PROPOSED RESIDENTIAL DEVELOPMENT
2570-2590 ARGYLE ROAD
CITY OF MISSISSAUGA

Urban Transportation Considerations Report
Addendum 1

Prepared For: Ranee Management

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1.0 INTRODUCTION

BA Group is retained by Ranee Management to provide transportation consulting services related to the proposed development of lands municipally known as 2570-2590 Argyle Road in the City of Mississauga (referred to herein as “the site”).

The site is generally bounded by non-residential uses to the north, Argyle Road to the east, a residential site (Willow Walk Estates – 2542 and 2556 Argyle Road) to the south, and May Fix Creek to the west, with a residential subdivision beyond.

BA Group prepared an urban transportation considerations report entitled *Proposed Residential Development, 2570-2590 Argyle Road, City of Mississauga*, dated September 2020, which was submitted to the City of Mississauga as part of the Zoning By-law Amendment application.

The City has since provided comments dated from November 2020 to February 2021.

This letter summarizes the comments and respective responses, and reflects the updated site plan for the proposed development.

2.0 UPDATED DEVELOPMENT PROGRAMME

Since the September 2020 TIS, the development programme has been revised. A comparison of key characteristics of the previous and current development is provided in **Table 1**. Reduced architectural site plans are included in **Attachment A** for reference.

The current application proposes 5 additional residential units, 15 fewer vehicle parking spaces, and 6 additional bicycle parking spaces.

TABLE 1 DEVELOPMENT STATISTICS

Use		Existing Buildings	New Buildings	Total
Previous Application (September 2020)				
Residential Units		119 1-bedroom units 134 2-bedroom units 253 units	101 1-bedroom units 123 2-bedroom units 26 3-bedroom units 250 units	220 1-bedroom units 257 2-bedroom units 26 3-bedroom units 503 units
Transportation Elements	Vehicle Parking Supply	288 resident spaces 34 visitor spaces 322 parking spaces	215 resident spaces 67 visitor spaces 282 parking spaces	503 resident spaces 101 visitor spaces 604 parking spaces
	Loading Supply	2 loading spaces	2 loading spaces	4 loading spaces
	Bicycle Parking Supply	-	40 short-term 176 long-term 216 total	40 short-term 176 long-term 216 total
Current Application				
Residential Units		119 1-bedroom units 134 2-bedroom units 253 units	128 1-bedroom units 102 2-bedroom units 25 3-bedroom units 255 units	247 1-bedroom units 236 2-bedroom units 25 3-bedroom units 508 units
Transportation Elements	Vehicle Parking Supply	253 resident spaces 41 visitor spaces 294 parking spaces	255 resident spaces 40 visitor spaces 295 parking spaces	508 resident spaces 81 visitor spaces 589 parking spaces
	Loading Supply	2 loading spaces	2 loading spaces	4 loading spaces
	Bicycle Parking Supply	-	40 short-term 182 long-term 222 total	40 short-term 182 long-term 222 total

3.0 VEHICLE PARKING

3.1 ZONING BY-LAW REQUIREMENTS

The site is subject to the parking requirements of the City of Mississauga Zoning By-law 0225-2007. The site is zoned “RA4-18”, which is classified as “Apartments”. Application of the City of Mississauga Zoning By-law 0225-2007 is summarized in **Table 2** and results in the requirement of 752 parking spaces including 650 spaces for residents and 102 spaces for visitors.

TABLE 2 MISSISSAUGA ZONING BY-LAW 0225-2007 (RA4-1) PARKING REQUIREMENTS

Use	Number of Units	Minimum Rate	Number of Parking Spaces
Resident			
Bachelor	0	1.00 spaces / unit	0
1-Bedroom	247	1.18 spaces / unit	291
2-Bedroom	236	1.36 spaces / unit	321
3-Bedroom	25	1.50 spaces / unit	38
Sub-Total	508	--	650
Non-Resident			
Visitor	508	0.20 spaces / unit	102
Total Spaces Required			**752**

Notes:
1. For the calculation of the required residential parking, the appropriate resident and / or visitor rate or ratio shall be calculated for each component and then rounded. Fractions of less than 0.5 shall be rounded down to the nearest whole number. Fractions equal to or greater than 0.5 shall be rounded up to the nearest whole number.

3.2 PREVIOUSLY PROPOSED PARKING SUPPLY

The previously proposed minimum parking supply rate for residents in the September 2020 TIS was developed based on a review of existing parking demand. It was also proposed to adopt the required minimum parking supply rate for visitors (0.20 spaces / unit) as outlined in the Zoning By-law. The proposed minimum rates in the first submission are as follows:

- Resident parking supply rate: 1.00 spaces / unit; and
- Visitor parking supply rate: 0.20 spaces / unit (meets Zoning By-law 0225-2007 requirement).

3.3 UPDATED PROPOSED PARKING SUPPLY

Subsequent to the September 2020 TIS submission, City staff have accepted a lower visitor parking rate of 0.15 spaces per unit[1]. The current development proposal illustrates 589 parking spaces including 508 spaces for residents and 81 spaces for visitors, equating to the following rates:

- Resident parking supply rate: 1.00 spaces / unit; and
- Visitor parking supply rate: 0.16 spaces / unit (meeting the City's accepted rate).

The resident parking supply rate of 1.00 spaces / unit for all unit types has been maintained in keeping with future and planned transit improvements along the Hurontario and Dundas corridors. Furthermore, the site is a rental property, and the Owner is able to allocate parking supply for specific units based on practical demand. The visitor parking supply has been reduced from the previous submission to match existing demand observed on site.

Based on the foregoing, and the City's acceptance of the visitor parking rate, the currently proposed parking provision is suitable for the site development. **Table 3** summarizes the proposed parking supply by location.

TABLE 3 PROPOSED PARKING SUPPLY

	Parking Supply		Total
	Surface	Garage	
Resident	99	409	508
Visitor	81	-	81
Total	**180**	**409**	**589**

3.4 VEHICLE PARKING SPACE DIMENSIONS

A total of 49 resident parking spaces located within the surface parking lot in the southwest corner of the site have slightly-reduced dimensions as compared to those required under the City of Mississauga's Zoning By-law 0225-2007.

The minimum Zoning By-law requirements are summarized as follows:

2.6m width x 5.2m length with a 7.0m drive aisle width

The proposed parking spaces have the following dimensions:

2.6m width x 5.2m length with a **6.7m drive aisle width**

[1] The lower visitor parking rate is documented in a letter titled *Comments on Transportation Report (Parking Review) for 2570 and 2590 Argyle Road*, dated December 3, 2020, from City Planning staff.

The design vehicle is based on an empirical review of the modern passenger vehicle fleet in Canada. Based on a statistical review of the top 100 vehicle models and sales in Canada between the years 2005 to 2014, the 95th percentile passenger design vehicle has the dimensions of approximately 2.0m width x 5.15m length (equivalent to a Dodge Grand Caravan). The practical allowance for door openings is 0.30m on either side for a total of 2.6m. The total module dimension is 11.9m for the 49 parking spaces with a reduced drive aisle of 6.7m and the parking space length of 5.2m, meeting typical minimum parking space and drive aisle dimensions in other municipalities, including the City of Toronto (requirement of 11.6m). This provides adequate manoeuvring area for design vehicles, particularly given the fact that a one-way circulation is proposed in this area. On this basis, the proposed parking space dimensions accommodate the design vehicles and are appropriate. A provision allowing for these reduced dimensions should be included in the site-specific Zoning By-law.

4.0 LOADING

4.1 LOADING REQUIREMENTS

Loading space requirements for the proposed development are summarized in **Table 4**. Application of the prevailing City of Mississauga Zoning By-Law 0225-2007 to the proposed development results in a requirement for three (3) loading spaces with minimum dimensions of 3.5 metres by 9.0 metres.

TABLE 4 CITY OF MISSISSAUGA ZONING BY-LAW 0225-2007 LOADING SPACE REQUIREMENTS

Use	Building	Number of Units	Minimum Requirement	Number of Loading Spaces
Residential	A	127	1 loading space for apartment dwelling containing > 30 units	1
	B	126		1
	C	255		1
Total				**3**

4.2 PROPOSED LOADING SUPPLY

The two (2) existing loading spaces will be maintained and two (2) additional loading spaces will be provided in an enclosed loading areas in Building C.

The four (4) loading spaces will exceed the City of Mississauga Zoning By-Law requirements. The site plan can appropriately accommodate the needs of the design vehicles. Vehicle Manoeuvring Diagrams illustrating the inbound and outbound manoeuvers of a Peel Region garbage collection vehicle and a small delivery truck / cube van are provided in **Attachment C**.

5.0 BICYCLE PARKING

The existing buildings do not have any bicycle parking spaces. The recommended bicycle parking supply rates of the City of Mississauga Cycling Master Plan have been applied to Building C. Application of these rates would result in the requirement for a total of 199 spaces (of which 179 are long-term and 20 are short-term spaces), as summarized in **Table 5**.

TABLE 5 MISSISSAUGA CYCLING MASTER PLAN BICYCLE PARKING REQUIREMENTS

Use	Building	Number of Units	Minimum Rate	Number of Bicycle Parking Spaces
Residential	C	255	Long-term: 0.70 spaces per unit Short-term: 0.08 spaces per unit Total: 0.78 spaces per unit	179 20 199

Notes:

1. For the calculation of the required residential parking, the appropriate resident and / or visitor rate or ratio shall be calculated for each component and then rounded. Fractions of less than 0.5 shall be rounded down to the nearest whole number. Fractions equal to or greater than 0.5 shall be rounded up to the nearest whole number.

A total of 222 bicycle parking spaces are proposed for Building C, including 182 long-term spaces and 40 short-term spaces. The proposed number of bicycle parking spaces exceeds the requirements for Building C based on recommended rates. Due to the rental tenure of the buildings, the bicycle parking spaces may be allocated to residents of the existing buildings (Buildings A and B) or the proposed building (Building C), based on location and availability.

6.0 TRAFFIC ANALYSIS UPDATE

The traffic volume forecasting and analysis methodology is largely consistent with the September 2020 TIS. The following sections outline any changes that result from the City's comments or the revised development proposal.

6.1 REVISED FUTURE BACKGROUND TRAFFIC VOLUMES

6.1.1 Corridor Growth Rates

Table 6 summarizes the revised corridor growth rates based on City comments. These rates have been applied to the horizon year of 2025.

TABLE 6 CORRIDOR GROWTH RATES

Corridor	Travel Direction	Weekday AM Peak Hour	Weekday PM Peak hour
Dundas Street West	Eastbound	0.5%	0.5%
	Westbound	0.5%	0.5%
Confederation Parkway	Northbound	2%	1%
	Southbound	1%	1.5%

6.1.2 Background Developments

Traffic allowances were made to account for new development proposals in proximity to the site that are either under construction, approved or under review.

Based on comments provided by the City, development statistics to three of the four developments have been revised. The four considered background developments include a total of 996 residential units and 685 m^2 retail Gross Floor Area (GFA). A summary of the background developments is provided in **Table 7**.

TABLE 7 BACKGROUND DEVELOPMENTS

Development Address	Development Statistics	Report Source	Trip Generation / Distribution Source
2512-2532 Argyle Road	101 residential units	Nextrans Consulting	TIS Report October 2018
86-90 Dundas Street East	336 residential units 300 m^2 commercial GFA	GHD Consulting	TIS Report October 2018
85-95 Dundas Street West	419 residential units 385 m^2 retail GFA	GHD Consulting	TIS Report October 2020
100 Dundas Street West	140 residential units	Not Available(1)	

Notes:

1. The 100 Dundas Street West development is the lands bounded by Confederation Parkway to the west, Dundas Street West to the north, King Street West to the south, and commercial uses to the east. The trip assignment pertaining to this development is taken from the GHD report dated October 2018 for 86-90 Dundas Street East.

6.2 TRIP GENERATION COMPARISON

The revised development proposal proposes five (5) additional residential units compared to the programme analyzed in the September 2020 TIS. As shown in **Table 8**, this results in a negligible change in anticipated site trips during both the weekday morning and afternoon peak hours. Consistent with the September 2020 TIS, the site is expected to generate in the order of 180 and 190 total two-way trips in the weekday morning and afternoon peak hours, respectively.

TABLE 8 SITE TRIP GENERATION SUMMARY

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Previous Submission (September 2020 Report)						
Total Site Trips (250 units)	50	130	180	100	90	190
Current Submission (This Study)						
Total Site Trips (255 units)	50	130	180	100	90	190
Difference						
Difference (+5 units)	0	0	0	0	0	0

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

6.3 TRAFFIC OPERATIONS ANALYSIS UPDATE

The following sections discuss the updated traffic operations analysis resulting from the revised future growth allowances. All input and calibration parameters in the Synchro model are consistent with those described in the September 2020 TIS.

6.3.1 Signalized Intersection Analysis

6.3.1.1 Dundas Street West/Parkerhill Road

The intersection of Dundas Street West/Parkerhill Road currently operates with cycle lengths of 160 seconds during both the weekday morning and afternoon peak hours. The results of the traffic analysis for this intersection are summarized in **Table 9**.

Under existing traffic conditions, the intersection operates under capacity at overall v/c of 0.47 and 0.52 during the weekday morning and afternoon peak hours, respectively.

Under future background traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.48 and 0.55 during the weekday morning and afternoon peak hours, respectively.

With the addition of site-generated traffic under future total traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.48 and 0.55 during the weekday morning and afternoon peak hours, respectively. New site traffic is expected to have a negligible impact on the intersection's overall capacity during the peak hours.

TABLE 9 DUNDAS STREET WEST/PARKERHILL ROAD

Movement	Existing Traffic Conditions		Future Background Traffic Conditions		Future Total Traffic Conditions	
	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.11 (0.19)	A (A)	0.12 (0.20)	A (A)	0.12 (0.20)	A (A)
EBTR	0.48 (0.35)	A (A)	0.49 (0.38)	A (A)	0.49 (0.38)	A (A)
WBL	0.02 (0.04)	A (A)	0.02 (0.04)	A (A)	0.02 (0.04)	A (A)
WBTR	0.28 (0.53)	A (B)	0.30 (0.56)	A (B)	0.30 (0.56)	A (B)
NBLTR	0.00 (0.24)	A (E)	0.00 (0.24)	A (E)	0.00 (0.24)	A (E)
SBL	0.30 (0.38)	E (E)	0.30 (0.38)	E (E)	0.30 (0.38)	E (E)
SBR	0.06 (0.20)	E (E)	0.06 (0.28)	E (E)	0.06 (0.28)	E (E)
Overall	**0.47 (0.52)**	**A (B)**	**0.48 (0.55)**	**A (B)**	**0.48 (0.55)**	**A (B)**

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

The Dundas Street West/Parkerhill Road intersection is located approximately 80m west of the Dundas Street West/Argyle Road intersection (centreline to centreline measurement). The available storage distance in the westbound lane group is approximately 60m from the stop bar at Parkerhill Road to the west curb on Argyle Road. Existing queue lengths for the westbound lane group based on observations undertaken on October 22, 2019, and Synchro results are summarized in **Table 10**, for comparison.

Based on Synchro results, the queue length in the westbound left turn lane is accommodated in the available storage distance. These results are confirmed by existing observations. Based on Synchro results, the shared westbound through and right turn queue length extends beyond Argyle Road for part of the signal cycle. Observed queue lengths are shorter than Synchro results due to the upstream signal metering at Dundas Street West/Confederation Parkway, but queues may extend beyond Argyle Road during part of the signal cycle. Intermittent blockage of Argyle Road is mitigated by courtesy gaps.

Under future background conditions, queue lengths are projected to increase. The queue length in the westbound left turn lane will continue to be accommodated in the available storage distance. The shared westbound through and right turn queue length will continue to extend beyond Argyle Road during part of the signal cycle. Motorists making the northbound left turn from Argyle Road will continue to rely on courtesy gaps.

Under future total conditions, queue lengths are projected to increase by less than one (1) vehicle length as compared to future background conditions. The queue length in the westbound left turn lane will continue to be accommodated in the available storage distance. The shared westbound through and right turn queue length will continue to extend beyond Argyle Road during part of the signal cycle. Motorists making the northbound left turn from Argyle Road will continue to rely on courtesy gaps.

No mitigation measures are recommended.

TABLE 10 QUEUE ANALYSIS RESULTS

Movement	Storage Length (m)	Existing Traffic Conditions Observed(2)		Existing Traffic Conditions Synchro Results		Future Background Traffic Conditions Synchro Results		Future Total Traffic Conditions Synchro Results	
		50th%ile	95th%ile	50th%ile	95th%ile	50th%ile	95th%ile	50th%ile	95th%ile
WBL	60	0.9 (0.4)	7.5 (7.5)	0.6 (1.2)	1.2 (2.4)	0.6 (1.1)	0.9 (2.4)	0.5 (1.2)	1.0 (2.3)
WBTR	--	12.6 (33.2)	32.3 (74.6)	60.7 (165.4)	101.2 (250.8)	67.5 (184.4)	112.1 (264.7)	67.3 (187.8)	112.2 (269.8)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. Average vehicle length of 7.5m adopted.

6.3.2 Dundas Street West/Confederation Parkway

The intersection of Dundas Street West/Confederation Parkway currently operates with cycle lengths of 160 seconds during both the weekday morning and afternoon peak hours. The results of the traffic analysis for this intersection are summarized in **Table 11**.

Under existing traffic conditions, the intersection operates under capacity at overall v/c of 0.69 and 0.83 during the weekday morning and afternoon peak hours, respectively.

Under future background traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.73 and 0.90 during the weekday morning and afternoon peak hours, respectively.

With the addition of site-generated traffic under future total traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.74 and 0.91 during the weekday morning and afternoon peak hours, respectively. New site traffic is expected to have a minor impact (approximately 1% increase) on the intersection's overall capacity during the peak hours.

No mitigation measures are recommended.

TABLE 11 DUNDAS STREET WEST/CONFEDERATION PARKWAY

Movement	Existing Traffic Conditions		Future Background Traffic Conditions		Future Total Traffic Conditions	
	V/C	LOS	V/C	LOS	V/C	LOS
EBL	0.36 (0.51)	C (C)	0.36 (0.56)	C (C)	0.38 (0.59)	C (C)
EBTR	0.77 (0.52)	D (C)	0.79 (0.57)	D (C)	0.80 (0.58)	D (C)
WBL	0.12 (0.11)	C (B)	0.19 (0.20)	C (C)	0.19 (0.20)	C (C)
WBTR	0.49 (0.78)	C (D)	0.50 (0.83)	C (D)	0.50 (0.84)	C (D)
NBL	0.53 (0.94)	C (E)	0.66 (1.04)	D (F)	0.66 (1.04)	D (F)
NBT	0.30 (0.44)	C (D)	0.35 (0.46)	C (D)	0.35 (0.46)	C (D)
NBR	0.02 (0.04)	A (C)	0.03 (0.06)	C (C)	0.03 (0.06)	C (C)
SBL	0.62 (0.77)	E (F)	0.69 (0.79)	E (F)	0.69 (0.79)	E (F)
SBT	0.57 (0.52)	D (E)	0.63 (0.54)	D (D)	0.63 (0.54)	D (D)
SBR	0.09 (0.32)	D (D)	0.09 (0.31)	D (D)	0.11 (0.32)	D (D)
Overall	**0.69 (0.83)**	**D (D)**	**0.73 (0.90)**	**D (D)**	**0.74 (0.91)**	**D (D)**

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

6.3.3 Confederation Parkway/King Street West

The intersection of Confederation Parkway/King Street West currently operates with a cycle length of 160 seconds during both the weekday morning and afternoon peak hours. The results of the traffic analysis for this intersection are summarized in **Table 12**.

Under existing traffic conditions, the intersection operates under capacity at overall v/c of 0.38 and 0.45 during the weekday morning and afternoon peak hours, respectively.

Under future background traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.42 and 0.49 during the weekday morning and afternoon peak hours, respectively.

With the addition of site-generated traffic under future total traffic conditions, the intersection will continue to operate under capacity at overall v/c of 0.42 and 0.49 during the weekday morning and afternoon peak hours, respectively. New site traffic is expected to have a negligible impact on the intersection's overall capacity during the peak hours.

No mitigation measures are recommended.

TABLE 12 CONFEDERATION PARKWAY/KING STREET WEST

Movement	Existing Traffic Conditions		Future Background Traffic Conditions		Future Total Traffic Conditions	
	V/C	LOS	V/C	LOS	V/C	LOS
WBL	0.30 (0.70)	E (E)	0.30 (0.70)	E (E)	0.30 (0.70)	E (E)
WBR	0.12 (0.23)	E (E)	0.12 (0.23)	E (E)	0.12 (0.23)	E (E)
NBT	0.38 (0.42)	A (A)	0.44 (0.48)	A (B)	0.44 (0.48)	A (B)
NBR	0.07 (0.07)	A (A)	0.07 (0.08)	A (A)	0.07 (0.08)	A (A)
SBL	0.31 (0.32)	A (A)	0.33 (0.35)	A (B)	0.33 (0.35)	A (B)
SBT	0.35 (0.30)	A (A)	0.38 (0.34)	A (A)	0.38 (0.34)	A (A)
Overall	**0.38 (0.45)**	**B (C)**	**0.42 (0.49)**	**B (C)**	**0.42 (0.49)**	**B (C)**

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

6.4 UNSIGNALIZED INTERSECTIONS OPERATIONS ANALYSIS

Table 13 summarizes operations analysis for unsignalized intersections. Synchro reports are attached in **Attachment D**. Key lane groups at the study area unsignalized intersections operate at LOS E or better under existing and future conditions.

TABLE 13 UNSIGNALIZED INTERSECTIONS

Lane Group	Existing Traffic Conditions			Future Background Traffic Conditions			Future Total Traffic Conditions		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Dundas Street West/Rugby Road									
EBL	0.03 (0.04)	9.0 (13.3)	A (B)	0.03 (0.04)	9.1 (14.0)	A (B)	0.03 (0.04)	9.2 (14.2)	A (B)
WBL	0.03 (0.04)	12.7 (11.0)	B (B)	0.03 (0.04)	13.0 (11.4)	B (B)	0.04 (0.04)	13.3 (11.5)	B (B)
NBL	0.14 (0.12)	31.7 (24.7)	D (C)	0.14 (0.14)	33.8 (26.8)	D (D)	0.15 (0.14)	35.2 (27.6)	E (D)
NBR	0.03 (0.07)	12.8 (12.7)	B (B)	0.03 (0.08)	12.9 (13.0)	B (B)	0.03 (0.08)	13.1 (13.1)	B (B)
SBLTR	0.02 (0.08)	9.1 (13.5)	A (B)	0.02 (0.09)	9.1 (14.2)	A (B)	0.02 (0.09)	9.1 (14.4)	A (B)
Confederation Parkway/Dunbar Road									
EBLTR	0.34 (0.26)	19.9 (21.8)	C (C)	0.40 (0.31)	23.1 (26.6)	C (D)	0.47 (0.37)	24.4 (27.0)	C (D)
WBLTR	0.01 (0.00)	12.9 (0.0)	B (A)	0.01 (0.00)	13.8 (0.0)	B (A)	0.01 (0.00)	13.8 (0.0)	B (A)
NBL	0.07 (0.08)	9.1 (9.1)	A (A)	0.08 (0.08)	9.3 (9.4)	A (A)	0.09 (0.11)	9.3 (9.5)	A (A)
Dundas Street West/Argyle Road									
WBL	0.05 (0.06)	13.1 (11.0)	B (B)	0.06 (0.08)	13.6 (11.6)	B (B)	0.07 (0.12)	13.8 (11.9)	B (B)
NBL	0.18 (0.17)	26.1 (20.5)	D (C)	0.24 (0.20)	29.0 (22.6)	D (C)	0.30 (0.23)	31.0 (23.4)	D (C)
NBR	0.09 (0.05)	13.1 (12.0)	B (B)	0.10 (0.06)	13.4 (12.4)	B (B)	0.16 (0.10)	14.0 (12.8)	B (B)
Argyle Road/North Site Driveway									
EBLR	0.03 (0.01)	9.2 (9.3)	A (A)	0.03 (0.01)	9.3 (9.5)	A (A)	0.09 (0.07)	9.8 (10.2)	A (B)
NBLT	0.00 (0.00)	0.0 (0.5)	A (A)	0.00 (0.00)	0.0 (0.5)	A (A)	0.01 (0.02)	0.8 (1.8)	A (A)

Argyle Road/Centre Site Driveway[2]									
EBLR	0.05 (0.04)	9.3 (9.5)	A (A)	0.05 (0.04)	9.4 (9.7)	A (A)	Access consolidated under future total conditions.		
NBLT	0.01 (0.01)	1.4 (1.5)	A (A)	0.01 (0.01)	1.1 (1.3)	A (A)			
Argyle Road/South Site Driveway									
EBLR	0.01 (0.01)	8.8 (9.2)	A (A)	0.01 (0.01)	8.9 (9.4)	A (A)	0.10 (0.08)	9.8 (10.1)	A (B)
NBLT	0.00 (0.00)	0.6 (0.0)	A (A)	0.00 (0.00)	0.5 (0.0)	A (A)	0.01 (0.01)	1.4 (1.2)	A (A)

Notes:
1. XX (XX) – Weekday Morning Peak Hour (Weekday Afternoon Peak Hour).
2. The central site driveway will be closed with the development of the site.

At the Dundas Street West/Argyle Road intersection, the shared westbound through and right turn queue length extending from the signalized Dundas Street West/Parkerhill Road intersection will continue to extend beyond Argyle Road for part of the signal cycle. Motorists making the northbound left turn from Argyle Road will continue to rely on courtesy gaps (discussed further in **Section 6.3.1.1**). Upstream and downstream signals along Dundas Street West also provide gaps in the corridor traffic stream. Maintenance of northbound left turn v/c ratios of 0.30 and 0.23 in the weekday morning and weekday afternoon peak hours, respectively, confirms sufficient capacity will be available to serve projected traffic volumes.

At the Dundas Street West/Rugby Road and Confederation Parkway/Dunbar Road intersections, similar effects with upstream and downstream signals along the major corridors provide gaps in the traffic stream, maintaining sufficient capacity on the minor approaches.

No mitigation measures are recommended.

Based on the foregoing, the conclusions of the traffic operations analysis are generally consistent with what has been reported in the September 2020 TIS.

7.0 SIGNAL WARRANT ANALYSIS

Signal warrant analysis was undertaken for the Dundas Street West/Argyle Road and Confederation Parkway/Dunbar Road intersections. The Dundas Street West/Argyle Road intersection is located 80m from the nearest signal at Dundas Street West/Parkerhill Road, while the Confederation Parkway/Dunbar Road intersection is located 105m from the nearest signal at Confederation Parkway/King Street West.

The methodology prescribed in Book 12 of the Ontario Traffic Manual (OTM) for signalized intersections was adopted as the basis for determining the necessity for a traffic signal at the aforementioned intersections. The manual provides a series of warrants that review appropriateness of a signal based on a number of factors including overall traffic volumes, collision history, turning movement volumes, and pedestrian crossing volumes amongst other criteria.

Based on the OTM methodology, a traffic signal is not warranted at the Dundas Street West/Argyle Road intersection, but is warranted under Justification 4 (Four-Hour Volume) at the Confederation Parkway/Dunbar Road intersection. Warrant results are provided in **Attachment E**.

Notwithstanding the warrant results, site traffic impacts on the eastbound movement from Dunbar Road onto Confederation Parkway are minor (additional 1-second delay to the eastbound movement). On this basis, signal installation at the intersection of Confederation Parkway/Dunbar Road is not warranted as a result of development.

8.0 RESPONSES TO AGENCY COMMENTS

8.1 CITY OF MISSISSAUGA COMMENTS

City of Mississauga Transportation and Works Department staff provided comments in February 2021. Reponses to transportation-related comments are below.

