, <1 veh	EBR: 0.35 (C) 19s, <1 veh
Future Total 2021	EBR: 0.30 (C) 16s, <1 Veh	EBR: 0.35 (C) 19s, <1 veh
Future Total 2031	EBR: 0.32 (C) 17s, <1 veh	EBR: 0.40 (C) 22s, 9m

Under the future background 2021 traffic conditions when Agnes Street is right-in/out only at Hurontario Street, the Hurontario Street capacity is constrained to two travel lanes and the eastbound right turn from Agnes Street to Hurontario Street is predicted to have longer but acceptable delays to enter the southbound stream during the peak hours because of southbound queuing and limited gap opportunities. While the impact of the added site traffic is marginally apparent under the future total 2021 and 2031 traffic conditions in both weekday peak hours, the operational characteristics are be expected to be satisfactory.

There are no improvements recommended at this intersection to accommodate the proposed development.

7.5 Confederation Parkway at Agnes Street

Capacity analyses during the weekday a.m. and p.m. peak hours is summarized in **Table 7** from detailed Synchro reports attached in the appendix.

Table 7 Capacity analyses Confederation Parkway at Agnes Street

Traffic Condition	Movement v/c (LOS) delay in seconds, 95 th Percentile Queue	
	AM Peak Hour	PM Peak Hour
Future Background 2021	<u>Overall: 0.31 (A)</u> EBLTR: 0.32 (C) 28s, 12m WBLT: 0.29 (C) 27s, 15m WBR: 0.13 (C) 26s, 15m NBL: 0.04 (A) 2s, <1 veh NBTR: 0.25 (A) 3s, 17m SBL: 0.20 (A) 3s, 9m SBTR: 0.31 (A) 3s, 23m	<u>Overall: 0.45 (A)</u> EBLTR: 0.08 (B) 13s, <1 veh WBLT: 0.23 (B) 14s, 14m WBR: 0.30 (B) 14s, 21m NBL: 0.03 (A) 4s, <1 veh NBTR: 0.50 (A) 5s, 35m SBL: 0.38 (A) 6s, 13m SBTR: 0.42 (A) 5s, 29m
Future Total 2021	<u>Overall: 0.32 (A)</u> EBLTR: 0.32 (C) 26s, 12m WBLT: 0.33 (C) 26s, 14m WBR: 0.14 (C) 24s, 15m NBL: 0.04 (A) 3s, <1 veh NBTR: 0.25 (A) 3s, 17m SBL: 0.21 (A) 4s, 9m SBTR: 0.32 (A) 3s, 22m	<u>Overall: 0.45 (A)</u> EBLTR: 0.08 (B) 14s, 8m WBLT: 0.23 (B) 14s, 16m WBR: 0.35 (B) 15s, 25m NBL: 0.03 (A) 4s, <1 veh NBTR: 0.49 (A) 5s, 39m SBL: 0.45 (A) 6s, 17m SBTR: 0.41 (A) 5s, 32m



Future Total 2031	<u>Overall: 0.39 (A)</u> EBLTR: 0.15 (B) 12s, 9m WBLT: 0.21 (B) 12s, 11m WBR: 0.17 (B) 12s, 13m NBL: 0.06 (A) 4s, <1 veh NBTR: 0.38 (A) 5s, 21m SBL: 0.33 (A) 5s, 11m SBTR: 0.45 (A) 5s, 25m	<u>Overall: 0.50 (A)</u> EBLTR: 0.08 (B) 16s, 8m WBLT: 0.24 (B) 16s, 16m WBR: 0.40 (B) 17s, 28m NBL: 0.04 (A) 4s, <1 veh NBTR: 0.53 (A) 5s, 47m SBL: 0.53 (A) 7s, 23m SBTR: 0.43 (A) 5s, 36m
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This intersection has good existing signalized operational characteristics in both weekday peak hours. There is almost no change under the future background to future total 2021 traffic conditions. Under 2031 traffic conditions, during both weekday a.m. and p.m. peak hours, the operational characteristics to be expected satisfactory with no queuing, minimum delay, and good reserve capacity.

There are no improvements recommended at this intersection to accommodate the proposed development.

8. Parking Assessment

8.1 Resident Parking

The site plan (dated October 7, 2019) proposes 405 dwelling units and 5,490 sq.ft of ground floor commercial area. The development's residential unit breakdown is as follows:

- 268 one bedroom units; and
- 66 two-bedroom units.

City staff have accepted parking rates that are lower within the study area. The required parking provision was calculated using the proposed unit breakdown as summarized in Table 3 below.

Table 8 Residential Parking Provision

Use	Units	Existing Bylaw Required Parking Rate	Proposed Parking Rate	Proposed Parking Supply
Resident Parking	One bedroom – 359 units	1.25	0.9	323
	Two bedroom – 46 units	1.40	1.0	46
Visitor Parking	Total residential units – 405 units	0.20	0.15	61
Retail	510 m ²	4.3 space per 100 m ²	0	0
	Total			430



The proposed parking provision for the site is 432 parking spaces, including 51 car stackers located in the underground garage plus 2 car share spaces located on the surface level. As has been accepted by City staff on other sites, no additional parking will be provided for the commercial uses, instead commercial parking will be shared with residential visitor parking.

8.2 Bicycle Parking

Table 9 Bicycle Parking Provision

Use	Units	Existing Bylaw Required Parking Rate	Required Space	Proposed Supply
Residential	Long Term	0.6 per unit	243	332
Residential	Short Term	0.15	61	15
Total				347

Bicycle parking is provide through a total of 332 long term spaces located in the underground garage and 15 short term spaces provide at surface level.

9. Travel Demand Management (TDM)

Development of site specific TDM measures for the proposed site is consistent with the Region of Peel Official Plan which aims to increase the use of transit in order to increase the sustainability of the transportation system and help maximize the use of existing transportation infrastructure. Therefore, in the context that the primary objective is to reduce single occupancy vehicle use, the plan will review opportunities to increase the travel options available in Peel, manage travel demand and reduce traffic congestion.

1.1 Travel Demand Management

TDM refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system.

TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality
- Decreased traffic congestion to reduce travel time
- Increased travel options for businesses and commuters
- Reduced personal transportation costs and energy consumptions
- Support Provincial smart growth objectives

The combined benefits listed above will assist in creating a more active and liveable community through improvements to overall active transportation standards for the local businesses and surrounding community.



This report identifies several site-related TDM measures that address City of Mississauga and Peel Region requirements.

1.2 Existing TDM opportunities

Public Transit – Existing and Future

Mi-Way Transit

Mississauga Transit currently operates routes 1, 19, 28, 91, 101(A), and 103 in the vicinity of the site. Routes 1 (Dundas) and 101(A) (Dundas Express), provide east-west service along the Dundas corridor south of the site. Routes 19 (Hurontario) and 103 (Hurontario Express) provide north-south service along the Hurontario corridor east of the site. Route 28 provides service on Confederation Parkway west of the site. Route 91 (Hillcrest) provide local service through the Cooksville GO Station north of the site. The site location is therefore centrally located and in close proximity to excellent Mi-Way transit service.

GO Transit

GO Transit operates both train and bus service at the Cooksville GO Station. There are currently 8 trains in each of the am and pm peak periods with service along the Milton line for downtown Toronto. GO Transit also operates a regular daily bus service through the Cooksville GO Station serving all stations on the Milton line as well as the Meadowvale Town Centre and the City Centre Transit Terminal.

Future Hurontario LRT

There is a planned LRT Stop at the intersection of Dundas Street and Hurontario Street approximately 275 metres walking distance from the subject site.

Sidewalk Connectivity

The proposed site plan provides adequate pedestrian connections to the adjacent existing and future public sidewalk system. There are boulevard sidewalks on both sides of the street along Confederation Parkway, Dundas Street and King Street West and Hurontario Street. Sidewalk connections to and from the proposed site are provided connecting to the existing sidewalks along Dundas Street West, Confederation Parkway and King Street West.

Active Transportation

The City of Mississauga Cycling Master Plan identifies the following active mode transportation plans (both municipal and regional) in the vicinity of the site:

- Confederation Parkway is an existing on-road bicycle route.
- Dundas Street West west of Confederation Parkway is a proposed primary boulevard bicycle route.
- Confederation Parkway and Hurontario Street are proposed primary on-road bicycle routes.



1.3 Proposed TDM measures

The TDM plan proposes measures to meet the objectives and targets to reduce vehicular demand and encourage passenger, transit, cycling, and walking. Details are reviewed with each of the following TDM measures.

Bicycle Parking

Visible, well-lit short term bicycle parking will be provided for visitors to the site at ground level. Secure indoor long term bicycle parking spaces will also be provided for residents within the underground parking garage.

Parking

The parking provision for the site is consistent with the reduced parking standard accepted for nearby developments. The reduced standard is appropriate given the proximity to transit corridors with increased service level, thus reducing parking demand and shifting peak-hour commuter trips to non-auto modes.

Car Share Space

The subject site provides two car share parking spaces within dedicated parking spaces that are in a priority location and publicly accessible.

Pedestrian and Bicycle Network Facility Information Distribution

People who cycle for recreational purposes are good groups to target as potential commuter cyclists. They have access to a bicycle, and may already be familiar with the City's network of cycling and trail facilities. Many residents, however, may have simply never tried cycling and could be unfamiliar with appropriate routes, techniques and advice for commuting to work / school by bike. This could be reinforced through a Bicycle Network Way-finder Map for residents that could be handed out as a pamphlet during regular communications throughout the year (i.e. Board meetings.).

Short-distance commuters could be targeted with messages focusing on the convenience, cost and health benefits of walking or cycling to work. In addition, practical advice regarding route selection, bike parking, and remaining active in cold or wet weather would be useful and affective. This information could be provided to residents during regular communications throughout the year

Elderly residents as well as people with physical limitations may be prevented from getting to their destination on their own. In these instances, carpools and shuttle services are important transportation options. The marketing of these opportunities and availability of the services should be provided in further detail to better inform these individuals.

There should be consideration given to providing content and materials for inclusion into an information package for all new residents on available pedestrian trails, cycling, and transit facilities and carpool options including community map, MiWay Transit route map, GO Transit route map and schedules.



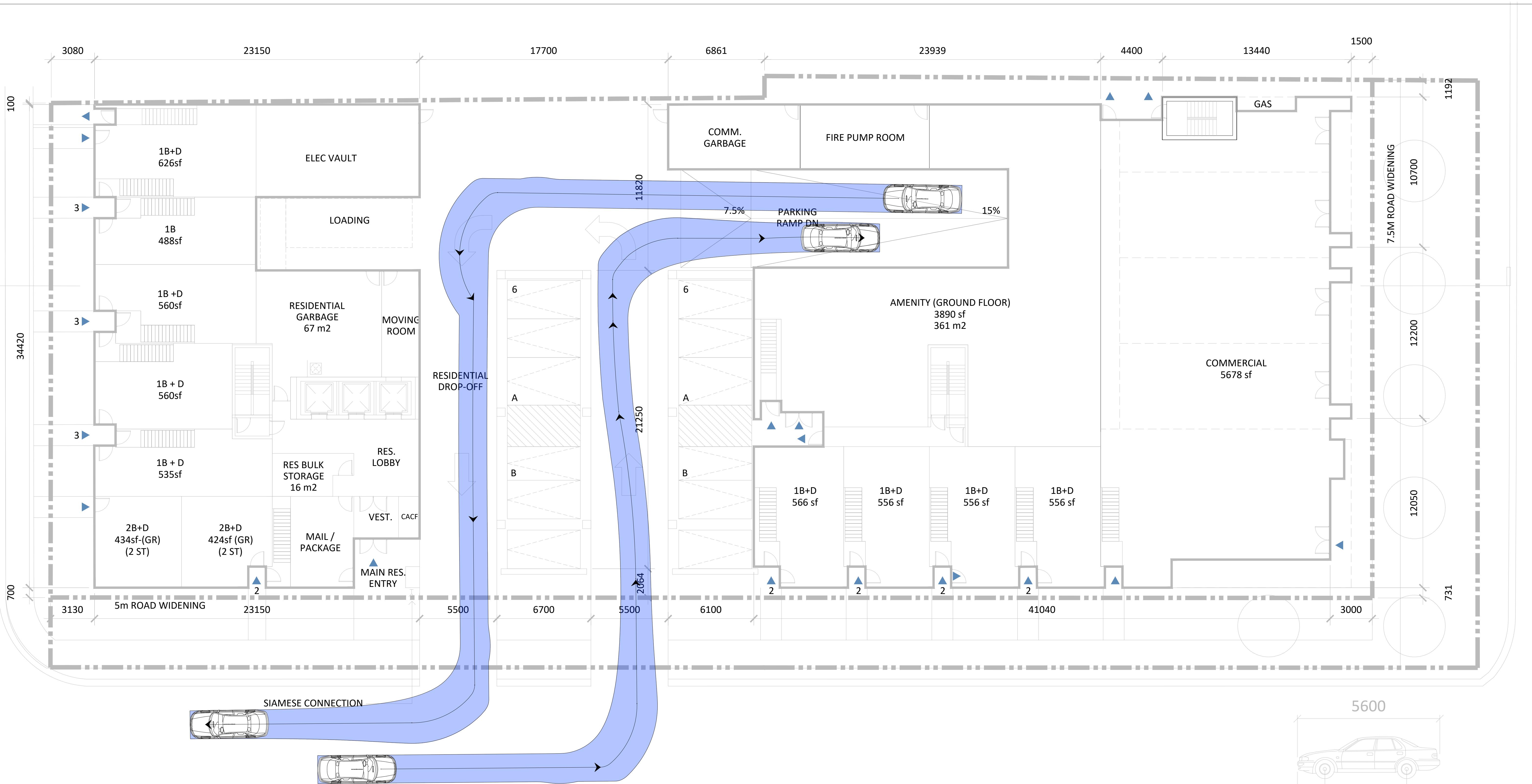
The Region of Peel and City of Mississauga should provide content and materials for inclusion into marketing material to distribute to prospective residents on available travel options.

Pre-loaded PRESTO cards

Given the location of the site adjacent to the various transit options, Peel Region and/or the City of Mississauga should consider providing each unit with a one-time twenty five dollar (\$25) pre-loaded PRESTO card, to be provided to the first owner of each respective unit, as an incentive to promote transit usage.

