Waterfront Toronto

Queens Quay Revitalization

Environmental Assessment

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Environmental Assessment

Traffic and Transit Operations Report

December 2009

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1 Introduction

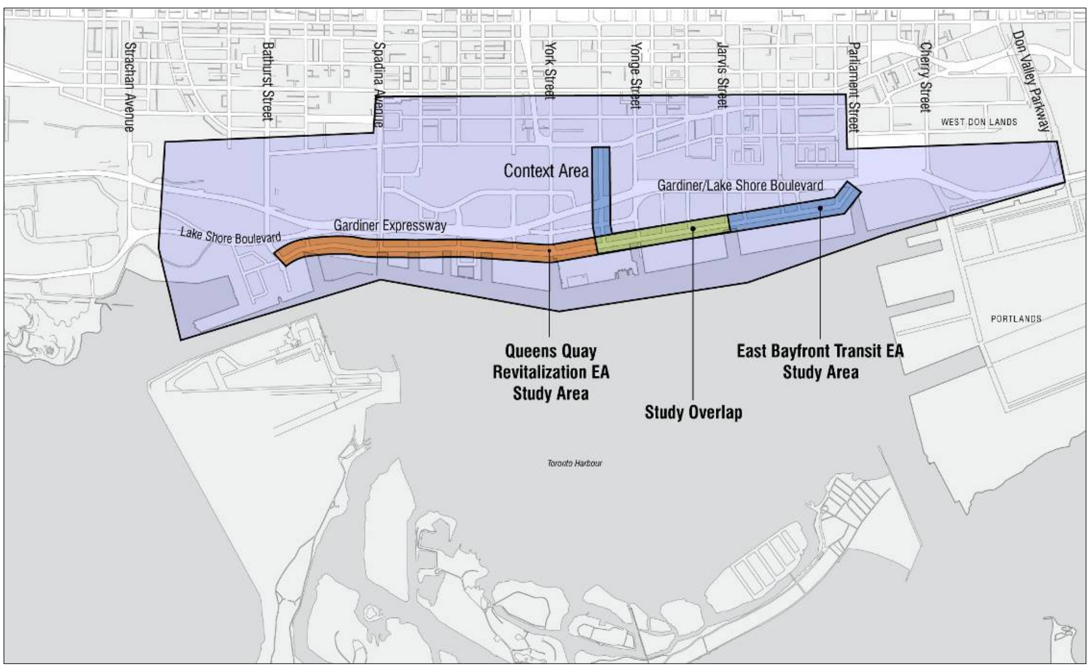
This report presents the findings of the traffic and transit analysis conducted as part of the Queens Quay Revitalization EA process and informs and supports the Environmental Study Report (ESR).

The pedestrian and bicycle improvements recommended as part of the preferred plan are supported by long standing waterfront and city of Toronto planning policies which are discussed in greater detail as part of the ESR.

This report provides documentation of data collection techniques, technical assumptions, detailed traffic operations analysis results, and key conclusions regarding Queens Quay operations under existing and future conditions.

The intent of this document is to support the goals of the environmental assessment and function as a technical appendix to the ESR. Key goals of the EA are to connect the Martin Goodman Trail throughout the Central Waterfront, improve transit access, improve pedestrian amenity and provide workable traffic access to the area. The main ESR document provides a more in depth review of the policy direction in support of these goals.

Figure 1: Study Area



The study area includes Queens Quay from just west of Lower Spadina Avenue to just west of Lower Jarvis Street. The context area is bounded by Front and Wellington Streets to the north, Fort York Boulevard to the west, and Don Roadway to the east.

The larger area is included to provide context in determining appropriate route choices for motorists with trips originating from or destined to lands accessed from Queens Quay. Key in this regard would be new roadway connections such as the Bremner Boulevard extension to Bathurst Street and the newly constructed Simcoe Street underpass.

2 Existing Conditions

2.1 Data Collection

Several types of data were collected to gain a complete understanding of existing conditions on Queens Quay. This section provides a description of the types of data that were collected for the Study. Additional description of the data categories and preliminary findings are provided in Appendix E.

Table 1: Data Collection Inventory

Type	Description and Purpose
Aerial Photography	Digital photography of Queens Quay and the waterfront promenade used for surface parking accumulation; observation; confirming geometry
Ground Level Photography	Digital photography to observe special operating conditions; points of interest; challenges
Time Lapse Photography	Digital photography to observe special operating conditions; changes over time; long stay parking
Base Mapping	Digital maps in CAD format with property lines, curbs etc. for use in development functional plans
Topographic Survey	Detailed legal survey of street including edge of pavement; sidewalks; street furniture; trees; utilities
Intersection Control	Lane configurations; turn restrictions etc. for input into modelling software
Signals	Phasing/timing; corridor control strategy; transit signal priority (TSP); controller type for input into modelling software
Curb Management	On-street parking and loading regulations
Automatic Traffic Recorder (ATR) Counts	Link volumes recorded mid-block to understand daily and hourly traffic patterns
Turning Movement Counts	Turning volumes at intersections classified by vehicle type; turning volumes at driveways during peak times to understand peak conditions and used as the baseline for future traffic forecasts.
RESCU[1] Counts	24-hour permanent counting stations on Lake Shore / Gardiner / DVP for understanding daily and hourly traffic patterns
Collision History	Historical collision data to identify locations where traffic safety may be a concern used to identify possible mitigating measures
Transit Data Existing Patronage (counts)	Existing and future boarding/alighting by stop location; vehicle operating parameters for input into future year transit models

Notes:

1. Road Emergency Services Communications Unit

2.2 Site Survey and Observation

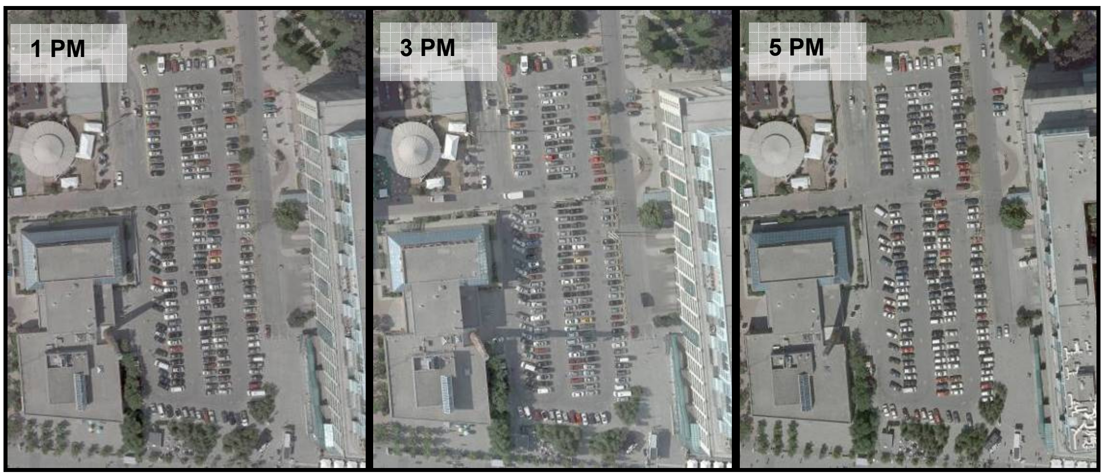
2.2.1 Aerial Photography

The EA Team commissioned aerial photography of the study area on Saturday August 11th 2007 documenting surface conditions at three key time periods: 1 PM, 3 PM, and 5 PM. These time periods were chosen to capture peak pedestrian, traffic and parking activity along Queens Quay and along the waters edge promenade and also for use in Harbourfront.

Aerial photography was used to:

- assemble a high resolution image base
- conduct surface parking inventory counts
- document operational characteristics such as congestion and on-street parking
- confirm geometric conditions

Figure 2: Aerial Photography at Harbourfront Centre Parking Lot



2.2.2 Ground Level Photography

The EA Team undertook ground level photography of the study area on Saturday August 11th and Sunday August 26th, 2007 to document surface conditions throughout the day from approximately 12 PM to 8 PM. These time periods were chosen to capture peak afternoon pedestrian activity around the Harbourfront. The purpose of the ground level photography was to observe operating conditions, locations of congestion, points of interest, on-street parking and user conflicts.

Figure 3: Ground Level Photography at Simcoe Slip

Photos of the site area show that while there is a lot of activity, there is insufficient space allocated for the different types of users on the street.

2.2.3 Time Lapse Photography

The EA Team undertook time-lapse photography of Queens Quay from Lower Simcoe Street to York Street on Saturday August 11th, 2007 from approximately 9 AM to 9 PM. The purpose of the time-lapse photography was to study operations along Queens Quay “sped up” over select periods of the day. Time-lapse photos were used to observe changes in vehicle patterns, pedestrian movement, and on-street parking.

Figure 4 - Time Lapse Photography at Lower Simcoe (facing east)

From the footage we were able to note a significant number of the vehicles entering the Harbourfront Centre and Queens Quay Terminal driveways were U-Turns from the Queens Quay / Lower Simcoe intersection. We also noted that buses parked at the curb for extended periods of time which indicated a need to provide formal parking for buses on the waterfront to avoid informal curbside parking.

2.2.4 Base Mapping

Aerial Lidar base mapping was provided by the city which includes curb lines, building footprints, of the entire central waterfront. This mapping informs cross section designs.

2.2.5 Topographic Survey

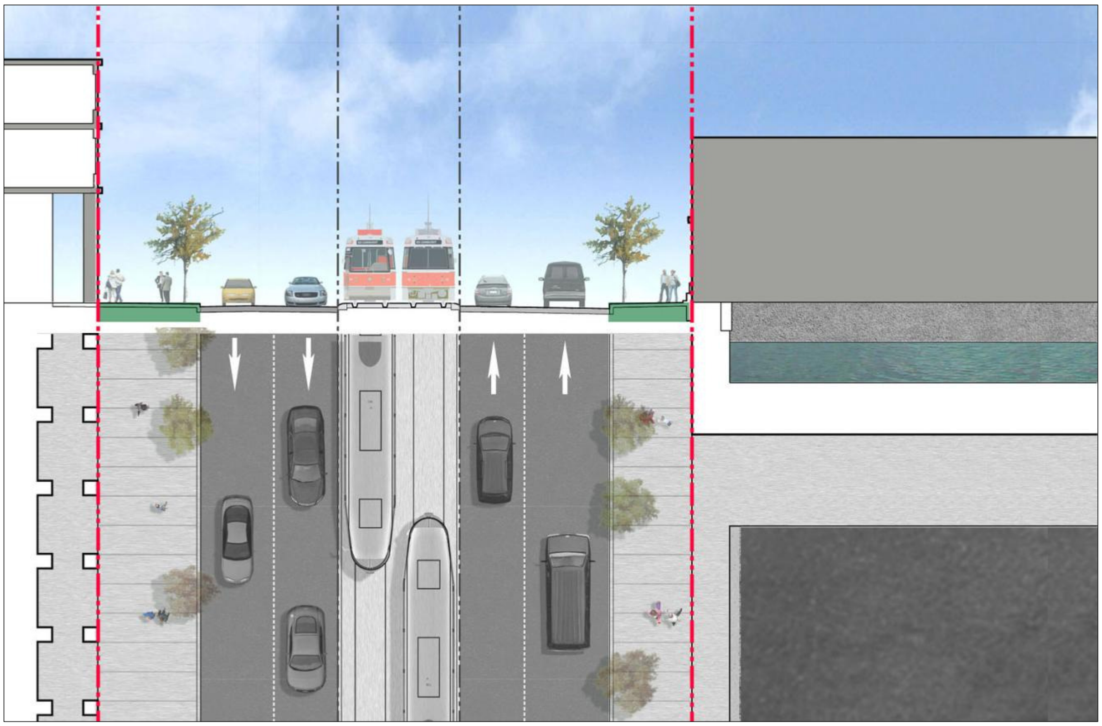
The team commissioned a detailed topographic survey of Queens Quay from Spadina to Jarvis for use in the detailed design phase of the project. The survey includes details such as edge of pavement; sidewalks; street furniture; trees; utilities etc.

2.3 Highway Control

2.3.1 Intersection Configurations

Intersection configurations were documented from aerial photography and confirmed with site visits. Intersection lane configurations are useful in understanding operating characteristics at each location and for accurate representation of the intersection when using modelling software.

Figure 5: Existing Cross Section (Typical)



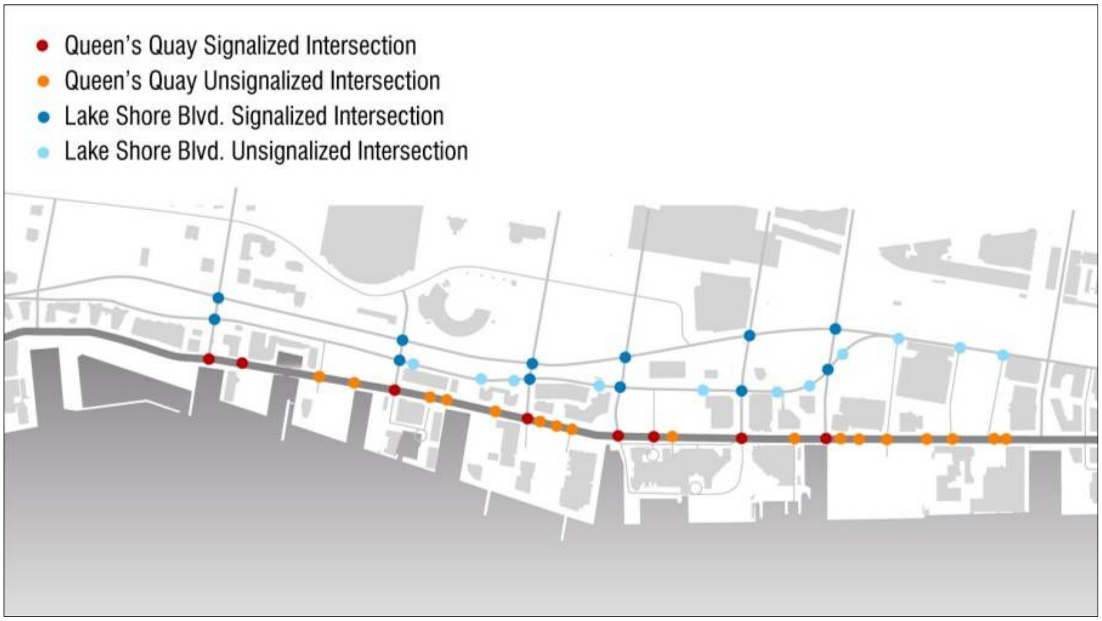
2.3.2 Intersection Control and Signals

The City of Toronto provided signal timing information for all intersections within the site area. The signal timing summaries provide cycle length, phase splits, types of phases; phase sequence, clearance intervals, offsets, pedestrian phases; controller type, transit signal priority scheme and the overall corridor control strategy. This information used as inputs to traffic modelling software which calculates intersection and corridor performance measures.

Intersections along Lakeshore Boulevard are equipped with the Split Cycle Offset Optimization Technique (SCOOT) adaptive signal control system, a centrally controlled system deployed throughout the city on key traffic corridors.

Intersections along Queens Quay run on the “Arterial Master Signal System” (AMSS). This system is unique in the city and is only deployed on Queens Quay. The system is controlled separately from the “Main Traffic Signal System” (MTSS) which centrally controls most of the signals in the City.

Figure 6: Study Area Intersection Locations



The City of Toronto recommends that signal timing information used in a study of this type be current to within the last six months. The team has the latest signal timings throughout the study period as provided by the City in January 2009.

The current signal strategy on Queens Quay is semi-actuated uncoordinated. Signals along the corridor do not communicate with each other but operate in a "free" condition only responding to traffic and transit calls approaching the intersection. The signals generally cycle between main east-west and north-south phases with the exception of Rees Street which only serves north-south movements if a call is placed by a vehicle or pedestrian.

Along Queens Quay, transit runs on "phase insertion" which provides two opportunities per cycle (three at Spadina) for a dedicated transit phase to be served. During the transit phase, no other movement is permitted for either vehicles or pedestrians. This type of operation is inefficient; however does allow for permissive turns over the TTC tracks at intersections.

2.3.3 Curb Management

Curb management refers to signed parking and loading regulations intended to manage activity within the curb lanes. Changes in curb management throughout the day (time of day changes etc.) can have a significant affect on street operations. Queens Quay has a general no parking rule for its entire length.

2.4 Traffic

2.4.1 Time Periods

Vehicle and pedestrian data was collected for the typical weekday morning and afternoon peak periods. Based on discussion with residents and other stakeholders, the summer weekend peak period was also added. The weekend summer peak is largely the result of visitor traffic to the waterfront. Turning movement count data was collected in the following periods:

- Typical Conditions – Autumn Weekday, October 4 and 11, 2007
- Large Summer Event – Hot & Spicy Food Festival, Saturday August 11, 2007
- Medium Summer Event – Ilha Formosa Festival, Sunday August 26, 2007 (during CNE)

The team also commissioned 24-hour ATR counts along Queens Quay during two, two-week periods to coincide with the turning movement count time periods. ATR data was collected for the following time periods:

- Friday August 10th to Monday August 27th 2007
- Monday October 1st to Sunday October 14th 2007

The following sections provide some additional detail on the traffic data collected.

2.4.2 Automatic Traffic Recorder (ATR)

Automatic traffic recorder data is collected to gain a full understanding traffic patterns throughout the day at a particular location, typically mid-block between signalized intersections.

From the larger sample of traff data which is collected 24 hours a day for several days, it is possible to draw comparisons between volumes on different days, assess daily traffic patterns, and confirm TMC volumes. ATR count locations were set up at five mid-block locations within the study area:

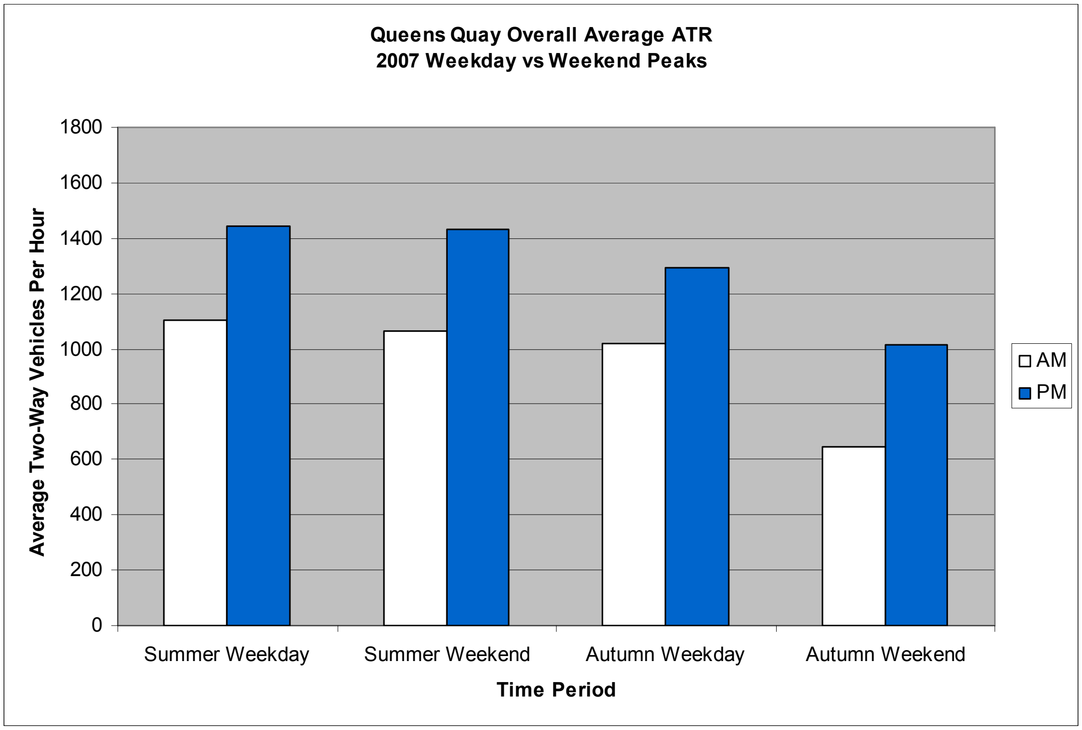
- Lower Spadina Avenue and Rees Street –west of the Beer Store / EMS driveway;
- Rees Street and Lower Simcoe Street – at the Rabba store;
- Lower Simcoe Street and York Street – just west of Queens Quay Terminal driveway;
- York Street and Bay Street – just west of the streetcar portal; and
- Bay Street and Yonge Street – at 10 Queens Quay.

Data from the five mid-block ATR counting stations was summarized to show the average recorded volume along the corridor into the following time periods:

- Average summer weekday and weekend day peak hours
- Average autumn weekday and weekend peak hours

A summary of average midblock volumes is shown in Figure 7.

Figure 7: ATR Peak Hour Volume Comparison



The analysis indicates that of the four time periods counted, summer weekday/weekend and autumn weekday are the highest volumes. Autumn weekend volumes do not represent a peak condition. This exercise was useful in determining what time period to analyze as a representative vehicle peak for the area. The team elected to focus on the autumn weekday as a representative average condition only slightly less busy than the summer peak.

Figure 8: ATR Count Peak Hour Summary

Notes:

1. morning peak (afternoon peak) [weekend afternoon peak]

2.4.3 Turning Movement Counts

Turning movement count data is collected to understand how traffic (classified by vehicle type), pedestrians and cyclists move through an intersection. Typically these counts are undertaken during a focused "peak period" of time of two to three hours in order to capture the "peak hour" of traffic volume through an intersection. The team commissioned turning movement counts at each intersection (including driveways) within the study area.

Queens Quay only was counted during the summer festivals. For the autumn weekday conditions, Queens Quay was counted October 11th and Lake Shore Boulevard was counted October 4th.

The count programme included all intersections on Queens Quay and Lake Shore Boulevard from and including Spadina Avenue to Yonge Street.

2.4.4 Road Emergency Services Communications Unit (RESCU) Counts

The RESCU system has over 200 detector stations across the Gardiner Expressway and Don Valley Parkway from Highway 427 to Highway 401. Also available from this system are traffic volume counts at 121 different counting stations. The City of Toronto provided the EA Team with 24-hour count information at 33 locations within the EA context area. RESCU counts were used in a similar manner as the ATR counts.

Data was gathered for the same time periods as the intersection turning movement counts to provide additional comfort in the TMC data collected. The counts were also useful in determining appropriate peak hour factors to use in analyzing intersection operations along Lake Shore Boulevard.

Table 2: Average Volumes by RESCU Station

Location	Summer Weekday		Autumn Weekday	
	Daily	Peak Hour	Daily	Peak Hour
LSB WB West of Rees	11,176	1,533	10,772	1,548
LSB EB West of Rees	27,303	2,609	26,068	2,690
LSB WB West of Bay	25,498	2,325	25,414	2,194
Harbour EB West of Bay	20,729	1,761	21,161	1,729

There were no significant discrepancies between the RESCU data and the TMC data. Review of the RESCU count data also indicates that summer weekday and autumn weekday daily totals and peak hour totals are similar.

2.4.5 Collision History Context Analysis

The City of Toronto has provided historical collision data for the past three years along Lake Shore Boulevard and Queens Quay from Lower Spadina Avenue to Lower Jarvis Street. The data was used to undertake and assess collision rates at intersections within the site area to find any key locations where traffic safety may be a concern. From this, potential mitigating measures can be implemented to improve safety.

A review of collision history was undertaken at all intersections within the study area. Table 3 presents average number of collision from 2004 to 2007 and summarizes the findings as collisions per million vehicle entering. Key findings:

- The average collision rate for all sites observed was 0.72 collisions per million vehicles entering
- The 85th percentile collision rate was 1.15 collisions per million vehicle entering.

The following five intersections and intersection locations within the site area have collision rates that exceed the 85th percentile.

Table 3: Locations with Collision Rate above 85th Percentile

Intersection	Average Collisions/Year (2004 to 2007)	Annual Average Daily Traffic (AADT)	Collisions per Million Vehicles Entering
Lake Shore & York	21	30,656	**1.90**
Lake Shore & Bay	34	38,033	**2.43**
Queens Quay - Simcoe to York	8	15,969	**1.37**
Queens Quay - Spadina to Rees	11	11,742	**2.57**
Queens Quay & York	8	18,125	**1.21**

Notes:

1. Rates calculated as (average collisions) / (AADT*365/1,000,000)
2. The spreadsheet calculations consider unrounded averages

From the detailed report, the highest single occurrence at each intersection location was westbound rear-end collisions. A common feature on all westbound approach at these intersections is a shared through/left turn lane and/or a shared through/right turn lane.

While shared through/right turn lanes are very common especially in urban area, shared through/left turn lanes are less common and are a likely factor in the high number of rear end collisions at this location.

For the midblock locations, the most frequent occurrence of collisions was either eastbound or westbound turning movement collisions. From observation of operations on Queens Quay, cars frequently turn across the streetcar right-of-way.

Detailed collision reports are contained in Appendix B.

2.4.6 License Plate Trace Survey

A license plate trace survey was commissioned in 2006 and undertaken by Ontario Traffic Inc. The purpose of the study was to gain an understanding of how many vehicle trips on Queens Quay were merely passing through with no origin or destination on Queens Quay. This type of activity is typically referred to a neighbourhood infiltration.

The license plate survey found that around 10 to 20 percent of traffic on Queens Quay was entering from one end of the site area and exiting out the other end. These movements were considered cut through trips as they were not originating from or destined to the site area.

The results of the license plate trace survey are summarized in Table 4 and Table 5.

Table 4: Spadina to Yonge Eastbound

Time Period	Total Cars	Cars Matched	Percent Match
AM	762	160	21%
PM	891	175	20%
Total	1653	335	20%

Source: Ontario Traffic Inc.

