484 Plains Road East Mixed-Use Development Transportation Impact Study

City of Burlington

Prepared For: National Homes (Plains Road) LP

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1.0 INTRODUCTION

1.1 STUDY OVERVIEW

BA Group is retained by National Home (Plains Road) LP, hereafter referred to as National Homes, to provide transportation advisory services in support of a proposed mixed-use development located at 484 Plains Road East (referred to herein as "the Site") in the City of Burlington.

The site is currently occupied by a commercial retail plaza with several tenants, including: Aldershot Home Hardware, The Bingo Connection, Dollar Tree, Compassionate Society and other shops. The plaza has a signalized access driveway onto Plains Road East and secondary access driveways with limited movements on the east and west limits of the property.

The site, which has an area of approximately 18,385 m^2, is located on the south side of Plains Road East and is bounded by low density residential uses to the south, east and west, Maplehurst Public School to the north and commercial uses to eth east and west along Plains Road.

The site location and context are illustrated in **Figure 1**.

The development program contemplates a mixed-use development with 397 dwelling units (including 280 condominium apartment units and 117 back-to-back townhouse units) and approximately 998.5 m^2 (10,748 ft^2) of non-residential uses on the ground floor of the apartment buildings. Vehicular access will be provided via the existing signalized access driveway onto Plains Road East.

Based upon the proposed development plan noted above, BA Group has undertaken a Transportation Impact Study to review various aspects of the development plan including:

- the existing transportation context;
- the proposed development plan – including new uses;
- site plan review – including parking and loading;
- existing and forecast traffic volumes on the area road network;
- site traffic volumes for the site based on the development plan; and
- traffic operations on the area road network under existing, future background and future total conditions.

This report provides a summary of our review.

1.2 STUDY PURPOSE & SCOPE

The purpose of this study is to review the transportation-related elements of the proposed development and identify any required improvements (if deemed necessary) from a transportation aspect.

As part of the traffic operations assessment, a review of the weekday morning and afternoon peak hour periods for existing, future background, and future total traffic conditions was undertaken at the following intersections:

- Plains Road East / King Road
- Plains Road East / 484 Plains Road East (East Access) & Shopper Drugs Mart Access
- Plains Road East / 484 Plains Road East (Main Access)
- Plains Road East / 484 Plains Road East (West Access)
- Plains Road East / Willowbrook Road & Falcon Boulevard

1.3 PROPOSED DEVELOPMENT

The proposed development comprises two 8-storey mixed-use buildings with 280 condominium apartment units and approximately 998.5 m^2 (10,748 ft^2) of non-residential uses, and seven townhouse blocks with 117 back to back townhouse units.

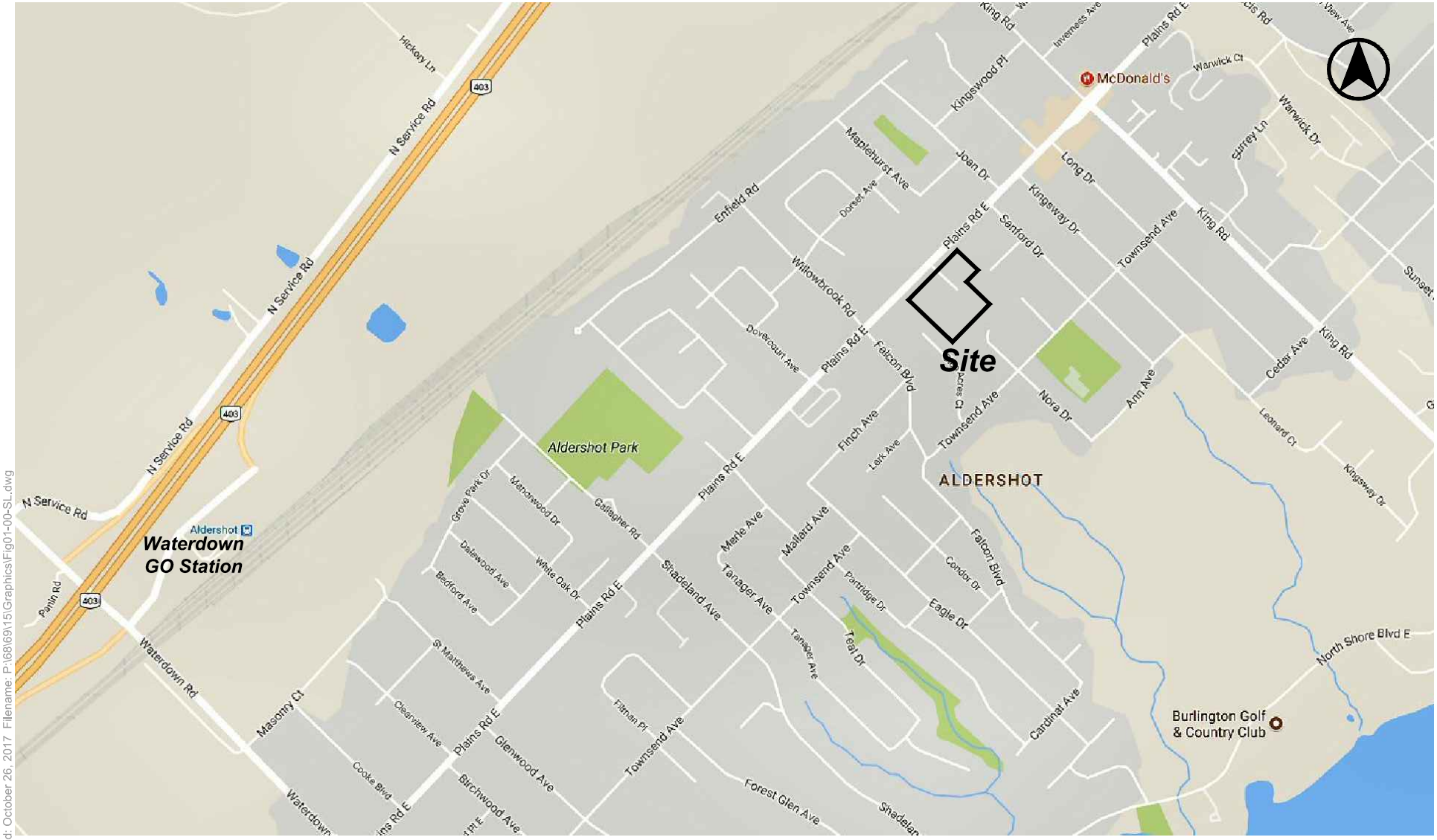
Condominium Apartments	**Residential Units**	**Non-residential GFA**
• Building 'A'	152 units	547.54 m^2
• Building 'B'	128 units	450.96 m^2
Apartments Units	280 units	998.50 m^2

Townhouse Blocks	**Residential Units**
• Block 'C'	12 units
• Block 'D'	15 units
• Block 'E'	24 units
• Block 'F'	18 units
• Block 'G'	12 units
• Block 'H'	18 units
• Block 'J'	18 units
Townhouse Units	117 units

	1 bedroom	**2 bedrooms**	**3 bedrooms**
• Buildings A and B	126 units	145 units	9 units
• Blocks C to J	0	117 units	0

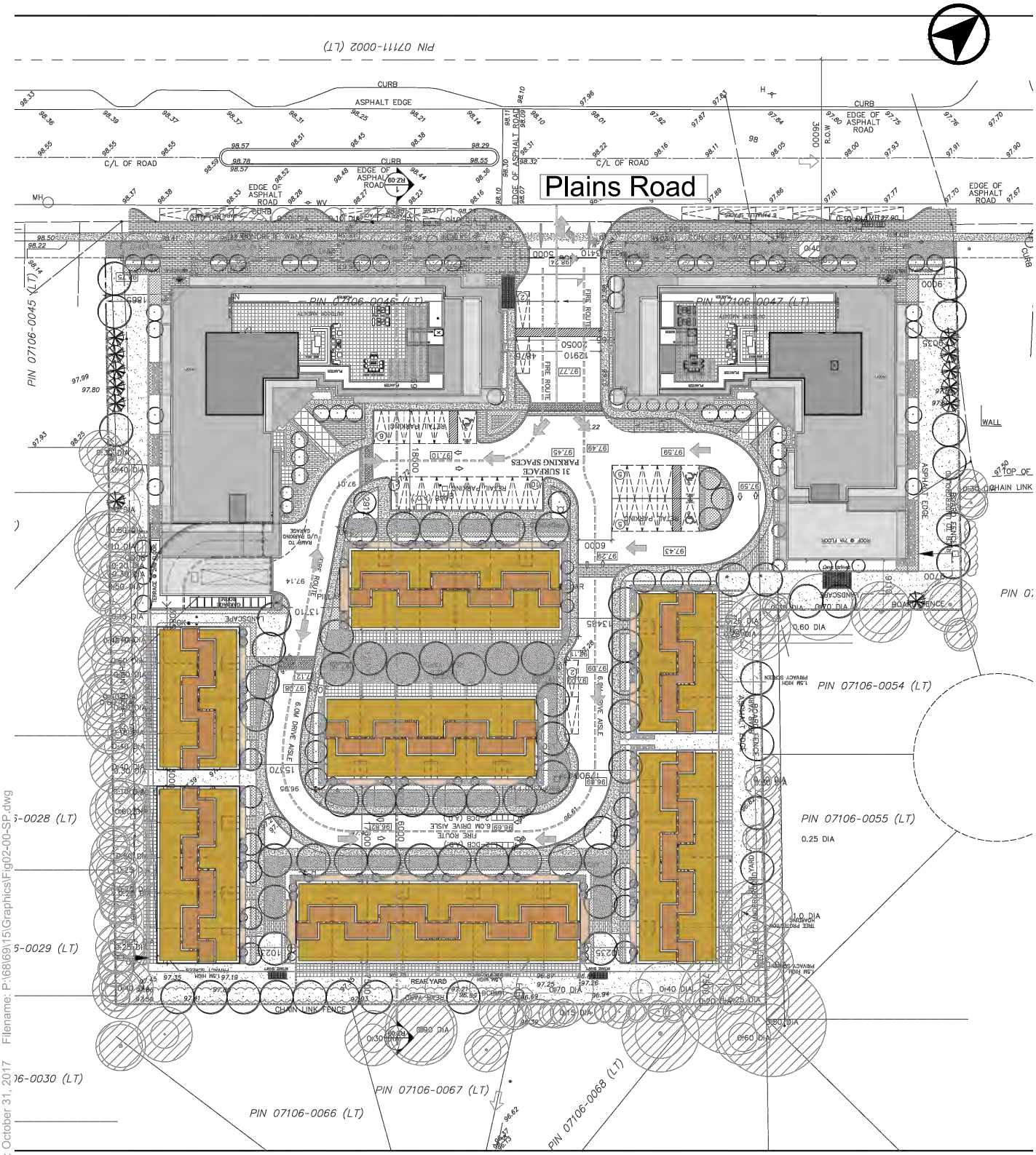
Vehicular access will be provided via the existing signalized access driveway onto Plains Road East. A total of 464 parking spaces will be provided, including 421 spaces in a single level garage, 31 surface parking spaces within the site and 12 lay-by parking spaces on Plains Road.

The proposed site plan is shown in **Figure 2**. Architectural site plans are also included in **Appendix A**.



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SITE LOCATION



SITE PLAN

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2.0 AREA TRANSPORTATION CONTEXT

The local transportation network consists of highly proximal arterials and freeways, frequent local transit services, nearby regional rail connections and infrastructure dedicated to active transportation, i.e., cycling, public transit, trails, etc.

2.1 ROAD NETWORK

The existing road network and lane configuration within the study area is shown in **Figure 3**. A brief description of the area road network is provided as follows.

King Road is a north-south arterial road under the jurisdiction of the City of Burlington. It extends from North Shore Boulevard to Mountain Brow Road in Hamilton. Within the study area, King Road has a 3-lane cross-section, where the middle lane accommodates a two-way left turn lane. The cross-section also accommodates bike lanes on each side. The posted speed is 50 km/h. On-street parking and/or stopping are not permitted on both sides of King Road.

Plains Road East is an east-west arterial road under the jurisdiction of the City of Burlington. It extends from the Queen Elizabeth Way (QEW) ramp terminals to Waterdown Road. Plains Road East has a 5-lane cross-section with two-way left turn lane. Bike lanes are provided in both travel directions on Plains Road East. The posted speed is 60 km/h.

Falcon Boulevard is a north-south local road under the jurisdiction of the City of Burlington. It extends north from Plains Road East to Cardinal Avenue. It is a 2-lane cross-section. The posted speed is 40 km/h. On-street parking is permitted on the east side of Falcon Boulevard, but no stopping is permitted on the west side of the road.

Willowbrook Road is a north-south local road under the jurisdiction of the City of Burlington. It extends south from Plains Road East to Enfield Road. It has a 2-lane cross-section. On-street parking is permitted on the east side. The road operates at a posted speed of 40 km/h.

2.1.1 Travel Characteristics

BA Group has undertaken a review of historical travel characteristics for the site vicinity, using information provided by the Transportation Tomorrow Survey (TTS) for the survey years 1996, 2001, 2006, and 2011. Modal choice travel characteristics for residential condominium and townhouse land uses in the area for peak period inbound and outbound directions are summarized in **Table 1**.

A review of the overall historical data indicates the proportion of people in the surrounding area of the site who chose to drive a car during the weekday morning and afternoon peak hour periods is relatively high and in the order of approximately two-thirds (2/3). The balance of travel is undertaken, including transit (approximately 6 to 11 %) and by foot and bicycles (5%). Additionally, given data is reflective of the 2011 data collection period, the proportion of transit and cyclists could be theoretically higher considering the introduction of improvements to local and regional transit and key cycling facilities within the vicinity of the site.

TABLE 1 MODAL SPLIT RESIDENTIAL TRIPS (TTS – 2011)

Year	Sustainable Travel Modes					Auto Driver
	Transit	Passenger[2]	Walk	Cycle	Total	
1996	4% (6%)	27% (22%)	6% (7%)	1% (1%)	**38% (36%)**	**62% (64%)**
2001	4% (4%)	17% (17%)	5% (3%)	0% (1%)	**26% (25%)**	**74% (75%)**
2006	6% (8%)	25% (17%)	4% (4%)	1% (1%)	**36% (30%)**	**64% (70%)**
2011	11% (6%)	21% (19%)	4% (4%)	1% (1%)	**37% (30%)**	**63% (70%)**

Notes:
1. Reflects all trips made to/from residential condominium and townhouse land uses within 2001 TTS Zones 2053-2055.
2. Includes auto passenger, taxi, school bus and motorcycle.
3. XX (XX) – Weekday Morning Peak Hour Period (Weekday Afternoon Peak Hour Period)

2.1.2 Transit Facilities

The site is served by Burlington Transit (BT) services running along Plains Road East and King Road. In particular, the site is serviced by the 1/1x Plains bus route, the 5 Francis-Downtown bus route, 101 Plains Express bus route and 300 Aldershot bus route. A brief description of there routes is provided below.

1 Plains is a regular bus service that operates all day, seven days a week. Its predominant travel path runs east-west along Plains Road West and Plains Road East, but extends well beyond the City of Burlington, spanning from the City of Hamilton's downtown (King Street East & James Street North) to the Burlington GO Station (Fairview Street). This service operates at 30-minute headways throughout the entire weekday and into the late evening until approximately 25:00. During weekends, 1 Plains operates at 30-minute headways for limited hours (approximately 6:30-21:00).

1x Plains is a weekday bus service that replaces the 1 Plains during daytime hours (approximately 4:30-20:00), Mondays to Fridays. This service operates along the same route as the 1 Plains at 30-minute headways.

5 Francis-Downtown is a regular bus service that operates all day, Monday to Saturday. The 5 Francis-Downtown route follows a U-shaped routing from the King Road / Plains Road East intersection to the Burlington GO Station (Fairview Street) via the lakeshore. The 5 Francis-Downtown provides high accessibility to the lakeshore areas and Downtown Burlington. The 5 Francis-Downtown offers 30-minute headways on weekdays and Saturday afternoons, and 60-minute headways on Saturday mornings. This route services the Plains Road East / King Road intersection.

101 Plains Express is an express service bus route that operates Monday to Friday during daytime hours. The service runs at 15-minute headways during peak periods (approximately 5:00-10:00 and 15:00-19:00). The 101 Plains Express travels east-west along Plains Road West and Plains Road east, following the same routing as the 1/1x Plains; however, it serves only select major stops between Burlington GO Station and Downtown Hamilton. Within Site environs, this route services the Plains Road East / King Road intersection.

300 Aldershot is a “Community Connection” transit service, using smaller transit vehicles to provide direct accessibility services to the entrance doors of major destinations. Beginning from LaSalle Towers to the west, this service runs east-west along Plains Road East before travelling north-south along Maple Avenue and terminating at the Burlington Seniors Centre (New Street). It offers 60-minute headways at the top of the hour from 11:00-14:00, Monday to Friday.

Bus stops for the abovementioned routes are located immediately north of the site access on Plains Road East. The existing area transit context is illustrated in **Figure 4**.

Local transit service improvements to Burlington Transit are planned in the City of Burlington’s Draft Official Plan, named “Grow Bold” (April 2017). While the new Transportation Master Plan, named “Go Bold”, has yet to be released at the time of this report, Chapter 6 of the Draft Official Plan – focused on Infrastructure, Transportation, and Utilities – defines policies for a *Frequent Transit Network* (FTN). The FTN is characterized by 15-minute minimum service intervals along a transit corridor, offering all-day service seven days a week.

Two components exist in the FTN, where roadways are categorized as “Justified” or “Candidate” corridors within the FTN network: Justified FTN corridors adequately demonstrate demand for FTN services in the future, while Candidate FTN corridors will require further study to evaluate suitability.

Plains Road East, already a predominant east-west connection across the City, is considered a Justified Corridor in the FTN. As the Burlington Transit network develops, Plains Road East is slated to become a high-frequency, all-day-service transit corridor.

Plains Road East is also designated as a primary mobility hub connector, forming a principal transportation connection between the intensification areas around the Burlington Downtown and the City’s GO Stations. Access from the Site to Burlington’s Downtown will be conveniently facilitated via a single transfer at both Brant Street (another primary mobility hub connector), or Maple Avenue (secondary mobility hub connector).

Regional rail improvements are planned for the Lakeshore West line as a part of the Regional Express Rail (RER) Project (GO Expansion). Generally, service improvements will offer high-acceleration electric trains, four times the existing number of off-peak trips, and twice the existing number of peak period trips.

Within the site environs, these improvements will result in 15-minute or better train service operating in both directions, all-day every day between Aldershot GO Station and Union Station. This service interval will be a dramatic improvement to the Line during the mid-day, evening, and weekends: current off-peak services along Lakeshore West operate at 30-minute service intervals. Changes to the Lakeshore West service are expected to be realized by the end of Metrolinx’s 10-year RER Project, around 2026.

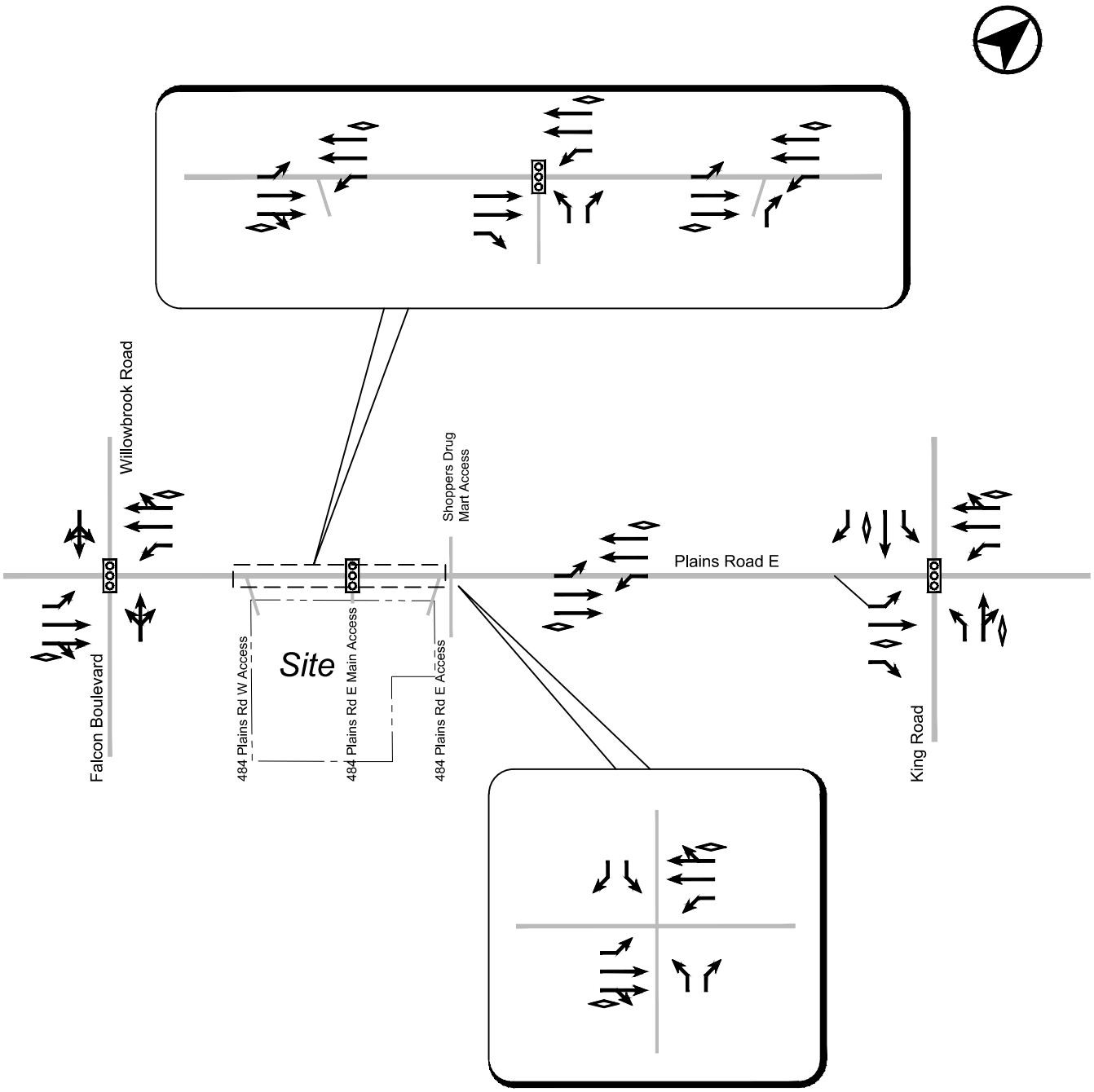
2.1.3 Cycling Facilities

The site is well situated in an area with several existing cycling facilities, including bicycle lanes and multi-use paths. The site is within the vicinity of the bicycle lanes on Plains Road East (i.e. east and west direction) and King Road (i.e. north and south direction), which provides access to additional cycling routes to the east and west, including the Francis Road Bikeway.

The Francis Road Bikeway is a fully-separated multi-use path that runs along the east side of the site. The path extends from North Shore Boulevard in the south to Warwick Drive in the north. The Francis Road Bikeway provides an alternative off-road bicycle path to the King Road bicycle lanes.

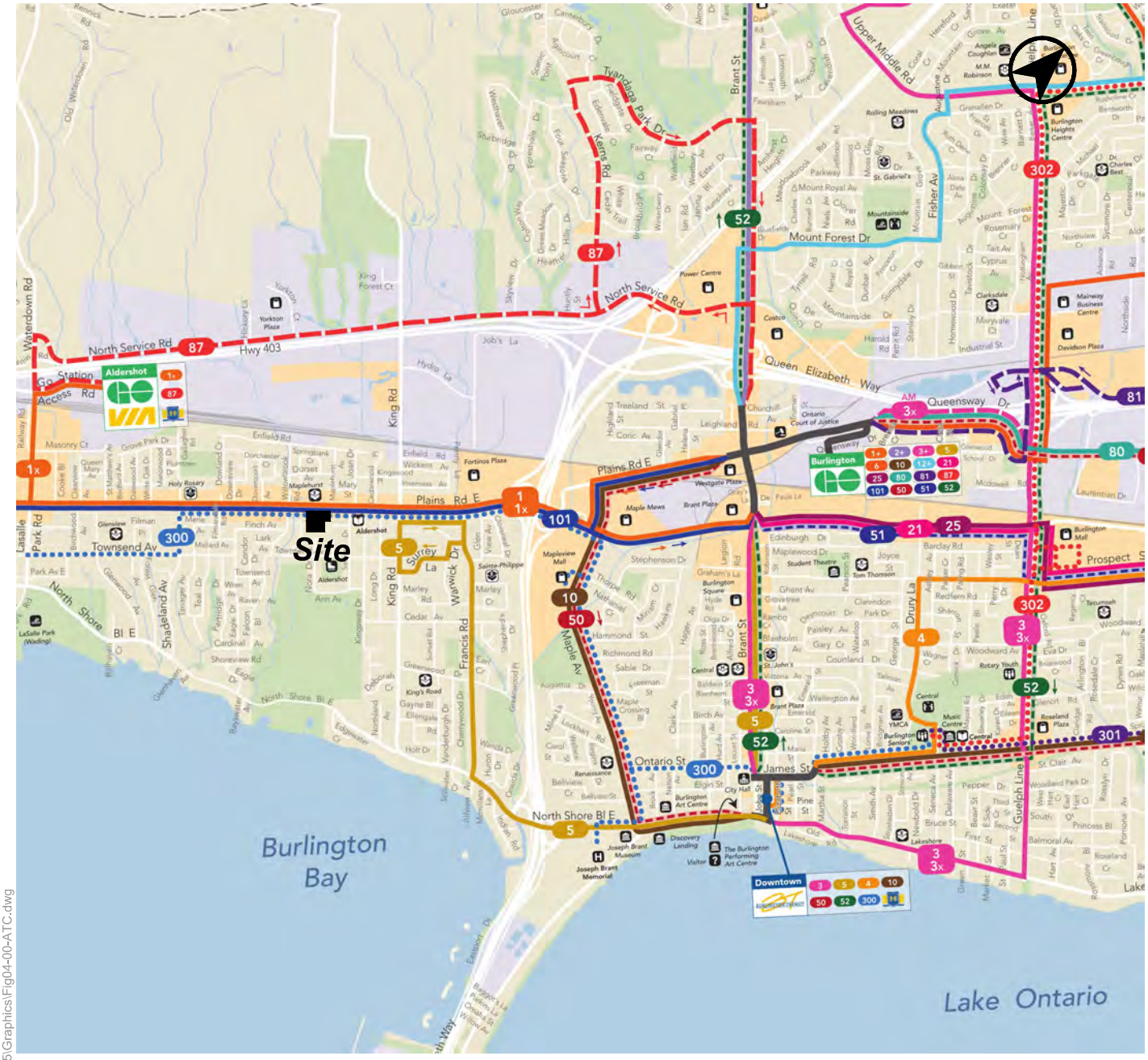
As part of the City of Burlington's Cycling Master Plan, the cycling infrastructure within the vicinity has been approved for improvements and implementation after 2021. The plan suggests that a long-term bicycle priority path will be implemented along Greenwood Drive, south of Plains Road East, will provide a connection between King Road and Maple Avenue through a grade-separated multi-use path which provides a direct, convenient and safe cycling connection to downtown Burlington area.

The local area cycling context is shown in **Figure 5**.



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EXISTING LANE CONFIGURATION



Route Service Times

Route		Peak Only	M-F	Sat	Sun	Hol
1	Plains		•	•	•	•
1x	Plains		•			
5	Francis - Downtown		•	•		
101	Plains Express		•			
300	Aldershot		•			

Map Legend

Transit

- Regular Service Bus Route
- Peak Service Bus Route[1]
- Limited Service Bus Route
- Late Night Service Bus Route
- GO Station
- HSR Transfer Point
- Oakville Transit Transfer Point
- Community Connection Route

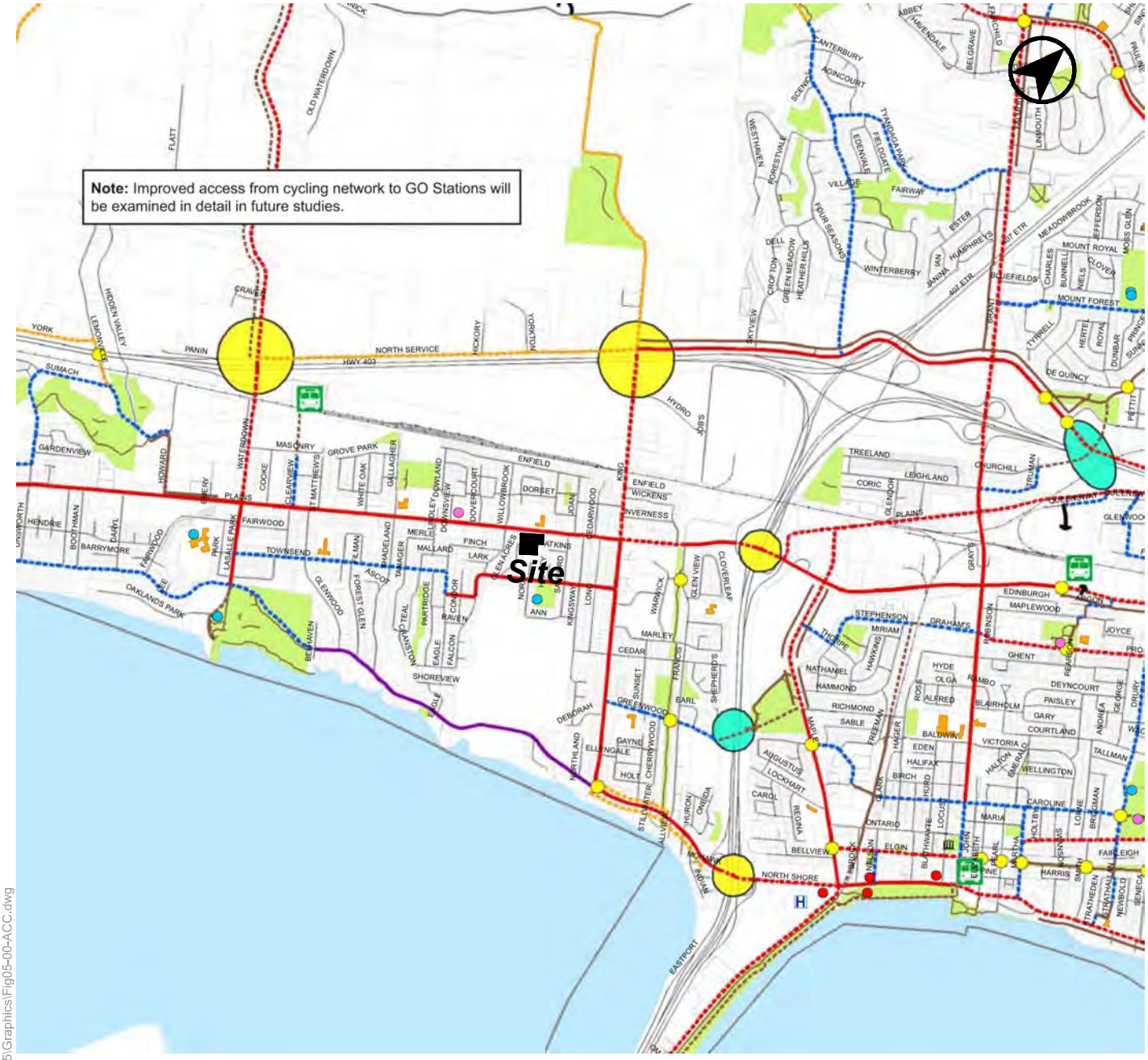
Symbols

- Hospital
- Shopping Centre
- Arena
- City Hall
- Courthouse
- Library
- Recreation Centre
- Community Centre
- Museum / Attraction
- Outdoor Pool
- Indoor Pool
- Information
- Public Secondary School
- Public Elementary School
- Catholic Secondary School
- Catholic Elementary School

[1]Peak hours are weekdays approximately 5 to 9 a.m. and 3 to 7 p.m.