8.1.1 Access Modification Details Comments

Comment (a): *The Site/Grading Plan shall be revised to dimension the existing driveway width(s) at the street and property line.*

Response:
See architectural drawings for dimension details.

Comment (b): *The Site/Grading Plan shall be revised to dimension the proposed driveway width(s) at the street and property line.*

Response:
The driveway dimensions are as shown on the architectural plans (see drawing A-003).

Comment (c): *The Site/Grading Plan shall be revised to dimension the entrance curb radii.*

Response:
The driveway dimensions are as shown on the architectural plans (see drawing A-003).

Comment (d): *Proposed driveway and entrance curb radii dimensions shall be in accordance with OPSD 350.010.*

Response:
Driveway details have been revised as per OPSD 350.010 (see drawing A-003).

Comment (e): *The Site/Grading Plan shall be revised to indicate the municipal curb and sidewalk continuous through the driveway.*

Response:
The site driveways have been revised to show the municipal curb and sidewalk continuous through the driveway (see drawing A-003).

Comment (f): *The Site/Grading Plan shall be revised to identify the portions of the municipal sidewalk and curb across the proposed access as "Heavy Duty Curb/Sidewalk as per City of Mississauga standards".*

Response:
Noted. Please refer to architectural plans.

Comment (g): *The Site/Grading Plan shall be revised to identify the portions of the curb returns at the proposed access as "Curb returns as per City of Mississauga standards".*

Response:
Noted. Please refer to architectural plans.

8.1.2 Traffic Impact Study Comments

Comment (1): *Please confirm if Terms of Reference have been provided for the City's review prior to conducting this TIS report. If yes, please include it in the Appendix section.*

Response:
The terms of reference letter is provided in **Attachment B**.

Comment (2): *As per DARC 19-177 comments, signal warrant analysis is required for Dundas/Argyle and Confederation/Dunbar intersections.*

Response:
The signal warrant analysis is discussed in **Section 7.0**. The Ontario Traffic Manual (OTM) Book 12 results worksheets are provided in **Attachment E**. Based on the OTM methodology, a traffic signal is not warranted at the Dundas Street West/Argyle Road intersection, but is warranted under Justification 4 (Four-Hour Volume) at the Confederation Parkway/Dunbar Road intersection.

Notwithstanding the warrant results, site traffic impacts on the eastbound movement from Dunbar Road onto Confederation Parkway are minor (additional 1-second delay to the eastbound movement). On this basis, signal installation at the intersection of Confederation Parkway/Dunbar Road is not warranted as a result of development.

Comment (3): *In addition to the provided analysis, please include the comparison for trip generation and impact to the road network between 12 storey apartment and 15 storey apartment.*

Response:
Trip generation characteristics for the current proposal compared to the previous proposal are summarized in **Section 6.2**.

Comment (4): *Future Background Traffic Volumes. 6.2.1 Corridor Growth. A rate of 2% per annum has been assumed for the corridor traffic growth. This section should be revised using the following breakdown of growth rates: - Dundas St AM/PM - 0.5% for EB & WB approaches - Confederation AM NB - 2%; SB - 1%; PM NB -1% SB - 1.5%*

Response:
Acknowledged. Based on these corridor growth rates, the future background growth and resulting traffic operations analysis has been revised. The updated corridor growth rates and traffic operations summaries are provided in **Sections 6.1.1** and **6.3**, respectively.

Comment (5): *Section 6.2.2 Background Developments. Table 11. Background Develompents. Number of units for 2512-2532 Argyle Rd has been changed to 101. Second development is 86-90 Dundas St E, and statistics should be updated to 336 residential units and 300 sq m commercial. Third development is 85-95 Dundas St W containing 419 units and 385 sq m retail and most recent TIS dated Oct 23, 2020. Please update the table accordingly.*

Response:
Acknowledged. The background development summary table in **Section 6.1.2** and resulting traffic operations analysis has been revised accordingly.

Comment (6): *6.4 Future Total Traffic Volume. Please provide the details for the horizon year used in the analysis in this section. In addition, all applicable Tables or Figures should be updated to show the horizon year.*

Response:
Acknowledged. The future horizon year of 2025 has been labelled where necessary in this addendum and in the traffic volume figures.

Comment (7): *Include a section to address any traffic concerns from the Community related to the proposed development.*

Response:
Consideration for community comments has been included in this addendum report.

8.1.3 Internal Site Circulation Comments

Comment (a): *Turning movement diagrams will be required to depict the internal site circulation.*

Response:
Vehicle Manoeuvring Diagrams are included in Appendix C.

Comment (b): *Confirmation from Fire and Emergency Services that the internal road is acceptable from an emergency response perspective.*

Response:
Noted. Fire route details are shown in architectural drawings (see drawing A-003).

Comment (c): *Confirmation from the Region of Peel that the internal road is acceptable from a waste collection perspective.*

Response:
Noted.

8.1.4 Additional Terms, Provisions, Conditions and Notes Comments

Comment: *The Transportation Impact Study prepared by BA Consulting Group, dated September 2020 identifies several TDM measures to be implemented as part of the proposed development to reduce single occupancy vehicle (SOV) trips to the site. The following shall be included under Schedule 'C' of the Development Agreement: "The owner agrees to incorporate the following TDM measures as part of their proposed development:*

(i) Bicycle Parking: Provide 216 bicycle parking spaces including 176 long-term spaces and 40 short-term.

(ii) Transit Information Centre: Provide an information centre within the proposed buildings that ensure current transit information sources (arrival times, route information, advisory notices) are conveniently available to all residents and visitors of the site.

Response:
To be addressed under separate cover by the Applicant.

8.1.5 Dundas Connects Comments

Comment: *The Owner is advised that Dundas Street is a major east-west arterial road in Mississauga and is identified in the City's Official Plan as an intensification corridor. The City of Mississauga has completed a master plan study of Dundas Street through the Dundas Connects project. This study explores ways to incorporate higher order transit on Dundas Street and investigate opportunities for associated transit-orientated development. The Owner is also advised to review project details as there will may be impacts to this site, such as future right-of-way widening and restricted access. Project details can be found at: https://www.dundasconnects.ca/*

Response: The subject site has no frontage along Dundas Street. However, these comments are noted.

8.2 REGION OF PEEL COMMENTS

Region of Peel Development Services – Public Works Department staff provided comments in February 2021. Reponses to transportation-related comments are below.

Comment (1): *Waste collection vehicle access route requirements can be met, including: - The Turning Radius from the centre line must be a minimum of 13 metres on all turns. This includes the turning radii to the entrance and exit of the site and the collection point. - In a situation where a waste collection vehicle must reverse the maximum straight back-up distance is 15 metres. - Overhead clearance outside of the Collection Point is a minimum of 4.4 metres from the top of the access road, along the Waste Collection Vehicle access and egress route is required.*

Response:
Vehicle manoeuvring diagrams illustrating the required turning radii are included in Appendix C.

Comment (2): *Waste Collection point and staging area has a minimum overhead clearance of 7.5 metres from the concrete pad.*

Response:
Refer to architectural drawings regarding the provided overhead clearances.

Comment (3): *A minimum 18 metre straight head-on approach to the indoor collection point is required. This approach is to be level and solid (+/- 2%) and the same width as the collection point.*

Response:
Given the physical constraints of the site and key structural building elements, it is not possible to provide an 18 metre straight head-on approach into the refuse loading space. However, the vehicle manoeuvring diagrams (see Appendix C) demonstrate that the refuse collection vehicle can appropriately enter and exit the refuse loading area within the defined space.

Comment (4): *The Collection Point must be of sufficient length for the Waste Collection Vehicle to wholly enter with forks down and to allow for safe moving and loading of bins. A minimum of 15 m must be provided from the front of the first bin within the indoor collection point. The A102 Level 1 Ground Floor Plan illustrated insufficient length of 12.68m from the overhead door to the column, please provide 15m.*

Response:
Refer to architectural drawings regarding waste collection area layout.

Comment (5): *See Appendix 7 of the Waste Collection Design Standards Manual for front-end bin dimensions. The bin size in the storage room and bin calculation must be shown and labelled on subsequent revised submissions.*

Response:
Noted.

* * * * *

Sincerely,
BA Consulting Group Ltd.

Margaret Briegmann, P. Eng.
Associate

Cc. Nathan Yau, Lead Transportation Analyst

ATTACHMENT A: REDUCED SCALE ARCHITECTURAL PLANS

DEVELOPMENT STATISTICS

m - Denotes Meters | *min - Denotes Minimum*
sm - Denotes Square Meters | *max - Denotes Maximum*

PROJECT DATA

Municipal Address of Subject Lands:	**2570 -2590 Argyle Road** Mississauga, Ontario
Legal Description:	**Part of Block A Registered Plan E-23**
Zoning By-law:	Zoning By-law 0225-2007, Enacting Bylaw BL-0225/07, BL-0131/18 Exception Zone Map # 15 By-law: 0174-2017 RA4-18

Zoning : (Apartment)	**RA4-18**	Proposed Use :	**Apartment**
(Greenlands)	**G1**	Lot Area:	**21,533.82** sm
Permitted F.S.I. : By-law: 0225-2007	**1.50**	Proposed F.S.I. :	**1.85**
		Proposed GFA COMBINED :	**39,945.04** sm
Mississauga Official Plan, Cookville NHD (West) FSI ranges 0.5 - 1.2		*Total NEW Building C*	18,755.44 sm
		Total EXISTING Building A & B	21,189.60 sm
		Existing F.S.I.	0.98
Permitted Lot Coverage:	**40%**	Proposed Lot Coverage:	**25%**
Lot Frontage:	142.56 m	No of Frontages:	1
Lot Depth:	174.02 m		
Established Grade:	**113.27** m	*CDG (Canadian Geodetic Datum)*	
Published Elevation	115.617 m		

BUILDING HEIGHT

STANDARD		*PROPOSED*	
Highest point of the roof surface of a flat roof: Height to Top of MPH Roof	N/A m	Highest point of the roof surface of a flat roof: Height to Top of MPH Roof C	47.30 m
No. of Storeys Permitted:	13 storeys	No. of Storeys Proposed C	14 storeys

BUILDING SETBACKS

STANDARD	*m*	*PROPOSED*	*m*
Front Yard Setback E	7.50 min	Front Yard Setback E	111.00
Side Yard Setback S	4.50 min	Side Yard Setback S	32.00
Side Yard Setback N	4.50 min	Side Yard Setback N	4.50
Rear Yard Setback W *	4.50 min	Rear Yard Setback W *	7.50

*to Greenlands zone (easement)

PROPOSED LANDSCAPED SOFT AREAS

	sm	%
Lot Area:	21,533.82	
Ground Floor Area*	5,371.2	25%
Landscaped Open Space**	9,259.5	43%
Paved Surface Area***	6,903.2	32%

** Building Footprint New + Existing*
*** Soft Landscaping + Hard Landscaping areas*
**** Driveway, Parking lots and loading areas*

PROPOSED RESIDENTIAL UNITS

TOTAL Number of Residential Units Building A, B, + C: **508**

EXISTING:	*Unit Count*	NEW:	*Unit Count*
Rental Building A:	127	Rental Building C:	255
Rental Building B:	126		
Total Building A + B:	**253**	Total Rental Building C:	**255**

PROPOSED AMENITY

STANDARD	*sm*	*PROVIDED*	*sm*
the greater of 5.6 m2 per dwelling unit or 10% of the site area			
10% of Site Area:	2,153.38	TOTAL Indoor Amenity Provided:	466.88
5.6 SM / Building C units +		TOTAL Outdoor (other) Provided:	698.18
Playground Replacement:	1,583.00	TOTAL Outdoor (at grade) Provided:	2,744.60
Required amenity:	**1,583.00**	TOTAL Amenity:	**3,909.66**
50% in one contiguous area	*791.50*		

PROPOSED PARKING SPACE

STANDARD	Pirk.Spaces	*PROVIDED*	Pirk.Spaces
Total Parking Spaces Required A, B + C:	**678**	Total Parking Spaces Provided:	**589**
New Building C		Breakdown of parking space by location:	
Breakdown of parking space by ratio:		Open Surface Spaces	180
Studio (1.00)	0	Above Grade Parking	254
1 Bedroom (1.18)	152	Below Grade Parking	155
2 Bedroom (1.36)	139	TOTAL	589
3 Bedroom (1.50)	38		
Residential TOTAL:	**325**		
Visitor TOTAL (0.20/unit)	**65**	***Building A + B Replacement***	**294**
TOTAL:	391	RATIO PROPOSED:	1.15
Building A and B Existing	287	***Building C***	**295**
		RATIO PROPOSED:	1.15
TOTAL:	678		

PROPOSED LOADING SPACE

STANDARD		*PROVIDED*	
	1 / Building		
Type of Loading Space Required:	3.5m x 9.0m	Type of Loading Space Provided:	3.5m x 9.0m
Building C	1	Building C	1
Building A Retain existing Loading Area			
Building B Retain existing Loading Area			

BREAKDOWN OF PROJECT DATA BY COMPONENTS - PROPOSED NEW BUILDING C

PROPOSED RESIDENTIAL UNIT MIX

PROVIDED TOTAL BUILDING C

Unit Type	*Unit Count*	Typical Unit Size	Percent
Studio	0	0.0sm	0%
1 Bedroom	128	0.0sm	50%
2 Bedroom	102	0.0sm	40%
3 Bedroom	25	0.0sm	10%
TOTAL C:	**255**		

PROPOSED AREAS

Zoning GFA	sm		
NEW C Residential GFA****	**18,755.44**	**** *GFA as defined by Zoning By-law*	
		Max GFA for each Storey above 12 Storeys	1,000.00 sm
		Proposed GFA (envelope) for 13th floor	1,418.58 sm
		Proposed GFA (envelope) for 14th floor	1,210.83 sm

BREAKDOWN OF PROJECT DATA BY COMPONENTS - EXISTING BUILDINGS A & B

RESIDENTIAL UNIT MIX - EXISTING

Existing BUILDING A - 2590 Argyle

Unit Type	*Unit Count*	%
Studio	0	0%
1 Bedroom	60	47%
2 Bedroom	67	53%
3 Bedroom	0	0%
TOTAL:	127	

Existing BUILDING B - 2570 Argyle

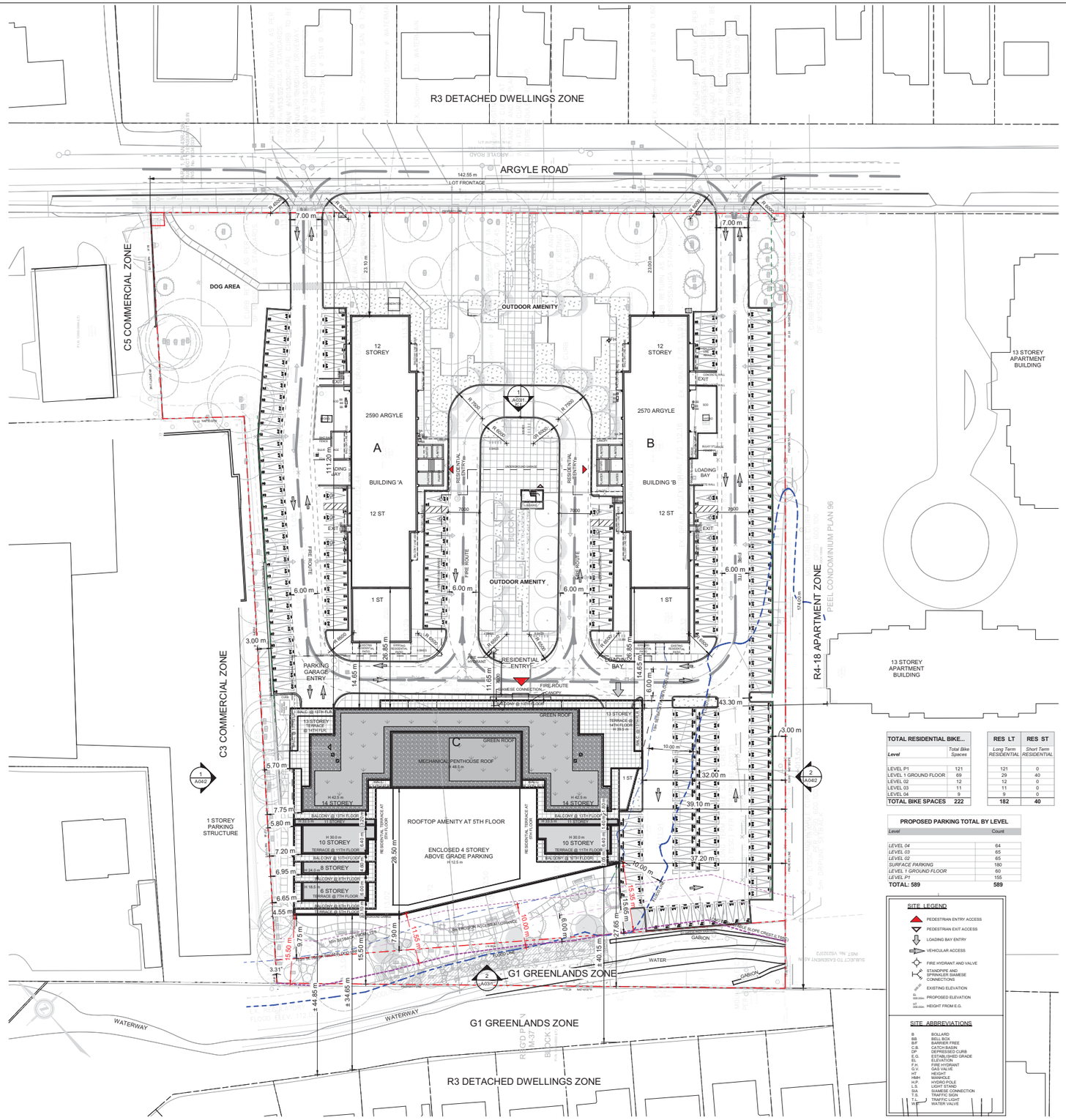
Unit Type	*Unit Count*	%
Studio	0	0%
1 Bedroom	59	47%
2 Bedroom	67	53%
3 Bedroom	0	0%
TOTAL:	126	

Existing TOTAL BUILDING A & B

Unit Type	*Unit Count*	Percent
Studio	0	0%
1 Bedroom	119	47%
2 Bedroom	134	53%
3 Bedroom	0	0%
TOTAL C & D:	**253**	

AREAS - EXISTING

Existing GFA	sm	
1840 EXISTING A Residential GFA [1]	10,594.80	[1] *As per Mississauga Data WITH NO DEDUCTIONS*
1850 EXISTING B Residential GFA [1]	10,594.80	
TOTAL:	**21,189.60**	



TOTAL RESIDENTIAL BIKE...	
Level	*Total Bike Spaces*
LEVEL P1	121
LEVEL 1 GROUND FLOOR	69
LEVEL 02	12
LEVEL 03	11
LEVEL 04	9
TOTAL BIKE SPACES	**222**

RES LT	RES ST
Long Term RESIDENTIAL	*Short Term RESIDENTIAL*
121	0
29	40
12	0
11	0
9	0
182	**40**

PROPOSED PARKING TOTAL BY LEVEL	
Level	*Count*
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	180
LEVEL 1 GROUND FLOOR	60
LEVEL P1	155
TOTAL: 589	**589**

SITE LEGEND

- PEDESTRIAN ENTRY ACCESS
- PEDESTRIAN EXIT ACCESS
- LOADING BAY ENTRY
- VEHICULAR ACCESS
- FIRE HYDRANT AND VALVE
- STANDPIPE AND SPRINKLER SIAMESE CONNECTIONS
- 100.00m EXISTING ELEVATION
- 100.00m PROPOSED ELEVATION
- 100.00m HEIGHT FROM E.G.

SITE ABBREVIATIONS

B	BOLLARD
BB	BELL BOX
BF	BARRIER FREE
C.B.	CATCH BASIN
DP	DEPRESSED CURB
E.G.	ESTABLISHED GRADE
EL	ELEVATION
F.H.	FIRE HYDRANT
G.V.	GAS VALVE
HI	HEIGHT
MMH	MANHOLE
H.P.	HYDRO POLE
L.S.	LIGHT STAND
SIA	SIAMESE CONNECTION
T.S.	TRAFFIC SIGN
T.L.	TRAFFIC LIGHT
W.V.	WATER VALVE

1 SITE PLAN
Scale: 1 : 300

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RANEE MANAGEMENT
4122 Bathurst St., Toronto, ON M3H 3P2
TEL: 416-756-3962

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KEYPLAN

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR RE-ZONING/OPA	2020-08-31
2	ISSUED FOR RE-ZONING/OPA	2022-04-08

SEAL

IBI GROUP
55 St. Clair Avenue West, 7th Floor,
Toronto, ON M4V 2Y7, Canada
Tel 416 596 1930 fax 416 596 0644
ibigroup.com

PROJECT
ARGYLE
2570 - 2590 Argyle Rd.
CITY OF MISSISSAUGA, ON
PART OF BLOCK A
REGISTERED PLAN E - 23

PROJECT NO: 120325	
DRAWN BY: -	CHECKED BY: -
PROJECT MGR: -	APPROVED BY: -

SHEET TITLE
CONCEPT SITE PLAN & OVERALL PROJECT STATISTICS

SHEET NUMBER	ISSUE
A-003	2

2022-04-13 12:20:02 PM

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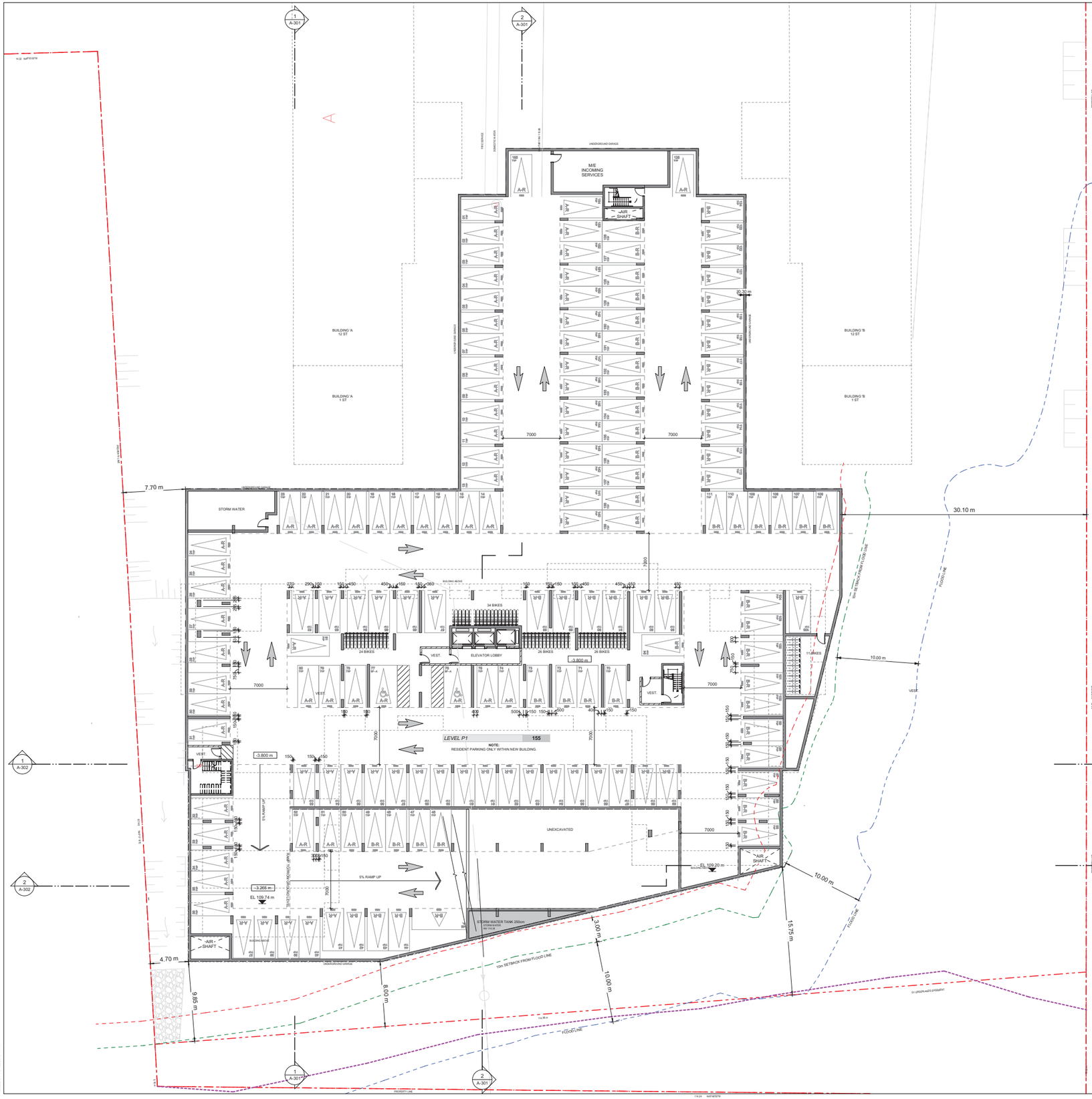


PROPOSED PARKING BLDG. A

Level	Count
SURFACE PARKING	43
LEVEL 1 GROUND FLOOR	5
LEVEL P1	79
A-R	**127**
SURFACE PARKING	21
A-V	**21**
TOTAL	**148**

BUILDING A (127 UNITS) :

127 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
21 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. B

Level	Count
SURFACE PARKING	44
LEVEL 1 GROUND FLOOR	6
LEVEL P1	76
B-R	**126**
SURFACE PARKING	20
B-V	**20**
TOTAL	**146**

BUILDING B (126 UNITS) :

126 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
20 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. C

Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	12
LEVEL 1 GROUND FLOOR	49
C-R	**255**
SURFACE PARKING	40
C-V	**40**
TOTAL	**295**

BUILDING C (255 UNITS) :

255 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
40 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING TOTAL BY LEVEL

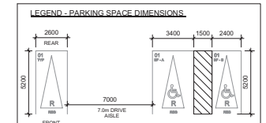
Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	180
LEVEL 1 GROUND FLOOR	60
LEVEL P1	155
TOTAL: 589	**589**

SITE TOTAL (508 UNITS)

508 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
81 VISITORS @ PROPOSED RATIO:0.15 / UNIT

SITE TOTAL PARKING SPACES : 589

LEGEND - PARKING SPACE DIMENSIONS



* 0.15m INCREASE ON EACH SIDE WITH OBSTRUCTION MORE THAN 1.0m FROM THE FRONT OR REAR OF THE PARKING SPACE

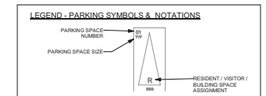
TYPICAL PARKING SPACE SIZE
5.2m LENGTH / 2.6m WIDTH* / 2.0m VERTICAL CLEARANCE

ACCESSIBLE PARKING SPACE

TYPE A
5.2m LENGTH
3.4m WIDTH , ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

TYPE B
5.2m LENGTH
2.4m WIDTH , ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

LEGEND - PARKING SYMBOLS & NOTATIONS



DESIGNATION TAG ABBREVIATIONS

R - DENOTES RESIDENTIAL
V - DENOTES VISITOR
A/B/C - DENOTES BUILDING A / B / C
TYP - DENOTES REGULAR CITY OF MISSISSAUGA SPACE SIZE
BF - DENOTES BARRIER FREE CITY OF MISSISSAUGA SPACE SIZE
SC - DENOTES SMALL CAR SPACE SIZE

TOTAL RESIDENTIAL BIKE...		RES LT	RES ST
Level	Total Bike Spaces	Long Term RESIDENTIAL	Short Term RESIDENTIAL
LEVEL P1	121	121	0
LEVEL 1 GROUND FLOOR	69	29	40
LEVEL 02	12	12	0
LEVEL 03	11	11	0
LEVEL 04	9	9	0
TOTAL BIKE SPACES	**222**	**182**	**40**