Table 5: Yonge to Spadina Westbound

Time Period	Total Cars	Cars Matched	Percent Match
AM	541	45	8%
PM	941	99	11%
Total	1482	144	10%

Source: Ontario Traffic Inc.

Due to the nature of the study, the infiltration traffic reported is considered a minimum. For example, if a vehicle entering at Spadina had made an eastbound left turn at Rees, Lower Simcoe, York or Bay, the vehicle would not have been captured, but would still in fact be cut-through traffic. Similarly, any westbound traffic that entered at Yonge but made a right turn at an intersection between Yonge and Spadina would also have been missed.

2.5 Transit

2.5.1 Existing Patronage

The Toronto Transit Commission (TTC) provided existing weekday and weekend passenger boarding and alighting volumes, existing and future transit headways, existing and future transit routes and existing transit signal priority strategy for the study area.

Existing transit passenger boarding and alighting volumes were provided for the 509 Harbourfront and 510 Spadina streetcar routes, which are the two routes currently operating along Queens Quay. Weekday volumes were measured in the spring of 2004; weekend volumes were measured in the spring of 2002 (510 Spadina) and spring of 2005 (509 Harbourfront).

Table 6: Peak Hour Transit Patronage

Transit Stop	Routes 509 & 510 Combined Patronage		
Eastbound	**Weekday Morning**	**Weekday Afternoon**	**Weekend Afternoon**
Lower Spadina Avenue	445	315	410
Rees Street	540	360	430
Lower Simcoe Street	590	385	450
York Street	665	485	495
LRT Station (Bay Street)	705	635	570
Westbound			
Lower Spadina Avenue	255	450	390
Rees Street	260	515	385
Lower Simcoe Street	285	600	385
York Street	285	645	430
LRT Station (Bay Street)	445	735	495

Source: Toronto Transit Commission

3 Alternative Design Concepts

In Phase 2 of the Queens Quay Revitalization Environmental Assessment (EA), the study team recommended *Physical Improvements within the Existing Right-of-Way* as the preferred Alternative Planning Solution. (A detailed description of the Environmental Assessment process undertaken for the Queens Quay Revitalization Study is provided in the Environmental Study Report)

Five Alternative Design Concepts were identified at the outset of Phase 3 of the Environmental Assessment, based on the preferred Alternative Planning Solution. The five alternatives were shortlisted to three alternatives and "Do Nothing" based on technical and environmental criteria. The alternatives included:

- Do Nothing
- Centre Transit with on-street bike lanes
- Southside Transit/Martin Goodman Trail with Two-way Traffic Operations
- Southside Transit/Martin Goodman with One-way Traffic Operations

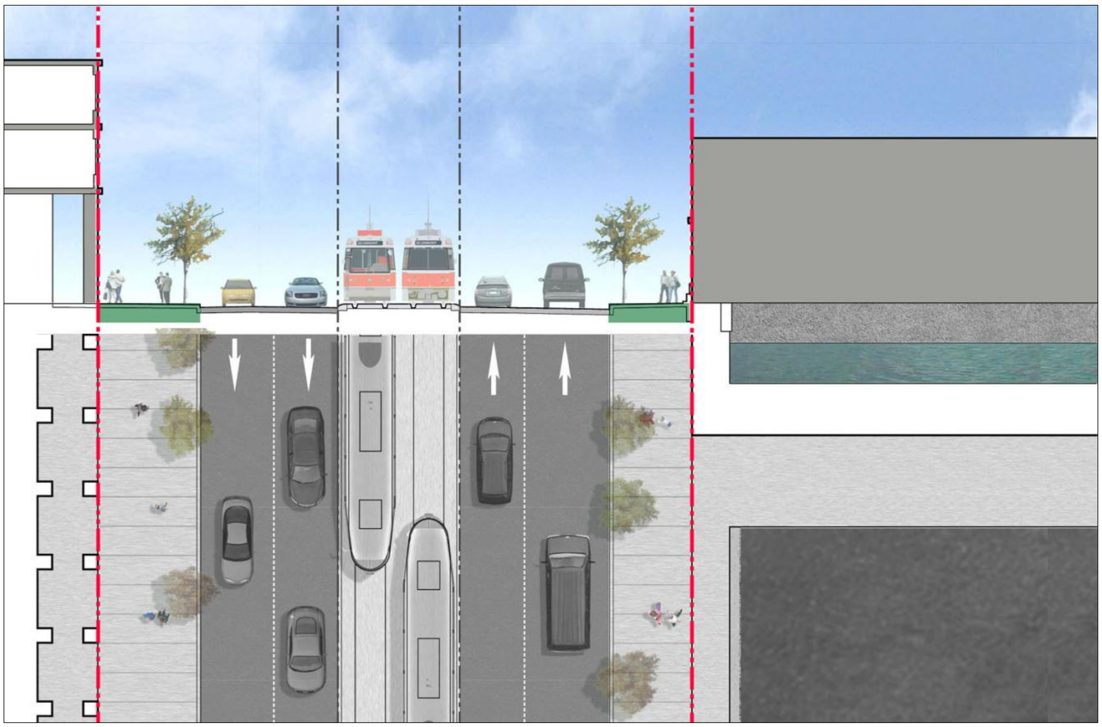
The three alternatives were refined in consultation with the public and stakeholders and were devised to address existing network issues. The four Alternative Design Concepts, including Do Nothing, were subject to a detailed evaluation which included the transit and traffic operations analysis documented in Section 5 of this report.

3.1 Do Nothing

The Do Nothing alternative assumes no operational or physical interventions to the study area. In accordance with EA requirements, this alternative was included in the evaluation process as a baseline condition upon which to compare the other alternatives.

Two-way traffic is maintained with transit in the centre median. Dedicated left turns are provided at intersections where possible. Transit runs on dedicated inserted phases within the cycle where all other modes are held. This phase strategy allows for permissive left turns and u-turns over the tracks, but does not allow transit to run with the main east-west green phase.

Figure 9: Do Nothing General Arrangement



3.2 Centre Transit

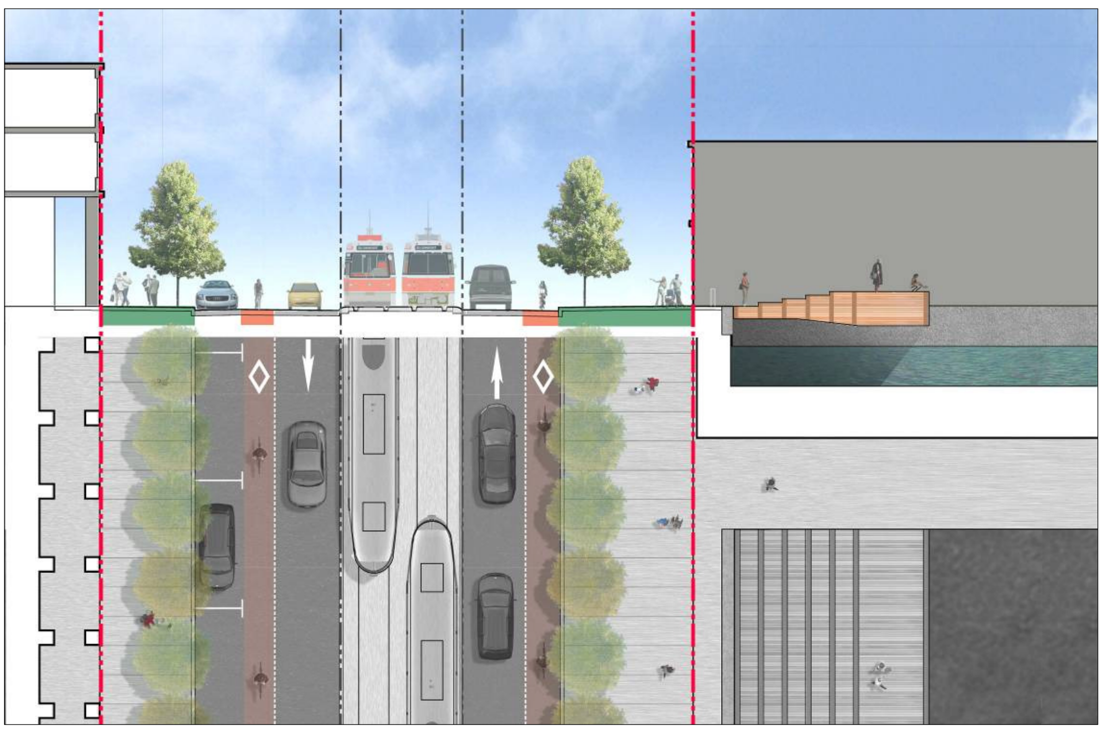
The centre transit alternative maintains the median LRT right-of-way in its current position while making other physical and operational changes to the roadway around it. The number of automobile lanes is reduced from two in each direction to one in each direction with a bike lane.

Eastbound and westbound bike lanes are provided adjacent to the north and south curbs of the street. Dedicated left turn bays are added to all intersections which would allow transit to run with the main east-west green, but does require all left turns to be fully protected in the phasing scheme. This operation is similar to what is currently deployed on Spadina Avenue and St. Clair Avenue West LRT lines.

The reduction in roadway width reduces the average north-south crossing distance for pedestrians to 23 metres compared with 25 metres in the do nothing alternative. On-street parking is provided where space permits.

Existing driveways between signals which serve lands south of Queens Quay will have right turns access as they do under existing conditions. The existing occurrence of illegal left turns over the streetcar right-of-way will no longer be possible under future conditions because the tracks will be within un-mountable barrier curbs similar to other lines in the city. Today, the right-of-way is mountable.

Figure 10: Centre Transit General Arrangement



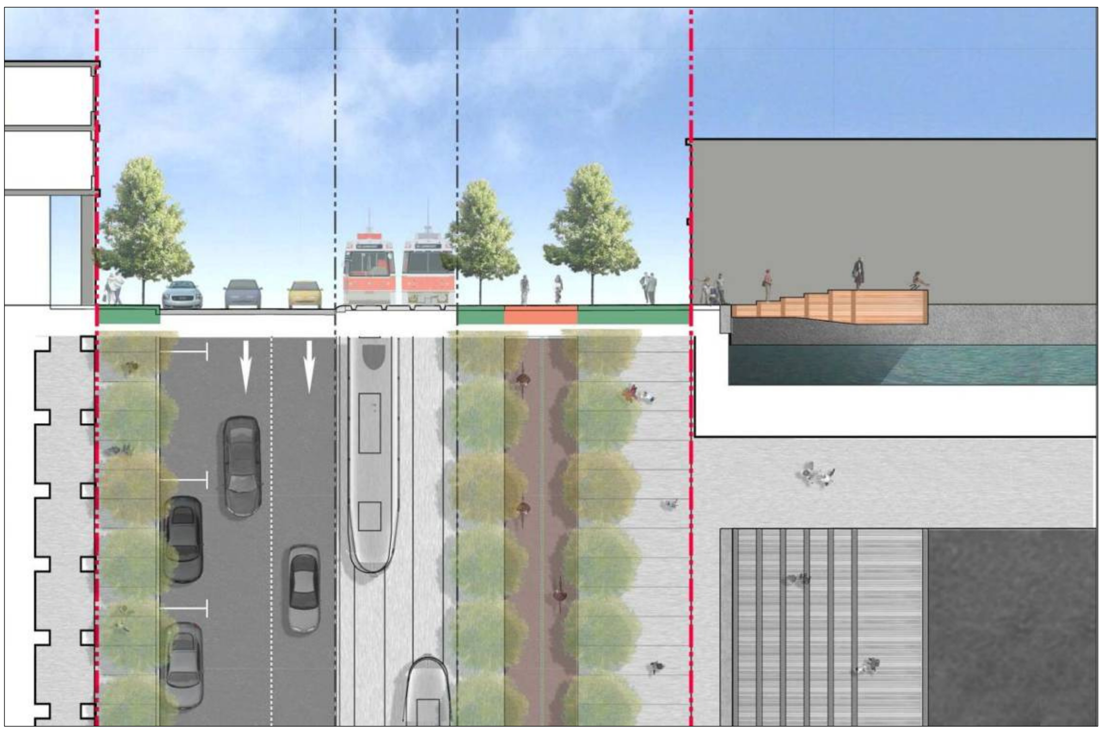
3.3 South Side One-way

The “south side one-way” alternative is similar to the two-way except only westbound traffic is permitted on the two vehicle lanes, dedicated left turn bays and protected phases are provided at all intersections. This arrangement provides equity of access to property south of Queens Quay.

The one-way provides a more typical traffic/transit relationship where there is no-contra flow between eastbound traffic and westbound streetcars which exists in the two-way. With two lanes, vehicles are also able to go around informal curb side parking or stopping without entering the oncoming lane.

A key drawback of this arrangement is the loss of eastbound traffic and eastbound left turns into downtown. All eastbound traffic would be forced to use Lake Shore Boulevard exacerbating the existing congestion on the main arterial of the waterfront.

Figure 11: South Side One-Way General Arrangement



3.4 South Side Two-way

The two-way south side alternative reconfigures the street by locating all traffic lanes north of the LRT right-of-way with pedestrian and bicycle facilities to the southern side of Queens Quay. Sidewalks are still provided on the north side of the tracks.

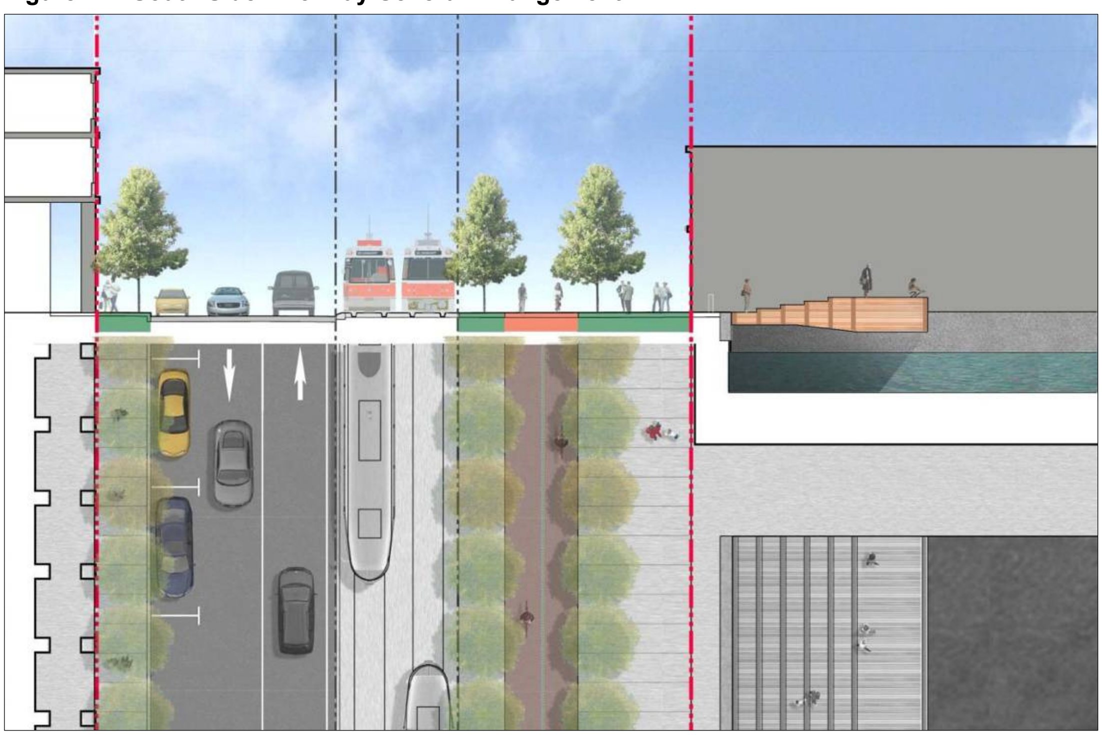
Similar to the centre alternative, the LRT runs east-west on its own right-of-way. The transit right-of-way is in fact in the same location as existing with only minor changes in alignment. The key benefit of the south side arrangement is the perception that transit is located off street and within the public realm.

The Martin Goodman Trail is completed from Spadina Avenue through East Bayfront on a 4 metre (approximate) east-west path located south of the transit ROW. An additional benefit of the south side configuration is that the average crossing distance for pedestrians to approximately 17 metres.

Dedicated turn bays are required at intersection where access is required to lands south of Queens Quay. Depending on the geometry at the location, intersections are equipped with either a dedicated left or right turn lane and signal phase for access across the tracks to the south, but not both. Where access is restricted from a particular direction, the team has ensured that access is still available via Lake Shore Boulevard or other north-south streets.

Similar to centre transit, transit runs with the main east-west green. Cycle lengths were increased over existing for the peak analysis hour to ensure the best possible transit operating speeds. While this provides the best speeds for east-west transit, north-south pedestrians will experience delays greater than existing.

Figure 12: South Side Two-Way General Arrangement



4 Travel Demand Forecasts

Existing volumes were modified based on design changes resulting from the alternatives, and new volume was added to reflect growth as described in the following sections. Four scenarios were developed for evaluation:

- Do Nothing
- Centre Transit
- South Side Two-Way
- South Side One-Way

The "Do Nothing" and "Centre Transit" alternatives have the same routing options available for motorists and therefore use the same traffic volume forecasts.

4.1 Existing Volumes

4.1.1 Intersection Traffic Count Information

Traffic volumes were collected during the morning and afternoon peak periods on the following dates:

- Thursday October 4th 2007 (Lake Shore Boulevard corridor)
- Thursday October 11th 2007 (Queens Quay corridor)

Signalized Intersections	**Unsignalized Intersections**
Queens Quay	**Queens Quay**
Lower Spadina Avenue	401 Queens Quay Aqua Condominium
TTC Loop	410 Queens Quay Harbour Terrace
Beer Store / EMS Driveway	Beer Store / EMS
Rees Street / Robertson Crescent	Robertson Crescent East
Lower Simcoe Street	250/260/270 Queens Quay
Queens Quay Terminal	228/230 Queens Quay The Riviera
York Street	8 York, 208/218 Queens Quay Waterclub
Waterpark Place Surface Lot / Harbour Square	207/211 Queens Quay Queens Quay Terminal
Bay Street	33/55/65/77/99 Harbour Square
Yonge Street	Waterpark Phase 1 & 2
Lake Shore Boulevard	Westin Harbour Castle
Lower Spadina Avenue	10 Queens Quay World Trade Centre
Rees Street	Captain John's Seafood
Lower Simcoe Street	MT27 Parking Lot
York Street	Freeland
Bay Street	Cooper
Yonge Street	Redpath
	Loblaws

4.1.2 Volume Balancing

Volumes at signalized intersections are “carried through” to adjacent unsignalized intersections where only driveway ins and outs were recorded. Volumes are carried from signalized intersections easterly until the next downstream signalized intersection.

Volumes are carried from signalized intersections along Queens Quay northerly until the next signalized intersection (Lake Shore Boulevard). (Volumes are balanced to Queens Quay).

4.2 New Development Related Traffic Allowances

4.2.1 Auto Trips

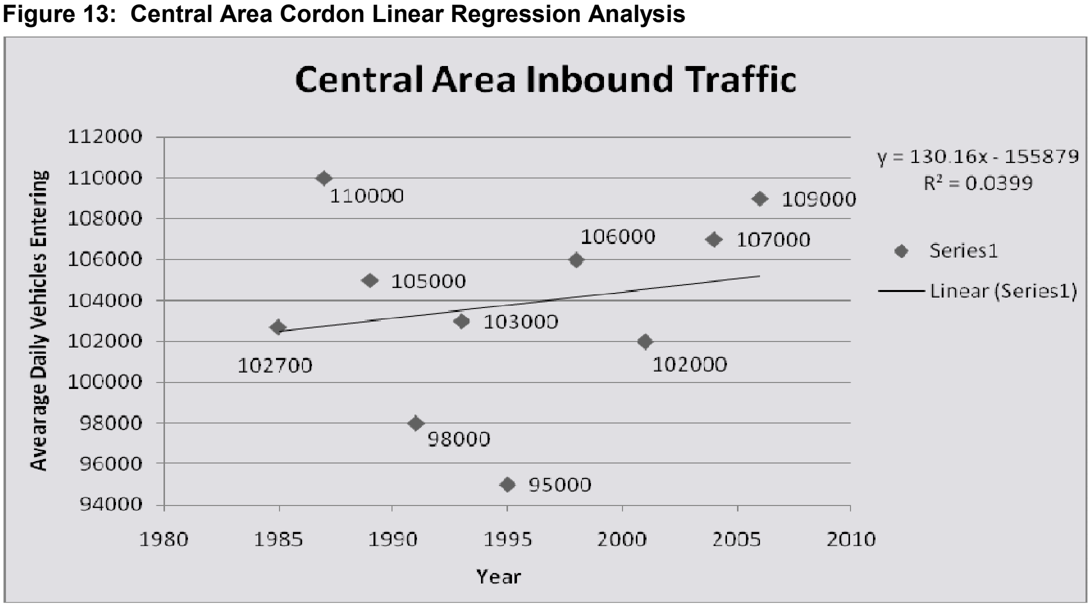
In collaboration with BA Consulting Group Ltd., a comprehensive set of traffic volume forecasts was compiled to assess future conditions within the waterfront. The volumes have been compiled from reports in support of current approved and under construction developments. New traffic is related to:

- Harbourfront Centre
- Waterpark Place Phase III
- Pier 27 Condominium (MT 27)
- Railway Lands (including Pinnacle)
- East Bayfront
- West Don Lands
- Lower Don Lands

The layers compile to represent a mature state of development to include all approved and under construction development within the central waterfront. This represents a full or 100 percent build-out which is a conservative assumption for development related activity. The volumes are compiled through spreadsheet analysis. Existing and future layers have been provided in Appendix A.

No percentage background corridor growth allowance was added to the network. Central area cordon count information for the City of Toronto indicates that from 1985 to 2006 there has been negligible growth overall. A linear regression analysis indicates that there has been approximately 0.13 percent compound annual growth from 1985 to 2006.

Figure 13: Central Area Cordon Linear Regression Analysis



A credit was applied to Queens Quay for traffic associated with existing East Bayfront and Pier 27 land uses. The credit represents traffic that would no longer be in the network after the existing land uses are removed. New traffic is then added to the network for new development on the same lands. Summing the negative traffic layer and the new development layer would give “net new” traffic. This layer is not provided on an individual graphic, but the layers are incorporated in future volumes.

Table 7 summarizes the total auto trips generate by planned and approved developments along the Toronto Central waterfront. Details including residential and commercial mix, dwelling units, floor area etc. are contained in Appendix E. Appendix E contains Section 4 – Traffic Volume Forecasts – of BA Group’s, *“East Bayfront Transit Class Environmental Assessment, Traffic Assessment, Queens Quay Design Alternative”* report.

Table 7: Auto Trip Generation

Development	**Morning Peak Hour**			**Afternoon Peak Hour**		
	In	**Out**	**2-Way**	**In**	**Out**	**2-Way**
Harbourfront Centre						
- Total Traffic	80	5	85	25	105	130
- Existing Traffic	35	5	40	10	50	60
- Net New Traffic	45	0	45	15	55	70
Waterpark Phase III						
- Net Site Traffic	270	25	295	35	225	260
MT27 Condo						
- Total Traffic	45	180	225	175	50	225
- Existing Traffic	242	50	292	105	260	365
- Net Site Traffic	-197	130	-67	70	-210	-140
East Bayfront	673	890	1563	1397	1243	2640
Railway Lands East						
- Total Traffic	940	645	1585	915	1035	1950
- Existing Traffic	120	5	125	45	130	175
- Net Site Traffic	820	640	1460	870	905	1775
Lower Don Lands (West of Cherry St.)	131	237	368	207	157	364
West Don Lands	300	805	1105	910	505	1415

4.2.2 Transit Trips

Future transit patronage forecasts were provided to the team by the TTC. The forecasts consider 2021 population and employment targets for the waterfront and include the Waterfront West LRT; East Bayfront Transit; West Don Lands Transit and transit servicing the Lower Don Lands/Port Lands and eastern Toronto / Beach.

Forecasted boarding and alighting data was provided by TTC. This information was input into the VISSIM models to accurately reflect transit dwell times at stops along Queens Quay. The transit dwell times play an important role in overall transit operations because varying arrival rates of passengers cause varying dwell times making it the least predictable (and therefore most challenging) factor in developing transit signal priority schemes.

Transit passenger forecasts are contained in Appendix D1.

4.3 Trip Assignment

4.3.1 Existing Auto Trip Reassignments

No existing trips were reassigned for either Do Nothing or Centre transit alternatives because for those alternatives, all existing movements are being maintained. For the south side two-way and south side one-way transit alternatives, several existing turning movements are not available under future conditions. Existing traffic volumes on those movements needed to be reassigned.

4.3.2 Auto Trip Assignment

Traffic volume assignments from adjacent areas have been extrapolated along the network to cover the full study area. Generally some volume is assigned to Lake Shore and some to Queens Quay. The exact number of vehicles that would use either is not possible to calculate, so for purposes of this study allowances have been made for traffic on both streets to account for different driver behaviours. Existing volumes were modified in the following ways:

- To account for observed traffic infiltration, westbound traffic volumes on Queens Quay were reduced by 50 vehicles in the west and up to 125 vehicles in the east. The adjustment was only necessary during the morning peak hour. This traffic is assumed to divert to Lake Shore Boulevard and corresponds to approximately 15 percent of existing traffic. We have assumed that all remaining traffic infiltration observed still uses Queens Quay under future conditions.
- Some traffic volumes into existing driveways have been reassigned to account for new turn restrictions specified by the alternatives.

New traffic volumes were assigned to the network based on directional distribution patterns extracted from Transportation Tomorrow Survey (TTS) data and split between Queens Quay and Lake Shore Boulevard. Detailed trip distribution tables are contained in Table 7 of Appendix E (Section 4 of BA Group's, *"East Bayfront Transit Class Environmental Assessment, Traffic Assessment, Queens Quay Design Alternative"* report).