Appendix A

Swept Path Analysis



P

mm
Width : 2000
Track : 2000
Lock to Lock Time : 6.0
Steering Angle : 35.9

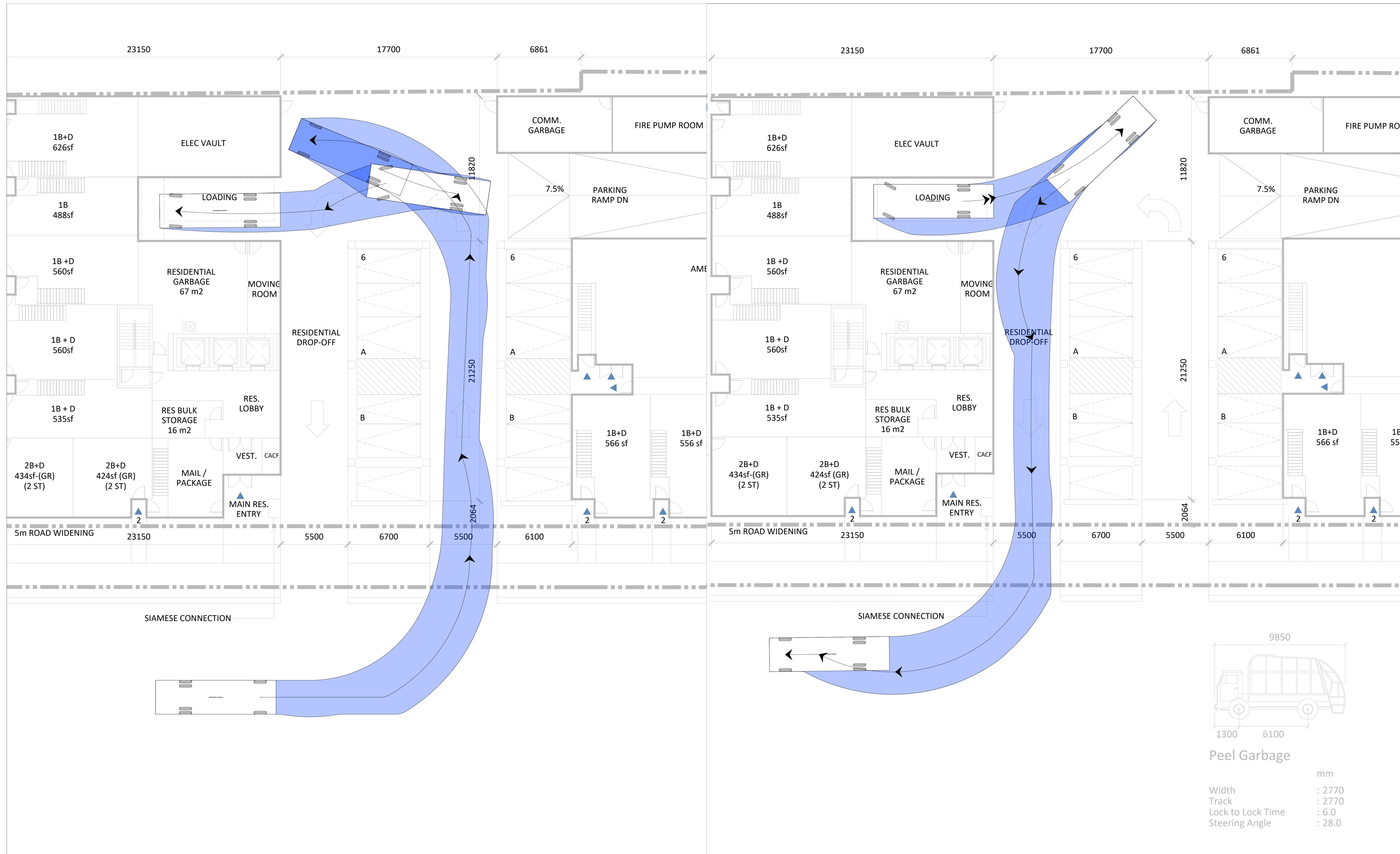
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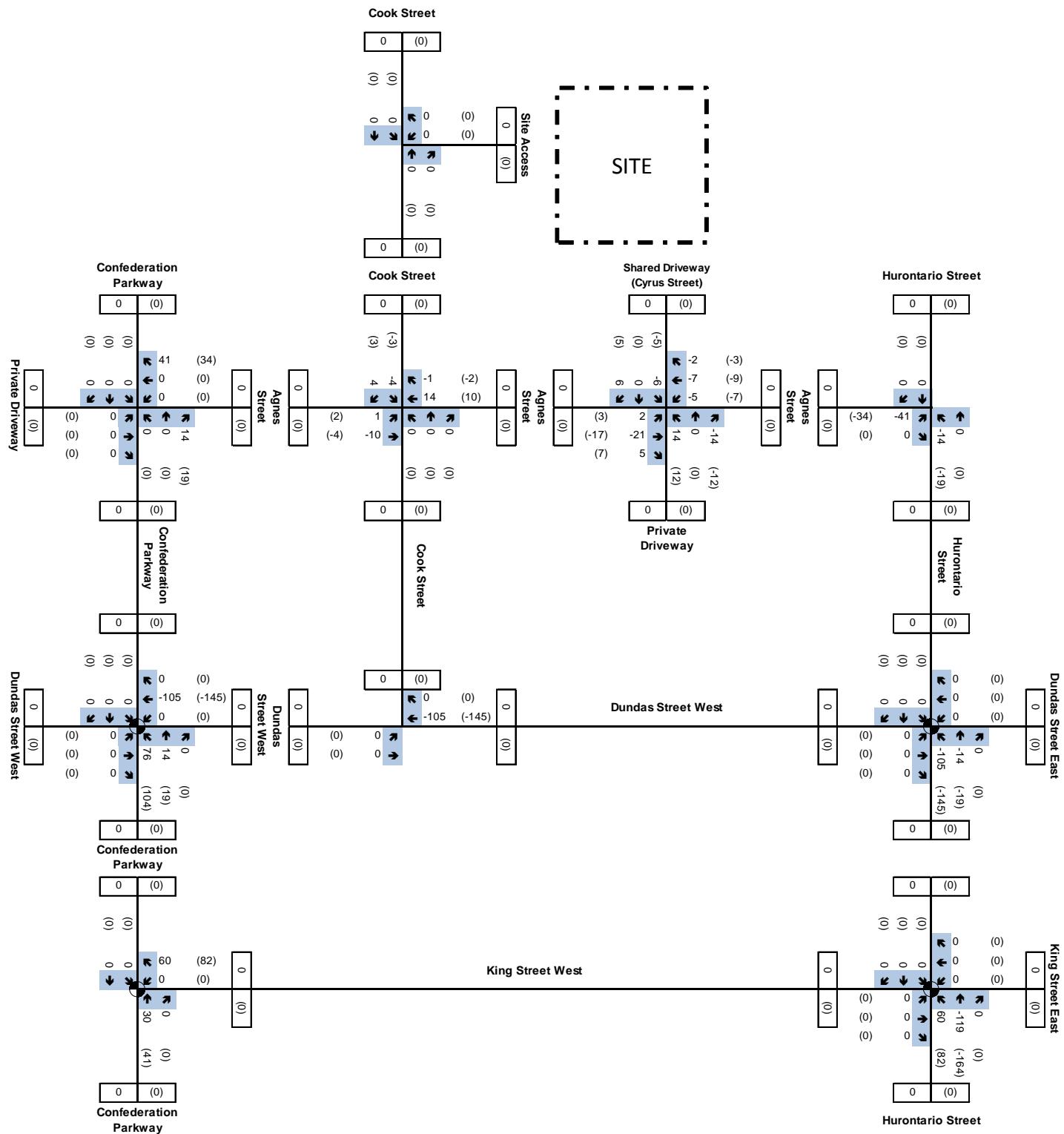


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	Original Size	Arch D
	Sheet No.	Sheet 2 of 2

Appendix B

Background Traffic Volumes



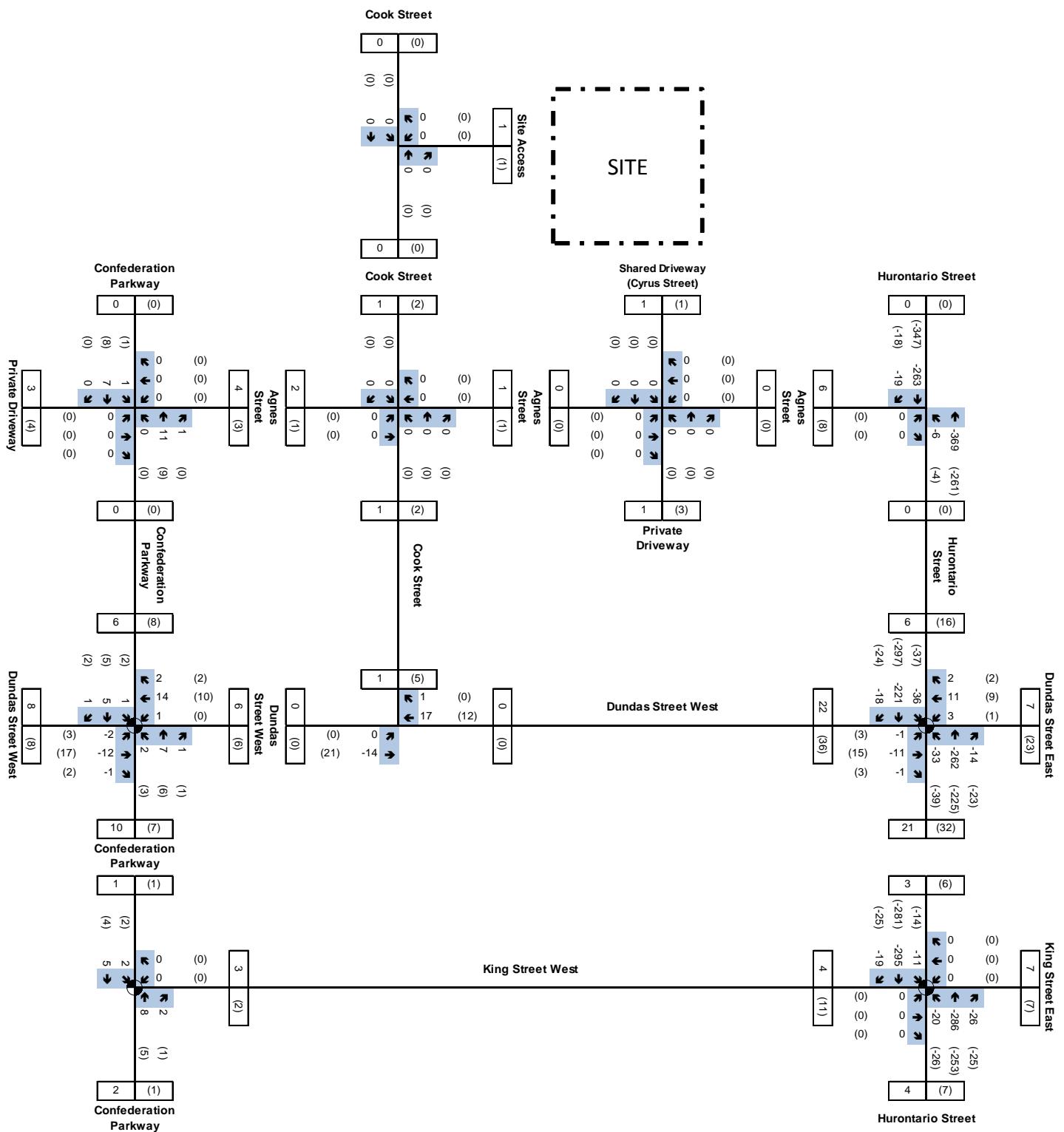
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 XX AM Peak Hour Volumes
 (XX) PM Peak Hour Volumes
 ☰ Signalized Intersection



Eminence Living Inc.
 45 Agnes Street
 Updated Traffic Impact Study
 LRT Impact
 Redistribution Traffic Volumes

Job Number | 28-21292
 Revision | B
 Date | Mar 2016

Figure AT-3



Legend

Legend

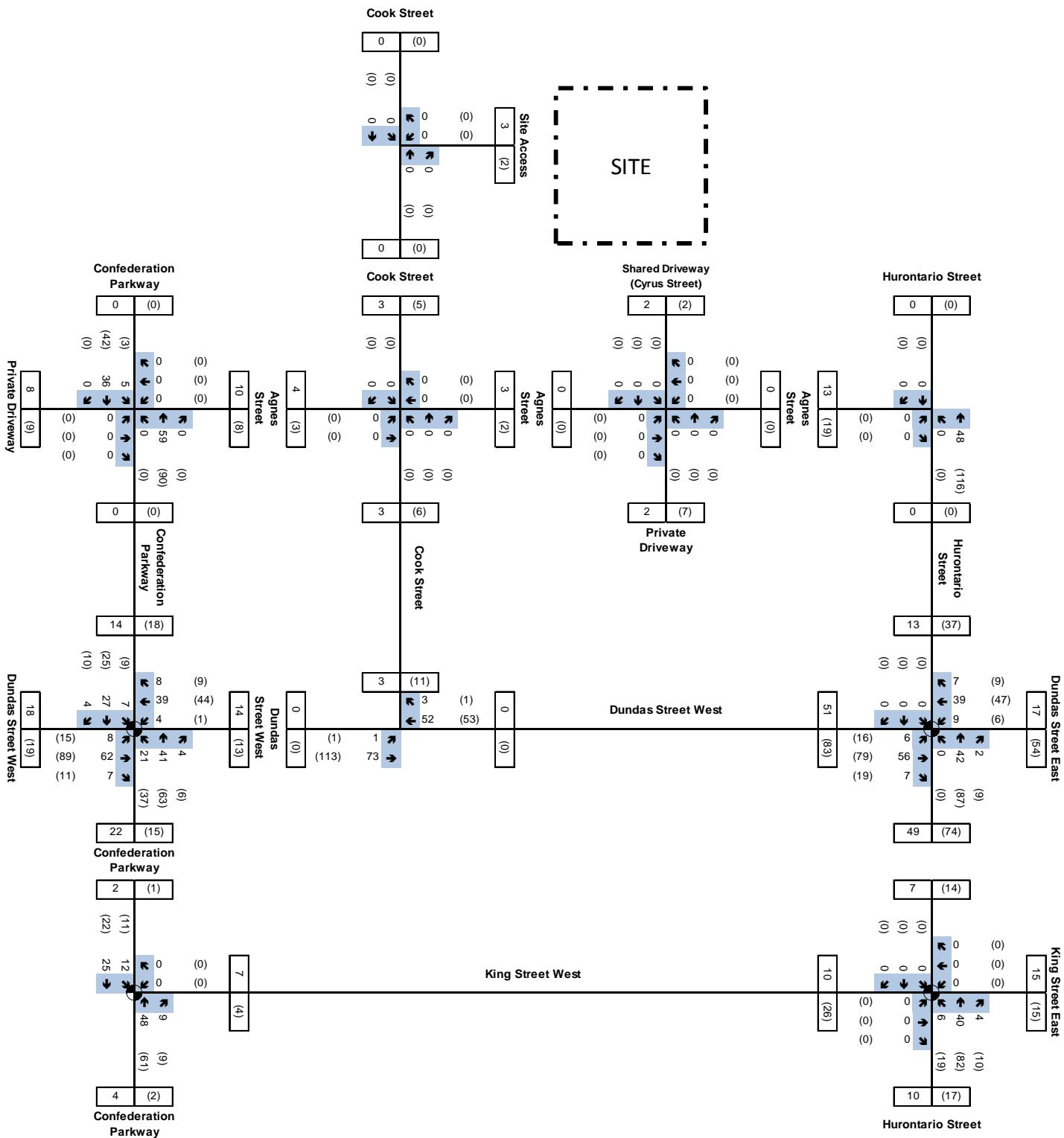
XX	AM Peak Hour Volumes
(XX)	PM Peak Hour Volumes
	Signalized Intersection



Eminence Living Inc.
45 Agnes Street
Updated Traffic Impact Study
2021 One-Time Traffic
Volume Growth Adjustment