BUILDING C (255 UNITS)

178 LONG TERM BIKES @ REQURIED RATIO: 0.7 / UNIT
20 SHORT TERM BIKES @ REQURIED RATIO: 0.08 / UNIT

BUILDING A+B (253 UNITS)

20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

1 A-101 PARKING LEVEL P1
Scale: 1 : 150

True North Project North

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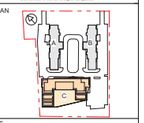
KEYPLAN



ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR RE-ZONING/OPA	2020-08-31
2	ISSUED FOR RE-ZONING/OPA	2022-04-08

SEAL

IBI GROUP
55 St. Clair Avenue West, 7th Floor,
Toronto, ON M4V 2Y7, Canada
tel 416 398 1930 fax 416 596 0644
ibigroup.com

PROJECT
ARGYLE
2570 - 2590 Argyle Rd.
CITY OF MISSISSAUGA, ON
PART OF BLOCK A
REGISTERED PLAN E - 23

PROJECT NO: 120325

DRAWN BY:	CHECKED BY:
-	-
PROJECT MGR:	APPROVED BY:
-	-

SHEET TITLE
UNDERGROUND GARAGE PLAN - LEVEL P1

SHEET NUMBER A-101 | ISSUE 2

2022-04-13 12:20:31 PM

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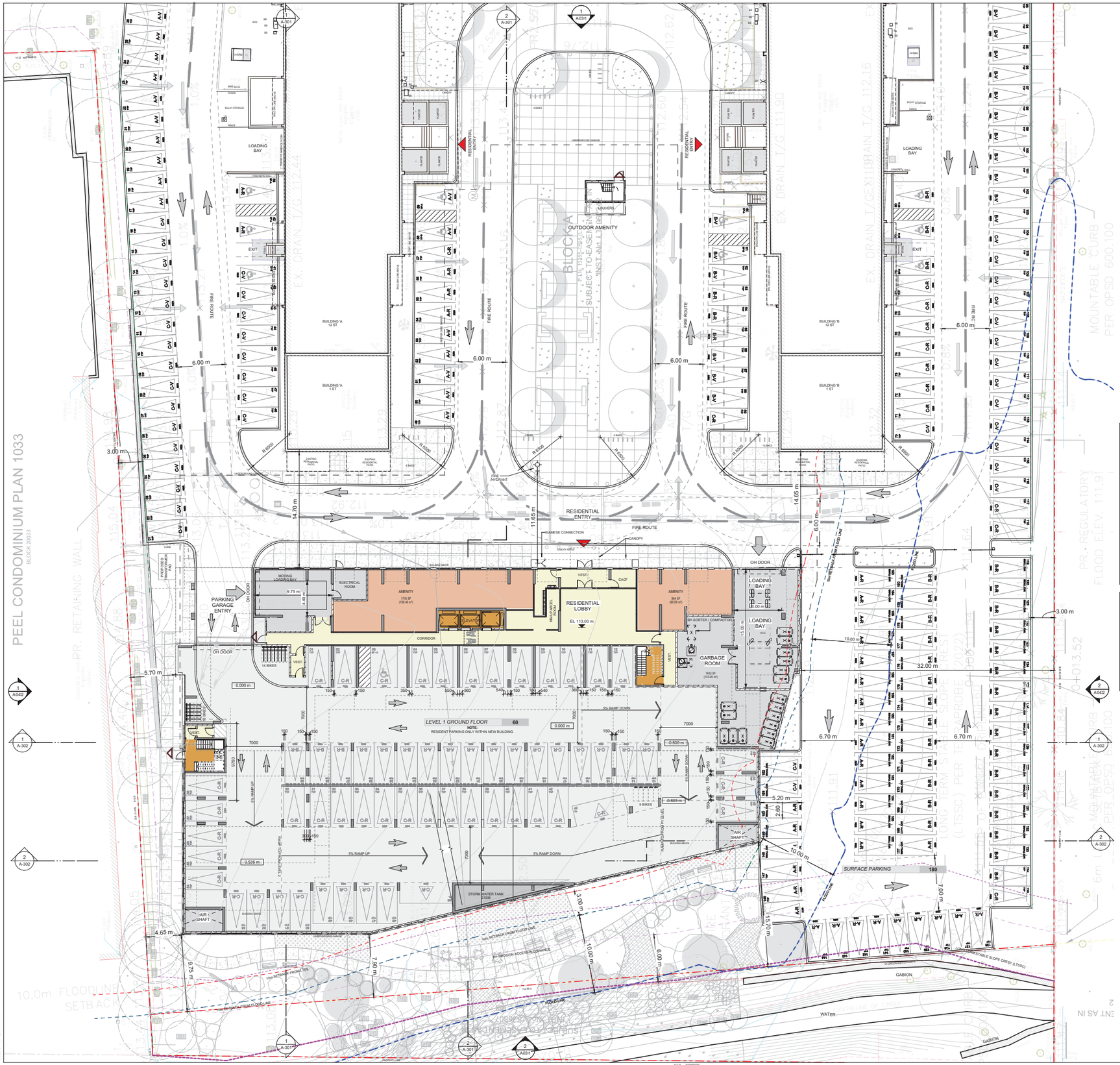


PROPOSED PARKING BLDG. A

Level	Count
SURFACE PARKING	43
LEVEL 1 GROUND FLOOR	5
LEVEL P1	79
A-R	**127**
SURFACE PARKING	21
A-V	**21**
TOTAL	**148**

BUILDING A (127 UNITS) :

127 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
21 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. B

Level	Count
SURFACE PARKING	44
LEVEL 1 GROUND FLOOR	6
LEVEL P1	76
B-R	**126**
SURFACE PARKING	20
B-V	**20**
TOTAL	**146**

BUILDING B (126 UNITS) :

126 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
20 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. C

Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	12
LEVEL 1 GROUND FLOOR	49
C-R	**255**
SURFACE PARKING	40
C-V	**40**
TOTAL	**295**

BUILDING C (255 UNITS) :

255 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
40 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING TOTAL BY LEVEL

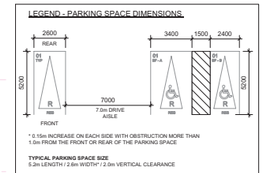
Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	180
LEVEL 1 GROUND FLOOR	60
LEVEL P1	155
TOTAL: 589	**589**

SITE TOTAL (508 UNITS)

508 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
81 VISITORS @ PROPOSED RATIO:0.15 / UNIT

SITE TOTAL PARKING SPACES : 589

LEGEND - PARKING SPACE DIMENSIONS



* 0.15m INCREASE ON EACH SIDE WITH OBSTRUCTION MORE THAN 1.0m FROM THE FRONT OR REAR OF THE PARKING SPACE

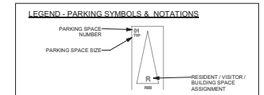
TYPICAL PARKING SPACE SIZE
5.2m LENGTH / 2.6m WIDTH* / 2.0m VERTICAL CLEARANCE

ACCESSIBLE PARKING SPACE

TYPE A
5.2m LENGTH
3.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

TYPE B
5.2m LENGTH
2.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

LEGEND - PARKING SYMBOLS & NOTATIONS



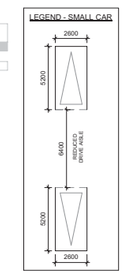
DESIGNATION TAG ABBREVATIONS

R - DENOTES RESIDENTIAL
V - DENOTES VISITOR
A/B/C - DENOTES BUILDING A / B / C
TYP - DENOTES REGULAR CITY OF MISSISSAUGA SPACE SIZE
TYP - DENOTES BARRIER FREE CITY OF MISSISSAUGA SPACE SIZE
SC - DENOTES SMALL CAR SPACE SIZE

SMALL CARS

Level	Count
SURFACE PARKING	48
TOTAL: 48	**48**

LEGEND - SMALL CAR



BUILDING C (255 UNITS)

178 LONG TERM BIKES @ REQURIED RATIO: 0.7 / UNIT
20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

BUILDING A+B (253 UNITS)

20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

TOTAL RESIDENTIAL BIKE...	
Level	Total Bike Spaces
LEVEL P1	121
LEVEL 1 GROUND FLOOR	69
LEVEL 02	12
LEVEL 03	11
LEVEL 04	9
TOTAL BIKE SPACES	**222**

RES LT	RES ST
Long Term RESIDENTIAL	Short Term RESIDENTIAL
121	0
29	40
12	0
11	0
9	0
182	**40**

1 A-102 GROUND FLOOR PLAN
Scale: 1 : 150

CLIENT
RANEE MANAGEMENT
4122 Bathurst St., Toronto, ON M3H 3P2
TEL: 416-756-3962

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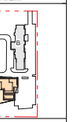
KEYPLAN



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SEAL

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PROJECT
ARGYLE
2570 - 2590 Argyle Rd.
CITY OF MISSISSAUGA, ON
PART OF BLOCK A
REGISTERED PLAN E - 23

PROJECT NO: 120325	
DRAWN BY: -	CHECKED BY: -
PROJECT MGR: -	APPROVED BY: -

SHEET TITLE
LEVEL 1 GROUND FLOOR PLAN

SHEET NUMBER A-102 | ISSUE 2

2022-04-13 12:31:14 PM

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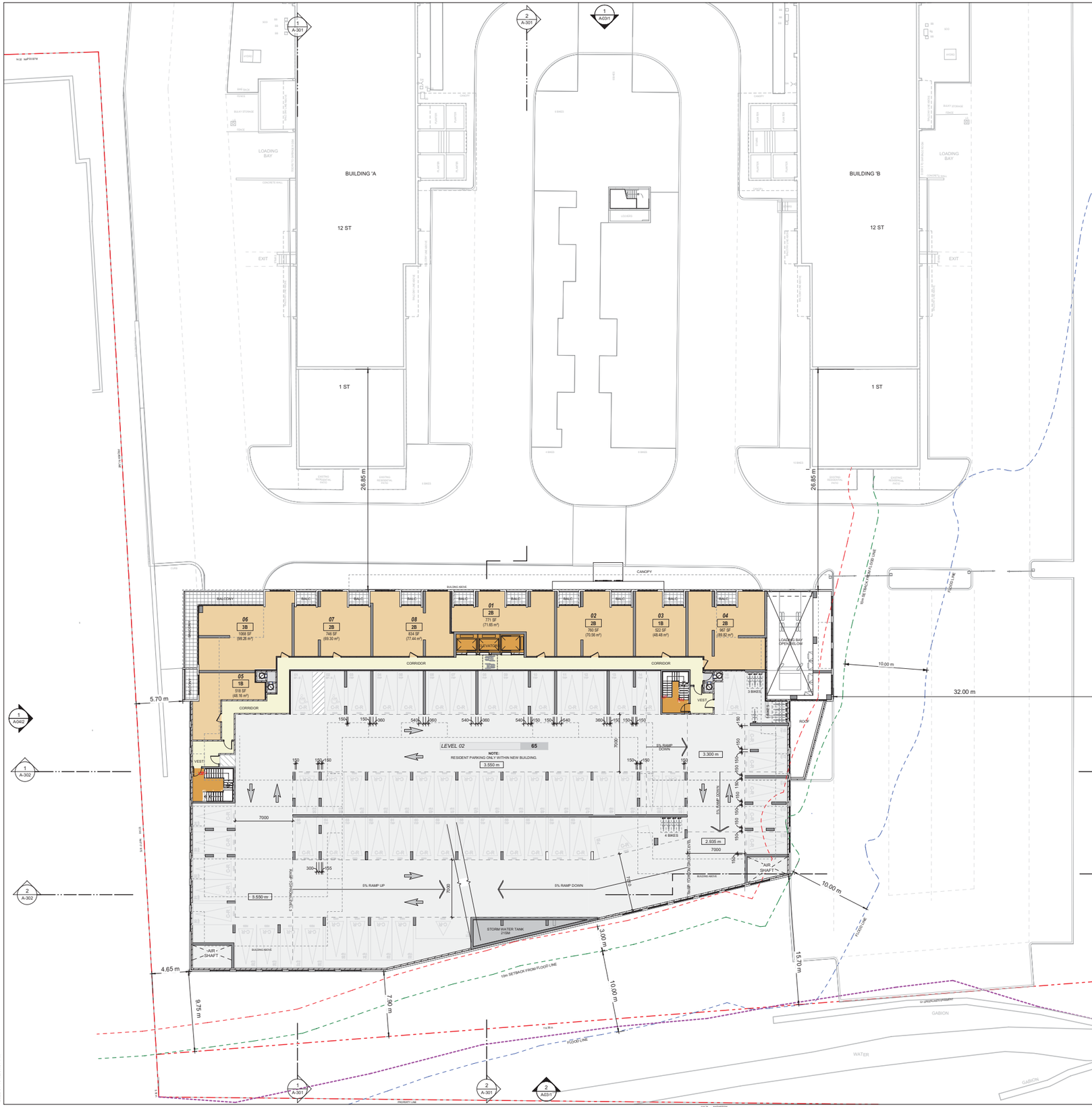


PROPOSED PARKING BLDG. A	
Level	*Count*
SURFACE PARKING	*43*
LEVEL 1 GROUND FLOOR	*5*
LEVEL P1	*79*
A-R	**127**
SURFACE PARKING	*21*
A-V	**21**
TOTAL	**148**

BUILDING A (127 UNITS) :

127 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
21 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. B	
Level	*Count*
SURFACE PARKING	*44*
LEVEL 1 GROUND FLOOR	*6*
LEVEL P1	*76*
B-R	**126**
SURFACE PARKING	*20*
B-V	**20**
TOTAL	**146**

BUILDING B (126 UNITS) :

126 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
20 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. C	
Level	*Count*
LEVEL 04	*64*
LEVEL 03	*65*
LEVEL 02	*65*
SURFACE PARKING	*12*
LEVEL 1 GROUND FLOOR	*49*
C-R	**255**
SURFACE PARKING	*40*
C-V	**40**
TOTAL	**295**

BUILDING C (255 UNITS) :

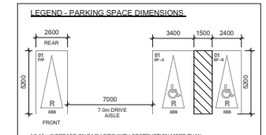
255 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
40 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING TOTAL BY LEVEL	
Level	*Count*
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	180
LEVEL 1 GROUND FLOOR	60
LEVEL P1	155
TOTAL: 589	**589**

SITE TOTAL (508 UNITS)
508 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
81 VISITORS @ PROPOSED RATIO:0.15 / UNIT

SITE TOTAL PARKING SPACES : 589

LEGEND - PARKING SPACE DIMENSIONS



* 0.15m INCREASE ON EACH SIDE WITH OBSTRUCTION MORE THAN 1.0m FROM THE FRONT OR REAR OF THE PARKING SPACE

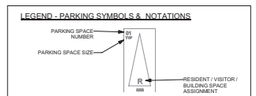
TYPICAL PARKING SPACE SIZE
5.2m LENGTH / 2.6m WIDTH* / 2.0m VERTICAL CLEARANCE

ACCESSIBLE PARKING SPACE

TYPE A
5.2m LENGTH
3.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

TYPE B
5.2m LENGTH
2.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

LEGEND - PARKING SYMBOLS & NOTATIONS



DESIGNATION TAG ABBREVATIONS

R - DENOTES RESIDENTIAL
V - DENOTES VISITOR
A/B/C - DENOTES BUILDING A / B / C
TYP - DENOTES REGULAR CITY OF MISSISSAUGA SPACE SIZE
BF - DENOTES BARRIER FREE CITY OF MISSISSAUGA SPACE SIZE
SC - DENOTES SMALL CAR SPACE SIZE

TOTAL RESIDENTIAL BIKE...		RES LT	RES ST
Level	*Total Bike Spaces*	*Long Term RESIDENTIAL*	*Short Term RESIDENTIAL*
LEVEL P1	121	121	0
LEVEL 1 GROUND FLOOR	69	29	40
LEVEL 02	12	12	0
LEVEL 03	11	11	0
LEVEL 04	9	9	0
TOTAL BIKE SPACES	**222**	**182**	**40**

BUILDING C (255 UNITS)

178 LONG TERM BIKES @ REQURIED RATIO: 0.7 / UNIT
20 SHORT TERM BIKES @ REQUIRED RATIO:0.08 / UNIT

BUILDING A+B (253 UNITS)

20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

LEVEL 2 - UNIT MIX	
Unit Type	*Count*
1B	2
2B	5
3B	1
UNIT TOTAL COUNT	8

1 A-103 LEVEL 2 FLOOR PLAN
Scale: 1 : 150

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TEL: 416-756-3962

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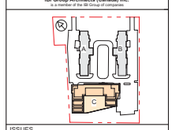

ISSUES

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1	ISSUED FOR RE-ZONING/OPA	2020-08-31
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SEAL

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PROJECT
ARGYLE
2570 - 2590 Argyle Rd.
CITY OF MISSISSAUGA, ON
PART OF BLOCK A
REGISTERED PLAN E - 23

PROJECT NO: 120325
DRAWN BY: -
CHECKED BY: -
PROJECT MGR: -
APPROVED BY: -

SHEET TITLE
LEVEL 2 FLOOR PLAN

SHEET NUMBER A-103
ISSUE 2

2022-04-13 12:31:37 PM

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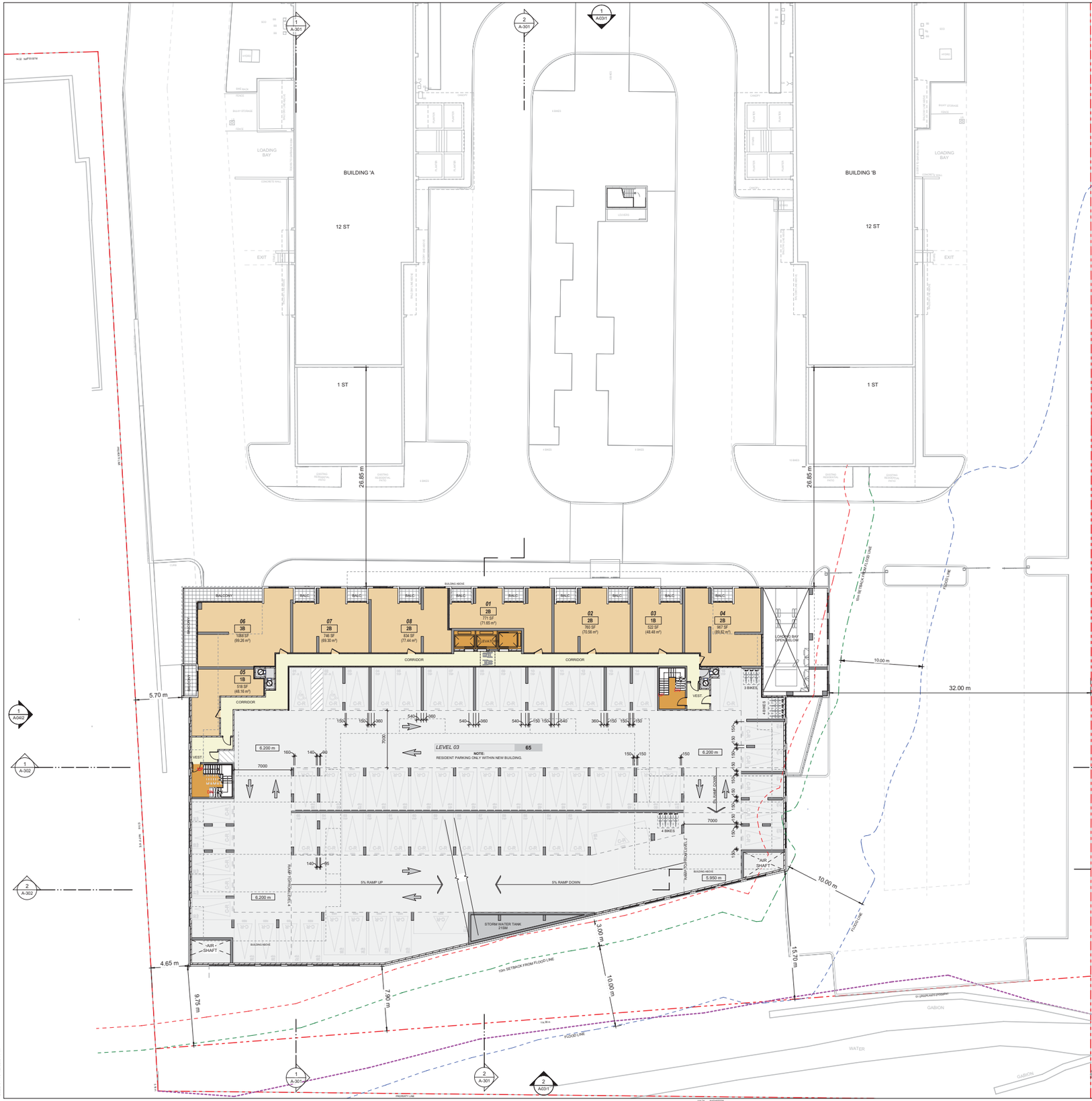


PROPOSED PARKING BLDG. A

Level	Count
SURFACE PARKING	43
LEVEL 1 GROUND FLOOR	5
LEVEL P1	79
A-R	**127**
SURFACE PARKING	21
A-V	**21**
TOTAL	**148**

BUILDING A (127 UNITS) :

127 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
21 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. B

Level	Count
SURFACE PARKING	44
LEVEL 1 GROUND FLOOR	6
LEVEL P1	76
B-R	**126**
SURFACE PARKING	20
B-V	**20**
TOTAL	**146**

BUILDING B (126 UNITS) :

126 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
20 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING BLDG. C

Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 03	65
SURFACE PARKING	12
LEVEL 1 GROUND FLOOR	49
C-R	**255**
SURFACE PARKING	40
C-V	**40**
TOTAL	**295**

BUILDING C (255 UNITS) :

255 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
40 VISITORS @ PROPOSED RATIO: 0.15 / UNIT

PROPOSED PARKING TOTAL BY LEVEL

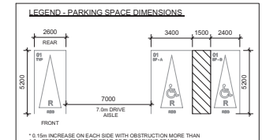
Level	Count
LEVEL 04	64
LEVEL 03	65
LEVEL 02	65
SURFACE PARKING	180
LEVEL 1 GROUND FLOOR	60
LEVEL P1	155
TOTAL: 589	**589**

SITE TOTAL (508 UNITS)

508 RESIDENTIAL @ PROPOSED RATIO: 1.0 / UNIT
81 VISITORS @ PROPOSED RATIO:0.15 / UNIT

SITE TOTAL PARKING SPACES : 589

LEGEND - PARKING SPACE DIMENSIONS



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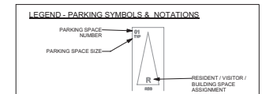
TYPICAL PARKING SPACE SIZE
5.2m LENGTH / 2.6m WIDTH* / 2.0m VERTICAL CLEARANCE

ACCESSIBLE PARKING SPACE

TYPE A
5.2m LENGTH
3.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

TYPE B
5.2m LENGTH
2.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

LEGEND - PARKING SYMBOLS & NOTATIONS



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TOTAL RESIDENTIAL BIKE...		RES LT	RES ST
Level	Total Bike Spaces	Long Term RESIDENTIAL	Short Term RESIDENTIAL
LEVEL P1	121	121	0
LEVEL 1 GROUND FLOOR	69	29	40
LEVEL 02	12	12	0
LEVEL 03	11	11	0
LEVEL 04	9	9	0
TOTAL BIKE SPACES	**222**	**182**	**40**

BUILDING C (255 UNITS)

178 LONG TERM BIKES @ REQURIED RATIO: 0.7 / UNIT
20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

BUILDING A+B (253 UNITS)

20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

LEVEL 3 - UNIT MIX	
Unit Type	Count
1B	2
2B	5
3B	1
UNIT TOTAL COUNT	8

1 A-104 LEVEL 3 FLOOR PLAN
Scale: 1 : 150

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TEL: 416-756-3962

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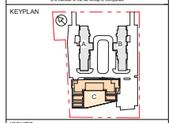
KEYPLAN



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REGISTERED PLAN E - 23

PROJECT NO: 120325
DRAWN BY: -
CHECKED BY: -
PROJECT MGR: -
APPROVED BY: -

SHEET TITLE
LEVEL 3 FLOOR PLAN

SHEET NUMBER A-104
ISSUE 2

2022-04-11 12:32:01 PM

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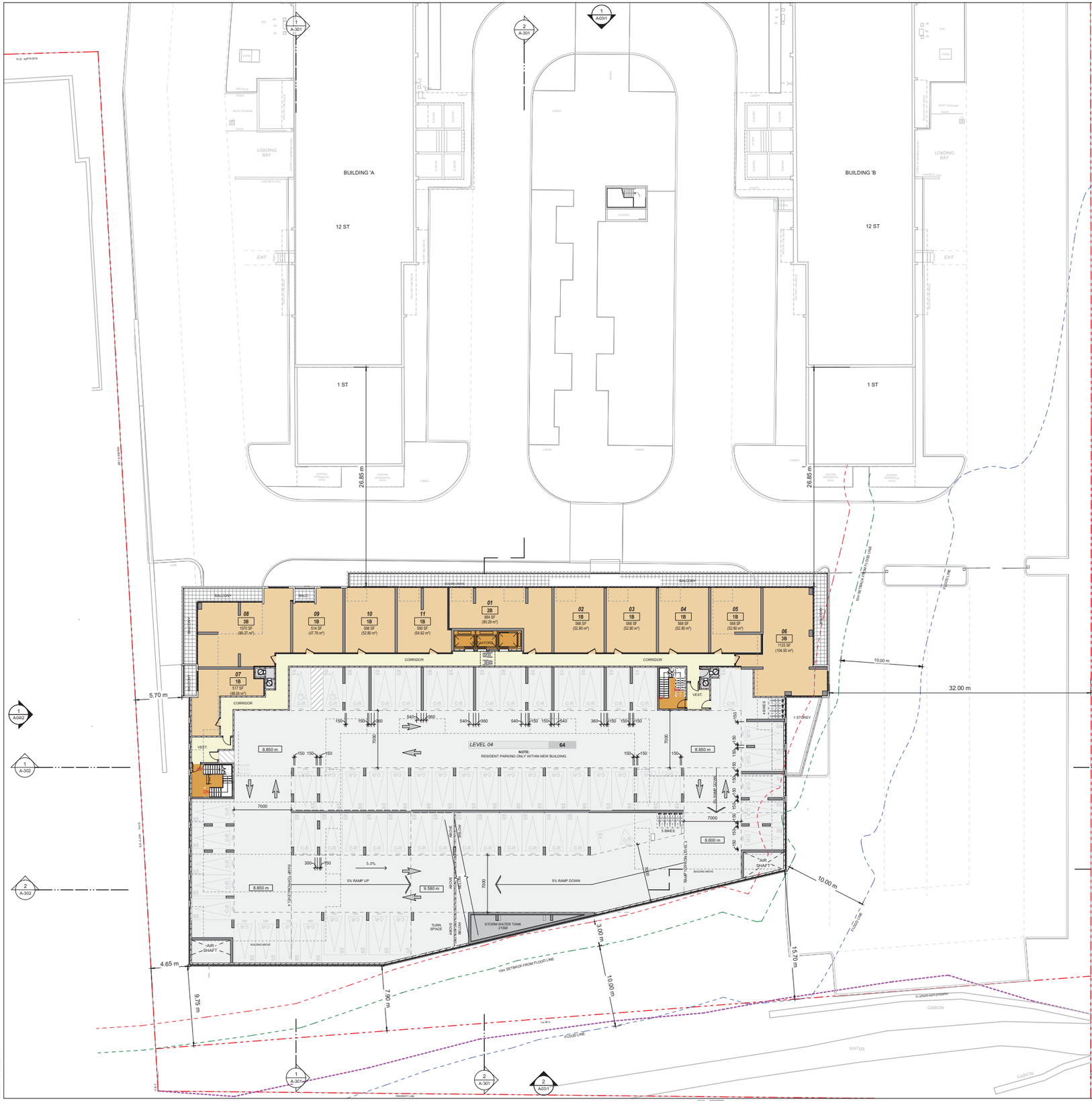