5 Operations Analysis

5.1 Methodology

5.1.1 Analysis Methodology

Detailed traffic operations model of Queens Quay using Synchro 7 operations analysis software based on Highway Capacity Manual (HCM2000) analysis methodology.

HCM 2000 methodology provides intersection measures of effectiveness in terms of a volume to capacity (V/C) ratio; delay; and level of service (LOS).

- Level of Service (LOS) is based Highway Capacity Manual (HCM) developed by the Transportation Research Board. This method categorizes various levels of delay based on the operations they describe. Table 8 summarizes the delay ranges for each LOS and the following text summarizes the type of conditions a driver is likely to encounter at each LOS.
- Delay (or control delay) is measured in seconds and is the sum of "stop delay" (time spent at a red signal) and "queue delay" (time spent decelerating/accelerating and advancing in a queue). Delay is summarized as an average by movement and for the intersection overall.
- Volume to capacity ratio (V/C) - measures the average amount of capacity available for a given movement. When the traffic volumes reach the capacity of a road, the v/c is equal to 1.0 indicating at-capacity conditions.

Table 8: Level of Service in relation to levels of delay (based on Highway Capacity Manual)

Level of Service (LOS) Letter Grade	Control Delay per Vehicle (seconds)
A	≤ 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

It is important to note that V/C ratios and LOS values do not always correlate. For example, a high V/C ratio of 0.80 or higher may not result in a LOS of D or E. Conversely, it is possible to have a movement with a low V/C ratio but with high delay such as in the case of fully protected turn phases.

In the case of Queens Quay, there are certain phases that serve a low volume of cars but because of the long cycle length needed for transit. There is always sufficient capacity to accommodate the demand, but motorists at times must wait a large portion of the cycle for the phase to show.

Lake Shore is the opposite where there is high V/C but relatively low delay and therefore LOS. There is high volume but because most of the traffic is served with a reasonable level of delay, the average delay for the intersection is also low.

The following describe typical operating characteristics of each LOS letter grade:

- LOS A describes operations with very low delay. This occurs when signal progression is extremely favourable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.
- LOS B describes operations with low but increased delay. This generally occurs with good progression and/or short cycle lengths. Again, most vehicles do not stop at the intersection.
- LOS C describes operations with moderate delay. These higher delays may result from fair progression and/or longer cycle lengths. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
- LOS D describes operations with heavy delay. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal coordination, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines substantially.
- LOS E describes very heavy delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios near capacity.
- LOS F typically describes ever increasing delays as queues begin to form. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios with cycle failures.

In order to compare corridor impacts, measures of effectiveness have been reported primarily for east-west movements along the Queens Quay and Lake Shore Boulevard corridors. In order to provide to best possible east-west progression for transit, side street phases are generally the minimum time required to serve pedestrian crossing times. Detailed summary worksheets, including side street measures of effectiveness, can be found in Appendix C. An evaluation of measure of effectiveness for north-south movements is included in Section 6 – Preferred Alternative.

5.1.2 Analysis Scenarios

A total of five scenarios have been analyzed as part of this study:

- Existing – Existing traffic with existing signal timings.
- Do Nothing – Future traffic with existing signal timings.
- Centre Transit – Future traffic with new signal timings.
- South Side Two-Way – Future traffic reassigned to reflect future turn restrictions, new signal timings.
- South Side One-Way – Future traffic reassigned to reflect closure of eastbound traffic lanes on Queens Quay and turn restrictions, new signal timings.

5.1.3 Road Network and Lane Configurations

Existing and Do Nothing lane configurations, storage and taper lengths have been input into Synchro to reflect existing arrangements. Future arrangements reflect the functional road layouts contained in For purposes of this analysis, link speeds have been left at the default value of 48 km/h, and lane widths have been assumed at 3.5 metres for all lanes within the study area.

5.1.4 Intersections Analyzed

The following signalized intersections have been analyzed and form the basis of the operations evaluation:

Queens Quay @	Lake Shore Boulevard @
Lower Spadina Avenue	Lower Spadina Avenue
TTC Loop	Rees Street
Beer Store / EMS Driveway	Lower Simcoe Street
Rees Street / Robertson Crescent	York Street
Lower Simcoe Street	Bay Street
Queens Quay Terminal	Yonge Street
York Street	
Waterpark Place Surface Lot / Harbour Square	
Bay Street	
Yonge Street	

5.1.5 Signal Timings

Existing signal timings are input into the evaluation models from signal timing plans provided by the City of Toronto in January 2009. For the existing model:

- Queens Quay signals from Lower Spadina to Bay, inclusive, are coded semi-actuated un-coordinated;
- Queens Quay / Yonge and Queens Quay / Jarvis are coded fixed time; and,
- Offsets were input where info was available.

Existing signal timings were unchanged for the Do Nothing scenario.

All proposed signal phasing strategies were agreed to in principle by the City of Toronto Urban Traffic Control Systems. The south-side transit intersection configuration, in particular the two-stage crossing strategy adopted at “T” intersections, were also agreed to in principle by the Canadian National Institute for the Blind (CNIB).

Basic signal timing assumptions for future scenarios are as follows:

- Signal cycle lengths are 120 seconds for the south side transit alternative, and 100 seconds for the centre transit alternative with the exception of Lower Spadina Avenue which is 136 seconds for the centre transit alternative.
- Transit runs with the main east-west green phase for the south side and centre transit alternatives. Minimum pedestrian walk internal is 7 seconds with a minimum clearance time equal to pedestrian walking distance divided by 1.2 metres/s walking speed
- For the south side transit alternative, any movement (left/right) from Queens Quay to south of the transit right-of-way must operate in a fully protected phase to avoid conflicts with transit vehicles; and also to avoid a condition were permissive turns block east-west transit vehicles (by sitting on the tracks) while waiting for a gap in cyclist/pedestrian flows along the Martin Goodman mixed use trail and sidewalk.

- Amber clearance is 4 seconds for all phases. Red clearance is 3 seconds for all phases where vehicles cross the transit right-of-way, and 2 seconds where vehicles do not cross the transit right-of-way (main east-west).

Signal timings were consistent between the Synchro and VISSIM models; however the VISSIM models employed a more sophisticated active transit signal priority scheme required for optimum transit performance. Detailed signal phasing plans are included in Appendix F.

Synchro does not explicitly represent transit vehicle agents, but can allocate signal time for transit vehicle crossings as specified by the existing signal timing plan. These are represented by “hold” phases where no automobile, bicycle or pedestrian movement are served.

5.1.6 Pedestrian Activity Assumptions

The base model pedestrian volumes were carried forward into the future alternatives for both the Synchro and VISSIM models. Area land owners indicated a desire for growth in visitors and business; however, no detailed forecasts were available for our use. The Canada Square parcel will generate additional pedestrian activity in the area, but that study would be for the venue to address any specific pedestrian needs in the area.

5.1.7 Peak Hour Factors

Peak hour factors are used to artificially increase hourly volumes to represent the worst 15 minutes of the hour. Table 9 contains calculated peak hour factors, for the Lake Shore Boulevard and Queens Quay within the study area. Peak hour factors along both corridors are generally over 0.80 with most in the 0.90 to 0.95 range. City of Toronto Synchro analysis guidelines recommend adopting a peak hour factor of 0.90 during the morning peak hour and a 0.95 during the afternoon peak hour.

Table 9: Calculated Peak Hour Factors

Count Location	October 1st (Mon)	October 2nd (Tue)	October 3rd (Wed)	October 10th (Wed)	October 11th (Thu)	October 12th (Fri)
	Lake Shore Boulevard					
West of Rees						
• Westbound	0.87 (0.95)	0.94 (0.96)	0.93 (0.94)	0.93 (0.90)	0.93 (0.98)	0.88 (0.96)
• Eastbound	0.97 (0.89)	0.97 (0.96)	0.96 (0.98)	0.98 (0.78)	0.95 (0.97)	0.97 (0.98)
West of Bay						
• Westbound	0.92 (0.91)	0.94 (0.95)	0.96 (0.98)	0.95 (0.92)	0.96 (0.92)	0.95 (0.93)
• Eastbound	0.96 (0.93)	0.95 (0.93)	0.89 (0.95)	0.96 (0.95)	0.92 (0.95)	0.96 (0.97)
Segment	Queens Quay					
Spadina to Rees						
• Westbound	0.87 (0.94)	0.92 (0.87)	0.93 (0.85)	0.93 (0.90)	0.94 (0.88)	0.87 (0.83)
• Eastbound	0.89 (0.95)	0.89 (0.77)	0.86 (0.90)	0.89 (0.86)	0.81 (0.90)	0.94 (0.94)
Simcoe to York						
• Westbound	0.89 (0.85)	0.92 (0.95)	0.87 (0.86)	0.93 (0.96)	0.89 (0.94)	0.85 (0.96)
• Eastbound	0.87 (0.97)	0.90 (0.91)	0.78 (0.90)	0.93(0.94)	0.92 (0.92)	0.90 (0.96)
York to Bay						
• Westbound	0.94 (0.96)	0.90 (0.89)	0.88 (0.96)	0.87 (0.88)	0.91 (0.95)	0.93 (0.94)
• Eastbound	0.92 (0.86)	0.88 (0.93)	0.88 (0.95)	0.97 (0.94)	0.90 (0.84)	0.89 (0.90)

Notes:
1. morning peak hour (afternoon peak hour)

A review of peak hour factors calculated from measured volumes as shown in Table 9 indicates that City's recommended peak hour factors are representative of traffic patterns on Queens Quay and have been adopted.

5.1.8 Heavy Vehicles

For the traffic operations analysis, existing observed heavy vehicle percentages have been used for the existing and future scenarios. For the VISSIM transit analysis, an average overall composition of 5 percent trucks was used for the traffic volume inputs.

5.1.9 Base Saturation Flow Rate Assumptions

Saturation flow rate is based on vehicle following time. For example, the two second following rule when driving would result in a total of 1800 vehicles passing a point per hour (i.e. 3600 seconds per hour divide by 2 seconds per vehicle = 1800 vehicles per hour. For this analysis, the ideal Saturation flow rate (vphg – vehicles per hour green) is 1900 for all movements which is a Synchro Default value that should not be changed without field studies.

The analysis for Queens Quay also considered the affects of frequent curb side loading and stopping that is prevalent on Queens Quay. The curb side activity was reflected in the Synchro model by defining the area as "Central Business District" (CBD), which imposes 10 percent base capacity reduction as per the *City of Toronto Synchro Guidelines v5.0* for all intersection within District 1 (former City of Toronto, East York and York).

The analysis does not consider a base capacity adjustment for intersection along Lake Shore Boulevard as was done for the Queens Quay corridor. Lake Shore Boulevard is within District 1; however, it is a unique major arterial roadway in that it has very few properties with frontage within the study area due to its location beneath the Gardiner Expressway. As such, there is very little curbside activity that would have an effect on the basic capacity of the roadway, so the 10 percent adjustment would not be appropriate.

5.1.10 Analysis Time Periods

Based on a detailed review of network traffic patterns and through comparisons between measured summer and autumn traffic volumes, the study team selected the autumn weekday as an appropriate representative day for traffic operations analysis.

Most intersections shared the same "natural" morning peak hour of 8:00 to 9:00 and afternoon peak hour of 17:00 to 18:00. In cases where the natural peak of a particular intersection was not as above, the intersection turning movement counts were recalculated to reflect the consolidated peak. This is known as "forcing" the peak hour and is done to ensure the best possible balance in volumes between intersections.

5.1.11 Transit Analysis

Due to limits of the Synchro software, detailed transit operations analysis was conducted using VISSIM microsimulation software. VISSIM is capable of providing detailed measures for transit vehicles such as travel time, delay, and queuing and headway variability.

Detailed transit vehicle operating parameters such as acceleration/deceleration speeds, passenger boarding times etc. were provided by the TTC and reflect operating parameters of the planned fleet. Technical specifications are included in Appendix D.

5.2 Existing Conditions Baseline

5.2.1 Traffic Operations Analysis

Existing conditions are analyzed to provide a future baseline scenario to which the EA design concepts will be compared. For this scenario, traffic volumes were increased as described in Section 4; however, all lane configurations and signal timings are the same as existing. See Table 12 and Table 13 for summary results. Detailed worksheets are in Appendix C1.

Queens Quay:

- Currently, most intersections in the Queens Quay corridor are under capacity and operate well in both the morning and afternoon peak hours.
- The Lower Spadina Avenue / Queens Quay intersection experiences a higher level of delay than the other intersections along Queens Quay and this is due to the high volume of eastbound left turns over the streetcar tracks, frequency of transit movements, and longer cycle length.
- At York Street and Queens Quay, the westbound shared left/through/right turn lane arrangement, coupled with busy traffic conditions and transit only phases, results in additional delays for this approach. The future alternatives attempt to address some of these issues.

Lake Shore Boulevard:

- Under existing conditions, Lake Shore Boulevard intersections are busy during the morning peak period with some intersections approaching capacity constrained conditions (V/C > 0.80). The afternoon peak hour is busier than the morning peak in overall volume, causing certain key intersection to approach capacity and experience higher delays.
- At Rees Street, Lake Shore Boulevard operates in capacity-constrained conditions due to the ramp located just downstream (eastbound) of the intersection, resulting in complex weaving movements and a considerable approach volume from the north. All of these movements compete for cycle time and there is not enough to serve all movements. During the afternoon peak hour, eastbound and westbound through movements have V/C ratios of 1.07 and 1.20, respectively. For existing conditions, V/C ratios should always be less than or equal to 1.00.
- For the Rees Street analysis, no adjustments were made to the saturation flow rates under existing conditions. A saturation flow study may reveal actual saturation flow rates are higher than the 1900 adopted; however, City Synchro guidelines only allow a base saturation flow rate adjustment of approximately 5 percent which would not get the existing V/C ratio below 1.0. We have assumed this baseline condition and will consider the delta in V/C on these key movements when assessing future scenarios.
- York Street / Lake Shore Boulevard intersection is also operating in capacity-constrained conditions during the afternoon peak hour. This is due to high volumes accessing the Gardiner Expressway westbound on-ramps immediately downstream of York Street which affects westbound and southbound movements in particular.

Table 10: Queens Quay Intersection Operations Analysis – Existing

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina	**0.58**	**36**	**D**	**0.53**	**34**	**C**
• Eastbound Left	0.55	70	E	0.50	69	E
• Eastbound Through	0.67	26	C	0.49	21	C
• Westbound Through	0.32	31	C	0.64	37	D
• Westbound Right	0.13	46	D	0.19	29	C
TTC Loop	**0.49**	**8**	**A**	**0.37**	**12**	**B**
• Eastbound Left	0.19	46	D	0.32	44	D
• Eastbound Through	0.48	1	A	0.35	1	A
• Westbound Through/Right	0.21	20	B	0.41	19	B
Rees Street	**0.41**	**18**	**B**	**0.43**	**20**	**B**
• Eastbound Left	0.27	17	B	0.47	24	C
• Eastbound Through/Right	0.47	18	B	0.30	16	B
• Westbound Shared	0.30	16	B	0.51	19	B
Lower Simcoe Street	**0.35**	**20**	**C**	**0.40**	**14**	**B**
• Eastbound Left	0.13	17	B	0.13	11	B
• Eastbound Through/Right	0.45	20	C	0.27	12	B
• Westbound U-Turn	0.25	20	B	0.12	11	B
• Westbound Through/Right	0.28	18	B	0.41	13	B
York Street	**0.62**	**32**	**C**	**0.61**	**40**	**D**
• Eastbound Left	0.49	23	C	0.43	23	C
• Eastbound Through/Right	0.47	24	C	0.38	23	C
• Westbound Shared	0.78	43	D	0.94	56	E
Waterpark Place Surface Lot	**0.49**	**20**	**C**	**0.42**	**19**	**B**
• Eastbound Shared	0.48	18	B	0.36	17	B
• Westbound Shared	0.45	18	B	0.49	18	B
Bay Street	**0.52**	**17**	**B**	**0.52**	**20**	**C**
• Eastbound Left	0.32	9	A	0.34	13	B
• Eastbound Through/Right	0.33	10	A	0.32	13	B
• Westbound Left	0.20	17	B	0.20	21	C
• Westbound Through	0.55	20	B	0.59	25	C
Yonge Street	**0.39**	**15**	**B**	**0.38**	**15**	**B**
• Eastbound Left	0.33	14	B	0.30	14	B
• Eastbound Through	0.34	12	B	0.34	12	B
• Westbound Through/Right	0.42	13	B	0.39	13	B

Table 11: Lake Shore Boulevard Intersection Operations Analysis – Existing

Lake Shore Boulevard @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina Avenue	**0.74**	**24**	**C**	**0.75**	**27**	**C**
• Eastbound Left (Ramp)	0.69	18	B	0.47	18	B
• Eastbound Through/Right	0.82	22	C	0.85	27	C
Rees Street	**0.69**	**26**	**C**	**0.95**	**101**	**F**
• Eastbound Left	0.61	39	D	0.79	59	E
• Eastbound Through/Right	0.84	25	C	1.07	85	F
• Westbound Left	0.16	61	E	0.49	56	E
• Westbound Through/Right	0.68	13	B	1.20	148	F
Lower Simcoe Street	**0.44**	**15**	**B**	**0.67**	**16**	**B**
• Eastbound Left	0.77	67	E	0.53	56	E
• Eastbound Through/Right	0.60	18	B	0.46	12	B
• Westbound Through/Right	0.45	5	A	0.45	14	B
York Street	**0.83**	**13**	**B**	**0.93**	**22**	**C**
• Westbound Through/Left	0.58	8	A	0.91	15	B
• Westbound Through/Right	0.80	9	A	0.47	6	A
Bay Street	**0.57**	**17**	**B**	**0.65**	**28**	**C**
• Westbound Shared	0.85	19	B	0.84	28	C
Yonge Street	**0.84**	**25**	**C**	**0.77**	**28**	**C**
• Westbound Through/Right	0.86	34	C	0.72	24	C
Harbour Street @	**Morning Peak Hour**			**Afternoon Peak Hour**		
	V/C	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
York Street	**0.58**	**18**	**B**	**0.67**	**35**	**D**
• Eastbound Shared	0.50	6	A	0.59	39	D
Bay Street	**0.85**	**33**	**C**	**0.61**	**22**	**C**
• Eastbound Left	0.68	11	B	0.82	25	C
• Eastbound Through	0.68	9	A	0.81	19	B
• Eastbound Through (Ramp)	1.09	103	F	0.70	34	C
Yonge Street	**0.49**	**22**	**C**	**0.45**	**13**	**B**
• Eastbound Left	0.72	23	C	0.32	5	A
• Eastbound Left/Through	0.68	20	B	0.31	5	A

5.3 Future Do Nothing

5.3.1 Traffic Operations Analysis

Do Nothing was analyzed to provide a future baseline scenario to which the EA design concepts will be compared. For this scenario, traffic volumes were increased as described in Section 4; however, all lane configurations and signal timings are the same as existing. See Table 12 and Table 13 for summary results. Detailed worksheets are in Appendix C2.

Queens Quay:

- The Queens Quay / Lower Spadina intersection operates acceptably during the morning peak hour with an overall LOS D and individual movement LOS ranging from C to E. Through movement V/C ratios are below 0.90. The afternoon peak hour is busier with an overall LOS of F. The westbound through movement is at a V/C of 1.26 and high delays.
- Queens Quay intersections with TTC Loop, Rees Street, Lower Simcoe Street, Waterpark Place Surface Lot / Harbour Square and Bay Street operate acceptably during both the morning and afternoon peak hours with overall intersection LOS B to C. Individual movement LOS range from A to D and V/C ratios are all below 0.60. Westbound at Bay Street is approaching capacity at 0.96; however volume is getting through with reasonable average delay (LOS D).
- York Street and Queens Quay has an overall LOS of D during the morning peak hour with the west westbound shared lanes operating at LOS E and a V/C ratio of 0.96. Eastbound movements operate well at LOS C. During the afternoon peak hour the overall intersection LOS is F and is governed again by the westbound shared lanes operating at LOS F with a V/C ratio of 1.27.
- The Yonge Street and Queens Quay has an overall LOS of C, with the eastbound left turn movement operating at LOS F and E during the morning and afternoon peak hours. This could be address through the addition of a dedicated eastbound left turn phase.

Lake Shore Boulevard:

- During the morning peak hour, Lake Shore Boulevard begins to experience capacity constraints westbound at Bay Street and Yonge Street. The eastbound off-ramp at Bay is also exceeding capacity; however, there is a study currently under way assessing alternative configurations for this ramp. For the purposes of this analysis, we have assumed the existing arrangement.
- The results of the analysis indicate, therefore, that the afternoon peak hour operates fairly well. While this may be true from an intersection capacity perspective considering Lake Shore Boulevard. In reality, there is queuing related to the Gardiner Expressway on-ramps which is not reflected in this analysis. Two key areas of concern are the Rees Street intersection and Bay Street intersection. The large volumes of Gardiner ramp related traffic at these intersections has an impact which may be mitigated through on-going work through other studies.

Note: Since the existing conditions analysis was undertaken, bike lanes have been added to Lower Simcoe Street and Rees Street between Lake Shore Boulevard and Queens Quay. The existing conditions analysis reflects the former arrangements before the addition of bike lanes, and the Do Nothing analysis reflects the lane arrangement after the addition of bike lanes.

Table 12: Queens Quay Intersection Operations Analysis – Do Nothing

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina	**0.66**	**46**	**D**	**0.82**	**91**	**F**
• Eastbound Left	0.45	54	D	0.41	54	D
• Eastbound Through	0.86	41	D	0.90	46	D
• Westbound Through	0.85	59	E	1.26	178	F
• Westbound Right	0.09	33	C	0.29	37	D
TTC Loop	**0.54**	**11**	**B**	**0.52**	**15**	**B**
• Eastbound Left	0.19	46	D	0.31	46	D
• Eastbound Through	0.52	2	A	0.50	2	A
• Westbound Through/Right	0.34	23	C	0.57	26	C
Rees Street	**0.42**	**19**	**B**	**0.52**	**22**	**C**
• Eastbound Left	0.32	18	B	0.64	35	C
• Eastbound Through/Right	0.51	19	B	0.49	19	B
• Westbound Shared	0.42	18	B	0.27	22	C
Lower Simcoe Street	**0.41**	**22**	**C**	**0.57**	**17**	**B**
• Eastbound Left	0.06	18	B	0.30	16	B
• Eastbound Through/Right	0.52	22	C	0.42	14	B
• Westbound U-Turn	0.41	25	C	0.17	12	B
• Westbound Through/Right	0.38	20	B	0.58	16	B
York Street	**0.69**	**40**	**D**	**0.78**	**98**	**F**
• Eastbound Left	0.58	26	C	0.61	30	C
• Eastbound Through/Right	0.53	25	C	0.55	25	C
• Westbound Shared	0.96	62	E	1.27	167	F
Waterpark Place Surface Lot	**0.70**	**25**	**C**	**0.79**	**36**	**D**
• Eastbound Shared	0.64	22	C	0.58	24	C
• Westbound Shared	0.73	24	C	0.68	27	C
Bay Street	**0.64**	**21**	**C**	**0.67**	**32**	**C**
• Eastbound Left	0.47	12	B	0.72	25	C
• Eastbound Through/Right	0.35	10	A	0.49	15	B
• Westbound Left	0.21	17	B	0.28	26	C
• Westbound Through	0.81	27	C	0.96	50	D
Yonge Street	**0.88**	**29**	**C**	**0.81**	**21**	**C**
• Eastbound Left	1.14	126	F	0.91	59	E
• Eastbound Through	0.29	12	B	0.42	13	B
• Westbound Through/Right	0.62	16	B	0.56	15	B

Table 13: Lake Shore Boulevard Intersection Operations Analysis – Do Nothing

Lake Shore Boulevard @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina Avenue	**0.76**	**25**	**C**	**0.81**	**32**	**C**
• Eastbound Left (Ramp)	0.72	19	B	0.51	19	B
• Eastbound Through/Right	0.85	23	C	0.95	35	C
Rees Street	**0.74**	**30**	**C**	**1.02**	**126**	**F**
• Eastbound Left	0.61	39	D	0.80	45	D
• Eastbound Through/Right	0.89	38	C	1.21	116	F
• Westbound Left	0.16	52	D	0.49	40	D
• Westbound Through/Right	0.98	30	C	1.36	177	F
Lower Simcoe Street	**0.52**	**17**	**B**	**0.83**	**30**	**C**
• Eastbound Left	0.87	75	E	0.82	34	C
• Eastbound Through/Right	0.64	22	C	0.57	24	C
• Westbound Through/Right	0.64	4	A	1.05	33	C
York Street	**0.98**	**21**	**C**	**1.81**	**61**	**E**
• Westbound Through/Left	0.90	9	A	1.06	38	D
• Westbound Through/Right	1.05	31	C	0.53	5	A
Bay Street	**0.82**	**98**	**F**	**0.82**	**45**	**D**
• Westbound Shared	1.29	144	F	1.08	55	D
Yonge Street	**1.06**	**107**	**F**	**0.91**	**42**	**D**
• Westbound Through/Right	1.30	172	F	1.00	48	D
Harbour Street @	**Morning Peak Hour**			**Afternoon Peak Hour**		
	V/C	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
York Street	**0.67**	**20**	**C**	**0.97**	**41**	**D**
• Eastbound Shared	0.57	9	A	0.81	20	B
Bay Street	**0.96**	**41**	**D**	**0.98**	**72**	**E**
• Eastbound Left	0.80	17	B	1.12	88	F
• Eastbound Through	0.81	14	B	1.10	71	E
• Eastbound Through (Ramp)	1.18	136	F	1.16	122	F
Yonge Street	**0.61**	**26**	**C**	**0.71**	**13**	**B**
• Eastbound Left	0.82	28	C	0.46	4	A
• Eastbound Left/Through	0.83	26	C	0.47	4	A

5.4 Centre Transit

5.4.1 Traffic Operations Analysis

The centre transit Synchro traffic operations analysis was matched, as closely as possible, to the VISSIM transit operations analysis. All cycle lengths except for Spadina, Bay and Yonge are 100 seconds as per the analysis undertaken by the TTC. Fully protected left turn phases across the TTC tracks are generally minimums to allow maximum east west green time for transit. See Table 14 and Table 15 for summary results. Detailed worksheets are in Appendix C3.