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AREA TRANSIT CONTEXT



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AREA CYCLING CONTEXT

3.0 SITE PLAN EVAULATION

3.1 PARKING REVIEW

3.1.1 By-law Requirements

As shown in Table 2 a total of 707 parking spaces are required based upon application of the Zoning By-law (2020) parking standard, including 568 parking spaces for residential uses (176 spaces for townhomes and 392 spaces), 139 spaces for residential visitors and 40 spaces for the commercial uses. We note, however, that the MXG designation on the site allows for retail parking spaces to be counted toward non-residential requirement on mixed-use sites. (ZBL-2020, subsection 4.6 clause C).

TABLE 2 ZONING BY-LAW PARKING REQUIREMENTS ZBL 2011-173

	Unit Type or GFA	Parking Rate	Required Spaces
Resident			
Townhomes			
1-Bedroom	0 units	1.25 spaces per unit	0 spaces
2-Bedroom	117 units	1.50 spaces per unit	176 spaces
3-Bedroom or more	0 units	1.75 spaces per unit	0 spaces
Apartment			
1-Bedroom	126 units	1.25 spaces per unit	158 spaces
2-Bedroom	145 units	1.50 spaces per unit	218 spaces
3-Bedroom or more	9 units	1.75 spaces per unit	16 spaces
Sub-Total Resident			***568 spaces***
Non-Resident			
Visitor	397 units	0.35 spaces per unit	139 spaces
Retail	998.5 sq. m.	4.00 per 100 sq. m.	40 spaces*
Sub-Total Non-Resident			178 spaces
Non-Resident with Sharing			*139 spaces*
TOTAL			**707 spaces**

*Zoning By-law 2020, Part 5, section 4.6 – states that where a development is comprised of a mix of residential and non-residential uses, non-residential parking located on the same property as the residential uses may be counted toward required visitor parking for the residential use.

The by-law would require a total of 707 spaces with sharing (568 resident and 139 non-resident).

3.1.2 Recommended Rates and Recent Approvals

Reduced parking ratios and/or standards and/or on-street parking ratios and/or standards may be permitted subject to evaluation by the City of the appropriateness or such standards, and implemented through the approval of development applications or other City initiatives. Policy 3.2.2 (j).

Recent staff approvals for 35 Plains Road East adopt modified parking standards for residential and retail uses in a mixed-use zone. These standards are lower than the existing by-law and are consistent with OP policies pertaining to reduced parking / on-street parking. They are also similar to the recommended City-Wide parking rates in the “City of Burlington City-Wide Parking Standards Review Consolidated Report” prepared by IBI Group, dated July 2017, which will be under review by City Council.

Similar to the in-effect by-law, the requirements for the 35 Plains Road East property allow for sharing between non-resident uses onsite. It is recommended that the proposed development provide parking supply based on these minimum parking rates as shown in **Table 3**.

TABLE 3 PROPOSED PARKING STANDARD

	Unit Type or GFA	Parking Rate	Required Spaces
Townhomes			
2-Bedroom	117 units	1.00 spaces per unit	117 spaces
Apartment			
1-Bedroom	126 units	1.00 spaces per unit	126 spaces
2-Bedroom	145 units	1.00 spaces per unit	145 spaces
3-Bedroom or more	9 units	1.00 spaces per unit	9 spaces
Sub-Total Resident			***397 spaces***
Non-Resident			
Visitor	397 units	0.14 spaces per unit	55 spaces
Retail	998.5 sq. m.	1 per 30 sq. m.	33 spaces*
Sub-Total Non-Resident			88 spaces
Non-Resident with Sharing			*55 spaces*
TOTAL			**452 spaces**

*Zoning By-law 2020, Part 5, section 4.6 – states that where a development is comprised of a mix of residential and non-residential uses, non-residential parking located on the same property as the residential uses may be counted toward required visitor parking for the residential use.

A total of 452 parking spaces will be available for the development, 421 parking spaces will be provided for residents in a single level underground garage and 31 surface parking spaces for visitors /retail uses. An additional 12 lay-by parking spaces will be provided along Plains Road to aid in circulation to the commercial units.

The proposed standards are lower than the prevailing by-law standards. However, the proposed standards are sufficient for the development and are recommended based upon the proximity to the GO Station and access to shops and services within walking distance from the subject development. The proposed standards are also consistent with OP policies pertaining to reduced parking / on-street parking. Also, they are consistent with the recommended City-Wide parking rates in the “City of Burlington City-Wide Parking Standards Review Consolidated Report” prepared by IBI Group, dated July 2017, which will be under review by City Council.

3.2 LOADING REVIEW

One loading space will be provided for the mixed-use development. This loading spaces has been reviewed to ensure that waste collection vehicles can access and egress the loading area in a suitable manner. Vehicle manoeuvring diagrams are provided in **Appendix A**.

A layby area has also been provided in front of the apartment buildings to facilitate short-term activities, such as passenger pick-up / drop-off, parcel deliveries, and food deliveries.

4.0 TRAVEL DEMAND MANAGEMENT

Travel Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality;
- Decreased traffic congestion to reduce travel time;
- Increased travel options for employees;
- Reduced personal transportation costs and energy consumption; and
- Support the Official Plan (OP) policies and Provincial smart growth objectives.

The following sections outline TDM measures that have been or are already incorporated with the development programme.

4.1.1 Incentives for Transit and Active Transportation

Smart Commute Registration

It is recommended that the proponent register with Smart Commute to promote efforts to cycle, walk, and use transit and carpool. Smart Commute provides services such as:

- The Emergency Ride Home program (covering staff up to $75 to get home in an emergency if they've commuted to work sustainably)
- The Smart Commute ride-matching tool to help find carpool partners
- Discounted transit pass programs
- Free bicycle clinics, winter cycling workshops and other commuting events
- A range of campaigns and contests throughout the year
- On-site expos with customized commute support, resources and giveaways
- Support with your internal communications, policy development (e.g. telework), exploration of infrastructure (e.g. shuttles, bike parking) or other customized support
- Opportunities for recognition such as the yearly Smart Commute Awards

Provision of a Traveling Brochure to Residents

It is recommended that a 'Traveling Brochure' (prepared by the Developer / Builder and distributed by the Owner) be provided to all new residents. This brochure will include practical and useful information regarding travelling options as well as surrounding amenities located in proximity to the subdivision. Some recommended contents are as follows:

- Public transit information, website addresses to different transit providers and contact information;
- Safety tips for pedestrians / cyclists;
- Benefits (environmental, economical, and improved health) of active transportation (walking and cycling); and,
- Carpooling information including registration and participation guidelines (Smart Commute).

The key purpose of this brochure is to minimize the individual effort from residents in getting alternative transportation information.

5.0 TRAFFIC VOLUMES

5.1 EXISTING TRAFFIC

5.1.1 Existing Baseline Vehicle Volumes

Existing baseline traffic and pedestrian volumes were established at intersections within the study area for the weekday morning and afternoon peak hour periods using traffic count information obtained from survey undertaken by Spectrum Inc. on Wednesday, June 7, 2017.
Traffic count information used to establish existing baseline traffic for analysis is summarized in **Table 4**.

TABLE 4 EXISTING TURNING MOVEMENT COUNT SUMMARY

Intersection	Control Type	Source Agency	Date Counted	Signal Timing Date[1]
Plains Road East / King Road	Signalized	Spectrum Inc.	June 7, 2017	June 6, 2017
Plains Road East / Willowbrook Road & Falcon Boulevard	Signalized	Spectrum Inc.	June 7, 2017	June 6, 2017
Plains Road East / 484 Plains Road East Main Access	Signalized	Spectrum Inc.	June 7, 2017	June 15, 2017
Plains Road East / 484 Plains Road East West Access	Unsignalized	Spectrum Inc.	June 7, 2017	--
Plains Road East / 484 Plains Road East Access & 516 Plains Road Access & Shopper Drugs Mart Access	Unsignalized	Spectrum Inc.	June 7, 2017	--

Notes:
1. Signal Timing data issued by the City of Burlington – Transportation Services.

The existing turning movement counts were reviewed in detail to ensure a general consistency in the traffic volumes on links between intersections. When necessary, minor volume adjustments were made to balance traffic volumes between intersection to provide a balanced and representative traffic volume base for the purposes of the traffic operations analysis undertaken as part of this assessment.

The existing turning movement counts are provided in **Appendix B**. Existing, balanced baseline area traffic volumes for the morning and afternoon peak hours are summarized in **Figure 6**.

5.1.2 Existing Site Traffic Volumes

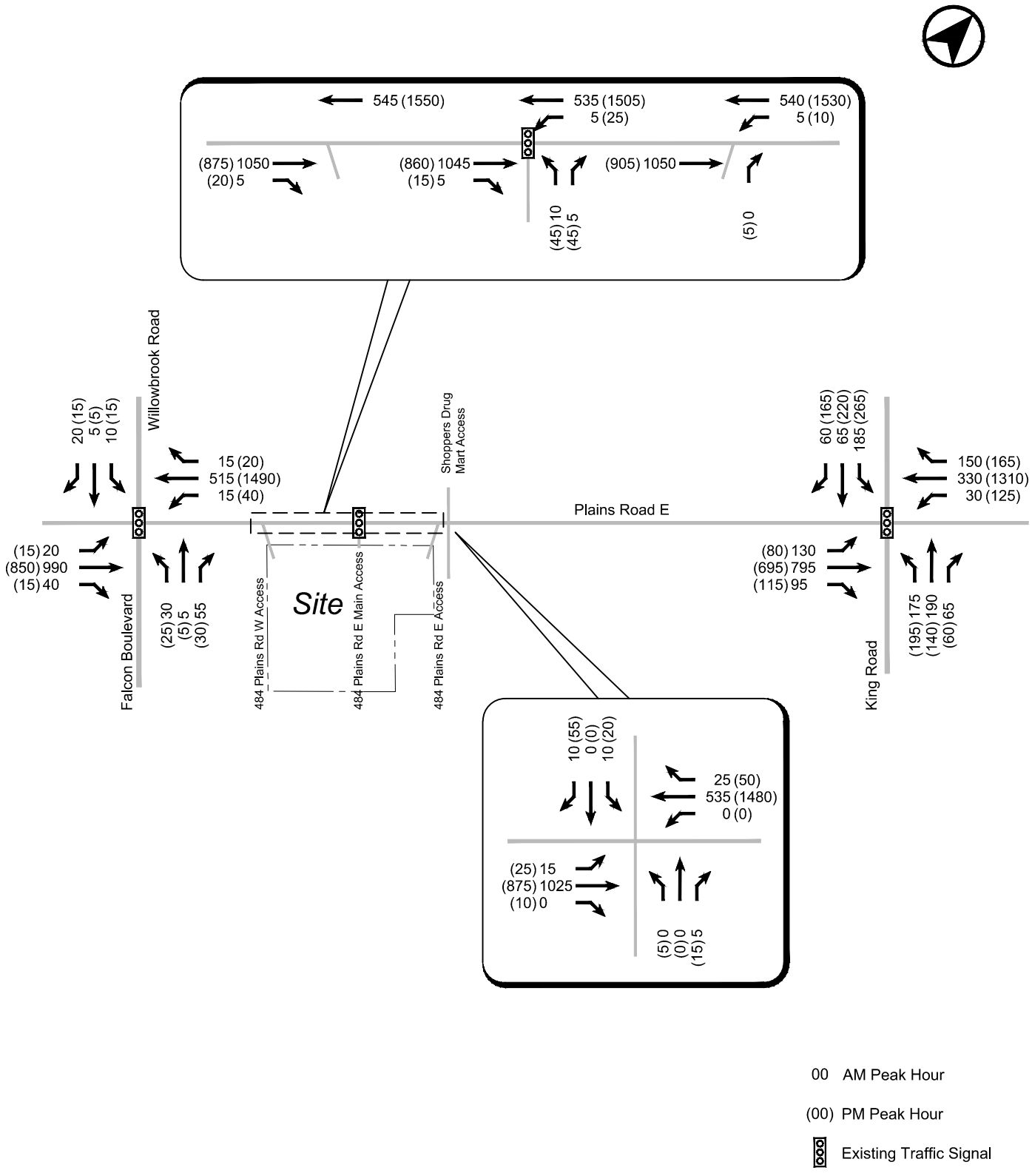
Existing site related traffic volumes were collected during the weekday morning and afternoon peak hour periods at the following entrances summarized in **Table 5**.

The existing site generates in the order of 35 and 165 two-way trips during the weekday morning and afternoon peak hour periods, respectively.

TABLE 5 EXISTING SITE TRAFFIC VOLUMES

Intersection	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Plains Road East / 484 Plains Road East Main Access	10	15	25	40	90	130
Plains Road East / 484 Plains Road East West Access	5	0	5	20	0	20
Plains Road East / 484 Plains Road East Access & 516 Plains Road Access & Shopper Drugs Mart Access	5	0	5	10	5	15
Total Site Traffic	**20**	**15**	**35**	**70**	**95**	**165**

Notes:
1. Vehicular trip volumes rounded to the nearest 5 vehicles.



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EXISTING TRAFFIC VOLUMES

5.2 FUTURE BACKGROUND TRAFFIC

A series of traffic allowances have been included to account for possible future corridor growth on the area road network as well as other area development new traffic activity within the site vicinity.

5.2.1 Generalized Area Corridor Growth

In consultation with the City of Burlington, future background conditions were enumerated based on a generalized traffic growth rate of 2% per annum. The established growth rate was adopted for a 5-year horizon based on the anticipated full build-out site. For the purposes of this traffic analysis, the growth rate was applied to all existing through movements at the key intersection of Plains Road East / King Road and carried throughout the network.

5.2.2 Area Background Developments

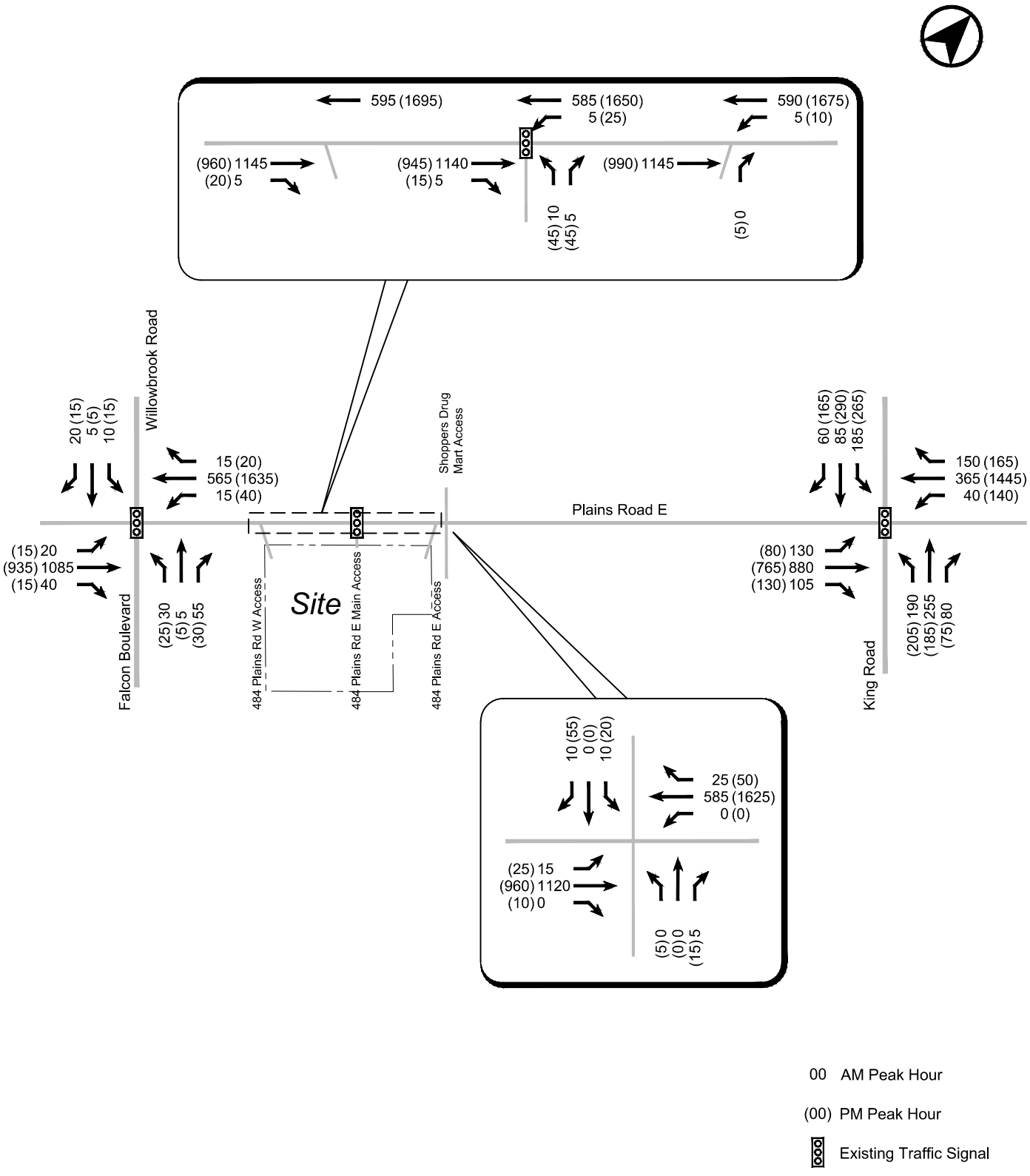
Traffic allowances were conservatively made for other specific proposed developments in the area, based on a review of a residential development project (Georgian Court Estates) completed by BA Group in August 2017.

Area development that has been considered are summarized in **Table 6** together with a description of the key development programme. Traffic allowances made for the development were based upon a traffic impact study submitted to the City of Burlington as part of the development application process.

TABLE 6 AREA BACKGROUND DEVELOPMENT

Site Location / Name	Development Statistics	Trip Generation Notes/ Sources
Georgian Court Estates	1,450 residential units	Transportation Considerations, BA Group, September 2017

The future background traffic volumes for the weekday morning and afternoon peak hours, which were developed by adding the abovementioned allowance for corridor growth to base existing traffic volumes, are summarized in **Figure 7**.



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FUTURE BACKGROUND TRAFFIC VOLUMES

5.3 SITE TRAFFIC GENERATION

Site traffic generation rates for the proposed development were based upon a review of trip rates outlined in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition. The land use codes that were relevant to the site's uses, including Residential Condominiums/Townhouses (Land Use Code 230) and Shopping Centre (Land Use Code 820).

5.3.1 Residential Trip Generation

Vehicular trip generation rates adopted for the proposed residential development were based on a review of data contained within the ITE Trip Generation Manual (9th Editions) for Land Use Code 230 – Residential Condominiums/Townhouses. This land use code provides a fitted curve equation from which the trip rates were derived based on the unit mix of the site. These rates were applied to 276 residential condominium units and 117 back to back townhouse units proposed for the site. Trip generation forecasts for the proposed residential development are summarized in **Table 7**.

TABLE 7 RESIDENTIAL CONDOMINIUMS/TOWNHOUSES TRIP GENERATION

	# of Units	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE Land Use Code 230 Trip Rates (Residential Condominiums/Townhouses)		0.07	0.33	0.39	0.32	0.16	0.47
Proposed Residential Trips	**393**	**25**	**130**	**155**	**125**	**60**	**185**

Notes:
1. Vehicular trip volumes rounded to the nearest 5 vehicles.

The residential condominiums and townhouses development are anticipated to generate approximately 155 and 185 two-way vehicle trips during the weekday morning and afternoon peak hour periods, respectively.

5.3.2 Retail Trip Generation

Vehicular trip generation rates adopted for the proposed retail component of the development plan was forecast based on a review of data contained within the ITE Trip Generation Manual (9th Edition) for Land Use Code 820 – Shopping Center. The average two-way trip rates for this land use code was used based on per 1,000 sq. feet of gross leasable area (GLA) of the site. Trip generation forecasts for the proposed retail components of the site are summarized in **Table 8**.

TABLE 8 RETAIL TRIP GENERATION

	GFA	AM Peak Hour			PM Peak Hour		
		In	Out	2-Way	In	Out	2-Way
ITE Code 820 Trip Rates (Shopping Center)		0.60	0.36	0.96	1.78	1.93	3.71
Proposed Residential Trips	**10,748 ft²**	**5**	**5**	**10**	**20**	**20**	**40**

Notes:
1. Vehicular trip volumes rounded to the nearest 5 vehicles.
2. Rates have been provided per 1,000 ft² of GLA, assumed at 95% of GFA.

The retail component of the development plan is anticipated to generate approximately 10 and 40 two-way vehicle trips during the weekday morning and afternoon peak hour periods, respectively.

5.3.3 Total Site Traffic Volumes

The proposed development is anticipated to generate in the order of 165 and 225 new two-way vehicular trips during the weekday morning and afternoon peak hour periods, respectively. The site currently contains several retail stores and a Bingo building, which will be removed in the future for the proposed development plan of 393 residential units and 10,748 ft^2 of retail. As such, the existing site traffic activity will be removed and when added to the new site traffic, the site would generate in the order of 130 and 60 net-new two-way vehicle trips during the weekday morning and afternoon peak hour periods, respectively. The total site traffic volumes are illustrated in **Table 9**.

TABLE 9 TOTAL SITE TRAFFIC VOLUMES

	AM Peak Hour			PM Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Existing Traffic						
Existing Retail Traffic	20	15	35	70	95	165
Proposed Uses						
Residential Trips	25	130	155	125	60	185
Retail Trips	5	5	10	20	20	40
Proposed Total New Site Trips	30	135	165	145	80	225
Primary Trips	30	135	165	140	75	215
Pass-By Trips[2]	0	0	0	-5	-5	-10
Total Site Traffic						
Total Net-New Site Trips	+10	+120	+130	+75	-15	+60

Notes:
1. Vehicular trip volumes rounded to the nearest 5 vehicles.
2. Pass-by trips were calculated to be 75% of the two-way retail trips during the weekday afternoon peak hour period, it was conservatively assumed to be 25% of the two-way retail trips during the weekday afternoon peak hour.

5.4 SITE TRAFFIC DISTRIBUTION

5.4.1 Residential Site Traffic Distribution

The trip distribution for the proposed residential site traffic was established based upon a review of data available through the 2011 Transportation Tomorrow Survey (TTS) for home-based vehicle trips to and from the study area during the weekday morning and afternoon peak hour periods. The distribution of inbound and outbound traffic adopted for the proposed residential development is outlined in **Table 10**.

TABLE 10 RESIDENTIAL SITE TRAFFIC DISTRIBUTION

To/From	Inbound	Outbound
North on King Road	5%	10%
South on King Road	10%	15%
East on Plains Road East	55%	45%
West on Plains Road East	30%	30%
Total	**100%**	**100%**

Notes:
1. Distributions rounded to the nearest 5 percent.
2. Based on a review of 2011 TTS data for home-based trips to and from 2006 TTS Zones 4053-4055 during weekday morning and afternoon peak periods.

5.4.2 Retail Site Traffic Distribution

The trip distribution pattern for the retail component of the site traffic was established based upon a review of existing site driveway and area traffic patterns during the weekday morning and afternoon peak hour periods. The proposed direction distribution of the site related traffic considers the orientation and configuration of the area street system, local access characteristics and movement restrictions. The distribution of inbound and outbound traffic adopted for the proposed retail development in the weekday morning and afternoon peak hour periods are outlined in **Table 11**.

Total site traffic volumes assigned to the area road network are illustrated in **Figure 8**.

Recognizing some driveway locations have been removed and removing the existing land uses for the proposed development plan, existing site traffic volumes were removed from the area road network as illustrated in **Figure 9**.

With the total site traffic volumes and the removal of existing site traffic volumes, the site has generated net-new site traffic volumes as illustrated in **Figure 10**.

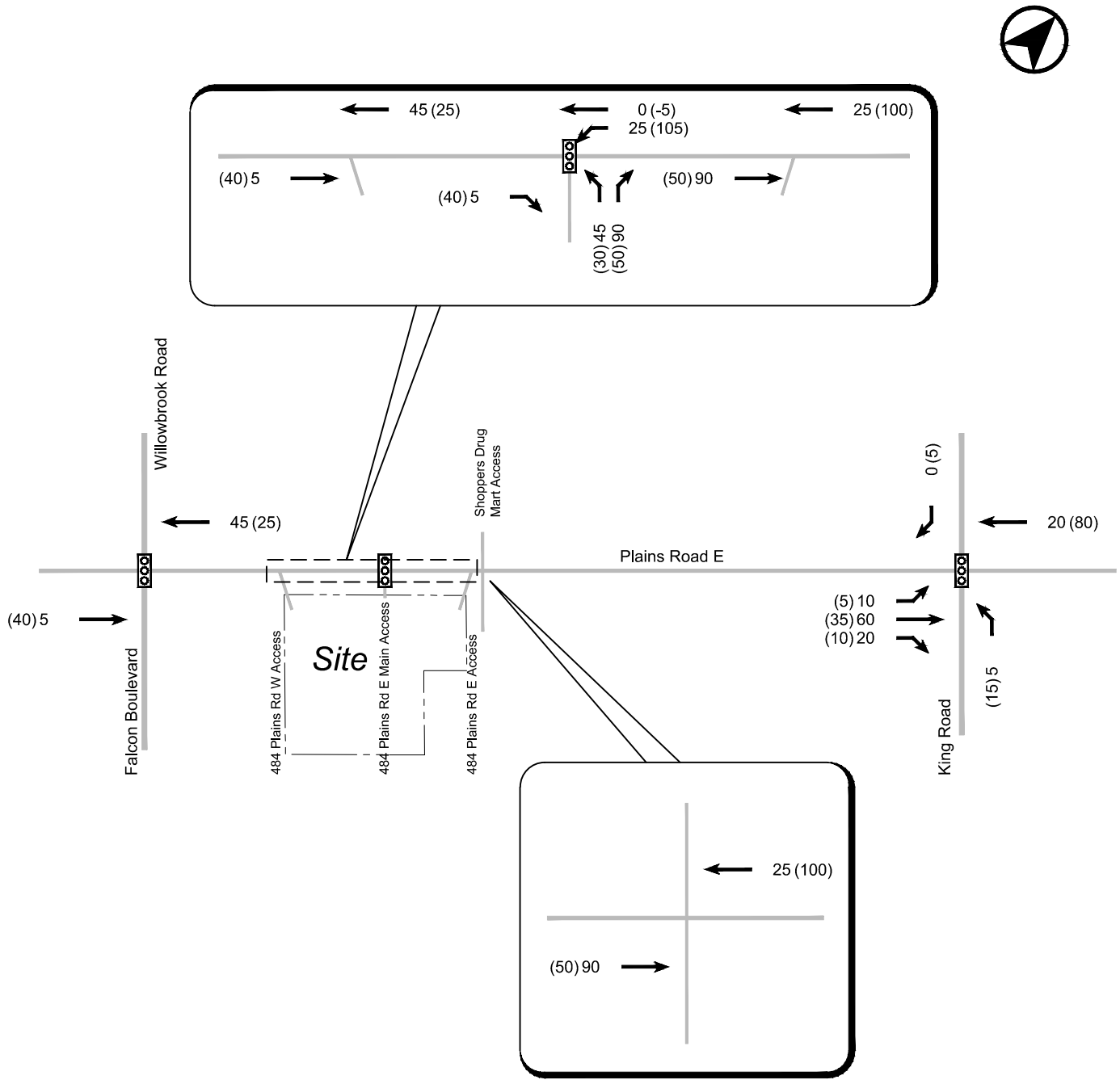
TABLE 11 RETAIL SITE TRAFFIC DISTRIBUTION

To/From	Inbound	Outbound
North on King Road	10% (5%)	0% (5%)
South on King Road	20% (5%)	5% (40%)
East on Plains Road East	40% (55%)	20% (5%)
West on Plains Road East	30% (35%)	75% (50%)
Total	**100% (100%)**	**100% (100%)**

Notes:
1. Distributions rounded to the nearest 5 percent.
2. Based on a review of 2011 TTS data for home-based trips to and from 2006 TTS Zones 4053-4055 during weekday morning and afternoon peak periods.
3. XX (XX) – weekday morning peak hour (weekday afternoon peak hour).