PROPOSED PARKING BLDG. A

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LEVEL 1 GROUND FLOOR	5
LEVEL P1	79
A-R	**127**
SURFACE PARKING	21
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BUILDING A (127 UNITS) :

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PROPOSED PARKING BLDG. B

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SURFACE PARKING	12
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BUILDING C (255 UNITS) :

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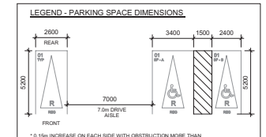

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ACCESSIBLE PARKING SPACE

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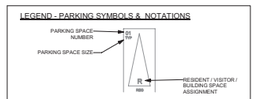
5.2m LENGTH
3.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

TYPE B
5.2m LENGTH
2.4m WIDTH - ADJACENT TO A 1.5m ACCESS AISLE
2.1m VERTICAL CLEARANCE

LEGEND - PARKING SYMBOLS & NOTATIONS



DESIGNATION TAG ABBREVATIONS

R - DENOTES RESIDENTIAL
V - DENOTES VISITOR
A/B/C - DENOTES BUILDING A / B / C
TYP - DENOTES REGULAR CITY OF MISSISSAUGA SPACE SIZE
BF - DENOTES BARRIER FREE CITY OF MISSISSAUGA SPACE SIZE
SC - DENOTES SMALL CAR SPACE SIZE

TOTAL RESIDENTIAL BIKE...		RES LT	RES ST
Level	Total Bike Spaces	Long Term RESIDENTIAL	Short Term RESIDENTIAL
LEVEL P1	121	121	0
LEVEL 1 GROUND FLOOR	69	29	40
LEVEL 02	12	12	0
LEVEL 03	11	11	0
LEVEL 04	9	9	0
TOTAL BIKE SPACES	**222**	**182**	**40**

BUILDING C (255 UNITS)

178 LONG TERM BIKES @ REQURIED RATIO: 0.7 / UNIT
20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

BUILDING A+B (253 UNITS)

20 SHORT TERM BIKES @ REQURIED RATIO:0.08 / UNIT

LEVEL 4 - UNIT MIX	
Unit Type	Count
1B	8
2B	1
3B	2
UNIT TOTAL COUNT	11

1 A-105 LEVEL 4 FLOOR PLAN
Scale: 1 : 150

CLIENT

RANEE MANAGEMENT
4122 Bathurst St., Toronto, ON M3H 3P2
TEL: 416-756-3962

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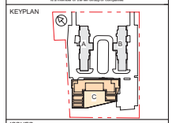
IBI Group Architects (Canada) Inc.
is a member of the IBI Group of companies

KEYPLAN



ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR RE-ZONING/OPA	2020-08-31
2	ISSUED FOR RE-ZONING/OPA	2022-04-08

SEAL

IBI GROUP
55 St. Clair Avenue West, 7th Floor,
Toronto, ON M4V 2Y7, Canada
tel 416 596 1930 fax 416 596 0644
ibigroup.com

PROJECT
ARGYLE
2570 - 2590 Argyle Rd.
CITY OF MISSISSAUGA, ON
PART OF BLOCK A
REGISTERED PLAN E - 23

PROJECT NO: 120325

DRAWN BY:	CHECKED BY:
-	-
PROJECT MGR:	APPROVED BY:
-	-

SHEET TITLE
LEVEL 4 FLOOR PLAN

SHEET NUMBER A-105 | ISSUE 2

2022-04-11 12:32:24 PM

C:\Users\admin-ibi\Documents\R22\ACAD\120325_Argyle Rev_cabinova_other.rvt

ATTACHMENT B: TERMS OF REFERENCE LETTER

November 21, 2019

Jekaterina Vassilyev
City of Mississauga Traffic Review
300 City Centre Drive
Mississauga, Ontario
(905) 615 3200 ext. 5798
jekaterina.vassilyev@mississauga.ca

RE: TERMS OF REFERENCE FOR TRANSPORTATION STUDY
2570-2590 ARGYLE ROAD, CITY OF MISSISSAUGA

Dear Ms. Vassilyev:

BA Group has prepared the following terms of reference for your review for the site known as 2570-2590 Argyle Road in the City of Mississauga.

Introduction

BA Group is retained to provide transportation consulting services related to the proposed development of lands municipally known as 2570-2590 Argyle Road in the City of Mississauga. The site is generally bounded by Argyle Road to the east, commercial and medical lands to the north, Willow Walk Estate to the south (2542 & 2556 Argyle Road) and a residential subdivision / neighbourhood to the west.

The existing site consists of two apartment buildings (Buildings 'A' and 'B') for a total of 253 residential units. The client, Ranee Management, is proposing to construct one new 13-storey apartment building for a total of 256 new residential units (Building 'C').

The site is subject to Zoning By-law Amendments which include conditions to be satisfied prior to development. This letter summarizes the proposed Terms of Reference for the Transportation Study that seeks to satisfy these conditions.

Background

The City of Mississauga provided transportation-related pre-submission comments in a project status report dated August 21, 2019. The following sections include the consideration of these comments and describe the proposed study area, analysis methodology and key analysis parameters.

Transportation Impact Study

The scope for the Transportation Impact Study has been established in consultation with the City of Mississauga and the Region of Peel. The study will be completed in accordance with the Region of Peel and the City of Mississauga's Traffic Impact Study Guidelines.

1. Study Area

The proposed study area for the Transportation Impact Study includes the following intersections:

- Dundas Street West / Confederation Parkway (signalized);
- Dundas Street West / Parkerhill Road (signalized);
- King Street West / Confederation Parkway (signalized);
- Dundas Street West / Argyle Road (unsignalized);
- Dundas Street West / Rugby Road (unsignalized);
- Confederation Parkway / Dunbar Road (unsignalized); and
- Argyle Road / 1840-1850 Site Driveways (all unsignalized).

Traffic data collection is planned for October 2019 and includes pedestrians, cyclists, buses, heavy vehicles and passenger vehicles. Signal timing plans for signalized intersections will be obtained from the City of Mississauga.

2. Analysis Periods

Traffic operations analysis will be completed for the following peak hours:

- Weekday morning peak hour; and
- Weekday afternoon peak hour.

3. Horizon Years

The following analysis scenarios will be considered:

- 2019 existing conditions;
- 2024 future background conditions with corridor growth and area background development traffic (5-year horizon); and
- 2024 future total conditions with the full build-out of the site development (5-year horizon).

4. Background Growth Allowances

Historical traffic volumes on Dundas Street West within the site vicinity will be examined to determine traffic growth on this corridor.

Traffic generated by background developments in proximity to the site will be considered based on discussions with City of Mississauga staff.

5. Trip Generation

A review of vehicle trip generation rates at the existing apartment buildings on-site will be conducted. These rates will be compared with other BA Group archived data and the trip rates provided by the ITE Trip Generation Manual (10th Edition) to develop a reasonable trip forecast for the proposed site.

6. Trip Distribution

Travel patterns for residential land uses will be based on the trip distribution observed for the existing apartment buildings on-site and data provided by Transportation Tomorrow Survey.

7. Operations Analysis

Traffic operations analysis will be completed using Synchro 9 analysis software, based on Highway Capacity Manual (HCM) 2000 methodology.

Existing signal timings will be adopted for the analysis of existing conditions. If changes to the signal timings are proposed under future background or future total conditions, a summary of the proposed adjustments will be provided.

Other parameters will be based on the requirements of the Region of Peel and City of Mississauga's Traffic Impact Study Guidelines.

8. Vehicle Parking, Bicycle Parking and Loading Review

The site's parking, loading and bicycle parking requirements with respect to the prevailing Zoning By-law will be reviewed and discussed.

9. Signal Warrant

The transportation impact study will include the evaluation of a signal warrant for the intersection of Dundas Street West / Argyle Road.

Transportation Demand Management Strategy

A Transportation Demand Management (TDM) strategy will be prepared based on the Region of Peel's *Transportation Demand Management Implementation Plan 2018-2022*. The TDM strategy will include a description of potential TDM measures to be confirmed with the Site Plan Amendment application.

Parking Study

Technical rationale for a reduced resident parking supply for the site will be provided. Tasks will include:

- Conducting parking demand surveys at existing apartment buildings to determine the existing level of parking utilization and to use the data as a proxy for estimating resident parking demand for the proposed new residential uses.
- Other parking demand surveys conducted by BA Group in the GTA for apartment buildings with a similar public transit context will be referenced.
- Determine the proposed site's resident parking demand.

Functional Site Plan Review

Site access, circulation and parking garage access, internal circulation and functionality will be reviewed. Loading space configurations and alternatives (if necessary) will be reviewed and provided. Furthermore, vehicle manoeuvring diagrams will be prepared to demonstrate the ability for delivery trucks and the City of Mississauga front-loading garbage trucks to access the loading spaces.

■ ■ ■ ■ ■ ■ ■

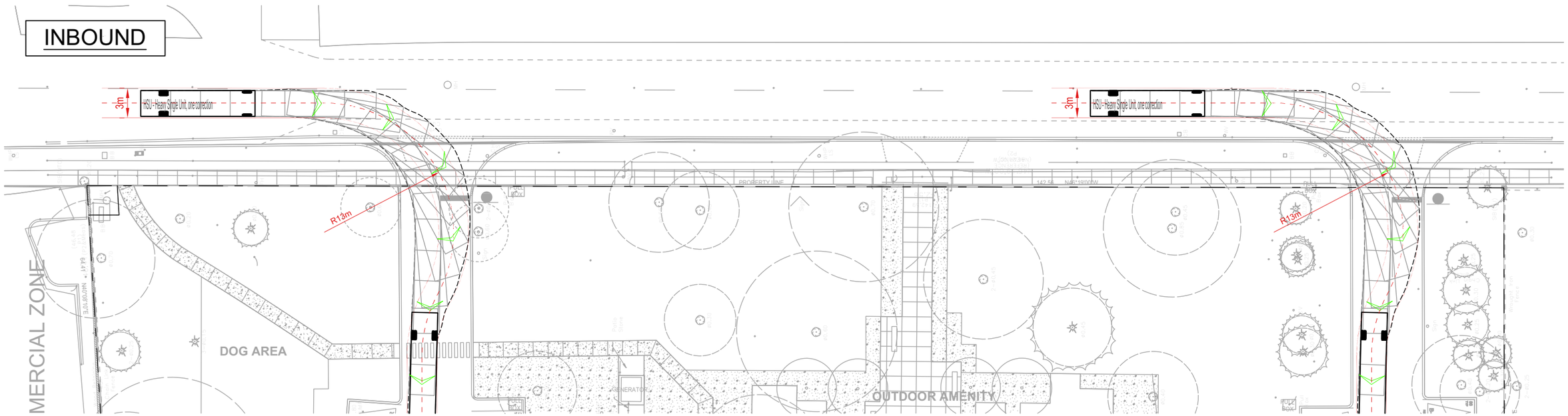
Please do not hesitate to contact our office with any questions or comments.

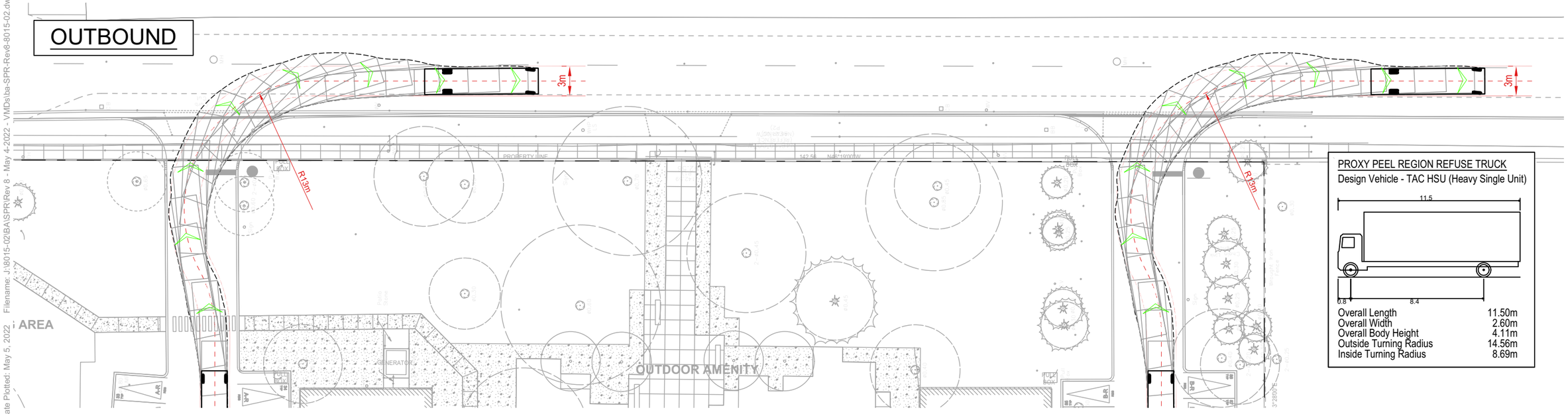
Sincerely,

Margaret Briegmann, P.Eng.
Associate

Cc. Nathan Yau

ATTACHMENT C: VEHICLE MANOEUVRING DIAGRAMS





PROXY PEEL REGION REFUSE TRUCK

Design Vehicle - TAC HSU (Heavy Single Unit)

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

BA Group

2570-2590 Argyle Road

Region of Peel Refuse Truck Proxy Design Vehicle

Inbound / Outbound Manoeuvres @ East & West Argyle Road Site Driveways

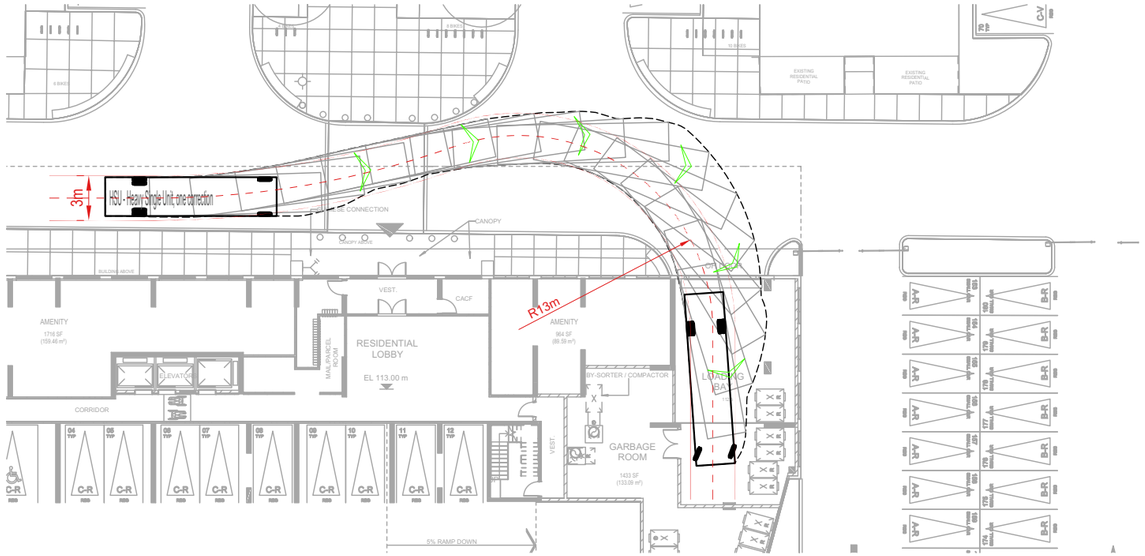
Project:	2570-2590 Argyle Rd
Project No.	8015-02
Date:	February 5, 2020
Revised:	May 4, 2022

Scale 1:400 — 0 2 4 6 8 10 20m

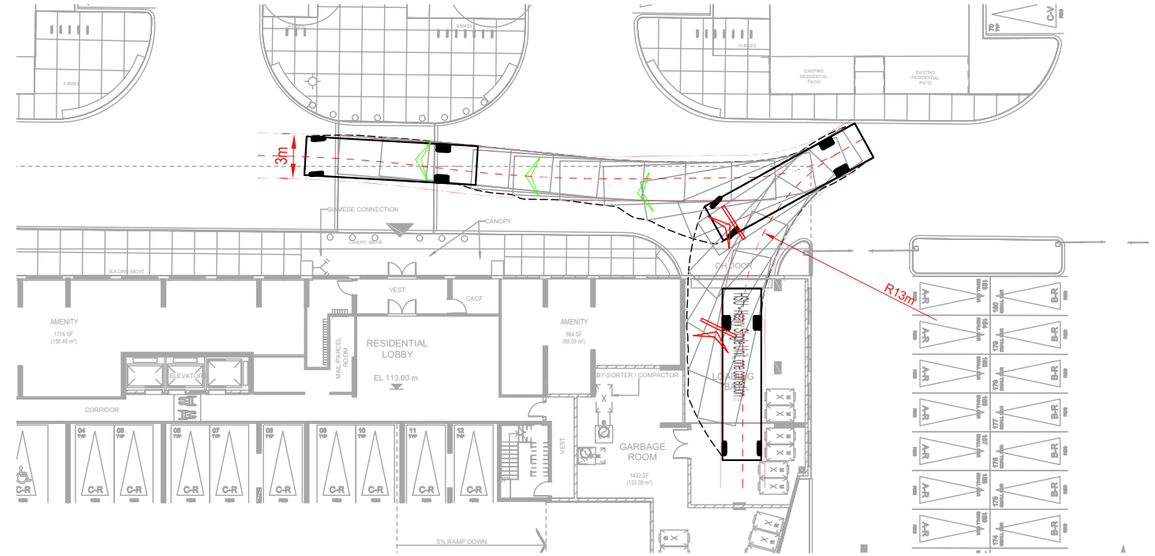
Drawing No. VMD-1a

Date Plotted: May 5, 2022 Filename: J:\8015-02\BA\SPR\Rev 8 - May 4-2022 - VMDs\ba-SPR-Rev8-8015-02.dwg

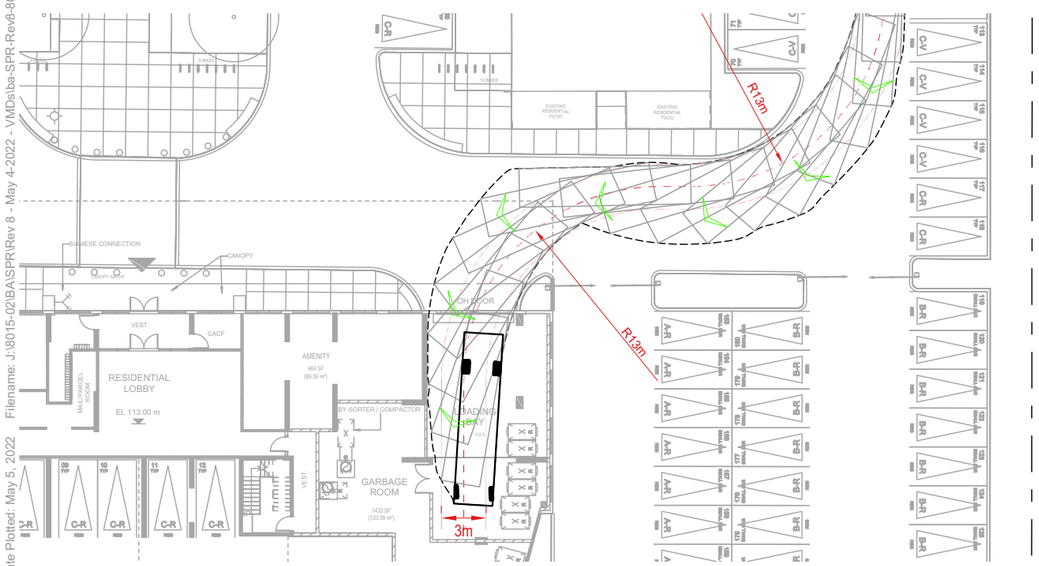
INBOUND (from West Site Driveway)



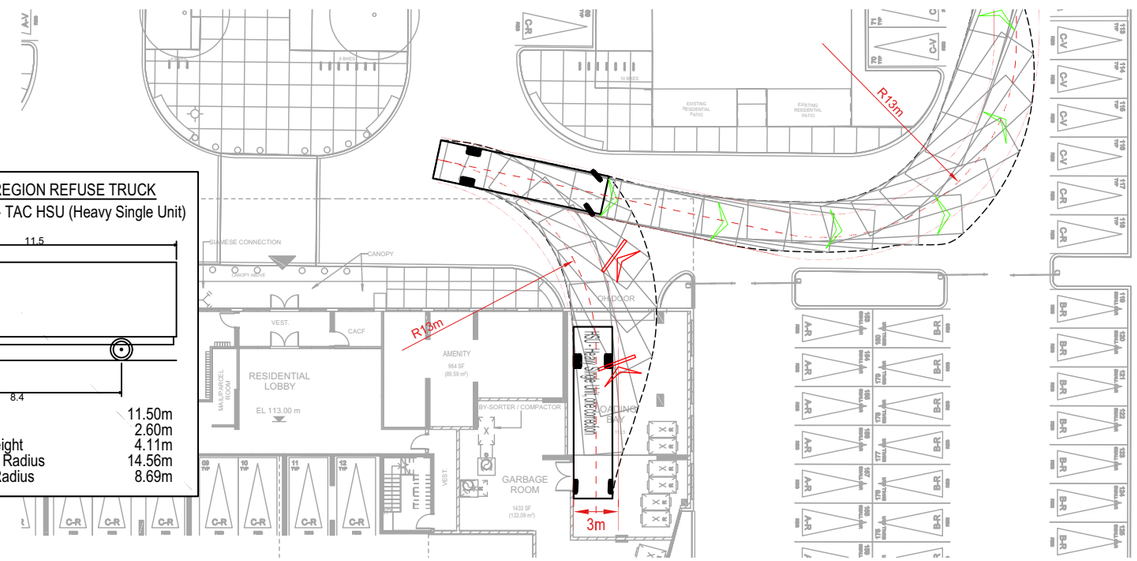
OUTBOUND (to West Site Driveway)



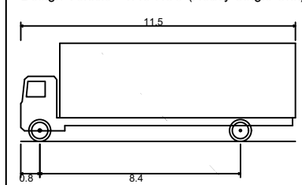
INBOUND (from West Site Driveway)



OUTBOUND (to West Site Driveway)



PROXY PEEL REGION REFUSE TRUCK
Design Vehicle - TAC HSU (Heavy Single Unit)



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

Date Plotted: May 5, 2022 Filename: J:\8015-02\BA\SPR\Rev 8 - May 4-2022 - VMDs\ba-SPR-Rev8-8015-02.dwg

BA Group

2570-2590 Argyle Road

Region of Peel Refuse Truck Proxy Design Vehicle

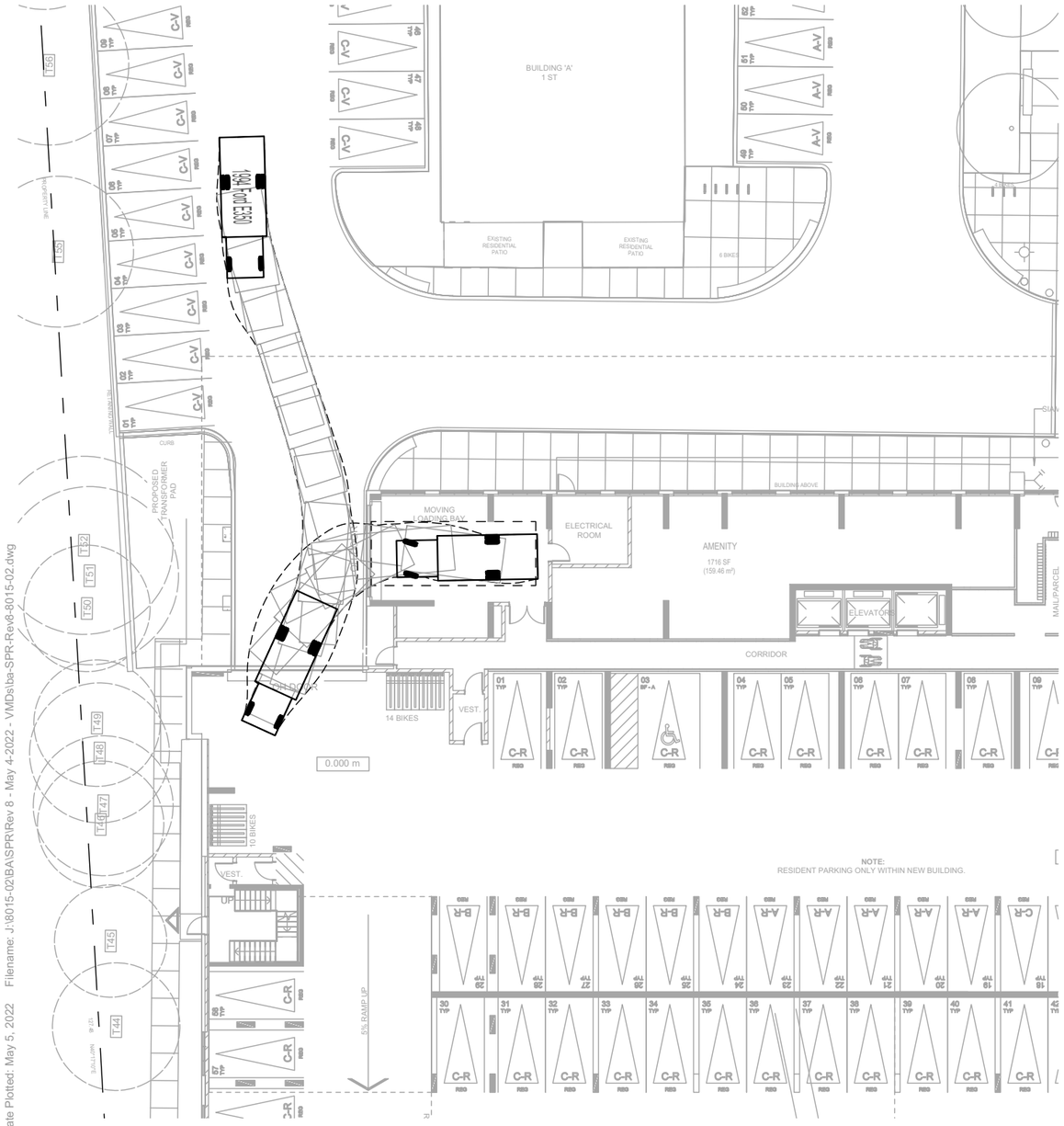
Inbound / Outbound Manoeuvres

Project:	2570-2590 Argyle Rd
Project No.	8015-02
Date:	February 5, 2020
Revised:	May 4, 2022