Queens Quay:

- The Lower Spadina Avenue intersection operates with an overall LOS D during both the morning and afternoon peak hours. Eastbound left turns operating at LOS E during both peaks however have V/C ratios less than 0.70. The westbound through movement is still an operational concern during the afternoon peak with a LOS E and V/C of 0.95.
- The TTC Loop, Beer Store / EMS and Yonge Street intersections operate well with overall LOS A to C, individual movement LOS A to D, and individual V/C ratios of 0.86 or less.
- Queens Quay intersections at Rees Street, Lower Simcoe Street, York Street, Water Park Place Surface Lot / Harbour Square operate a LOS C to D overall during the morning and afternoon peak hours. A common trait of these intersections is the necessity for fully protected eastbound and westbound left turns over the tracks. The protected lefts result in fairly high delays (LOS D to F); however the capacity can generally be accommodated. The only instance where the movement is over capacity is the eastbound left at Rees Street which could be mitigated by providing a short callable green time extension or increasing the minimum phase time. It is possible to improve the LOS of these movements by adding additional turn phase time at the expense of east-west traffic and transit.
- The Bay Street intersection operates at overall LOS D with the eastbound lefts and westbound through movements competing for time in the cycle. The short 90 second cycle length used in the centre transit analysis could be extended to mitigate the capacity issues at this location. (i.e. south side transit uses a 103 second cycle length at Bay and Queens Quay).

Lake Shore Boulevard:

- Along Lake Shore Boulevard, some efficiency can be realized through signal timing adjustments. Notably, operations at intersections with Harbour Street have been improved over Do Nothing. We still expect capacity constraints at Bay Street and Yonge Street westbound during the morning peak hour, at also at Rees Street during both peak hours.

Centre Transit provides a feasible alternative which could provide generally acceptable traffic operations. Cycle lengths and signal timings could be further optimized to provide better operations along the corridor. The key inherent constraints with the centre transit alternative is due to the fully protected eastbound left turns competing for time with westbound through movements on Queens Quay. Side streets will generally experience more delay than the main east-west movements.

Table 14: Queens Quay Intersection Operations Analysis – Centre Transit

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina	**0.69**	**38**	**D**	**0.75**	**48**	**D**
• Eastbound Left	0.68	76	E	0.60	69	E
• Eastbound Through	0.78	32	C	0.81	34	C
• Westbound Through	0.64	39	D	0.95	67	E
• Westbound Right	0.09	27	C	0.23	30	C
TTC Loop	**0.50**	**4**	**A**	**0.47**	**9**	**A**
• Eastbound Left	0.28	46	D	0.40	47	D
• Eastbound Through	0.50	1	A	0.48	1	A
• Westbound Through/Right	0.23	3	A	0.39	13	B
Beer Store / EMS	**0.54**	**4**	**A**	**0.64**	**22**	**C**
• Eastbound Left	No vol.	-	-	0.23	54	D
• Eastbound Through/Right	0.56	4	A	0.67	14	B
• Westbound Left	No vol.	-	-	No vol.	-	-
• Westbound Through/Right	0.32	1	A	0.83	29	C
Rees Street	**0.66**	**35**	**C**	**0.77**	**39**	**D**
• Eastbound Left	0.85	76	E	1.05	148	F
• Eastbound Through/Right	0.87	43	D	0.84	19	B
• Westbound Left	0.54	67	E	0.48	59	E
• Westbound Through/Right	0.68	15	B	1.03	43	D
Lower Simcoe Street	**0.71**	**43**	**D**	**0.75**	**55**	**D**
• Eastbound Left	0.68	55	E	0.78	60	E
• Eastbound Through/Right	0.95	47	D	0.86	47	D
• Westbound Left	0.86	62	E	0.91	87	F
• Westbound Through/Right	0.66	36	D	1.07	66	E
York Street	**0.72**	**26**	**C**	**0.78**	**34**	**C**
• Eastbound Left	0.81	64	E	0.85	89	F
• Eastbound Through/Right	0.89	22	C	0.85	29	C
• Westbound Left	0.38	63	E	0.23	60	E
• Westbound Through	0.83	25	C	1.01	42	D
• Westbound Right	0.31	11	B	0.43	10	A
Waterpark Place Surface Lot	**0.64**	**24**	**C**	**0.96**	**42**	**D**
• Eastbound Left	0.56	65	E	0.36	65	E
• Eastbound Through/Right	0.84	17	B	0.87	19	B
• Westbound Left	0.42	55	D	0.47	55	E
• Westbound Through	0.80	30	C	0.98	51	D
• Westbound Right	0.34	18	B	0.0.	12	B
Bay Street	**1.06**	**49**	**D**	**0.84**	**55**	**D**
• Eastbound Left	0.87	59	E	1.20	153	F
• Eastbound Through/Right	0.72	21	C	0.90	34	C
• Westbound Left	0.23	16	B	0.35	25	C
• Westbound Through	1.11	84	F	1.06	79	E
• Westbound Right	0.37	14	B	0.21	19	B
Yonge Street	**0.65**	**22**	**C**	**0.74**	**25**	**C**
• Eastbound Left	0.86	42	D	0.81	40	D
• Eastbound Through	0.49	19	A	0.73	20	B
• Westbound Through/Right	0.70	23	C	0.64	21	C

Table 15: Lake Shore Boulevard Intersection Operations Analysis – Centre Transit

Lake Shore Boulevard @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina Avenue	**0.76**	**25**	**C**	**0.82**	**27**	**C**
• Eastbound Left (Ramp)	0.72	19	B	0.48	17	B
• Eastbound Through/Right	0.85	23	C	0.89	28	C
Rees Street	**0.74**	27	**C**	**1.09**	**116**	**F**
• Eastbound Left	0.61	39	D	0.97	73	E
• Eastbound Through/Right	0.89	28	C	1.21	119	F
• Westbound Left	0.16	57	E	0.49	39	D
• Westbound Through/Right	0.84	16	B	1.29	143	F
Lower Simcoe Street	**0.52**	**15**	**B**	**0.83**	**30**	**C**
• Eastbound Left	0.09	9	A	0.82	36	D
• Eastbound Through/Right	0.64	20	B	0.57	26	C
• Westbound Through/Right	0.63	6	A	1.05	32	C
York Street	**0.98**	21	**C**	**1.17**	**73**	**E**
• Westbound Through/Left	0.90	10	A	1.10	56	E
• Westbound Through/Right	1.05	31	C	0.54	6	A
Bay Street	**0.82**	**98**	**F**	**0.83**	**30**	**C**
• Westbound Shared	1.29	144	F	0.99	25	C
Yonge Street	**1.06**	**109**	**F**	**0.93**	**37**	**D**
• Westbound Through/Right	1.30	172	F	0.93	34	C
Harbour Street @	**Morning Peak Hour**			**Afternoon Peak Hour**		
	V/C	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
York Street	**0.67**	20	**B**	**0.87**	**36**	**D**
• Eastbound Shared	0.57	8	A	0.87	24	C
Bay Street	**0.80**	**22**	**C**	**0.91**	**33**	**C**
• Eastbound Left	0.80	18	B	0.88	21	C
• Eastbound Through	0.81	14	B	0.85	16	B
• Eastbound Through (Ramp)	0.66	23	C	0.90	40	D
Yonge Street	**0.61**	**18**	**B**	**0.70**	**13**	**B**
• Eastbound Left	0.82	17	B	0.71	5	A
• Eastbound Left/Through	0.83	14	B	0.74	5	A

5.5 South Side One-Way

5.5.1 Traffic Operations Analysis

The south side transit one-way Synchro traffic operations analysis uses the same intersection offsets used for the south side two-way scenario. All cycle lengths except for Bay and Yonge are 120 seconds. Fully protected left turn phases across the TTC tracks are generally minimums to allow maximum east west green time for transit. See Table 16 and Table 17 for summary results. Detailed worksheets are in Appendix C4.

Queens Quay:

- Lower Spadina Avenue, Beer Store / EMS, Bay Street and Yonge Street operate acceptably during the morning and afternoon peak hours with overall intersection LOS ranging from A to D. Individual movement LOS range from A to D with all movements operating at V/C of 0.85 (Spadina westbound) or lower.
- TTC Loop, Rees Street, Lower Simcoe and Queens Quay Terminal operate well overall with LOS ranging from A to C. These intersections however have fully protected westbound left turns over the TTC right-of-way which experience higher delays resulting in LOS E to F. It is possible to improve the LOS of these movements by adding more turn phase time at the expense of east-west transit time.
- York Street operates fairly well with overall LOS C and D during the morning and afternoon peak hours respectively. The southbound left turn movement is heavily loaded with the detour traffic returning to Queens Quay form eastbound Lake Shore Boulevard and is operating a LOS C to D with a V/C of 0.84 to 0.85. The extended southbound phase does take some time from westbound through movements which are operating at LOS D with V/C ratios of 0.76 to 0.94.

Lake Shore Boulevard:

- Due to the reassignment of eastbound Queens Quay traffic to eastbound Lake Shore Boulevard through Lower Spadina Avenue, Rees Street and Lower Simcoe to York Street, traffic operations at these intersections has deteriorated compared to all other future scenarios. For example, the traffic diversion caused eastbound through movements at Lower Spadina Avenue and Rees Street to exceed available capacity and operate at LOS E to F.
- Rees Street would experience capacity constrained conditions during the afternoon peak hour in particular.
- Rerouting of Railway Lands traffic from Queens Quay to Lake Shore Boulevard has also placed additional volume on the eastbound left turn at Lower Simcoe Street causing this movement to potentially exceed capacity and experience long delays.
- The same constraints still experienced at Bay and Yonge Streets westbound.

The south side transit with one-way traffic is a feasible traffic operations alternative for Queens Quay, however could have adverse affects on Lake Shore Boulevard operations, in particular between Lower Spadina and York Street.

Due to their nature, fully protected westbound left turns over the TTC right-of-way may experience delays similar to the fully protected left and right turns of the other alternatives. A notable benefit of the south side transit one-way traffic alternative would be simplified geometry on Queens Quay between Spadina and York, plus there would be no need for a “contra flow” buffer between the vehicle travel lanes and TTC right-of-way.

Table 16: Queens Quay Intersection Operations Analysis – South Side One-Way

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina	**0.36**	**19**	**B**	**0.54**	**40**	**D**
• Westbound Through	0.51	20	C	0.85	45	D
• Westbound Right	0.10	8	A	0.20	27	C
TTC Loop	**0.19**	**11**	**B**	**B**	**11**	**B**
• Westbound Left	0.33	75	E	F	91	F
• Westbound Through/Right	0.00	4	A	A	7	A
Beer Store / EMS	**0.17**	**5**	**A**	**0.30**	**4**	**A**
• Westbound Left	No vol.	-	-	No vol.	-	-
• Westbound Through/Right	0.20	4	A	0.36	3	A
Rees Street	**0.24**	**16**	**B**	**0.33**	**21**	**C**
• Westbound Left	0.43	70	E	0.57	69	E
• Westbound Through/Right	0.24	3	A	0.36	12	B
Lower Simcoe Street	**0.24**	**15**	**B**	**0.34**	**12**	**B**
• Westbound Left	0.60	89	F	0.38	71	E
• Westbound Through/Right	0.26	2	A	0.39	5	A
Queens Quay Terminal	**0.24**	**6**	**A**	**0.30**	**4**	**A**
• Westbound Left	0.33	82	F	0.46	77	E
• Westbound Through	0.27	2	A	0.35	1	A
York Street	**0.80**	**34**	**C**	**0.87**	**44**	**D**
• Westbound Left	0.12	32	C	0.10	24	C
• Westbound Through/Right	0.76	45	D	0.94	53	D
• Southbound Left	0.85	26	C	0.84	37	D
Bay Street	**0.79**	**26**	**C**	**0.60**	**23**	**C**
• Eastbound Left	0.47	16	B	0.37	13	B
• Eastbound Through/Right	0.61	19	B	0.51	15	B
• Westbound Left	0.19	15	B	0.16	18	B
• Westbound Through/Right	0.80	23	C	0.68	26	C
Yonge Street	**0.52**	**15**	**B**	**0.64**	**27**	**C**
• Eastbound Left	0.41	9	A	0.52	32	C
• Eastbound Through	0.49	7	A	0.49	27	C
• Westbound Through/Right	0.52	12	B	0.51	15	B

Table 17: Operations Analysis Summary – South Side Transit, One-Way Traffic

Lake Shore Boulevard @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina Avenue	**0.85**	**45**	**D**	**0.95**	**60**	**E**
• Eastbound Left (Ramp)	0.72	20	B	0.50	15	B
• Eastbound Through/Right	1.05	57	E	1.07	62	E
Rees Street	**0.89**	**72**	**E**	**1.30**	**151**	**F**
• Eastbound Left	0.68	41	D	1.12	114	F
• Eastbound Through/Right	1.14	95	F	1.39	213	F
• Westbound Left	0.16	66	E	0.49	47	D
• Westbound Through/Right	0.98	40	D	1.08	79	E
Lower Simcoe Street	**0.70**	**14**	**B**	**0.92**	**46**	**D**
• Eastbound Left	0.18	6	A	1.69	365	F
• Eastbound Through/Right	0.89	20	C	0.83	20	C
• Westbound Through/Right	0.64	4	A	1.05	42	D
York Street	**0.92**	**14**	**B**	**1.14**	**71**	**E**
• Westbound Through/Left	0.85	**9**	A	1.10	56	E
• Westbound Through/Right	0.98	**9**	A	0.54	6	A
Bay Street	**0.82**	**99**	**F**	**0.83**	**34**	**C**
• Westbound Shared	1.29	145	F	1.01	32	C
Yonge Street	**1.06**	**109**	**F**	**0.93**	**36**	**D**
• Westbound Through/Right	1.30	172	F	0.93	33	C
Harbour Street @	**Morning Peak Hour**			**Afternoon Peak Hour**		
	V/C	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
York Street	**0.78**	**22**	**C**	**1.02**	**68**	**E**
• Eastbound Shared	0.83	18	B	1.01	51	D
Bay Street	**0.82**	**24**	**C**	**0.96**	**39**	**D**
• Eastbound Left	0.82	21	C	0.99	37	D
• Eastbound Through	0.83	18	B	0.97	28	C
• Eastbound Through (Ramp)	0.70	24	C	0.98	53	D
Yonge Street	**0.56**	**17**	**B**	**0.69**	**12**	**B**
• Eastbound Left	0.82	18	B	0.47	5	A
• Eastbound Left/Through	0.83	14	B	0.48	5	A

5.6 South Side Two-Way

5.6.1 Traffic Operations Analysis

The south side transit, two-way Synchro traffic operations analysis was matched, as closely as possible, to the VISSIM transit operations analysis for this scenario. All cycle lengths except for Bay and Yonge are 120 seconds. Fully protected right turn phases across the TTC tracks are minimums to allow maximum east west green time for transit. See Table 18 and Table 19 for summary results. Detailed worksheets are in Appendix C5.

Queens Quay:

- The Lower Spadina / Queens Quay intersection operates fairly well with overall LOS C during the morning and afternoon peak hours. Individual movement LOS ranges from LOS A to D with all movements operating with V/C of 0.83 or lower. The greatest improvements in operations at this intersection is the ability of eastbound left turns to operate permissive, allowing turn on inter-green and more time to allocated to the westbound through.
- The TTC Loop operates acceptably during the morning and afternoon peak hours with overall LOS of B to C. Individual movement LOS ranging from A to D at V/Cs are all below 0.80. The exception is the westbound left turn at LOS E during the afternoon peak hour. This is because the phase must be fully protected to cross the TTC right-fo-way.
- The Beer Store / EMS, Lower Simcoe Street, Bay Street and Yonge Street intersections all operate fairly well with overall intersection LOS ranging from A to C and individual movement LOS ranging from A to D during the morning and afternoon peak hours. All movements are below a V/C ratio of 0.80 with the exception of the westbound through at Bay and Yonge Streets where it operates at 0.82 to 0.94.
- Rees Street and Queens Quay Terminal operate well overall with LOS B to C; however the fully protected right turns over the TTC right-of-way have fairly high delays resulting in LOS D to F. This is again due to the fully protected turns being minimum phase lengths to provide maximum east-west green time for transit. It is important to note that there is sufficient capacity for these movements, and it is possible to provide more time to turns for better LOS at the expense of east-west transit time.
- York Street operates well overall with LOS B during the morning and afternoon peak hours. The westbound left turn at York Street is the only movement worse than LOS B, at LOS E. This is again due to the phase being fully protected in order to cross the TTC right-of-way. While delays are fairly high, there is sufficient capacity to accommodate the movement.

Lake Shore Boulevard:

- Lake Shore Boulevard operations are similar to Centre Transit with constrains at Yonge and Bay Street westbound during the morning peak hour, and at Rees Street in afternoon peak hour.

The south side transit with two-way traffic is a feasible traffic operations alternative. Due to their nature, fully protected westbound left and eastbound right turns over the TTC right-of-way have delays similar to the fully protected eastbound and westbound left turns of the centre transit alternative. A notable benefit of the south side transit is that eastbound left turns can run permissive which can allows for more time in the cycle for westbound through.

Table 18: Queens Quay Intersection Operations Analysis – South Side Two-Way

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina	**0.64**	**25**	**C**	**0.63**	**33**	**C**
• Eastbound Left	0.27	21	C	0.39	26	C
• Eastbound Through	0.79	35	C	0.83	37	D
• Westbound Through	0.51	10	B	0.76	30	C
• Westbound Right	0.10	3	A	0.19	24	C
TTC Loop	**0.63**	**22**	**C**	**0.60**	**19**	**B**
• Eastbound Left	0.06	5	A	0.16	6	A
• Eastbound Through	0.78	18	B	0.75	14	B
• Westbound Left	0.33	53	D	0.52	75	E
• Westbound Through/Right	0.45	24	C	0.78	21	C
Beer Store / EMS	**0.51**	**9**	**A**	**0.54**	**15**	**B**
• Eastbound Left	No vol.	-	-	0.02	1	A
• Eastbound Through	0.64	11	B	0.61	10	A
• Westbound Left	No vol.	-	-	No vol.	-	-
• Westbound Through/Right	0.39	5	A	0.67	18	B
Rees Street	**0.60**	**20**	**C**	**0.73**	**27**	**C**
• Eastbound Through/Left	0.67	9	A	0.82	35	C
• Eastbound Right	0.68	99	F	0.52	46	D
• Westbound Through/Right	0.50	22	C	0.71	9	A
Lower Simcoe Street	**0.62**	**16**	**B**	**0.65**	**22**	**C**
• Eastbound Left	0.23	6	A	0.41	16	B
• Eastbound Through	0.68	11	B	0.61	17	B
• Westbound Left	0.60	52	D	0.53	51	D
• Westbound Through/Right	0.42	11	B	0.67	18	B
Queens Quay Terminal	**0.49**	**13**	**B**	**0.55**	**12**	**B**
• Eastbound Through	0.62	9	A	0.55	9	A
• Eastbound Right	0.32	71	E	0.46	64	E
• Westbound Through	0.60	14	B	0.69	12	B
York Street	**0.64**	**19**	**B**	**0.62**	**16**	**B**
• Eastbound Left	0.33	6	A	0.26	6	A
• Eastbound Through	0.66	11	B	0.67	12	B
• Westbound Left	0.52	63	E	0.46	63	E
• Westbound Through	0.40	10	B	0.59	12	B
• Westbound Right	0.17	8	A	0.30	9	A
Bay Street	**0.81**	**31**	**B**	**0.80**	**26**	**C**
• Eastbound Left	0.52	17	B	0.69	22	C
• Eastbound Through/Right	0.63	16	B	0.76	20	B
• Westbound Left	0.16	20	B	0.23	19	B
• Westbound Through	0.94	45	D	0.86	33	C
• Westbound Right	0.30	29	C	0.35	21	C
Yonge Street	**0.74**	**21**	**C**	**0.72**	**21**	**C**
• Eastbound Left	0.53	19	B	0.48	13	B
• Eastbound Through	0.56	16	B	0.72	17	B
• Westbound Through	0.82	23	C	0.65	16	B
• Westbound Right	0.14	8	A	0.20	9	A

Table 19: Lake Shore Boulevard Intersection Operations Analysis– South Side Two-Way

Lake Shore Boulevard @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Spadina Avenue	**0.77**	**25**	**C**	**0.83**	**28**	**C**
• Eastbound Left (Ramp)	0.73	20	B	0.50	17	B
• Eastbound Through/Right	0.86	24	C	0.91	29	C
Rees Street	**0.75**	28	**C**	**1.08**	**120**	**F**
• Eastbound Left	0.61	39	D	0.97	72	E
• Eastbound Through/Right	0.91	29	C	1.24	132	F
• Westbound Left	0.16	59	E	0.49	40	D
• Westbound Through/Right	0.84	17	B	1.29	143	F
Lower Simcoe Street	**0.54**	**17**	**B**	**0.86**	**31**	**C**
• Eastbound Left	0.09	9	A	0.82	35	D
• Eastbound Through/Right	0.66	21	C	0.59	27	C
• Westbound Through/Right	0.63	11	B	1.05	33	C
York Street	**0.99**	21	**C**	**1.15**	**72**	**E**
• Westbound Through/Left	0.90	10	A	1.07	46	D
• Westbound Through/Right	1.05	31	C	0.53	6	A
Bay Street	**0.82**	**99**	**F**	**0.84**	**31**	**C**
• Westbound Shared	1.29	145	F	0.99	27	C
Yonge Street	**1.06**	**109**	**F**	**0.93**	**37**	**D**
• Westbound Through/Right	1.30	172	F	0.93	33	C
Harbour Street @	**Morning Peak Hour**			**Afternoon Peak Hour**		
	V/C	**Delay**	**LOS**	**V/C**	**Delay**	**LOS**
York Street	**0.67**	20	**B**	**0.89**	**36**	**D**
• Eastbound Shared	0.58	7	A	0.88	24	C
Bay Street	**0.81**	**22**	**C**	**0.93**	**34**	**C**
• Eastbound Left	0.80	18	B	0.87	21	C
• Eastbound Through	0.81	14	B	0.85	16	B
• Eastbound Through (Ramp)	0.67	23	B	0.86	34	C
Yonge Street	**0.57**	**17**	**B**	**0.69**	**12**	**B**
• Eastbound Left	0.82	17	B	0.46	6	A
• Eastbound Left/Through	0.84	14	B	0.48	5	A

5.7 Overall Intersection Operations Summary Comparison

5.7.1 Queens Quay Summary Comparison

Under Do Nothing, there were two instances where traffic operations approach level of service E or F. This is due to the signal strategy currently deployed on Queens Quay today and its inability to adapt to future traffic levels. In particular, there is a constraint at the York Street intersection during the afternoon peak hour in the westbound direction. This constraint is due to inadequate time in the cycle to accommodate the increased demand. The shared westbound through/left turn lane places an additional constraint on westbound through capacity if through vehicles get stuck behind a left turn vehicle waiting for a gap in on-coming traffic.

At Spadina, the constraints are similar to existing and are due to the high number of transit movements and dedicated phases which compete with auto demand at the intersection.

The south side alternatives operate similarly in terms of traffic operations along Queens Quay. Overall intersection levels-of-service (LOS) are LOS D or better. The south side transit arrangement provides some benefit to traffic over centre transit because the majority of traffic is oriented to the north. When transit is on the south side of the street, there is less volume turning over the TTC right-of-way.

Based on this analysis, the south side two-way transit alternative provides the best overall operations in terms of overall intersection delay to traffic. Detailed traffic operations worksheets are provided in Appendix C.

Table 20: Queens Quay Overall Intersection Operations Comparative Summary

Queens Quay @	Do Nothing	Centre Transit	South Side One-Way	South Side Two-Way
Lower Spadina Avenue	D / F	D / D	B / D	C / C
TTC Loop	B / B	A / A	B / B	C / B
EMS / Beer Store	Unsignalized	A / C	A / A	A / B
Rees Street	B / C	C / D	B / C	B / C
Robertson Crescent East[2]	Unsignalized	Unsignalized	Unsignalized	A / A
Lower Simcoe Street	C / B	D / D	B / B	B / C
Queens Quay Terminal	Unsignalized	Unsignalized	A / A	B / B
York Street	D / F	C / C	C / D	B / B
Harbour Square	C / D	C / D	Removed	Removed
Bay Street	C / C	D / D	C / C	B / C
Yonge Street	C / C	C / C	B / C	C / C

Notes:
1. morning peak hour / afternoon peak hour
2. See section 6.2.3 for analysis details

5.7.2 Lake Shore Boulevard Summary Comparison

Under "Do Nothing", traffic operations begin to deteriorate along Lake Shore Boulevard due to the high level of forecasted development throughout the central waterfront. The impacts to Lake Shore Boulevard due to waterfront traffic growth are similar as shown for all future scenarios. The south side one-way alternative does have increased localized impacts on Lake Shore Boulevard because of added eastbound traffic between Lower Spadina Avenue and York Street; however, the overall network impacts are in the same order-of-magnitude.