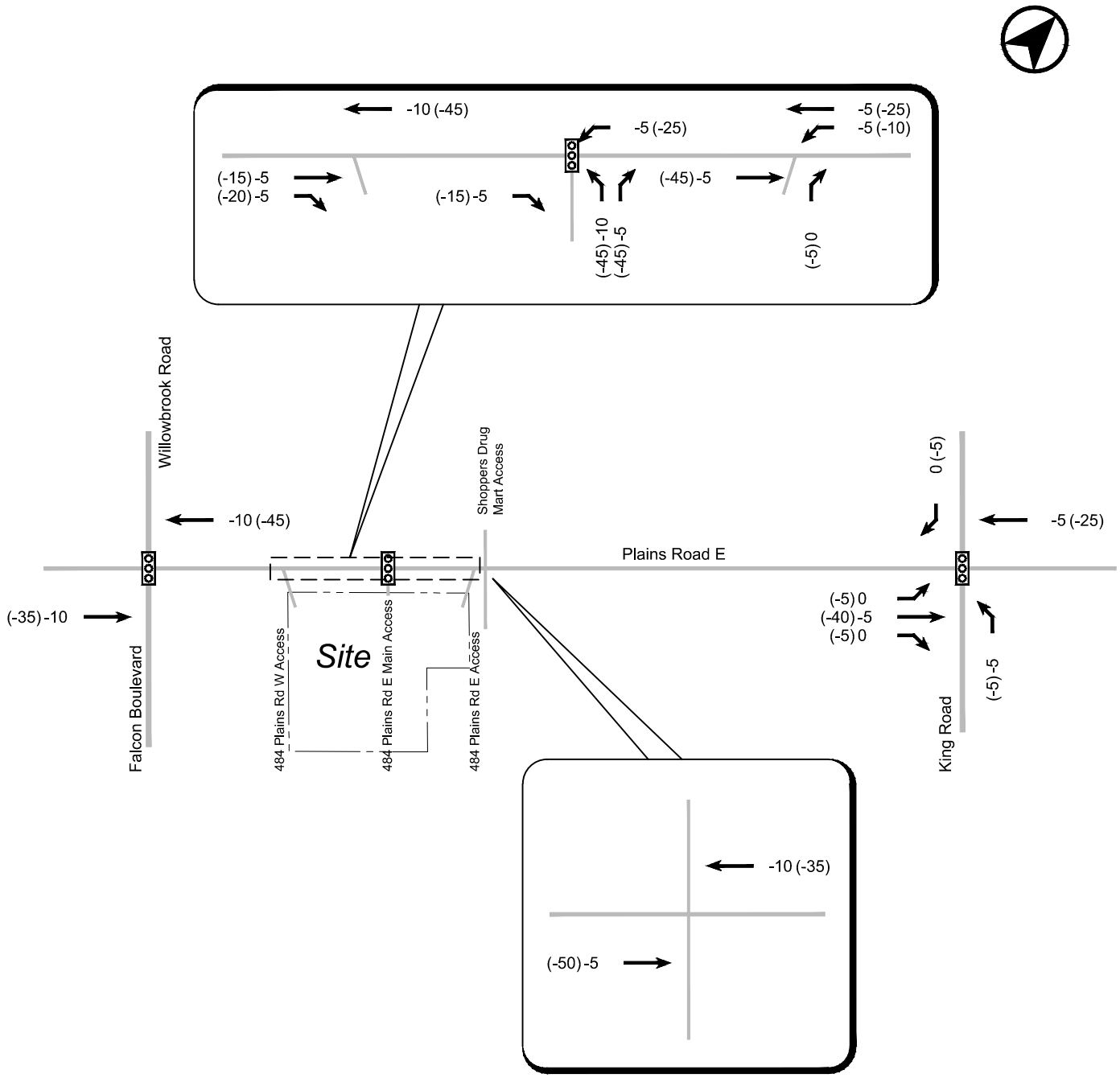
5.5 FUTURE TOTAL TRAFFIC

Future total traffic volumes were developed by adding net-new site-generated traffic to future background traffic volumes. **Figure 11** illustrates future total traffic volumes for the weekday morning and afternoon peak hours.



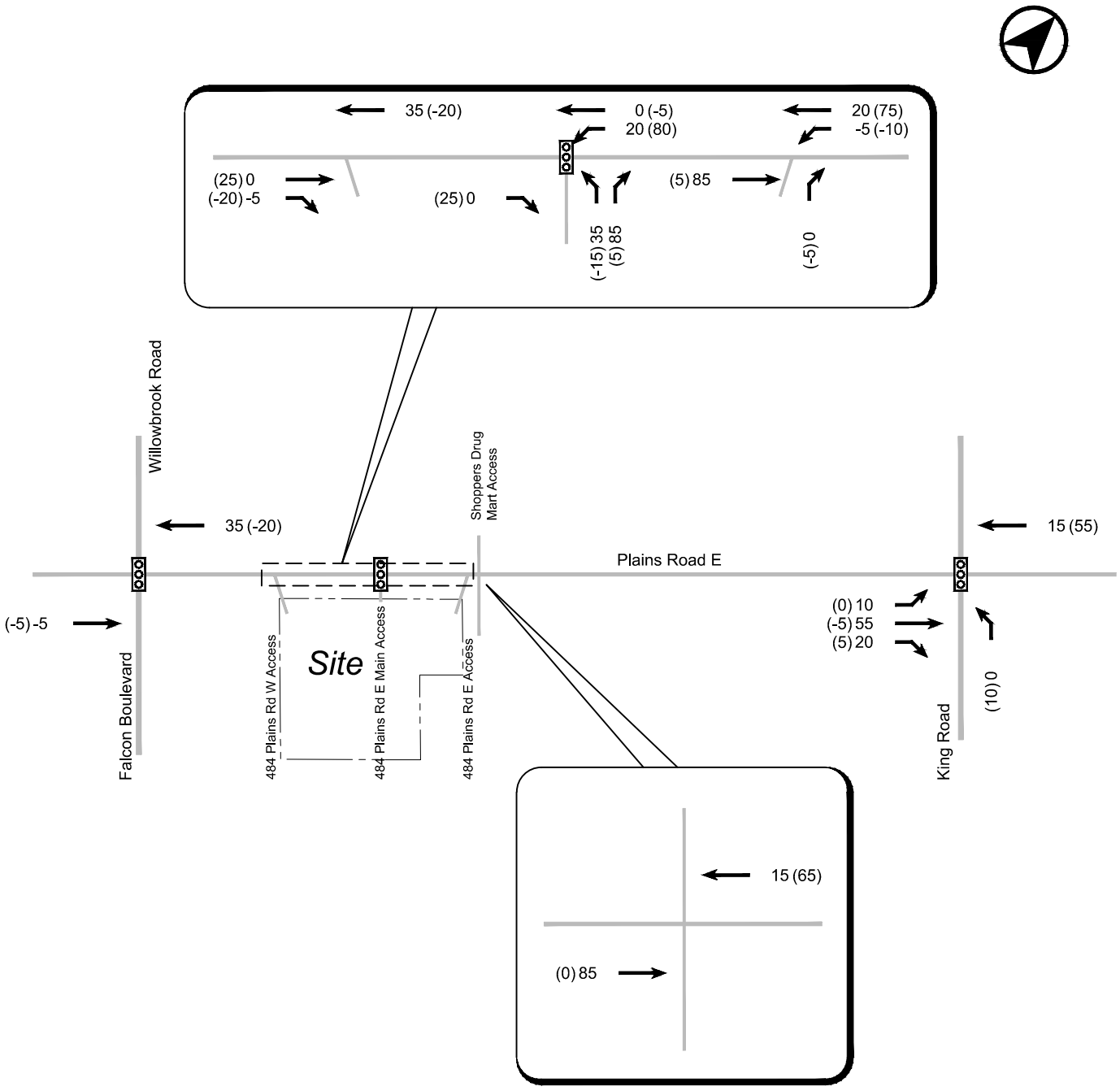
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SITE TRAFFIC VOLUMES



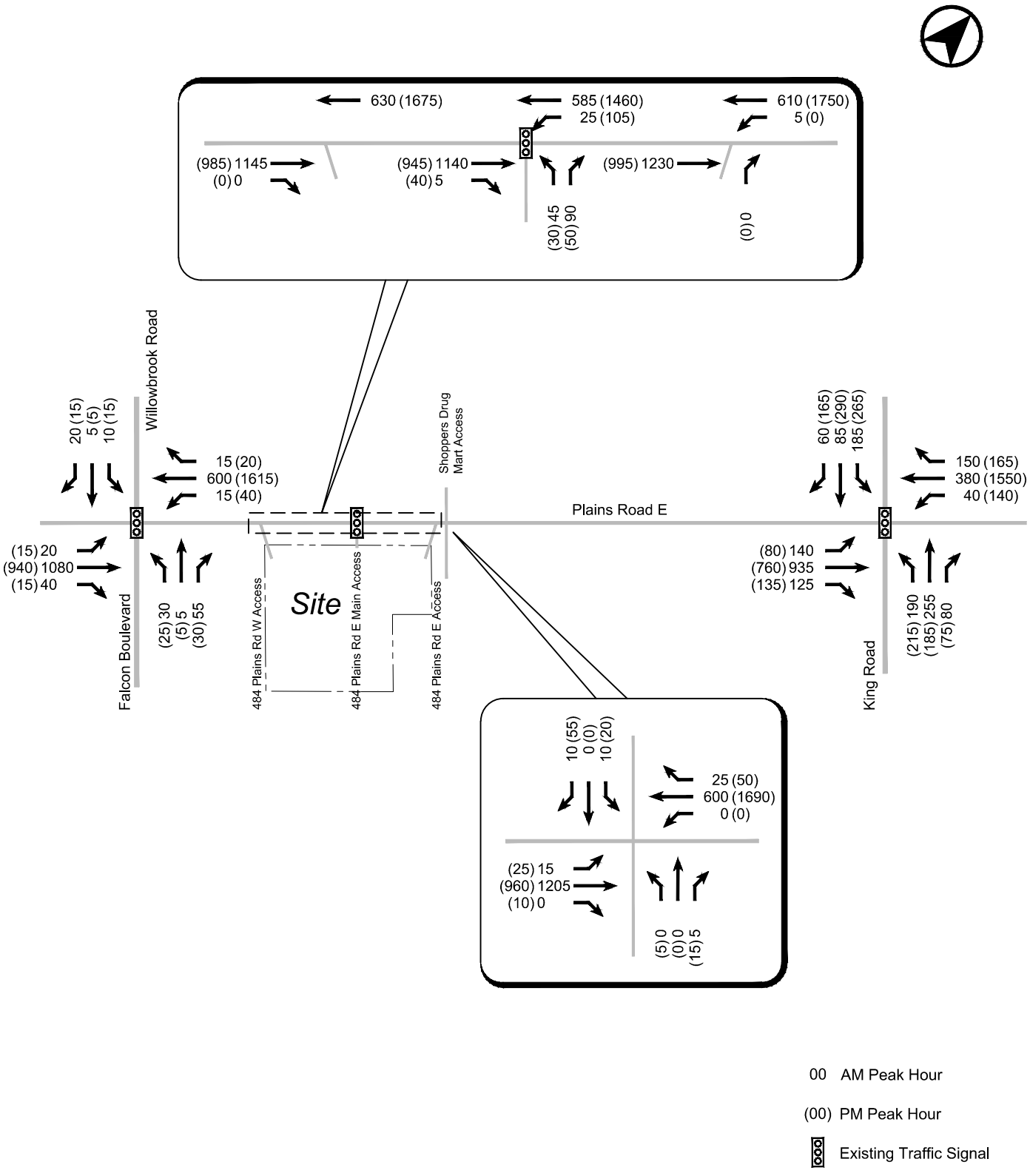
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REMOVAL OF EXISTING SITE TRAFFIC VOLUMES



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NET NEW SITE TRAFFIC VOLUMES



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FUTURE TOTAL TRAFFIC VOLUMES

6.0 TRAFFIC OPERATIONS

Traffic operations analyses were undertaken at the study area intersections for the weekday morning and afternoon peak travel hours under the following traffic conditions:

- existing traffic conditions;
- future background traffic conditions, which including allowances for general corridor traffic growth and area specific developments; and
- future total traffic conditions, which take into consideration future background traffic volumes plus site-generate traffic volumes.

6.1 ANALYSIS METHODOLOGY

Traffic operations analyses have been completed using the Synchro (Version 9.1) capacity analysis software in accordance with the methodologies outlined in the *Highway Capacity Manual* (HCM) and City of Burlington's *Transportation Impact Study Guidelines*.

The key performance indicator of the signalized intersection evaluation is an intersection performance index (volume to capacity ratio, or v/c), where a v/c index of 1.00 indicated 'at or near capacity' conditions.

The key performance indicator of the unsignalized intersection / driveway analyses is an average delay per vehicles (in seconds) and a level of service (LOS) designations, where the LOS A (little delay) to LOS F (extended delay) range provides an understanding of the relative time a motorist may have to wait to complete a turn at an intersection or driveway.

Signal Timings

Existing traffic signal timing plans for all signalized intersections within the study area were obtained from the City of Burlington. Analyses were undertaken using this signal timing plan for existing, future background and future total traffic conditions. Existing cycle lengths for all signalized intersection within the study area were maintained for all scenarios.

Signal timings at the Plains Road East / King Road intersection have been optimized under future background conditions in response to changing traffic demands and to best accommodate traffic activity at the intersection. The optimized signal timings at the Plains Road East / King Road intersection were carried into future total traffic conditions.

The existing and proposed traffic signal timing plans are provided in **Appendix B**.

Saturation Flow Rates

The base saturation flow rate of 1,900 passenger cars per hour of green time per lane (pcphgpl) was adopted as the base assumption in the Synchro analysis.

Heavy Vehicle Assumptions
Heavy and medium truck percentages incorporated into the analyses were based on information obtained from observations made during existing intersection turning movement counts.

The relative proportions of heavy vehicles within the traffic stream were used as the basis for the heavy vehicle adjustment factor determinations. These adjustment factors were using the Synchro analysis for all scenarios.

Road Network Assumptions

Existing lane configurations in the area road network have been assumed in the analysis for the existing, future background and future total traffic scenarios.

Under future total conditions, the existing unsignalized site driveway located in the east and west of Plains Road East will be removed and the proposed development will operate under a single signalized site driveway, which is currently the main site access under existing conditions.

The existing and future road network intersection lane configurations are shown in **Figure 3**.

Synchro analysis work sheets are included in **Appendix C to E.**

Calibrations of Existing Movements

No calibration of existing conditions was undertaken for this analysis.

6.2 ANALYSIS SUMMARY

6.2.1 Signalized Intersection Analysis

The v/c ratio and LOS were assessed for the following signalized intersections within the 484 Plains Road East Study Area:

- Plains Road East / King Road;
- Plains Road East / Willowbrook Road & Falcon Boulevard; and
- Plains Road East / 484 Plains Road East Main Access.

6.2.1.1 Plains Road East / King Road

The Plains Road East / King Road intersection operates under traffic signal control with cycle length of 100 seconds and 120 seconds in the weekday morning and afternoon peak hour periods, respectively. The existing cycle length was maintained in all analysis scenarios. A summary of traffic analysis results for this intersection is shown in **Table 12**.

TABLE 12 PLAINS ROAD EAST / KING ROAD

Critical Movements	Existing Condition		Future Background Conditions		Future Background Conditions (Optimize)		Future Total Conditions	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.29 (0.46)	B (C)	0.30 (0.47)	B (C)	0.33 (0.56)	B (C)	0.36 (0.56)	B (C)
EBT	0.51 (0.42)	B (B)	0.57 (0.47)	C (C)	0.61 (0.44)	C (B)	0.65 (0.44)	C (B)
EBR	0.07 (0.09)	B (B)	0.08 (0.12)	B (B)	0.08 (0.11)	B (B)	0.09 (0.12)	B (B)
WBL	0.11 (0.31)	B (B)	0.16 (0.39)	B (B)	0.18 (0.40)	B (B)	0.19 (0.40)	B (B)
WBTR	0.31 (0.87)	B (C)	0.34 (0.98)	B (D)	0.37 (0.93)	C (D)	0.38 (0.96)	C (D)
NBL	0.41 (0.68)	C (D)	0.44 (0.80)	C (D)	0.40 (0.83)	C (E)	0.40 (0.87)	C (E)
NBTR	0.78 (0.67)	D (D)	0.98 (0.78)	F (E)	0.84 (0.80)	D (E)	0.84 (0.80)	D (E)
SBL	0.62 (0.88)	C (E)	0.72 (0.95)	D (E)	0.65 (0.98)	C (F)	0.65 (0.98)	C (F)
SBT	0.20 (0.71)	D (D)	0.26 (0.83)	D (E)	0.22 (0.85)	C (E)	0.22 (0.85)	C (E)
SBR	0.04 (0.11)	B (B)	0.04 (0.14)	B (B)	0.04 (0.13)	B (B)	0.04 (0.13)	B (B)
Overall	**0.58 (0.85)**	**C (C)**	**0.68 (0.94)**	**C (D)**	**0.68 (0.93)**	**C (D)**	**0.70 (0.95)**	**C (D)**

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

Under existing conditions, the intersection operates at a busy but acceptable level of service with an overall v/c ratio of 0.58 during the weekday morning peak hour period and 0.85 during the weekday afternoon peak hour period.

Under future background condition, with the additional traffic allowance made for generalized corridor growth and specific area developments, the intersection continues to operate at a busy level of service with an overall v/c ratio of 0.68 and 0.94 during the weekday morning and afternoon peak hour periods. It is noteworthy that certain movements are experiencing near or close to capacity, particularly the northbound through movement on King Road. As such, improvements have been made to the northbound through movement by optimizing the signal timing splits within the existing cycle lengths (i.e. giving the northbound through movement more time and reducing time from the east-west movements). With the optimizations in future background condition, the intersection operates at an acceptable level of service with an overall v/c ratio of 0.68 and 0.93 during the weekday morning and afternoon peak hour periods, respectively.

Under future total conditions, with the addition of site-generated traffic and removal of existing site traffic, the intersection continues to operate at a busy, but acceptable level of service with an overall v/c ratio of 0.70 and 0.95 during weekday morning and afternoon peak hour periods, respectively. It should be noted that the signal timing split optimizations were carried from the future background to the future total analysis (i.e. signal timing splits were optimized within the existing cycle lengths).

6.2.1.2 Plains Road East / Willowbrook Road & Falcon Boulevard

The Plains Road East / Willowbrook Road & Falcon Boulevard intersection operates under traffic signal control with cycle length of 100 seconds in the weekday morning and afternoon peak hour periods, respectively. The existing cycle length was maintained in all analysis scenarios. A summary of traffic analysis results for this intersection is shown in **Table 13**.

TABLE 13 PLAINS ROAD EAST / WILLOWBROOK ROAD & FALCON BOULEVARD

Critical Movements	Existing Conditions		Future Background Conditions		Future Total Conditions	
	v/c	LOS	v/c	LOS	v/c	LOS
EBL	0.04 (0.07)	A (A)	0.04 (0.09)	A (A)	0.04 (0.08)	A (A)
EBTR	0.39 (0.32)	A (A)	0.43 (0.35)	A (A)	0.43 (0.35)	A (A)
WBL	0.04 (0.09)	A (A)	0.05 (0.10)	A (A)	0.04 (0.10)	A (A)
WBTR	0.21 (0.55)	A (A)	0.23 (0.60)	A (A)	0.24 (0.60)	A (A)
NBLTR	0.31 (0.27)	D (D)	0.31 (0.27)	D (D)	0.31 (0.27)	D (D)
SBLTR	0.14 (0.16)	D (D)	0.14 (0.16)	D (D)	0.14 (0.16)	D (D)
Overall	**0.38 (0.52)**	**A (A)**	**0.42 (0.57)**	**A (A)**	**0.41 (0.56)**	**A (A)**

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

Under existing, future background and future total conditions, the intersection operates at an acceptable level of service during the weekday morning and afternoon peak hour periods with overall v/c ratios of 0.41 and 0.56, respectively.

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the Plains Road East / Willowbrook Road & Falcon Boulevard intersection. No mitigation measures or improvements are recommended at this intersection.

6.2.1.3 Plains Road East / 484 Plains Road East Main Access

The Plains Road East / 484 Plains Road East Main Access intersection operates under traffic signal control with cycle length of 100 seconds in the weekday morning and afternoon peak hour periods, respectively. The existing cycle length was maintained in all analysis scenarios. A summary of traffic analysis results for this intersection is show in **Table 14**.

TABLE 14 PLAINS ROAD EAST / 484 PLAINS ROAD EAST MAIN ACCESS

Critical Movements	Existing Conditions		Future Background Conditions		Future Total Conditions	
	v/c	LOS	v/c	LOS	v/c	LOS
EBTR	0.38 (0.32)	A (A)	0.41 (0.35)	A (A)	0.43 (0.35)	A (A)
WBLT	0.21 (0.61)	A (A)	0.23 (0.67)	A (A)	0.27 (0.81)	A (A)
NBL	0.23 (0.37)	D (D)	0.23 (0.37)	D (D)	0.37 (0.36)	D (D)
NBR	0.00 (0.03)	A (A)	0.00 (0.03)	A (A)	0.06 (0.03)	A (A)
Overall	**0.37 (0.59)**	**A (A)**	**0.40 (0.64)**	**A (A)**	**0.43 (0.78)**	**A (A)**

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

Under existing, future background and future total conditions, the intersection operates at an acceptable level of service during the weekday morning and afternoon peak hour periods with overall v/c ratios of 0.43 and 0.78, respectively.

Based on the foregoing, the traffic generated by the proposed development can be acceptably accommodated at the Plains Road East / 484 Plains Road East Main Access intersection. No mitigation measures or improvements are recommended at this intersection.

6.3 UNSIGNALIZED INTERSECTION ANALYSIS

The delay in seconds and LOS were assessed for the following unsignalized intersections within the 484 Plains Road East Study Area:

- Plains Road East / 484 Plains Road East (West Access);
- Plains Road East / 484 Plains Road East (East Access); and
- Plains Road East / 516 Plains Road East & Shopper Drugs Mart Access.

Traffic operated at all unsignalized intersections within the study area are acceptable under all scenarios without any need for road improvements or mitigation measures. All movements will function at LOS A to LOS D in the future total scenario. The results of the capacity analysis undertaken at the unsignalized intersections within the study area are summarized in **Table 15**.

TABLE 15 UNSIGNALIZED INTERSECTION ANALYSIS SUMMARY

Intersection / Movement	Existing Conditions		Future Background Conditions		Future Total Conditions	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Plains Road East / 484 Plains Road East (West Access)						
WBL	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)
NBLR	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)
Plains Road East / 516 Plains Road East Access & Shopper Drugs Mart Access						
EBL	0.5 (1.4)	A (A)	0.5 (1.5)	A (A)	0.5 (1.7)	A (A)
WBL	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)	0.0 (0.0)	A (A)
NBLTR	11.1 (12.8)	B (B)	11.3 (13.3)	B (B)	1.3 (13.6)	B (B)
SBLT	14.6 (22.6)	B (C)	15.4 (24.1)	C (C)	15.6 (26.0)	C (D)
SBR	10.2 (10.5)	B (B)	10.4 (11.3)	B (B)	10.5 (11.6)	B (B)
Plains Road East / 484 Plains Road (East Access)						
WBL	0.4 (0.4)	A (A)	0.4 (0.4)	A (A)	0.0 (0.0)	A (A)
NBLR	0.0 (10.4)	A (B)	0.0 (10.6)	A (B)	0.0 (0.0)	A (A)

Notes:
1. 0.00 (0.00) – Weekday Afternoon Peak Hour (Weekend Saturday Peak Hour)
2. For purposes of the analysis, the unsignalized 5-legged intersection was split into two unsignalized intersections (i.e. a T-intersection and a 4-legged intersection)

7.0 SUMMARY AND CONCLUSIONS

BA Group has been retained to provide transportation advisory services in support of the development at 484 Plains Road East in the City of Burlington. Provided below is a summary of key findings from this study:

The Development Plan

- The development would contain approximately 397 dwelling units and 998.5 m^2 retail floor area.
- The proposed mix-use development will replace the existing retail plaza with a Bingo Hall, Home Hardware and Dollar Tree stores and other retail commercial uses.
- The development plan has a full movement, signalized access driveway onto Plains Road East. This is the primary access for the existing retail plaza.

Transportation Context

- The site is bounded by low density residential uses to the south, east and west, Maplehurst Public School to the north and commercial uses to eth east and west along Plains Road.
- The site driveway which connect to Plains Road East allow for connectivity to the area road network at large.
- Transportation Tomorrow Survey data indicates that 67 percent of peak hour travel in the area is through means other than single occupant vehicles. Peak hour transit usage is approximately 6 to 11 percent in the area.
- The Aldershot GO station is located within a radius of approximately 1500 metres to the northwest of the site, providing access to GO Transit service (i.e. the Lakeshore West GO line) which provides peak directional train service between Hamilton and Union Station in Toronto.
- Burlington bus routes (1 Plains, 101 Plains Express, 300 Aldershot and 5 Francis- Downtown) operate in the area, providing local transit connectivity.

Transportation alternatives k) Transportation Demand Management strategies will be used to encourage increased transit ridership, walking and bicycling in the City

Loading Arrangements

- The site has been designed to permit waste collection vehicles to circulate through the site and access waste collection facilities.

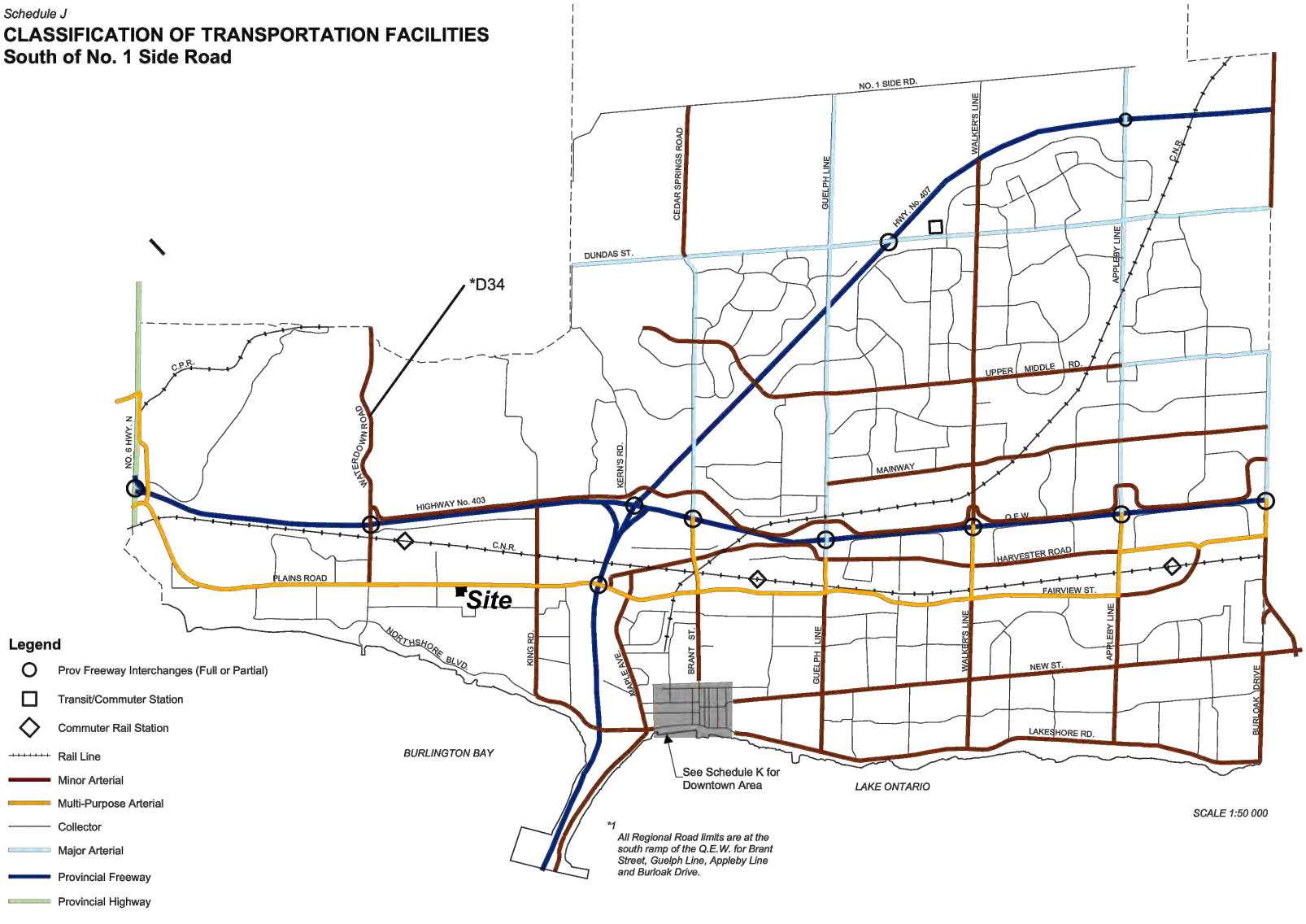
Parking

- The site provides 464 off-street parking spaces of which 421 are for residents and 43 are for visitors /retail uses. An additional 12 lay-by parking spaces will be provided on Plains Roads for commercial uses.
- The proposed standards are lower than the prevailing by-law standards. However, these the proposed standards are supportive and are recommended based upon the proximity to the GO Station and access to shops and services within walking distance from the subject development.
- The proposed standards are also consistent with OP policies pertaining to reduced parking / on-street parking. Also, they are consistent with the recommended City-Wide parking rates in the “City of Burlington City-Wide Parking Standards Review Consolidated Report” prepared by IBI Group, dated July 2017, which will be under review by City Council.

Traffic Operations

- Nearby signalized intersections are forecast to operate in a reasonable manner. Under existing and future traffic conditions, and the Plains Road intersections at Falcon Boulevard / Willowbrook Road, King Road and at the Site Access operate with overall v/c ratios of less than 0.80 during peak hours during AM peak hours.
- Under forecasted site traffic, the signalized site access driveway on Plains Road is expected to operate with overall v/c ratios of less than 0.80 during peak hours.
- Site traffic can be appropriately accommodated at study area intersections.