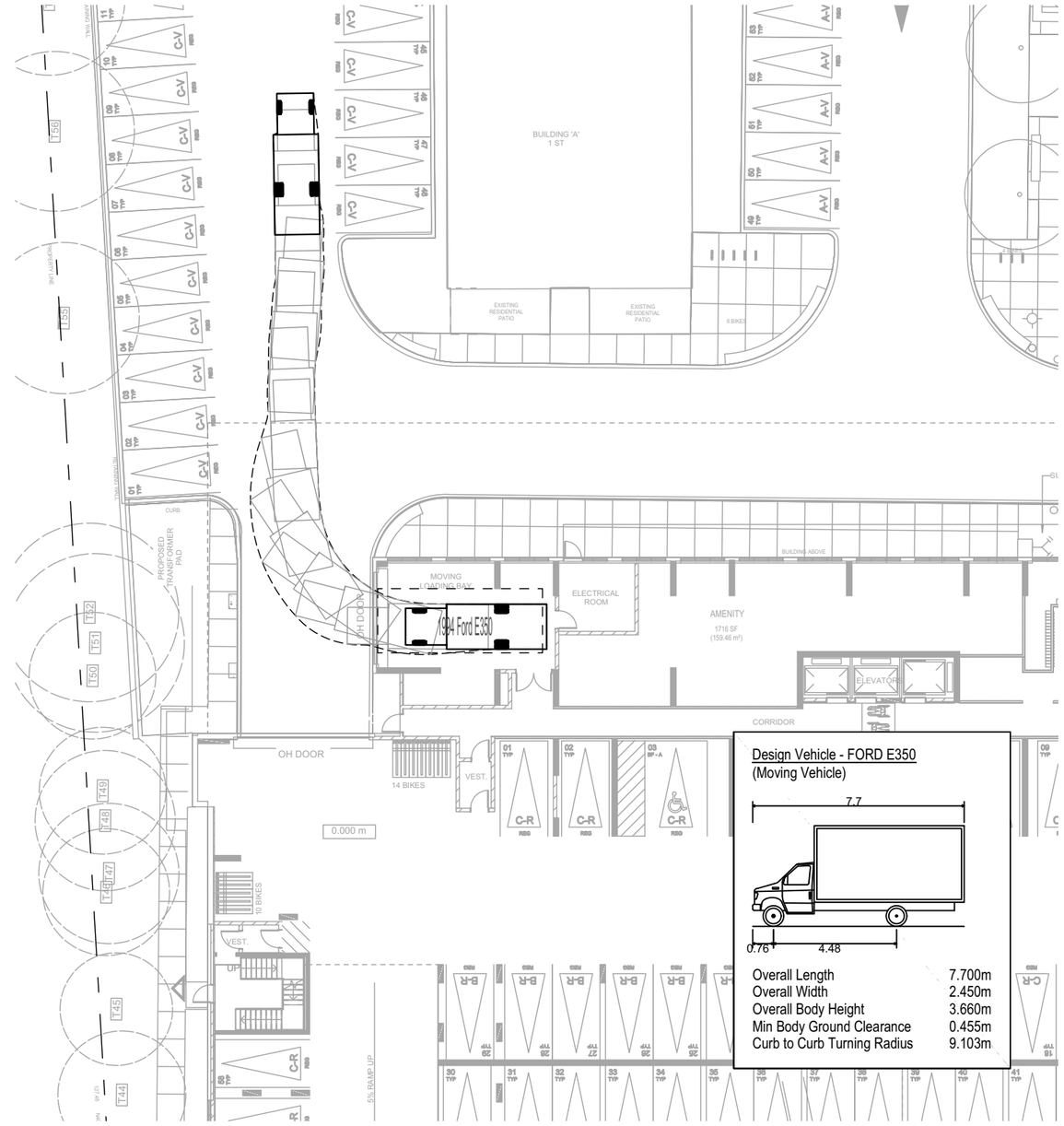
Scale 1:400 — 0 2 4 6 8 10 20m

Drawing No. VMD-1b

INBOUND



OUTBOUND



Date Plotted: May 5, 2022 Filename: J:\8015-02\BA\SPR\Rev 8 - May 4-2022 - VMDs\ba-SPR-Rev8-8015-02.dwg

BA Group

2570-2590 Argyle Road

Moving/Delivery Design Vehicle

Inbound / Outbound Manoeuvres

Project:	2570-2590 Argyle Rd
Project No.	8015-02
Date:	February 5, 2020
Revised:	May 4, 2022

Scale 1:300 (0 5 10m)

Drawing No. VMD-2

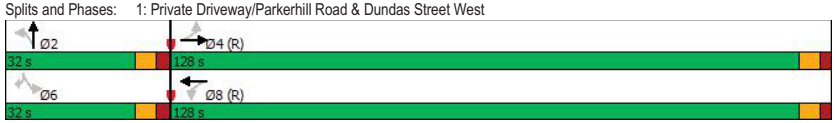
ATTACHMENT D: UPDATED SYNCHRO WORKSHEETS

Lane Group	EBL	EBT	WBL	WBT	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	55	1295	5	710	20	80	
Future Volume (vph)	55	1295	5	710	20	80	
Turn Type	Perm	NA	Perm	NA	Perm	Perm	
Protected Phases		4		8			2
Permitted Phases	4		8		6	6	
Detector Phase	4	4	8	8	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	137.5	137.5	137.5	137.5	9.0	9.0	
Actuated g/C Ratio	0.86	0.86	0.86	0.86	0.06	0.06	
v/c Ratio	0.11	0.48	0.02	0.28	0.30	0.51	
Control Delay	2.4	3.3	5.4	8.9	82.2	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.4	3.3	5.4	8.9	82.2	23.8	
LOS	A	A	A	A	F	C	
Approach Delay		3.3		8.8			
Approach LOS		A		A			

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	60	1419	5	805	22	87
v/c Ratio	0.11	0.48	0.02	0.28	0.30	0.51
Control Delay	2.4	3.3	5.4	8.9	82.2	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.4	3.3	5.4	8.9	82.2	23.8
Queue Length 50th (m)	2.3	43.8	0.6	60.7	7.3	0.0
Queue Length 95th (m)	5.6	62.1	m1.2	101.2	17.5	18.7
Internal Link Dist (m)		269.7		55.8		
Turn Bay Length (m)	45.0		60.0			
Base Capacity (vph)	533	2978	285	2867	206	316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.48	0.02	0.28	0.11	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1295	10	5	710	30	0	0	0	20	0	80
Future Volume (vph)	55	1295	10	5	710	30	0	0	0	20	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95					1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00					1.00		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00					1.00		1.00
Frt	1.00	1.00		1.00	0.99					1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)	1694	3466		1796	3336					1656		1553
Flt Permitted	0.35	1.00		0.18	1.00					0.76		1.00
Satd. Flow (perm)	618	3466		331	3336					1320		1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1408	11	5	772	33	0	0	0	22	0	87
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	82
Lane Group Flow (vph)	60	1419	0	5	804	0	0	0	0	22	0	5
Confl. Peds. (#/hr)	15		10	10		15						
Heavy Vehicles (%)	4%	4%	0%	0%	7%	10%	0%	0%	0%	9%	0%	4%
Turn Type	Perm	NA		Perm	NA					Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	137.5	137.5		137.5	137.5					9.0		9.0
Effective Green, g (s)	137.5	137.5		137.5	137.5					9.0		9.0
Actuated g/C Ratio	0.86	0.86		0.86	0.86					0.06		0.06
Clearance Time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)	531	2978		284	2866					74		87
v/s Ratio Prot		c0.41			0.24							
v/s Ratio Perm	0.10			0.02						c0.02		0.00
v/c Ratio	0.11	0.48		0.02	0.28					0.30		0.06
Uniform Delay, d1	1.8	2.7		1.6	2.1					72.5		71.5
Progression Factor	1.00	1.00		2.82	4.05					1.00		1.00
Incremental Delay, d2	0.4	0.5		0.1	0.2					2.2		0.3
Delay (s)	2.2	3.2		4.6	8.7					74.7		71.8
Level of Service	A	A		A	A					E		E
Approach Delay (s)		3.2			8.6			0.0			72.3	
Approach LOS		A			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1240	35	15	700	30	20	0	15	0	0	15
Future Volume (Veh/h)	25	1240	35	15	700	30	20	0	15	0	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	1305	37	16	737	32	21	0	16	0	0	16
Pedestrians								35			35	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								3			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.86			0.91			0.91	0.91	0.91	0.91	0.91	0.86
vC, conflicting volume	804			1377			1827	2246	706	1540	2249	420
vC1, stage 1 conf vol							1410	1410		820	820	
vC2, stage 2 conf vol							416	836		720	1429	
vCu, unblocked vol	456			1212			1253	1714	472	938	1717	10
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			86	100	97	100	100	98
cM capacity (veh/h)	935			484			156	193	479	343	179	900

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	870	472	16	491	278	21	16	16
Volume Left	26	0	0	16	0	0	21	0	0
Volume Right	0	0	37	0	0	32	0	16	16
cSH	935	1700	1700	484	1700	1700	156	479	900
Volume to Capacity	0.03	0.51	0.28	0.03	0.29	0.16	0.14	0.03	0.02
Queue Length 95th (m)	0.7	0.0	0.0	0.8	0.0	0.0	3.6	0.8	0.4
Control Delay (s)	9.0	0.0	0.0	12.7	0.0	0.0	31.7	12.8	9.1
Lane LOS	A			B			D	B	A
Approach Delay (s)	0.2			0.3			23.5		9.1
Approach LOS							C		A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	52.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	125	1015	15	525	140	360	25	150	515	80
Future Volume (vph)	125	1015	15	525	140	360	25	150	515	80
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	86.4	76.2	80.5	65.5	67.6	63.1	63.1	47.2	47.2	47.2
Actuated g/C Ratio	0.54	0.48	0.50	0.41	0.42	0.39	0.39	0.30	0.30	0.30
v/c Ratio	0.35	0.77	0.08	0.51	0.50	0.29	0.04	0.59	0.55	0.20
Control Delay	27.5	46.4	18.9	36.6	31.5	29.9	0.2	58.1	49.8	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	46.4	18.9	36.6	31.5	29.9	0.2	58.1	49.8	11.9
LOS	C	D	B	D	C	C	A	E	D	B
Approach Delay		44.5		36.2		28.9			47.4	
Approach LOS		D		D		C			D	

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 40.9 — Intersection LOS: D
Intersection Capacity Utilization 123.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	1252	16	681	154	396	27	165	566	88
v/c Ratio	0.35	0.77	0.08	0.51	0.50	0.29	0.04	0.59	0.55	0.20
Control Delay	27.5	46.4	18.9	36.6	31.5	29.9	0.2	58.1	49.8	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	46.4	18.9	36.6	31.5	29.9	0.2	58.1	49.8	11.9
Queue Length 50th (m)	26.6	185.5	2.7	93.2	24.6	35.4	0.0	44.9	79.7	2.9
Queue Length 95th (m)	44.3	251.5	6.6	111.8	36.5	44.8	m0.3	73.8	101.9	17.0
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	388	1624	197	1347	306	1876	822	427	1572	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.77	0.08	0.51	0.50	0.21	0.03	0.39	0.36	0.14

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1015	125	15	525	95	140	360	25	150	515	80
Future Volume (vph)	125	1015	125	15	525	95	140	360	25	150	515	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1761	3399		1686	3274		1725	3471	1475	1730	3471	1327
Flt Permitted	0.29	1.00		0.12	1.00		0.27	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	541	3399		210	3274		498	3471	1475	944	3471	1327
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	137	1115	137	16	577	104	154	396	27	165	566	88
RTOR Reduction (vph)	0	4	0	0	8	0	0	0	17	0	0	54
Lane Group Flow (vph)	137	1248	0	16	673	0	154	396	10	165	566	34
Confl. Peds. (#/hr)	55		60	60		55	60		30	30		60
Heavy Vehicles (%)	2%	4%	0%	7%	7%	4%	4%	4%	4%	2%	4%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	83.2	76.2		71.3	67.3		61.3	61.3	61.3	45.5	45.5	45.5
Effective Green, g (s)	83.2	76.2		71.3	67.3		61.3	61.3	61.3	45.5	45.5	45.5
Actuated g/C Ratio	0.52	0.48		0.45	0.42		0.38	0.38	0.38	0.28	0.28	0.28
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	1618		130	1377		288	1329	565	268	987	377
v/s Ratio Prot	c0.03	c0.37		0.00	0.21		c0.04	0.11			0.16	
v/s Ratio Perm	0.16			0.05			0.16		0.01	c0.17		0.03
v/c Ratio	0.36	0.77		0.12	0.49		0.53	0.30	0.02	0.62	0.57	0.09
Uniform Delay, d1	21.2	34.7		28.1	33.8		34.7	34.4	30.7	49.7	49.0	42.1
Progression Factor	1.33	1.19		1.00	1.00		0.88	0.89	0.15	1.00	1.00	1.00
Incremental Delay, d2	0.5	2.2		0.4	0.3		1.8	0.5	0.1	10.2	2.4	0.5
Delay (s)	28.8	43.5		28.5	34.1		32.4	31.1	4.7	59.8	51.4	42.5
Level of Service	C	D		C	C		C	C	A	E	D	D
Approach Delay (s)		42.1			34.0			30.2			52.1	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	40.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	123.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	5	0	65	40	5
Future Volume (Veh/h)	15	5	0	65	40	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	6	0	76	47	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	141	65	68			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	141	65	68			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	846	992	1527			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	76	53
Volume Left	17	0	0
Volume Right	6	0	6
cSH	880	1527	1700
Volume to Capacity	0.03	0.00	0.03
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	15	10	45	40	5
Future Volume (Veh/h)	20	15	10	45	40	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	26	19	13	58	52	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	154	70	73			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	154	70	73			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	99			
cM capacity (veh/h)	825	986	1520			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	71	58
Volume Left	26	13	0
Volume Right	19	0	6
cSH	886	1520	1700
Volume to Capacity	0.05	0.01	0.03
Queue Length 95th (m)	1.3	0.2	0.0
Control Delay (s)	9.3	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	1.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	19.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	5	55	55	0
Future Volume (Veh/h)	0	10	5	55	55	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	12	6	67	67	0
Pedestrians	25					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	171	92	92			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	171	92	92			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	803	951	1484			

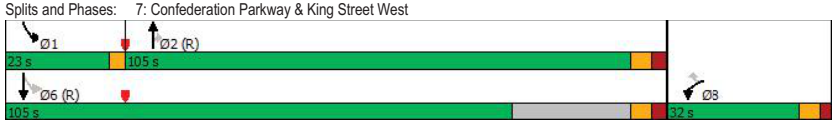
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	73	67
Volume Left	0	6	0
Volume Right	12	0	0
cSH	951	1484	1700
Volume to Capacity	0.01	0.00	0.04
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	8.8	0.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	0.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	490	80	200	495
Future Volume (vph)	30	170	490	80	200	495
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	9.8	9.8	124.5	124.5	140.7	136.7
Actuated g/C Ratio	0.06	0.06	0.78	0.78	0.88	0.85
v/c Ratio	0.30	0.69	0.38	0.07	0.30	0.35
Control Delay	77.7	22.5	7.0	3.9	4.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.7	22.5	7.0	3.9	4.5	4.7
LOS	E	C	A	A	A	A
Approach Delay	30.7		6.6			4.6
Approach LOS	C		A			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	189	544	89	222	550
v/c Ratio	0.30	0.69	0.38	0.07	0.30	0.35
Control Delay	77.7	22.5	7.0	3.9	4.5	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.7	22.5	7.0	3.9	4.5	4.7
Queue Length 50th (m)	10.9	0.0	46.4	4.3	8.8	33.0
Queue Length 95th (m)	22.5	25.6	88.2	11.9	m19.1	39.9
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	406	1421	1200	810	1576
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.47	0.38	0.07	0.27	0.35

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	490	80	200	495
Future Volume (vph)	30	170	490	80	200	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1553	1827	1537	1765	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.42	1.00
Satd. Flow (perm)	1805	1553	1827	1537	780	1845
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	189	544	89	222	550
RTOR Reduction (vph)	0	177	0	5	0	0
Lane Group Flow (vph)	33	12	544	84	222	550
Confl. Peds. (#/hr)	5			5	5	
Heavy Vehicles (%)	0%	4%	4%	1%	2%	3%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.8	9.8	124.5	124.5	136.7	136.7
Effective Green, g (s)	9.8	9.8	124.5	124.5	136.7	136.7
Actuated g/C Ratio	0.06	0.06	0.78	0.78	0.85	0.85
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	95	1421	1195	723	1576
v/s Ratio Prot	c0.02		c0.30		0.02	c0.30
v/s Ratio Perm		0.01		0.05	0.24	
v/c Ratio	0.30	0.12	0.38	0.07	0.31	0.35
Uniform Delay, d1	71.8	71.0	5.6	4.2	2.5	2.4
Progression Factor	1.00	1.00	1.00	1.00	2.41	1.56
Incremental Delay, d2	1.5	0.6	0.8	0.1	0.2	0.6
Delay (s)	73.4	71.6	6.4	4.3	6.2	4.3
Level of Service	E	E	A	A	A	A
Approach Delay (s)	71.9		6.1			4.9
Approach LOS	E		A			A

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	100	0	0	5	60	555	0	0	510	15
Future Volume (Veh/h)	10	0	100	0	0	5	60	555	0	0	510	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	115	0	0	6	69	638	0	0	586	17
Pedestrians		10			20			5				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			2			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	1378	1392	601	1502	1409	658	613			658		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1370	1385	539	1502	1403	658	552			658		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	77	100	100	99	93			100		
cM capacity (veh/h)	95	123	503	66	119	460	954			924		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	126	6	69	638	0	0	586	17
Volume Left	11	0	69	0	0	0	0	0
Volume Right	115	6	0	0	0	0	0	17
cSH	366	460	954	1700	1700	1700	1700	1700
Volume to Capacity	0.34	0.01	0.07	0.38	0.00	0.00	0.34	0.01
Queue Length 95th (m)	12.0	0.3	1.9	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	19.9	12.9	9.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	A					
Approach Delay (s)	19.9	12.9	0.9			0.0		
Approach LOS	C	B						

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1285	30	20	710	35	40
Future Volume (Veh/h)	1285	30	20	710	35	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1382	32	22	763	38	43
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.90		0.95	0.90
vC, conflicting volume			1429		1838	722
vC1, stage 1 conf vol					1413	
vC2, stage 2 conf vol					426	
vCu, unblocked vol			1252		1296	466
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.3		3.5	3.3
p0 queue free %			95		82	91
cM capacity (veh/h)			466		209	487

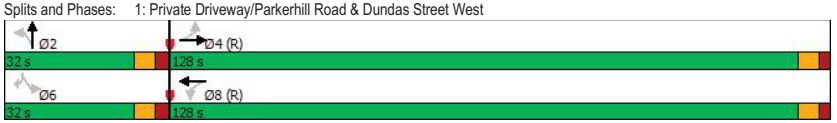
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	921	493	22	382	382	38	43
Volume Left	0	0	22	0	0	38	0
Volume Right	0	32	0	0	0	0	43
cSH	1700	1700	466	1700	1700	209	487
Volume to Capacity	0.54	0.29	0.05	0.22	0.22	0.18	0.09
Queue Length 95th (m)	0.0	0.0	1.2	0.0	0.0	5.2	2.3
Control Delay (s)	0.0	0.0	13.1	0.0	0.0	26.1	13.1
Lane LOS			B			D	B
Approach Delay (s)	0.0		0.4			19.2	
Approach LOS						C	

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		46.5%	ICU Level of Service	A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	40	1025	15	1530	5	40	80
Future Volume (vph)	40	1025	15	1530	5	40	80
Turn Type	Perm	NA	Perm	NA	NA	Perm	Perm
Protected Phases		4		8	2		
Permitted Phases	4		8			6	6
Detector Phase	4	4	8	8	2	6	6
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	135.9	135.9	135.9	135.9	10.6	10.6	10.6
Actuated g/C Ratio	0.85	0.85	0.85	0.85	0.07	0.07	0.07
v/c Ratio	0.18	0.35	0.04	0.54	0.32	0.38	0.50
Control Delay	4.6	3.1	4.9	13.4	54.9	80.9	32.1
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	4.6	3.1	4.9	13.8	54.9	80.9	32.1
LOS	A	A	A	B	D	F	C
Approach Delay		3.1		13.7	54.9		
Approach LOS		A		B	D		

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 11.7	Intersection LOS: B
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Group Flow (vph)	41	1056	15	1612	40	41	82
v/c Ratio	0.18	0.35	0.04	0.54	0.32	0.38	0.50
Control Delay	4.6	3.1	4.9	13.4	54.9	80.9	32.1
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	4.6	3.1	4.9	13.8	54.9	80.9	32.1
Queue Length 50th (m)	1.9	31.1	1.2	165.4	8.1	13.4	5.2
Queue Length 95th (m)	5.9	45.9	m2.4	250.8	20.9	26.7	23.5
Internal Link Dist (m)		269.7		55.8	40.3		
Turn Bay Length (m)	45.0		60.0				
Base Capacity (vph)	222	2996	416	3012	271	252	295
Starvation Cap Reductn	0	0	0	791	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	0.18	0.35	0.04	0.73	0.15	0.16	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1025	10	15	1530	50	20	5	15	40	0	80
Future Volume (vph)	40	1025	10	15	1530	50	20	5	15	40	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00		0.95
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.98		0.99		1.00
Frt	1.00	1.00		1.00	1.00			0.95		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95		1.00
Satd. Flow (prot)	1797	3527		1760	3548			1657		1782		1532
Flt Permitted	0.14	1.00		0.26	1.00			0.98		0.86		1.00
Satd. Flow (perm)	260	3527		486	3548			1657		1616		1532
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	1046	10	15	1561	51	20	5	15	41	0	82
RTOR Reduction (vph)	0	0	0	0	1	0	0	14	0	0	0	62
Lane Group Flow (vph)	41	1056	0	15	1611	0	0	26	0	41	0	20
Confl. Peds. (#/hr)	15		25	25		15	15		5	5		15
Heavy Vehicles (%)	0%	2%	9%	0%	1%	0%	0%	25%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Effective Green, g (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.07		0.07		0.07
Clearance Time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	220	2995		412	3013			109		107		101
v/s Ratio Prot		0.30			c0.45							
v/s Ratio Perm	0.16			0.03				0.02		c0.03		0.01
v/c Ratio	0.19	0.35		0.04	0.53			0.24		0.38		0.20
Uniform Delay, d1	2.2	2.6		1.9	3.3			70.9		71.6		70.7
Progression Factor	1.00	1.00		2.09	3.63			1.00		1.00		1.00
Incremental Delay, d2	1.9	0.3		0.1	0.5			1.1		2.3		1.0
Delay (s)	4.0	2.9		4.0	12.6			72.0		73.8		71.7
Level of Service	A	A		A	B			E		E		E
Approach Delay (s)		3.0			12.5			72.0			72.4	
Approach LOS		A			B			E			E	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	980	40	25	1510	15	25	0	35	5	0	30
Future Volume (Veh/h)	15	980	40	25	1510	15	25	0	35	5	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	1032	42	26	1589	16	26	0	37	5	0	32
Pedestrians		5			5			50			40	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			4			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.69			0.95			0.72	0.72	0.95	0.72	0.72	0.69
vC, conflicting volume	1645			1124			2018	2832	592	2279	2845	848
vC1, stage 1 conf vol							1135	1135		1689	1689	
vC2, stage 2 conf vol							884	1697		590	1156	
vCu, unblocked vol	1050			1020			1310	2438	458	1671	2456	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			96			88	100	93	96	100	96
cM capacity (veh/h)	451			625			208	137	502	136	141	730

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	16	688	386	26	1059	546	26	37	37
Volume Left	16	0	0	26	0	0	26	0	5
Volume Right	0	0	42	0	0	16	0	37	32
cSH	451	1700	1700	625	1700	1700	208	502	459
Volume to Capacity	0.04	0.40	0.23	0.04	0.62	0.32	0.12	0.07	0.08
Queue Length 95th (m)	0.9	0.0	0.0	1.0	0.0	0.0	3.4	1.9	2.1
Control Delay (s)	13.3	0.0	0.0	11.0	0.0	0.0	24.7	12.7	13.5
Lane LOS	B			B			C	B	B
Approach Delay (s)	0.2			0.2			17.7		13.5
Approach LOS							C		B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		57.0%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	120	775	35	1110	265	500	55	150	425	165
Future Volume (vph)	120	775	35	1110	265	500	55	150	425	165
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	96.8	81.6	90.2	75.2	57.0	52.5	52.5	38.2	38.2	38.2
Actuated g/C Ratio	0.60	0.51	0.56	0.47	0.36	0.33	0.33	0.24	0.24	0.24
v/c Ratio	0.50	0.52	0.10	0.79	0.89	0.44	0.11	0.76	0.51	0.41
Control Delay	26.4	34.6	16.1	40.8	64.0	38.0	5.9	78.7	54.0	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	34.6	16.1	40.8	64.0	38.0	5.9	78.7	54.0	29.1
LOS	C	C	B	D	E	D	A	E	D	C
Approach Delay		33.6		40.1		44.2			53.5	
Approach LOS		C		D		D			D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 41.8	Intersection LOS: D
Intersection Capacity Utilization 124.2%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	908	36	1276	270	510	56	153	434	168
v/c Ratio	0.50	0.52	0.10	0.79	0.89	0.44	0.11	0.76	0.51	0.41
Control Delay	26.4	34.6	16.1	40.8	64.0	38.0	5.9	78.7	54.0	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.4	34.6	16.1	40.8	64.0	38.0	5.9	78.7	54.0	29.1
Queue Length 50th (m)	21.4	122.0	4.5	179.1	54.6	56.7	0.3	49.1	68.4	26.5
Queue Length 95th (m)	36.9	163.5	12.4	#283.0	#66.9	62.3	m4.5	69.2	75.1	43.8
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	245	1741	350	1623	303	1932	799	382	1603	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.52	0.10	0.79	0.89	0.26	0.07	0.40	0.27	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	775	115	35	1110	140	265	500	55	150	425	165
Future Volume (vph)	120	775	115	35	1110	140	265	500	55	150	425	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.91	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		0.99	1.00		0.99	1.00	1.00	0.96	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3401		1796	3447		1786	3574	1433	1730	3539	1472
Flt Permitted	0.09	1.00		0.25	1.00		0.34	1.00	1.00	0.46	1.00	1.00
Satd. Flow (perm)	174	3401		480	3447		633	3574	1433	845	3539	1472
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	122	791	117	36	1133	143	270	510	56	153	434	168
RTOR Reduction (vph)	0	5	0	0	4	0	0	0	37	0	0	57
Lane Group Flow (vph)	122	903	0	36	1272	0	270	510	19	153	434	111
Confl. Peds. (#/hr)	75		90	90		75	60		65	65		60
Heavy Vehicles (%)	1%	3%	0%	0%	2%	1%	0%	1%	2%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	92.6	81.6		83.7	75.7		51.9	51.9	51.9	37.7	37.7	37.7
Effective Green, g (s)	92.6	81.6		83.7	75.7		51.9	51.9	51.9	37.7	37.7	37.7
Actuated g/C Ratio	0.58	0.51		0.52	0.47		0.32	0.32	0.32	0.24	0.24	0.24
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	240	1734		316	1630		286	1159	464	199	833	346
v/s Ratio Prot	c0.04	0.27		0.01	c0.37		c0.07	0.14			0.12	
v/s Ratio Perm	0.25			0.05			c0.24		0.01	0.18		0.08
v/c Ratio	0.51	0.52		0.11	0.78		0.94	0.44	0.04	0.77	0.52	0.32
Uniform Delay, d1	24.3	26.2		19.3	35.2		50.5	42.6	37.0	57.1	53.3	50.6
Progression Factor	1.21	1.19		1.00	1.00		0.87	0.89	0.76	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.3		0.2	2.5		35.0	1.1	0.1	24.4	2.3	2.4
Delay (s)	31.0	31.4		19.4	37.7		78.8	39.1	28.3	81.5	55.6	53.0
Level of Service	C	C		B	D		E	D	C	F	E	D
Approach Delay (s)		31.4			37.2			51.2			60.3	
Approach LOS		C			D			D			E	