For both the Centre Transit and South Side Two-Way alternatives, Lake Shore Boulevard operates under similar conditions. Rees Street operates at LOS F during the afternoon peak due to heavy demand in every direction. Bay Street and Yonge Street may also experience delays resulting in LOS F due to heavy demand from the eastbound Gardiner off-ramps competing for time with westbound development traffic.

It is important to note that while future growth will place higher demand on the waterfront road network; Queens Quay is not intended to be a relief "valve" for Lake Shore Boulevard. Capacity constraints on Lake Shore Boulevard will need to be addressed from a systems point of view considering all available modes of transportation.

Several individual movements and approaches on Lake Shore Boulevard are forecasted to experience at capacity and high delay conditions. Detailed traffic operations worksheets are provided in Appendix C.

Table 21: Lake Shore Boulevard Overall Intersection Operations Comparative Summary

Lake Shore Boulevard @	**Do Nothing**	**Centre Transit**	**South Side One-Way**	**South Side Two-Way**
Lower Spadina Avenue	C / C	C / C	D / E	C / C
Rees Street	C / F	C / F	E / F	C / F
Lower Simcoe Street	B / C	B / C	B / D	B / C
York Street (WB)	C / E	C / E	B / E	C / E
Bay Street (WB)	F / D	F / C	F / C	F / C
Yonge Street (WB)	F / D	F / D	F / D	F / D
Harbour Street @				
York Street (EB)	C / D	B / D	C / E	B / D
Bay Street (EB)	D / E	C / C	C / D	C / C
Yonge Street (EB)	C / B	B / B	B / B	B / B

Notes:

1. morning peak hour / afternoon peak hour

5.8 Future Queens Quay Transit Operations

In order to assess impacts on transit operations for future configurations of Queens Quay, we modelled both south side two-way and centre transit options using VISSIM micro-simulation software.

We worked with PTV America to develop a unique transit signal priority and coordination scheme to maximize transit travel speeds throughout the corridor. The results of these models demonstrated that additional signals had additional impact on transit operations in terms of delay and service reliability.

Originally, the centre and south side alternatives had 9 and 12 signals, respectively, from Lower Spadina Avenue to Cherry Street. Because the centre transit alternative had fewer signals, the analysis showed that it was 20 to 30 percent faster throughout the corridor.

Service reliability was also measured and found that the centre transit alternative adhered to its scheduled headway somewhat better than south side, with centre operating at LOS A to C, and south side operating at LOS A to D.

Detailed results and documentation of the transit analysis is included in Appendix D.

Given the importance of providing the best possible transit service for the waterfront in order to achieve the transit modal split targets necessary to support development, it was determined that all options had to minimize the number of signalized intersections.

A baseline VISSIM analysis was completed for the initial centre and south side alternatives in Spring 2008. The south side alternative was refined and retested since that time. Table 22 summarizes the travel time results of the transit operations analysis done since the original analysis. The analysis completed for the final south side configuration includes total of 9 signals west of Bay Street – the same number of signals included in the centre transit alternative. Analysis of the final south side configuration indicated that it was possible to greatly improve speeds by reducing signals. The transit speed of the south side alternative was improved and found to be only 1 to 8 percent slower than centre transit. It is important to note that because the corridor is short, the difference in actual travel time is approximately 2 to 26 seconds.

Further discussion on the transit scenarios that were analyzed during the study is provided in Appendix D.

From a transit operations perspective, the south side and centre transit alternatives provide the similar levels of service with minor variations in travel speeds which can be attributed to scenario specific differences at intersections such as geometry and signal timings.

Table 22: Transit Analysis Timeline

	No. of Signals		Average Speed		Average Travel Time	
Model Scenario	**West**	**East**	**West**	**East**	**West**	**East**
Existing Condition	8	N/A	12.4 to 14.0	N/A	N/A	N/A
Centre Transit: Baseline Model (Spring 2008)	9	5	17.2 to 20.9	20.6 to 23.1	258 to 308	287 to 316
South Side Transit: Baseline Model (Spring 2008)	12	11	13.2 to 17.3	16.9 to 19.3	312 to 405	311 to 356
South Side Transit: Final Configuration (Sept 2009)	9	6	16.0 to 21.1	18.0 to 19.7[2]	260 to 334	305 to 334[2]
Difference: Final Configuration South Side from Centre	**0**	**+1**	**-1.2 to -0.2**	**-1.6 to -3.4**	**+2 to +26**	**+18 to +18**
Percentage Change					**1 to 8%**	**5 to 6%**

Notes:

1. Models considered corridor from Spadina Avenue to Cherry Street. Signal count from Bathurst Street to Parliament Street
2. Redpath West entrance. RI/RO assumed for Centre Transit.
3. Interpolated figures: Based on an additional 18 seconds per trip to account for delay caused by adding one signal (18 seconds).
4. Note possible to interpolate.

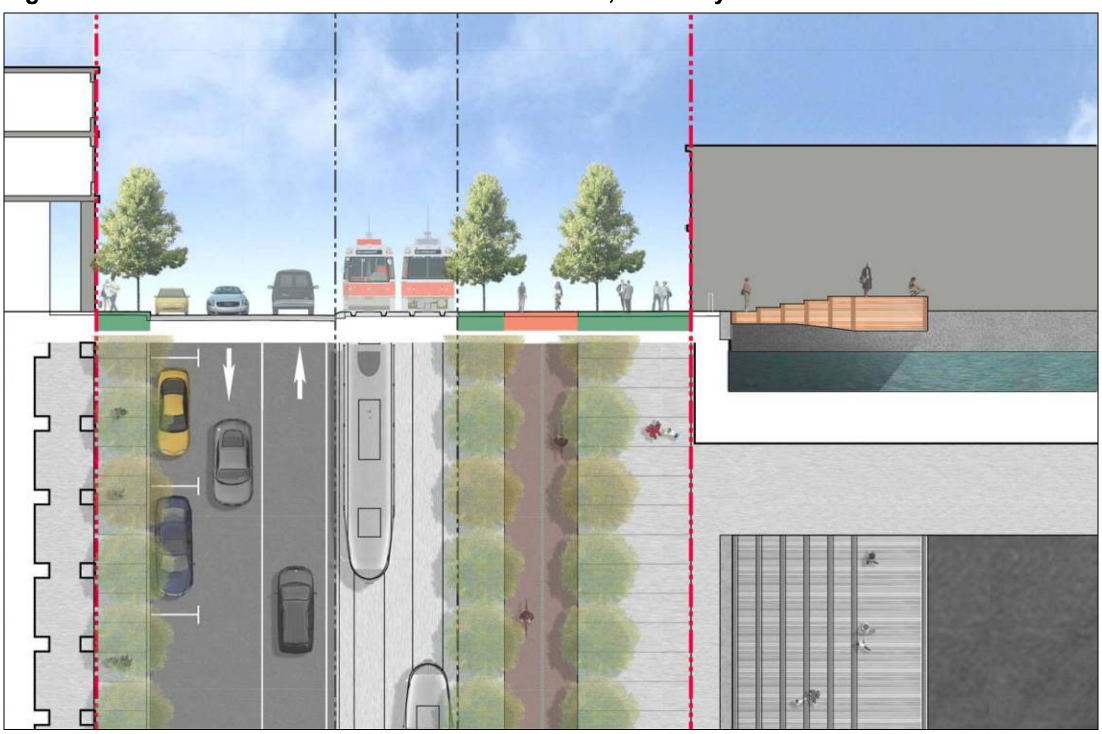
6 Preferred Alternative

6.1 South Side Transit, Two-Way Traffic

Based on this analysis and considering the more broad policy and public realm objectives, the team recommended that the south side two-way alternative (illustrated in Figure 14) as the best overall solution for Queens Quay. The recommendation is based on the following key points:

- Reduced north-south crossing distance for pedestrians allows more time in the cycle to be dedicated to east-west transit and traffic.
- The ability for eastbound left turns to proceed without a dedicated turn phase allows more time to be dedicated to westbound traffic resulting in overall better levels of service at intersections with eastbound left turns.
- The dedicated Martin Goodman trail provides a safe and efficient facility for bicycles and pedestrians which is an improvement over today and better overall than on-street bike lanes.
- Two-way traffic can be accommodated on Queens Quay at an acceptable level of service with only minor re-routings to Lake Shore Boulevard.
- Adequate auto access can be provided to all lands south of Queens Quay with minor access modifications.
- On-street loading and parking can be accommodated where space permits on the north curb of Queens Quay.

Figure 14: Preferred Alternative – South Side Transit, Two-Way Traffic



6.2 Access Modifications

This section describes in detail changes to access for the primary tenants of Queens Quay west from Lower Spadina Avenue to Yonge Street. Also included is a description of proposed changes to access at Redpath Sugar.

6.2.1 401 (Harbour Terrace) / 410 (Aqua) Queens Quay West, Shoppers Drug Mart

The Harbour Terrace and Aqua condominiums located at 401 and 410 Queens Quay and the Shopper Drug Mart store within 390 Queens Quay all have primary vehicular access from the Queens Quay / TTC Loop intersection. This is a complex intersection with three separate “legs” on the north side of Queens Quay. No pedestrian crossings are currently provided and, due to the complexity of the intersection, are not proposed for the recommended alternative.

- **401 Queens Quay West (Harbour Terrace)** is on the south side of Queens Quay between Spadina and the TTC Loop. Under existing conditions, access is provided at a single right-in/right-out driveway from Queens Quay. Westbound left turns in, and northbound left turns out, are physically restricted by a raised median.

  Under the recommended arrangement, access will be modified to westbound left turn in and northbound left and right turns out. The westbound left is fully protected of the TTC right-of-way. The northbound egress is an improvement over existing conditions because motorists can now go east or west instead of just east.

- **410 Queens Quay West (Aqua)** is on the north side of Queens Quay between Spadina and the TTC Loop. Primary existing vehicular access is provided at a single driveway within the north leg of the intersection. Loading and servicing access is provided within the TTC Loop. There are three southbound movements from the north leg with two of them (Shoppers Drug Mart and Aqua) provided with dedicated southbound right-turn-only phases.

  This condition has been maintained under future conditions for Aqua, and the proposal also includes a raised median to guide exiting vehicles to the west. Access is not changed for Aqua.

- **390 Queens Quay West (Shoppers Drug Mart)** is on the north side of Queens Quay just east of the TTC Loop. Under existing conditions, Shoppers has an eastbound left turn in, westbound right turn in and southbound right turn out. Southbound left turns out are restricted by a raised median.

  The recommended re-design of the intersection maintains the eastbound left turn in, westbound right turn in and southbound right turn out. Due to the split phasing proposed for this intersection, it is also possible to allow the southbound left turns out which were previously restricted.

On balance, the access condition for properties adjacent to the Queens Quay TTC Loop has improved under the preferred alternative and is the most flexible alternative in terms of egress. Table 23 provides detailed traffic operations for the intersection.

Harbour Terrace residents will experience some delay when entering and exiting the driveway during peak times. Side street and turn phases are set to minimum green and clearance times with levels of service D to E. The relatively high delay is because of the 120 second cycle length and large portion of time dedicated to east-west traffic and transit movements.

Transit operations are particularly important at this location because of the close signal spacing between Lower Spadina Avenue and TTC Loop, and platforms. While there will be some delay, the volumes are low and there is sufficient capacity at the intersection to accommodate demand.

Table 23: Queens Quay / TTC Loop Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
TTC Loop	**0.63**	**22**	**C**	**0.60**	**19**	**B**
• Eastbound Left	0.06	5	A	0.16	6	A
• Eastbound Through	0.78	18	B	0.75	14	B
• Westbound Left	0.33	53	D	0.52	75	E
• Westbound Through/Right	0.45	24	C	0.78	21	C
• Northbound Shared	0.25	64	E	0.21	63	E
• Southbound Shared	0.05	46	D	0.04	45	D

6.2.2 339 (EMS) and 350 / 370 / 390 (Maple Leaf Quay) Queens Quay West

A new signalized intersection is proposed for at the Emergency Medical Services (EMS) / 350 Queens Quay / Beer Store driveways. The new signalized intersection is required to provide access to EMS and Toronto Fire Services south of the transit right-of-way and also provides a formal pedestrian crossing facility between Rees Street and Lower Spadina Avenue.

- **350 / 370 / 390 Queens Quay West (Maple Leaf Quay and The Beer Store)** are located on the north side of Queens Quay across from HtO park between the TTC Loop and Rees Street. Existing access provided at a right-in/right-out driveway adjacent to 350. The driveway is aligned with the driveway across the street (for 339); however, due to turn restrictions prohibiting movements over the transit right of way, inbound (eastbound) and outbound (southbound) left turns are not permitted.

  A new signalized intersection is proposed at this location for the preferred design. The signal will allow for eastbound left turns into the site as well as southbound left and right turns out. Westbound right turns into the site will be maintained.

- **339 Queens Quay West (Toronto EMS Station No. 36 and Toronto Fire Station No. 334)** are located on the south side of Queens Quay adjacent to HtO Park between Peter Slip and Rees Slip. As noted above, left turns are not permitted at the intersection with Queens Quay and the driveway is right-in/right-out only; however, City Council passed a motion in December 2008 exempting emergency vehicles from the turn prohibitions.

  The new signal proposed will provide a formal westbound left turn in, as well as northbound left and right turns out. This is a change from existing where eastbound right turns in are permitted. Under the future arrangement, eastbound right turns would be prohibited; however, emergency vehicles could also be exempt from this prohibition through subsequent council decision (similar to the 2008 decision.

The addition of the new signal provides better overall vehicular access and also allows for a pedestrian crossing at HtO Park. Table 24provides detailed traffic operations for the intersection.

The turning movements at this driveway are low, especially in the case of the EMS driveway. Eastbound and westbound left turns are expected to operate well at LOS A. Site street delays are expected to be at LOS D, again due to the signal phasing strategy which allocates most of the time in the cycle to east-west traffic and transit.

Table 24: Queens Quay / Beer Store / EMS Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Beer Store / EMS	**0.51**	**9**	**A**	**0.54**	**15**	**B**
• Eastbound Left	No vol.	-	-	0.02	1	A
• Eastbound Through	0.64	11	B	0.61	10	A
• Westbound Left	No vol.	-	-	No vol.	-	-
• Westbound Through/Right	0.39	5	A	0.67	18	B
• Northbound Shared	No vol.	-	-	No vol.	-	-
• Southbound Shared	0.05	40	D	0.05	39	D

6.2.3 Rees Street / Robertson Crescent and Queens Quay West

Queens Quay, just east of Rees Street is one of the narrowest sections of the street with a total width from building to building of less than 30 metres. Robertson Crescent intersects with Queens Quay at Rees Street (Robertson Crescent West) and approximately 90 metres east of Rees Street (Robertson Crescent East). Key tenants of Robertson Crescent include the Radisson Hotel, Toronto Police Marine Unit, Pier Four Restaurant, Wallymagoo's Marine Bar and PawsWay.

Under existing conditions, Robertson Crescent West (at Rees) can be access from all directions at the Rees Street fully signalized intersection. Robertson Crescent (East) is restricted to right-in/right-out only due to the streetcar median right-of-way, although some motorists turn left over the streetcar tracks illegally.

Robertson Crescent is affected the most under the preferred design of Queens Quay. The recommended plan maintains the signalized intersection at Rees Street, but with the following changes:

- Eastbound left turns are permitted, however the existing dedicated eastbound left turn lane is removed and now this movement must be made from a shared lane (left/through).
- Eastbound right turns into Robertson Crescent are still permitted; however, this movement is proposed to take place from a dedicated eastbound right turn lane. The dedicated turn lane and fully protected turn phase are required to crossing the TTC streetcar right-of-way.
- Access from the east is no longer possible from Queens Quay due to the elimination of the westbound left turn. Under the new configuration, there is not sufficient space available to provide a westbound left turn while still providing adequate width for transit platforms, sidewalks and the Martin Goodman Trail. Access from the east will require motorists to use Lake Shore Boulevard and make an eastbound left turn at Rees Street.
- Northbound and southbound approaches to the intersection still provide full movements.

Throughout the Environmental Assessment, the future configuration of Robertson Crescent East was the topic of much discussion. The recommended plan considered closing Robertson Crescent East as a measure to improve transit travel time and service reliability. The closure would require all traffic entering and exiting Robertson crescent to do so at the Rees Street / Robertson Crescent West / Queens Quay signalized intersection. The closure also required that a bus turnaround be constructed adjacent to, and partially cantilevered over, the Police Marine Unit slip.

At executive committee on June 2 2009, a motion was passed recommending that the EA team explore alternative methods to keep Robertson Crescent open at least to allow bus traffic to exit so the bus turnaround facility was not required. The team explored five alternatives:

- 1 Close eastern driveway of Robertson Crescent (with turnaround).
- 2a Gated eastern driveway of Robertson Crescent (with turnaround)
- 2b Gated eastern driveway of Robertson Crescent (with three point turn)
- 3a Signalized eastern driveway of Robertson Crescent (no pedestrian crossing)
- 3b Signalized eastern driveway of Robertson Crescent (with pedestrian crossing)

Table 25 contains a detailed evaluation of the alternatives. The outcome of the evaluation was to recommend closing Robertson Crescent East due to the operational and safety concerns associated with the gate, and the potential delay to transit associated with the signal.

At council on October 1 2009, a motion was passed recommending that Robertson Crescent East be open as egress only controlled by a transit pre-empted signal. The motion is as follows:

"The Queens Quay Revitalization Environmental Assessment report and Environmental Study Report (ESR) provide for an additional egress only traffic control signal at the Robertson Crescent/Queens Quay West intersection under the following conditions:

- *the signal be limited to right turn (eastbound) egress only;*
- *the signal will operate under complete transit pre-emptive control;*
- *the signal will operate independent of, and not be coordinated with, any of the adjacent or nearby signals;*
- *the intersection at this location will not provide north-south pedestrian crossing facilities;*
- *an alternative location for loading and drop-off for adjacent landowners and businesses be confirmed; and*
- *the proposed bus turning plaza be removed from the Environmental Assessment recommendations."*

The traffic operations analysis for the Rees Street / Robertson Crescent / Queens Quay intersection contained in this report assumes that all traffic volume in and out of Robertson Crescent are still assigned to the Rees Street signalized intersection. See Plate 9-3 in the ESR for an illustration of the final recommended arrangement at Robertson Crescent.

Table 25: Robertson Crescent Operational Scenario Evaluation

Option	Scenario	Delay to Transit	Operations	Urban Design	Cost
1	**Close eastern driveway of Robertson Crescent (with turnaround)**	• No impact.	• Limits egress and westbound access to Radisson Hotel and other businesses/residents on Robertson Crescent. • Potential conflicts between pedestrians and vehicles on plaza at Pier 4/auto turnaround (cul-de-sac). • Creates additional potential conflict point between buses/heavy trucks and pedestrians adjacent to 245 Queens Quay as a result of the turnaround. • May impact boat operations; however turnaround would provide bus loading space.	• Requires construction of additional turn around over police basin and at existing east entrance. • Provides on-street parking/loading on Queens Quay.	• Additional cost for 2 turnarounds approximately $5million.
2a	**Gated eastern driveway of Robertson Crescent (with turnaround)**	• No significant impact. • Requires buses to exit over TTC right of way. • Risk that buses waiting on tracks for gap in traffic may conflict with TTC.	• Improved egress. Limits westbound access to Radisson Hotel and other businesses/residents on Robertson Crescent. • Potential conflicts between pedestrians and vehicles on plaza at Pier 4/auto turnaround (cul-de-sac). • Creates additional potential conflict between buses/heavy trucks and pedestrians adjacent to 245 Queens Quay as a result of the turnaround. • May impact boat operations; however turnaround would provide bus loading space.	• Requires construction of additional turn around over police basin and at existing east entrance. • Turnaround at eastern egress more complex/potential conflict between vehicles and pedestrians. • Provides on-street parking/loading on Queens Quay.	• Additional cost for 2 turnarounds approximately $5million. • Additional cost for gate hardware.
2b	**Gated eastern driveway of Robertson Crescent (with three point turn)**	• No significant impact. • Requires both buses and heavy trucks to exit over TTC right of way. • Risk that vehicles waiting on tracks for gap in traffic may conflict with TTC.	• Improved egress. Limits westbound access to Radisson Hotel and other businesses/residents on Robertson Crescent. • Potential conflicts between pedestrians and vehicles on plaza at Pier 4/auto turnaround (cul-de-sac). • Creates additional potential conflict point adjacent to 245 Queens Quay as a result of three point turn movement. • Reversing vehicles in shared pedestrian area is a potential safety hazard. • May have greater impact on boat operations due to limited capacity for bus loading due to three point turn.	• Creates more typical road network. • Turnaround at eastern egress more complex/potential conflict between vehicles and pedestrians. • Provides on-street parking/loading on Queens Quay.	• Additional cost for 1 turnaround (at egress). • Additional cost for gate hardware.
3a	**Signalized eastern driveway of Robertson Crescent (no pedestrian crossing)**	• No impact. Signal is adaptive and only provides vehicle phases when no transit vehicles are present.	• Best access and egress to Robertson Crescent. Westbound left turn permitted. • Increases number of signals on Queens Quay. • Short block between Robertson E. and Rees Street potential queue spillback (WB) beyond Robertson East.	• Creates most typical access condition. • Turnarounds not required. • Rabba loses on-street loading stalls.	• Additional cost for signal hardware approximately $150k.
3b	**Signalized eastern driveway of Robertson Crescent (with pedestrian crossing)**	• Approximately 30 second additional average delay to transit due to pedestrian calls and clearance intervals.	• Best access and egress to Robertson Crescent. Westbound left turn permitted. • Increases number of signals on Queens Quay. • Short block between Robertson E. and Rees Street potential queue spillback (WB) beyond Robertson East.	• Creates most typical access condition. • Turnarounds not required. • Rabba loses on-street loading stalls.	• Additional cost for signal hardware approximately $150k.

Table 26 provides a summary of traffic operations at the Rees Street signalized intersection. Overall operations for the intersection are typical downtown conditions with average delays at LOS C. The side street movements have higher delay at LOS D again due to the signal strategy which maximizes east-west green time for traffic and transit.

The eastbound right turn into Robertson Crescent is shown at LOS F. Delays for this movement will be higher than average under future conditions because it is controlled by a short, 15 second fully protected phase which can be called only once per 120 second cycle. While delays could be in the order of 100 seconds, there is sufficient capacity to accommodate the demand (most trips are assumed to approach Robertson Crescent from the north via Rees Street).

It would be possible to reduce the average delay for the eastbound right turn if the phase were equipped with extensions or if the minimum green time were extended. This would of course impact (albeit minor) the amount of green time for east-west transit, Martin Goodman Trail and sidewalk.

The Robertson Crescent East transit pre-empted signal will operate well at LOS A. Side street demand is fairly low and there will be sufficient capacity to accommodate the movement; however, in order to maintain transit priority, delays will be somewhat higher at LOS E.

Table 26: Queens Quay / Rees Street / Robertson Crescent Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Rees Street	**0.60**	**20**	**B**	**0.76**	**31**	**C**
• Eastbound Through/Left	0.67	9	A	0.88	46	C
• Eastbound Right	0.68	99	F	0.52	46	D
• Westbound Through/Right	0.50	21	C	0.73	11	B
• Northbound Left	0.06	40	D	0.09	40	D
• Northbound Through/Right	0.11	40	D	0.15	41	D
• Southbound Left	0.31	43	D	0.30	43	D
• Southbound Through/Right	0.16	41	D	0.34	43	D
Robertson Crescent East	**0.51**	**3**	**A**	**0.53**	**3**	**A**
• Eastbound Through	0.51	3	A	0.52	2	A
• Westbound Through	0.33	1	A	0.53	2	A
• Northbound Right	0.50	68	E	0.55	66	E

6.2.4 250 / 260 / 270 Queens Quay West

The condominium at 250 / 260 / 270 Queens Quay will only have minor changes to access. Key ground floor tenants of the building are Rabba Fine Foods and Swiss Chalet (among others). Under existing conditions, is provided at two driveways. One driveway is on Rees Street between Queens Quay and Lake Shore Boulevard, and the other on Queens Quay across from and slightly east of Robertson Crescent East. Due to the streetcar right-of-way, the Queens Quay driveway is right turns only.

Under future conditions, no physical changes are proposed to either driveway; however, the south side transit arrangement with traffic north of the tracks will now make it possible to have full movements at the Queens Quay driveway.

6.2.5 228 / 230 Queens Quay West (The Riviera)

The Riviera at 228 / 230 Queens Quay West will also be largely unaffected by the changes to Queens Quay. Existing access is provided at a primary driveway on Lower Simcoe Street between Queens Quay and Lake Shore Boulevard. There is also a secondary one-way right-out exit only driveway onto Queens Quay across from Simcoe Slip.

Under future conditions, no changes are proposed to the access condition for the Riviera; however, due to the south side transit configuration, vehicles exiting onto Queens Quay would be able to make a left or right turn.

6.2.6 235 Queens Quay West (Harbourfront Centre)

Harbourfront Centre is located at 235 Queens Quay in the southwest quadrant of the Queens Quay / Lower Simcoe intersection. It is the focal point of activities on the waterfront and will need to have good access under any future arrangement of Queens Quay.

Existing access is provided at a single right-in/right-out driveway mid-way between Lower Simcoe and the Queens Quay Terminal driveway. This driveway services an approximately 230 stall surface parking lot and loading bays for Harbourfront Centre and Enwave Theatre.

Plans for Harbourfront Centre include the replacement of the existing surface lot with up to 500 stalls of underground parking in a single garage. Vehicular access to the garage is proposed at the south leg of Lower Simcoe Street creating a four-way intersection and direct north-south connections between Harbourfront Centre and Lower Simcoe Street. Under this arrangement, common for all future scenarios, the driveway mid-way between Lower Simcoe and the Queens Quay Terminal driveway would be closed. Space on top of the new underground parking garage is being planned for the new Canada Square retail village.