APPENDIX A:
Architectural Plan & Vehicle Manoeuvring Diagrams



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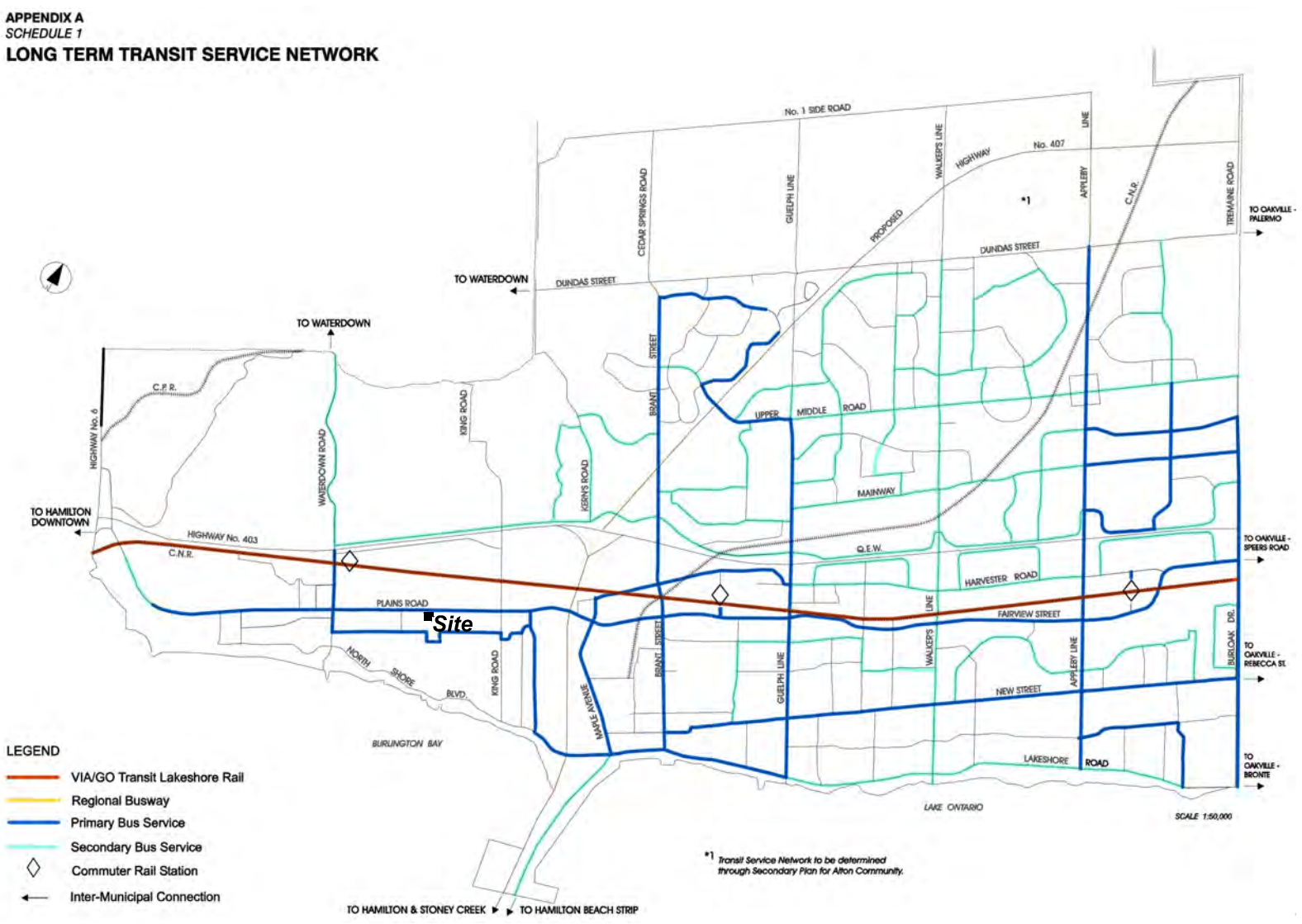
CLASSIFICATION OF TRANSPORTATION FACILITIES

South of No. 1 Side Road

BA Group

Proposed Mixed-Use Development - 484 Plains Road East
6869-15 September 2017

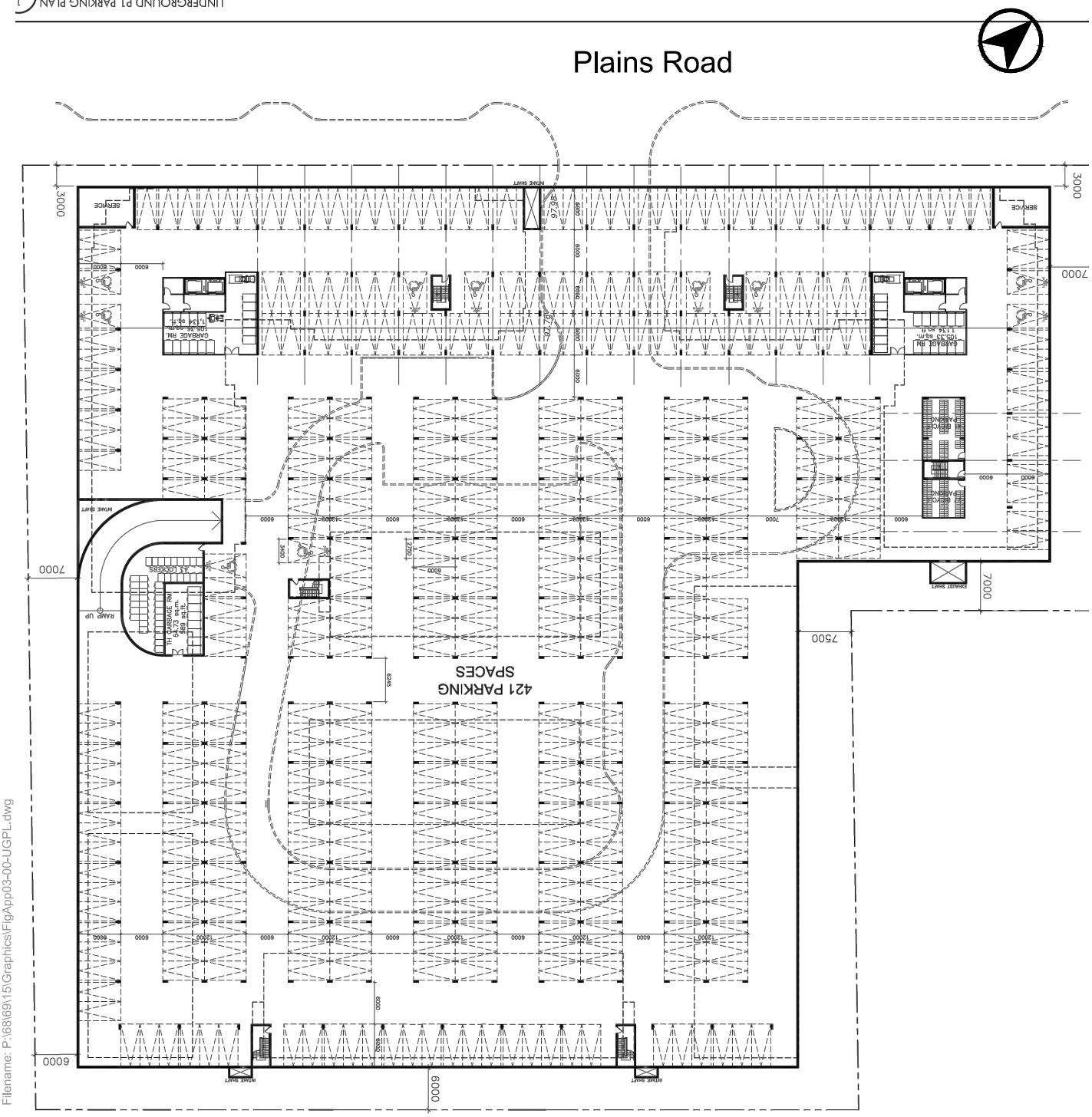
Appendix Figure 1



Date Plotted: September 20, 2017 Filename: P:\68\69\15\Graphics\FigApp02-00-LTTSN.dwg

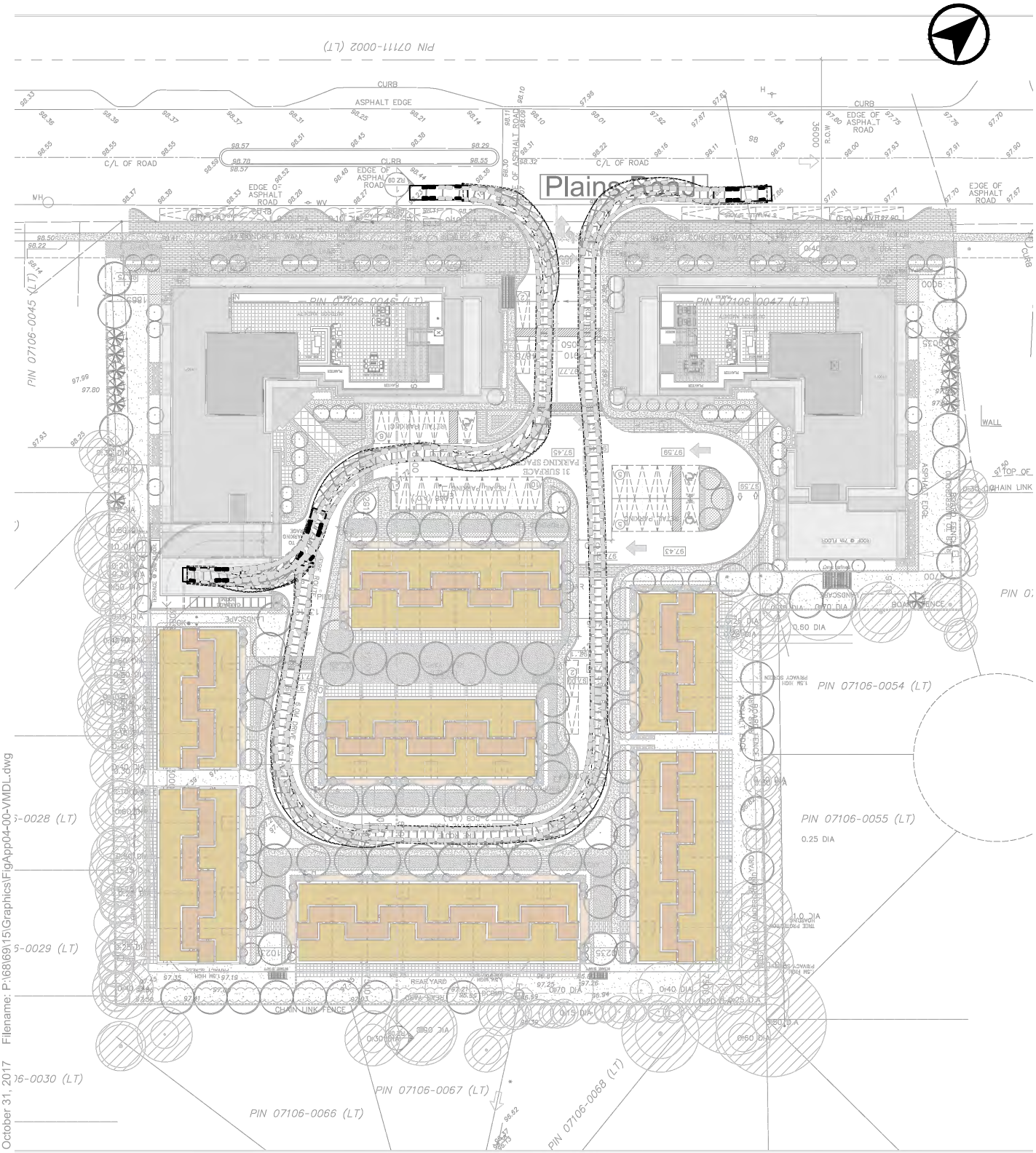
LONG TERM TRANSIT SERVICE NETWORK

Schedule 1



Date Plotted: October 31, 2017 Filename: P:\68\6915\Graphics\FigApp03-00-UGPL.dwg

UNDERGROUND PARKING LEVEL P1



Date Plotted: October 31, 2017 Filename: P:\68\69\15\Graphics\FigApp04-00-VMDL.dwg

VEHICLE MANOEUVRING DIAGRAM
Garbage Truck

APPENDIX B:
Traffic Signal Timing Plans & Turning Movement Counts (Traffic Volumes)

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Plains Rd @ King Rd	112	4	ACS/3	172.22.21.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		BP
2	2016	12	20	Timings updated - Plains Road Optimization	

PHASE DESCRIPTION

Ph1	WBLT- Plains Rd	Ph5	EBLT - Plains Rd
Ph2	EB - Plains Rd	Ph6	WB - Plains Rd
Ph3	SBLT - King Rd	Ph7	NBLT - King Rd
Ph4	NB - King Rd	Ph8	SB - King Rd

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use	X	X	X	X	X	X	X	X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green	6	8	6	8	6	8	6	8
Walk		16		12		16		12
Ped. Clearance		14		17		14		17
Pedestrian Carry Over								
Vehicle Extension	3	3	3	3	3	3	3	3
MAX 1	15	35	15	25	15	35	15	25
MAX 2	15	35	15	25	15	35	15	25
Yellow Change	4	4	4	4	4	4	4	4
Red Clearance		2		3		2		3
Phase Minimum:	**11**	**37**	**11**	**37**	**11**	**37**	**11**	**37**

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	100	58	1	1	10	50	15	25	10	50	10	30
2	100	38	1	2	11	44	17	28	11	44	17	28
3	120	50	1	3	14	60	15	31	14	60	15	31
4	100	76	1	4	12	44	14	30	12	44	14	30
10	0	0	1	10	0	0		0	0	0		0

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	1	06:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	11:30	3	1
2	2	4	19:00	4	1
2	2	10	22:00	254	1
3	3	4	09:00	4	1
3	3	10	20:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Special Programming:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Line No:	Model:	IP address:	Controller Make:
Plains @ Downsview	118	4	ACS/3	172.22.19.2	Econolite

Type of Operation: 8 Phase Semi-Actuated

*-Start from Main Menu

No	Date			Description	Prepared by
	Y	M	D		BP
3	2017	5	3	SS Walk and FDW adjusted, MS Walk adjusted, Splits adjusted to meet min	

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	EB - Plains Road	Ph6	WB - Plains Road
Ph3		Ph7	
Ph4	NB - Falcon Boulevard	Ph8	SB - Willowbrook Road

PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

Phase:	1	2	3	4	5	6	7	8
Phase in Use		X		X		X		X
Exclusive PED								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Timing Plan: 1

	Phase: 1	2	3	4	5	6	7	8
Minimum Green		8		8		8		8
Walk		8		8		8		8
Ped. Clearance		8		15		8		15
Pedestrian Carry Over								
Vehicle Extension		3		3		3		3
MAX 1		35		25		35		25
MAX 2		35		25		35		25
Yellow Change		4		4		4		4
Red Clearance		2		3		2		3
Phase Minimum:	**1**	**23**	**1**	**31**	**1**	**23**	**1**	**31**

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

Phase:	1	2	3	4	5	6	7	8
Lock Detector								
Vehicle Recall								
Pedestrian Recall		X				X		
MAX Recall		X				X		
Min Recall								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec)							
					1	2	3	4	5	6	7	8
1	100	32	1	1		69		31		69		31
2	90	78	1	2		59		31		59		31
3	100	71	1	3		69		31		69		31
4	85	27	1	4		54		31		54		31
10	0	0	1	10		0		0		0		0

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	4	06:00	4	1
1	1	1	07:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	10:30	3	1
2	2	4	17:00	4	1
2	2	10	21:00	254	1
3	3	4	09:30	4	1
3	3	2	12:00	2	1
3	3	4	17:00	4	1
3	3	10	21:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

Note:

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Intersection Name:	TS ID:	Group No:	IP address:
Plains Rd @ Maplehurst School	113		172.22.20.2
Controller Make:	**Model:**		
Econolite	ACS/3		

Type of Operation: 8 Phase Semi-Actuated

No	Date Y	M	D	Description	Prepared by
1	2015			Implement timings in Centracs	YK

*- Start from Main Manu

PHASE DESCRIPTION

Ph1		Ph5	
Ph2	EB - Plains Rd	Ph6	WB - Plains Rd
Ph3		Ph7	
Ph4	NB - Maplehurst Plaza	Ph8	SB - Maplehurst School

CONFIGURATION (PHASE SEQ): PHASE IN USE/EXCLUSIVE PED (MM) *- 1 - 2

	Phase:	1	2	3	4	5	6	7	8
Phase in Use	:		X		X		X		X
Exclusive PED	:								

CONTROLLER TIMING DATA - VEHICLE TIMING * - 2 - 1

Basic Timings	Phase:	1	2	3	4	5	6	7	8
Minimum Green	:		8		8		8		8
Walk	:		25		10		25		10
Ped. Clearance	:		8		16		8		16
Vehicle Extension	:		3		3		3		3
MAX 1	:		35		25		35		25
MAX 2	:		35		25		35		25
Yellow Change	:		4		4		4		4
Red Clearance	:		2		3		2		3

PHASE DATA - VEHICLE AND PEDESTRIAN RECALLS * - 2 - 8

	Phase:	1	2	3	4	5	6	7	8
Lock Detector	:								
Vehicle Recall	:								
Pedestrian Recall	:		X				X		
MAX Recall	:		X				X		
Soft Recall	:								

COORDINATION: COORDINATOR PATTERN, SPLIT PATTERN * - 3 - 2, - 3 - 3

Coordinator Pattern (CP)	Cycle Length	Offset (sec)	Timing Plan	Split Pattern	Phases (sec) 1	2	3	4	5	6	7	8
1	100	36	1	1		64		36		64		36
2	90	87	1	2		54		36		54		36
3	100	50	1	3		64		36		64		36
4	85	31	1	4		48		37		48		37
10	0	0	1	10		0		0		0		0

Intersection Name:	TS ID:	Group No:	IP address:
Plains Rd @ Maplehurst School	113		172.22.20.2
Controller Make:	**Model:**		
Econolite	ACS/3		

CP # 1, 2, 10	Phase:	1	2	3	4	5	6	7	8
Coord Phase	:		X				X		
Vehicle Recall	:								
Pedestrian Recall *(3-3, 5-2)	:		X				X		
Recall to MAX Time	:								
Phase Omit	:								
Special Function Outputs	:								

Coordinator Pattern #	Prefer.	Phase							
		1	2	3	4	5	6	7	8
	1								
	2								

X - select "." deselect

TIME BASE: ACTION PLAN, DAY PLAN *** - 5 - 2, - 5 - 3, -5 - 4**

Day Plan	Sched. #	Action Plan	Time Period	Pattern	Timing Plan
1	1	4	06:00	4	1
1	1	1	07:00	1	1
1	1	2	09:00	2	1
1	1	3	15:30	3	1
1	1	4	19:00	4	1
1	1	10	22:00	254	1
2	2	4	08:00	4	1
2	2	3	10:30	3	1
2	2	4	17:00	4	1
2	2	10	21:00	254	1
3	3	4	09:30	4	1
3	3	2	12:00	2	1
3	3	4	17:00	4	1
3	3	10	21:00	254	1

Schedule 1 = Day Plan 1
Schedule 2 = Day Plan 2
Schedule 3 = Day Plan 3

Day Plan 1 (Weekday)
Day Plan 2 (Saturday)
Day Plan 3 (Sunday, Holidays)

Action Plan 10 = free (254)

TIME BASE DATA - TIME OF YEAR EVENTS *** - 5 - 5**

Events	Exception Day		MON/ MON	DOW/ DOW	WOM/ Year	Day Plan
New Year's Day	1	Fixed	1	1	0	3
Family Day	2	Float	2	2	3	3
Good Friday	3	Float	4	6	1	3
Victoria Day	4	Float	5	2	3	3
Canada Day	5	Fixed	7	1	0	3
Civic Day	6	Float	8	2	1	3
Labour Day	7	Float	9	2	1	3
Thanksgiving	8	Float	10	2	2	3
Christmas Day	9	Fixed	12	25	0	3

Spectrum

Turning Movement Count
Location Name: PLAINS RD & KING RD
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (6 . PLAINS RD & KING RD)

Start Time	N Approach KING RD						E Approach PLAINS RD						S Approach KING RD						W Approach PLAINS RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	3	9	25	0	4	37	22	56	4	0	3	82	9	44	25	0	4	78	18	126	22	1	1	167	364	
07:15:00	7	12	33	0	3	52	24	49	8	0	7	81	9	56	22	0	3	87	16	171	31	0	0	218	438	
07:30:00	8	17	58	0	3	83	16	41	5	0	7	62	13	42	23	0	3	78	21	198	29	0	1	248	471	
07:45:00	15	16	54	0	1	85	38	80	6	0	5	124	14	51	48	0	4	113	22	211	41	0	0	274	596	1869
08:00:00	17	23	46	0	2	86	38	75	7	2	3	122	17	44	49	0	1	110	35	198	32	0	0	265	583	2088
08:15:00	12	15	45	0	1	72	40	93	8	0	2	141	15	38	43	0	0	96	16	194	24	0	0	234	543	2193
08:30:00	16	12	38	0	0	66	34	83	11	0	3	128	19	56	34	0	2	109	21	192	31	0	2	244	547	2269
08:45:00	12	13	56	0	4	81	43	99	13	0	1	155	19	57	43	0	1	119	23	179	32	0	2	234	589	2262
09:00:00	17	17	43	0	1	77	35	110	14	2	2	161	18	41	45	0	0	104	30	164	31	0	3	225	567	2246
09:15:00	17	14	34	0	7	65	29	94	16	1	0	140	22	33	30	0	3	85	19	171	34	0	2	224	514	2217
09:30:00	21	21	35	0	2	77	24	103	15	0	0	142	15	37	29	0	4	81	13	164	22	0	0	199	499	2169
09:45:00	20	18	43	0	2	81	26	114	17	1	3	158	17	30	36	0	1	83	21	170	31	0	2	222	544	2124
BREAK																										
15:00:00	35	34	67	0	3	136	37	215	20	0	10	272	19	46	40	0	6	105	23	166	35	0	3	224	737	
15:15:00	30	37	47	0	5	114	43	235	16	0	3	294	14	41	33	0	5	88	29	153	20	0	5	202	698	
15:30:00	37	53	59	0	7	149	52	233	19	0	12	304	15	39	35	0	6	89	15	135	21	0	5	171	713	
15:45:00	38	32	63	0	11	133	44	236	26	0	4	306	21	23	50	0	4	94	30	177	24	0	1	231	764	2912
16:00:00	37	39	80	0	5	156	36	218	27	0	1	281	12	46	36	0	5	94	31	140	22	0	1	193	724	2899
16:15:00	32	32	64	0	4	128	37	294	16	0	4	347	16	38	47	0	4	101	19	178	25	0	1	222	798	2999
16:30:00	45	52	82	0	4	179	40	276	25	0	5	341	16	49	37	0	10	102	39	150	27	0	6	216	838	3124
16:45:00	38	46	64	0	6	148	43	320	20	0	8	383	10	37	44	0	16	91	29	175	18	0	4	222	844	3204
17:00:00	27	59	93	0	11	179	50	308	16	0	6	374	12	39	40	0	4	91	30	151	22	0	4	203	847	3327
17:15:00	43	63	64	0	3	170	29	376	29	0	5	434	7	29	49	0	6	85	25	189	18	0	4	232	921	3450
17:30:00	53	55	62	0	16	170	36	304	36	0	4	376	21	40	42	0	3	103	29	164	14	0	5	207	856	3468
17:45:00	43	42	47	0	3	132	52	323	42	0	11	417	22	33	64	0	11	119	31	192	26	1	2	250	918	3542
Grand Total	623	731	1302	0	108	2656	868	4335	416	6	109	5625	372	989	944	0	106	2305	585	4108	632	2	54	5327	**15913**	-
Approach%	23.5%	27.5%	49%	0%		-	15.4%	77.1%	7.4%	0.1%		-	16.1%	42.9%	41%	0%		-	11%	77.1%	11.9%	0%		-	-	-
Totals %	3.9%	4.6%	8.2%	0%		16.7%	5.5%	27.2%	2.6%	0%		35.3%	2.3%	6.2%	5.9%	0%		14.5%	3.7%	25.8%	4%	0%		33.5%	-	-
Heavy	18	7	27	0		-	37	123	6	0		-	16	14	23	0		-	13	146	14	0		-	-	-
Heavy %	2.9%	1%	2.1%	0%		-	4.3%	2.8%	1.4%	0%		-	4.3%	1.4%	2.4%	0%		-	2.2%	3.6%	2.2%	0%		-	-	-
Bicycles	2	12	0	0		-	2	10	2	0		-	1	3	4	0		-	1	14	0	0		-	-	-
Bicycle %	0.3%	1.6%	0%	0%		-	0.2%	0.2%	0.5%	0%		-	0.3%	0.3%	0.4%	0%		-	0.2%	0.3%	0%	0%		-	-	-

Spectrum

Turning Movement Count
Location Name: PLAINS RD & KING RD
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

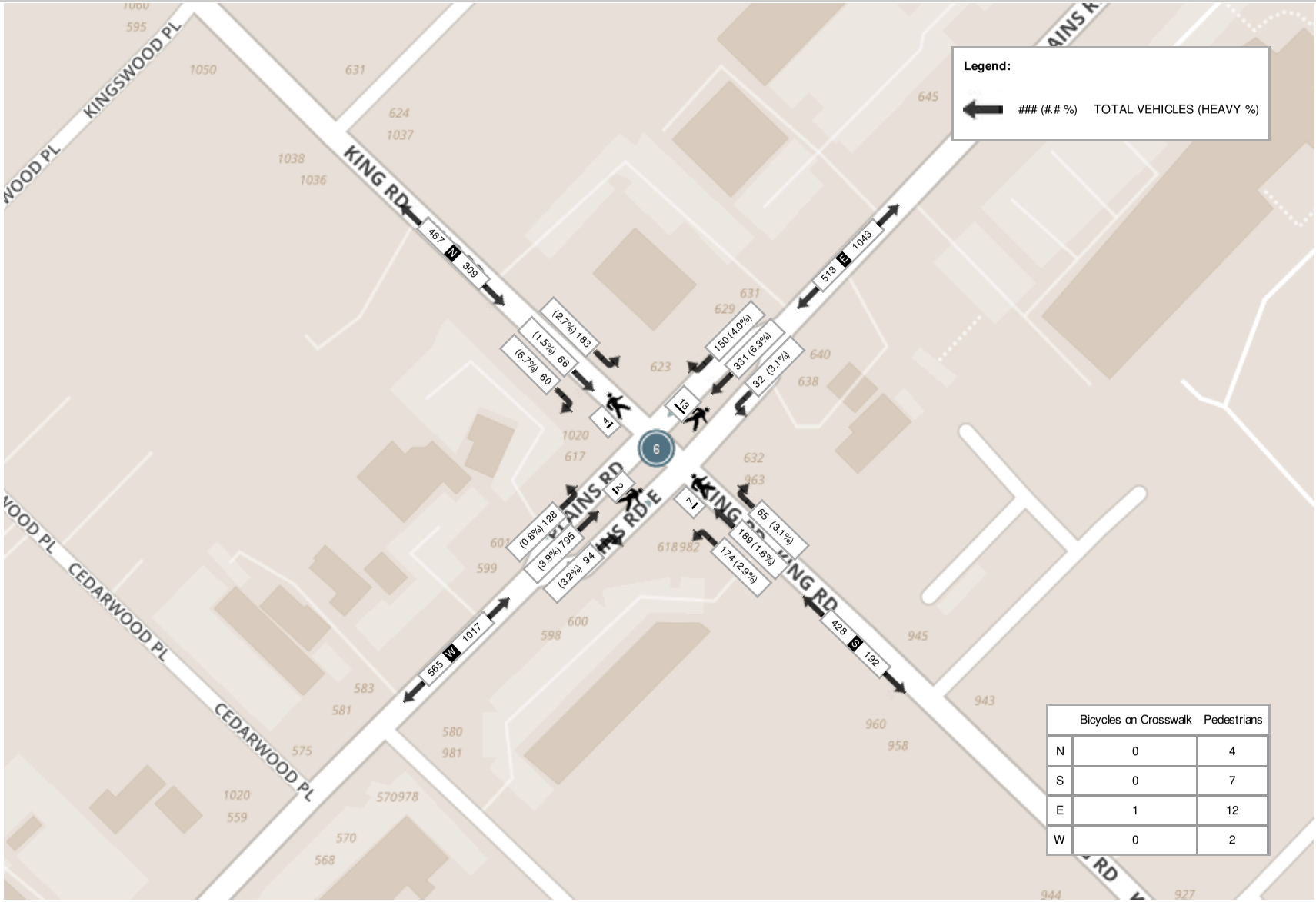
Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)

Start Time	N Approach KING RD						E Approach PLAINS RD						S Approach KING RD						W Approach PLAINS RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	15	16	54	0	1	85	38	80	6	0	5	124	14	51	48	0	4	113	22	211	41	0	0	274	596
08:00:00	17	23	46	0	2	86	38	75	7	2	3	122	17	44	49	0	1	110	35	198	32	0	0	265	583
08:15:00	12	15	45	0	1	72	40	93	8	0	2	141	15	38	43	0	0	96	16	194	24	0	0	234	543
08:30:00	16	12	38	0	0	66	34	83	11	0	3	128	19	56	34	0	2	109	21	192	31	0	2	244	547
Grand Total	60	66	183	0	4	309	150	331	32	2	13	515	65	189	174	0	7	428	94	795	128	0	2	1017	**2269**
Approach%	19.4%	21.4%	59.2%	0%		-	29.1%	64.3%	6.2%	0.4%		-	15.2%	44.2%	40.7%	0%		-	9.2%	78.2%	12.6%	0%		-	-
Totals %	2.6%	2.9%	8.1%	0%		13.6%	6.6%	14.6%	1.4%	0.1%		22.7%	2.9%	8.3%	7.7%	0%		18.9%	4.1%	35%	5.6%	0%		44.8%	-
PHF	0.88	0.72	0.85	0		0.9	0.94	0.89	0.73	0.25		0.91	0.86	0.84	0.89	0		0.95	0.67	0.94	0.78	0		0.93	-
Heavy	4	1	5	0		10	6	21	1	0		28	2	3	5	0		10	3	31	1	0		35	-
Heavy %	6.7%	1.5%	2.7%	0%		3.2%	4%	6.3%	3.1%	0%		5.4%	3.1%	1.6%	2.9%	0%		2.3%	3.2%	3.9%	0.8%	0%		3.4%	-
Lights	56	65	178	0		299	144	310	31	2		487	63	186	169	0		418	91	764	127	0		982	-
Lights %	93.3%	98.5%	97.3%	0%		96.8%	96%	93.7%	96.9%	100%		94.6%	96.9%	98.4%	97.1%	0%		97.7%	96.8%	96.1%	99.2%	0%		96.6%	-
Single-Unit Trucks	2	0	4	0		6	4	11	1	0		16	0	2	0	0		2	1	16	0	0		17	-
Single-Unit Trucks %	3.3%	0%	2.2%	0%		1.9%	2.7%	3.3%	3.1%	0%		3.1%	0%	1.1%	0%	0%		0.5%	1.1%	2%	0%	0%		1.7%	-
Buses	2	1	0	0		3	1	8	0	0		9	2	1	5	0		8	2	15	1	0		18	-
Buses %	3.3%	1.5%	0%	0%		1%	0.7%	2.4%	0%	0%		1.7%	3.1%	0.5%	2.9%	0%		1.9%	2.1%	1.9%	0.8%	0%		1.8%	-
Articulated Trucks	0	0	1	0		1	1	2	0	0		3	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	0%	0%	0.5%	0%		0.3%	0.7%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	12	-	-	-	-	-	7	-	-	-	-	-	2	-	-
Pedestrians%	-	-	-	-	15.4%		-	-	-	-	46.2%		-	-	-	-	26.9%		-	-	-	-	7.7%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	3.8%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)