Job Number | 28-21292
Revision | B
Date | Mar 2016

Figure AT-4



Legend

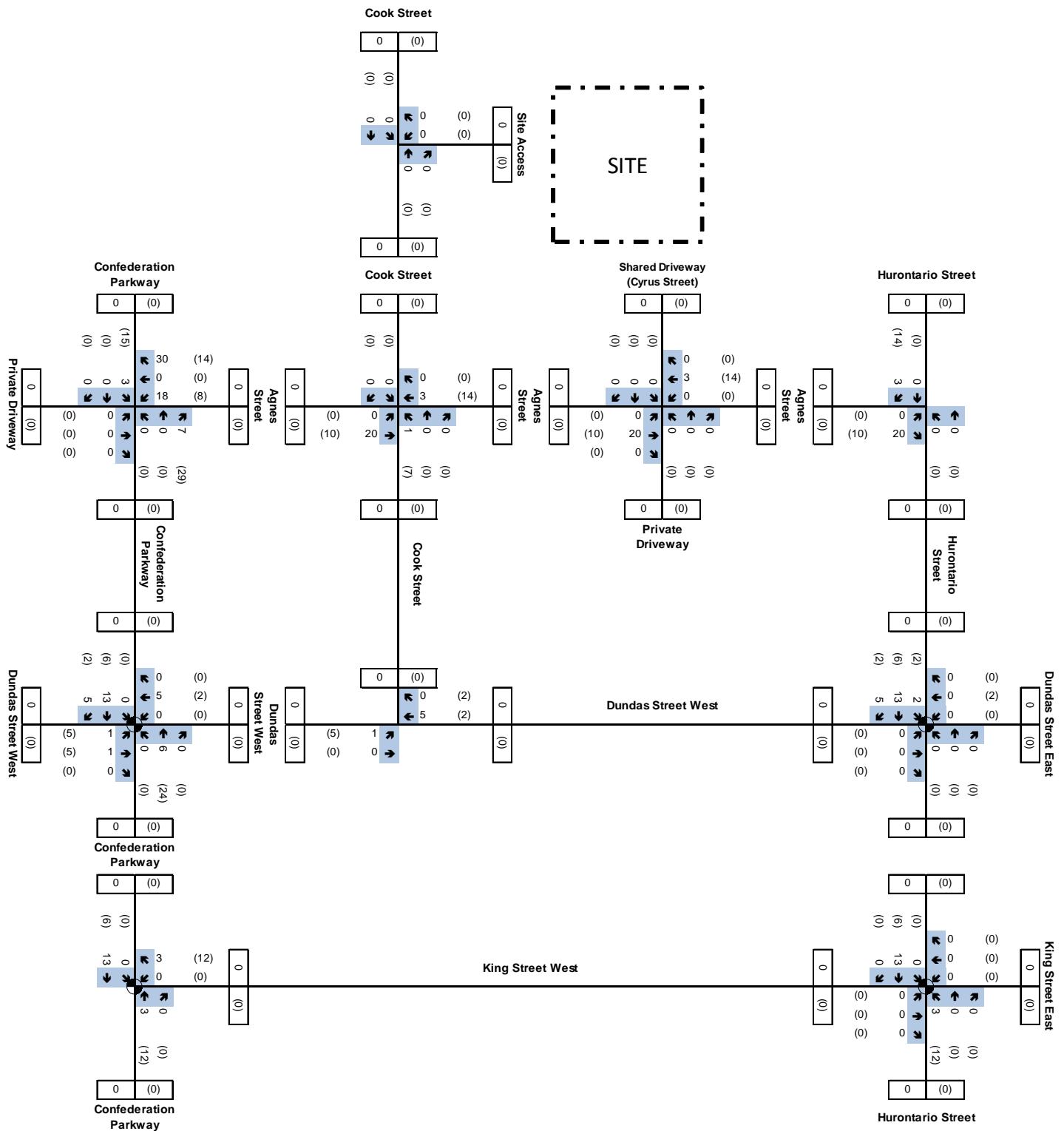
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XX AM Peak Hour Volumes
(XX) PM Peak Hour Volumes
 Signalized Intersection



Eminence Living Inc.
45 Agnes Street
Updated Traffic Impact Study
2021-2031
Traffic Volume Growth

Job Number | 28-21292
Revision | B
Date | Mar 2016

Figure AT-5



Legend

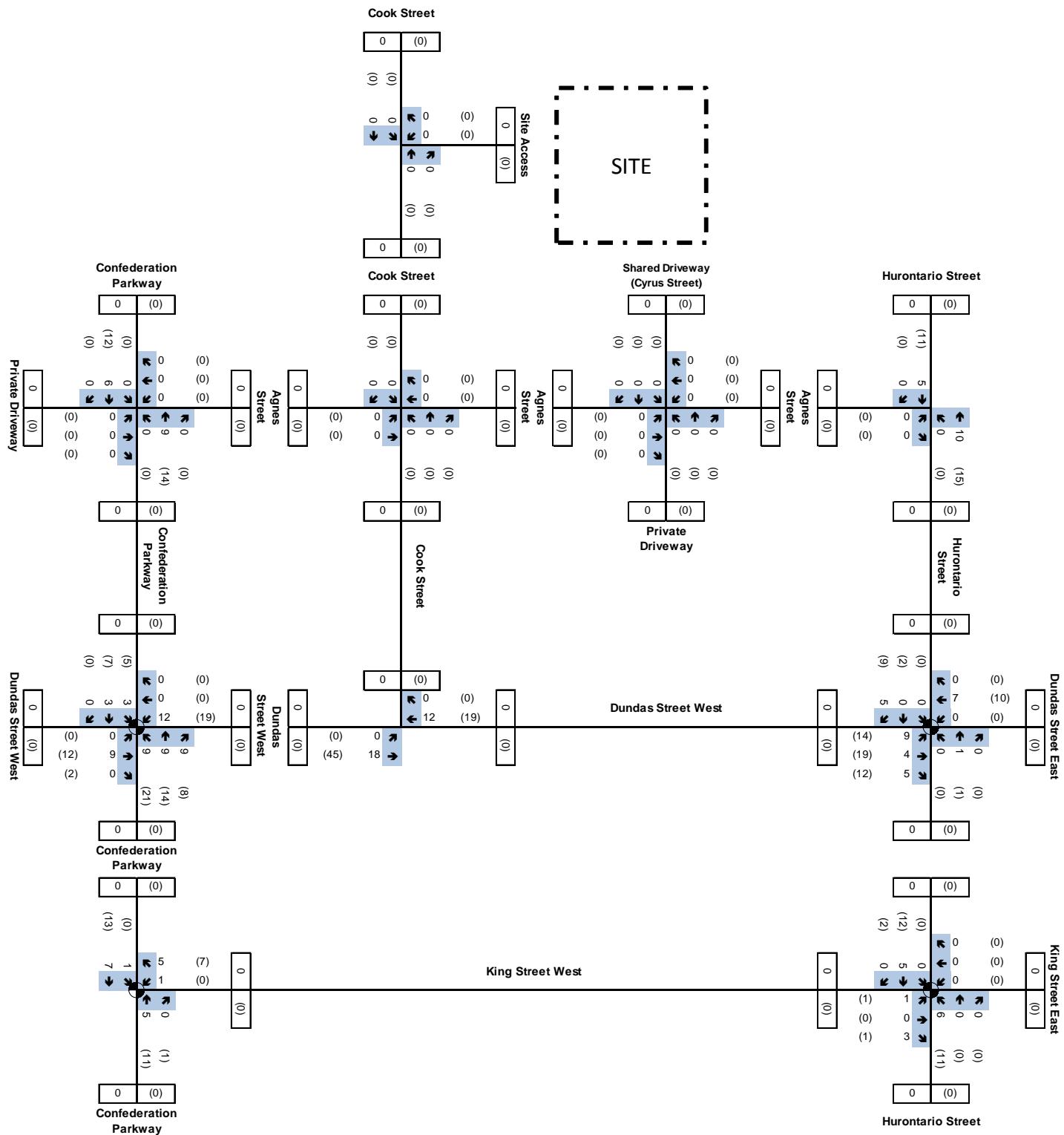
- XX AM Peak Hour Volumes
- (XX) PM Peak Hour Volumes
- Signalized Intersection



Eminence Living Inc.
45 Agnes Street
Updated Traffic Impact Study
71 Agnes Street
Traffic Volumes

Job Number | 28-21292
Revision | B
Date | Mar 2016

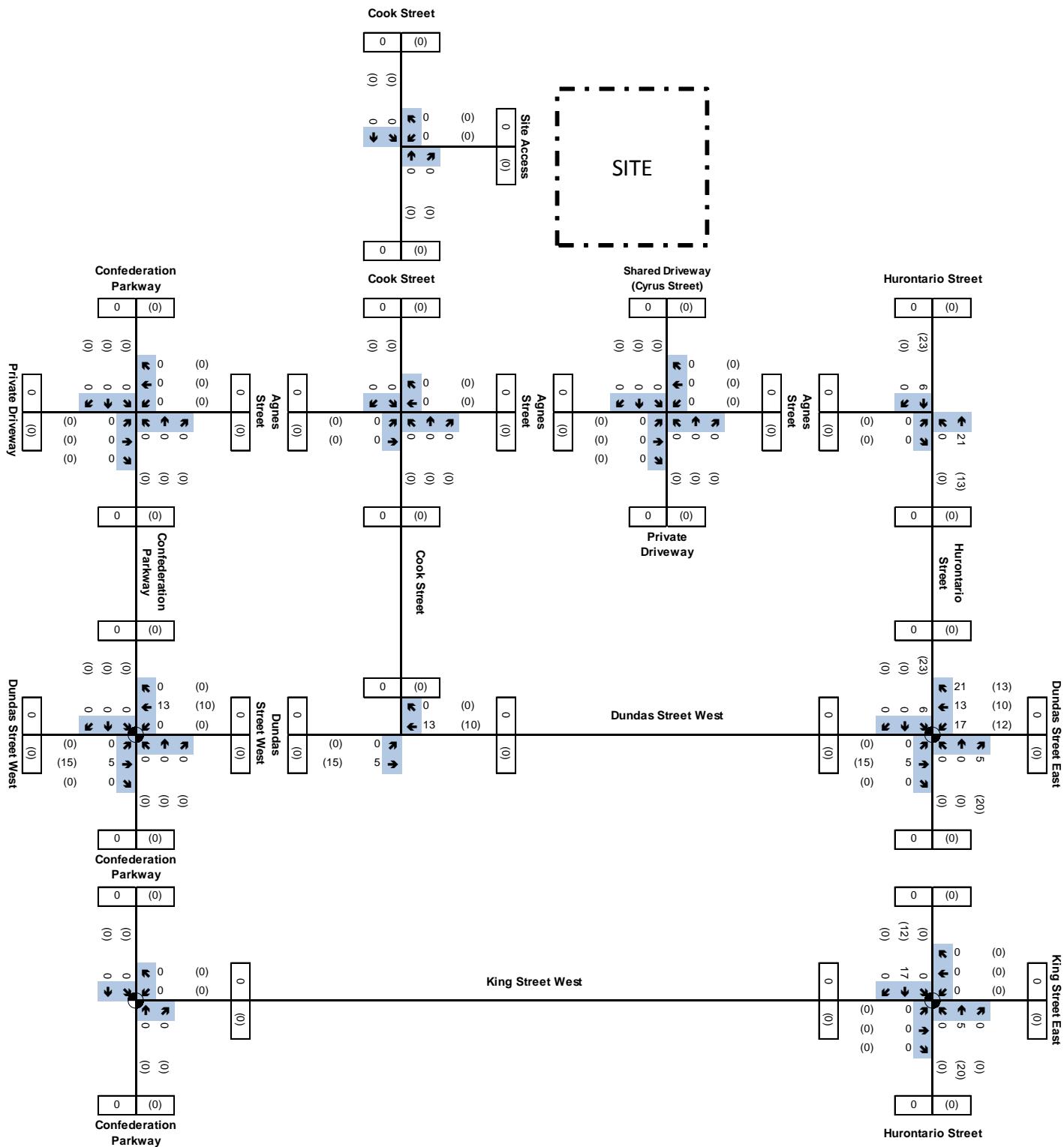
Figure AT-6



Plot Date: 10 March 2016 - 5:06 PM
 Plotted by: Michael Dowdall
 Job Number: 28-21292
 Revision: B
 Date: Mar 2016

Eminence Living Inc.
 45 Agnes Street
 Updated Traffic Impact Study
 90-110 Dundas Street West
 Traffic Volumes

Figure AT-7



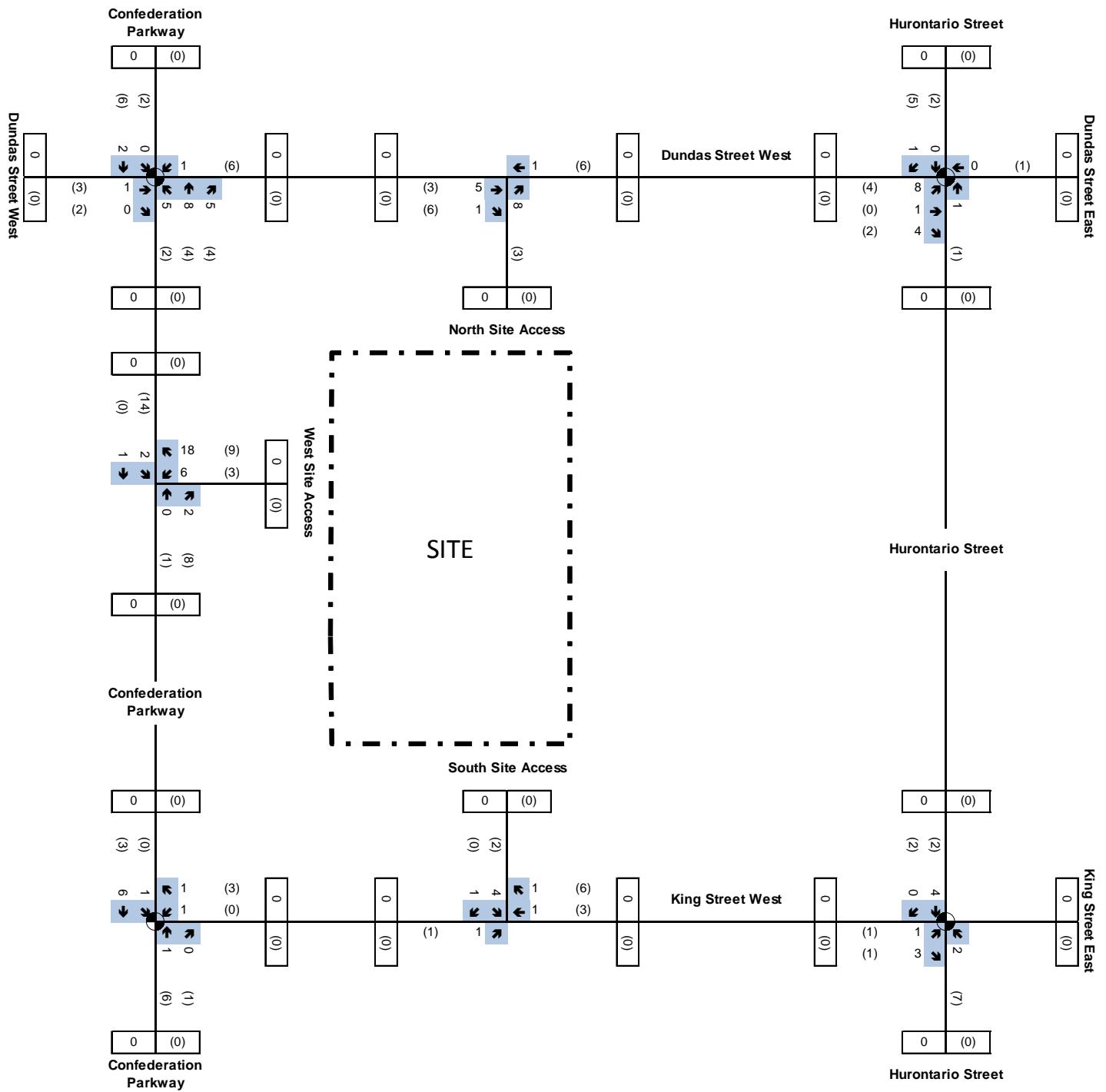
Plot Date: 10 March 2016 - 5:07 PM
 Plotted by: Michael Dowdall
 Job Number: 28-21292
 Revision: B
 Date: Mar 2016