Intersection Summary

HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	124.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	5	75	65	10
Future Volume (Veh/h)	5	5	5	75	65	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	6	6	87	76	12
Pedestrians	20					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	201	102	108			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201	102	108			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	776	943	1470			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	93	88
Volume Left	6	6	0
Volume Right	6	0	12
cSH	851	1470	1700
Volume to Capacity	0.01	0.00	0.05
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	9.3	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	0.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	15	65	55	15
Future Volume (Veh/h)	15	10	15	65	55	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	12	18	77	65	18
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	207	99	103			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	207	99	103			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	763	942	1476			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	95	83
Volume Left	18	18	0
Volume Right	12	0	18
cSH	826	1476	1700
Volume to Capacity	0.04	0.01	0.05
Queue Length 95th (m)	0.9	0.3	0.0
Control Delay (s)	9.5	1.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	22.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	0	75	60	5
Future Volume (Veh/h)	5	5	0	75	60	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	6	6	0	97	78	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	193	96	99			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	193	96	99			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	790	954	1488			

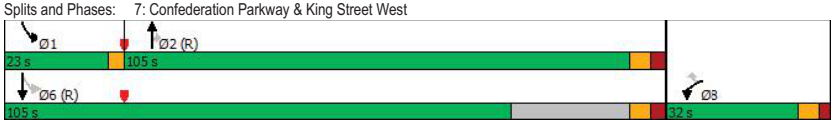
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	97	84
Volume Left	6	0	0
Volume Right	6	0	6
cSH	865	1488	1700
Volume to Capacity	0.01	0.00	0.05
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	545	80	195	425
Future Volume (vph)	130	340	545	80	195	425
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	17.4	17.4	116.9	116.9	133.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.83	0.81
v/c Ratio	0.70	0.73	0.42	0.08	0.31	0.30
Control Delay	86.7	15.2	10.3	5.8	6.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	10.3	5.8	6.5	5.0
LOS	F	B	B	A	A	A
Approach Delay	35.0		9.7			5.5
Approach LOS	C		A			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 62.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	137	358	574	84	205	447
v/c Ratio	0.70	0.73	0.42	0.08	0.31	0.30
Control Delay	86.7	15.2	10.3	5.8	6.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	10.3	5.8	6.5	5.0
Queue Length 50th (m)	45.0	0.0	67.8	5.6	13.3	23.4
Queue Length 95th (m)	67.0	33.0	110.7	13.5	21.7	35.5
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	549	1361	1063	739	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.65	0.42	0.08	0.28	0.30

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	545	80	195	425
Future Volume (vph)	130	340	545	80	195	425
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1561	1863	1448	1774	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.39	1.00
Satd. Flow (perm)	1805	1561	1863	1448	725	1863
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	358	574	84	205	447
RTOR Reduction (vph)	0	319	0	5	0	0
Lane Group Flow (vph)	137	39	574	79	205	447
Confl. Peds. (#/hr)	10	5		20	20	
Heavy Vehicles (%)	0%	1%	2%	1%	1%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.4	17.4	117.0	117.0	129.1	129.1
Effective Green, g (s)	17.4	17.4	117.0	117.0	129.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.81	0.81
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	169	1362	1058	644	1503
v/s Ratio Prot	c0.08		c0.31		c0.02	0.24
v/s Ratio Perm		0.02		0.05	0.24	
v/c Ratio	0.70	0.23	0.42	0.07	0.32	0.30
Uniform Delay, d1	68.8	65.2	8.4	6.1	4.5	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.84	1.04
Incremental Delay, d2	10.4	0.7	1.0	0.1	0.3	0.5
Delay (s)	79.2	65.9	9.3	6.2	8.5	4.6
Level of Service	E	E	A	A	A	A
Approach Delay (s)	69.6		8.9			5.8
Approach LOS	E		A			A

Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	55	0	0	0	70	610	5	0	515	40
Future Volume (Veh/h)	15	0	55	0	0	0	70	610	5	0	515	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	16	0	57	0	0	0	73	635	5	0	536	42
Pedestrians		30			25							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	1347	1377	566	1399	1414	660	608			665		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1337	1369	507	1393	1409	660	552			665		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	89	100	100	100	92			100		
cM capacity (veh/h)	110	123	522	90	116	457	943			914		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	73	0	73	635	5	0	536	42
Volume Left	16	0	73	0	0	0	0	0
Volume Right	57	0	0	0	5	0	0	42
cSH	286	1700	943	1700	1700	1700	1700	1700
Volume to Capacity	0.26	0.00	0.08	0.37	0.00	0.00	0.32	0.02
Queue Length 95th (m)	7.9	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	21.8	0.0	9.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	A	A					
Approach Delay (s)	21.8	0.0	0.9			0.0		
Approach LOS	C	A						

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1035	45	35	1550	45	25
Future Volume (Veh/h)	1035	45	35	1550	45	25
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1078	47	36	1615	47	26
Pedestrians				5	20	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.93		0.74	0.93
vC, conflicting volume			1145		2001	588
vC1, stage 1 conf vol					1122	
vC2, stage 2 conf vol					880	
vCu, unblocked vol			1015		1249	419
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		83	95
cM capacity (veh/h)			635		279	539

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	719	406	36	808	808	47	26
Volume Left	0	0	36	0	0	47	0
Volume Right	0	47	0	0	0	0	26
cSH	1700	1700	635	1700	1700	279	539
Volume to Capacity	0.42	0.24	0.06	0.47	0.47	0.17	0.05
Queue Length 95th (m)	0.0	0.0	1.4	0.0	0.0	4.8	1.2
Control Delay (s)	0.0	0.0	11.0	0.0	0.0	20.5	12.0
Lane LOS			B			C	B
Approach Delay (s)	0.0		0.2			17.5	
Approach LOS						C	

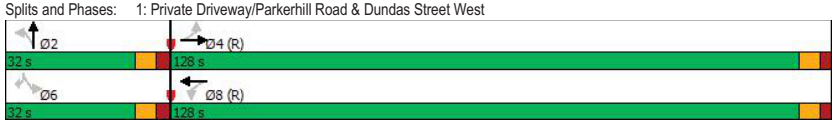
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	54.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	55	1340	5	765	20	80	
Future Volume (vph)	55	1340	5	765	20	80	
Turn Type	Perm	NA	Perm	NA	Perm	Perm	
Protected Phases		4		8			2
Permitted Phases	4		8		6	6	
Detector Phase	4	4	8	8	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	137.5	137.5	137.5	137.5	9.0	9.0	
Actuated g/C Ratio	0.86	0.86	0.86	0.86	0.06	0.06	
v/c Ratio	0.12	0.49	0.02	0.30	0.30	0.51	
Control Delay	2.5	3.4	4.6	8.6	82.2	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.5	3.4	4.6	8.6	82.2	23.8	
LOS	A	A	A	A	F	C	
Approach Delay		3.4		8.6			
Approach LOS		A		A			

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	60	1468	5	865	22	87
v/c Ratio	0.12	0.49	0.02	0.30	0.30	0.51
Control Delay	2.5	3.4	4.6	8.6	82.2	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	3.4	4.6	8.6	82.2	23.8
Queue Length 50th (m)	2.3	46.5	0.6	67.5	7.3	0.0
Queue Length 95th (m)	5.6	65.6	m0.9	112.1	17.5	18.7
Internal Link Dist (m)		269.7		55.8		
Turn Bay Length (m)	45.0		60.0			
Base Capacity (vph)	500	2978	270	2868	206	316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.49	0.02	0.30	0.11	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1340	10	5	765	30	0	0	0	20	0	80
Future Volume (vph)	55	1340	10	5	765	30	0	0	0	20	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95					1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00					1.00		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00					1.00		1.00
Frt	1.00	1.00		1.00	0.99					1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)	1698	3466		1797	3339					1656		1553
Flt Permitted	0.32	1.00		0.17	1.00					0.76		1.00
Satd. Flow (perm)	581	3466		313	3339					1320		1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1457	11	5	832	33	0	0	0	22	0	87
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	82
Lane Group Flow (vph)	60	1468	0	5	864	0	0	0	0	22	0	5
Confl. Peds. (#/hr)	15		10	10		15						
Heavy Vehicles (%)	4%	4%	0%	0%	7%	10%	0%	0%	0%	9%	0%	4%
Turn Type	Perm	NA		Perm	NA					Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	137.5	137.5		137.5	137.5					9.0		9.0
Effective Green, g (s)	137.5	137.5		137.5	137.5					9.0		9.0
Actuated g/C Ratio	0.86	0.86		0.86	0.86					0.06		0.06
Clearance Time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)	499	2978		268	2869					74		87
v/s Ratio Prot		c0.42			0.26							
v/s Ratio Perm	0.10			0.02						c0.02		0.00
v/c Ratio	0.12	0.49		0.02	0.30					0.30		0.06
Uniform Delay, d1	1.8	2.7		1.6	2.1					72.5		71.5
Progression Factor	1.00	1.00		2.39	3.82					1.00		1.00
Incremental Delay, d2	0.5	0.6		0.1	0.2					2.2		0.3
Delay (s)	2.3	3.3		4.0	8.4					74.7		71.8
Level of Service	A	A		A	A					E		E
Approach Delay (s)		3.3			8.4			0.0			72.3	
Approach LOS		A			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1285	35	15	750	30	20	0	15	0	0	15
Future Volume (Veh/h)	25	1285	35	15	750	30	20	0	15	0	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	1353	37	16	789	32	21	0	16	0	0	16
Pedestrians								35			35	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								3			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.86			0.90			0.91	0.91	0.90	0.91	0.91	0.86
vC, conflicting volume	856			1425			1901	2346	730	1616	2349	446
vC1, stage 1 conf vol							1458	1458		872	872	
vC2, stage 2 conf vol							442	888		744	1477	
vCu, unblocked vol	495			1250			1291	1783	478	977	1785	15
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			97			86	100	97	100	100	98
cM capacity (veh/h)	897			464			146	182	471	328	168	887

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	902	488	16	526	295	21	16	16
Volume Left	26	0	0	16	0	0	21	0	0
Volume Right	0	0	37	0	0	32	0	16	16
cSH	897	1700	1700	464	1700	1700	146	471	887
Volume to Capacity	0.03	0.53	0.29	0.03	0.31	0.17	0.14	0.03	0.02
Queue Length 95th (m)	0.7	0.0	0.0	0.9	0.0	0.0	3.9	0.8	0.4
Control Delay (s)	9.1	0.0	0.0	13.0	0.0	0.0	33.8	12.9	9.1
Lane LOS	A			B			D	B	A
Approach Delay (s)	0.2			0.2			24.8		9.1
Approach LOS							C		A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	53.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	125	1060	25	565	150	405	35	155	545	80
Future Volume (vph)	125	1060	25	565	150	405	35	155	545	80
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	90.0	77.5	84.4	69.4	63.7	59.2	59.2	44.8	44.8	44.8
Actuated g/C Ratio	0.56	0.48	0.53	0.43	0.40	0.37	0.37	0.28	0.28	0.28
v/c Ratio	0.35	0.79	0.14	0.51	0.63	0.35	0.07	0.67	0.62	0.21
Control Delay	25.9	48.8	18.4	34.6	38.3	32.7	1.9	65.2	53.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	48.8	18.4	34.6	38.3	32.7	1.9	65.2	53.0	11.9
LOS	C	D	B	C	D	C	A	E	D	B
Approach Delay		46.7		34.1		32.3			51.2	
Approach LOS		D		C		C			D	

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 42.6 — Intersection LOS: D
Intersection Capacity Utilization 123.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	1302	27	725	165	445	38	170	599	88
v/c Ratio	0.35	0.79	0.14	0.51	0.63	0.35	0.07	0.67	0.62	0.21
Control Delay	25.9	48.8	18.4	34.6	38.3	32.7	1.9	65.2	53.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	48.8	18.4	34.6	38.3	32.7	1.9	65.2	53.0	11.9
Queue Length 50th (m)	21.4	216.3	3.4	81.0	34.8	58.3	0.0	54.4	98.8	3.4
Queue Length 95th (m)	46.0	#278.3	10.2	126.1	38.1	49.0	2.2	74.7	104.4	16.4
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	389	1650	190	1428	264	1876	822	408	1572	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.79	0.14	0.51	0.63	0.24	0.05	0.42	0.38	0.14

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	1060	125	25	565	95	150	405	35	155	545	80
Future Volume (vph)	125	1060	125	25	565	95	150	405	35	155	545	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1762	3402		1686	3280		1727	3471	1475	1732	3471	1327
Flt Permitted	0.28	1.00		0.10	1.00		0.24	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	517	3402		185	3280		438	3471	1475	902	3471	1327
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	137	1165	137	27	621	104	165	445	38	170	599	88
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	24	0	0	55
Lane Group Flow (vph)	137	1298	0	27	718	0	165	445	14	170	599	33
Confl. Peds. (#/hr)	55		60	60		55	60		30	30		60
Heavy Vehicles (%)	2%	4%	0%	7%	7%	4%	4%	4%	4%	2%	4%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	86.5	77.5		76.6	70.6		58.0	58.0	58.0	43.6	43.6	43.6
Effective Green, g (s)	86.5	77.5		76.6	70.6		58.0	58.0	58.0	43.6	43.6	43.6
Actuated g/C Ratio	0.54	0.48		0.48	0.44		0.36	0.36	0.36	0.27	0.27	0.27
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	379	1647		144	1447		250	1258	534	245	945	361
v/s Ratio Prot	c0.03	c0.38		0.01	0.22		c0.05	0.13			0.17	
v/s Ratio Perm	0.17			0.08			c0.19		0.01	0.19		0.03
v/c Ratio	0.36	0.79		0.19	0.50		0.66	0.35	0.03	0.69	0.63	0.09
Uniform Delay, d1	19.7	34.4		26.4	32.0		37.6	37.3	32.8	52.2	51.2	43.4
Progression Factor	1.37	1.28		1.00	1.00		0.88	0.88	0.62	1.00	1.00	1.00
Incremental Delay, d2	0.5	2.4		0.6	0.3		5.8	0.7	0.1	15.0	3.2	0.5
Delay (s)	27.5	46.5		27.0	32.3		38.8	33.7	20.4	67.2	54.4	43.9
Level of Service	C	D		C	C		D	C	C	E	D	D
Approach Delay (s)		44.7			32.1			34.2			55.9	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	123.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	5	0	80	50	5
Future Volume (Veh/h)	15	5	0	80	50	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	6	0	93	58	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	169	76	79			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	169	76	79			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	816	978	1513			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	23	93	64
Volume Left	17	0	0
Volume Right	6	0	6
cSH	853	1513	1700
Volume to Capacity	0.03	0.00	0.04
Queue Length 95th (m)	0.7	0.0	0.0
Control Delay (s)	9.3	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.3	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	15	10	60	50	5
Future Volume (Veh/h)	20	15	10	60	50	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	26	19	13	78	65	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	187	83	86			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	187	83	86			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	99			
cM capacity (veh/h)	790	970	1504			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	91	71
Volume Left	26	13	0
Volume Right	19	0	6
cSH	857	1504	1700
Volume to Capacity	0.05	0.01	0.04
Queue Length 95th (m)	1.3	0.2	0.0
Control Delay (s)	9.4	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	20.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	10	5	70	65	0
Future Volume (Veh/h)	0	10	5	70	65	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	0	12	6	85	79	0
Pedestrians	25					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	201	104	104			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	201	104	104			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	772	936	1469			

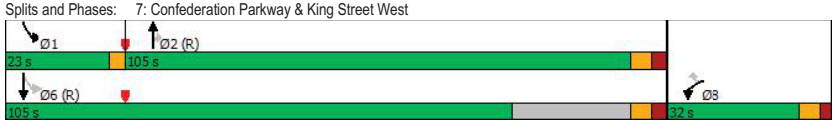
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	91	79
Volume Left	0	6	0
Volume Right	12	0	0
cSH	936	1469	1700
Volume to Capacity	0.01	0.00	0.05
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	8.9	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	0.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	555	80	200	535
Future Volume (vph)	30	170	555	80	200	535
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	9.8	9.8	123.6	123.6	140.7	136.7
Actuated g/C Ratio	0.06	0.06	0.77	0.77	0.88	0.85
v/c Ratio	0.30	0.69	0.44	0.07	0.32	0.38
Control Delay	77.7	22.5	8.0	4.3	5.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	77.7	22.5	8.0	4.3	5.6	5.6
LOS	E	C	A	A	A	A
Approach Delay	30.7		7.5			5.6
Approach LOS	C		A			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	189	617	89	222	594
v/c Ratio	0.30	0.69	0.44	0.07	0.32	0.38
Control Delay	77.7	22.5	8.0	4.3	5.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	77.7	22.5	8.0	4.3	5.6	5.6
Queue Length 50th (m)	10.9	0.0	58.2	4.6	12.8	47.3
Queue Length 95th (m)	22.5	25.6	109.3	12.5	m21.2	46.3
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	406	1411	1191	755	1576
Starvation Cap Reductn	0	0	0	0	0	347
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.47	0.44	0.07	0.29	0.48

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	555	80	200	535
Future Volume (vph)	30	170	555	80	200	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1553	1827	1537	1766	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1805	1553	1827	1537	706	1845
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	189	617	89	222	594
RTOR Reduction (vph)	0	177	0	4	0	0
Lane Group Flow (vph)	33	12	617	85	222	594
Confl. Peds. (#/hr)	5			5	5	
Heavy Vehicles (%)	0%	4%	4%	1%	2%	3%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.8	9.8	123.6	123.6	136.7	136.7
Effective Green, g (s)	9.8	9.8	123.6	123.6	136.7	136.7
Actuated g/C Ratio	0.06	0.06	0.77	0.77	0.85	0.85
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	95	1411	1187	670	1576
v/s Ratio Prot	c0.02		c0.34		0.02	c0.32
v/s Ratio Perm		0.01		0.06	0.26	
v/c Ratio	0.30	0.12	0.44	0.07	0.33	0.38
Uniform Delay, d1	71.8	71.0	6.3	4.4	2.9	2.5
Progression Factor	1.00	1.00	1.00	1.00	3.01	1.73
Incremental Delay, d2	1.5	0.6	1.0	0.1	0.3	0.6
Delay (s)	73.4	71.6	7.2	4.5	9.0	5.0
Level of Service	E	E	A	A	A	A
Approach Delay (s)	71.9		6.9			6.1
Approach LOS	E		A			A

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	105	0	0	5	60	620	0	0	550	15
Future Volume (Veh/h)	10	0	105	0	0	5	60	620	0	0	550	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	121	0	0	6	69	713	0	0	632	17
Pedestrians		10			20			5				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			2			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1499	1513	647	1629	1530	733	659			733		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1499	1514	580	1639	1532	733	593			733		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	100	74	100	100	99	92			100		
cM capacity (veh/h)	76	101	473	51	98	417	913			866		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	132	6	69	713	0	0	632	17
Volume Left	11	0	69	0	0	0	0	0
Volume Right	121	6	0	0	0	0	0	17
cSH	329	417	913	1700	1700	1700	1700	1700
Volume to Capacity	0.40	0.01	0.08	0.42	0.00	0.00	0.37	0.01
Queue Length 95th (m)	14.9	0.4	2.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	23.1	13.8	9.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	A					
Approach Delay (s)	23.1	13.8	0.8			0.0		
Approach LOS	C	B						

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1325	35	25	755	45	45
Future Volume (Veh/h)	1325	35	25	755	45	45
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1425	38	27	812	48	48
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			1478		1919	746
vC1, stage 1 conf vol					1459	
vC2, stage 2 conf vol					460	
vCu, unblocked vol			1294		1340	474
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.3		3.5	3.3
p0 queue free %			94		76	90
cM capacity (veh/h)			445		197	477

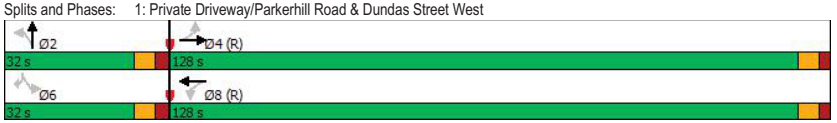
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	950	513	27	406	406	48	48
Volume Left	0	0	27	0	0	48	0
Volume Right	0	38	0	0	0	0	48
cSH	1700	1700	445	1700	1700	197	477
Volume to Capacity	0.56	0.30	0.06	0.24	0.24	0.24	0.10
Queue Length 95th (m)	0.0	0.0	1.5	0.0	0.0	7.3	2.7
Control Delay (s)	0.0	0.0	13.6	0.0	0.0	29.0	13.4
Lane LOS			B			D	B
Approach Delay (s)	0.0		0.4			21.2	
Approach LOS						C	

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		47.8%	ICU Level of Service	A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	40	1095	15	1605	5	40	80
Future Volume (vph)	40	1095	15	1605	5	40	80
Turn Type	Perm	NA	Perm	NA	NA	Perm	Perm
Protected Phases		4		8	2		
Permitted Phases	4		8			6	6
Detector Phase	4	4	8	8	2	6	6
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	135.9	135.9	135.9	135.9	10.6	10.6	10.6
Actuated g/C Ratio	0.85	0.85	0.85	0.85	0.07	0.07	0.07
v/c Ratio	0.20	0.38	0.04	0.56	0.32	0.38	0.53
Control Delay	5.1	3.2	5.0	14.1	54.9	80.9	38.1
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	5.1	3.2	5.0	14.6	54.9	80.9	38.1
LOS	A	A	A	B	D	F	D
Approach Delay		3.3		14.5	54.9		
Approach LOS		A		B	D		

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 81.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Group Flow (vph)	41	1127	15	1689	40	41	82
v/c Ratio	0.20	0.38	0.04	0.56	0.32	0.38	0.53
Control Delay	5.1	3.2	5.0	14.1	54.9	80.9	38.1
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	5.1	3.2	5.0	14.6	54.9	80.9	38.1
Queue Length 50th (m)	2.0	34.1	1.1	184.4	8.1	13.4	7.8
Queue Length 95th (m)	6.2	50.3	m2.4	m264.7	20.9	26.7	26.4
Internal Link Dist (m)		269.7		55.8	40.3		
Turn Bay Length (m)	45.0		60.0				
Base Capacity (vph)	202	2996	385	3012	271	252	288
Starvation Cap Reductn	0	0	0	794	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	0.38	0.04	0.76	0.15	0.16	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1095	10	15	1605	50	20	5	15	40	0	80
Future Volume (vph)	40	1095	10	15	1605	50	20	5	15	40	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00		0.95
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.98		0.99		1.00
Frt	1.00	1.00		1.00	1.00			0.95		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95		1.00
Satd. Flow (prot)	1805	3528		1766	3549			1657		1782		1532
Flt Permitted	0.13	1.00		0.24	1.00			0.98		0.86		1.00
Satd. Flow (perm)	238	3528		451	3549			1657		1616		1532
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	1117	10	15	1638	51	20	5	15	41	0	82
RTOR Reduction (vph)	0	0	0	0	1	0	0	14	0	0	0	54
Lane Group Flow (vph)	41	1127	0	15	1688	0	0	26	0	41	0	28
Confl. Peds. (#/hr)	15		25	25		15	15		5	5		15
Heavy Vehicles (%)	0%	2%	9%	0%	1%	0%	0%	25%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Effective Green, g (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.07		0.07		0.07
Clearance Time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	202	2996		383	3014			109		107		101
v/s Ratio Prot		0.32			c0.48							
v/s Ratio Perm	0.17			0.03				0.02		c0.03		0.02
v/c Ratio	0.20	0.38		0.04	0.56			0.24		0.38		0.28
Uniform Delay, d1	2.2	2.7		1.9	3.5			70.9		71.6		71.0
Progression Factor	1.00	1.00		2.10	3.67			1.00		1.00		1.00
Incremental Delay, d2	2.3	0.4		0.1	0.5			1.1		2.3		1.5
Delay (s)	4.4	3.0		4.1	13.2			72.0		73.8		72.5
Level of Service	A	A		A	B			E		E		E
Approach Delay (s)		3.1			13.1			72.0			73.0	
Approach LOS		A			B			E			E	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1045	40	25	1590	15	25	0	35	5	0	30
Future Volume (Veh/h)	15	1045	40	25	1590	15	25	0	35	5	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	1100	42	26	1674	16	26	0	37	5	0	32
Pedestrians		5			5			50			40	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			4			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.67			0.94			0.70	0.70	0.94	0.70	0.70	0.67
vC, conflicting volume	1730			1192			2129	2985	626	2398	2998	890
vC1, stage 1 conf vol							1203	1203		1774	1774	
vC2, stage 2 conf vol							926	1782		624	1224	
vCu, unblocked vol	1092			1075			1355	2585	472	1741	2603	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			96			86	100	92	96	100	95
cM capacity (veh/h)	416			591			191	124	487	123	128	699

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	16	733	409	26	1116	574	26	37	37
Volume Left	16	0	0	26	0	0	26	0	5
Volume Right	0	0	42	0	0	16	0	37	32
cSH	416	1700	1700	591	1700	1700	191	487	427
Volume to Capacity	0.04	0.43	0.24	0.04	0.66	0.34	0.14	0.08	0.09
Queue Length 95th (m)	1.0	0.0	0.0	1.1	0.0	0.0	3.7	2.0	2.3
Control Delay (s)	14.0	0.0	0.0	11.4	0.0	0.0	26.8	13.0	14.2
Lane LOS	B			B			D	B	B
Approach Delay (s)	0.2			0.2			18.7		14.2
Approach LOS							C		B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		59.2%	ICU Level of Service B
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	120	840	55	1170	285	540	65	155	465	165
Future Volume (vph)	120	840	55	1170	285	540	65	155	465	165
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	95.1	80.0	88.9	73.9	58.6	54.1	54.1	40.0	40.0	40.0
Actuated g/C Ratio	0.59	0.50	0.56	0.46	0.37	0.34	0.34	0.25	0.25	0.25
v/c Ratio	0.55	0.57	0.18	0.84	0.99	0.46	0.13	0.78	0.54	0.40
Control Delay	32.2	36.7	17.6	44.0	83.1	37.7	8.1	79.4	53.2	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	36.7	17.6	44.0	83.1	37.7	8.1	79.4	53.2	27.8
LOS	C	D	B	D	F	D	A	E	D	C
Approach Delay		36.2		42.9		50.1			53.0	
Approach LOS		D		D		D			D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 44.6	Intersection LOS: D
Intersection Capacity Utilization 125.7%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	122	974	56	1337	291	551	66	158	474	168
v/c Ratio	0.55	0.57	0.18	0.84	0.99	0.46	0.13	0.78	0.54	0.40
Control Delay	32.2	36.7	17.6	44.0	83.1	37.7	8.1	79.4	53.2	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	36.7	17.6	44.0	83.1	37.7	8.1	79.4	53.2	27.8
Queue Length 50th (m)	21.7	136.2	7.3	196.7	~55.6	56.8	1.8	50.4	74.0	25.8
Queue Length 95th (m)	41.8	177.4	17.9	#313.3	#83.5	69.3	m7.7	70.4	80.1	42.6
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	220	1707	317	1597	295	1932	799	368	1603	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.57	0.18	0.84	0.99	0.29	0.08	0.43	0.30	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	840	115	55	1170	140	285	540	65	155	465	165
Future Volume (vph)	120	840	115	55	1170	140	285	540	65	155	465	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.91	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.96	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3408		1798	3451		1789	3574	1433	1734	3539	1472
Flt Permitted	0.07	1.00		0.22	1.00		0.31	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	137	3408		420	3451		587	3574	1433	814	3539	1472
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	122	857	117	56	1194	143	291	551	66	158	474	168
RTOR Reduction (vph)	0	5	0	0	4	0	0	0	37	0	0	57
Lane Group Flow (vph)	122	970	0	56	1333	0	291	551	29	158	474	111
Confl. Peds. (#/hr)	75		90	90		75	60		65	65		60
Heavy Vehicles (%)	1%	3%	0%	0%	2%	1%	0%	1%	2%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	91.0	80.0		82.5	74.5		53.5	53.5	53.5	39.4	39.4	39.4
Effective Green, g (s)	91.0	80.0		82.5	74.5		53.5	53.5	53.5	39.4	39.4	39.4
Actuated g/C Ratio	0.57	0.50		0.52	0.47		0.33	0.33	0.33	0.25	0.25	0.25
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	217	1704		285	1606		279	1195	479	200	871	362
v/s Ratio Prot	c0.05	0.28		0.01	c0.39		c0.07	0.15			0.13	
v/s Ratio Perm	0.27			0.09			c0.28		0.02	0.19		0.08
v/c Ratio	0.56	0.57		0.20	0.83		1.04	0.46	0.06	0.79	0.54	0.31
Uniform Delay, d1	27.4	28.0		20.5	37.2		51.0	41.9	36.2	56.4	52.5	49.2
Progression Factor	1.07	1.16		1.00	1.00		0.87	0.90	0.84	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.4		0.3	3.7		61.4	1.1	0.2	26.5	2.4	2.2
Delay (s)	32.5	32.9		20.9	40.9		105.9	38.9	30.6	82.9	54.9	51.4
Level of Service	C	C		C	D		F	D	C	F	D	D
Approach Delay (s)		32.9			40.1			59.8			59.7	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	125.7%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	5	85	85	10
Future Volume (Veh/h)	5	5	5	85	85	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	6	6	99	99	12
Pedestrians	20					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	236	125	131			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236	125	131			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	741	915	1442			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	105	111
Volume Left	6	6	0
Volume Right	6	0	12
cSH	819	1442	1700
Volume to Capacity	0.01	0.00	0.07
Queue Length 95th (m)	0.4	0.1	0.0
Control Delay (s)	9.5	0.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	0.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	19.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	15	10	15	75	75	15
Future Volume (Veh/h)	15	10	15	75	75	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	18	12	18	89	89	18
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	243	123	127			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	243	123	127			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	99			
cM capacity (veh/h)	728	914	1447			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	30	107	107
Volume Left	18	18	0
Volume Right	12	0	18
cSH	793	1447	1700
Volume to Capacity	0.04	0.01	0.06
Queue Length 95th (m)	0.9	0.3	0.0
Control Delay (s)	9.7	1.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	1.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	23.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	5	0	85	80	5
Future Volume (Veh/h)	5	5	0	85	80	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	6	6	0	110	104	6
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	232	122	125			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	232	122	125			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	751	923	1456			