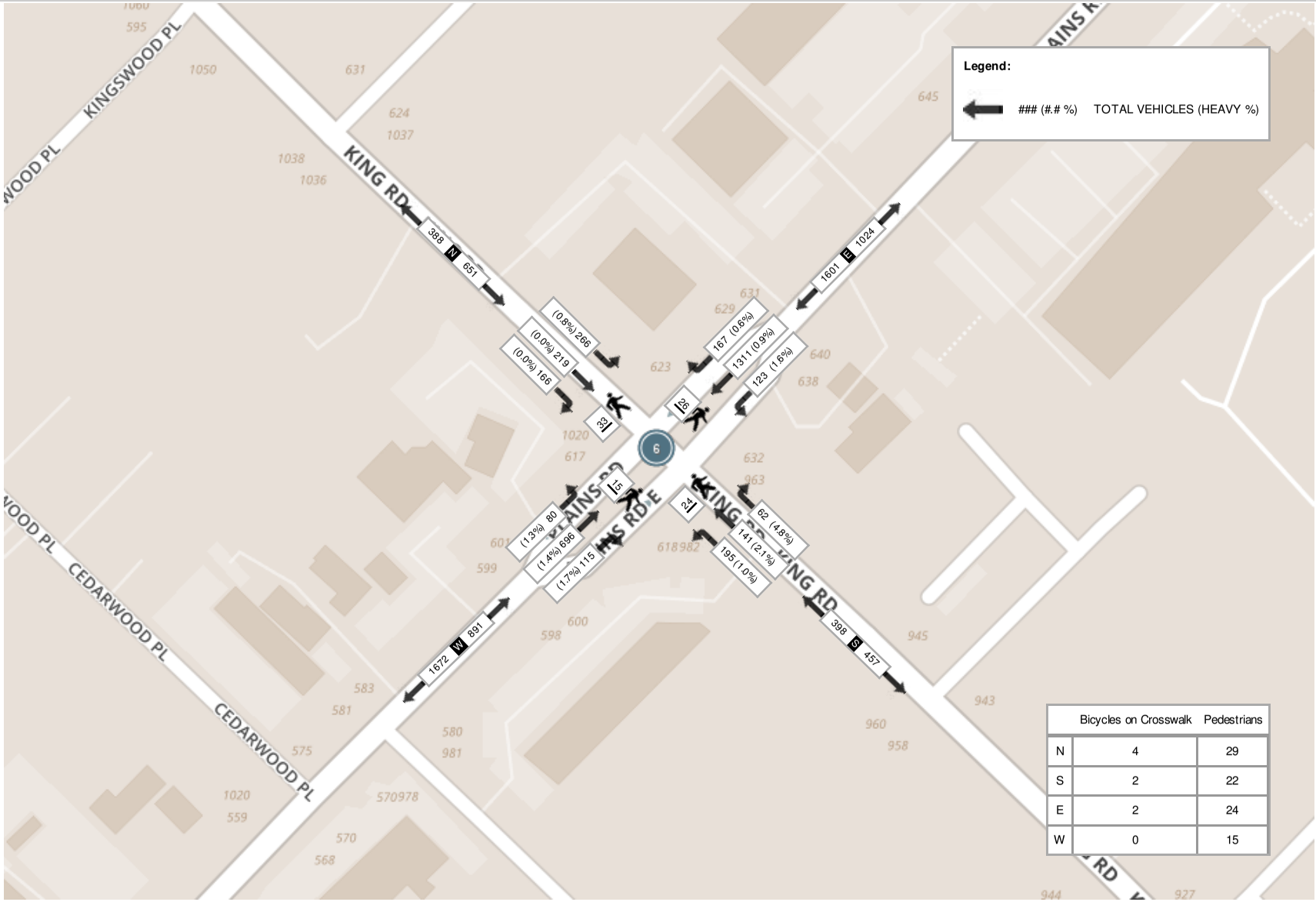
Start Time	N Approach KING RD						E Approach PLAINS RD						S Approach KING RD						W Approach PLAINS RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:00:00	27	59	93	0	11	179	50	308	16	0	6	374	12	39	40	0	4	91	30	151	22	0	4	203	847
17:15:00	43	63	64	0	3	170	29	376	29	0	5	434	7	29	49	0	6	85	25	189	18	0	4	232	921
17:30:00	53	55	62	0	16	170	36	304	36	0	4	376	21	40	42	0	3	103	29	164	14	0	5	207	856
17:45:00	43	42	47	0	3	132	52	323	42	0	11	417	22	33	64	0	11	119	31	192	26	1	2	250	918
Grand Total	166	219	266	0	33	651	167	1311	123	0	26	1601	62	141	195	0	24	398	115	696	80	1	15	892	**3542**
Approach%	25.5%	33.6%	40.9%	0%		-	10.4%	81.9%	7.7%	0%		-	15.6%	35.4%	49%	0%		-	12.9%	78%	9%	0.1%		-	**-**
Totals %	4.7%	6.2%	7.5%	0%		18.4%	4.7%	37%	3.5%	0%		45.2%	1.8%	4%	5.5%	0%		11.2%	3.2%	19.6%	2.3%	0%		25.2%	**-**
PHF	0.78	0.87	0.72	0		0.91	0.8	0.87	0.73	0		0.92	0.7	0.88	0.76	0		0.84	0.93	0.91	0.77	0.25		0.89	**-**
Heavy	0	0	2	0		2	1	12	2	0		15	3	3	2	0		8	2	10	1	0		13	**-**
Heavy %	0%	0%	0.8%	0%		0.3%	0.6%	0.9%	1.6%	0%		0.9%	4.8%	2.1%	1%	0%		2%	1.7%	1.4%	1.3%	0%		1.5%	**-**
Lights	166	219	264	0		649	166	1299	121	0		1586	59	138	193	0		390	113	686	79	1		879	**-**
Lights %	100%	100%	99.2%	0%		99.7%	99.4%	99.1%	98.4%	0%		99.1%	95.2%	97.9%	99%	0%		98%	98.3%	98.6%	98.8%	100%		98.5%	**-**
Single-Unit Trucks	0	0	2	0		2	1	6	1	0		8	0	3	2	0		5	2	3	1	0		6	**-**
Single-Unit Trucks %	0%	0%	0.8%	0%		0.3%	0.6%	0.5%	0.8%	0%		0.5%	0%	2.1%	1%	0%		1.3%	1.7%	0.4%	1.3%	0%		0.7%	**-**
Buses	0	0	0	0		0	0	6	1	0		7	3	0	0	0		3	0	4	0	0		4	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.5%	0.8%	0%		0.4%	4.8%	0%	0%	0%		0.8%	0%	0.6%	0%	0%		0.4%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	**-**
Pedestrians	-	-	-	-	29	-	-	-	-	-	24	-	-	-	-	-	22	-	-	-	-	-	15	-	**-**
Pedestrians%	-	-	-	-	29.6%		-	-	-	-	24.5%		-	-	-	-	22.4%		-	-	-	-	15.3%		**-**
Bicycles on Crosswalk	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	4.1%		-	-	-	-	2%		-	-	-	-	2%		-	-	-	-	0%		**-**
Bicycles on Road	2	3	0	0	0	-	0	2	0	0	0	-	0	1	0	0	0	-	0	3	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	4
S	0	7
E	1	12
W	0	2

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)



	Bicycles on Crosswalk	Pedestrians
N	4	29
S	2	22
E	2	24
W	0	15

Spectrum

Turning Movement Count
Location Name: PLAINS RD E & WILLOWBROOK RD
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (5 . PLAINS RD E & WILLOWBROOK RD)

Start Time	N Approach WILLOWBROOK RD						E Approach PLAINS RD						S Approach FALCON BLVD						W Approach PLAINS RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	3	0	1	0	0	4	2	73	1	0	0	76	11	1	4	0	2	16	6	134	1	0	0	141	237	
07:15:00	1	0	3	0	3	4	2	74	4	0	0	80	9	0	4	0	3	13	6	191	6	0	1	203	300	
07:30:00	7	1	0	0	3	8	1	72	2	0	2	75	18	1	5	0	4	24	9	226	4	0	1	239	346	
07:45:00	7	2	3	0	2	12	3	130	3	0	0	136	11	0	8	0	3	19	2	247	5	0	1	254	421	1304
08:00:00	3	0	3	0	2	6	3	127	1	0	1	131	11	1	5	0	3	17	9	249	2	0	0	260	414	1481
08:15:00	7	2	1	0	1	10	3	122	4	0	1	129	21	1	9	0	0	31	11	206	6	0	0	223	393	1574
08:30:00	5	0	3	0	3	8	8	104	8	0	2	120	12	1	6	0	2	19	16	233	7	0	1	256	403	1631
08:45:00	6	0	4	0	4	10	4	110	1	0	1	115	14	0	4	0	3	18	8	186	8	0	0	202	345	1555
09:00:00	10	1	6	0	7	17	2	148	8	0	3	158	10	2	6	0	5	18	7	203	12	0	2	222	415	1556
09:15:00	7	0	8	0	1	15	2	122	6	0	1	130	9	0	5	0	3	14	5	179	0	0	2	184	343	1506
09:30:00	1	1	1	0	1	3	5	135	1	0	4	141	8	0	6	0	2	14	5	162	0	0	0	167	325	1428
09:45:00	4	0	3	0	1	7	0	118	9	0	0	127	9	0	7	0	1	16	2	174	3	0	0	179	329	1412
BREAK																										
15:00:00	1	0	6	0	6	7	6	236	10	0	1	252	11	0	16	0	4	27	9	201	2	0	3	212	498	
15:15:00	6	1	3	0	6	10	6	250	12	0	3	268	10	0	3	0	11	13	9	193	3	0	1	205	496	
15:30:00	3	0	6	0	6	9	7	247	8	0	3	262	17	3	9	0	4	29	4	174	7	0	0	185	485	
15:45:00	13	2	3	0	4	18	2	283	13	1	4	299	17	1	2	0	13	20	3	188	4	0	2	195	532	2011
16:00:00	9	0	2	0	0	11	6	253	16	0	0	275	7	1	10	0	4	18	6	170	2	0	0	178	482	1995
16:15:00	8	3	4	0	1	15	4	299	10	0	3	313	8	0	6	0	4	14	5	208	3	0	0	216	558	2057
16:30:00	9	1	4	0	4	14	7	304	10	0	6	321	11	2	5	0	9	18	3	212	1	0	2	216	569	2141
16:45:00	2	0	1	0	1	3	2	356	6	0	1	364	7	1	5	0	2	13	5	199	3	0	0	207	587	2196
17:00:00	5	0	2	0	4	7	5	344	9	0	7	358	7	1	10	0	6	18	5	200	3	0	3	208	591	2305
17:15:00	3	3	5	0	2	11	7	384	11	0	0	402	5	0	6	0	1	11	3	204	3	0	1	210	634	2381
17:30:00	2	0	4	0	2	6	3	362	9	0	0	374	5	0	4	0	6	9	4	223	4	0	1	231	620	2432
17:45:00	4	1	3	0	1	8	4	372	11	0	2	387	11	2	7	0	4	20	5	205	4	0	0	214	629	2474
Grand Total	126	18	79	0	65	223	94	5025	173	1	45	5293	259	18	152	0	99	429	147	4767	93	0	21	5007	**10952**	-
Approach%	56.5%	8.1%	35.4%	0%		-	1.8%	94.9%	3.3%	0%		-	60.4%	4.2%	35.4%	0%		-	2.9%	95.2%	1.9%	0%		-	-	-
Totals %	1.2%	0.2%	0.7%	0%		2%	0.9%	45.9%	1.6%	0%		48.3%	2.4%	0.2%	1.4%	0%		3.9%	1.3%	43.5%	0.8%	0%		45.7%	-	-
Heavy	12	1	7	0		-	8	144	2	0		-	5	0	1	0		-	5	145	10	0		-	-	-
Heavy %	9.5%	5.6%	8.9%	0%		-	8.5%	2.9%	1.2%	0%		-	1.9%	0%	0.7%	0%		-	3.4%	3%	10.8%	0%		-	-	-
Bicycles	0	0	0	0		-	0	24	0	0		-	0	1	0	0		-	0	16	0	0		-	-	-
Bicycle %	0%	0%	0%	0%		-	0%	0.5%	0%	0%		-	0%	5.6%	0%	0%		-	0%	0.3%	0%	0%		-	-	-

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

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Toronto ON, CANADA, M4V 1K9

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)

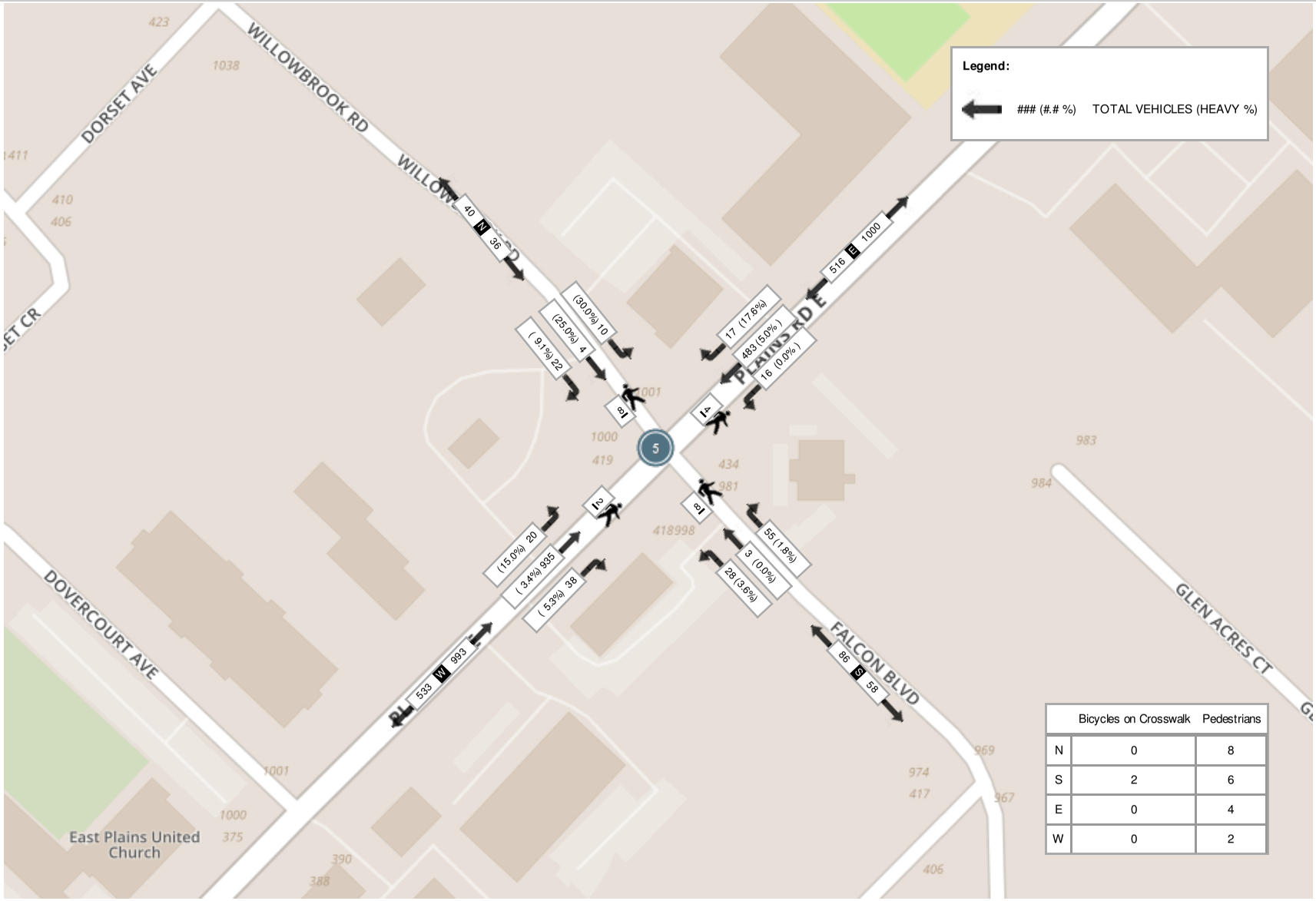
Start Time	N Approach WILLOWBROOK RD						E Approach PLAINS RD						S Approach FALCON BLVD						W Approach PLAINS RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	7	2	3	0	2	12	3	130	3	0	0	136	11	0	8	0	3	19	2	247	5	0	1	254	421
08:00:00	3	0	3	0	2	6	3	127	1	0	1	131	11	1	5	0	3	17	9	249	2	0	0	260	414
08:15:00	7	2	1	0	1	10	3	122	4	0	1	129	21	1	9	0	0	31	11	206	6	0	0	223	393
08:30:00	5	0	3	0	3	8	8	104	8	0	2	120	12	1	6	0	2	19	16	233	7	0	1	256	403
Grand Total	22	4	10	0	8	36	17	483	16	0	4	516	55	3	28	0	8	86	38	935	20	0	2	993	**1631**
Approach%	61.1%	11.1%	27.8%	0%		-	3.3%	93.6%	3.1%	0%		-	64%	3.5%	32.6%	0%		-	3.8%	94.2%	2%	0%		-	-
Totals %	1.3%	0.2%	0.6%	0%		2.2%	1%	29.6%	1%	0%		31.6%	3.4%	0.2%	1.7%	0%		5.3%	2.3%	57.3%	1.2%	0%		60.9%	-
PHF	0.79	0.5	0.83	0		0.75	0.53	0.93	0.5	0		0.95	0.65	0.75	0.78	0		0.69	0.59	0.94	0.71	0		0.95	-
Heavy	2	1	3	0		6	3	24	0	0		27	1	0	1	0		2	2	32	3	0		37	-
Heavy %	9.1%	25%	30%	0%		16.7%	17.6%	5%	0%	0%		5.2%	1.8%	0%	3.6%	0%		2.3%	5.3%	3.4%	15%	0%		3.7%	-
Lights	20	3	7	0		30	14	459	16	0		489	54	3	27	0		84	36	903	17	0		956	-
Lights %	90.9%	75%	70%	0%		83.3%	82.4%	95%	100%	0%		94.8%	98.2%	100%	96.4%	0%		97.7%	94.7%	96.6%	85%	0%		96.3%	-
Single-Unit Trucks	0	0	2	0		2	1	11	0	0		12	0	0	0	0		0	2	15	1	0		18	-
Single-Unit Trucks %	0%	0%	20%	0%		5.6%	5.9%	2.3%	0%	0%		2.3%	0%	0%	0%	0%		0%	5.3%	1.6%	5%	0%		1.8%	-
Buses	1	1	1	0		3	2	13	0	0		15	1	0	1	0		2	0	17	2	0		19	-
Buses %	4.5%	25%	10%	0%		8.3%	11.8%	2.7%	0%	0%		2.9%	1.8%	0%	3.6%	0%		2.3%	0%	1.8%	10%	0%		1.9%	-
Articulated Trucks	1	0	0	0		1	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Articulated Trucks %	4.5%	0%	0%	0%		2.8%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	8	-	-	-	-	-	4	-	-	-	-	-	6	-	-	-	-	-	2	-	-
Pedestrians%	-	-	-	-	36.4%		-	-	-	-	18.2%		-	-	-	-	27.3%		-	-	-	-	9.1%		-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	9.1%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	1	0	0	0	-	0	0	0	0	0	-	0	5	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

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Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)

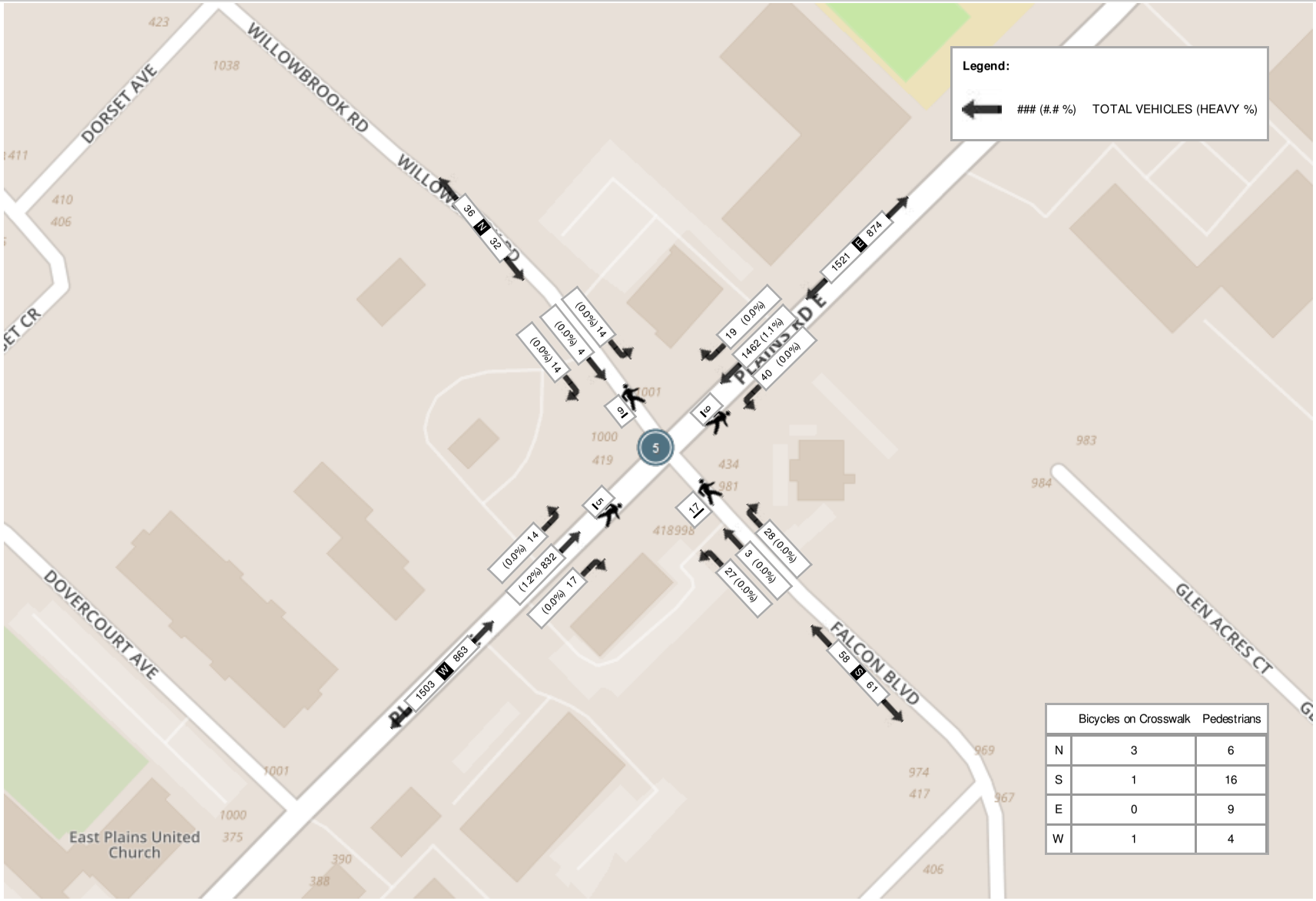
Start Time	N Approach WILLOWBROOK RD						E Approach PLAINS RD						S Approach FALCON BLVD						W Approach PLAINS RD						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:00:00	5	0	2	0	4	7	5	344	9	0	7	358	7	1	10	0	6	18	5	200	3	0	3	208	591
17:15:00	3	3	5	0	2	11	7	384	11	0	0	402	5	0	6	0	1	11	3	204	3	0	1	210	634
17:30:00	2	0	4	0	2	6	3	362	9	0	0	374	5	0	4	0	6	9	4	223	4	0	1	231	620
17:45:00	4	1	3	0	1	8	4	372	11	0	2	387	11	2	7	0	4	20	5	205	4	0	0	214	629
Grand Total	14	4	14	0	9	32	19	1462	40	0	9	1521	28	3	27	0	17	58	17	832	14	0	5	863	**2474**
Approach%	43.8%	12.5%	43.8%	0%		-	1.2%	96.1%	2.6%	0%		-	48.3%	5.2%	46.6%	0%		-	2%	96.4%	1.6%	0%		-	**-**
Totals %	0.6%	0.2%	0.6%	0%		1.3%	0.8%	59.1%	1.6%	0%		61.5%	1.1%	0.1%	1.1%	0%		2.3%	0.7%	33.6%	0.6%	0%		34.9%	**-**
PHF	0.7	0.33	0.7	0		0.73	0.68	0.95	0.91	0		0.95	0.64	0.38	0.68	0		0.73	0.85	0.93	0.88	0		0.93	**-**
Heavy	0	0	0	0		0	0	16	0	0		16	0	0	0	0		0	0	10	0	0		10	**-**
Heavy %	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.2%	**-**
Lights	14	4	14	0		32	19	1446	40	0		1505	28	3	27	0		58	17	822	14	0		853	**-**
Lights %	100%	100%	100%	0%		100%	100%	98.9%	100%	0%		98.9%	100%	100%	100%	0%		100%	100%	98.8%	100%	0%		98.8%	**-**
Single-Unit Trucks	0	0	0	0		0	0	10	0	0		10	0	0	0	0		0	0	4	0	0		4	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.5%	**-**
Buses	0	0	0	0		0	0	6	0	0		6	0	0	0	0		0	0	5	0	0		5	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%		0.1%	**-**
Pedestrians	-	-	-	-	6	-	-	-	-	-	9	-	-	-	-	-	16	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	15%		-	-	-	-	22.5%		-	-	-	-	40%		-	-	-	-	10%		**-**
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	7.5%		-	-	-	-	0%		-	-	-	-	2.5%		-	-	-	-	2.5%		**-**
Bicycles on Road	0	0	0	0	0	-	0	7	0	0	0	-	0	1	0	0	0	-	0	3	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	8
S	2	6
E	0	4
W	0	2

Peak Hour: 05:00 PM - 06:00 PM **Weather: Unknown (21.6 °C)**



	Bicycles on Crosswalk	Pedestrians
N	3	6
S	1	16
E	0	9
W	1	4

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (2 . PLAINS RD E & 484 PLAINS RD E (MAIN ACCESS))

Start Time	E Approach PLAINS RD E					S Approach 484 PLAINS RD E (MAIN ACCESS)					W Approach PLAINS RD E					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	U-Turn W:W	Peds W:	Approach Total		
07:00:00	85	0	0	0	85	0	0	0	3	0	0	158	0	0	158	243	
07:15:00	75	1	0	0	76	3	0	0	0	3	0	211	0	0	211	290	
07:30:00	79	0	0	0	79	0	0	0	1	0	2	249	0	0	251	330	
07:45:00	137	3	0	0	140	1	1	0	2	2	0	279	0	0	279	421	1284
08:00:00	134	0	0	0	134	0	0	0	1	0	0	260	0	0	260	394	1435
08:15:00	142	1	0	0	143	1	4	0	0	5	3	245	0	3	248	396	1541
08:30:00	121	3	0	0	124	1	4	0	3	5	0	260	0	8	260	389	1600
08:45:00	125	3	0	0	128	2	1	0	12	3	1	208	0	11	209	340	1519
09:00:00	158	5	0	2	163	11	8	0	12	19	3	228	0	59	231	413	1538
09:15:00	136	2	0	0	138	2	4	0	2	6	2	201	0	3	203	347	1489
09:30:00	143	2	0	0	145	2	2	0	5	4	5	214	0	1	219	368	1468
09:45:00	136	2	0	0	138	3	2	0	6	5	2	218	0	4	220	363	1491
BREAK																	
15:00:00	243	8	0	0	251	17	21	0	1	38	4	218	0	5	222	511	
15:15:00	268	7	0	0	275	6	8	0	28	14	3	193	0	22	196	485	
15:30:00	247	16	0	0	263	3	8	0	19	11	2	186	0	43	188	462	
15:45:00	298	3	0	0	301	16	13	0	24	29	4	203	0	52	207	537	1995
16:00:00	271	4	0	0	275	2	11	0	3	13	5	186	0	16	191	479	1963
16:15:00	313	4	0	0	317	5	8	0	7	13	2	214	0	7	216	546	2024
16:30:00	325	8	0	0	333	15	12	0	5	27	6	194	0	2	200	560	2122
16:45:00	354	5	0	0	359	4	12	0	1	16	7	213	0	3	220	595	2180
17:00:00	353	7	0	0	360	6	11	0	5	17	5	204	0	7	209	586	2287
17:15:00	402	4	0	0	406	6	8	0	4	14	3	213	0	1	216	636	2377
17:30:00	364	8	0	0	372	5	7	0	7	12	1	232	0	7	233	617	2434

17:45:00	384	5	0	0	389	29	17	0	5	46	5	205	0	1	210	645	2484
Grand Total	5293	101	0	2	5394	140	162	0	156	302	65	5192	0	255	5257	**10953**	-
Approach%	98.1%	1.9%	0%		-	46.4%	53.6%	0%		-	1.2%	98.8%	0%		-	**-**	-
Totals %	48.3%	0.9%	0%		49.2%	1.3%	1.5%	0%		2.8%	0.6%	47.4%	0%		48%	**-**	-
Heavy	170	1	0		-	0	2	0		-	1	167	0		-	**-**	-
Heavy %	3.2%	1%	0%		-	0%	1.2%	0%		-	1.5%	3.2%	0%		-	**-**	-
Bicycles	22	1	0		-	1	0	0		-	0	25	0		-	**-**	-
Bicycle %	0.4%	1%	0%		-	0.7%	0%	0%		-	0%	0.5%	0%		-	**-**	-

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)