Eminence Living Inc.
 45 Agnes Street
 Updated Traffic Impact Study
 86-90 Dundas Street East
 Traffic Volumes

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Figure AT-8



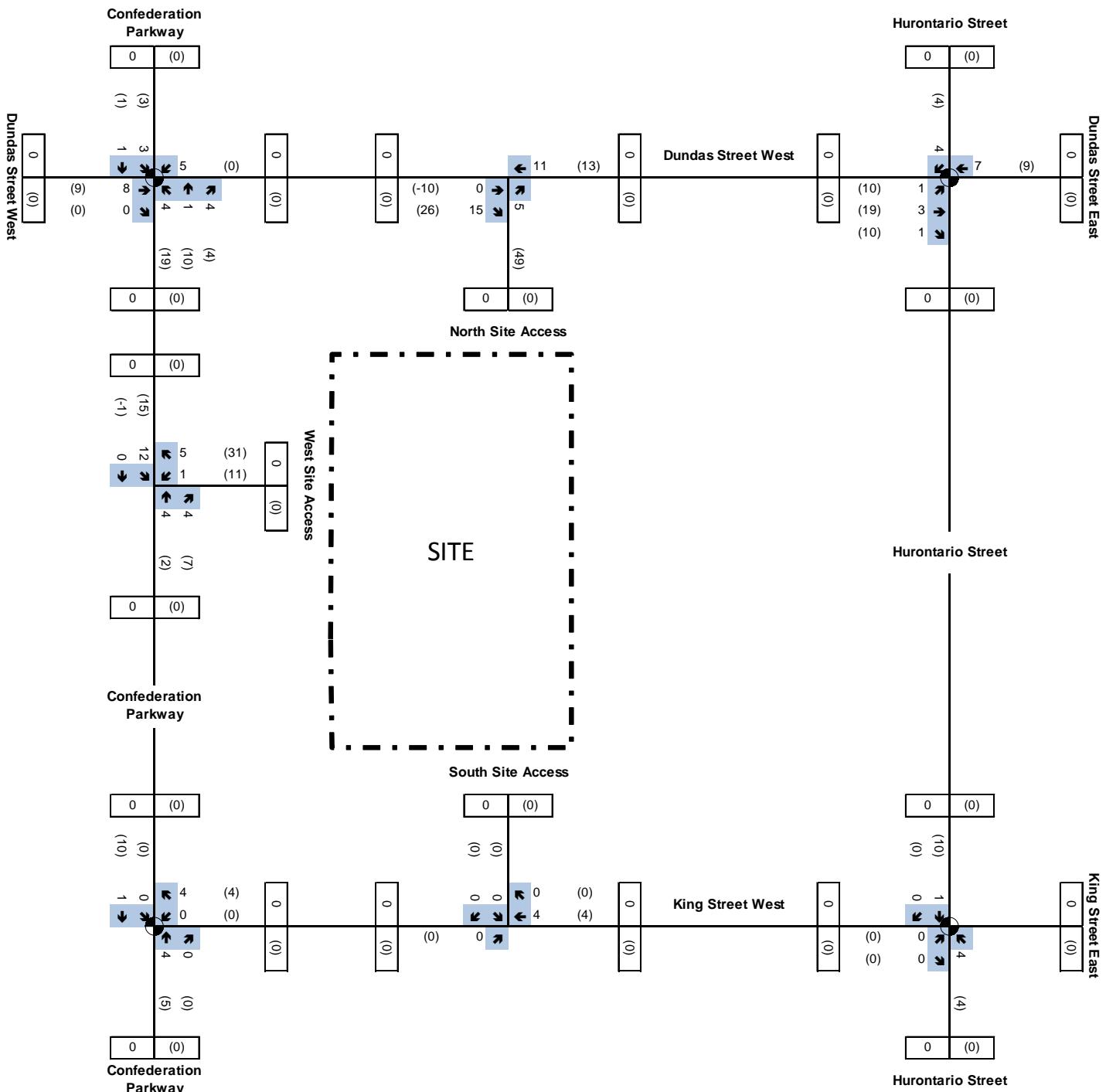
Legend
 XX AM Peak Hour Volumes
 (XX) PM Peak Hour Volumes
 ⚡ Signalized Intersection



675553 Ontario Ltd.
 90-110 Dundas Street West
 Updated Traffic Impact Study

Job Number | 07194
 Revision | B
 Date | Mar 2016

Estimated Residential Site Trips **Figure 07**



Legend

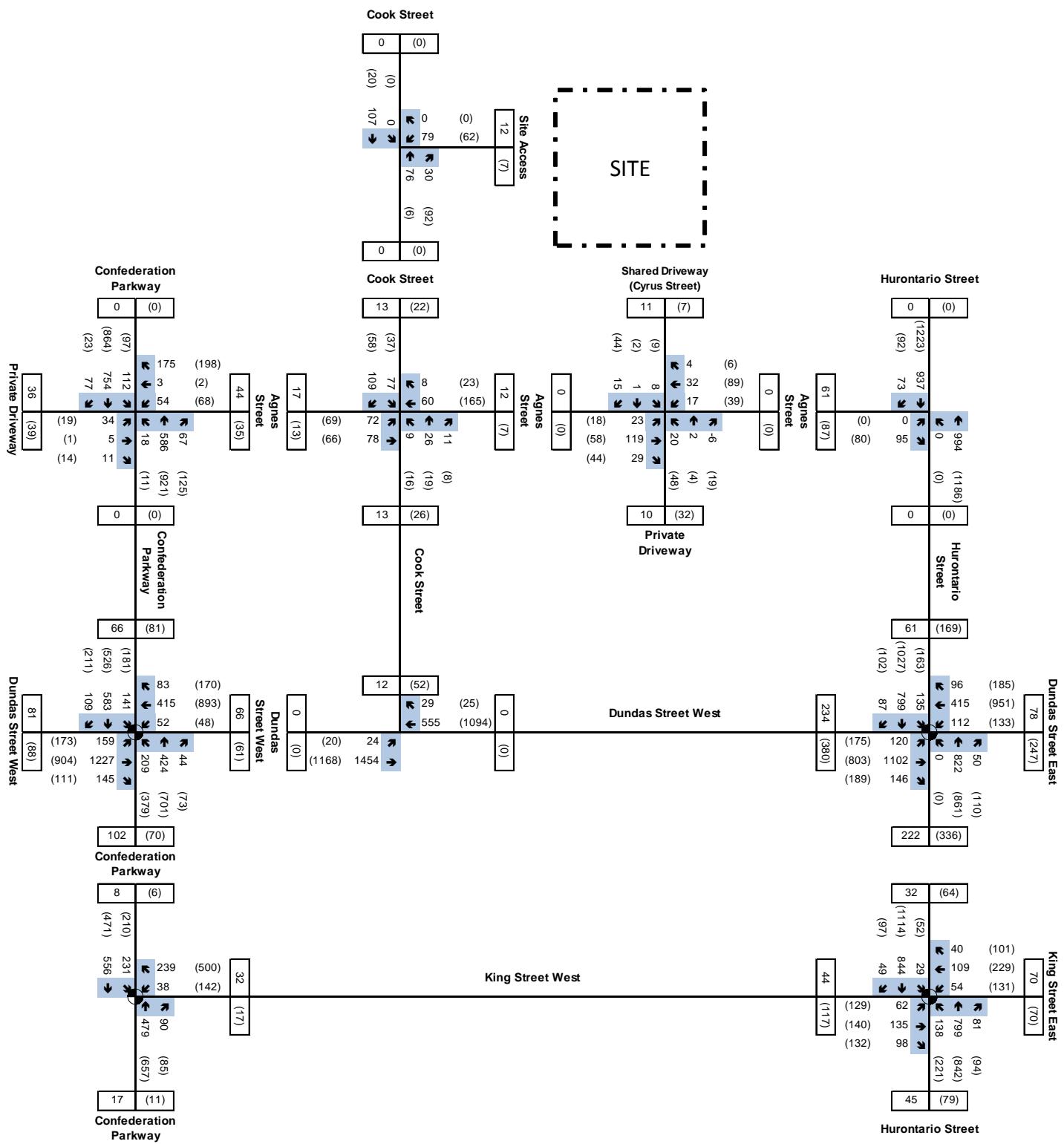
XX AM Peak Hour Volumes
 (XX) PM Peak Hour Volumes
 Signalized Intersection



675553 Ontario Ltd.
 90-110 Dundas Street West
 Updated Traffic Impact Study

Job Number | 07194
 Revision | B
 Date | Mar 2016

Estimated Commercial Site Trips **Figure 08**



Legend
 XX AM Peak Hour Volumes
 (XX) PM Peak Hour Volumes
 Signalized Intersection

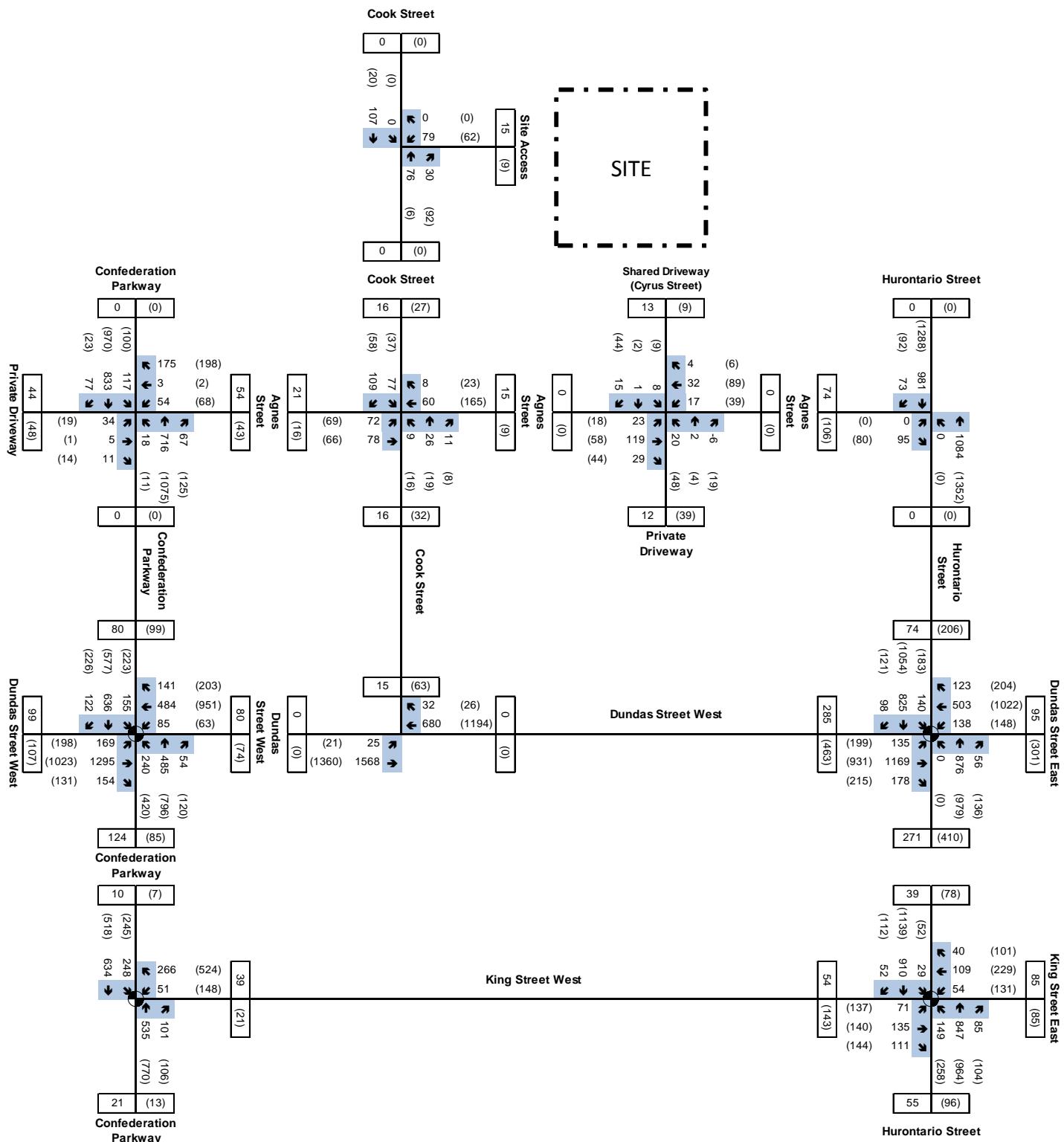


Eminence Living Inc.
 45 Agnes Street
 Updated Traffic Impact Study

Job Number | 28-21292
 Revision | B
 Date | Mar 2016

2021 Total Traffic Volumes

Figure 09



Legend

XX AM Peak Hour Volumes
 (XX) PM Peak Hour Volumes
 Signalized Intersection



Eminence Living Inc.
45 Agnes Street
Updated Traffic Impact Study

Job Number 28-21292
Revision B
Date Mar 2016

2031 Total Traffic Volumes

Figure 10

Appendix C

Capacity Analysis

Queues

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Background

AM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	120	1102	146	112	511	872	135	886
v/c Ratio	0.31	0.82	0.33	0.58	0.39	0.64	0.52	0.56
Control Delay	20.9	48.0	16.8	34.9	28.6	37.3	27.6	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	48.0	16.8	34.9	28.6	37.3	27.6	28.7
Queue Length 50th (m)	23.8	164.2	20.0	15.9	47.9	104.0	20.7	93.7
Queue Length 95th (m)	m31.6	187.7	m35.6	32.6	62.5	126.6	33.6	114.4
Internal Link Dist (m)		363.1			131.0	188.0		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	383	1406	463	195	1372	1372	259	1577
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.78	0.32	0.57	0.37	0.64	0.52	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Background

AM Peak Hour

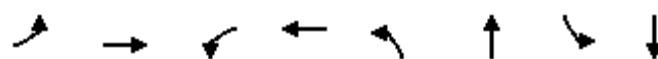
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	120	1102	146	112	415	96	0	822	50	135	799	87
Future Volume (vph)	120	1102	146	112	415	96	0	822	50	135	799	87
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.75	1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.97			0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1731	3579	1023	1768	3221			3489		1747	3354	
Flt Permitted	0.41	1.00	1.00	0.08	1.00			1.00		0.18	1.00	
Satd. Flow (perm)	749	3579	1023	141	3221			3489		330	3354	
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)	120	1102	146	112	415	96	0	822	50	135	799	87
RTOR Reduction (vph)	0	0	63	0	15	0	0	3	0	0	6	0
Lane Group Flow (vph)	120	1102	83	112	496	0	0	869	0	135	880	0
Confl. Peds. (#/hr)	61		222	222		61	234		78	78		234
Heavy Vehicles (%)	2%	2%	3%	1%	7%	15%	7%	3%	5%	2%	4%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4					2		
Actuated Green, G (s)	55.1	50.1	50.1	61.9	53.9			52.9		63.6	63.6	
Effective Green, g (s)	59.1	52.6	52.6	63.9	56.4			54.9		65.6	65.6	
Actuated g/C Ratio	0.42	0.38	0.38	0.46	0.40			0.39		0.47	0.47	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	365	1344	384	189	1297			1368		252	1571	
v/s Ratio Prot	0.02	c0.31		c0.05	0.15			c0.25		0.04	c0.26	
v/s Ratio Perm	0.12		0.08	0.22						0.21		
v/c Ratio	0.33	0.82	0.22	0.59	0.38			0.64		0.54	0.56	
Uniform Delay, d1	25.3	39.4	29.7	28.6	29.5			34.4		24.3	26.8	
Progression Factor	1.00	1.11	1.51	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.9	0.2	4.9	0.2			2.3		2.2	1.4	
Delay (s)	25.5	46.7	45.1	33.6	29.7			36.7		26.5	28.3	
Level of Service	C	D	D	C	C			D		C	C	
Approach Delay (s)		44.7			30.4			36.7			28.0	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay		36.2				HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)			12.0			
Intersection Capacity Utilization		89.8%				ICU Level of Service			E			
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2021 Future Background

AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	1372	52	498	209	468	141	692
v/c Ratio	0.34	0.71	0.51	0.30	0.73	0.36	0.63	0.80
Control Delay	15.9	25.0	58.5	30.8	43.9	31.5	61.0	55.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2
Total Delay	15.9	25.0	58.5	30.8	43.9	31.5	61.0	61.9
Queue Length 50th (m)	19.6	140.0	13.0	59.2	38.5	47.7	35.2	93.7
Queue Length 95th (m)	30.9	165.8	m29.2	75.7	#60.0	62.0	60.0	117.1
Internal Link Dist (m)		381.0		363.1		131.3		99.2
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	473	1929	102	1639	296	1318	223	869
Starvation Cap Reductn	0	0	0	0	0	0	0	132
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.71	0.51	0.30	0.71	0.36	0.63	0.94

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2021 Future Background
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↓	
Traffic Volume (vph)	159	1227	145	52	415	83	209	424	44	141	583	109
Future Volume (vph)	159	1227	145	52	415	83	209	424	44	141	583	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		0.95	1.00	
Fr _t	1.00	0.98		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1722	3453		1706	3254		1784	3469		1717	3355	
Flt Permitted	0.41	1.00		0.11	1.00		0.15	1.00		0.48	1.00	
Satd. Flow (perm)	742	3453		205	3254		285	3469		874	3355	
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)	159	1227	145	52	415	83	209	424	44	141	583	109
RTOR Reduction (vph)	0	7	0	0	12	0	0	6	0	0	11	0
Lane Group Flow (vph)	159	1365	0	52	486	0	209	462	0	141	681	0
Confl. Peds. (#/hr)	66		102	102		66	81		66	66		81
Heavy Vehicles (%)	5%	3%	3%	6%	9%	4%	2%	3%	0%	1%	3%	10%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2				6		4				8	
Actuated Green, G (s)	75.0	75.0		67.0	67.0		51.0	51.0		33.8	33.8	
Effective Green, g (s)	77.0	78.0		70.0	70.0		53.0	53.0		35.8	35.8	
Actuated g/C Ratio	0.55	0.56		0.50	0.50		0.38	0.38		0.26	0.26	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	457	1923		102	1627		281	1313		223	857	
v/s Ratio Prot	0.02	c0.40			0.15		c0.09	0.13			c0.20	
v/s Ratio Perm	0.17			0.25			0.20			0.16		
v/c Ratio	0.35	0.71		0.51	0.30		0.74	0.35		0.63	0.79	
Uniform Delay, d1	16.0	22.7		23.5	20.6		33.1	31.2		46.3	48.7	
Progression Factor	1.00	1.00		1.52	1.54		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.3		16.2	0.4		10.2	0.7		12.9	7.5	
Delay (s)	16.4	25.0		51.8	32.2		43.3	31.9		59.1	56.2	
Level of Service	B	C		D	C		D	C		E	E	
Approach Delay (s)		24.1			34.0			35.4			56.7	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay		35.3				HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		140.0				Sum of lost time (s)			11.0			
Intersection Capacity Utilization		134.9%				ICU Level of Service			H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
5: Hurontario Street & Agnes Street

2021 Future Background
AM Peak Hour

Movement	EBL	EBC	NBL	NBT	SBT	SBR
Lane Configurations		↑		↑↑	↑↓	
Traffic Volume (veh/h)	0	95	0	994	937	73
Future Volume (Veh/h)	0	95	0	994	937	73
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	95	0	994	937	73
Pedestrians	61					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	5					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)				119		
pX, platoon unblocked	0.80					
vC, conflicting volume	1532	566	1071			
vC1, stage 1 conf vol	1034					
vC2, stage 2 conf vol	497					
vCu, unblocked vol	1173	566	1071			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	242	438	596			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	95	497	497	625	385	
Volume Left	0	0	0	0	0	
Volume Right	95	0	0	0	73	
cSH	438	1700	1700	1700	1700	
Volume to Capacity	0.22	0.29	0.29	0.37	0.23	
Queue Length 95th (m)	6.2	0.0	0.0	0.0	0.0	
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	15.5	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		41.1%		ICU Level of Service		A
Analysis Period (min)		15				



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	54	178	18	653	112	831
v/c Ratio	0.37	0.29	0.51	0.04	0.25	0.20	0.31
Control Delay	28.2	28.4	10.2	3.0	2.9	3.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.2	28.4	10.2	3.0	2.9	3.9	3.2
Queue Length 50th (m)	4.1	5.7	0.3	0.4	8.4	2.8	11.4
Queue Length 95th (m)	12.7	14.3	14.5	2.0	16.6	8.9	22.3
Internal Link Dist (m)	58.6		388.8		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	251	356	514	466	2618	556	2639
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	0.20	0.15	0.35	0.04	0.25	0.20	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2021 Future Background
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	11	54	3	175	18	586	67	112	754	77
Future Volume (vph)	34	5	11	54	3	175	18	586	67	112	754	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
	4.0			4.0			4.0			4.0		4.0
Lane Util. Factor	1.00			1.00			1.00	0.95		1.00		0.95
Frpb, ped/bikes	1.00			1.00			1.00	0.99		1.00		0.99
Flpb, ped/bikes	1.00			1.00			0.98	1.00		0.96		1.00
Fr _t	0.97			1.00			1.00	0.98		1.00		0.99
Flt Protected	0.97			0.95			0.95	1.00		0.95		1.00
Satd. Flow (prot)	1764			1615			1576			1784	3470	1741
Flt Permitted	0.55			0.87			1.00			0.33	1.00	0.40
Satd. Flow (perm)	1001			1472			1576			620	3470	740
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)	34	5	11	54	3	175	18	586	67	112	754	77
RTOR Reduction (vph)	0	10	0	0	153	0	0	9	0	0	8	0
Lane Group Flow (vph)	0	40	0	54	25	0	18	644	0	112	823	0
Confl. Peds. (#/hr)							36			44		36
Heavy Vehicles (%)	0%	0%	10%	13%	0%	4%	0%	2%	6%	1%	2%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.4			8.4			49.8	49.8		49.8		49.8
Effective Green, g (s)	8.4			8.4			49.8	49.8		49.8		49.8
Actuated g/C Ratio	0.13			0.13			0.75	0.75		0.75		0.75
Clearance Time (s)	4.0			4.0			4.0	4.0		4.0		4.0
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	127			186			199			466	2610	556
v/s Ratio Prot					0.02			0.19				c0.24
v/s Ratio Perm	c0.04			0.04			0.03			0.15		
v/c Ratio	0.32			0.29			0.13			0.04	0.25	0.20
Uniform Delay, d1	26.3			26.2			25.6			2.1	2.5	2.4
Progression Factor	1.00			1.00			1.00			1.00	1.00	1.00
Incremental Delay, d2	1.4			0.9			0.3			0.2	0.2	0.8
Delay (s)	27.7			27.1			25.9			2.2	2.7	3.2
Level of Service	C			C			C			A	A	A
Approach Delay (s)	27.7				26.2					2.7		3.0
Approach LOS	C				C					A		A
Intersection Summary												
HCM 2000 Control Delay				6.4			HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio				0.31								
Actuated Cycle Length (s)				66.2			Sum of lost time (s)			8.0		
Intersection Capacity Utilization				57.9%			ICU Level of Service			B		
Analysis Period (min)				15								
c Critical Lane Group												

Queues

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Background

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	175	803	189	133	1136	971	163	1129
v/c Ratio	0.77	0.59	0.46	0.46	0.91	0.76	0.72	0.72
Control Delay	40.8	38.9	25.2	24.3	52.5	43.3	40.3	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	38.9	25.2	24.3	52.5	43.3	40.3	33.9
Queue Length 50th (m)	34.8	107.6	31.0	19.1	153.2	123.7	25.4	131.6
Queue Length 95th (m)	m#64.4	127.2	m56.4	31.0	#185.0	149.8	#48.8	157.5
Internal Link Dist (m)		363.1			130.7	154.2		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	232	1392	416	289	1269	1270	226	1571
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.58	0.45	0.46	0.90	0.76	0.72	0.72

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.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Background

PM Peak Hour

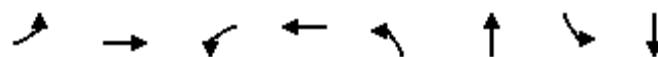
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	175	803	189	133	951	185	0	861	110	163	1027	102
Future Volume (vph)	175	803	189	133	951	185	0	861	110	163	1027	102
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.68	1.00	0.97			0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.98			0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1752	3544	940	1744	3386			3403		1746	3426	
Flt Permitted	0.08	1.00	1.00	0.22	1.00			1.00		0.12	1.00	
Satd. Flow (perm)	142	3544	940	407	3386			3403		226	3426	
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)	175	803	189	133	951	185	0	861	110	163	1027	102
RTOR Reduction (vph)	0	0	48	0	11	0	0	7	0	0	5	0
Lane Group Flow (vph)	175	803	141	133	1125	0	0	964	0	163	1124	0
Confl. Peds. (#/hr)	169		336	336		169	380		247	247		380
Heavy Vehicles (%)	2%	3%	2%	1%	2%	1%	2%	3%	0%	2%	2%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4					2		
Actuated Green, G (s)	63.3	51.7	51.7	57.7	48.9			50.0		62.0	62.0	
Effective Green, g (s)	65.5	54.2	54.2	61.7	51.4			52.0		64.0	64.0	
Actuated g/C Ratio	0.47	0.39	0.39	0.44	0.37			0.37		0.46	0.46	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	222	1372	363	282	1243			1263		222	1566	
v/s Ratio Prot	c0.08	0.23		0.04	c0.33			c0.28		c0.06	0.33	
v/s Ratio Perm	0.29		0.15	0.17						0.28		
v/c Ratio	0.79	0.59	0.39	0.47	0.90			0.76		0.73	0.72	
Uniform Delay, d1	35.7	34.0	31.0	25.3	42.0			38.6		27.6	30.7	
Progression Factor	0.72	1.09	1.21	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	14.1	0.5	0.6	1.2	9.5			4.4		11.9	2.9	
Delay (s)	39.8	37.7	38.0	26.5	51.4			43.0		39.5	33.6	
Level of Service	D	D	D	C	D			D		D	C	
Approach Delay (s)		38.1			48.8			43.0			34.3	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay		41.0			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		105.9%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2021 Future Background

PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	1015	48	1063	379	774	181	737
v/c Ratio	0.78	0.57	0.27	0.68	0.94	0.71	0.61	0.95
Control Delay	42.9	24.6	27.8	36.2	71.6	46.8	34.0	72.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6
Total Delay	42.9	24.6	27.8	36.2	71.6	46.8	34.0	85.0
Queue Length 50th (m)	23.9	97.6	12.7	154.1	86.4	100.1	30.1	102.3
Queue Length 95th (m)	#47.4	117.8	m15.1	m174.0	#146.2	123.2	46.4	#142.0
Internal Link Dist (m)	381.0		363.1		44.9		99.2	
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	221	1775	180	1563	407	1096	312	777
Starvation Cap Reductn	0	0	0	0	0	0	0	50
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.57	0.27	0.68	0.93	0.71	0.58	1.01

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2021 Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↓	
Traffic Volume (vph)	173	904	111	48	893	170	379	701	73	181	526	211
Future Volume (vph)	173	904	111	48	893	170	379	701	73	181	526	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788	3437		1803	3449		1803	3533		1799	3323	
Flt Permitted	0.13	1.00		0.21	1.00		0.12	1.00		0.23	1.00	
Satd. Flow (perm)	251	3437		402	3449		234	3533		428	3323	
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)	173	904	111	48	893	170	379	701	73	181	526	211
RTOR Reduction (vph)	0	7	0	0	11	0	0	6	0	0	30	0
Lane Group Flow (vph)	173	1008	0	48	1052	0	379	768	0	181	707	0
Confl. Peds. (#/hr)	81		70	70		81	88		61	61		88
Heavy Vehicles (%)	2%	4%	1%	0%	2%	2%	1%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2				6		4			8		
Actuated Green, G (s)	69.0	69.0		60.0	60.0		57.0	41.2		42.3	29.5	
Effective Green, g (s)	71.0	72.0		63.0	63.0		59.0	43.2		46.3	31.5	
Actuated g/C Ratio	0.51	0.51		0.45	0.45		0.42	0.31		0.33	0.22	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1767		180	1552		395	1090		286	747	
v/s Ratio Prot	c0.05	0.29			c0.30		c0.18	0.22		0.07	c0.21	
v/s Ratio Perm	0.36			0.12			0.22			0.14		
v/c Ratio	0.80	0.57		0.27	0.68		0.96	0.71		0.63	0.95	
Uniform Delay, d1	24.3	23.4		24.1	30.5		42.2	42.8		35.5	53.4	
Progression Factor	1.00	1.00		1.01	1.16		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.2	1.3		1.9	1.3		34.4	3.8		4.5	22.1	
Delay (s)	43.5	24.7		26.3	36.5		76.6	46.6		40.0	75.5	
Level of Service	D	C		C	D		E	D		D	E	
Approach Delay (s)		27.5			36.1			56.5			68.5	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM 2000 Control Delay		45.9										D
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		140.0										11.0
Intersection Capacity Utilization		144.3%										H
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
5: Hurontario Street & Agnes Street

2021 Future Background
PM Peak Hour

Movement	EBL	EBC	NBL	NBT	SBT	SBR
Lane Configurations				↑↑	↑↓	
Traffic Volume (veh/h)	0	80	0	1186	1223	92
Future Volume (Veh/h)	0	80	0	1186	1223	92
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	0	1186	1223	92
Pedestrians	87					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	7					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)				119		
pX, platoon unblocked	0.76					
vC, conflicting volume	1949	744	1402			
vC1, stage 1 conf vol	1356					
vC2, stage 2 conf vol	593					
vCu, unblocked vol	1617	744	1402			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	100			
cM capacity (veh/h)	155	334	457			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	80	593	593	815	500	
Volume Left	0	0	0	0	0	
Volume Right	80	0	0	0	92	
cSH	334	1700	1700	1700	1700	
Volume to Capacity	0.24	0.35	0.35	0.48	0.29	
Queue Length 95th (m)	7.0	0.0	0.0	0.0	0.0	
Control Delay (s)	19.1	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	19.1	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		48.7%		ICU Level of Service		A
Analysis Period (min)		15				