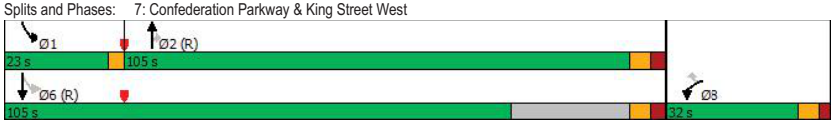
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	110	110
Volume Left	6	0	0
Volume Right	6	0	6
cSH	828	1456	1700
Volume to Capacity	0.01	0.00	0.06
Queue Length 95th (m)	0.4	0.0	0.0
Control Delay (s)	9.4	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.4	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		18.0%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	615	80	195	485
Future Volume (vph)	130	340	615	80	195	485
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	17.4	17.4	116.9	116.9	133.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.83	0.81
v/c Ratio	0.70	0.73	0.48	0.08	0.34	0.34
Control Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	11.1	6.0	7.1	5.4
LOS	F	B	B	A	A	A
Approach Delay	35.0		10.5			5.9
Approach LOS	C		B			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	137	358	647	84	205	511
v/c Ratio	0.70	0.73	0.48	0.08	0.34	0.34
Control Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Length 50th (m)	45.0	0.0	81.0	5.8	13.7	31.4
Queue Length 95th (m)	67.0	33.0	131.7	13.8	22.4	35.8
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	549	1361	1062	687	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.65	0.48	0.08	0.30	0.34

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	615	80	195	485
Future Volume (vph)	130	340	615	80	195	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1561	1863	1448	1778	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1805	1561	1863	1448	653	1863
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	358	647	84	205	511
RTOR Reduction (vph)	0	319	0	5	0	0
Lane Group Flow (vph)	137	39	647	79	205	511
Confl. Peds. (#/hr)	10	5		20	20	
Heavy Vehicles (%)	0%	1%	2%	1%	1%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.4	17.4	117.0	117.0	129.1	129.1
Effective Green, g (s)	17.4	17.4	117.0	117.0	129.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.81	0.81
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	169	1362	1058	590	1503
v/s Ratio Prot	c0.08		c0.35		0.02	c0.27
v/s Ratio Perm		0.02		0.05	0.26	
v/c Ratio	0.70	0.23	0.48	0.08	0.35	0.34
Uniform Delay, d1	68.8	65.2	8.9	6.1	5.1	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.95	1.06
Incremental Delay, d2	10.4	0.7	1.2	0.1	0.3	0.6
Delay (s)	79.2	65.9	10.0	6.3	10.3	4.9
Level of Service	E	E	B	A	B	A
Approach Delay (s)	69.6		9.6			6.5
Approach LOS	E		A			A

Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	55	0	0	0	70	680	5	0	575	40
Future Volume (Veh/h)	15	0	55	0	0	0	70	680	5	0	575	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	16	0	57	0	0	0	73	708	5	0	599	42
Pedestrians		30			25							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1483	1513	629	1535	1550	733	671			738		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1482	1514	561	1538	1554	733	606			738		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	81	100	88	100	100	100	92			100		
cM capacity (veh/h)	86	98	480	69	93	415	888			859		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	73	0	73	708	5	0	599	42
Volume Left	16	0	73	0	0	0	0	0
Volume Right	57	0	0	0	5	0	0	42
cSH	239	1700	888	1700	1700	1700	1700	1700
Volume to Capacity	0.31	0.00	0.08	0.42	0.00	0.00	0.35	0.02
Queue Length 95th (m)	10.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	26.6	0.0	9.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	A	A					
Approach Delay (s)	26.6	0.0	0.9			0.0		
Approach LOS	D	A						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1095	55	45	1620	50	30
Future Volume (Veh/h)	1095	55	45	1620	50	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1141	57	47	1688	52	31
Pedestrians				5	20	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.93		0.71	0.93
vC, conflicting volume			1218		2128	624
vC1, stage 1 conf vol					1190	
vC2, stage 2 conf vol					938	
vCu, unblocked vol			1079		1318	439
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		80	94
cM capacity (veh/h)			597		257	519

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	761	437	47	844	844	52	31
Volume Left	0	0	47	0	0	52	0
Volume Right	0	57	0	0	0	0	31
cSH	1700	1700	597	1700	1700	257	519
Volume to Capacity	0.45	0.26	0.08	0.50	0.50	0.20	0.06
Queue Length 95th (m)	0.0	0.0	2.0	0.0	0.0	5.9	1.5
Control Delay (s)	0.0	0.0	11.6	0.0	0.0	22.6	12.4
Lane LOS			B			C	B
Approach Delay (s)	0.0		0.3			18.8	
Approach LOS						C	

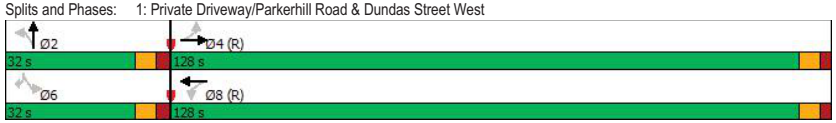
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	SBL	SBR	Ø2
Lane Configurations							
Traffic Volume (vph)	55	1345	5	775	20	80	
Future Volume (vph)	55	1345	5	775	20	80	
Turn Type	Perm	NA	Perm	NA	Perm	Perm	
Protected Phases		4		8			2
Permitted Phases	4		8		6	6	
Detector Phase	4	4	8	8	6	6	
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	137.5	137.5	137.5	137.5	9.0	9.0	
Actuated g/C Ratio	0.86	0.86	0.86	0.86	0.06	0.06	
v/c Ratio	0.12	0.49	0.02	0.31	0.30	0.51	
Control Delay	2.5	3.5	4.4	8.5	82.2	23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.5	3.5	4.4	8.5	82.2	23.8	
LOS	A	A	A	A	F	C	
Approach Delay		3.4		8.5			
Approach LOS		A		A			

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 6.6 — Intersection LOS: A
Intersection Capacity Utilization 57.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	60	1473	5	875	22	87
v/c Ratio	0.12	0.49	0.02	0.31	0.30	0.51
Control Delay	2.5	3.5	4.4	8.5	82.2	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.5	3.5	4.4	8.5	82.2	23.8
Queue Length 50th (m)	2.3	46.7	0.5	67.3	7.3	0.0
Queue Length 95th (m)	5.6	65.8	m1.0	112.2	17.5	18.7
Internal Link Dist (m)		269.7		55.8		
Turn Bay Length (m)	45.0		60.0			
Base Capacity (vph)	497	2978	269	2868	206	316
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.49	0.02	0.31	0.11	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	1345	10	5	775	30	0	0	0	20	0	80
Future Volume (vph)	55	1345	10	5	775	30	0	0	0	20	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95					1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00					1.00		1.00
Flpb, ped/bikes	0.98	1.00		1.00	1.00					1.00		1.00
Frt	1.00	1.00		1.00	0.99					1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00					0.95		1.00
Satd. Flow (prot)	1698	3466		1797	3339					1656		1553
Flt Permitted	0.32	1.00		0.16	1.00					0.76		1.00
Satd. Flow (perm)	575	3466		311	3339					1320		1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	1462	11	5	842	33	0	0	0	22	0	87
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	82
Lane Group Flow (vph)	60	1473	0	5	874	0	0	0	0	22	0	5
Confl. Peds. (#/hr)	15		10	10		15						
Heavy Vehicles (%)	4%	4%	0%	0%	7%	10%	0%	0%	0%	9%	0%	4%
Turn Type	Perm	NA		Perm	NA					Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	137.5	137.5		137.5	137.5					9.0		9.0
Effective Green, g (s)	137.5	137.5		137.5	137.5					9.0		9.0
Actuated g/C Ratio	0.86	0.86		0.86	0.86					0.06		0.06
Clearance Time (s)	6.5	6.5		6.5	6.5					7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0					3.0		3.0
Lane Grp Cap (vph)	494	2978		267	2869					74		87
v/s Ratio Prot		c0.42			0.26							
v/s Ratio Perm	0.10			0.02						c0.02		0.00
v/c Ratio	0.12	0.49		0.02	0.30					0.30		0.06
Uniform Delay, d1	1.8	2.8		1.6	2.1					72.5		71.5
Progression Factor	1.00	1.00		2.27	3.75					1.00		1.00
Incremental Delay, d2	0.5	0.6		0.1	0.3					2.2		0.3
Delay (s)	2.3	3.3		3.8	8.3					74.7		71.8
Level of Service	A	A		A	A					E		E
Approach Delay (s)		3.3			8.3			0.0			72.3	
Approach LOS		A			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	1310	35	15	755	30	20	0	15	0	0	15
Future Volume (Veh/h)	25	1310	35	15	755	30	20	0	15	0	0	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	1379	37	16	795	32	21	0	16	0	0	16
Pedestrians								35			35	
Lane Width (m)								3.6			3.6	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								3			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.86			0.90			0.91	0.91	0.90	0.91	0.91	0.86
vC, conflicting volume	862			1451			1930	2378	743	1636	2381	448
vC1, stage 1 conf vol							1484	1484		878	878	
vC2, stage 2 conf vol							446	894		758	1503	
vCu, unblocked vol	500			1279			1321	1816	492	995	1819	17
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			85	100	97	100	100	98
cM capacity (veh/h)	892			452			140	177	461	322	163	884

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	26	919	497	16	530	297	21	16	16
Volume Left	26	0	0	16	0	0	21	0	0
Volume Right	0	0	37	0	0	32	0	16	16
cSH	892	1700	1700	452	1700	1700	140	461	884
Volume to Capacity	0.03	0.54	0.29	0.04	0.31	0.17	0.15	0.03	0.02
Queue Length 95th (m)	0.7	0.0	0.0	0.9	0.0	0.0	4.1	0.9	0.4
Control Delay (s)	9.2	0.0	0.0	13.3	0.0	0.0	35.2	13.1	9.1
Lane LOS	A			B			E	B	A
Approach Delay (s)	0.2			0.3			25.6		9.1
Approach LOS							D		A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	130	1080	25	565	150	405	35	155	545	85
Future Volume (vph)	130	1080	25	565	150	405	35	155	545	85
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	90.1	77.5	84.2	69.2	63.7	59.2	59.2	44.8	44.8	44.8
Actuated g/C Ratio	0.56	0.48	0.53	0.43	0.40	0.37	0.37	0.28	0.28	0.28
v/c Ratio	0.37	0.80	0.15	0.51	0.62	0.35	0.07	0.67	0.62	0.22
Control Delay	26.0	49.2	18.6	34.8	38.2	32.7	1.9	65.2	53.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	49.2	18.6	34.8	38.2	32.7	1.9	65.2	53.0	13.1
LOS	C	D	B	C	D	C	A	E	D	B
Approach Delay		47.0		34.3		32.3			51.1	
Approach LOS		D		C		C			D	

Intersection Summary

Cycle Length: 160
Actuated Cycle Length: 160
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 42.8 — Intersection LOS: D
Intersection Capacity Utilization 123.1% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	143	1324	27	725	165	445	38	170	599	93
v/c Ratio	0.37	0.80	0.15	0.51	0.62	0.35	0.07	0.67	0.62	0.22
Control Delay	26.0	49.2	18.6	34.8	38.2	32.7	1.9	65.2	53.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.0	49.2	18.6	34.8	38.2	32.7	1.9	65.2	53.0	13.1
Queue Length 50th (m)	22.4	222.0	3.4	81.0	34.8	58.3	0.0	54.4	98.8	4.7
Queue Length 95th (m)	47.5	#286.1	10.2	126.8	38.1	49.0	2.2	74.7	104.4	17.9
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	390	1651	185	1424	264	1876	822	408	1572	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.80	0.15	0.51	0.63	0.24	0.05	0.42	0.38	0.14

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	1080	125	25	565	95	150	405	35	155	545	85
Future Volume (vph)	130	1080	125	25	565	95	150	405	35	155	545	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1762	3403		1686	3280		1727	3471	1475	1732	3471	1327
Flt Permitted	0.28	1.00		0.10	1.00		0.24	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	516	3403		174	3280		438	3471	1475	902	3471	1327
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	143	1187	137	27	621	104	165	445	38	170	599	93
RTOR Reduction (vph)	0	4	0	0	7	0	0	0	24	0	0	55
Lane Group Flow (vph)	143	1320	0	27	718	0	165	445	14	170	599	38
Confl. Peds. (#/hr)	55		60	60		55	60		30	30		60
Heavy Vehicles (%)	2%	4%	0%	7%	7%	4%	4%	4%	4%	2%	4%	11%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	86.5	77.5		76.4	70.4		58.0	58.0	58.0	43.6	43.6	43.6
Effective Green, g (s)	86.5	77.5		76.4	70.4		58.0	58.0	58.0	43.6	43.6	43.6
Actuated g/C Ratio	0.54	0.48		0.48	0.44		0.36	0.36	0.36	0.27	0.27	0.27
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	380	1648		139	1443		250	1258	534	245	945	361
v/s Ratio Prot	c0.03	c0.39		0.01	0.22		c0.05	0.13			0.17	
v/s Ratio Perm	0.17			0.08			c0.19		0.01	0.19		0.03
v/c Ratio	0.38	0.80		0.19	0.50		0.66	0.35	0.03	0.69	0.63	0.11
Uniform Delay, d1	19.8	34.8		26.8	32.1		37.6	37.3	32.8	52.2	51.2	43.6
Progression Factor	1.36	1.28		1.00	1.00		0.88	0.88	0.62	1.00	1.00	1.00
Incremental Delay, d2	0.6	2.7		0.7	0.3		5.8	0.7	0.1	15.0	3.2	0.6
Delay (s)	27.5	47.0		27.5	32.4		38.8	33.7	20.4	67.2	54.4	44.2
Level of Service	C	D		C	C		D	C	C	E	D	D
Approach Delay (s)		45.1			32.2			34.2			55.8	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	123.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	25	10	90	50	15
Future Volume (Veh/h)	40	25	10	90	50	15
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	47	29	12	105	58	17
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	210	82	90			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	210	82	90			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	97	99			
cM capacity (veh/h)	766	972	1499			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	117	75
Volume Left	47	12	0
Volume Right	29	0	17
cSH	834	1499	1700
Volume to Capacity	0.09	0.01	0.04
Queue Length 95th (m)	2.4	0.2	0.0
Control Delay (s)	9.8	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	0.8	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	100	75	0
Future Volume (Veh/h)	0	0	0	100	75	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	0	0	0	130	97	0
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	242	112	112			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	242	112	112			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	741	935	1472			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	130	97
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1472	1700
Volume to Capacity	0.00	0.00	0.06
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	35	15	70	65	10
Future Volume (Veh/h)	30	35	15	70	65	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	37	43	18	85	79	12
Pedestrians	25					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	231	110	116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	231	110	116			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	95	99			
cM capacity (veh/h)	737	929	1454			

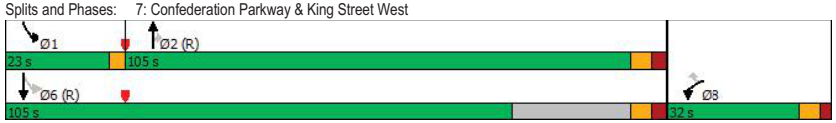
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	80	103	91
Volume Left	37	18	0
Volume Right	43	0	12
cSH	829	1454	1700
Volume to Capacity	0.10	0.01	0.05
Queue Length 95th (m)	2.6	0.3	0.0
Control Delay (s)	9.8	1.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	1.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	21.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	555	80	200	535
Future Volume (vph)	30	170	555	80	200	535
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	9.8	9.8	123.6	123.6	140.7	136.7
Actuated g/C Ratio	0.06	0.06	0.77	0.77	0.88	0.85
v/c Ratio	0.30	0.69	0.44	0.07	0.32	0.38
Control Delay	77.7	22.5	8.0	4.3	5.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	77.7	22.5	8.0	4.3	5.6	5.6
LOS	E	C	A	A	A	A
Approach Delay	30.7		7.5			5.6
Approach LOS	C		A			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 9.6	Intersection LOS: A
Intersection Capacity Utilization 61.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	33	189	617	89	222	594
v/c Ratio	0.30	0.69	0.44	0.07	0.32	0.38
Control Delay	77.7	22.5	8.0	4.3	5.6	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2
Total Delay	77.7	22.5	8.0	4.3	5.6	5.6
Queue Length 50th (m)	10.9	0.0	58.2	4.6	12.8	47.3
Queue Length 95th (m)	22.5	25.6	109.3	12.5	m20.9	46.3
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	406	1411	1191	755	1576
Starvation Cap Reductn	0	0	0	0	0	347
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.47	0.44	0.07	0.29	0.48

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

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	30	170	555	80	200	535
Future Volume (vph)	30	170	555	80	200	535
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1553	1827	1537	1766	1845
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1805	1553	1827	1537	706	1845
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	33	189	617	89	222	594
RTOR Reduction (vph)	0	177	0	4	0	0
Lane Group Flow (vph)	33	12	617	85	222	594
Confl. Peds. (#/hr)	5			5	5	
Heavy Vehicles (%)	0%	4%	4%	1%	2%	3%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.8	9.8	123.6	123.6	136.7	136.7
Effective Green, g (s)	9.8	9.8	123.6	123.6	136.7	136.7
Actuated g/C Ratio	0.06	0.06	0.77	0.77	0.85	0.85
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	110	95	1411	1187	670	1576
v/s Ratio Prot	c0.02		c0.34		0.02	c0.32
v/s Ratio Perm		0.01		0.06	0.26	
v/c Ratio	0.30	0.12	0.44	0.07	0.33	0.38
Uniform Delay, d1	71.8	71.0	6.3	4.4	2.9	2.5
Progression Factor	1.00	1.00	1.00	1.00	3.01	1.73
Incremental Delay, d2	1.5	0.6	1.0	0.1	0.3	0.6
Delay (s)	73.4	71.6	7.2	4.5	9.0	5.0
Level of Service	E	E	A	A	A	A
Approach Delay (s)	71.9		6.9			6.1
Approach LOS	E		A			A

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	130	0	0	5	70	620	0	0	550	15
Future Volume (Veh/h)	10	0	130	0	0	5	70	620	0	0	550	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	11	0	149	0	0	6	80	713	0	0	632	17
Pedestrians		10			20			5				
Lane Width (m)		3.6			3.6			3.6				
Walking Speed (m/s)		1.2			1.2			1.2				
Percent Blockage		1			2			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1521	1535	647	1679	1552	733	659			733		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1523	1538	580	1693	1556	733	593			733		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.7	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	68	100	100	99	91			100		
cM capacity (veh/h)	72	96	473	42	94	417	913			866		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	160	6	80	713	0	0	632	17
Volume Left	11	0	80	0	0	0	0	0
Volume Right	149	6	0	0	0	0	0	17
cSH	342	417	913	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.01	0.09	0.42	0.00	0.00	0.37	0.01
Queue Length 95th (m)	19.1	0.4	2.3	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	24.4	13.8	9.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	A					
Approach Delay (s)	24.4	13.8	0.9			0.0		
Approach LOS	C	B						

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1325	40	30	755	55	70
Future Volume (Veh/h)	1325	40	30	755	55	70
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1425	43	32	812	59	75
Pedestrians					15	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.89		0.94	0.89
vC, conflicting volume			1483		1932	749
vC1, stage 1 conf vol					1462	
vC2, stage 2 conf vol					470	
vCu, unblocked vol			1298		1351	475
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.3		3.5	3.3
p0 queue free %			93		70	84
cM capacity (veh/h)			443		197	477

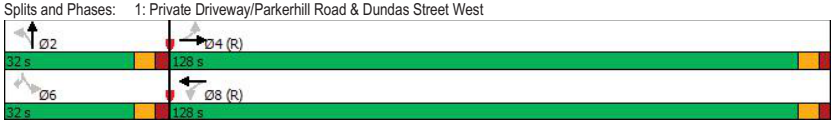
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	950	518	32	406	406	59	75
Volume Left	0	0	32	0	0	59	0
Volume Right	0	43	0	0	0	0	75
cSH	1700	1700	443	1700	1700	197	477
Volume to Capacity	0.56	0.30	0.07	0.24	0.24	0.30	0.16
Queue Length 95th (m)	0.0	0.0	1.9	0.0	0.0	9.6	4.4
Control Delay (s)	0.0	0.0	13.8	0.0	0.0	31.0	14.0
Lane LOS			B			D	B
Approach Delay (s)	0.0		0.5			21.4	
Approach LOS						C	

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		48.9%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	40	1105	15	1610	5	40	80
Future Volume (vph)	40	1105	15	1610	5	40	80
Turn Type	Perm	NA	Perm	NA	NA	Perm	Perm
Protected Phases		4		8	2		
Permitted Phases	4		8			6	6
Detector Phase	4	4	8	8	2	6	6
Switch Phase							
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Minimum Split (s)	22.5	22.5	22.5	22.5	25.0	25.0	25.0
Total Split (s)	128.0	128.0	128.0	128.0	32.0	32.0	32.0
Total Split (%)	80.0%	80.0%	80.0%	80.0%	20.0%	20.0%	20.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	6.5	6.5	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None	None
Act Effct Green (s)	135.9	135.9	135.9	135.9	10.6	10.6	10.6
Actuated g/C Ratio	0.85	0.85	0.85	0.85	0.07	0.07	0.07
v/c Ratio	0.20	0.38	0.04	0.56	0.32	0.38	0.53
Control Delay	5.2	3.2	4.9	14.2	54.9	80.9	39.0
Queue Delay	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	5.2	3.2	4.9	14.8	54.9	80.9	39.0
LOS	A	A	A	B	D	F	D
Approach Delay		3.3		14.7	54.9		
Approach LOS		A		B	D		

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 158 (99%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 12.3	Intersection LOS: B
Intersection Capacity Utilization 81.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Private Driveway/Parkerhill Road & Dundas Street West



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBR
Lane Group Flow (vph)	41	1138	15	1694	40	41	82
v/c Ratio	0.20	0.38	0.04	0.56	0.32	0.38	0.53
Control Delay	5.2	3.2	4.9	14.2	54.9	80.9	39.0
Queue Delay	0.0	0.0	0.0	0.6	0.0	0.0	0.0
Total Delay	5.2	3.2	4.9	14.8	54.9	80.9	39.0
Queue Length 50th (m)	2.0	34.7	1.2	187.8	8.1	13.4	8.1
Queue Length 95th (m)	6.2	50.8	m2.3	m269.8	20.9	26.7	26.7
Internal Link Dist (m)		269.7		55.8	40.3		
Turn Bay Length (m)	45.0		60.0				
Base Capacity (vph)	200	2996	381	3012	271	252	287
Starvation Cap Reductn	0	0	0	800	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	0.38	0.04	0.77	0.15	0.16	0.29

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1105	10	15	1610	50	20	5	15	40	0	80
Future Volume (vph)	40	1105	10	15	1610	50	20	5	15	40	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		1.00		0.95
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.98		0.99		1.00
Frt	1.00	1.00		1.00	1.00			0.95		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98		0.95		1.00
Satd. Flow (prot)	1805	3528		1767	3549			1657		1782		1532
Flt Permitted	0.12	1.00		0.24	1.00			0.98		0.86		1.00
Satd. Flow (perm)	236	3528		446	3549			1657		1616		1532
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	1128	10	15	1643	51	20	5	15	41	0	82
RTOR Reduction (vph)	0	0	0	0	1	0	0	14	0	0	0	53
Lane Group Flow (vph)	41	1138	0	15	1693	0	0	26	0	41	0	29
Confl. Peds. (#/hr)	15		25	25		15	15		5	5		15
Heavy Vehicles (%)	0%	2%	9%	0%	1%	0%	0%	25%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm		Perm
Protected Phases		4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Effective Green, g (s)	135.9	135.9		135.9	135.9			10.6		10.6		10.6
Actuated g/C Ratio	0.85	0.85		0.85	0.85			0.07		0.07		0.07
Clearance Time (s)	6.5	6.5		6.5	6.5			7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	200	2996		378	3014			109		107		101
v/s Ratio Prot		0.32			c0.48							
v/s Ratio Perm	0.17			0.03				0.02		c0.03		0.02
v/c Ratio	0.20	0.38		0.04	0.56			0.24		0.38		0.28
Uniform Delay, d1	2.2	2.7		1.9	3.5			70.9		71.6		71.1
Progression Factor	1.00	1.00		2.07	3.70			1.00		1.00		1.00
Incremental Delay, d2	2.3	0.4		0.1	0.5			1.1		2.3		1.6
Delay (s)	4.5	3.0		4.0	13.3			72.0		73.8		72.6
Level of Service	A	A		A	B			E		E		E
Approach Delay (s)		3.1			13.3			72.0			73.0	
Approach LOS		A			B			E			E	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1065	40	25	1610	15	25	0	35	5	0	30
Future Volume (Veh/h)	15	1065	40	25	1610	15	25	0	35	5	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	1121	42	26	1695	16	26	0	37	5	0	32
Pedestrians		5			5			50			40	
Lane Width (m)		3.6			3.6			3.6			3.6	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			4			3	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		249			93							
pX, platoon unblocked	0.66			0.94			0.69	0.69	0.94	0.69	0.69	0.66
vC, conflicting volume	1751			1213			2160	3027	636	2430	3040	900
vC1, stage 1 conf vol							1224	1224		1795	1795	
vC2, stage 2 conf vol							936	1803		634	1245	
vCu, unblocked vol	1101			1096			1380	2639	482	1771	2657	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			96			86	100	92	96	100	95
cM capacity (veh/h)	408			580			185	121	480	119	125	691