Table 27 summarizes traffic operations at Lower Simcoe and Queens Quay assuming a fully signalized intersection and traffic associated with a new 500 stall parking garage. The only prohibited movement is eastbound right turns, which cannot be provided due to limited space for a dedicated turn lane. Motorists approaching from the west could do so via Lake Shore Boulevard.

The intersection is expected to have reasonable delays in the LOS A to D range. Side street delays are somewhat higher at LOS D again due to the need to provide maximum east-west green time for traffic and transit.

Table 27: Queens Quay / Lower Simcoe / Harbourfront Centre Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Lower Simcoe Street	**0.62**	**16**	**B**	**0.65**	**22**	**C**
• Eastbound Left	0.23	6	A	0.41	16	B
• Eastbound Through	0.68	11	B	0.61	17	B
• Westbound Left	0.60	52	D	0.53	51	D
• Westbound Through/Right	0.42	11	B	0.67	18	B
• Northbound Left	No Vol.	-	-	0.07	40	D
• Northbound Through/Right	0.02	39	D	0.28	42	D
• Southbound Left	0.47	45	D	0.57	48	D
• Southbound Through/Right	0.16	41	D	0.06	40	D

6.2.7 York Street, 208 / 218 Queens Quay West (Waterclub)

The Waterclub condominium is located in the northwest quadrant of the York Street and Queens Quay intersection. Under existing conditions, access is provided via three driveways:

- Queens Quay between York Street and Lower Simcoe Street (right-in/right-out);
- Lower Simcoe Street between Queens Quay and Lake Shore Boulevard (all moves);
- Lake Shore Boulevard approximately 60 metres west of York Street (right-in/right-out).

With all traffic north of the streetcar right-of-way in the recommended alternative, it is now possible to allow all movements at the Queens Quay driveway.

6.2.8 207 / 211 Queens Quay West (Queens Quay Terminal)

Queens Quay Terminal is another major attraction on the Toronto waterfront. In addition to major retail and services, the building also houses approximately 70 condominium units. Existing access is provided at a single driveway located on the south side of Queens Quay approximately mid-way between Lower Simcoe Street and York Street. The driveway is right-in/right-out only however some motorists do make left turns in and out of the driveway over the raised TTC streetcar median. The driveway serves short term parking, structured resident parking and commercial loading along the west side of the building. Also, in front of the building there is a taxi lay-by along the south curb of Queens Quay.

The preferred alternative for Queens Quay would require minor modification to access. A fully signalized intersection is proposed at the existing driveway. Eastbound right turns in will be maintained, however will be provided with a fully protected phases to cross the streetcar tracks. Westbound left turns in will be prohibited over the tracks, similar to existing conditions. An improvement over the existing conditions is the exiting motorists will be able to turn left or right without illegally crossing the streetcar right-of-way. This is an improvement over existing conditions and provides more choice for motorists.

The intersections operates will relatively low delay overall at LOS B. Similar to the intersections along the corridor, movements in an out of the driveway experience longer delays at LOS D to E due to the need to provide maximum east-west green time for traffic and transit. While delays are LOS D to E, there is more than sufficient capacity to accommodate the volume of traffic.

This new signalized intersection will also be equipped with pedestrian crossings and transit platforms. The transit platforms will replace both the existing Lower Simcoe and York Street platforms at this consolidated location. Combining the stops improves geometric conditions at both Lower Simcoe and York Streets by freeing up space, and also creates a stop will be directly adjacent to the planned Canada Square.

Table 28: Queens Quay / Queens Quay Terminal Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
Queens Quay Terminal	**0.49**	**13**	**B**	**0.55**	**12**	**B**
• Eastbound Through	0.62	9	A	0.55	9	A
• Eastbound Right	0.32	71	E	0.46	64	E
• Westbound Through	0.60	14	B	0.69	12	B
• Northbound Left	0.02	39	D	0.03	40	D
• Northbound Right	0.01	39	D	0.04	40	D

6.2.9 33 / 55 / 65 / 77 / 99 Harbour Square (Harbour Square)

Harbour Square is the largest residential complex on the Toronto Waterfront with a total of five buildings and approximately 2,000 units. Existing access is provided at four driveways. The two main driveways are the south legs of both the York Street and Bay Street signalized intersections. Between York and Bay there are two additional driveways. At the existing mid block signal (opposite a surface parking lot) is a driveway which provides general access to the parking garage and residential / retail loading facilities. Just east of this driveway is the fourth driveway for access to the garbage loading and bus storage facilities.

For the recommended alternative, Queens Quay will be split into an eastbound service lane south of the tracks, and a two way roadway north of the tracks. This arrangement has been developed in order to maintain access to the two Harbour Squared driveways between York Street and Bay Street. The existing signal between York Street and Bay Street will be removed and the two driveways on the eastbound service lane will have right turns only.

At York Street, eastbound right turns from Queens Quay would be prohibited at York Street but maintained at Bay Street. There is not enough space at York Street to provide the dedicated turn lane and protected phase required to cross the TTC streetcar right-of-way. Westbound left turns will still be permitted as today, but will have a dedicated lane which is an improvement over existing conditions where westbound left turns are form a shared lane. All movements would still be permitted at Bay Street.

Table 29 summarizes traffic operations for the Queens Quay / York Street and Queens Quay / Bay Street signalized intersections.

Table 29: Queens Quay / York Street and Queens Quay / Bay Street Operations Summary

Queens Quay @	Morning Peak Hour			Afternoon Peak Hour		
	V/C	Delay	LOS	V/C	Delay	LOS
York Street	**0.64**	**19**	**B**	**0.62**	**16**	**B**
• Eastbound Left	0.33	6	A	0.26	6	A
• Eastbound Through	0.66	11	B	0.67	12	B
• Westbound Left	0.52	63	E	0.46	63	E
• Westbound Through	0.40	10	B	0.59	12	B
• Westbound Right	0.17	8	A	0.30	9	A
• Northbound Shared	0.56	44	D	0.23	40	D
• Southbound Left	0.61	47	D	0.42	43	D
• Southbound Through	0.09	37	D	0.11	39	D
• Southbound Right	0.28	41	D	0.24	41	D
Bay Street	**0.81**	**31**	**B**	**0.80**	**26**	**C**
• Eastbound Left	0.52	17	B	0.69	22	C
• Eastbound Through/Right	0.63	16	B	0.76	20	B
• Westbound Left	0.16	20	B	0.23	19	B
• Westbound Through	0.94	45	D	0.86	33	C
• Westbound Right	0.30	29	C	0.35	21	C
• Northbound Left	0.05	28	C	0.02	28	C
• Northbound Through/Right	0.31	31	C	0.11	29	C
• Southbound Left	0.52	35	C	0.61	39	D
• Southbound Through/Right	0.47	33	C	0.17	30	C

At York Street, the main east-west through movements operate with relatively low delay at LOS B. The westbound left turn has higher delays at LOS E because the movement operates on a fully protected phase which can only be called once per cycle. This is again at typical condition for turns across the TTC streetcar right-of-way.

At Bay Street, overall LOS is B to C. The streetcar is under ground at Bay Street so there is no need for the fully protected turn phases over the tracks, and the signal cycle length is also shorter at 103 seconds instead of 120 seconds. We see that there is a more equitable distribution of delay throughout the intersection.

6.2.10 Westin Harbour Castle

Between the portal just west of Bay Street and the proposed portal between Yonge Street and Freeland Street, the streetcar would operate in a tunnel under the Queens Quay. In this case, access for the Westin Harbour Castle is maintained as in existing conditions. There are proposed changes to the street cross section in front of the Hotel, but all existing movements will still be permitted. The taxi staging area located on Queens Quay adjacent to the hotel would also be maintained.

Appendix A

Figures

A1 Traffic Control

Figure A1- 1: Existing Traffic Controls, Spadina to York

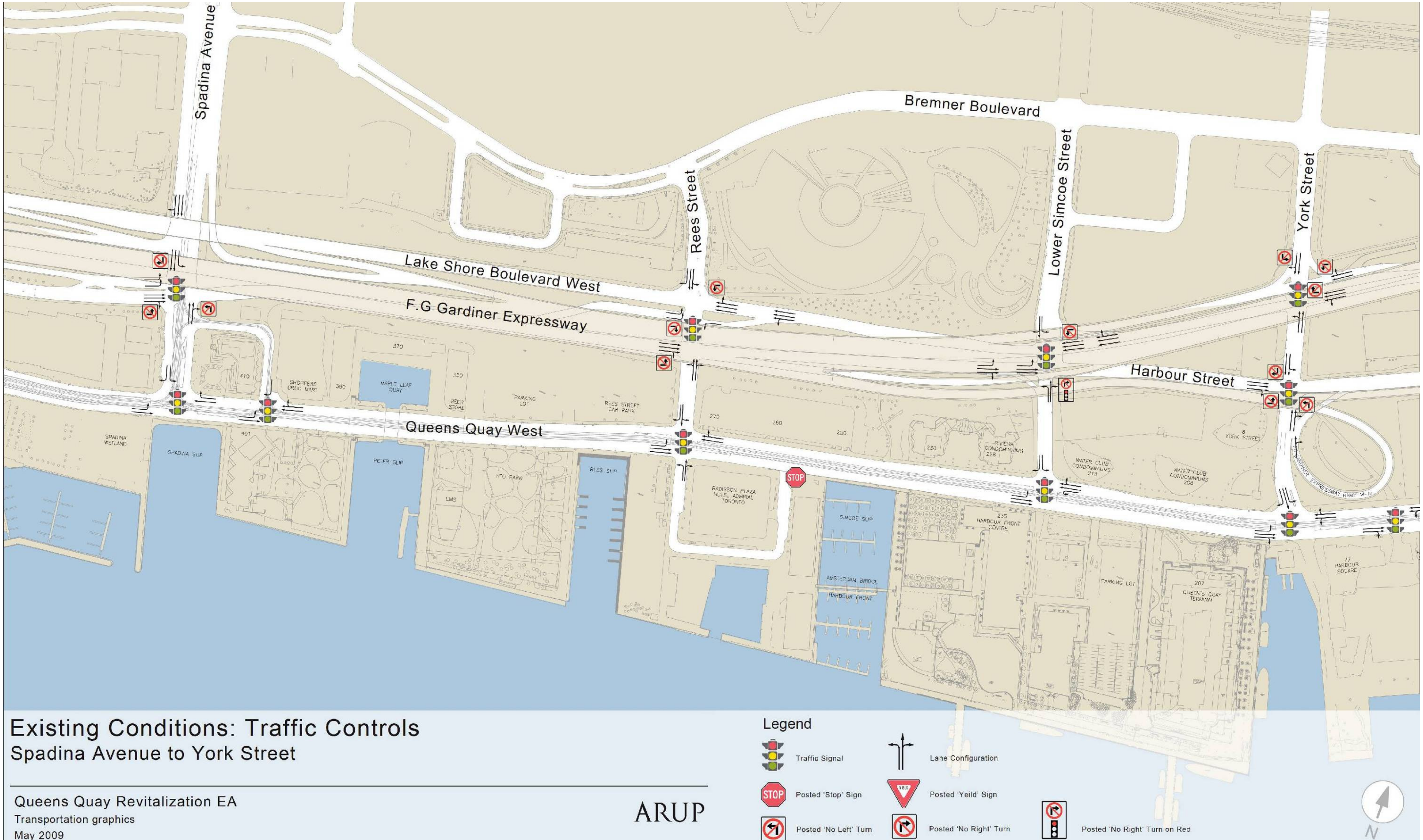
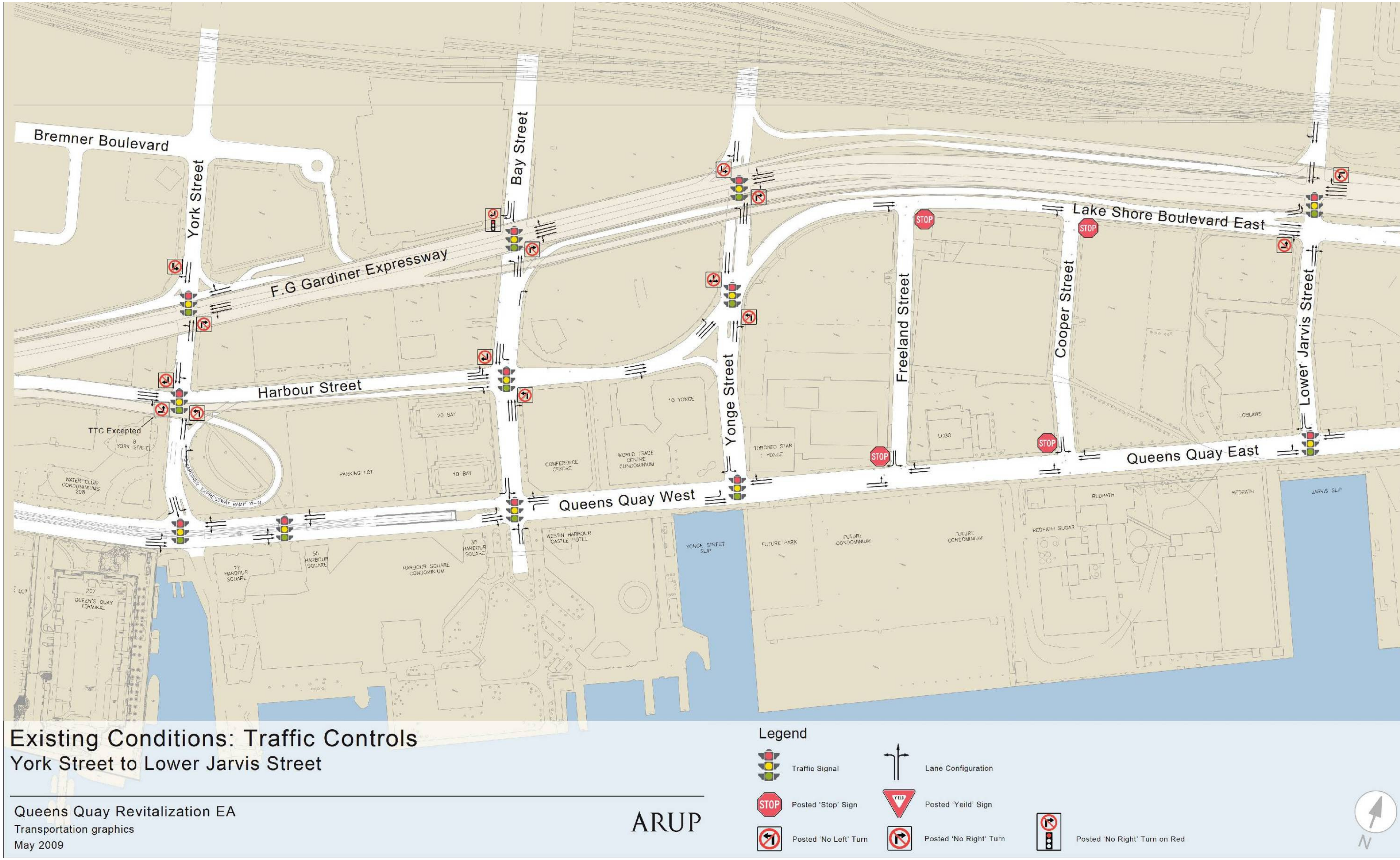