Start Time	E Approach PLAINS RD E					S Approach 484 PLAINS RD E (MAIN ACCESS)					W Approach PLAINS RD E					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
07:45:00	137	3	0	0	140	1	1	0	2	2	0	279	0	0	279	421
08:00:00	134	0	0	0	134	0	0	0	1	0	0	260	0	0	260	394
08:15:00	142	1	0	0	143	1	4	0	0	5	3	245	0	3	248	396
08:30:00	121	3	0	0	124	1	4	0	3	5	0	260	0	8	260	389
Grand Total	534	7	0	0	541	3	9	0	6	12	3	1044	0	11	1047	**1600**
Approach%	98.7%	1.3%	0%		-	25%	75%	0%		-	0.3%	99.7%	0%		-	-
Totals %	33.4%	0.4%	0%		33.8%	0.2%	0.6%	0%		0.8%	0.2%	65.3%	0%		65.4%	-
PHF	0.94	0.58	0		0.95	0.75	0.56	0		0.6	0.25	0.94	0		0.94	-
Heavy	33	0	0		33	0	0	0		0	0	36	0		36	-
Heavy %	6.2%	0%	0%		6.1%	0%	0%	0%		0%	0%	3.4%	0%		3.4%	-
Lights	501	7	0		508	3	9	0		12	3	1008	0		1011	-
Lights %	93.8%	100%	0%		93.9%	100%	100%	0%		100%	100%	96.6%	0%		96.6%	-
Single-Unit Trucks	17	0	0		17	0	0	0		0	0	18	0		18	-
Single-Unit Trucks %	3.2%	0%	0%		3.1%	0%	0%	0%		0%	0%	1.7%	0%		1.7%	-
Buses	15	0	0		15	0	0	0		0	0	18	0		18	-
Buses %	2.8%	0%	0%		2.8%	0%	0%	0%		0%	0%	1.7%	0%		1.7%	-
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0.2%	0%	0%		0.2%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	0	-	-	-	-	4	-	-	-	-	9	-	-
Pedestrians%	-	-	-	0%		-	-	-	23.5%		-	-	-	52.9%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	2	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	11.8%		-	-	-	11.8%		-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	8	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)

Start Time	E Approach PLAINS RD E					S Approach 484 PLAINS RD E (MAIN ACCESS)					W Approach PLAINS RD E					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
17:00:00	353	7	0	0	360	6	11	0	5	17	5	204	0	7	209	586
17:15:00	402	4	0	0	406	6	8	0	4	14	3	213	0	1	216	636
17:30:00	364	8	0	0	372	5	7	0	7	12	1	232	0	7	233	617
17:45:00	384	5	0	0	389	29	17	0	5	46	5	205	0	1	210	645
Grand Total	1503	24	0	0	1527	46	43	0	21	89	14	854	0	16	868	**2484**
Approach%	98.4%	1.6%	0%		-	51.7%	48.3%	0%		-	1.6%	98.4%	0%		-	-
Totals %	60.5%	1%	0%		61.5%	1.9%	1.7%	0%		3.6%	0.6%	34.4%	0%		34.9%	-
PHF	0.93	0.75	0		0.94	0.4	0.63	0		0.48	0.7	0.92	0		0.93	-
Heavy	20	0	0		20	0	0	0		0	0	12	0		12	-
Heavy %	1.3%	0%	0%		1.3%	0%	0%	0%		0%	0%	1.4%	0%		1.4%	-
Lights	1483	24	0		1507	46	43	0		89	14	842	0		856	-
Lights %	98.7%	100%	0%		98.7%	100%	100%	0%		100%	100%	98.6%	0%		98.6%	-
Single-Unit Trucks	12	0	0		12	0	0	0		0	0	6	0		6	-
Single-Unit Trucks %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	0%	0.7%	0%		0.7%	-
Buses	6	0	0		6	0	0	0		0	0	6	0		6	-
Buses %	0.4%	0%	0%		0.4%	0%	0%	0%		0%	0%	0.7%	0%		0.7%	-
Articulated Trucks	2	0	0		2	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0.1%	0%	0%		0.1%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	0	-	-	-	-	12	-	-	-	-	8	-	-
Pedestrians%	-	-	-	0%		-	-	-	32.4%		-	-	-	21.6%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	9	-	-	-	-	8	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	24.3%		-	-	-	21.6%		-
Bicycles on Road	7	0	0	0	-	0	0	0	0	-	0	3	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)



	Bicycles on Crosswalk	Pedestrians
S	2	4
E	0	0
W	2	9

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)



	Bicycles on Crosswalk	Pedestrians
S	9	12
E	0	0
W	8	8

Spectrum

Turning Movement Count
Location Name: PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & 516 PLAINS RD E ACCESS / SHOPPERS DRUG MART ACCESS
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (1 . PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & 516 PLAINS RD E ACCESS / SHOPPERS DRUG MART ACCESS)

Start Time	N Approach: PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & SHOP							E Approach: PLAINS RD E							S Approach: PLAIN516 PLAINS RD E ACCESS							SW Approach: 484 PLAINS RD E (EAST ACCESS)							W Approach: PLAINS RD E							Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Bear Right N:SW	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Bear Left E:SW	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	Hard Left S:SW	U-Turn S:S	Peds S:	Approach Total	Hard Right SW:S	Bear Right SW:E	Bear Left SW:N	Hard Left SW:W	U-Turn SW:SW	Peds SW:	Approach Total	Hard Right W:SW	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	1	0	0	2	0	0	3	3	85	0	0	0	1	88	0	0	0	0	0	3	0	0	1	0	0	0	3	1	0	0	157	1	0	0	158	250	
07:15:00	1	0	0	1	0	2	2	0	75	0	0	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	212	2	0	0	214	291	
07:30:00	0	0	0	2	0	0	2	3	76	0	0	0	0	79	1	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	248	0	0	0	248	330	
07:45:00	0	0	0	1	0	1	1	4	137	0	0	0	0	141	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	280	2	0	0	282	424	1295
08:00:00	3	0	0	4	0	2	7	8	128	0	0	0	0	136	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	258	3	0	0	261	404	1449
08:15:00	4	0	0	3	0	0	7	5	135	0	0	0	0	140	2	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	235	5	0	0	240	390	1548
08:30:00	4	0	0	3	0	2	7	6	119	3	0	0	0	128	1	0	0	0	0	3	1	0	0	0	0	0	3	0	1	0	248	7	0	0	256	392	1610
08:45:00	4	0	0	7	0	2	11	10	125	2	0	0	0	137	1	0	0	0	0	8	1	0	0	0	0	0	7	0	0	2	203	4	0	0	209	358	1544
09:00:00	7	0	0	6	0	8	13	9	163	2	1	0	0	175	4	0	0	0	0	4	4	0	3	0	0	0	10	3	0	1	224	10	0	0	235	430	1570
09:15:00	5	0	0	6	0	4	11	13	127	2	0	0	0	142	3	0	1	0	0	1	4	0	1	0	0	0	1	1	1	1	188	9	0	0	199	357	1537
09:30:00	13	0	0	9	0	0	22	12	134	1	0	0	0	147	1	0	2	0	0	4	3	0	0	0	0	0	3	0	1	0	200	7	0	2	208	380	1525
09:45:00	4	0	0	5	0	2	9	8	131	4	0	0	0	143	0	1	0	0	0	6	1	0	1	0	1	0	6	2	0	3	208	6	0	0	217	372	1539
BREAK																																					
15:00:00	10	0	0	8	0	7	18	23	233	2	5	0	1	263	5	0	0	0	0	2	5	0	2	0	0	0	0	2	1	6	222	6	0	0	235	523	
15:15:00	21	0	0	7	0	7	28	13	241	5	3	0	0	262	2	0	1	0	0	28	3	0	1	0	0	0	28	1	0	5	190	6	0	2	201	495	
15:30:00	11	0	0	2	0	7	13	14	247	5	2	0	0	268	3	1	1	0	0	5	5	0	2	0	0	0	5	2	0	1	182	4	0	1	187	475	
15:45:00	16	0	0	8	0	10	24	10	262	2	3	0	0	277	5	0	1	0	0	14	6	0	1	0	0	0	14	1	0	4	210	6	0	0	220	528	2021
16:00:00	17	0	0	11	0	1	28	20	259	0	3	0	0	282	1	0	2	0	0	8	3	0	3	0	1	0	6	4	1	4	187	3	0	0	195	512	2010
16:15:00	21	0	0	2	0	0	23	22	301	4	1	0	0	328	3	0	2	0	0	3	5	0	1	0	0	0	3	1	0	3	200	6	0	0	209	566	2081
16:30:00	12	0	0	11	0	4	23	16	321	4	2	0	0	343	5	0	1	0	0	3	6	0	2	0	0	0	3	2	1	1	215	6	0	1	223	597	2203
16:45:00	13	0	0	6	0	2	19	12	339	1	5	0	0	357	3	0	1	0	0	2	4	0	1	0	0	0	2	1	0	1	213	6	0	0	220	601	2276
17:00:00	12	0	0	3	0	3	15	13	355	3	1	0	0	372	2	0	2	0	0	3	4	0	1	0	0	0	5	1	0	2	210	4	0	0	216	608	2372
17:15:00	12	1	0	6	0	1	19	14	384	1	1	0	0	400	7	0	0	0	0	10	7	0	1	0	0	0	7	1	0	2	206	8	0	0	216	643	2449
17:30:00	23	0	0	7	0	0	30	13	354	4	0	0	0	371	2	0	0	0	0	7	2	0	0	0	0	0	7	0	0	5	219	6	0	0	230	633	2485
17:45:00	6	1	0	6	0	1	13	11	371	2	0	0	0	384	3	0	4	0	0	5	7	0	1	0	1	0	4	2	1	2	231	8	0	0	242	648	2532
Grand Total	220	2	0	126	0	66	348	262	5102	47	27	0	2	5438	54	2	19	0	0	123	75	0	22	0	3	0	121	25	7	43	5146	125	0	6	5321	**11207**	-
Approach%	63.2%	0.6%	0%	36.2%	0%		-	4.8%	93.8%	0.9%	0.5%	0%		-	72%	2.7%	25.3%	0%	0%		-	0%	88%	0%	12%	0%		-	0.1%	0.8%	96.7%	2.3%	0%		-	-	-
Totals %	2%	0%	0%	1.1%	0%		3.1%	2.3%	45.5%	0.4%	0.2%	0%		48.5%	0.5%	0%	0.2%	0%	0%		0.7%	0%	0.2%	0%	0%	0%		0.2%	0.1%	0.4%	45.9%	1.1%	0%		47.5%	-	-
Heavy	0	0	0	1	0		-	2	150	0	0	0		-	1	0	0	0	0		-	0	0	0	0	0		-	0	0	167	0	0		-	-	-
Heavy %	0%	0%	0%	0.8%	0%		-	0.8%	2.9%	0%	0%	0%		-	1.9%	0%	0%	0%	0%		-	0%	0%	0%	0%	0%		-	0%	0%	3.2%	0%	0%		-	-	-
Bicycles	1	0	1	0	0		-	0	22	0	0	0		-	0	0	0	0	0		-	0	1	0	0	0		-	0	0	25	0	0		-	-	-
Bicycle %	0.5%	0%	0%	0%	0%		-	0%	0.4%	0%	0%	0%		-	0%	0%	0%	0%	0%		-	0%	4.5%	0%	0%	0%		-	0%	0%	0.5%	0%	0%		-	-	-

Spectrum

Turning Movement Count
Location Name: PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & 516 PLAINS RD E ACCESS / SHOPPERS DRUG MART ACCESS
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)

Start Time	N Approach: PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & SHOP							E Approach: PLAINS RD E							S Approach: PLAIN516 PLAINS RD E ACCESS							SW Approach: 484 PLAINS RD E (EAST ACCESS)							W Approach: PLAINS RD E							Int. Total (15 min)
	Right	Bear Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Bear Left	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	Hard Left	U-Turn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Peds	Approach Total	Hard Right	Right	Thru	Left	U-Turn	Peds	Approach Total	
07:45:00	0	0	0	1	0	1	1	4	137	0	0	0	0	141	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	280	2	0	0	282	424
08:00:00	3	0	0	4	0	2	7	8	128	0	0	0	0	136	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	258	3	0	0	261	404
08:15:00	4	0	0	3	0	0	7	5	135	0	0	0	0	140	2	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	235	5	0	0	240	390
08:30:00	4	0	0	3	0	2	7	6	119	3	0	0	0	128	1	0	0	0	0	3	1	0	0	0	0	0	3	0	1	0	248	7	0	0	256	392
Grand Total	11	0	0	11	0	5	22	23	519	3	0	0	0	545	3	0	1	0	0	6	4	0	0	0	0	0	6	0	1	0	1021	17	0	0	1039	**1610**
Approach%	50%	0%	0%	50%	0%		-	4.2%	95.2%	0.6%	0%	0%		-	75%	0%	25%	0%	0%		-	0%	0%	0%	0%	0%		-	0.1%	0%	98.3%	1.6%	0%		-	**-**
Totals %	0.7%	0%	0%	0.7%	0%		1.4%	1.4%	32.2%	0.2%	0%	0%		33.9%	0.2%	0%	0.1%	0%	0%		0.2%	0%	0%	0%	0%	0%		0%	0.1%	0%	63.4%	1.1%	0%		64.5%	**-**
PHF	0.69	0	0	0.69	0		0.79	0.72	0.95	0.25	0	0		0.97	0.38	0	0.25	0	0		0.33	0	0	0	0	0		0	0.25	0	0.91	0.61	0		0.92	**-**
Heavy	0	0	0	0	0		0	0	28	0	0	0		28	0	0	0	0	0		0	0	0	0	0	0		0	0	0	39	0	0		39	**-**
Heavy %	0%	0%	0%	0%	0%		0%	0%	5.4%	0%	0%	0%		5.1%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	3.8%	0%	0%		3.8%	**-**
Lights	11	0	0	11	0		22	23	491	3	0	0		517	3	0	1	0	0		4	0	0	0	0	0		0	1	0	982	17	0		1000	**-**
Lights %	100%	0%	0%	100%	0%		100%	100%	94.6%	100%	0%	0%		94.9%	100%	0%	100%	0%	0%		100%	0%	0%	0%	0%	0%		0%	100%	0%	96.2%	100%	0%		96.2%	**-**
Single-Unit Trucks	0	0	0	0	0		0	0	13	0	0	0		13	0	0	0	0	0		0	0	0	0	0	0		0	0	0	20	0	0		20	**-**
Single-Unit Trucks %	0%	0%	0%	0%	0%		0%	0%	2.5%	0%	0%	0%		2.4%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	2%	0%	0%		1.9%	**-**
Buses	0	0	0	0	0		0	0	14	0	0	0		14	0	0	0	0	0		0	0	0	0	0	0		0	0	0	19	0	0		19	**-**
Buses %	0%	0%	0%	0%	0%		0%	0%	2.7%	0%	0%	0%		2.6%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	1.9%	0%	0%		1.8%	**-**
Articulated Trucks	0	0	0	0	0		0	0	1	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%	0%		0.2%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	-	0	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	-	23.5%		-	-	-	-	-	0%		-	-	-	-	-	11.8%		-	-	-	-	-	11.8%		-	-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	4	-	-	-	-	-	-	4	-	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	-	5.9%		-	-	-	-	-	0%		-	-	-	-	-	23.5%		-	-	-	-	-	23.5%		-	-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	8	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & 516 PLAINS RD E ACCESS / SHOPPERS DRUG MART ACCESS
Date: Wed, Jun 07, 2017 Deployment Lead: Walter Fugaj

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)

Start Time	N Approach PLAINS RD E / 484 PLAINS RD E (EAST ACCESS) & SHOP							E Approach PLAINS RD E							S Approach PLAIN516 PLAINS RD E ACCESS							SW Approach 484 PLAINS RD E (EAST ACCESS)							W Approach PLAINS RD E							Int. Total (15 min)
	Right	Bear Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Bear Left	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	Hard Left	U-Turn	Peds	Approach Total	Hard Right	Bear Right	Bear Left	Hard Left	U-Turn	Peds	Approach Total	Hard Right	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:00:00	12	0	0	3	0	3	15	13	355	3	1	0	0	372	2	0	2	0	0	3	4	0	1	0	0	0	5	1	0	2	210	4	0	0	216	608
17:15:00	12	1	0	6	0	1	19	14	384	1	1	0	0	400	7	0	0	0	0	10	7	0	1	0	0	0	7	1	0	2	206	8	0	0	216	643
17:30:00	23	0	0	7	0	0	30	13	354	4	0	0	0	371	2	0	0	0	0	7	2	0	0	0	0	0	7	0	0	5	219	6	0	0	230	633
17:45:00	6	1	0	6	0	1	13	11	371	2	0	0	0	384	3	0	4	0	0	5	7	0	1	0	1	0	4	2	1	2	231	8	0	0	242	648
Grand Total	53	2	0	22	0	5	77	51	1464	10	2	0	0	1527	14	0	6	0	0	25	20	0	3	0	1	0	23	4	1	11	866	26	0	0	904	**2532**
Approach%	68.8%	2.6%	0%	28.6%	0%		-	3.3%	95.9%	0.7%	0.1%	0%		-	70%	0%	30%	0%	0%		-	0%	75%	0%	25%	0%		-	0.1%	1.2%	95.8%	2.9%	0%		-	-
Totals %	2.1%	0.1%	0%	0.9%	0%		3%	2%	57.8%	0.4%	0.1%	0%		60.3%	0.6%	0%	0.2%	0%	0%		0.8%	0%	0.1%	0%	0%	0%		0.2%	0%	0.4%	34.2%	1%	0%		35.7%	-
PHF	0.58	0.5	0	0.79	0		0.64	0.91	0.95	0.63	0.5	0		0.95	0.5	0	0.38	0	0		0.71	0	0.75	0	0.25	0		0.5	0.25	0.55	0.94	0.81	0		0.93	-
Heavy	0	0	0	0	0		0	0	18	0	0	0		18	0	0	0	0	0		0	0	0	0	0	0		0	0	0	12	0	0		12	-
Heavy %	0%	0%	0%	0%	0%		0%	0%	1.2%	0%	0%	0%		1.2%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	1.4%	0%	0%		1.3%	-
Lights	53	2	0	22	0		77	51	1446	10	2	0		1509	14	0	6	0	0		20	0	3	0	1	0		4	1	11	854	26	0		892	-
Lights %	100%	100%	0%	100%	0%		100%	100%	98.8%	100%	100%	0%		98.8%	100%	0%	100%	0%	0%		100%	0%	100%	0%	100%	0%		100%	100%	100%	98.6%	100%	0%		98.7%	-
Single-Unit Trucks	0	0	0	0	0		0	0	10	0	0	0		10	0	0	0	0	0		0	0	0	0	0	0		0	0	0	7	0	0		7	-
Single-Unit Trucks %	0%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%	0%		0.7%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0.8%	0%	0%		0.8%	-
Buses	0	0	0	0	0		0	0	7	0	0	0		7	0	0	0	0	0		0	0	0	0	0	0		0	0	0	4	0	0		4	-
Buses %	0%	0%	0%	0%	0%		0%	0%	0.5%	0%	0%	0%		0.5%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0.5%	0%	0%		0.4%	-
Articulated Trucks	0	0	0	0	0		0	0	1	0	0	0		1	0	0	0	0	0		0	0	0	0	0	0		0	0	0	1	0	0		1	-
Articulated Trucks %	0%	0%	0%	0%	0%		0%	0%	0.1%	0%	0%	0%		0.1%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%		0%	0%	0%	0.1%	0%	0%		0.1%	-
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	-	0	-	-	-	-	-	-	21	-	-	-	-	-	-	16	-	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	-	7.5%		-	-	-	-	-	0%		-	-	-	-	-	39.6%		-	-	-	-	-	30.2%		-	-	-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	4	-	-	-	-	-	-	7	-	-	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	-	-	1.9%		-	-	-	-	-	0%		-	-	-	-	-	7.5%		-	-	-	-	-	13.2%		-	-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	0	-	0	7	0	0	0	0	-	0	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	3	0	0	0	-	-
Bicycles on Road%	-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-	-	-	-	-	0%		-

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

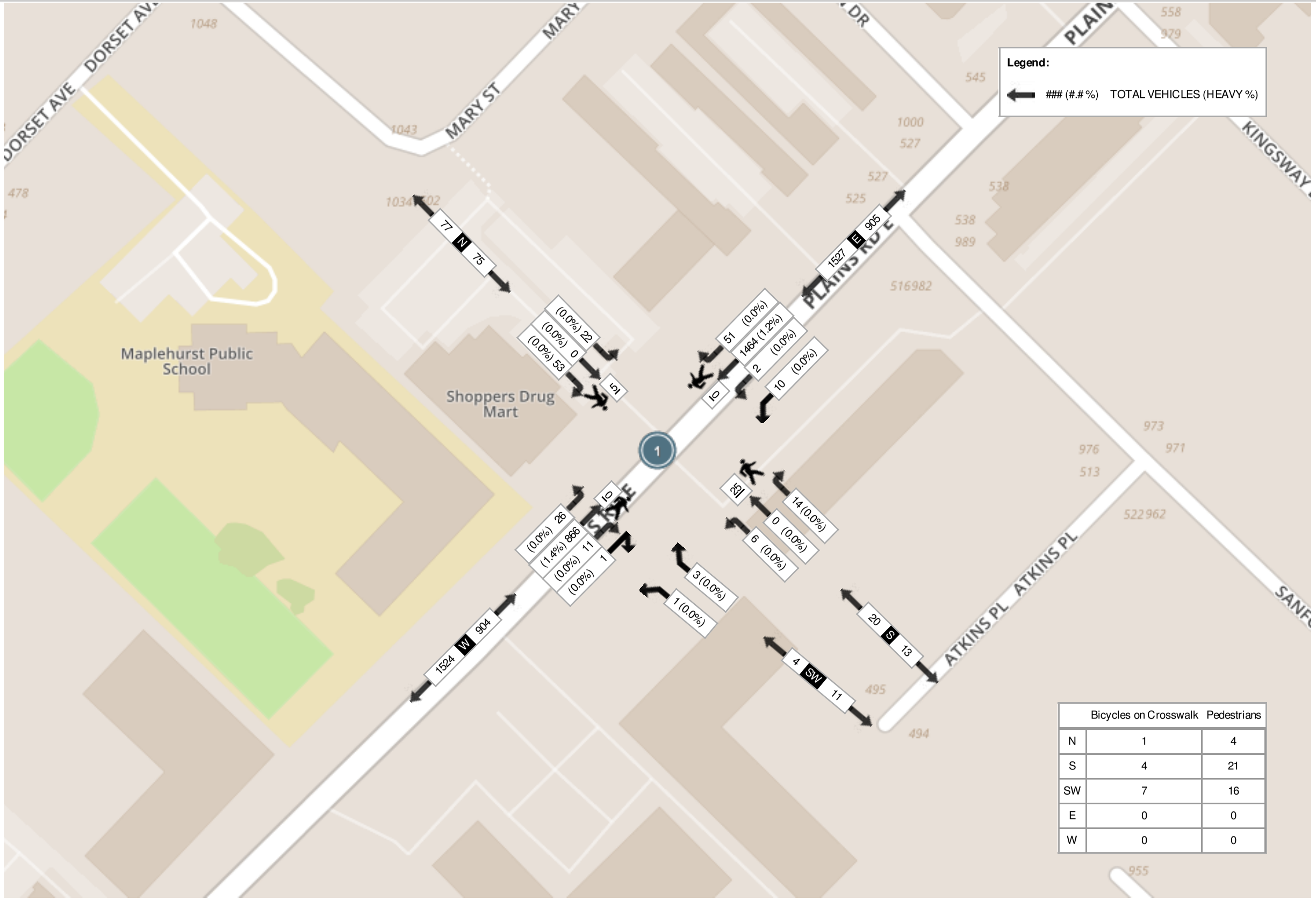
Peak Hour: 07:45 AM - 08:45 AM   Weather: Unknown (10.8 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	4
S	4	2
SW	4	2
E	0	0
W	0	0

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	4
S	4	21
SW	7	16
E	0	0
W	0	0

BA Group
45 St. Clair Avenue West, Suite 300
Toronto ON, CANADA, M4V 1K9

Turning Movement Count (3 . PLAINS RD E & 484 PLAINS RD E (WEST ACCESS))

Start Time	E Approach PLAINS RD E					S Approach PLAINS RD E					W Approach 484 PLAINS RD E (WEST ACCESS)					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	U-Turn W:W	Peds W:	Approach Total		
07:00:00	92	0	0	0	92	0	0	0	3	0	2	160	0	0	162	254	
07:15:00	75	0	0	0	75	0	0	0	0	0	2	212	0	0	214	289	
07:30:00	77	0	0	0	77	0	0	0	1	0	0	252	0	0	252	329	
07:45:00	141	0	0	0	141	1	0	0	2	1	0	275	0	0	275	417	1289
08:00:00	132	0	0	0	132	0	0	0	2	0	1	256	0	0	257	389	1424
08:15:00	139	0	0	0	139	0	0	0	2	0	2	251	0	0	253	392	1527
08:30:00	127	0	0	0	127	0	1	0	2	1	4	261	0	0	265	393	1591
08:45:00	125	1	1	0	127	0	1	0	6	1	5	213	0	0	218	346	1520
09:00:00	170	0	0	0	170	0	1	0	8	1	11	228	0	0	239	410	1541
09:15:00	133	0	0	0	133	0	0	0	2	0	3	199	0	0	202	335	1484
09:30:00	149	1	0	1	150	0	0	0	6	0	3	217	0	0	220	370	1461
09:45:00	135	0	0	0	135	0	0	0	5	0	2	219	0	0	221	356	1471
BREAK																	
15:00:00	259	1	0	0	260	1	0	0	7	1	8	223	0	0	231	492	
15:15:00	271	0	0	0	271	0	0	0	10	0	8	200	0	0	208	479	
15:30:00	266	0	0	0	266	0	0	0	10	0	15	189	0	0	204	470	
15:45:00	306	0	1	0	307	1	0	0	6	1	2	206	0	0	208	516	1957
16:00:00	287	0	0	0	287	0	0	0	10	0	4	187	0	0	191	478	1943
16:15:00	323	0	0	0	323	0	0	0	6	0	3	222	0	0	225	548	2012
16:30:00	327	0	0	0	327	0	0	0	9	0	7	207	0	0	214	541	2083
16:45:00	365	0	0	0	365	0	0	0	0	0	6	217	0	1	223	588	2155
17:00:00	367	0	0	0	367	0	0	0	8	0	5	212	0	0	217	584	2261
17:15:00	409	0	1	0	410	0	0	0	3	0	4	218	0	0	222	632	2345
17:30:00	381	0	0	1	381	2	0	0	3	2	5	226	0	0	231	614	2418

17:45:00	392	0	0	0	392	0	0	0	7	0	7	213	0	0	220	612	2442
Grand Total	5448	3	3	2	5454	5	3	0	118	8	109	5263	0	1	5372	**10834**	-
Approach%	99.9%	0.1%	0.1%		-	62.5%	37.5%	0%		-	2%	98%	0%		-	**-**	-
Totals %	50.3%	0%	0%		50.3%	0%	0%	0%		0.1%	1%	48.6%	0%		49.6%	**-**	-
Heavy	151	0	0		-	0	0	0		-	0	171	0		-	**-**	-
Heavy %	2.8%	0%	0%		-	0%	0%	0%		-	0%	3.2%	0%		-	**-**	-
Bicycles	26	0	0		-	0	0	0		-	1	24	0		-	**-**	-
Bicycle %	0.5%	0%	0%		-	0%	0%	0%		-	0.9%	0.5%	0%		-	**-**	-

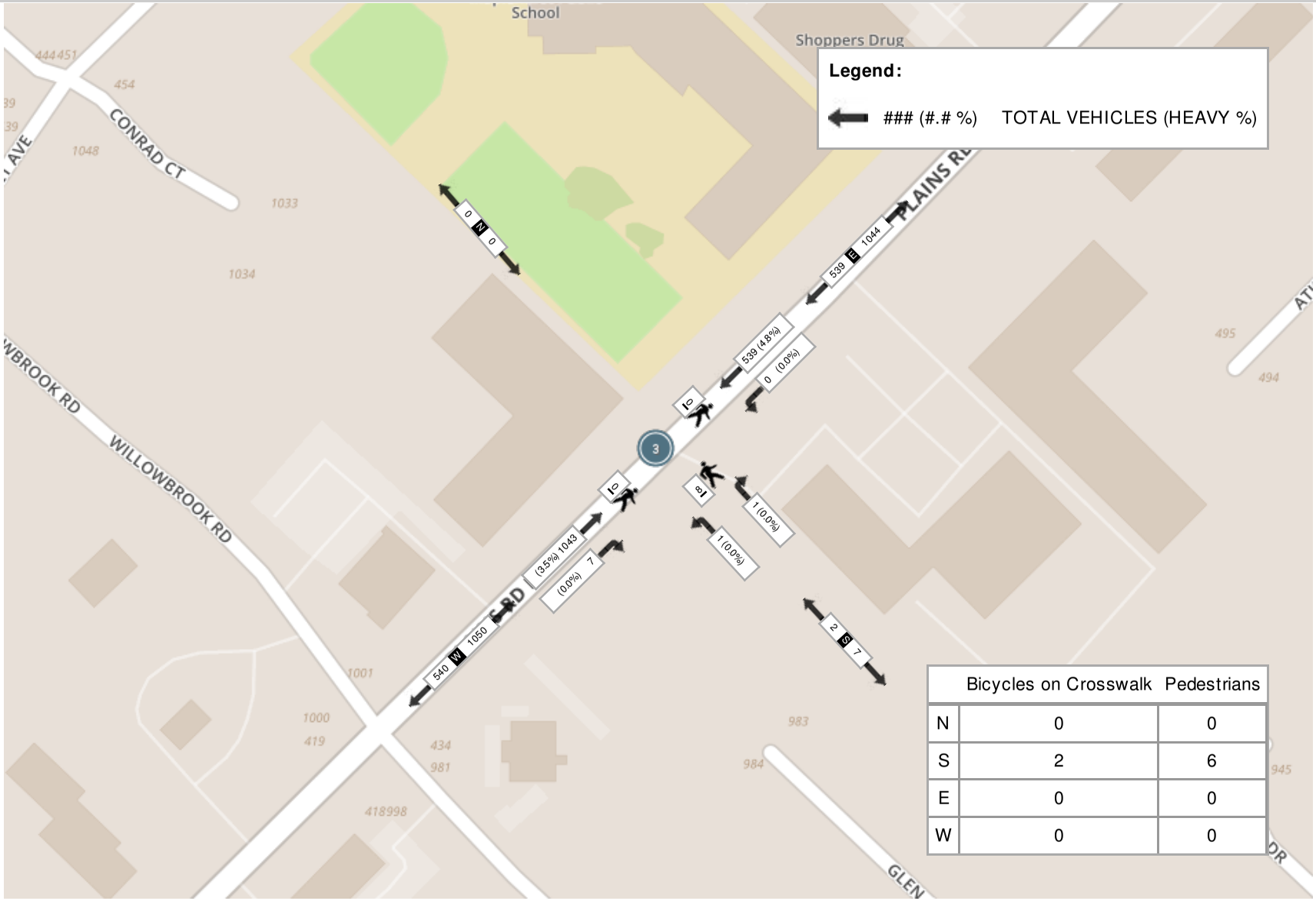
Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)