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	68	200	11	1046	97	887
v/c Ratio	0.11	0.23	0.46	0.03	0.51	0.38	0.42
Control Delay	11.9	16.4	10.8	4.4	5.9	10.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	16.4	10.8	4.4	5.9	10.4	5.5
Queue Length 50th (m)	0.9	3.0	3.4	0.2	14.6	2.5	12.0
Queue Length 95th (m)	7.2	14.2	20.7	1.8	35.3	12.7	29.2
Internal Link Dist (m)	58.6		388.8		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	759	743	910	529	3326	411	3398
Starvation Cap Reductn	0	0	0	0	114	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	0.04	0.09	0.22	0.02	0.33	0.24	0.26

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2021 Future Background
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1	14	68	2	198	11	921	125	97	864	23
Future Volume (vph)	19	1	14	68	2	198	11	921	125	97	864	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00			1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00		0.99	1.00		0.99	1.00	
Fr _t	0.94			1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.97			0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765			1825	1620		1801	3527		1756	3595	
Flt Permitted	0.79			0.73	1.00		0.30	1.00		0.24	1.00	
Satd. Flow (perm)	1429			1412	1620		563	3527		437	3595	
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)	19	1	14	68	2	198	11	921	125	97	864	23
RTOR Reduction (vph)	0	11	0	0	97	0	0	16	0	0	3	0
Lane Group Flow (vph)	0	23	0	68	103	0	11	1030	0	97	884	0
Confl. Peds. (#/hr)							39		35	35		39
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	0%	3%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3		8.3	8.3		23.2	23.2		23.2	23.2		
Effective Green, g (s)	8.3		8.3	8.3		23.2	23.2		23.2	23.2		
Actuated g/C Ratio	0.21		0.21	0.21		0.59	0.59		0.59	0.59		
Clearance Time (s)	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	300		296	340		330	2071		256	2111		
v/s Ratio Prot				c0.06			c0.29			0.25		
v/s Ratio Perm	0.02		0.05			0.02			0.22			
v/c Ratio	0.08		0.23	0.30		0.03	0.50		0.38	0.42		
Uniform Delay, d1	12.5		12.9	13.2		3.4	4.8		4.3	4.5		
Progression Factor	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.1		0.4	0.5		0.0	0.2		0.9	0.1		
Delay (s)	12.6		13.3	13.7		3.5	4.9		5.3	4.6		
Level of Service	B		B	B		A	A		A	A		
Approach Delay (s)	12.6			13.6			4.9			4.7		
Approach LOS	B			B			A			A		
Intersection Summary												
HCM 2000 Control Delay		5.9		HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		39.5		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		65.3%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

2021 Future Total

AM Peak Hour

1: Hurontario Street & Dundas Street West/Dundas Street East



Lane Group	EBL	EBT	EBC	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	135	1105	158	112	513	872	135	886
v/c Ratio	0.35	0.82	0.35	0.58	0.39	0.64	0.52	0.56
Control Delay	22.3	47.6	17.5	35.3	28.7	37.3	27.6	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	47.6	17.5	35.3	28.7	37.3	27.6	28.7
Queue Length 50th (m)	27.0	164.0	21.8	15.9	48.1	104.0	20.7	93.7
Queue Length 95th (m)	m37.6	187.3	m40.6	32.9	62.7	126.6	33.6	114.4
Internal Link Dist (m)		363.1			131.0	188.0		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	383	1406	463	194	1372	1370	259	1576
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.79	0.34	0.58	0.37	0.64	0.52	0.56

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Total

AM Peak Hour

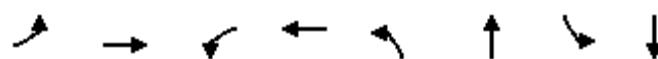
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	135	1105	158	112	417	96	0	822	50	135	799	87
Future Volume (vph)	135	1105	158	112	417	96	0	822	50	135	799	87
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.75	1.00	0.99			0.99		1.00	0.97	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.97			0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1731	3579	1023	1768	3222			3489		1747	3354	
Flt Permitted	0.41	1.00	1.00	0.08	1.00			1.00		0.18	1.00	
Satd. Flow (perm)	747	3579	1023	140	3222			3489		330	3354	
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)	135	1105	158	112	417	96	0	822	50	135	799	87
RTOR Reduction (vph)	0	0	63	0	15	0	0	3	0	0	6	0
Lane Group Flow (vph)	135	1105	95	112	498	0	0	869	0	135	880	0
Confl. Peds. (#/hr)	61		222	222		61	234		78	78		234
Heavy Vehicles (%)	2%	2%	3%	1%	7%	15%	7%	3%	5%	2%	4%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4						2	
Actuated Green, G (s)	55.1	50.1	50.1	61.9	53.9			52.9		63.6	63.6	
Effective Green, g (s)	59.1	52.6	52.6	63.9	56.4			54.9		65.6	65.6	
Actuated g/C Ratio	0.42	0.38	0.38	0.46	0.40			0.39		0.47	0.47	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	364	1344	384	189	1298			1368		252	1571	
v/s Ratio Prot	0.02	c0.31		c0.05	0.15			c0.25		0.04	c0.26	
v/s Ratio Perm	0.14		0.09	0.22						0.21		
v/c Ratio	0.37	0.82	0.25	0.59	0.38			0.64		0.54	0.56	
Uniform Delay, d1	25.5	39.5	30.1	28.7	29.5			34.4		24.3	26.8	
Progression Factor	1.03	1.10	1.38	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.5	3.1	0.2	4.9	0.2			2.3		2.2	1.4	
Delay (s)	26.7	46.4	41.9	33.6	29.7			36.7		26.5	28.3	
Level of Service	C	D	D	C	C			D		C	C	
Approach Delay (s)		44.0			30.4			36.7			28.0	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay		36.0			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		89.8%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2021 Future Total

AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	159	1376	66	510	209	476	141	692
v/c Ratio	0.33	0.69	0.58	0.30	0.81	0.38	0.67	0.84
Control Delay	14.3	22.6	62.0	30.0	54.9	33.9	64.8	59.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.1
Total Delay	14.3	22.6	62.0	30.0	54.9	33.9	64.8	68.3
Queue Length 50th (m)	18.5	133.1	16.7	59.7	40.0	50.3	35.6	94.6
Queue Length 95th (m)	29.1	157.7	m#37.3	76.1	#75.8	65.4	#63.5	118.2
Internal Link Dist (m)		381.0		363.1		131.3		99.2
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	488	2003	114	1710	260	1241	211	828
Starvation Cap Reductn	0	0	0	0	0	0	0	113
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.69	0.58	0.30	0.80	0.38	0.67	0.97

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2021 Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↓	
Traffic Volume (vph)	159	1231	145	66	427	83	209	424	52	141	583	109
Future Volume (vph)	159	1231	145	66	427	83	209	424	52	141	583	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		0.95	1.00	
Fr _t	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1722	3453		1706	3257		1785	3456		1718	3355	
Flt Permitted	0.41	1.00		0.12	1.00		0.14	1.00		0.48	1.00	
Satd. Flow (perm)	741	3453		219	3257		254	3456		867	3355	
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)	159	1231	145	66	427	83	209	424	52	141	583	109
RTOR Reduction (vph)	0	6	0	0	11	0	0	6	0	0	11	0
Lane Group Flow (vph)	159	1370	0	66	499	0	209	470	0	141	681	0
Confl. Peds. (#/hr)	66		102	102		66	81		66	66		81
Heavy Vehicles (%)	5%	3%	3%	6%	9%	4%	2%	3%	0%	1%	3%	10%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2				6		4				8	
Actuated Green, G (s)	78.0	78.0		70.0	70.0		48.0	48.0		32.1	32.1	
Effective Green, g (s)	80.0	81.0		73.0	73.0		50.0	50.0		34.1	34.1	
Actuated g/C Ratio	0.57	0.58		0.52	0.52		0.36	0.36		0.24	0.24	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	472	1997		114	1698		253	1234		211	817	
v/s Ratio Prot	0.02	c0.40			0.15		c0.09	0.14			c0.20	
v/s Ratio Perm	0.18			0.30			0.21			0.16		
v/c Ratio	0.34	0.69		0.58	0.29		0.83	0.38		0.67	0.83	
Uniform Delay, d1	14.5	20.6		23.0	18.9		35.4	33.5		47.8	50.2	
Progression Factor	1.00	1.00		1.59	1.63		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.9		18.8	0.4		19.3	0.9		15.6	9.7	
Delay (s)	14.9	22.6		55.3	31.3		54.7	34.4		63.4	60.0	
Level of Service	B	C		E	C		D	C		E	E	
Approach Delay (s)		21.8			34.1			40.6			60.6	
Approach LOS		C			C			D			E	
Intersection Summary												
HCM 2000 Control Delay		36.2			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)				11.0			
Intersection Capacity Utilization		134.9%			ICU Level of Service				H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

5: Hurontario Street & Agnes Street

2021 Future Total

AM Peak Hour

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	95	0	1010	937	73
Future Volume (Veh/h)	0	95	0	1010	937	73
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	95	0	1010	937	73
Pedestrians	61					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	5					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)				119		
pX, platoon unblocked	0.80					
vC, conflicting volume	1540	566	1071			
vC1, stage 1 conf vol	1034					
vC2, stage 2 conf vol	505					
vCu, unblocked vol	1183	566	1071			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	100			
cM capacity (veh/h)	242	438	596			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	95	505	505	625	385	
Volume Left	0	0	0	0	0	
Volume Right	95	0	0	0	73	
cSH	438	1700	1700	1700	1700	
Volume to Capacity	0.22	0.30	0.30	0.37	0.23	
Queue Length 95th (m)	6.2	0.0	0.0	0.0	0.0	
Control Delay (s)	15.5	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	15.5	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		41.1%		ICU Level of Service		A
Analysis Period (min)		15				

Queues

2021 Future Total

AM Peak Hour

6: Confederation Parkway & Private Driveway/Agnes Street



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	54	195	18	653	117	831
v/c Ratio	0.37	0.33	0.52	0.04	0.25	0.21	0.32
Control Delay	26.6	28.2	9.7	3.1	3.0	4.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	28.2	9.7	3.1	3.0	4.2	3.3
Queue Length 50th (m)	3.8	5.3	0.3	0.4	8.4	2.9	11.4
Queue Length 95th (m)	12.0	13.8	14.5	2.0	16.4	9.2	22.0
Internal Link Dist (m)	58.6		388.8		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	318	399	641	458	2566	546	2588
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	0.16	0.14	0.30	0.04	0.25	0.21	0.32

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2021 Future Total
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	11	54	3	192	18	586	67	117	754	77
Future Volume (vph)	34	5	11	54	3	192	18	586	67	117	754	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
	4.0			4.0			4.0			4.0		4.0
Lane Util. Factor	1.00			1.00			1.00	0.95		1.00		0.95
Frpb, ped/bikes	1.00			1.00			1.00	0.99		1.00		0.99
Flpb, ped/bikes	1.00			1.00			0.98	1.00		0.97		1.00
Fr _t	0.97			1.00			1.00	0.98		1.00		0.99
Flt Protected	0.97			0.95			0.95	1.00		0.95		1.00
Satd. Flow (prot)	1764			1615			1575			1787	3472	1745
Flt Permitted	0.53			0.72			1.00			0.33	1.00	0.40
Satd. Flow (perm)	960			1232			1575			620	3472	741
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)	34	5	11	54	3	192	18	586	67	117	754	77
RTOR Reduction (vph)	0	10	0	0	167	0	0	8	0	0	7	0
Lane Group Flow (vph)	0	40	0	54	28	0	18	645	0	117	824	0
Confl. Peds. (#/hr)							36			44	44	36
Heavy Vehicles (%)	0%	0%	10%	13%	0%	4%	0%	2%	6%	1%	2%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.2			8.2			45.6	45.6		45.6	45.6	
Effective Green, g (s)	8.2			8.2			45.6	45.6		45.6	45.6	
Actuated g/C Ratio	0.13			0.13			0.74	0.74		0.74	0.74	
Clearance Time (s)	4.0			4.0			4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0			3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	127			163			208			457	2561	546
v/s Ratio Prot					0.02			0.19				c0.24
v/s Ratio Perm	0.04			c0.04			0.03			0.16		
v/c Ratio	0.32			0.33			0.14			0.04	0.25	0.21
Uniform Delay, d1	24.3			24.3			23.7			2.2	2.6	2.5
Progression Factor	1.00			1.00			1.00			1.00	1.00	1.00
Incremental Delay, d2	1.5			1.2			0.3			0.2	0.2	0.9
Delay (s)	25.7			25.5			24.0			2.3	2.8	3.4
Level of Service	C			C			C			A	A	A
Approach Delay (s)	25.7				24.3					2.8		3.1
Approach LOS	C				C					A		A
Intersection Summary												
HCM 2000 Control Delay				6.4			HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio				0.32								
Actuated Cycle Length (s)				61.8			Sum of lost time (s)			8.0		
Intersection Capacity Utilization				59.0%			ICU Level of Service			B		
Analysis Period (min)				15								
c Critical Lane Group												

Queues

2021 Future Total

1: Hurontario Street & Dundas Street West/Dundas Street East

PM Peak Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	185	807	198	133	1140	971	163	1130
v/c Ratio	0.78	0.57	0.47	0.47	0.91	0.79	0.72	0.73
Control Delay	40.3	36.9	24.4	23.9	52.7	45.7	41.6	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.3	36.9	24.4	23.9	52.7	45.7	41.6	34.9
Queue Length 50th (m)	36.8	105.9	32.3	18.8	154.0	126.7	25.8	133.6
Queue Length 95th (m)	m#66.4	128.3	m58.6	30.5	#187.4	153.4	#51.1	159.9
Internal Link Dist (m)		363.1			130.7	154.2		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	244	1442	428	285	1270	1228	229	1548
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.56	0.46	0.47	0.90	0.79	0.71	0.73

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.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2021 Future Total

PM Peak Hour

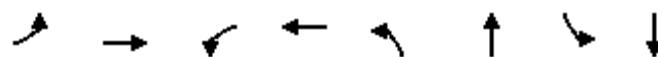
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	185	807	198	133	955	185	0	861	110	163	1027	103
Future Volume (vph)	185	807	198	133	955	185	0	861	110	163	1027	103
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.68	1.00	0.97			0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.98			0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1752	3544	940	1741	3386			3403		1747	3425	
Flt Permitted	0.08	1.00	1.00	0.23	1.00			1.00		0.11	1.00	
Satd. Flow (perm)	142	3544	940	430	3386			3403		209	3425	
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)	185	807	198	133	955	185	0	861	110	163	1027	103
RTOR Reduction (vph)	0	0	47	0	11	0	0	7	0	0	5	0
Lane Group Flow (vph)	185	807	151	133	1129	0	0	964	0	163	1125	0
Confl. Peds. (#/hr)	169		336	336		169	380		247	247		380
Heavy Vehicles (%)	2%	3%	2%	1%	2%	1%	2%	3%	0%	2%	2%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4					2		
Actuated Green, G (s)	64.4	53.4	53.4	56.9	48.9			48.3		61.1	61.1	
Effective Green, g (s)	66.4	55.9	55.9	60.9	51.4			50.3		63.1	63.1	
Actuated g/C Ratio	0.47	0.40	0.40	0.43	0.37			0.36		0.45	0.45	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	234	1415	375	280	1243			1222		223	1543	
v/s Ratio Prot	c0.08	0.23		0.03	c0.33			c0.28		0.06	c0.33	
v/s Ratio Perm	0.29		0.16	0.17						0.27		
v/c Ratio	0.79	0.57	0.40	0.47	0.91			0.79		0.73	0.73	
Uniform Delay, d1	36.7	32.7	30.1	25.4	42.1			40.1		28.4	31.5	
Progression Factor	0.69	1.09	1.17	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	13.7	0.5	0.6	1.3	9.7			5.2		11.6	3.1	
Delay (s)	39.1	36.0	35.8	26.7	51.8			45.3		40.0	34.5	
Level of Service	D	D	D	C	D			D		D	C	
Approach Delay (s)		36.4			49.2			45.3			35.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay		41.3			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.81										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		106.5%			ICU Level of Service			G				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2021 Future Total

PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	1027	58	1071	379	799	182	737
v/c Ratio	0.79	0.58	0.33	0.69	0.94	0.74	0.63	0.95
Control Delay	43.9	24.8	31.2	37.2	71.6	48.3	34.8	72.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.6
Total Delay	43.9	24.8	31.2	37.2	71.6	48.3	34.8	85.0
Queue Length 50th (m)	23.9	99.4	15.4	155.1	86.4	104.3	30.3	102.3
Queue Length 95th (m)	#48.3	119.8	m18.2	m174.6	#146.2	129.5	46.8	#142.0
Internal Link Dist (m)		381.0		363.1		192.0		99.2
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	219	1775	176	1563	407	1080	314	777
Starvation Cap Reductn	0	0	0	0	0	0	0	50
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.58	0.33	0.69	0.93	0.74	0.58	1.01

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2021 Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↓	
Traffic Volume (vph)	173	916	111	58	901	170	379	701	98	182	526	211
Future Volume (vph)	173	916	111	58	901	170	379	701	98	182	526	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788	3438		1804	3450		1803	3509		1801	3323	
Flt Permitted	0.13	1.00		0.21	1.00		0.12	1.00		0.20	1.00	
Satd. Flow (perm)	246	3438		394	3450		234	3509		382	3323	
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)	173	916	111	58	901	170	379	701	98	182	526	211
RTOR Reduction (vph)	0	7	0	0	11	0	0	8	0	0	30	0
Lane Group Flow (vph)	173	1020	0	58	1060	0	379	791	0	182	707	0
Confl. Peds. (#/hr)	81		70	70		81	88		61	61		88
Heavy Vehicles (%)	2%	4%	1%	0%	2%	2%	1%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2				6		4			8		
Actuated Green, G (s)	69.0	69.0		60.0	60.0		57.0	40.8		42.7	29.5	
Effective Green, g (s)	71.0	72.0		63.0	63.0		59.0	42.8		46.7	31.5	
Actuated g/C Ratio	0.51	0.51		0.45	0.45		0.42	0.31		0.33	0.22	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	1768		177	1552		395	1072		281	747	
v/s Ratio Prot	c0.05	0.30			c0.31		c0.18	0.23		0.07	c0.21	
v/s Ratio Perm	0.37			0.15			0.22			0.15		
v/c Ratio	0.82	0.58		0.33	0.68		0.96	0.74		0.65	0.95	
Uniform Delay, d1	24.4	23.5		24.8	30.6		42.2	43.6		35.5	53.4	
Progression Factor	1.00	1.00		1.07	1.18		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.9	1.4		2.6	1.3		34.4	4.6		5.1	22.1	
Delay (s)	45.4	24.9		29.3	37.5		76.6	48.1		40.5	75.5	
Level of Service	D	C		C	D		E	D		D	E	
Approach Delay (s)		27.8			37.0			57.3			68.6	
Approach LOS		C			D			E			E	
Intersection Summary												
HCM 2000 Control Delay		46.5					HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)			11.0		
Intersection Capacity Utilization		144.3%					ICU Level of Service			H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
5: Hurontario Street & Agnes Street

2021 Future Total
PM Peak Hour

Movement	EBL	EBC	NBL	NBT	SBT	SBR
Lane Configurations				↑↑	↑↓	
Traffic Volume (veh/h)	0	80	0	1186	1223	92
Future Volume (Veh/h)	0	80	0	1186	1223	92
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	0	1186	1223	92
Pedestrians	87					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	7					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)				119		
pX, platoon unblocked	0.76					
vC, conflicting volume	1949	744	1402			
vC1, stage 1 conf vol	1356					
vC2, stage 2 conf vol	593					
vCu, unblocked vol	1609	744	1402			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	100			
cM capacity (veh/h)	155	334	457			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	80	593	593	815	500	
Volume Left	0	0	0	0	0	
Volume Right	80	0	0	0	92	
cSH	334	1700	1700	1700	1700	
Volume to Capacity	0.24	0.35	0.35	0.48	0.29	
Queue Length 95th (m)	7.0	0.0	0.0	0.0	0.0	
Control Delay (s)	19.1	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	19.1	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		48.7%		ICU Level of Service		A
Analysis Period (min)		15				

Queues

2021 Future Total

PM Peak Hour

6: Confederation Parkway & Private Driveway/Agnes Street



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	68	216	11	1046	116	887
v/c Ratio	0.11	0.23	0.50	0.03	0.50	0.45	0.42
Control Delay	13.0	17.8	12.4	4.5	6.0	12.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	17.8	12.4	4.5	6.0	12.4	5.6
Queue Length 50th (m)	0.9	3.1	4.3	0.2	15.2	3.3	12.6
Queue Length 95th (m)	8.0	15.7	25.8	1.9	39.2	17.2	32.3
Internal Link Dist (m)	58.6		388.8		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	728	712	878	513	3240	400	3309
Starvation Cap Reductn	0	0	0	0	168	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	0.05	0.10	0.25	0.02	0.34	0.29	0.27

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2021 Future Total
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1	14	68	2	214	11	921	125	116	864	23
Future Volume (vph)	19	1	14	68	2	214	11	921	125	116	864	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00			1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00		0.99	1.00		0.99	1.00	
Fr _t	0.94			1.00	0.85		1.00	0.98		1.00	1.00	
Flt Protected	0.97			0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765			1825	1620		1799	3526		1755	3594	
Flt Permitted	0.79			0.73	1.00		0.30	1.00		0.24	1.00	
Satd. Flow (perm)	1430			1412	1620		561	3526		436	3594	
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)	19	1	14	68	2	214	11	921	125	116	864	23
RTOR Reduction (vph)	0	11	0	0	97	0	0	15	0	0	3	0
Lane Group Flow (vph)	0	23	0	68	119	0	11	1031	0	116	884	0
Confl. Peds. (#/hr)							39		35	35		39
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	0%	3%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.9		8.9	8.9		25.1	25.1		25.1	25.1		
Effective Green, g (s)	8.9		8.9	8.9		25.1	25.1		25.1	25.1		
Actuated g/C Ratio	0.21		0.21	0.21		0.60	0.60		0.60	0.60		
Clearance Time (s)	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	303		299	343		335	2107		260	2147		
v/s Ratio Prot				c0.07			c0.29			0.25		
v/s Ratio Perm	0.02		0.05			0.02			0.27			
v/c Ratio	0.08		0.23	0.35		0.03	0.49		0.45	0.41		
Uniform Delay, d1	13.3		13.7	14.1		3.5	4.8		4.6	4.5		
Progression Factor	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	0.1		0.4	0.6		0.0	0.2		1.2	0.1		
Delay (s)	13.4		14.1	14.7		3.5	5.0		5.9	4.6		
Level of Service	B		B	B		A	A		A	A		
Approach Delay (s)	13.4			14.5			5.0			4.8		
Approach LOS	B			B			A			A		
Intersection Summary												
HCM 2000 Control Delay		6.2		HCM 2000 Level of Service				A				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		42.0		Sum of lost time (s)				8.0				
Intersection Capacity Utilization		65.3%		ICU Level of Service				C				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

2031 Total Traffic

AM Peak Hour

1: Hurontario Street & Dundas Street West/Dundas Street East



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	141	1168	185	138	621	931	140	918
v/c Ratio	0.40	0.86	0.45	0.67	0.48	0.68	0.62	0.60
Control Delay	21.9	50.3	24.1	41.4	31.2	38.5	34.2	30.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.9	50.3	24.1	41.4	31.2	38.5	34.2	30.2
Queue Length 50th (m)	28.2	174.6	31.2	19.9	63.0	112.3	21.5	98.6
Queue Length 95th (m)	m36.8	198.3	m55.6	#42.7	80.1	136.1	34.7	120.1
Internal Link Dist (m)		58.8			131.0	98.0		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	353	1380	414	209	1318	1366	224	1538
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.85	0.45	0.66	0.47	0.68	0.63	0.60

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.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2031 Total Traffic

AM Peak Hour

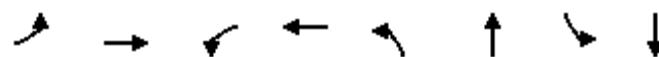
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	141	1168	185	138	498	123	0	875	56	140	825	93
Future Volume (vph)	141	1168	185	138	498	123	0	875	56	140	825	93
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.69	1.00	0.98			0.99		1.00	0.97	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.97			0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1736	3579	950	1769	3202			3482		1748	3340	
Flt Permitted	0.33	1.00	1.00	0.07	1.00			1.00		0.15	1.00	
Satd. Flow (perm)	605	3579	950	139	3202			3482		283	3340	
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)	141	1168	185	138	498	123	0	875	56	140	825	93
RTOR Reduction (vph)	0	0	49	0	16	0	0	3	0	0	6	0
Lane Group Flow (vph)	141	1168	136	138	605	0	0	928	0	140	912	0
Confl. Peds. (#/hr)	74		271	271		74	285		95	95		285
Heavy Vehicles (%)	2%	2%	3%	1%	7%	15%	7%	3%	5%	2%	4%	6%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4					2		
Actuated Green, G (s)	57.4	50.4	50.4	63.2	53.3			52.8		62.2	62.2	
Effective Green, g (s)	61.4	52.9	52.9	65.3	55.8			54.8		64.2	64.2	
Actuated g/C Ratio	0.44	0.38	0.38	0.47	0.40			0.39		0.46	0.46	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	338	1352	358	203	1276			1362		217	1531	
v/s Ratio Prot	0.03	c0.33		c0.06	0.19			c0.27		c0.04	0.27	
v/s Ratio Perm	0.16		0.14	0.26						0.26		
v/c Ratio	0.42	0.86	0.38	0.68	0.47			0.68		0.65	0.60	
Uniform Delay, d1	24.5	40.2	31.7	29.4	31.2			35.4		26.0	28.2	
Progression Factor	1.02	1.11	1.17	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.6	4.3	0.5	8.7	0.3			2.8		6.4	1.7	
Delay (s)	25.5	49.0	37.6	38.2	31.5			38.1		32.4	29.9	
Level of Service	C	D	D	D	C			D		C	C	
Approach Delay (s)		45.4			32.7			38.1			30.3	
Approach LOS		D			C			D			C	
Intersection Summary												
HCM 2000 Control Delay		37.8			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		92.2%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2031 Total Traffic

AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	169	1444	87	637	231	529	152	755
v/c Ratio	0.39	0.71	0.82	0.37	0.97	0.44	0.79	0.95
Control Delay	14.4	22.1	91.5	28.3	87.2	36.5	78.2	72.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.5
Total Delay	14.4	22.1	91.5	28.3	87.2	36.5	78.2	103.1
Queue Length 50th (m)	19.0	139.1	24.3	75.2	47.0	58.5	39.8	107.2
Queue Length 95th (m)	29.5	164.6	m#55.3	92.0	#99.6	75.2	#76.7	#145.8
Internal Link Dist (m)		381.0		118.4		44.9		99.2
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	434	2048	106	1741	238	1191	193	798
Starvation Cap Reductn	0	0	0	0	0	0	0	90
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.71	0.82	0.37	0.97	0.44	0.79	1.07

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2031 Total Traffic
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↓		↑	↑↓		↑	↑↓		↑	↑↓	
Traffic Volume (vph)	169	1290	154	87	496	141	231	476	53	152	633	122
Future Volume (vph)	169	1290	154	87	496	141	231	476	53	152	633	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	0.99	1.00		0.99	1.00		1.00	1.00		0.94	1.00	
Fr _t	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1725	3445		1705	3215		1787	3457		1707	3336	
Flt Permitted	0.35	1.00		0.11	1.00		0.12	1.00		0.46	1.00	
Satd. Flow (perm)	627	3445		199	3215		221	3457		818	3336	
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)	169	1290	154	87	496	141	231	476	53	152	633	122
RTOR Reduction (vph)	0	7	0	0	19	0	0	6	0	0	11	0
Lane Group Flow (vph)	169	1437	0	87	618	0	231	523	0	152	744	0
Confl. Peds. (#/hr)	80		124	124		80	53		80	80		99
Heavy Vehicles (%)	5%	3%	3%	6%	9%	4%	2%	3%	0%	1%	3%	10%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases	5	2			6		7	4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	80.0	80.0		72.0	72.0		46.0	46.0		31.0	31.0	
Effective Green, g (s)	82.0	83.0		75.0	75.0		48.0	48.0		33.0	33.0	
Actuated g/C Ratio	0.59	0.59		0.54	0.54		0.34	0.34		0.24	0.24	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	422	2042		106	1722		232	1185		192	786	
v/s Ratio Prot	0.02	c0.42			0.19		c0.10	0.15			c0.22	
v/s Ratio Perm	0.21		c0.44			0.24			0.19			
v/c Ratio	0.40	0.70		0.82	0.36		1.00	0.44		0.79	0.95	
Uniform Delay, d1	14.0	19.9		26.9	18.7		39.0	35.6		50.3	52.6	
Progression Factor	1.00	1.00		1.53	1.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.1		46.2	0.5		57.5	1.2		27.5	21.3	
Delay (s)	14.6	22.0		87.5	30.1		96.5	36.8		77.8	74.0	
Level of Service	B	C		F	C		F	D		E	E	
Approach Delay (s)		21.2			37.0			55.0			74.6	
Approach LOS		C			D			D			E	
Intersection Summary												
HCM 2000 Control Delay		42.6			HCM 2000 Level of Service				D			
HCM 2000 Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)				11.0			
Intersection Capacity Utilization		136.1%			ICU Level of Service				H			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
5: Hurontario Street & Agnes Street

2031 Total Traffic
AM Peak Hour

Movement	EBL	EBC	NBL	NBT	SBT	SBR
Lane Configurations				↑↑	↑↑	
Traffic Volume (veh/h)	0	95	0	1090	976	79
Future Volume (Veh/h)	0	95	0	1090	976	79
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	95	0	1090	976	79
Pedestrians	74					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	6					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)				119		
pX, platoon unblocked	0.78					
vC, conflicting volume	1634	602	1129			
vC1, stage 1 conf vol	1090					
vC2, stage 2 conf vol	545					
vCu, unblocked vol	1259	602	1129			
tC, single (s)	6.8	7.0	4.2			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	77	100			
cM capacity (veh/h)	222	410	560			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	95	545	545	651	404	
Volume Left	0	0	0	0	0	
Volume Right	95	0	0	0	79	
cSH	410	1700	1700	1700	1700	
Volume to Capacity	0.23	0.32	0.32	0.38	0.24	
Queue Length 95th (m)	6.7	0.0	0.0	0.0	0.0	
Control Delay (s)	16.4	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	16.4	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		42.4%		ICU Level of Service		A
Analysis Period (min)		15				

Queues

2031 Total Traffic

AM Peak Hour

6: Confederation Parkway & Private Driveway/Agnes Street



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	54	195	18	774	122	904
v/c Ratio	0.18	0.21	0.42	0.06	0.39	0.34	0.45
Control Delay	12.6	15.1	7.0	4.3	5.0	7.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	15.1	7.0	4.3	5.0	7.6	5.4
Queue Length 50th (m)	1.6	2.2	0.8	0.4	9.4	2.9	11.6
Queue Length 95th (m)	9.1	10.6	13.3	2.2	20.8	11.3	25.3
Internal Link Dist (m)	58.6		138.7		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	788	738	1015	531	3379	622	3401
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	0.06	0.07	0.19	0.03	0.23	0.20	0.27