Figure A1- 2: Existing Traffic Controls, York to Jarvis



A2 Transit Systems

Figure A2- 1: Existing Transit Routes, Spadina to York

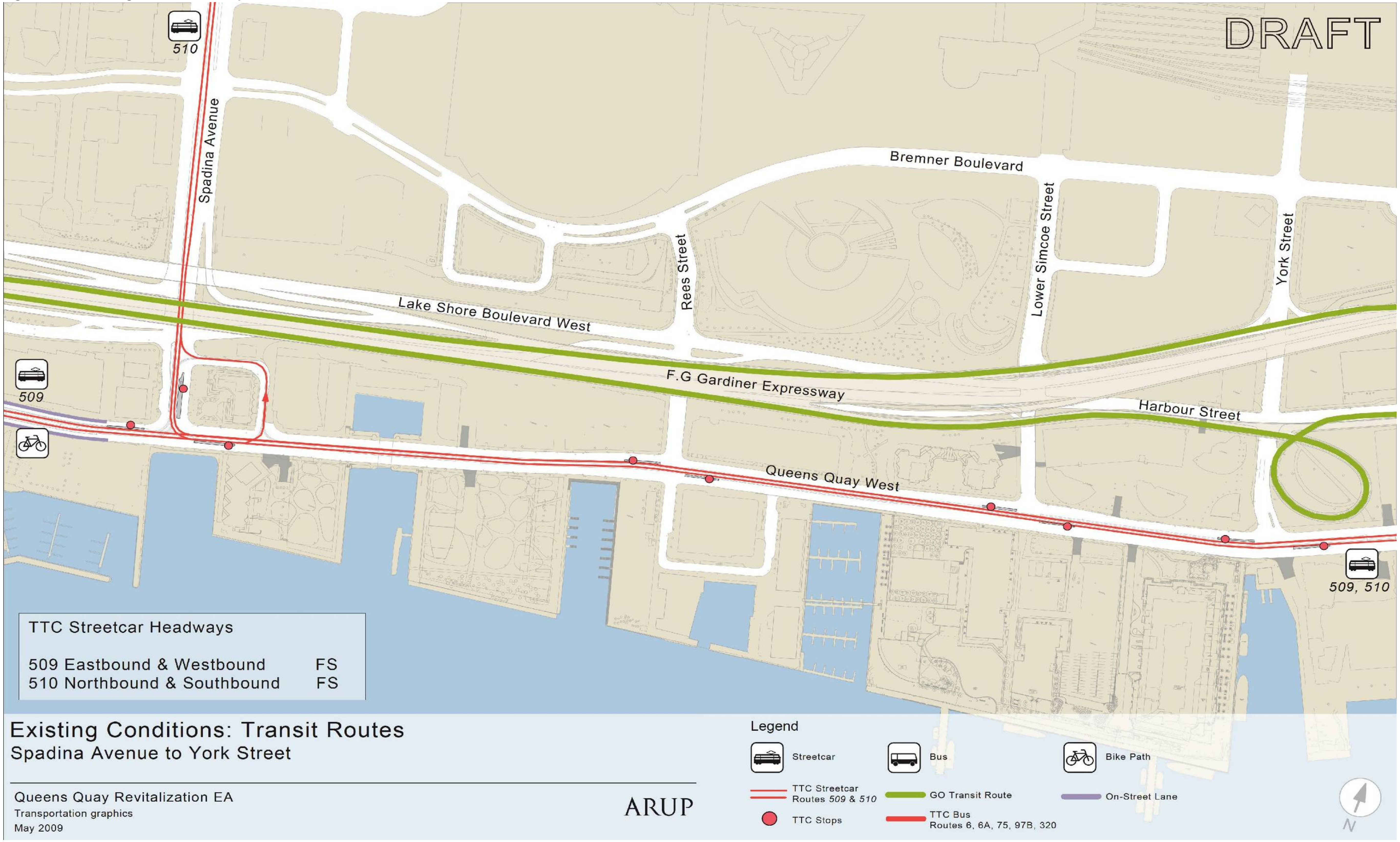


Figure A2- 2: Existing Transit Routes, York to Jarvis

A3 Existing Volumes

Figure A3- 1: AM Existing, Spadina to York

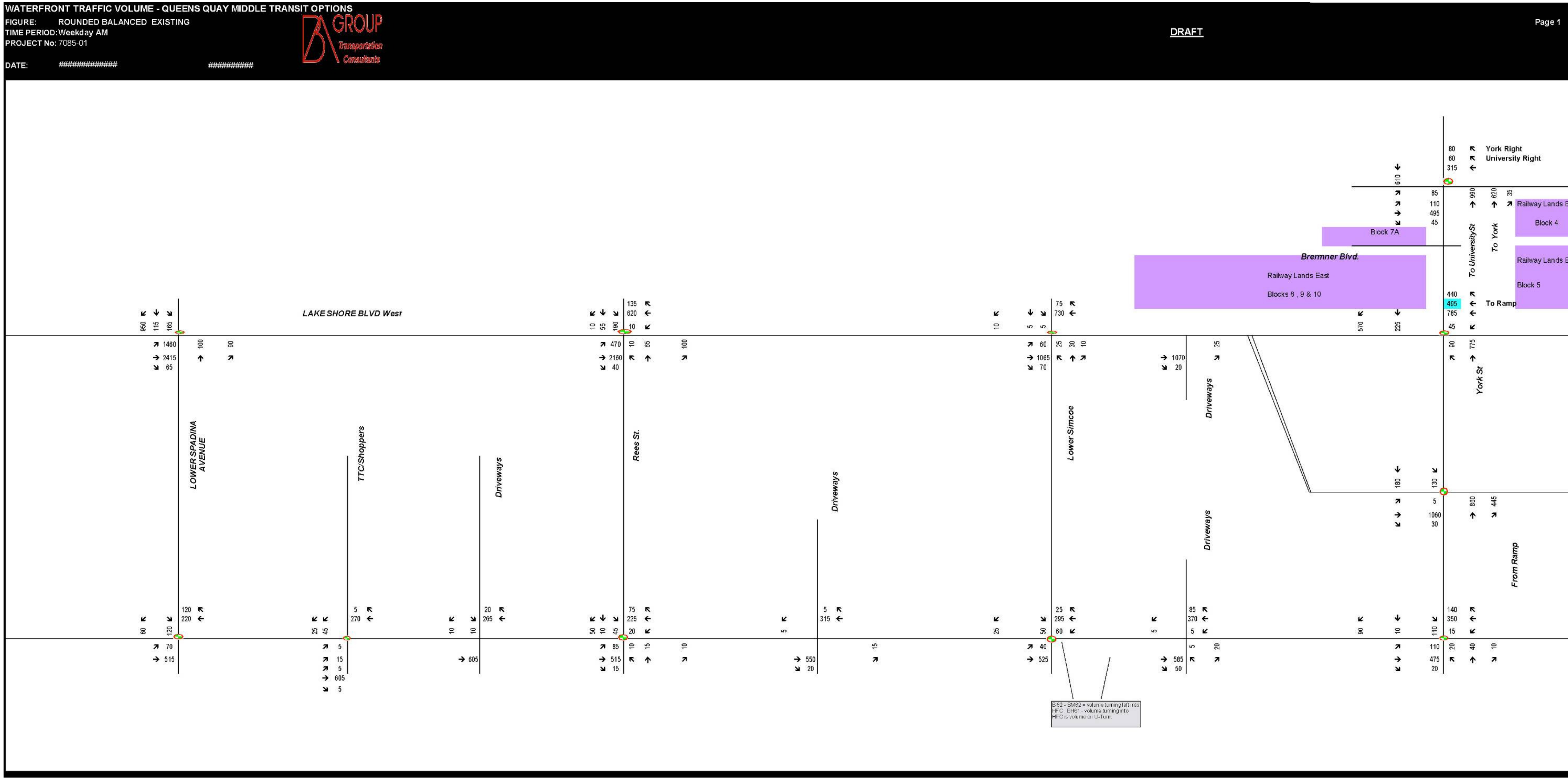


Figure A3- 2: AM Existing, Bay to Cooper

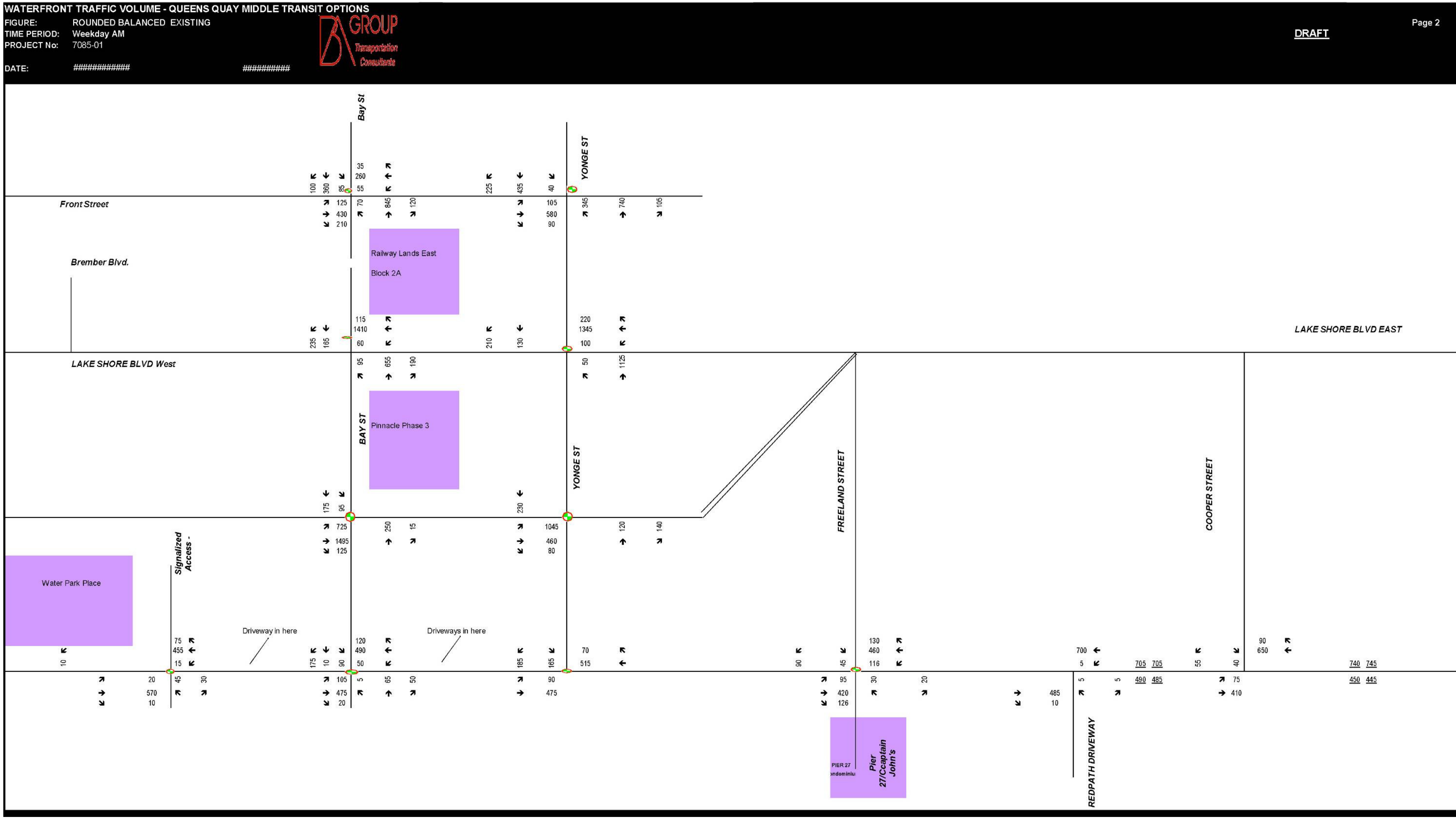


Figure A3- 3: PM Existing Spadina to York

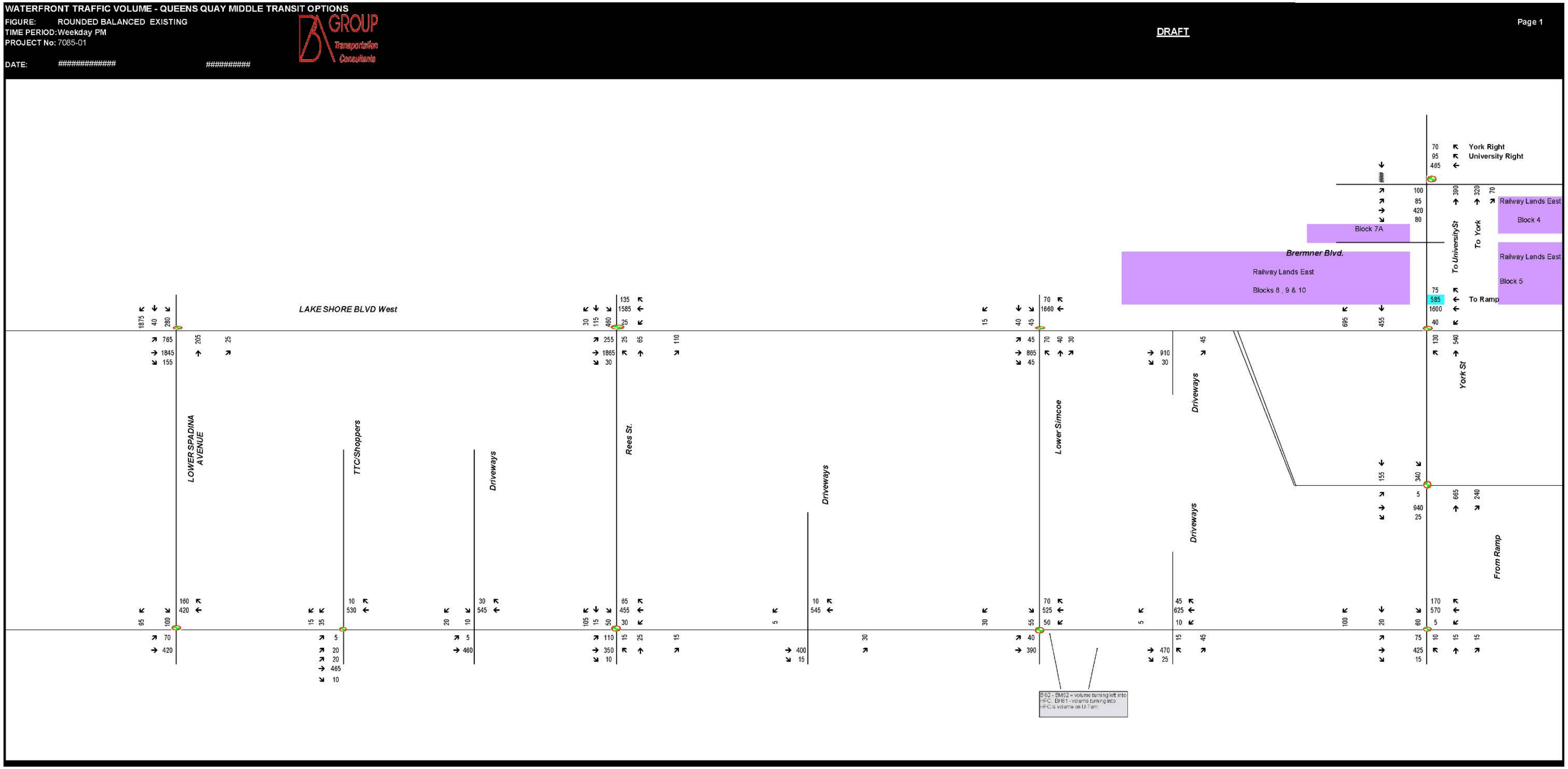
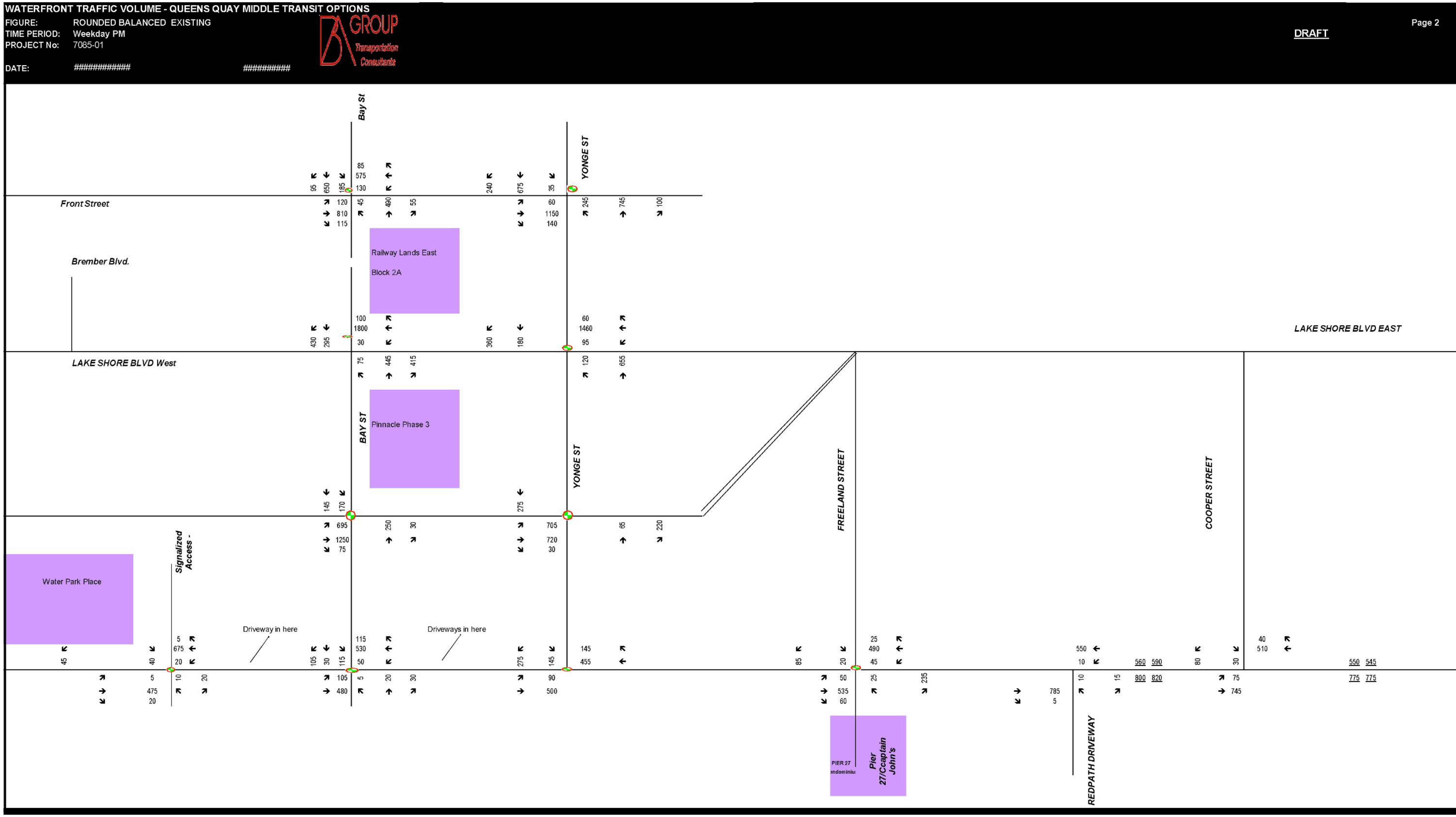