Start Time	E Approach PLAINS RD E					S Approach PLAINS RD E					W Approach 484 PLAINS RD E (WEST ACCESS)					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
07:45:00	141	0	0	0	141	1	0	0	2	1	0	275	0	0	275	417
08:00:00	132	0	0	0	132	0	0	0	2	0	1	256	0	0	257	389
08:15:00	139	0	0	0	139	0	0	0	2	0	2	251	0	0	253	392
08:30:00	127	0	0	0	127	0	1	0	2	1	4	261	0	0	265	393
Grand Total	539	0	0	0	539	1	1	0	8	2	7	1043	0	0	1050	**1591**
Approach%	100%	0%	0%		-	50%	50%	0%		-	0.7%	99.3%	0%		-	-
Totals %	33.9%	0%	0%		33.9%	0.1%	0.1%	0%		0.1%	0.4%	65.6%	0%		66%	-
PHF	0.96	0	0		0.96	0.25	0.25	0		0.5	0.44	0.95	0		0.95	-
Heavy	26	0	0		26	0	0	0		0	0	37	0		37	-
Heavy %	4.8%	0%	0%		4.8%	0%	0%	0%		0%	0%	3.5%	0%		3.5%	-
Lights	513	0	0		513	1	1	0		2	7	1006	0		1013	-
Lights %	95.2%	0%	0%		95.2%	100%	100%	0%		100%	100%	96.5%	0%		96.5%	-
Single-Unit Trucks	12	0	0		12	0	0	0		0	0	20	0		20	-
Single-Unit Trucks %	2.2%	0%	0%		2.2%	0%	0%	0%		0%	0%	1.9%	0%		1.9%	-
Buses	13	0	0		13	0	0	0		0	0	17	0		17	-
Buses %	2.4%	0%	0%		2.4%	0%	0%	0%		0%	0%	1.6%	0%		1.6%	-
Articulated Trucks	1	0	0		1	0	0	0		0	0	0	0		0	-
Articulated Trucks %	0.2%	0%	0%		0.2%	0%	0%	0%		0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
Pedestrians%	-	-	-	0%		-	-	-	75%		-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	25%		-	-	-	0%		-
Bicycles on Road	1	0	0	0	-	0	0	0	0	-	0	8	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)

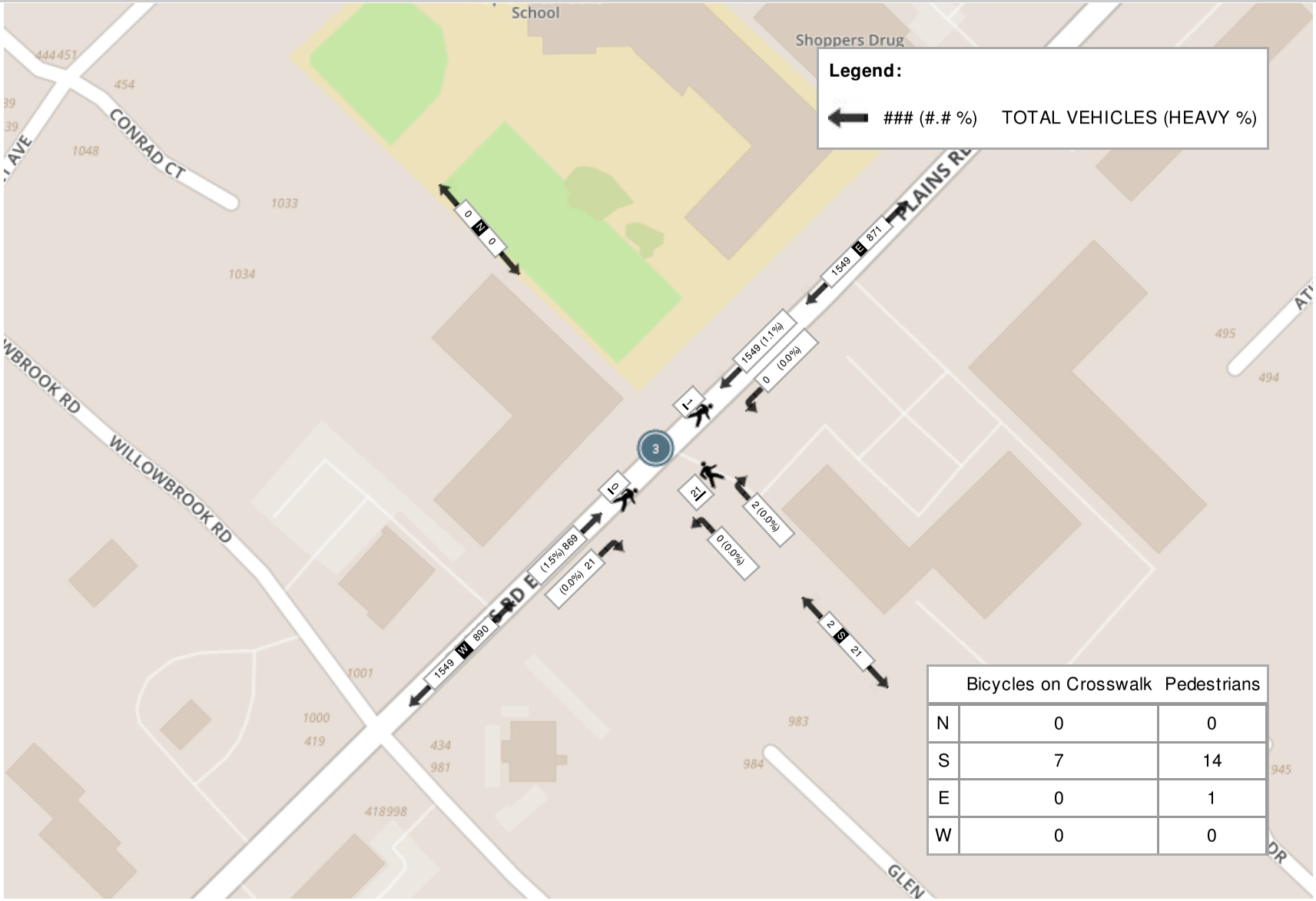
Start Time	E Approach PLAINS RD E					S Approach PLAINS RD E					W Approach 484 PLAINS RD E (WEST ACCESS)					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
17:00:00	367	0	0	0	367	0	0	0	8	0	5	212	0	0	217	584
17:15:00	409	0	1	0	410	0	0	0	3	0	4	218	0	0	222	632
17:30:00	381	0	0	1	381	2	0	0	3	2	5	226	0	0	231	614
17:45:00	392	0	0	0	392	0	0	0	7	0	7	213	0	0	220	612
Grand Total	1549	0	1	1	1550	2	0	0	21	2	21	869	0	0	890	**2442**
Approach%	99.9%	0%	0.1%		-	100%	0%	0%		-	2.4%	97.6%	0%		-	-
Totals %	63.4%	0%	0%		63.5%	0.1%	0%	0%		0.1%	0.9%	35.6%	0%		36.4%	-
PHF	0.95	0	0.25		0.95	0.25	0	0		0.25	0.75	0.96	0		0.96	-
Heavy	17	0	0		17	0	0	0		0	0	13	0		13	-
Heavy %	1.1%	0%	0%		1.1%	0%	0%	0%		0%	0%	1.5%	0%		1.5%	-
Lights	1532	0	1		1533	2	0	0		2	21	856	0		877	-
Lights %	98.9%	0%	100%		98.9%	100%	0%	0%		100%	100%	98.5%	0%		98.5%	-
Single-Unit Trucks	12	0	0		12	0	0	0		0	0	7	0		7	-
Single-Unit Trucks %	0.8%	0%	0%		0.8%	0%	0%	0%		0%	0%	0.8%	0%		0.8%	-
Buses	5	0	0		5	0	0	0		0	0	5	0		5	-
Buses %	0.3%	0%	0%		0.3%	0%	0%	0%		0%	0%	0.6%	0%		0.6%	-
Articulated Trucks	0	0	0		0	0	0	0		0	0	1	0		1	-
Articulated Trucks %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0.1%	0%		0.1%	-
Pedestrians	-	-	-	1	-	-	-	-	14	-	-	-	-	0	-	-
Pedestrians%	-	-	-	4.5%		-	-	-	63.6%		-	-	-	0%		-
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	7	-	-	-	-	0	-	-
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	31.8%		-	-	-	0%		-
Bicycles on Road	9	0	0	0	-	0	0	0	0	-	0	3	0	0	-	-
Bicycles on Road%	-	-	-	0%		-	-	-	0%		-	-	-	0%		-

Peak Hour: 07:45 AM - 08:45 AM Weather: Unknown (10.8 °C)



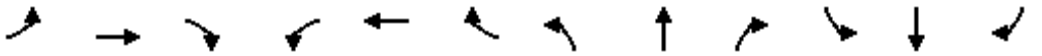
	Bicycles on Crosswalk	Pedestrians
N	0	0
S	2	6
E	0	0
W	0	0

Peak Hour: 05:00 PM - 06:00 PM Weather: Unknown (21.6 °C)



	Bicycles on Crosswalk	Pedestrians
N	0	0
S	7	14
E	0	1
W	0	0

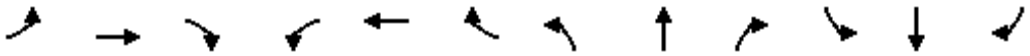
APPENDIX C:
Synchro Analysis Worksheets – Existing Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	795	95	30	330	150	175	190	65	185	65	60
Future Volume (vph)	130	795	95	30	330	150	175	190	65	185	65	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1764	3433	1471	1732	3197		1731	1753		1729	1842	1472
Flt Permitted	0.40	1.00	1.00	0.27	1.00		0.71	1.00		0.34	1.00	1.00
Satd. Flow (perm)	744	3433	1471	487	3197		1285	1753		613	1842	1472
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	837	100	32	347	158	184	200	68	195	68	63
RTOR Reduction (vph)	0	0	52	0	52	0	0	12	0	0	0	34
Lane Group Flow (vph)	137	837	48	32	453	0	184	256	0	195	68	29
Confl. Peds. (#/hr)	7		4	4		7	2		13	13		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	4%	3%	3%	6%	4%	3%	2%	3%	3%	2%	7%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	54.1	48.1	48.1	49.3	45.7		29.2	18.2		28.8	18.0	45.7
Effective Green, g (s)	56.1	49.1	49.1	51.3	46.7		31.2	19.2		30.8	19.0	46.7
Actuated g/C Ratio	0.55	0.48	0.48	0.50	0.46		0.31	0.19		0.30	0.19	0.46
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	480	1657	710	301	1468		446	330		315	344	675
v/s Ratio Prot	c0.02	c0.24		0.00	0.14		0.05	c0.15		c0.07	0.04	
v/s Ratio Perm	0.14		0.03	0.05			0.08			0.12		0.02
v/c Ratio	0.29	0.51	0.07	0.11	0.31		0.41	0.78		0.62	0.20	0.04
Uniform Delay, d1	11.4	18.0	14.1	13.2	17.3		27.3	39.2		28.3	34.9	15.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	1.1	0.2	0.2	0.5		0.6	10.8		3.6	0.3	0.1
Delay (s)	11.7	19.1	14.2	13.4	17.9		28.0	50.0		31.9	35.2	15.3
Level of Service	B	B	B	B	B		C	D		C	D	B
Approach Delay (s)		17.7			17.6			41.1			29.4	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	72.6%	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 (vph)	20	990	40	15	515	15	30	5	55	10	5	20
Future Volume (vph)	20	990	40	15	515	15	30	5	55	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1536	3437		1777	3370			1625			1439	
Flt Permitted	0.45	1.00		0.26	1.00			0.87			0.90	
Satd. Flow (perm)	724	3437		477	3370			1445			1308	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	1021	41	15	531	15	31	5	57	10	5	21
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	19	0
Lane Group Flow (vph)	21	1060	0	15	545	0	0	41	0	0	17	0
Confl. Peds. (#/hr)	8		8	8		8	2		4	4		2
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	15%	3%	5%	0%	5%	18%	4%	0%	2%	30%	25%	9%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	69.8	69.8		69.8	69.8			7.4			7.4	
Effective Green, g (s)	70.8	70.8		70.8	70.8			8.4			8.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	568	2697		374	2645			134			121	
v/s Ratio Prot		c0.31			0.16							
v/s Ratio Perm	0.03			0.03				c0.03			0.01	
v/c Ratio	0.04	0.39		0.04	0.21			0.31			0.14	
Uniform Delay, d1	2.1	3.0		2.2	2.5			38.2			37.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.4		0.2	0.2			1.3			0.5	
Delay (s)	2.3	3.4		2.4	2.7			39.5			38.1	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.4			2.7			39.5			38.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1050	5	0	545	0	0
Future Volume (Veh/h)	1050	5	0	545	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1105	5	0	574	0	0
Pedestrians					8	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.91		0.92	0.91
vC, conflicting volume			1118		1402	563
vC1, stage 1 conf vol					1116	
vC2, stage 2 conf vol					287	
vCu, unblocked vol			928		1164	317
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			672		303	618

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	737	373	0	287	287	0
Volume Left	0	0	0	0	0	0
Volume Right	0	5	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.43	0.22	0.00	0.17	0.17	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

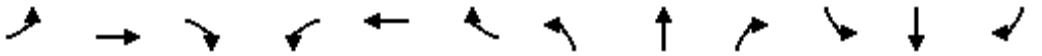
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1045	5	5	535	10	5
Future Volume (vph)	1045	5	5	535	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3464			3354	1785	1597
Flt Permitted	1.00			0.95	0.95	1.00
Satd. Flow (perm)	3464			3179	1785	1597
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1100	5	5	563	11	5
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	1105	0	0	568	11	4
Confl. Peds. (#/hr)		6	6		11	
Confl. Bikes (#/hr)		8				
Heavy Vehicles (%)	3%	0%	0%	6%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	73.4			73.4	1.4	73.4
Effective Green, g (s)	74.4			74.4	2.4	74.4
Actuated g/C Ratio	0.85			0.85	0.03	0.85
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2935			2693	48	1353
v/s Ratio Prot	c0.32				c0.01	
v/s Ratio Perm				0.18		0.00
v/c Ratio	0.38			0.21	0.23	0.00
Uniform Delay, d1	1.5			1.2	41.8	1.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.2	2.4	0.0
Delay (s)	1.9			1.4	44.2	1.0
Level of Service	A			A	D	A
Approach Delay (s)	1.9			1.4	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
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	1025	0	0	535	25	0	0	5	10	0	10
Future Volume (Veh/h)	15	1025	0	0	535	25	0	0	5	10	0	10
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	1079	0	0	563	26	0	0	5	11	0	11
Pedestrians								6			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	594			1085			1410	1711	546	1158	1698	300
vC1, stage 1 conf vol							1117	1117		581	581	
vC2, stage 2 conf vol							292	594		576	1117	
vCu, unblocked vol	594			937			1287	1612	356	1015	1598	300
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 %	98			100			100	100	99	97	100	98
cM capacity (veh/h)	988			683			238	263	597	386	266	700

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	556	540	375	214	5	11	11
Volume Left	16	0	0	0	0	11	0
Volume Right	0	0	0	26	5	0	11
cSH	988	1700	1700	1700	597	386	700
Volume to Capacity	0.02	0.32	0.22	0.13	0.01	0.03	0.02
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.2	0.7	0.4
Control Delay (s)	0.5	0.0	0.0	0.0	11.1	14.6	10.2
Lane LOS	A				B	B	B
Approach Delay (s)	0.2		0.0		11.1	12.4	
Approach LOS					B	B	

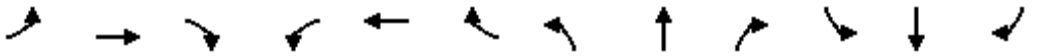
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	52.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1050	0	5	540	0	0
Future Volume (Veh/h)	1050	0	5	540	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1105	0	5	568	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			1105		1399	552
vC1, stage 1 conf vol					1105	
vC2, stage 2 conf vol					294	
vCu, unblocked vol			956		1273	361
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 %			99		100	100
cM capacity (veh/h)			674		297	595

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	737	368	194	379	0
Volume Left	0	0	5	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	674	1700	1700
Volume to Capacity	0.43	0.22	0.01	0.22	0.00
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	0.4	0.0	0.0
Lane LOS			A		A
Approach Delay (s)	0.0		0.1		0.0
Approach LOS					A

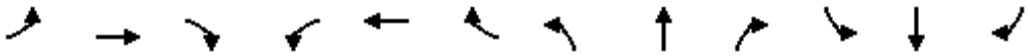
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	695	115	125	1310	165	195	140	60	265	220	165
Future Volume (vph)	80	695	115	125	1310	165	195	140	60	265	220	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	0.99		1.00	0.98		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3535	1426	1744	3443		1761	1713		1754	1879	1549
Flt Permitted	0.07	1.00	1.00	0.29	1.00		0.37	1.00		0.41	1.00	1.00
Satd. Flow (perm)	133	3535	1426	540	3443		694	1713		764	1879	1549
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	83	724	120	130	1365	172	203	146	62	276	229	172
RTOR Reduction (vph)	0	0	55	0	7	0	0	13	0	0	0	84
Lane Group Flow (vph)	83	724	65	130	1530	0	203	196	0	276	229	88
Confl. Peds. (#/hr)	33		24	24		33	15		26	26		15
Confl. Bikes (#/hr)			3			2			1			3
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	1%	2%	5%	1%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	61.4	55.0	55.0	65.8	57.2		29.1	18.3		29.5	18.5	57.2
Effective Green, g (s)	63.4	56.0	56.0	67.8	58.2		31.1	19.3		31.5	19.5	58.2
Actuated g/C Ratio	0.56	0.49	0.49	0.60	0.51		0.27	0.17		0.28	0.17	0.51
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	180	1738	701	422	1759		300	290		315	321	791
v/s Ratio Prot	c0.03	0.20		c0.03	c0.44		0.07	0.11		c0.09	0.12	
v/s Ratio Perm	0.23		0.05	0.16			0.11			c0.15		0.06
v/c Ratio	0.46	0.42	0.09	0.31	0.87		0.68	0.67		0.88	0.71	0.11
Uniform Delay, d1	19.8	18.5	15.4	11.0	24.5		34.3	44.4		37.2	44.6	14.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.7	0.3	0.4	6.2		5.9	6.1		22.7	7.3	0.3
Delay (s)	21.6	19.2	15.7	11.4	30.7		40.3	50.4		59.9	51.9	14.7
Level of Service	C	B	B	B	C		D	D		E	D	B
Approach Delay (s)		19.0			29.2			45.4			45.7	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	113.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
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 (vph)	15	850	15	40	1490	20	25	5	30	15	5	15
Future Volume (vph)	15	850	15	40	1490	20	25	5	30	15	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			0.99	
Frt	1.00	1.00		1.00	1.00			0.93			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1781	3522		1761	3526			1666			1691	
Flt Permitted	0.14	1.00		0.32	1.00			0.85			0.86	
Satd. Flow (perm)	267	3522		584	3526			1442			1488	
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)	15	867	15	41	1520	20	26	5	31	15	5	15
RTOR Reduction (vph)	0	1	0	0	1	0	0	28	0	0	14	0
Lane Group Flow (vph)	15	881	0	41	1539	0	0	34	0	0	21	0
Confl. Peds. (#/hr)	9		17	17		9	5		9	9		5
Confl. Bikes (#/hr)			3			7			1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.5	71.5		71.5	71.5			7.0			7.0	
Effective Green, g (s)	72.5	72.5		72.5	72.5			8.0			8.0	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	211	2790		462	2793			126			130	
v/s Ratio Prot		0.25			c0.44							
v/s Ratio Perm	0.06			0.07				c0.02			0.01	
v/c Ratio	0.07	0.32		0.09	0.55			0.27			0.16	
Uniform Delay, d1	2.1	2.6		2.1	3.5			39.0			38.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.7	0.3		0.4	0.8			1.1			0.6	
Delay (s)	2.7	2.9		2.5	4.3			40.2			39.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		2.9			4.2			40.2			39.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	875	20	0	1550	0	0
Future Volume (Veh/h)	875	20	0	1550	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	902	21	0	1598	0	0
Pedestrians				1	21	
Lane Width (m)				3.5	3.5	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.94		0.86	0.94
vC, conflicting volume			944		1732	484
vC1, stage 1 conf vol					934	
vC2, stage 2 conf vol					799	
vCu, unblocked vol			804		1181	312
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			763		337	635

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	601	322	0	799	799	0
Volume Left	0	0	0	0	0	0
Volume Right	0	21	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.35	0.19	0.00	0.47	0.47	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

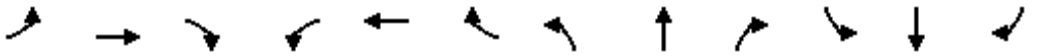
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	860	15	25	1505	45	45
Future Volume (vph)	860	15	25	1505	45	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3523			3518	1785	1597
Flt Permitted	1.00			0.93	0.95	1.00
Satd. Flow (perm)	3523			3270	1785	1597
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	896	16	26	1568	47	47
RTOR Reduction (vph)	1	0	0	0	0	9
Lane Group Flow (vph)	911	0	0	1594	47	38
Confl. Peds. (#/hr)		21	21		16	
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	68.0			68.0	5.2	68.0
Effective Green, g (s)	69.0			69.0	6.2	69.0
Actuated g/C Ratio	0.80			0.80	0.07	0.80
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2820			2617	128	1278
v/s Ratio Prot	0.26				c0.03	
v/s Ratio Perm				c0.49		0.02
v/c Ratio	0.32			0.61	0.37	0.03
Uniform Delay, d1	2.3			3.3	38.1	1.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			1.1	1.8	0.0
Delay (s)	2.6			4.4	39.9	1.8
Level of Service	A			A	D	A
Approach Delay (s)	2.6			4.4	20.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	75.2%	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)	25	875	10	0	1480	50	5	0	15	20	0	55
Future Volume (Veh/h)	25	875	10	0	1480	50	5	0	15	20	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	26	893	10	0	1510	51	5	0	15	20	0	56
Pedestrians								25			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked	0.65			0.93			0.68	0.68	0.93	0.68	0.68	0.65
vC, conflicting volume	1566			928			1786	2541	476	2054	2520	786
vC1, stage 1 conf vol							975	975		1540	1540	
vC2, stage 2 conf vol							811	1566		514	980	
vCu, unblocked vol	795			780			786	1891	297	1178	1861	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 %	95			100			98	100	98	91	100	92
cM capacity (veh/h)	541			774			277	191	645	225	209	707

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	472	456	1007	554	20	20	56
Volume Left	26	0	0	0	5	20	0
Volume Right	0	10	0	51	15	0	56
cSH	541	1700	1700	1700	484	225	707
Volume to Capacity	0.05	0.27	0.59	0.33	0.04	0.09	0.08
Queue Length 95th (m)	1.2	0.0	0.0	0.0	1.0	2.3	2.1
Control Delay (s)	1.4	0.0	0.0	0.0	12.8	22.6	10.5
Lane LOS	A				B	C	B
Approach Delay (s)	0.7		0.0		12.8	13.7	
Approach LOS					B	B	

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	59.3%	ICU Level of Service		B
Analysis Period (min)	15			

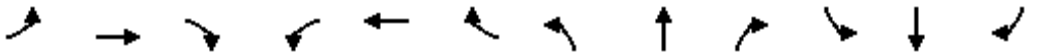


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	905	0	10	1530	0	5
Future Volume (Veh/h)	905	0	10	1530	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	923	0	10	1561	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			923		1724	462
vC1, stage 1 conf vol					923	
vC2, stage 2 conf vol					800	
vCu, unblocked vol			772		1631	277
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 %			99		100	99
cM capacity (veh/h)			794		287	677

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	615	308	530	1041	5
Volume Left	0	0	10	0	0
Volume Right	0	0	0	0	5
cSH	1700	1700	794	1700	677
Volume to Capacity	0.36	0.18	0.01	0.61	0.01
Queue Length 95th (m)	0.0	0.0	0.3	0.0	0.2
Control Delay (s)	0.0	0.0	0.4	0.0	10.4
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		10.4
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

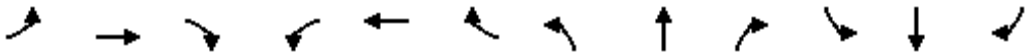
APPENDIX D:
Synchro Analysis Worksheets – Future Background Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	880	105	40	365	150	190	255	80	185	85	60
Future Volume (vph)	130	880	105	40	365	150	190	255	80	185	85	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1764	3433	1471	1732	3208		1731	1759		1731	1842	1472
Flt Permitted	0.38	1.00	1.00	0.22	1.00		0.66	1.00		0.21	1.00	1.00
Satd. Flow (perm)	699	3433	1471	410	3208		1212	1759		376	1842	1472
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	926	111	42	384	158	200	268	84	195	89	63
RTOR Reduction (vph)	0	0	58	0	44	0	0	11	0	0	0	34
Lane Group Flow (vph)	137	926	53	42	498	0	200	341	0	195	89	29
Confl. Peds. (#/hr)	7		4	4		7	2		13	13		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	4%	3%	3%	6%	4%	3%	2%	3%	3%	2%	7%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	54.0	48.0	48.0	49.2	45.6		31.3	19.4		29.3	18.4	45.6
Effective Green, g (s)	56.0	49.0	49.0	51.2	46.6		33.3	20.4		31.3	19.4	46.6
Actuated g/C Ratio	0.54	0.48	0.48	0.50	0.45		0.32	0.20		0.30	0.19	0.45
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	452	1634	700	263	1452		457	348		271	347	666
v/s Ratio Prot	c0.02	c0.27		0.01	0.16		c0.05	c0.19		c0.08	0.05	
v/s Ratio Perm	0.14		0.04	0.07			0.09			0.14		0.02
v/c Ratio	0.30	0.57	0.08	0.16	0.34		0.44	0.98		0.72	0.26	0.04
Uniform Delay, d1	12.0	19.3	14.6	14.1	18.2		26.6	41.0		29.1	35.6	15.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	1.4	0.2	0.3	0.6		0.7	42.1		8.8	0.4	0.1
Delay (s)	12.3	20.8	14.9	14.4	18.9		27.3	83.2		37.9	36.0	15.8
Level of Service	B	C	B	B	B		C	F		D	D	B
Approach Delay (s)		19.2			18.6			62.9			33.4	
Approach LOS		B			B			E			C	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.9%	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 (vph)	20	1085	40	15	565	15	30	5	55	10	5	20
Future Volume (vph)	20	1085	40	15	565	15	30	5	55	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1537	3440		1778	3373			1625			1439	
Flt Permitted	0.43	1.00		0.23	1.00			0.87			0.90	
Satd. Flow (perm)	690	3440		425	3373			1445			1308	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	1119	41	15	582	15	31	5	57	10	5	21
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	19	0
Lane Group Flow (vph)	21	1158	0	15	596	0	0	41	0	0	17	0
Confl. Peds. (#/hr)	8		8	8		8	2		4	4		2
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	15%	3%	5%	0%	5%	18%	4%	0%	2%	30%	25%	9%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	69.8	69.8		69.8	69.8			7.4			7.4	
Effective Green, g (s)	70.8	70.8		70.8	70.8			8.4			8.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	541	2700		333	2647			134			121	
v/s Ratio Prot		c0.34			0.18							
v/s Ratio Perm	0.03			0.04				c0.03			0.01	
v/c Ratio	0.04	0.43		0.05	0.23			0.31			0.14	
Uniform Delay, d1	2.2	3.1		2.2	2.5			38.2			37.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.5		0.3	0.2			1.3			0.5	
Delay (s)	2.3	3.6		2.4	2.7			39.5			38.1	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.6			2.7			39.5			38.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1145	5	0	595	0	0
Future Volume (Veh/h)	1145	5	0	595	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1205	5	0	626	0	0
Pedestrians					8	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.89		0.90	0.89
vC, conflicting volume			1218		1528	613
vC1, stage 1 conf vol					1216	
vC2, stage 2 conf vol					313	
vCu, unblocked vol			1003		1251	325
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			619		273	600

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	803	407	0	313	313	0
Volume Left	0	0	0	0	0	0
Volume Right	0	5	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.24	0.00	0.18	0.18	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

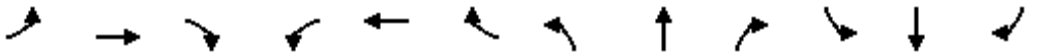
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1140	5	5	585	10	5
Future Volume (vph)	1140	5	5	585	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3464			3354	1785	1597
Flt Permitted	1.00			0.95	0.95	1.00
Satd. Flow (perm)	3464			3178	1785	1597
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1200	5	5	616	11	5
RTOR Reduction (vph)	0	0	0	0	0	1
Lane Group Flow (vph)	1205	0	0	621	11	4
Confl. Peds. (#/hr)		6	6		11	
Confl. Bikes (#/hr)		8				
Heavy Vehicles (%)	3%	0%	0%	6%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	73.4			73.4	1.4	73.4
Effective Green, g (s)	74.4			74.4	2.4	74.4
Actuated g/C Ratio	0.85			0.85	0.03	0.85
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2935			2692	48	1353
v/s Ratio Prot	c0.35				c0.01	
v/s Ratio Perm				0.20		0.00
v/c Ratio	0.41			0.23	0.23	0.00
Uniform Delay, d1	1.6			1.3	41.8	1.0
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.4			0.2	2.4	0.0
Delay (s)	2.0			1.5	44.2	1.0
Level of Service	A			A	D	A
Approach Delay (s)	2.0			1.5	30.7	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	2.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	87.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
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	1120	0	0	585	25	0	0	5	10	0	10
Future Volume (Veh/h)	15	1120	0	0	585	25	0	0	5	10	0	10
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	1179	0	0	616	26	0	0	5	11	0	11
Pedestrians								6			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	647			1185			1536	1864	596	1260	1851	326
vC1, stage 1 conf vol							1217	1217		634	634	
vC2, stage 2 conf vol							319	647		626	1217	
vCu, unblocked vol	647			1019			1402	1760	376	1102	1746	326
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 %	98			100			100	100	99	97	100	98
cM capacity (veh/h)	944			628			209	238	572	358	240	673