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2031 Total Traffic
AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	5	11	54	3	192	18	707	67	122	827	77
Future Volume (vph)	34	5	11	54	3	192	18	707	67	122	827	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
	4.0			4.0			4.0			4.0		4.0
Lane Util. Factor	1.00			1.00			1.00	0.95		1.00		0.95
Frpb, ped/bikes	1.00			1.00			1.00	0.99		1.00		0.99
Flpb, ped/bikes	1.00			1.00			0.99	1.00		0.98		1.00
Fr _t	0.97			1.00			1.00	0.99		1.00		0.99
Flt Protected	0.97			0.95			0.95	1.00		0.95		1.00
Satd. Flow (prot)	1764			1615			1575			1801	3496	1770
Flt Permitted	0.72			0.72			1.00			0.29	1.00	0.35
Satd. Flow (perm)	1308			1232			1575			552	3496	650
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)	34	5	11	54	3	192	18	707	67	122	827	77
RTOR Reduction (vph)	0	9	0	0	139	0	0	10	0	0	10	0
Lane Group Flow (vph)	0	41	0	54	56	0	18	764	0	122	894	0
Confl. Peds. (#/hr)							44			54	54	44
Heavy Vehicles (%)	0%	0%	10%	13%	0%	4%	0%	2%	6%	1%	2%	1%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.5		7.5	7.5			20.5	20.5		20.5	20.5	
Effective Green, g (s)	7.5		7.5	7.5			20.5	20.5		20.5	20.5	
Actuated g/C Ratio	0.21		0.21	0.21			0.57	0.57		0.57	0.57	
Clearance Time (s)	4.0		4.0	4.0			4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272		256	328			314	1990		370	2001	
v/s Ratio Prot				0.04				0.22			c0.25	
v/s Ratio Perm	0.03		c0.04				0.03			0.19		
v/c Ratio	0.15		0.21	0.17			0.06	0.38		0.33	0.45	
Uniform Delay, d1	11.6		11.8	11.7			3.4	4.3		4.1	4.5	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3		0.4	0.2			0.1	0.1		0.5	0.2	
Delay (s)	11.9		12.2	11.9			3.5	4.4		4.6	4.6	
Level of Service	B		B	B			A	A		A	A	
Approach Delay (s)	11.9			12.0				4.4			4.6	
Approach LOS	B			B			A			A		
Intersection Summary												
HCM 2000 Control Delay		5.6									A	
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)	36.0										8.0	
Intersection Capacity Utilization	61.0%										B	
Analysis Period (min)		15										
c Critical Lane Group												

Queues

2031 Total Traffic

PM Peak Hour

1: Hurontario Street & Dundas Street West/Dundas Street East



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	195	916	212	148	1220	1114	183	1165
v/c Ratio	0.89	0.69	0.54	0.56	0.97	0.90	0.90	0.74
Control Delay	54.0	43.0	28.5	27.5	61.6	52.7	74.1	34.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	43.0	28.5	27.5	61.6	52.7	74.1	34.6
Queue Length 50th (m)	39.0	125.4	36.6	21.8	171.7	151.7	34.6	136.2
Queue Length 95th (m)	m#74.6	152.7	m58.6	34.6	#219.4	#186.2	#78.2	163.0
Internal Link Dist (m)		363.1			130.7	165.0		95.3
Turn Bay Length (m)	40.0		25.0	35.0			55.0	
Base Capacity (vph)	220	1319	390	280	1258	1236	204	1564
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.69	0.54	0.53	0.97	0.90	0.90	0.74

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.

HCM Signalized Intersection Capacity Analysis

1: Hurontario Street & Dundas Street West/Dundas Street East

2031 Total Traffic

PM Peak Hour

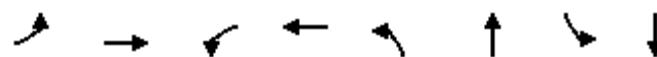
Movement	EBL	EBT	EBC	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑	↑	↑	↑↑			↑↑		↑	↑↑	
Traffic Volume (vph)	195	916	212	148	1016	204	0	978	136	183	1052	113
Future Volume (vph)	195	916	212	148	1016	204	0	978	136	183	1052	113
Ideal Flow (vphpl)	1860	1900	1640	1860	1900	1640	1860	1900	1640	1860	1900	1640
Total Lost time (s)	1.0	5.0	5.0	1.0	5.0			5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.66	1.00	0.96			0.97		1.00	0.97	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00			1.00		1.00	1.00	
Fr _t	1.00	1.00	0.85	1.00	0.97			0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1752	3544	918	1758	3357			3371		1750	3410	
Flt Permitted	0.08	1.00	1.00	0.15	1.00			1.00		0.08	1.00	
Satd. Flow (perm)	143	3544	918	274	3357			3371		142	3410	
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	916	212	148	1016	204	0	978	136	183	1052	113
RTOR Reduction (vph)	0	0	49	0	12	0	0	8	0	0	6	0
Lane Group Flow (vph)	195	916	163	148	1208	0	0	1106	0	183	1159	0
Confl. Peds. (#/hr)	206		410	410		206	463		301	301		463
Heavy Vehicles (%)	2%	3%	2%	1%	2%	1%	2%	3%	0%	2%	2%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA			NA		pm+pt	NA	
Protected Phases	3	8		7	4			6		5	2	
Permitted Phases	8			8	4					2		
Actuated Green, G (s)	60.6	49.6	49.6	60.4	49.5			49.0		62.0	62.0	
Effective Green, g (s)	64.6	52.1	52.1	64.4	52.0			51.0		64.0	64.0	
Actuated g/C Ratio	0.46	0.37	0.37	0.46	0.37			0.36		0.46	0.46	
Clearance Time (s)	3.0	7.5	7.5	3.0	7.5			7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	215	1318	341	262	1246			1228		202	1558	
v/s Ratio Prot	c0.08	0.26		0.05	c0.36			c0.33		c0.08	0.34	
v/s Ratio Perm	0.33		0.18	0.21						0.34		
v/c Ratio	0.91	0.69	0.48	0.56	0.97			0.90		0.91	0.74	
Uniform Delay, d1	39.8	37.2	33.6	25.8	43.2			42.1		38.0	31.3	
Progression Factor	0.71	1.08	1.12	1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	28.4	1.1	0.7	2.8	18.4			10.7		38.0	3.3	
Delay (s)	56.6	41.4	38.2	28.6	61.6			52.9		76.0	34.5	
Level of Service	E	D	D	C	E			D		E	C	
Approach Delay (s)		43.1			58.0			52.9			40.2	
Approach LOS		D			E			D			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)		140.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		110.6%			ICU Level of Service			H				
Analysis Period (min)		15										
c Critical Lane Group												

Queues

3: Confederation Parkway & Dundas Street West

2031 Total Traffic

PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	198	1152	54	1162	399	919	219	796
v/c Ratio	0.95	0.65	0.39	0.77	1.01	0.85	0.87	1.02
Control Delay	77.3	26.6	33.9	38.4	88.5	53.6	65.7	86.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	30.2
Total Delay	77.3	26.6	33.9	38.4	88.5	53.6	65.7	116.8
Queue Length 50th (m)	31.6	117.8	14.3	170.1	~96.0	124.1	42.1	~117.5
Queue Length 95th (m)	#80.3	141.1	m16.3	m178.7	#162.5	150.8	#86.9	#158.0
Internal Link Dist (m)	381.0			363.1		115.7		99.2
Turn Bay Length (m)	15.0		15.0		30.0		50.0	
Base Capacity (vph)	208	1770	138	1507	394	1079	253	783
Starvation Cap Reductn	0	0	0	0	0	0	0	62
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.65	0.39	0.77	1.01	0.85	0.87	1.10

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.

HCM Signalized Intersection Capacity Analysis
3: Confederation Parkway & Dundas Street West

2031 Total Traffic
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑↑		↑	↑↑		↑	↑↑		↑	↑↑	
Traffic Volume (vph)	198	1023	129	54	959	203	399	782	137	219	570	226
Future Volume (vph)	198	1023	129	54	959	203	399	782	137	219	570	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	4.0		4.0	4.0		1.0	5.0		1.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98		1.00	0.98		1.00	0.95	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.98		1.00	0.97		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1788	3431		1804	3429		1803	3477		1804	3299	
Flt Permitted	0.09	1.00		0.17	1.00		0.12	1.00		0.12	1.00	
Satd. Flow (perm)	176	3431		318	3429		230	3477		237	3299	
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)	198	1023	129	54	959	203	399	782	137	219	570	226
RTOR Reduction (vph)	0	7	0	0	13	0	0	10	0	0	30	0
Lane Group Flow (vph)	198	1145	0	54	1149	0	399	909	0	219	766	0
Confl. Peds. (#/hr)	99		85	85		99	107		74	74		107
Heavy Vehicles (%)	2%	4%	1%	0%	2%	2%	1%	1%	0%	1%	1%	1%
Turn Type	pm+pt	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2			6		7	4		3	8	
Permitted Phases	2				6			4			8	
Actuated Green, G (s)	69.0	69.0		58.0	58.0		57.0	41.0		43.0	30.0	
Effective Green, g (s)	71.0	72.0		61.0	61.0		59.0	43.0		47.0	32.0	
Actuated g/C Ratio	0.51	0.51		0.44	0.44		0.42	0.31		0.34	0.23	
Clearance Time (s)	3.0	7.0		7.0	7.0		3.0	7.0		3.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	204	1764		138	1494		389	1067		247	754	
v/s Ratio Prot	c0.07	0.33			c0.34		c0.19	0.26		0.09	c0.23	
v/s Ratio Perm	0.42			0.17			0.24			0.20		
v/c Ratio	0.97	0.65		0.39	0.77		1.03	0.85		0.89	1.02	
Uniform Delay, d1	31.7	24.8		26.9	33.5		43.6	45.5		37.3	54.0	
Progression Factor	1.00	1.00		1.03	1.10		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.3	1.9		3.7	1.8		52.4	8.6		29.3	36.8	
Delay (s)	86.0	26.7		31.3	38.7		96.0	54.1		66.6	90.8	
Level of Service	F	C		C	D		F	D		E	F	
Approach Delay (s)		35.4			38.4			66.8			85.6	
Approach LOS		D			D			E			F	
Intersection Summary												
HCM 2000 Control Delay		55.0					HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio		0.87										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)			11.0		
Intersection Capacity Utilization		146.0%					ICU Level of Service			H		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
5: Hurontario Street & Agnes Street

2031 Total Traffic
PM Peak Hour

Movement	EBL	EBC	NBL	NBT	SBT	SBR
Lane Configurations				↑↑	↑↓	
Traffic Volume (veh/h)	0	83	0	1346	1277	110
Future Volume (Veh/h)	0	83	0	1346	1277	110
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	83	0	1346	1277	110
Pedestrians	106					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	9					
Right turn flare (veh)						
Median type			Raised	Raised		
Median storage veh				1	1	
Upstream signal (m)			119			
pX, platoon unblocked	0.70					
vC, conflicting volume	2111	800	1493			
vC1, stage 1 conf vol	1438					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1725	800	1493			
tC, single (s)	6.9	6.9	4.1			
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	73	100			
cM capacity (veh/h)	136	302	414			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	83	673	673	851	536	
Volume Left	0	0	0	0	0	
Volume Right	83	0	0	0	110	
cSH	302	1700	1700	1700	1700	
Volume to Capacity	0.27	0.40	0.40	0.50	0.32	
Queue Length 95th (m)	8.3	0.0	0.0	0.0	0.0	
Control Delay (s)	21.4	0.0	0.0	0.0	0.0	
Lane LOS	C					
Approach Delay (s)	21.4	0.0		0.0		
Approach LOS	C					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		51.1%		ICU Level of Service		A
Analysis Period (min)		15				

Queues

2031 Total Traffic

PM Peak Hour

6: Confederation Parkway & Private Driveway/Agnes Street



Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	68	200	11	1186	119	981
v/c Ratio	0.11	0.24	0.51	0.04	0.54	0.53	0.44
Control Delay	14.6	20.3	16.4	4.4	6.2	16.5	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	20.3	16.4	4.4	6.2	16.5	5.5
Queue Length 50th (m)	1.1	4.0	6.8	0.3	20.4	4.0	16.0
Queue Length 95th (m)	8.0	15.8	28.0	1.9	46.1	22.7	35.8
Internal Link Dist (m)	58.6		388.8		99.2		286.0
Turn Bay Length (m)		25.0		20.0		15.0	
Base Capacity (vph)	652	629	769	432	3086	314	3146
Starvation Cap Reductn	0	0	0	0	157	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	0.05	0.11	0.26	0.03	0.40	0.38	0.31

Intersection Summary

HCM Signalized Intersection Capacity Analysis
6: Confederation Parkway & Private Driveway/Agnes Street

2031 Total Traffic
PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1	14	68	2	198	11	1061	125	119	958	23
Future Volume (vph)	19	1	14	68	2	198	11	1061	125	119	958	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
	4.0			4.0			4.0			4.0		4.0
Lane Util. Factor	1.00			1.00			1.00	0.95		1.00		0.95
Frpb, ped/bikes	1.00			1.00			1.00	0.99		1.00		1.00
Flpb, ped/bikes	1.00			1.00			0.98	1.00		0.99		1.00
Fr _t	0.94			1.00			1.00	0.98		1.00		1.00
Flt Protected	0.97			0.95			0.95	1.00		0.95		1.00
Satd. Flow (prot)	1765			1825			1620			1795	3530	1754
Flt Permitted	0.80			0.73			1.00			0.26	1.00	0.20
Satd. Flow (perm)	1447			1412			1620			495	3530	361
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)	19	1	14	68	2	198	11	1061	125	119	958	23
RTOR Reduction (vph)	0	11	0	0	69	0	0	12	0	0	2	0
Lane Group Flow (vph)	0	23	0	68	131	0	11	1174	0	119	979	0
Confl. Peds. (#/hr)							48			43	43	48
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	1%	0%	3%	1%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	9.5			9.5	9.5		29.6	29.6		29.6	29.6	
Effective Green, g (s)	9.5			9.5	9.5		29.6	29.6		29.6	29.6	
Actuated g/C Ratio	0.20			0.20	0.20		0.63	0.63		0.63	0.63	
Clearance Time (s)	4.0			4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	291			284	326		311	2218		226	2259	
v/s Ratio Prot					c0.08			c0.33			0.27	
v/s Ratio Perm	0.02			0.05			0.02			0.33		
v/c Ratio	0.08			0.24	0.40		0.04	0.53		0.53	0.43	
Uniform Delay, d1	15.2			15.8	16.3		3.3	4.9		4.9	4.5	
Progression Factor	1.00			1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1			0.4	0.8		0.0	0.2		2.2	0.1	
Delay (s)	15.4			16.2	17.2		3.4	5.1		7.1	4.6	
Level of Service	B			B	B		A	A		A	A	
Approach Delay (s)	15.4				16.9			5.1			4.9	
Approach LOS	B				B			A			A	
Intersection Summary												
HCM 2000 Control Delay				6.3			HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio				0.50								
Actuated Cycle Length (s)				47.1			Sum of lost time (s)			8.0		
Intersection Capacity Utilization				69.2%			ICU Level of Service			C		
Analysis Period (min)				15								
c Critical Lane Group												



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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