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	16	747	416	26	1130	581	26	37	37
Volume Left	16	0	0	26	0	0	26	0	5
Volume Right	0	0	42	0	0	16	0	37	32
cSH	408	1700	1700	580	1700	1700	185	480	419
Volume to Capacity	0.04	0.44	0.24	0.04	0.66	0.34	0.14	0.08	0.09
Queue Length 95th (m)	1.0	0.0	0.0	1.1	0.0	0.0	3.8	2.0	2.3
Control Delay (s)	14.2	0.0	0.0	11.5	0.0	0.0	27.6	13.1	14.4
Lane LOS	B			B			D	B	B
Approach Delay (s)	0.2			0.2			19.1		14.4
Approach LOS							C		B

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		59.8%	ICU Level of Service
Analysis Period (min)		15	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	125	855	55	1185	285	540	65	155	465	170
Future Volume (vph)	125	855	55	1185	285	540	65	155	465	170
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4	3	8	5	2			6	
Permitted Phases	4		8		2		2	6		6
Detector Phase	7	4	3	8	5	2	2	6	6	6
Switch Phase										
Minimum Initial (s)	12.0	35.0	10.0	35.0	10.0	30.0	30.0	30.0	30.0	30.0
Minimum Split (s)	15.0	51.0	13.0	51.0	13.0	44.5	44.5	44.5	44.5	44.5
Total Split (s)	15.0	53.0	13.0	51.0	14.0	94.0	94.0	80.0	80.0	80.0
Total Split (%)	9.4%	33.1%	8.1%	31.9%	8.8%	58.8%	58.8%	50.0%	50.0%	50.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	4.0	0.0	4.0	0.0	3.5	3.5	3.5	3.5	3.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	8.0	3.0	8.0	3.0	7.5	7.5	7.5	7.5	7.5
Lead/Lag	Lead	Lag	Lead	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes
Recall Mode	None	Min	None	Min	None	C-Min	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	95.2	80.0	88.6	73.5	58.6	54.1	54.1	40.0	40.0	40.0
Actuated g/C Ratio	0.60	0.50	0.55	0.46	0.37	0.34	0.34	0.25	0.25	0.25
v/c Ratio	0.58	0.58	0.18	0.85	0.99	0.46	0.13	0.78	0.54	0.41
Control Delay	35.2	36.8	17.6	45.0	83.1	37.7	8.1	79.4	53.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	36.8	17.6	45.0	83.1	37.7	8.1	79.4	53.2	28.7
LOS	D	D	B	D	F	D	A	E	D	C
Approach Delay		36.6		43.9		50.1			53.1	
Approach LOS		D		D		D			D	

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 97 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 45.0	Intersection LOS: D
Intersection Capacity Utilization 126.1%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: Confederation Parkway & Dundas Street West

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	128	989	56	1352	291	551	66	158	474	173
v/c Ratio	0.58	0.58	0.18	0.85	0.99	0.46	0.13	0.78	0.54	0.41
Control Delay	35.2	36.8	17.6	45.0	83.1	37.7	8.1	79.4	53.2	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	36.8	17.6	45.0	83.1	37.7	8.1	79.4	53.2	28.7
Queue Length 50th (m)	22.6	138.3	7.3	201.8	~55.6	56.8	1.8	50.4	74.0	27.4
Queue Length 95th (m)	46.2	180.6	17.9	#321.6	#83.5	69.3	m7.7	70.4	80.1	44.4
Internal Link Dist (m)		69.4		224.3		81.3			72.7	
Turn Bay Length (m)	35.0		40.0		50.0		10.0	55.0		10.0
Base Capacity (vph)	219	1708	312	1590	295	1932	799	368	1603	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.58	0.18	0.85	0.99	0.29	0.08	0.43	0.30	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	125	855	115	55	1185	140	285	540	65	155	465	170
Future Volume (vph)	125	855	115	55	1185	140	285	540	65	155	465	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.91	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.96	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	3409		1799	3452		1789	3574	1433	1734	3539	1472
Flt Permitted	0.07	1.00		0.22	1.00		0.31	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	127	3409		411	3452		587	3574	1433	814	3539	1472
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	128	872	117	56	1209	143	291	551	66	158	474	173
RTOR Reduction (vph)	0	5	0	0	4	0	0	0	37	0	0	57
Lane Group Flow (vph)	128	985	0	56	1348	0	291	551	29	158	474	116
Confl. Peds. (#/hr)	75		90	90		75	60		65	65		60
Heavy Vehicles (%)	1%	3%	0%	0%	2%	1%	0%	1%	2%	0%	2%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	91.0	80.0		82.1	74.1		53.5	53.5	53.5	39.4	39.4	39.4
Effective Green, g (s)	91.0	80.0		82.1	74.1		53.5	53.5	53.5	39.4	39.4	39.4
Actuated g/C Ratio	0.57	0.50		0.51	0.46		0.33	0.33	0.33	0.25	0.25	0.25
Clearance Time (s)	3.0	8.0		3.0	8.0		3.0	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	216	1704		280	1598		279	1195	479	200	871	362
v/s Ratio Prot	c0.05	0.29		0.01	c0.39		c0.07	0.15			0.13	
v/s Ratio Perm	0.28			0.09			c0.28		0.02	0.19		0.08
v/c Ratio	0.59	0.58		0.20	0.84		1.04	0.46	0.06	0.79	0.54	0.32
Uniform Delay, d1	28.5	28.1		20.8	37.8		51.0	41.9	36.2	56.4	52.5	49.4
Progression Factor	1.05	1.16		1.00	1.00		0.87	0.90	0.84	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.5		0.4	4.3		61.4	1.1	0.2	26.5	2.4	2.3
Delay (s)	34.0	33.1		21.1	42.1		105.9	38.9	30.6	82.9	54.9	51.7
Level of Service	C	C		C	D		F	D	C	F	D	D
Approach Delay (s)		33.2			41.3			59.8			59.7	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	21.5
Intersection Capacity Utilization	126.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	20	25	90	90	35
Future Volume (Veh/h)	25	20	25	90	90	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	29	23	29	105	105	41
Pedestrians	20					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	2					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	308	146	166			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	308	146	166			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	96	97	98			
cM capacity (veh/h)	662	892	1401			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	52	134	146
Volume Left	29	29	0
Volume Right	23	0	41
cSH	748	1401	1700
Volume to Capacity	0.07	0.02	0.09
Queue Length 95th (m)	1.8	0.5	0.0
Control Delay (s)	10.2	1.8	0.0
Lane LOS	B	A	
Approach Delay (s)	10.2	1.8	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	115	110	0
Future Volume (Veh/h)	0	0	0	115	110	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	0	0	137	131	0
Pedestrians	20			5		
Lane Width (m)	3.6			3.6		
Walking Speed (m/s)	1.2			1.2		
Percent Blockage	2			0		
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	288	156	151			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288	156	151			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	695	876	1418			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	137	131
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1418	1700
Volume to Capacity	0.00	0.00	0.08
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	25	20	15	90	85	25
Future Volume (Veh/h)	25	20	15	90	85	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	32	26	19	117	110	32
Pedestrians	15					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	296	141	157			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	296	141	157			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	99			
cM capacity (veh/h)	681	901	1417			

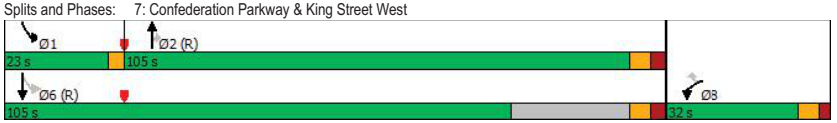
Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	58	136	142
Volume Left	32	19	0
Volume Right	26	0	32
cSH	765	1417	1700
Volume to Capacity	0.08	0.01	0.08
Queue Length 95th (m)	2.0	0.3	0.0
Control Delay (s)	10.1	1.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.1	1.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization		22.2%	ICU Level of Service A
Analysis Period (min)		15	

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	615	80	195	485
Future Volume (vph)	130	340	615	80	195	485
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	8.0	8.0	5.0	8.0
Minimum Split (s)	26.5	26.5	28.0	28.0	8.0	28.0
Total Split (s)	32.0	32.0	105.0	105.0	23.0	105.0
Total Split (%)	20.0%	20.0%	65.6%	65.6%	14.4%	65.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	2.5	2.5	3.0	3.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	17.4	17.4	116.9	116.9	133.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.83	0.81
v/c Ratio	0.70	0.73	0.48	0.08	0.34	0.34
Control Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	11.1	6.0	7.1	5.4
LOS	F	B	B	A	A	A
Approach Delay	35.0		10.5			5.9
Approach LOS	C		B			A

Intersection Summary	
Cycle Length: 160	
Actuated Cycle Length: 160	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 66.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Confederation Parkway & King Street West



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	137	358	647	84	205	511
v/c Ratio	0.70	0.73	0.48	0.08	0.34	0.34
Control Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.7	15.2	11.1	6.0	7.1	5.4
Queue Length 50th (m)	45.0	0.0	81.0	5.8	13.7	31.4
Queue Length 95th (m)	67.0	33.0	131.7	13.8	22.4	35.4
Internal Link Dist (m)	84.6		81.2			86.7
Turn Bay Length (m)				10.0		
Base Capacity (vph)	287	549	1361	1062	687	1503
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.65	0.48	0.08	0.30	0.34

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	130	340	615	80	195	485
Future Volume (vph)	130	340	615	80	195	485
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	0.91	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.99	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1561	1863	1448	1778	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.35	1.00
Satd. Flow (perm)	1805	1561	1863	1448	653	1863
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	358	647	84	205	511
RTOR Reduction (vph)	0	319	0	5	0	0
Lane Group Flow (vph)	137	39	647	79	205	511
Confl. Peds. (#/hr)	10	5		20	20	
Heavy Vehicles (%)	0%	1%	2%	1%	1%	2%
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Actuated Green, G (s)	17.4	17.4	117.0	117.0	129.1	129.1
Effective Green, g (s)	17.4	17.4	117.0	117.0	129.1	129.1
Actuated g/C Ratio	0.11	0.11	0.73	0.73	0.81	0.81
Clearance Time (s)	6.5	6.5	7.0	7.0	3.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	196	169	1362	1058	590	1503
v/s Ratio Prot	c0.08		c0.35		0.02	c0.27
v/s Ratio Perm		0.02		0.05	0.26	
v/c Ratio	0.70	0.23	0.48	0.08	0.35	0.34
Uniform Delay, d1	68.8	65.2	8.9	6.1	5.1	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.94	1.05
Incremental Delay, d2	10.4	0.7	1.2	0.1	0.3	0.6
Delay (s)	79.2	65.9	10.0	6.3	10.2	4.9
Level of Service	E	E	B	A	B	A
Approach Delay (s)	69.6		9.6			6.4
Approach LOS	E		A			A

Intersection Summary

HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	75	0	0	0	90	680	5	0	575	40
Future Volume (Veh/h)	15	0	75	0	0	0	90	680	5	0	575	40
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	16	0	78	0	0	0	94	708	5	0	599	42
Pedestrians		30			25							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		3			2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)											105	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1525	1555	629	1598	1592	733	671			738		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1527	1559	561	1606	1599	733	606			738		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	100	84	100	100	100	89			100		
cM capacity (veh/h)	78	90	480	58	85	415	888			859		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	94	0	94	708	5	0	599	42
Volume Left	16	0	94	0	0	0	0	0
Volume Right	78	0	0	0	5	0	0	42
cSH	256	1700	888	1700	1700	1700	1700	1700
Volume to Capacity	0.37	0.00	0.11	0.42	0.00	0.00	0.35	0.02
Queue Length 95th (m)	12.9	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	27.0	0.0	9.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	A	A					
Approach Delay (s)	27.0	0.0	1.1			0.0		
Approach LOS	D	A						

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1095	65	65	1620	55	50
Future Volume (Veh/h)	1095	65	65	1620	55	50
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1141	68	68	1688	57	52
Pedestrians				5	20	
Lane Width (m)				3.6	3.6	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	80			262		
pX, platoon unblocked			0.93		0.71	0.93
vC, conflicting volume			1229		2175	630
vC1, stage 1 conf vol					1195	
vC2, stage 2 conf vol					980	
vCu, unblocked vol			1089		1365	442
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			88		77	90
cM capacity (veh/h)			591		252	516

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	761	448	68	844	844	57	52
Volume Left	0	0	68	0	0	57	0
Volume Right	0	68	0	0	0	0	52
cSH	1700	1700	591	1700	1700	252	516
Volume to Capacity	0.45	0.26	0.12	0.50	0.50	0.23	0.10
Queue Length 95th (m)	0.0	0.0	3.1	0.0	0.0	6.8	2.7
Control Delay (s)	0.0	0.0	11.9	0.0	0.0	23.4	12.8
Lane LOS			B			C	B
Approach Delay (s)	0.0		0.5			18.3	
Approach LOS						C	

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

ATTACHMENT E: SIGNAL WARRANT ANALYSIS WORKSHEETS

Traffic Projections

	E Approach DUNDAS ST W						S Approach ARGYLE ST						W Approach DUNDAS ST W					
START TIME	Left	Thru	U-Turn	Peds CCW	Peds CW	Approach Total	Left	Right	U-Turn	Peds CCW	Peds CW	Approach Total	Thru	Right	U-Turn	Peds CCW	Peds CW	Approach Total
07:30:00	2	144	0	0	0	146	10	12	0	1	1	22	299	3	0	0	0	302
07:45:00	3	123	0	0	0	126	5	19	0	3	3	24	318	10	0	0	0	328
08:00:00	2	164	0	1	0	166	11	10	0	4	3	21	342	9	0	0	0	351
08:15:00	6	155	0	0	0	161	8	9	0	0	0	17	284	9	0	0	0	293
08:30:00	5	221	0	0	0	226	6	11	0	0	0	17	292	4	0	0	2	296
08:45:00	5	170	0	1	0	175	8	12	0	5	1	20	366	8	0	0	0	374
09:00:00	4	167	0	1	2	171	9	7	0	2	2	16	266	6	0	0	0	272
09:15:00	6	178	0	0	1	184	5	7	0	3	1	12	296	3	0	0	0	299
09:30:00	6	174	0	1	0	180	6	3	0	2	3	8	288	6	0	0	0	294
09:45:00	3	182	0	0	0	185	4	10	0	0	3	14	295	8	0	0	0	303
10:00:00	2	175	0	0	1	177	6	9	0	0	0	15	277	7	0	0	0	284
10:15:00	5	176	0	0	0	181	4	12	0	1	0	16	195	2	0	0	0	197
10:30:00	6	168	0	0	0	174	8	7	0	0	2	15	269	9	0	0	1	278
10:45:00	3	199	0	0	0	202	6	8	0	2	2	14	198	7	0	0	0	205
11:00:00	5	202	0	0	0	207	5	6	0	2	2	11	238	6	0	0	0	244
11:15:00	7	209	0	1	0	216	11	8	0	3	0	19	242	8	1	0	0	251
11:30:00	7	211	0	1	0	218	8	11	0	3	1	19	225	5	0	0	0	230
11:45:00	8	212	0	2	0	220	6	7	0	1	2	13	228	3	0	0	0	231
12:00:00	7	232	0	0	2	239	8	9	0	4	2	17	196	5	0	0	0	201
12:15:00	5	231	0	1	0	236	4	9	0	1	5	13	242	10	0	0	0	252
12:30:00	4	243	0	0	0	247	6	14	0	1	1	20	199	6	0	0	0	205
12:45:00	7	229	0	0	0	236	10	8	0	7	2	18	206	11	0	0	0	217
13:00:00	11	245	0	0	0	256	4	7	0	1	0	11	212	10	0	0	0	222
13:15:00	2	252	0	1	5	254	5	11	0	6	0	16	215	9	0	0	0	224
13:30:00	3	223	0	1	1	226	8	10	0	3	3	18	201	5	0	0	0	206
13:45:00	12	237	0	0	0	249	12	8	0	7	1	20	222	4	0	0	0	226
14:00:00	4	255	0	0	1	259	9	8	0	3	1	17	205	14	0	0	0	219
14:15:00	6	262	0	0	0	268	11	8	0	5	7	19	199	4	0	0	0	203
14:30:00	2	262	0	0	0	264	11	10	0	2	0	21	241	10	0	3	0	251
14:45:00	6	282	0	0	0	288	11	9	0	9	6	20	200	7	0	0	0	207
15:00:00	7	295	1	0	0	303	7	3	0	8	2	10	197	8	0	0	0	205
15:15:00	4	300	0	0	0	304	10	3	0	2	3	13	261	18	0	0	0	279
15:30:00	9	270	0	1	2	279	5	7	0	2	3	12	223	8	0	1	0	231
15:45:00	8	350	0	0	1	358	9	7	0	1	1	16	222	8	0	0	0	230
16:00:00	8	323	0	0	0	331	11	7	0	9	0	18	218	6	0	0	0	224
16:15:00	7	388	0	1	1	395	8	7	0	0	1	15	252	14	0	0	0	266
16:30:00	7	344	0	1	0	351	9	7	0	1	1	16	245	9	0	2	0	254
16:45:00	7	333	0	0	0	340	19	15	0	1	0	34	251	7	0	1	0	258
17:00:00	9	407	0	1	0	416	7	6	0	3	3	13	252	8	0	0	0	260
17:15:00	13	374	0	0	0	387	11	5	0	2	0	16	231	7	0	0	0	238
17:30:00	7	360	0	2	0	367	14	11	0	5	6	25	254	14	0	0	0	268
17:45:00	5	367	0	0	0	372	11	5	0	2	1	16	264	17	0	0	0	281
Grand Total	**245**	**10294**	**1**	**17**	**17**	**10540**	**345**	**362**	**0**	**117**	**75**	**707**	**10326**	**332**	**1**	**7**	**3**	**10659**

	Hourly Vol
07:30:00	1957
07:45:00	2026
08:00:00	2117
08:15:00	2038
08:30:00	2062
08:45:00	2005
09:00:00	1938
09:15:00	1955
09:30:00	1854
09:45:00	1839
10:00:00	1758
10:15:00	1744
10:30:00	1835
10:45:00	1835
11:00:00	1878
11:15:00	1873
11:30:00	1889
11:45:00	1894
12:00:00	1901
12:15:00	1933
12:30:00	1926
12:45:00	1904
13:00:00	1928
13:15:00	1934
13:30:00	1930
13:45:00	2016
14:00:00	2036
14:15:00	2058
14:30:00	2164
14:45:00	2150
15:00:00	2239
15:15:00	2295
15:30:00	2375
15:45:00	2474
16:00:00	2502
16:15:00	2618
16:30:00	2583
16:45:00	2622
17:00:00	2659

07:30:00	1957
08:30:00	2062
09:30:00	1854
10:30:00	1835
11:30:00	1889
13:00:00	1928
14:00:00	2036
15:00:00	2239
16:00:00	2502
17:00:00	2659

Start Hour		%
07:30:00	1957	95%
08:30:00	2062	100%
11:30:00	1889	92%
13:00:00	1928	94%
14:00:00	2036	77%
15:00:00	2239	84%
16:00:00	2502	94%
17:00:00	2659	100%

Start Hour		%
07:30:00	1957	95%
08:30:00	2062	100%
11:30:00	1889	92%
13:00:00	1928	94%
14:00:00	2036	77%
15:00:00	2239	84%
16:00:00	2502	94%
17:00:00	2659	100%

Dundas / Argyle

EBL	EBT	EBR	NBL	NBT	NBR	WBL	WBT	WBR	SBL	SBT	SBR
0	1258	38	52	0	66	28	717	0	0	0	0
	1325	40	55		70	30	755				
0	1214	37	50	0	64	27	692	0	0	0	0
0	1239	37	51	0	65	28	706	0	0	0	0
0	838	50	42	0	38	50	1240	0	0	0	0
0	922	55	46	0	42	55	1364	0	0	0	0
0	1030	61	52	0	47	61	1524	0	0	0	0
	1095	65	55		50	65	1620				

Confederation / Dunbar

NBL	NBT	NBR	EBL	EBT	EBR	SBL	SBT	SBR	WBL	WBT	WBR
66	588	0	9	0	123	0	522	14	0	0	5
70	620		10		130		550	15			5
64	568	0	9	0	119	0	504	14	0	0	5
65	580	0	9	0	122	0	514	14	0	0	5
69	521	4	11	0	57	0	440	31	0	0	0
76	573	4	13	0	63	0	484	34	0	0	0
85	640	5	14	0	71	0	541	38	0	0	0
90	680	5	15		75		575	40			

Confederation Parkway / Dunbar Road

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Confederation Parkway / Dunbar Road

What is the direction of the Main Road street? North-South

When was the data collected? 2019

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 1

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 4

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Northbound Approach			Minor Eastbound Approach			Main Southbound Approach			Minor Westbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:30	66	588	0	9	0	123	0	522	14	0	0	5	0
9:30	70	620		10		130		550	15			5	0
12:30	64	568	0	9	0	119	0	504	14	0	0	5	0
14:00	65	580	0	9	0	122	0	514	14	0	0	5	0
15:00	69	521	4	11	0	57	0	440	31	0	0	0	0
16:00	76	573	4	13	0	63	0	484	34	0	0	0	0
17:00	85	640	5	14	0	71	0	541	38	0	0	0	0
18:00	90	680	5	15		75		575	40				0
Total	**585**	**4,770**	**18**	**90**	**0**	**760**	**0**	**4,130**	**200**	**0**	**0**	**20**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume									
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	100%		100%						
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									9,703

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0		0				0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	100%		100%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Confederation Parkway / Dunbar Road Count Date: 2019

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☑	FREE FLOW ☐	RESTR. FLOW ☐	8:30	9:30	12:30	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	1,327	1,400	1,283	1,309	1,133	1,247	1,394	1,480		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	120	170	120	170	137	145	133	136	68	76	85	90		
	COMPLIANCE %				81	85	78	80	40	45	50	53	512	64

Restricted Flow Signal Justification 1:			
Both 1A and 1B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☑	FREE FLOW ☐	RESTR. FLOW ☐	8:30	9:30	12:30	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	1,190	1,255	1,150	1,173	1,065	1,171	1,309	1,390		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	9	10	9	9	11	13	14	15		
	COMPLIANCE %				12	13	12	12	15	17	19	20	120	15

Restricted Flow Signal Justification 2:		
Both 2A and 2B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimun Vehicular Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	8:30	1,190	132	80	100 %	100 %
	9:30	1,255	140	80	100 %	
	17:00	1,309	85	80	100 %	
	18:00	1,390	90	80	100 %	

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Confederation Parkway / Dunbar Road Count Date: 2019

Summary Results

Justification			Compliance	Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100 %	☐	☑
	B	Crossing Volume	64 %		
2. Delay to Cross Traffic	A	Main Road	100 %	☐	☑
	B	Crossing Road	15 %		
3. Combination	A	Justificaton 1	64 %	☐	☑
	B	Justification 2	15 %		
4. 4-Hr Volume			100 %	☑	☐
5. Collision Experience			0 %	☐	☑
6. Pedestrians	A	Volume	Justification not met	☐	☑
	B	Delay	Justification not met		

Dundas Street West / Argyle Road

Input Data Sheet

Analysis Sheet | Results Sheet | Proposed Collision

GO TO Justification:

What are the intersecting roadways? Dundas Street West / Argyle Road

What is the direction of the Main Road street? East-West

When was the data collected? 2019

Justification 1 - 4: Volume Warrants

a.- Number of lanes on the Main Road? 2 or more

b.- Number of lanes on the Minor Road? 1

c.- How many approaches? 3

d.- What is the operating environment? Urban **Population >= 10,000 AND Speed < 70 km/hr**

e.- What is the eight hour vehicle volume at the intersection? (Please fill in table below)

Hour Ending	Main Eastbound Approach			Minor Northbound Approach			Main Westbound Approach			Minor Southbound Approach			Pedestrians Crossing Main Road
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
8:30	0	1258	38	52	0	66	28	717	0	0	0	0	0
9:30		1325	40	55		70	30	755					0
12:30	0	1214	37	50	0	64	27	692	0	0	0	0	0
14:00	0	1239	37	51	0	65	28	706	0	0	0	0	0
15:00	0	838	50	42	0	38	50	1240	0	0	0	0	0
16:00	0	922	55	46	0	42	55	1364	0	0	0	0	0
17:00	0	1030	61	52	0	47	61	1524	0	0	0	0	0
18:00		1095	65	55		50	65	1620					0
Total	**0**	**8,921**	**383**	**403**	**0**	**442**	**344**	**8,618**	**0**	**0**	**0**	**0**	**0**

Justification 5: Collision Experience

Preceding Months	Number of Collisions*
1-12	0
13-24	0
25-36	0

* Include only collisions that are susceptable to correction through the installation of traffic signal control

Justification 6: Pedestrian Volume

a.- Please fill in table below summarizing total pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume									
Factored 8 hour pedestrian volume	0		0		0		0		
% Assigned to crossing rate	100%		100%						
Net 8 Hour Pedestrian Volume at Crossing									0
Net 8 Hour Vehicular Volume on Street Being Crossed									18,266

b.- Please fill in table below summarizing delay to pedestrians crossing major roadway at the intersection or in proximity to the intersection (zones). Please reference Section 4.8 of the Manual for further explanation and graphical representation.

	Zone 1		Zone 2		Zone 3 (if needed)		Zone 4 (if needed)		Total
	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	Assisted	Unassisted	
Total 8 hour pedestrian volume	0	0	0	0	0	0	0	0	
Total 8 hour pedestrians delayed greater than 10 seconds	0		0				0	0	
Factored volume of total pedestrians	0		0		0		0		
Factored volume of delayed pedestrians	0		0		0		0		
% Assigned to Crossing Rate	100%		100%		0%		0%		
Net 8 Hour Volume of Total Pedestrians									0
Net 8 Hour Volume of Delayed Pedestrians									0

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Dundas Street West / Argyle Road Count Date: 2019

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:30	9:30	12:30	14:00	15:00	16:00	17:00	18:00		
1A	480	720	600	900	2,159	2,275	2,084	2,126	2,258	2,484	2,775	2,950		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
1B	180	255	180	255	118	125	114	116	80	88	99	105		
	COMPLIANCE %				46	49	45	45	31	35	39	41	331	41

Restricted Flow Signal Justification 1:			
Both 1A and 1B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Lesser of 1A or 1B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:30	9:30	12:30	14:00	15:00	16:00	17:00	18:00		
2A	480	720	600	900	2,041	2,150	1,970	2,010	2,178	2,396	2,676	2,845		
	COMPLIANCE %				100	100	100	100	100	100	100	100	800	100
2B	50	75	50	75	52	55	50	51	42	46	52	55		
	COMPLIANCE %				69	73	67	68	56	61	69	73	537	67

Restricted Flow Signal Justification 2:		
Both 2A and 2B 100% Fullfilled each of 8 hours	Yes ☐	No ☑
Lesser of 2A or 2B at least 80% fulfilled each of 8 hours	Yes ☐	No ☑

Justification 3: Combination

Combination Justification 1 and 2

Justification Satisfied 80% or More				Two Justifications Satisfied 80% or More	
Justification 1	Minimun Vehicular Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main)	Heaviest Minor Approach	Required Value	Average % Compliance	Overall % Compliance
		X	Y (actual)	Y (warrant threshold)		
Justification 4	15:00	2,178	80	115	70 %	81 %
	16:00	2,396	88	115	77 %	
	17:00	2,676	99	115	86 %	
	18:00	2,845	105	115	91 %	

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

Intersection: Dundas Street West / Argyle Road Count Date: 2019

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	100	%	☐	☑
	B	Crossing Volume	41	%		
2. Delay to Cross Traffic	A	Main Road	100	%	☐	☑
	B	Crossing Road	67	%		
3. Combination	A	Justificaton 1	41	%	☐	☑
	B	Justification 2	67	%		
4. 4-Hr Volume			81	%	☐	☑
5. Collision Experience			0	%	☐	☑
6. Pedestrians	A	Volume	Justification not met		☐	☑
	B	Delay	Justification not met			