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	606	590	411	231	5	11	11
Volume Left	16	0	0	0	0	11	0
Volume Right	0	0	0	26	5	0	11
cSH	944	1700	1700	1700	572	358	673
Volume to Capacity	0.02	0.35	0.24	0.14	0.01	0.03	0.02
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.2	0.8	0.4
Control Delay (s)	0.5	0.0	0.0	0.0	11.3	15.4	10.4
Lane LOS	A				B	C	B
Approach Delay (s)	0.2		0.0		11.3	12.9	
Approach LOS					B	B	

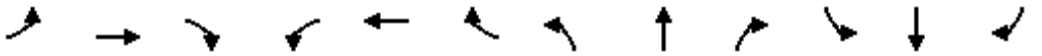
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	55.4%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1145	0	5	590	0	0
Future Volume (Veh/h)	1145	0	5	590	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1205	0	5	621	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			1205		1526	602
vC1, stage 1 conf vol					1205	
vC2, stage 2 conf vol					320	
vCu, unblocked vol			1040		1390	382
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 %			99		100	100
cM capacity (veh/h)			619		265	569

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	803	402	212	414	0
Volume Left	0	0	5	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	619	1700	1700
Volume to Capacity	0.47	0.24	0.01	0.24	0.00
Queue Length 95th (m)	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	0.0	0.0	0.4	0.0	0.0
Lane LOS			A		A
Approach Delay (s)	0.0		0.1		0.0
Approach LOS					A

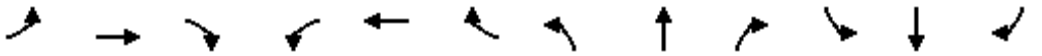
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	880	105	40	365	150	190	255	80	185	85	60
Future Volume (vph)	130	880	105	40	365	150	190	255	80	185	85	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1764	3433	1470	1733	3208		1731	1760		1731	1842	1472
Flt Permitted	0.36	1.00	1.00	0.21	1.00		0.67	1.00		0.25	1.00	1.00
Satd. Flow (perm)	677	3433	1470	382	3208		1214	1760		464	1842	1472
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	926	111	42	384	158	200	268	84	195	89	63
RTOR Reduction (vph)	0	0	62	0	44	0	0	12	0	0	0	37
Lane Group Flow (vph)	137	926	49	42	498	0	200	340	0	195	89	26
Confl. Peds. (#/hr)	7		4	4		7	2		13	13		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	4%	3%	3%	6%	4%	3%	2%	3%	3%	2%	7%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	50.1	44.1	44.1	45.3	41.7		34.3	22.4		32.1	21.3	41.7
Effective Green, g (s)	52.1	45.1	45.1	47.3	42.7		36.3	23.4		34.1	22.3	42.7
Actuated g/C Ratio	0.51	0.44	0.44	0.46	0.42		0.36	0.23		0.33	0.22	0.42
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	420	1519	650	238	1344		497	404		301	403	616
v/s Ratio Prot	c0.02	c0.27		0.01	0.16		c0.05	c0.19		c0.07	0.05	
v/s Ratio Perm	0.14		0.03	0.07			0.09			0.14		0.02
v/c Ratio	0.33	0.61	0.08	0.18	0.37		0.40	0.84		0.65	0.22	0.04
Uniform Delay, d1	13.6	21.7	16.4	16.0	20.4		23.9	37.5		26.3	32.7	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.8	0.2	0.4	0.8		0.5	14.7		4.7	0.3	0.1
Delay (s)	14.1	23.5	16.6	16.3	21.1		24.4	52.2		31.0	32.9	17.6
Level of Service	B	C	B	B	C		C	D		C	C	B
Approach Delay (s)		21.8			20.8			42.1			29.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

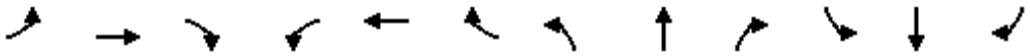
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	765	130	140	1445	165	205	185	75	265	290	165
Future Volume (vph)	80	765	130	140	1445	165	205	185	75	265	290	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	0.99		1.00	0.98		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3535	1424	1746	3450		1764	1721		1760	1879	1548
Flt Permitted	0.07	1.00	1.00	0.25	1.00		0.25	1.00		0.31	1.00	1.00
Satd. Flow (perm)	133	3535	1424	466	3450		456	1721		571	1879	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	83	797	135	146	1505	172	214	193	78	276	302	172
RTOR Reduction (vph)	0	0	57	0	7	0	0	12	0	0	0	68
Lane Group Flow (vph)	83	797	78	146	1670	0	214	259	0	276	302	104
Confl. Peds. (#/hr)	33		24	24		33	15		26	26		15
Confl. Bikes (#/hr)			3			2			1			3
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	1%	2%	5%	1%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	61.6	55.0	55.0	66.4	57.4		32.6	21.7		32.8	21.8	57.4
Effective Green, g (s)	63.6	56.0	56.0	68.4	58.4		34.6	22.7		34.8	22.8	58.4
Actuated g/C Ratio	0.54	0.48	0.48	0.58	0.50		0.29	0.19		0.30	0.19	0.50
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	177	1681	677	379	1711		266	331		290	363	768
v/s Ratio Prot	c0.03	0.23		c0.03	c0.48		0.08	0.15		c0.10	0.16	
v/s Ratio Perm	0.22		0.05	0.19			0.16			c0.18		0.07
v/c Ratio	0.47	0.47	0.12	0.39	0.98		0.80	0.78		0.95	0.83	0.14
Uniform Delay, d1	24.3	20.9	17.1	12.7	29.0		34.3	45.1		37.8	45.6	16.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	1.0	0.3	0.7	16.8		16.0	11.4		39.8	14.9	0.4
Delay (s)	26.3	21.8	17.5	13.4	45.8		50.3	56.6		77.6	60.5	16.4
Level of Service	C	C	B	B	D		D	E		E	E	B
Approach Delay (s)		21.6			43.2			53.8			56.7	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	117.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
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 (vph)	15	935	15	40	1635	20	25	5	30	15	5	15
Future Volume (vph)	15	935	15	40	1635	20	25	5	30	15	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			0.99	
Frt	1.00	1.00		1.00	1.00			0.93			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1782	3523		1764	3527			1666			1691	
Flt Permitted	0.12	1.00		0.29	1.00			0.85			0.86	
Satd. Flow (perm)	218	3523		530	3527			1442			1488	
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)	15	954	15	41	1668	20	26	5	31	15	5	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	28	0	0	14	0
Lane Group Flow (vph)	15	968	0	41	1688	0	0	34	0	0	21	0
Confl. Peds. (#/hr)	9		17	17		9	5		9	9		5
Confl. Bikes (#/hr)			3			7			1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.5	71.5		71.5	71.5			7.0			7.0	
Effective Green, g (s)	72.5	72.5		72.5	72.5			8.0			8.0	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	172	2791		419	2794			126			130	
v/s Ratio Prot		0.27			c0.48							
v/s Ratio Perm	0.07			0.08				c0.02			0.01	
v/c Ratio	0.09	0.35		0.10	0.60			0.27			0.16	
Uniform Delay, d1	2.1	2.7		2.1	3.8			39.0			38.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.0	0.3		0.5	1.0			1.1			0.6	
Delay (s)	3.1	3.1		2.6	4.8			40.2			39.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.1			4.7			40.2			39.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	960	20	0	1695	0	0
Future Volume (Veh/h)	960	20	0	1695	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	990	21	0	1747	0	0
Pedestrians				1	21	
Lane Width (m)				3.5	3.5	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.92		0.82	0.92
vC, conflicting volume			1032		1895	528
vC1, stage 1 conf vol					1022	
vC2, stage 2 conf vol					874	
vCu, unblocked vol			870		1243	324
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			711		311	615

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	660	351	0	874	874	0
Volume Left	0	0	0	0	0	0
Volume Right	0	21	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.21	0.00	0.51	0.51	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

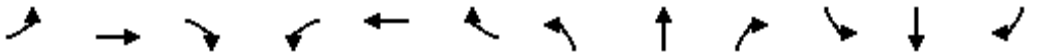
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	945	15	25	1650	45	45
Future Volume (vph)	945	15	25	1650	45	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3524			3518	1785	1597
Flt Permitted	1.00			0.93	0.95	1.00
Satd. Flow (perm)	3524			3267	1785	1597
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	984	16	26	1719	47	47
RTOR Reduction (vph)	1	0	0	0	0	9
Lane Group Flow (vph)	999	0	0	1745	47	38
Confl. Peds. (#/hr)		21	21		16	
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	68.0			68.0	5.2	68.0
Effective Green, g (s)	69.0			69.0	6.2	69.0
Actuated g/C Ratio	0.80			0.80	0.07	0.80
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2820			2615	128	1278
v/s Ratio Prot	0.28				c0.03	
v/s Ratio Perm				c0.53		0.02
v/c Ratio	0.35			0.67	0.37	0.03
Uniform Delay, d1	2.4			3.7	38.1	1.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			1.4	1.8	0.0
Delay (s)	2.7			5.1	39.9	1.8
Level of Service	A			A	D	A
Approach Delay (s)	2.7			5.1	20.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.1%	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)	25	960	10	0	1625	50	5	0	15	20	0	55
Future Volume (Veh/h)	25	960	10	0	1625	50	5	0	15	20	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	26	980	10	0	1658	51	5	0	15	20	0	56
Pedestrians								25			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked	0.58			0.92			0.61	0.61	0.92	0.61	0.61	0.58
vC, conflicting volume	1714			1015			1947	2776	520	2246	2756	860
vC1, stage 1 conf vol							1062	1062		1688	1688	
vC2, stage 2 conf vol							885	1714		557	1067	
vCu, unblocked vol	767			848			719	2068	312	1205	2035	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 %	95			100			98	100	98	90	100	91
cM capacity (veh/h)	491			721			249	171	624	208	189	626

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	516	500	1105	604	20	20	56
Volume Left	26	0	0	0	5	20	0
Volume Right	0	10	0	51	15	0	56
cSH	491	1700	1700	1700	453	208	626
Volume to Capacity	0.05	0.29	0.65	0.36	0.04	0.10	0.09
Queue Length 95th (m)	1.3	0.0	0.0	0.0	1.1	2.5	2.3
Control Delay (s)	1.5	0.0	0.0	0.0	13.3	24.1	11.3
Lane LOS	A				B	C	B
Approach Delay (s)	0.8		0.0		13.3	14.7	
Approach LOS					B	B	

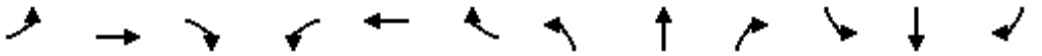
Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	63.3%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	990	0	10	1675	0	5
Future Volume (Veh/h)	990	0	10	1675	0	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1010	0	10	1709	0	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.92		0.92	0.92
vC, conflicting volume			1010		1884	505
vC1, stage 1 conf vol					1010	
vC2, stage 2 conf vol					874	
vCu, unblocked vol			841		1790	293
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 %			99		100	99
cM capacity (veh/h)			740		258	654

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	673	337	580	1139	5
Volume Left	0	0	10	0	0
Volume Right	0	0	0	0	5
cSH	1700	1700	740	1700	654
Volume to Capacity	0.40	0.20	0.01	0.67	0.01
Queue Length 95th (m)	0.0	0.0	0.3	0.0	0.2
Control Delay (s)	0.0	0.0	0.4	0.0	10.6
Lane LOS			A		B
Approach Delay (s)	0.0		0.1		10.6
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

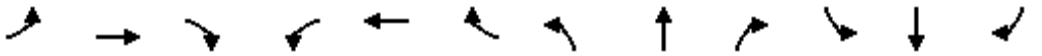


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	765	130	140	1445	165	205	185	75	265	290	165
Future Volume (vph)	80	765	130	140	1445	165	205	185	75	265	290	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	0.99		1.00	0.98		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3535	1423	1745	3450		1765	1721		1760	1879	1548
Flt Permitted	0.07	1.00	1.00	0.27	1.00		0.23	1.00		0.30	1.00	1.00
Satd. Flow (perm)	122	3535	1423	499	3450		426	1721		553	1879	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	83	797	135	146	1505	172	214	193	78	276	302	172
RTOR Reduction (vph)	0	0	53	0	7	0	0	12	0	0	0	70
Lane Group Flow (vph)	83	797	82	146	1670	0	214	259	0	276	302	102
Confl. Peds. (#/hr)	33		24	24		33	15		26	26		15
Confl. Bikes (#/hr)			3			2			1			3
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	1%	2%	5%	1%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	64.7	59.9	59.9	67.1	61.1		32.5	21.5		32.5	21.5	61.1
Effective Green, g (s)	66.7	60.9	60.9	69.1	62.1		34.5	22.5		34.5	22.5	62.1
Actuated g/C Ratio	0.56	0.51	0.51	0.58	0.52		0.29	0.19		0.29	0.19	0.52
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	148	1803	725	361	1794		257	324		281	354	805
v/s Ratio Prot	c0.03	0.23		c0.02	c0.48		0.08	0.15		c0.10	0.16	
v/s Ratio Perm	0.29		0.06	0.21			0.16			c0.19		0.07
v/c Ratio	0.56	0.44	0.11	0.40	0.93		0.83	0.80		0.98	0.85	0.13
Uniform Delay, d1	23.8	18.5	15.2	12.6	26.7		35.3	46.3		39.3	46.9	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.8	0.8	0.3	0.7	10.2		20.0	12.9		48.5	17.7	0.3
Delay (s)	28.6	19.3	15.5	13.4	36.8		55.4	59.2		87.8	64.6	15.0
Level of Service	C	B	B	B	D		E	E		F	E	B
Approach Delay (s)		19.5			34.9			57.5			61.8	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

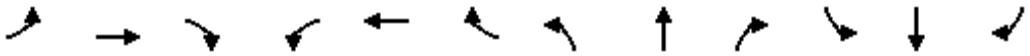
APPENDIX E:
Synchro Analysis Worksheets – Future Total Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	935	125	40	380	150	190	255	80	185	85	60
Future Volume (vph)	140	935	125	40	380	150	190	255	80	185	85	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1765	3433	1470	1733	3213		1731	1760		1731	1842	1472
Flt Permitted	0.36	1.00	1.00	0.19	1.00		0.67	1.00		0.25	1.00	1.00
Satd. Flow (perm)	660	3433	1470	338	3213		1214	1760		464	1842	1472
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	147	984	132	42	400	158	200	268	84	195	89	63
RTOR Reduction (vph)	0	0	74	0	41	0	0	12	0	0	0	37
Lane Group Flow (vph)	147	984	58	42	517	0	200	340	0	195	89	26
Confl. Peds. (#/hr)	7		4	4		7	2		13	13		2
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	4%	3%	3%	6%	4%	3%	2%	3%	3%	2%	7%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	50.1	44.1	44.1	45.3	41.7		34.3	22.4		32.1	21.3	41.7
Effective Green, g (s)	52.1	45.1	45.1	47.3	42.7		36.3	23.4		34.1	22.3	42.7
Actuated g/C Ratio	0.51	0.44	0.44	0.46	0.42		0.36	0.23		0.33	0.22	0.42
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	413	1519	650	219	1346		497	404		301	403	616
v/s Ratio Prot	c0.02	c0.29		0.01	0.16		c0.05	c0.19		c0.07	0.05	
v/s Ratio Perm	0.16		0.04	0.08			0.09			0.14		0.02
v/c Ratio	0.36	0.65	0.09	0.19	0.38		0.40	0.84		0.65	0.22	0.04
Uniform Delay, d1	13.8	22.2	16.5	16.3	20.5		23.9	37.5		26.3	32.7	17.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	2.2	0.3	0.4	0.8		0.5	14.7		4.7	0.3	0.1
Delay (s)	14.3	24.3	16.8	16.7	21.3		24.4	52.2		31.0	32.9	17.6
Level of Service	B	C	B	B	C		C	D		C	C	B
Approach Delay (s)		22.4			21.0			42.1			29.1	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	77.4%	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 (vph)	20	1080	40	15	600	15	30	5	55	10	5	20
Future Volume (vph)	20	1080	40	15	600	15	30	5	55	10	5	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	1.00			0.92			0.92	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1538	3440		1778	3375			1625			1439	
Flt Permitted	0.41	1.00		0.23	1.00			0.87			0.90	
Satd. Flow (perm)	666	3440		428	3375			1445			1308	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	21	1113	41	15	619	15	31	5	57	10	5	21
RTOR Reduction (vph)	0	2	0	0	1	0	0	52	0	0	19	0
Lane Group Flow (vph)	21	1152	0	15	633	0	0	41	0	0	17	0
Confl. Peds. (#/hr)	8		8	8		8	2		4	4		2
Confl. Bikes (#/hr)			5			1						
Heavy Vehicles (%)	15%	3%	5%	0%	5%	18%	4%	0%	2%	30%	25%	9%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	69.8	69.8		69.8	69.8			7.4			7.4	
Effective Green, g (s)	70.8	70.8		70.8	70.8			8.4			8.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	522	2700		335	2649			134			121	
v/s Ratio Prot		c0.34			0.19							
v/s Ratio Perm	0.03			0.04				c0.03			0.01	
v/c Ratio	0.04	0.43		0.04	0.24			0.31			0.14	
Uniform Delay, d1	2.2	3.1		2.2	2.6			38.2			37.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.5		0.3	0.2			1.3			0.5	
Delay (s)	2.3	3.6		2.4	2.8			39.5			38.1	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.6			2.8			39.5			38.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1145	0	0	630	0	0
Future Volume (Veh/h)	1145	0	0	630	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1205	0	0	663	0	0
Pedestrians					8	
Lane Width (m)					3.5	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.89		0.91	0.89
vC, conflicting volume			1213		1544	610
vC1, stage 1 conf vol					1213	
vC2, stage 2 conf vol					332	
vCu, unblocked vol			999		1219	325
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			622		274	601

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	803	402	0	332	332	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.47	0.24	0.00	0.20	0.20	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

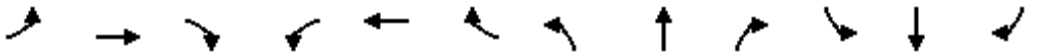
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1140	5	25	585	45	90
Future Volume (vph)	1140	5	25	585	45	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3464			3355	1785	1597
Flt Permitted	1.00			0.88	0.95	1.00
Satd. Flow (perm)	3464			2948	1785	1597
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1200	5	26	616	47	95
RTOR Reduction (vph)	0	0	0	0	0	19
Lane Group Flow (vph)	1205	0	0	642	47	76
Confl. Peds. (#/hr)		6	6		11	
Confl. Bikes (#/hr)		8				
Heavy Vehicles (%)	3%	0%	0%	6%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	68.0			68.0	5.2	68.0
Effective Green, g (s)	69.0			69.0	6.2	69.0
Actuated g/C Ratio	0.80			0.80	0.07	0.80
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2772			2359	128	1278
v/s Ratio Prot	c0.35				c0.03	
v/s Ratio Perm				0.22		0.05
v/c Ratio	0.43			0.27	0.37	0.06
Uniform Delay, d1	2.6			2.2	38.1	1.8
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.5			0.3	1.8	0.1
Delay (s)	3.1			2.5	39.9	1.9
Level of Service	A			A	D	A
Approach Delay (s)	3.1			2.5	14.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	11.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
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	1205	0	0	600	25	0	0	5	10	0	10
Future Volume (Veh/h)	15	1205	0	0	600	25	0	0	5	10	0	10
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	1268	0	0	632	26	0	0	5	11	0	11
Pedestrians								6			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								0			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked				0.89			0.89	0.89	0.89	0.89	0.89	
vC, conflicting volume	663			1274			1633	1969	640	1321	1956	334
vC1, stage 1 conf vol							1306	1306		650	650	
vC2, stage 2 conf vol							327	663		671	1306	
vCu, unblocked vol	663			1063			1465	1843	351	1115	1828	334
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 %	98			100			100	100	99	97	100	98
cM capacity (veh/h)	932			588			191	222	577	352	224	665

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	650	634	421	237	5	11	11
Volume Left	16	0	0	0	0	11	0
Volume Right	0	0	0	26	5	0	11
cSH	932	1700	1700	1700	577	352	665
Volume to Capacity	0.02	0.37	0.25	0.14	0.01	0.03	0.02
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.2	0.8	0.4
Control Delay (s)	0.5	0.0	0.0	0.0	11.3	15.6	10.5
Lane LOS	A				B	C	B
Approach Delay (s)	0.2		0.0		11.3	13.0	
Approach LOS					B	B	

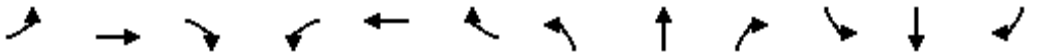
Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	57.8%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1230	0	0	610	0	0
Future Volume (Veh/h)	1230	0	0	610	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1295	0	0	642	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.89		0.89	0.89
vC, conflicting volume			1295		1616	648
vC1, stage 1 conf vol					1295	
vC2, stage 2 conf vol					321	
vCu, unblocked vol			1086		1446	359
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			579		245	573

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	863	432	321	321	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.51	0.25	0.19	0.19	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

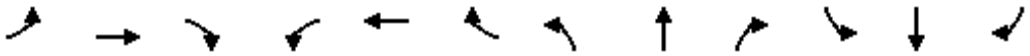
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	760	135	140	1500	165	215	185	75	265	290	165
Future Volume (vph)	80	760	135	140	1500	165	215	185	75	265	290	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0	5.0	3.0	5.0		3.0	6.0		3.0	6.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	0.99		1.00	0.98		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1767	3535	1423	1745	3452		1765	1721		1760	1879	1548
Flt Permitted	0.07	1.00	1.00	0.27	1.00		0.23	1.00		0.30	1.00	1.00
Satd. Flow (perm)	122	3535	1423	503	3452		426	1721		553	1879	1548
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	83	792	141	146	1562	172	224	193	78	276	302	172
RTOR Reduction (vph)	0	0	53	0	7	0	0	12	0	0	0	70
Lane Group Flow (vph)	83	792	88	146	1728	0	224	259	0	276	302	102
Confl. Peds. (#/hr)	33		24	24		33	15		26	26		15
Confl. Bikes (#/hr)			3			2			1			3
Heavy Vehicles (%)	1%	1%	2%	2%	1%	1%	1%	2%	5%	1%	0%	0%
Bus Blockages (#/hr)	0	0	6	0	0	6	0	0	2	0	0	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	custom
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		6
Actuated Green, G (s)	64.7	59.9	59.9	67.1	61.1		32.5	21.5		32.5	21.5	61.1
Effective Green, g (s)	66.7	60.9	60.9	69.1	62.1		34.5	22.5		34.5	22.5	62.1
Actuated g/C Ratio	0.56	0.51	0.51	0.58	0.52		0.29	0.19		0.29	0.19	0.52
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	7.0		4.0	7.0	6.0
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)	148	1803	725	363	1795		257	324		281	354	805
v/s Ratio Prot	c0.03	0.22		c0.02	c0.50		0.09	0.15		c0.10	0.16	
v/s Ratio Perm	0.29		0.06	0.21			0.16			c0.19		0.07
v/c Ratio	0.56	0.44	0.12	0.40	0.96		0.87	0.80		0.98	0.85	0.13
Uniform Delay, d1	25.0	18.5	15.3	12.6	27.5		35.9	46.3		39.3	46.9	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.8	0.8	0.3	0.7	14.1		26.0	12.9		48.5	17.7	0.3
Delay (s)	29.8	19.2	15.6	13.3	41.6		61.9	59.2		87.8	64.6	15.0
Level of Service	C	B	B	B	D		E	E		F	E	B
Approach Delay (s)		19.6			39.4			60.4			61.8	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
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 (vph)	15	940	15	40	1615	20	25	5	30	15	5	15
Future Volume (vph)	15	940	15	40	1615	20	25	5	30	15	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0			6.0			6.0	
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			0.98			0.99	
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.99			0.99	
Frt	1.00	1.00		1.00	1.00			0.93			0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	
Satd. Flow (prot)	1782	3523		1764	3527			1666			1691	
Flt Permitted	0.12	1.00		0.28	1.00			0.85			0.86	
Satd. Flow (perm)	225	3523		527	3527			1442			1488	
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)	15	959	15	41	1648	20	26	5	31	15	5	15
RTOR Reduction (vph)	0	1	0	0	0	0	0	28	0	0	14	0
Lane Group Flow (vph)	15	973	0	41	1668	0	0	34	0	0	21	0
Confl. Peds. (#/hr)	9		17	17		9	5		9	9		5
Confl. Bikes (#/hr)			3			7			1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	2	0	0	0	0	0	0	0	0	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	71.5	71.5		71.5	71.5			7.0			7.0	
Effective Green, g (s)	72.5	72.5		72.5	72.5			8.0			8.0	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.09			0.09	
Clearance Time (s)	6.0	6.0		6.0	6.0			7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	178	2791		417	2794			126			130	
v/s Ratio Prot		0.28			c0.47							
v/s Ratio Perm	0.07			0.08				c0.02			0.01	
v/c Ratio	0.08	0.35		0.10	0.60			0.27			0.16	
Uniform Delay, d1	2.1	2.7		2.1	3.7			39.0			38.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	0.3		0.5	0.9			1.1			0.6	
Delay (s)	3.0	3.1		2.6	4.7			40.2			39.3	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		3.1			4.6			40.2			39.3	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	5.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	61.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	985	0	0	1675	0	0
Future Volume (Veh/h)	985	0	0	1675	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	1015	0	0	1727	0	0
Pedestrians				1	21	
Lane Width (m)				3.5	3.5	
Walking Speed (m/s)				1.2	1.2	
Percent Blockage				0	2	
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh)	2					
Upstream signal (m)	124			71		
pX, platoon unblocked			0.92		0.84	0.92
vC, conflicting volume			1036		1900	530
vC1, stage 1 conf vol					1036	
vC2, stage 2 conf vol					864	
vCu, unblocked vol			873		1269	324
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			709		305	614

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	677	338	0	864	864	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.40	0.20	0.00	0.51	0.51	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A
Approach Delay (s)	0.0		0.0			0.0
Approach LOS						A

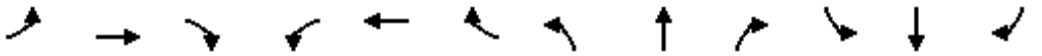
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	945	40	105	1645	30	50
Future Volume (vph)	945	40	105	1645	30	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	6.0	5.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	3507			3511	1785	1597
Flt Permitted	1.00			0.78	0.95	1.00
Satd. Flow (perm)	3507			2735	1785	1597
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	984	42	109	1714	31	52
RTOR Reduction (vph)	1	0	0	0	0	9
Lane Group Flow (vph)	1025	0	0	1823	31	43
Confl. Peds. (#/hr)		21	21		16	
Confl. Bikes (#/hr)		3				
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Bus Blockages (#/hr)	0	2	0	2	0	0
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	2			6	4	
Permitted Phases			6			2
Actuated Green, G (s)	70.6			70.6	3.2	70.6
Effective Green, g (s)	71.6			71.6	4.2	71.6
Actuated g/C Ratio	0.82			0.82	0.05	0.82
Clearance Time (s)	6.0			6.0	7.0	6.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	2892			2256	86	1317
v/s Ratio Prot	0.29				c0.02	
v/s Ratio Perm				c0.67		0.03
v/c Ratio	0.35			0.81	0.36	0.03
Uniform Delay, d1	1.9			4.0	40.0	1.4
Progression Factor	1.00			1.00	1.00	1.00
Incremental Delay, d2	0.3			3.2	2.6	0.0
Delay (s)	2.2			7.2	42.6	1.4
Level of Service	A			A	D	A
Approach Delay (s)	2.2			7.2	16.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
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	960	10	0	1690	50	5	0	15	20	0	55
Future Volume (Veh/h)	25	960	10	0	1690	50	5	0	15	20	0	55
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	26	980	10	0	1724	51	5	0	15	20	0	56
Pedestrians								25			5	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (m)		77			402							
pX, platoon unblocked	0.56			0.93			0.59	0.59	0.93	0.59	0.59	0.56
vC, conflicting volume	1780			1015			1980	2842	520	2312	2822	892
vC1, stage 1 conf vol							1062	1062		1754	1754	
vC2, stage 2 conf vol							918	1780		557	1067	
vCu, unblocked vol	802			869			745	2208	337	1308	2173	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 %	94			100			98	100	98	90	100	91
cM capacity (veh/h)	459			716			242	159	606	191	178	603

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	516	500	1149	626	20	20	56
Volume Left	26	0	0	0	5	20	0
Volume Right	0	10	0	51	15	0	56
cSH	459	1700	1700	1700	440	191	603
Volume to Capacity	0.06	0.29	0.68	0.37	0.05	0.10	0.09
Queue Length 95th (m)	1.4	0.0	0.0	0.0	1.1	2.8	2.4
Control Delay (s)	1.7	0.0	0.0	0.0	13.6	26.0	11.6
Lane LOS	A				B	D	B
Approach Delay (s)	0.9		0.0		13.6	15.4	
Approach LOS					B	C	

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	65.1%	ICU Level of Service		C
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	995	0	0	1750	0	0
Future Volume (Veh/h)	995	0	0	1750	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	1015	0	0	1786	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (m)	58					
pX, platoon unblocked			0.93		0.93	0.93
vC, conflicting volume			1015		1908	508
vC1, stage 1 conf vol					1015	
vC2, stage 2 conf vol					893	
vCu, unblocked vol			866		1826	320
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			731		254	634

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	677	338	893	893	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.40	0.20	0.53	0.53	0.00
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					A
Approach Delay (s)	0.0		0.0		0.0
Approach LOS					A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		