Figure A3- 4: PM Existing, Bay to Cooper



A4 Future Do Nothing / Centre Transit Volumes

Figure A4- 1: AM Future Centre, Reassigned Existing, Spadina to Bay

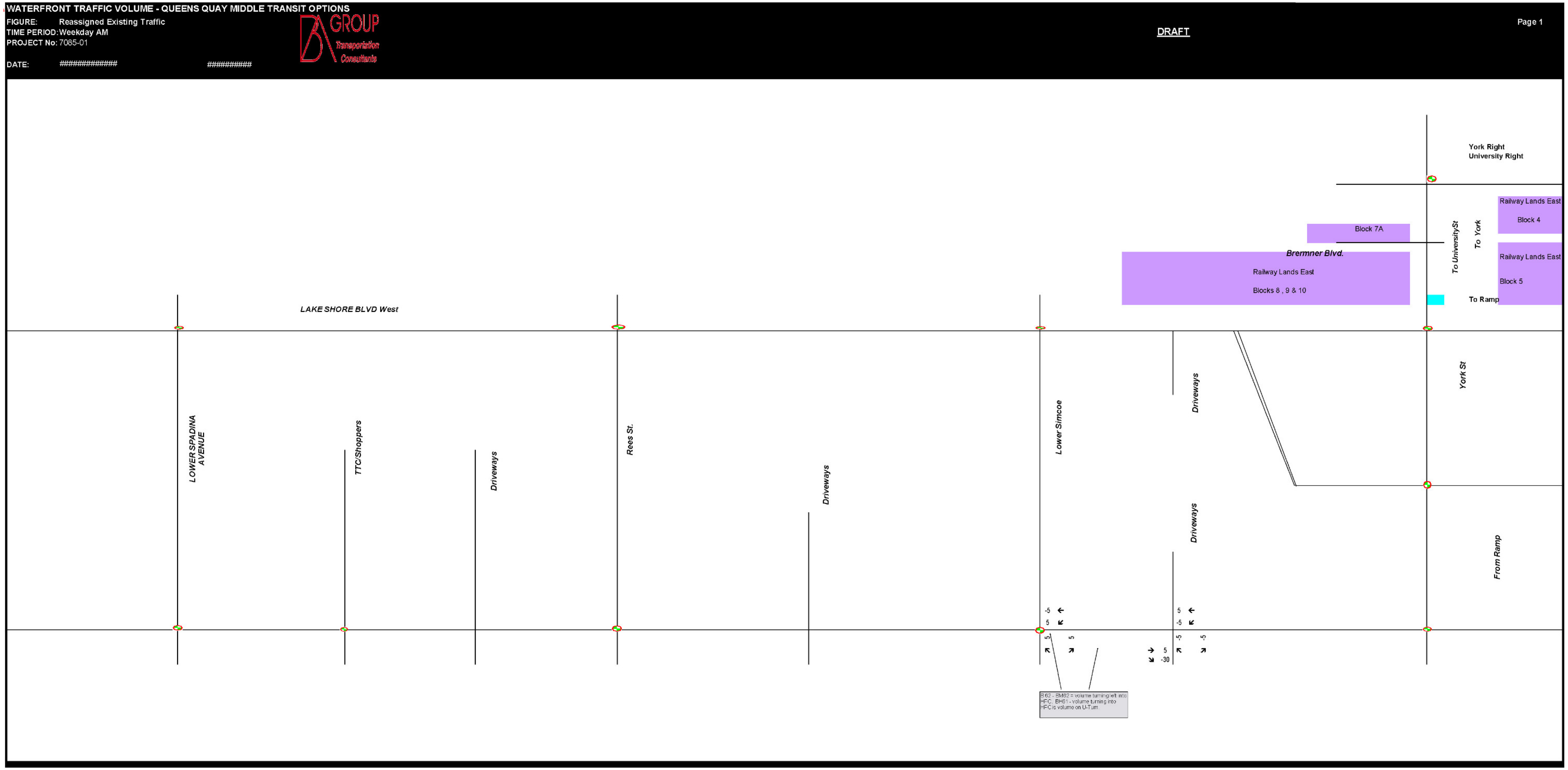


Figure A4- 2: AM Future Centre, Reassigned Existing, Bay to Cooper

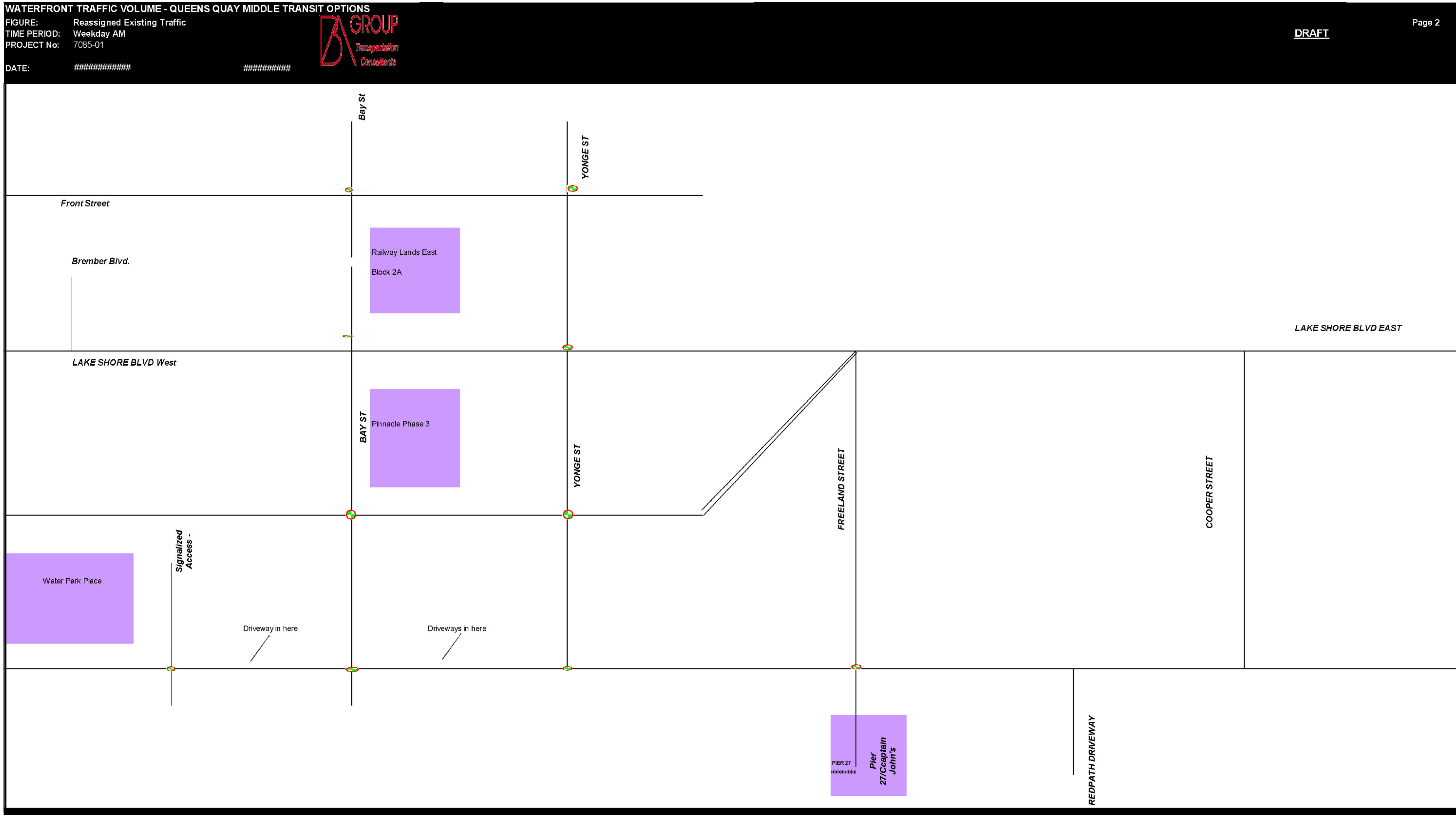


Figure A4- 3: AM Future Centre, Harbourfront Centre Traffic, Spadina to York

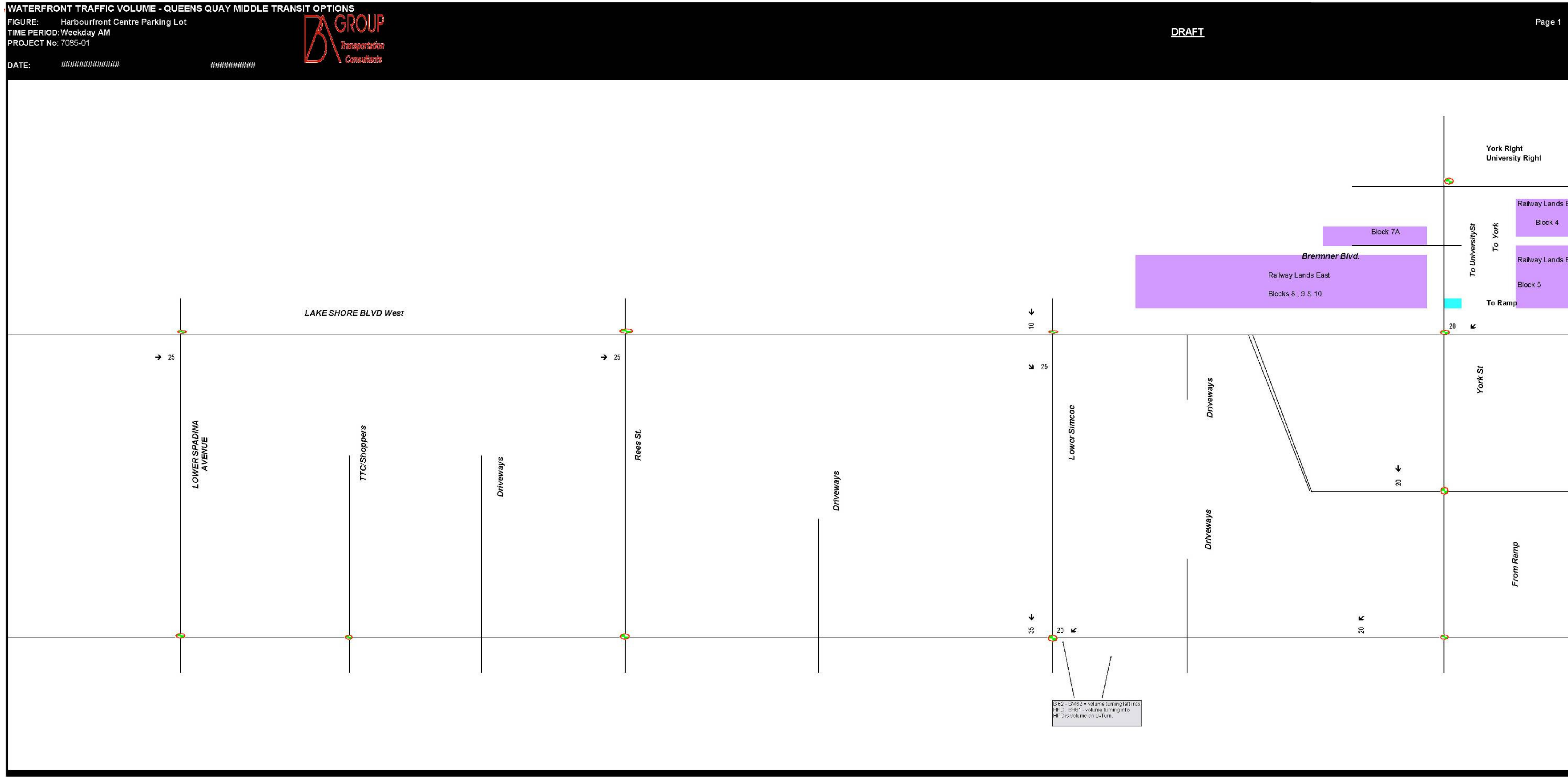


Figure A4- 4: AM Future Centre, Harbourfront Centre Traffic, Bay to Cooper

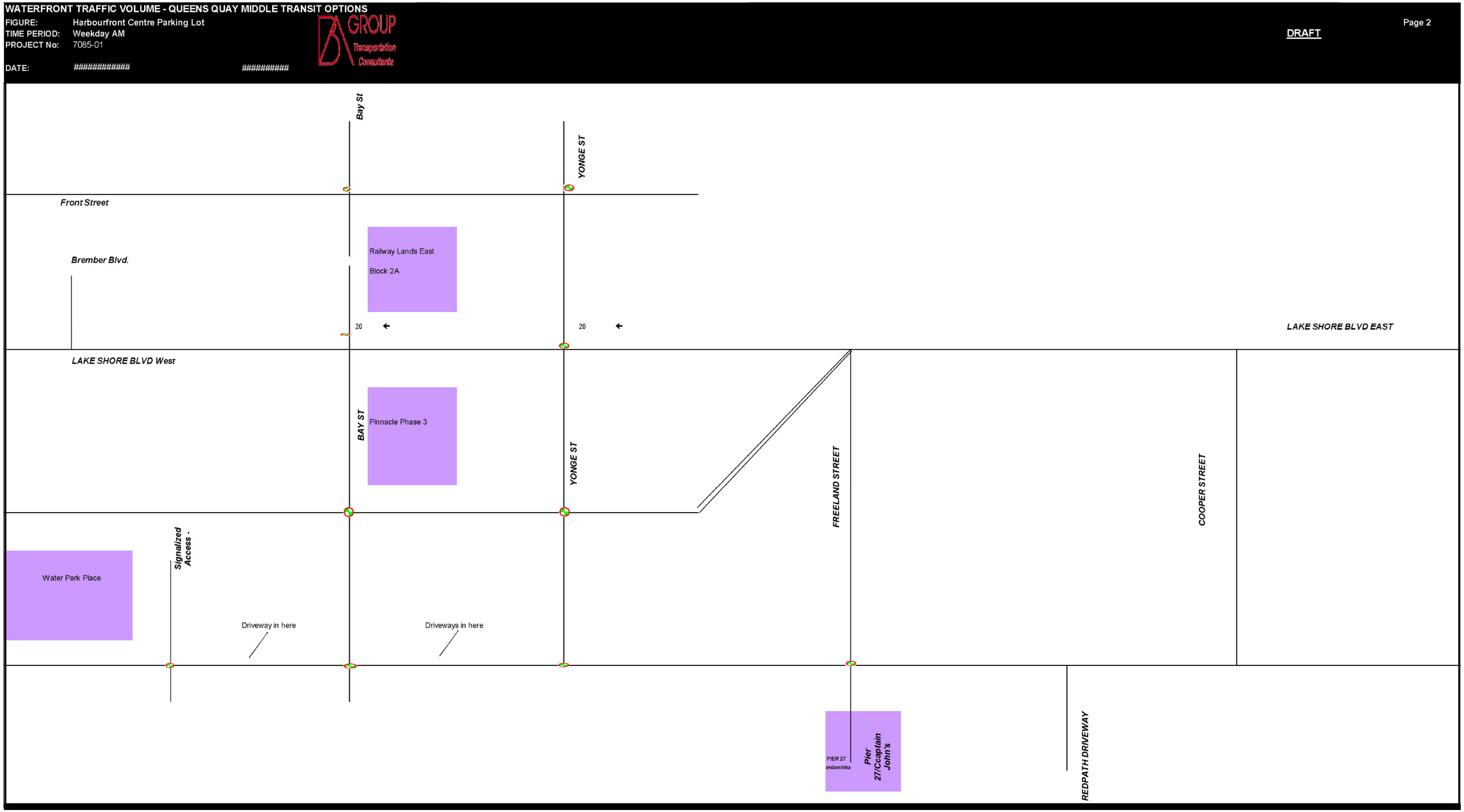


Figure A4- 5: AM Future Centre, Waterpark Place, Spadina to York

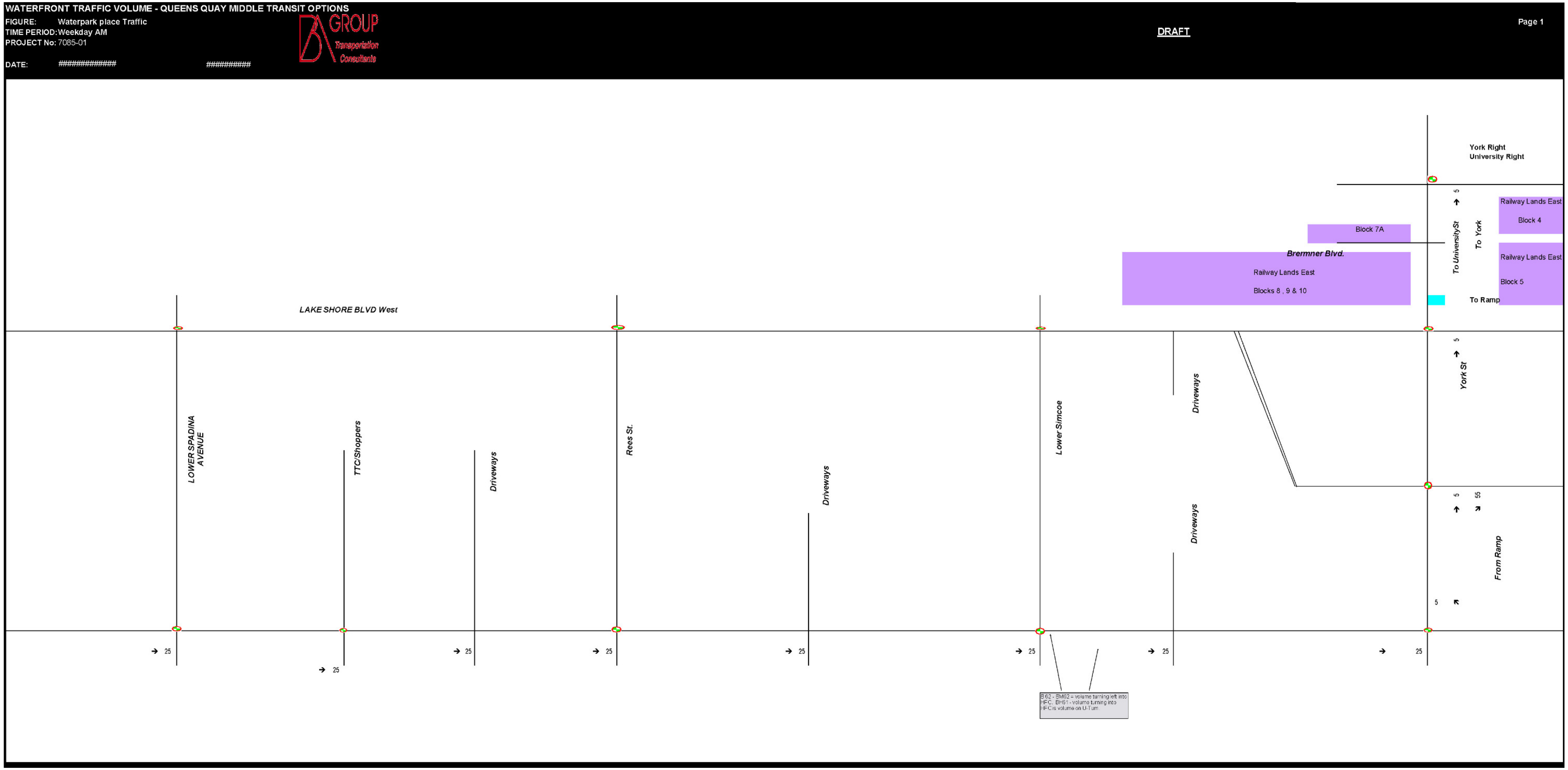


Figure A4- 6: AM Future Centre, Waterpark Place, Bay to Cooper

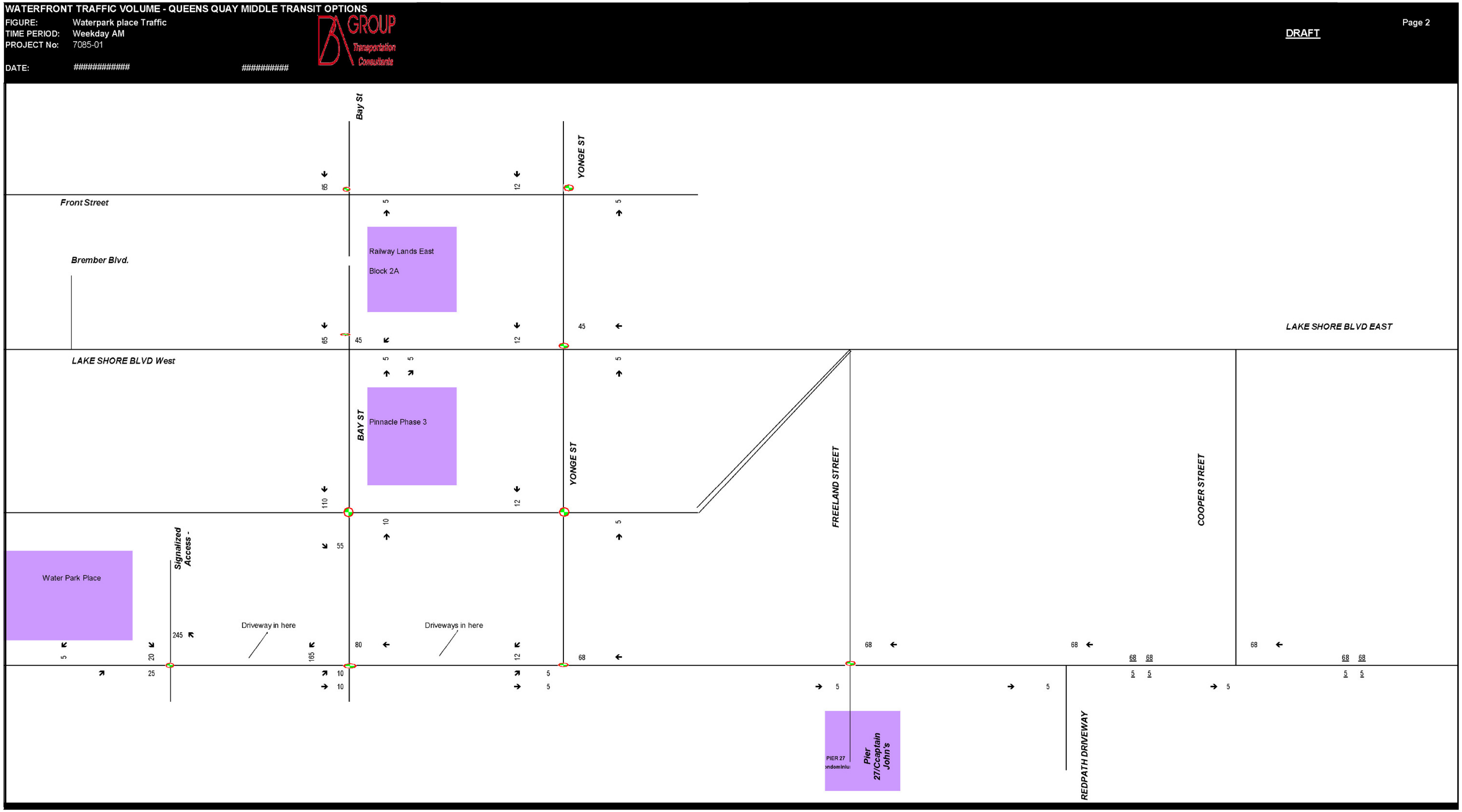


Figure A4- 7: AM Future Centre, Pier 27, Spadina to Bay

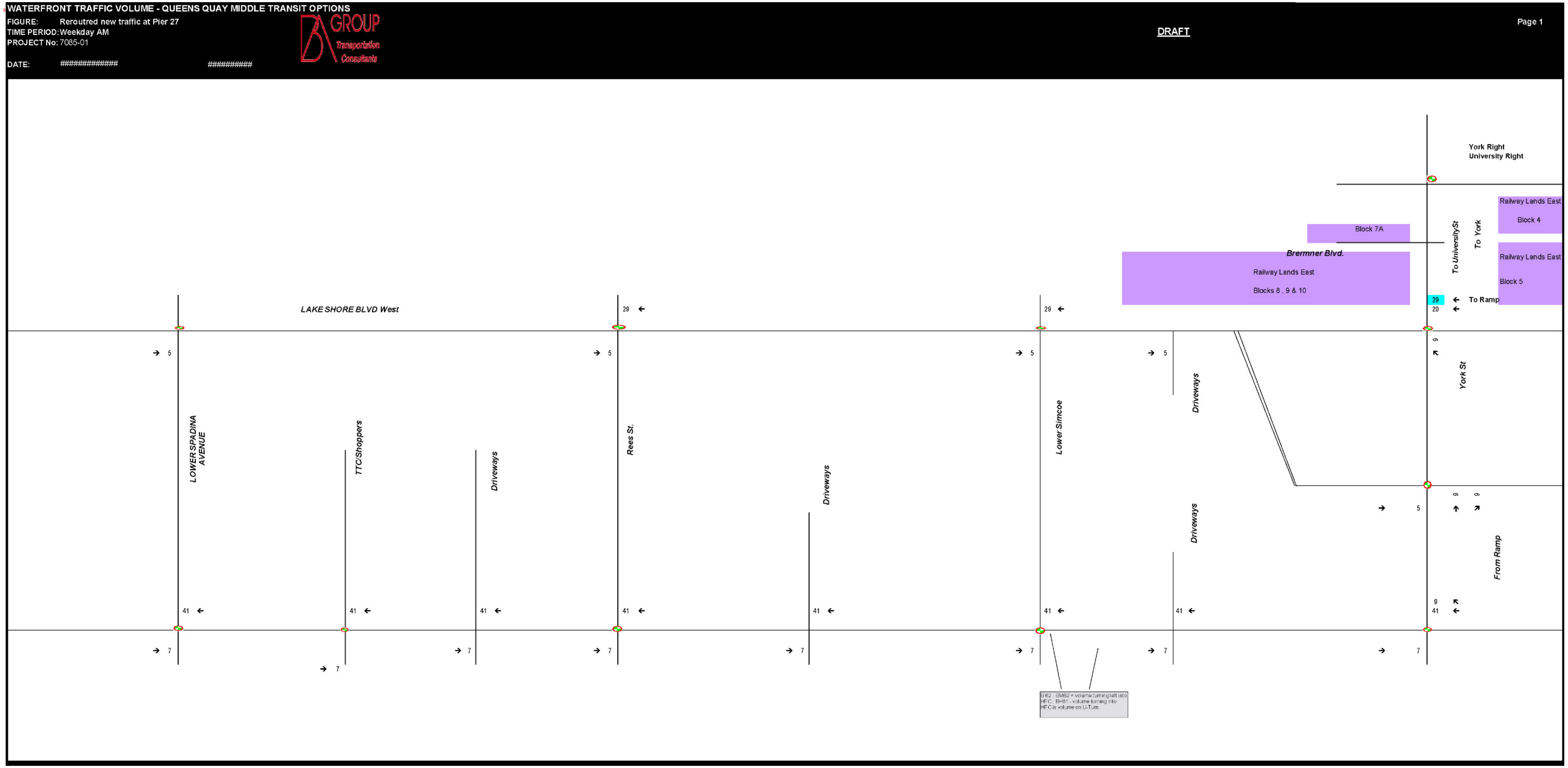


Figure A4- 8: AM Future Centre, Pier 27, Bay to Cooper

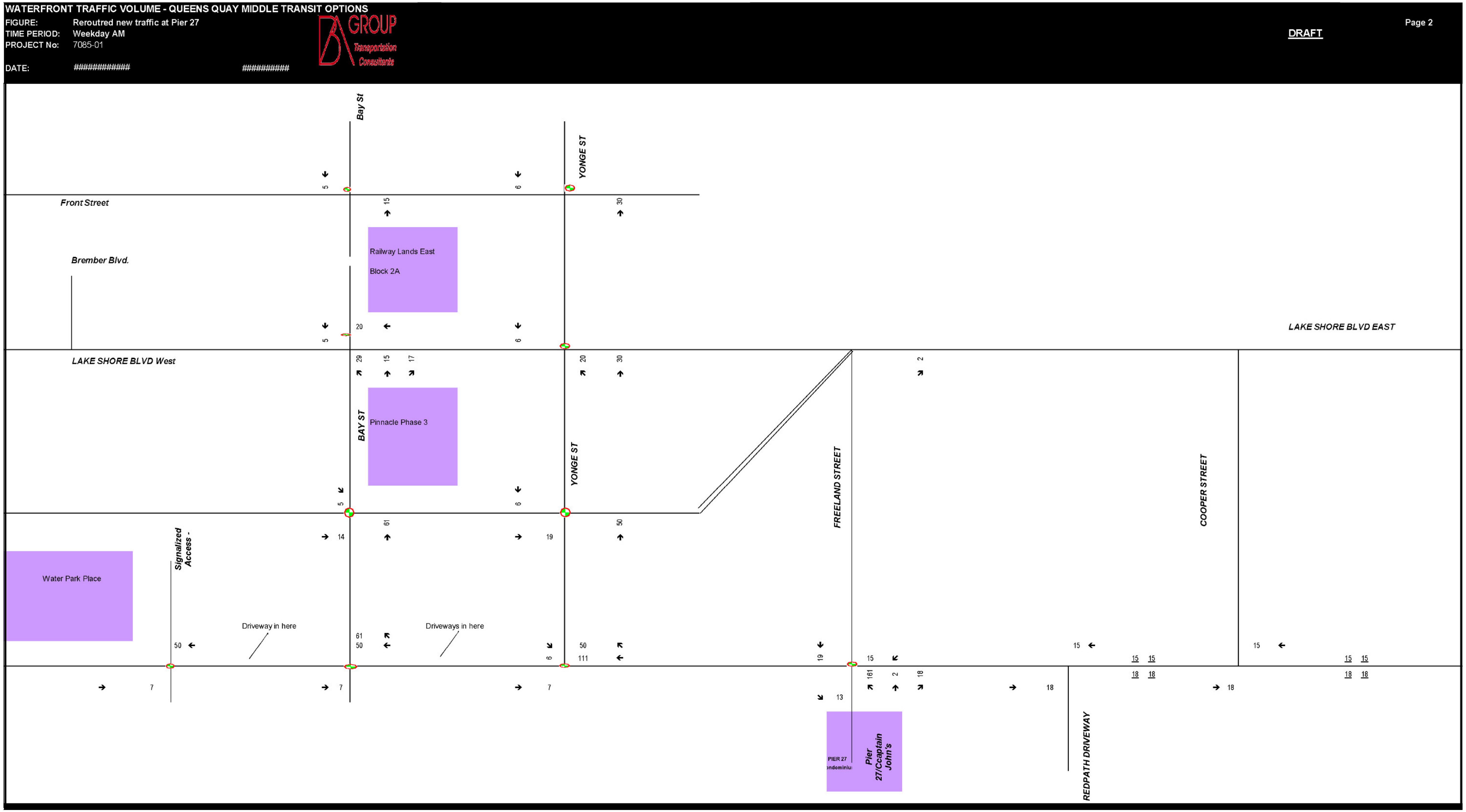


Figure A4- 9: AM Future Centre, East Bayfront, Spadina to York

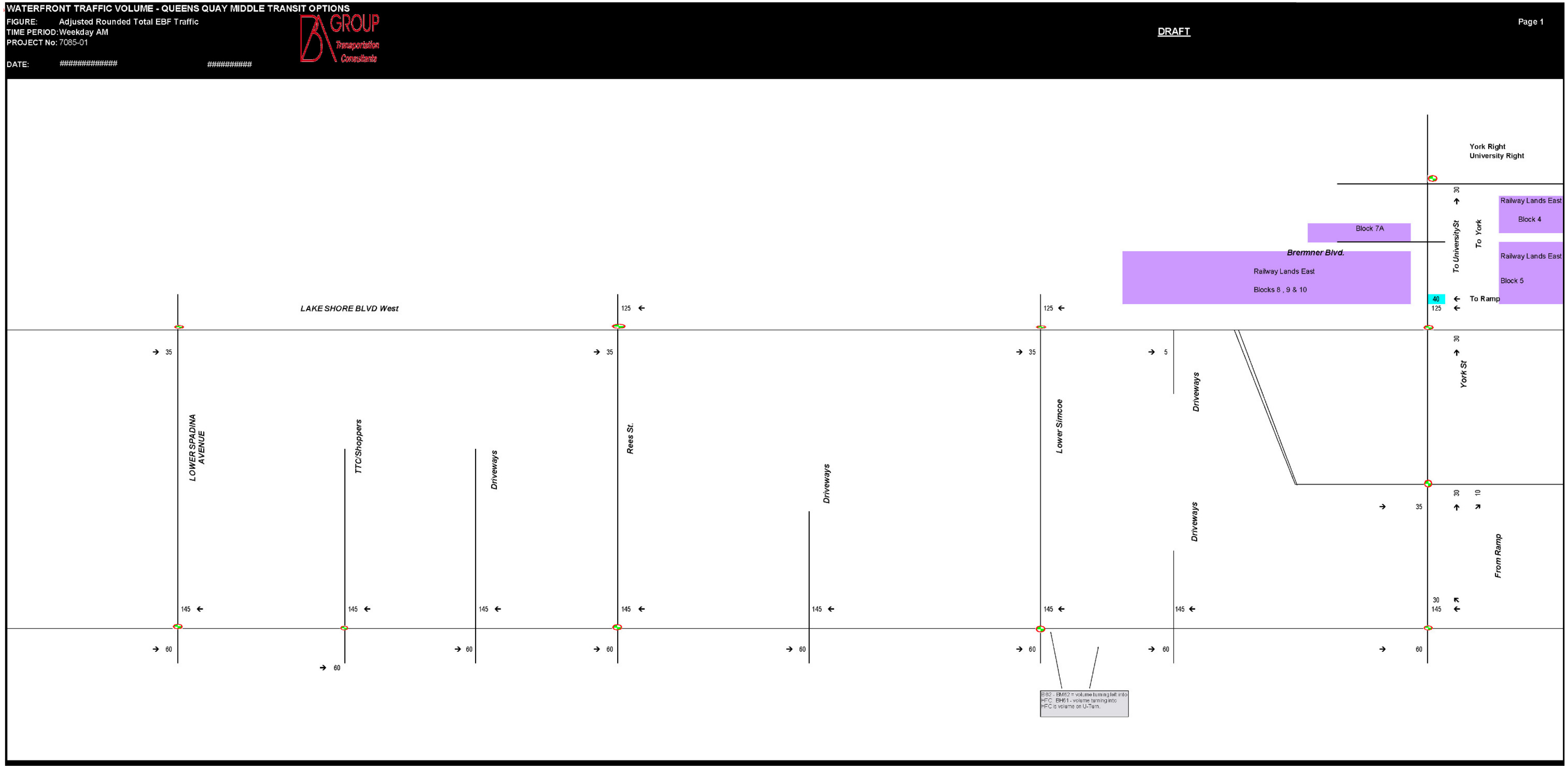


Figure A4- 10: AM Future Centre, East Bayfront, Bay to Cooper

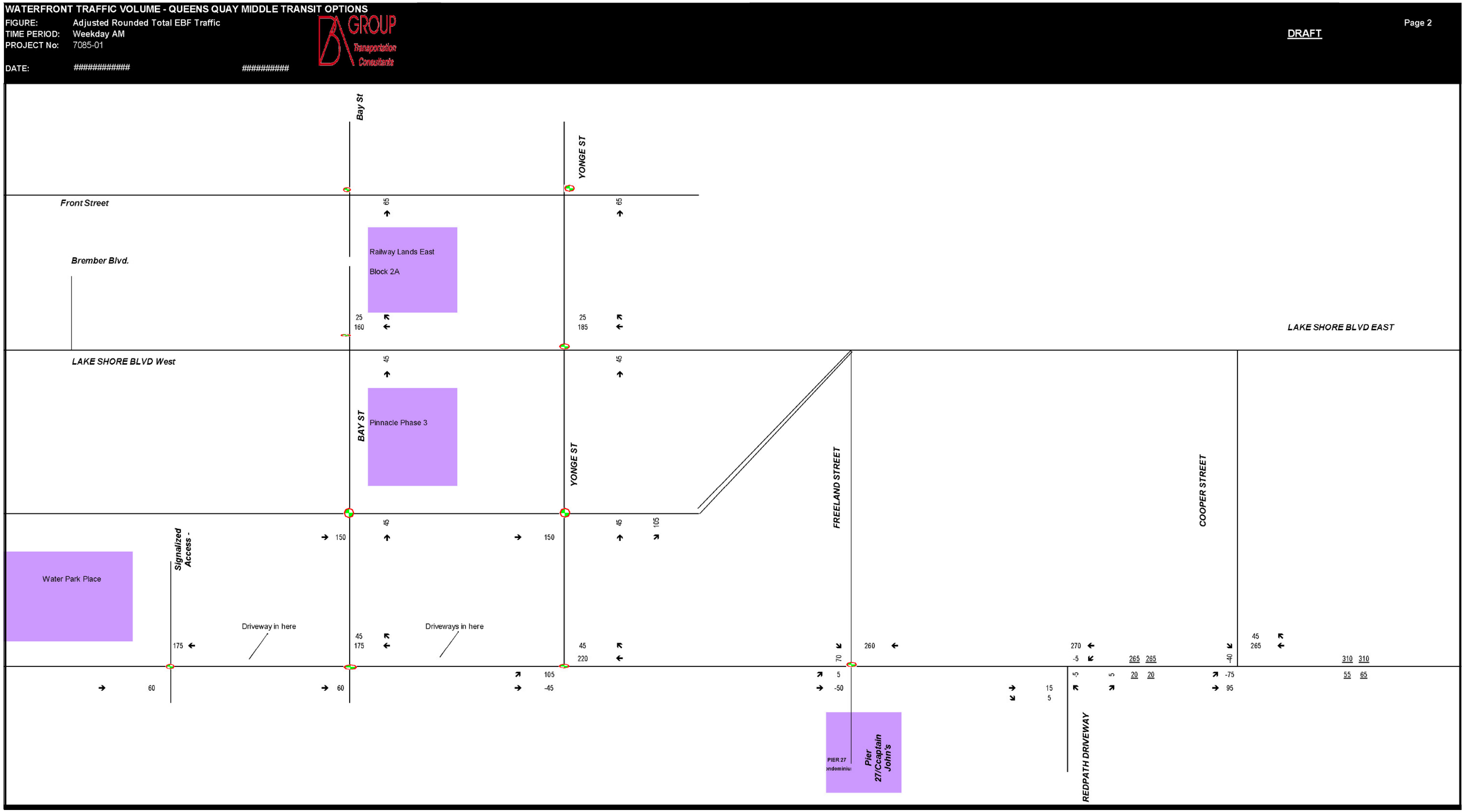


Figure A4- 11: AM Future Centre, Railway Lands, Spadina to Bay

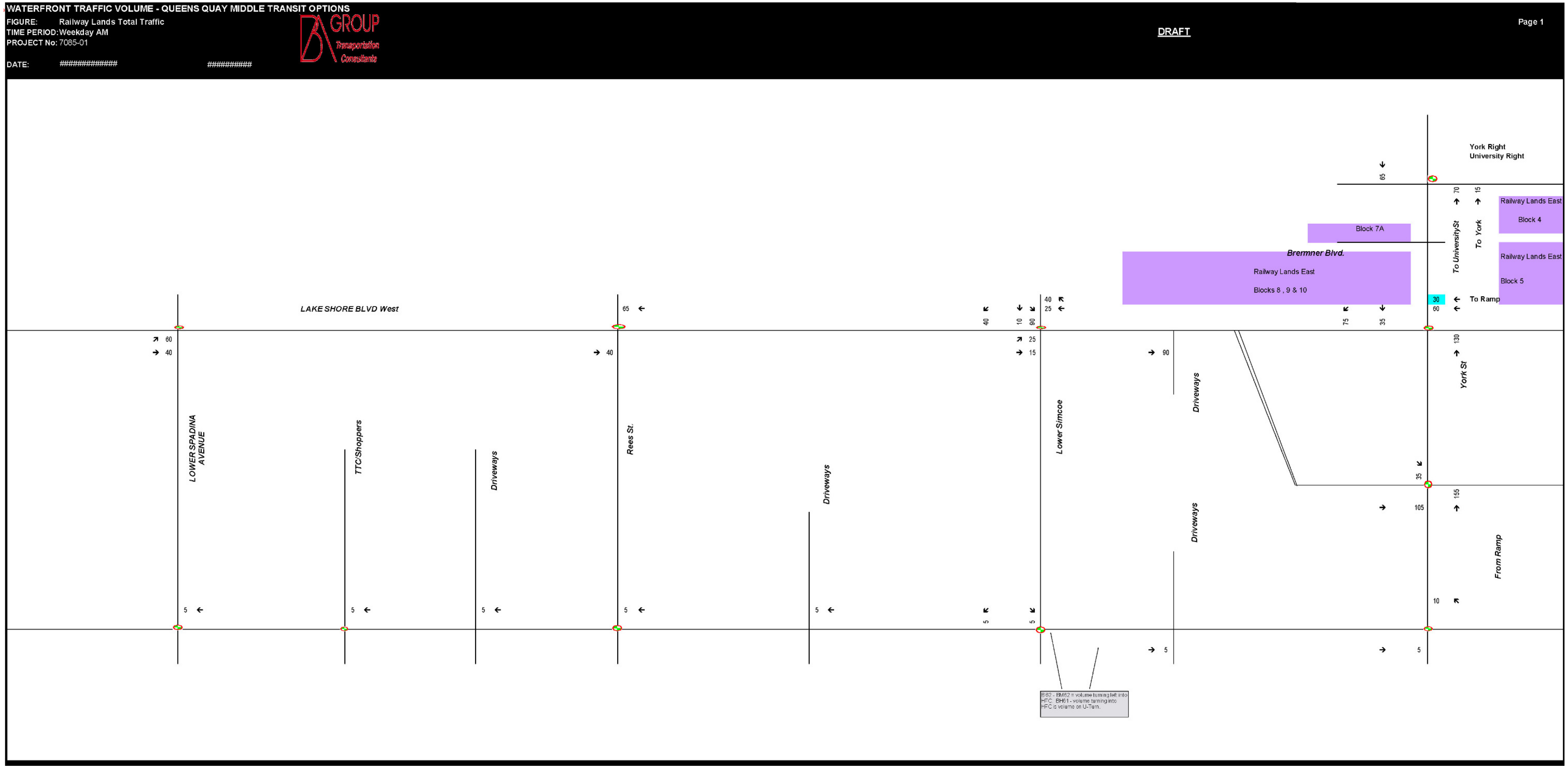


Figure A4- 12: AM Future Centre, Railway Lands, Bay to Cooper

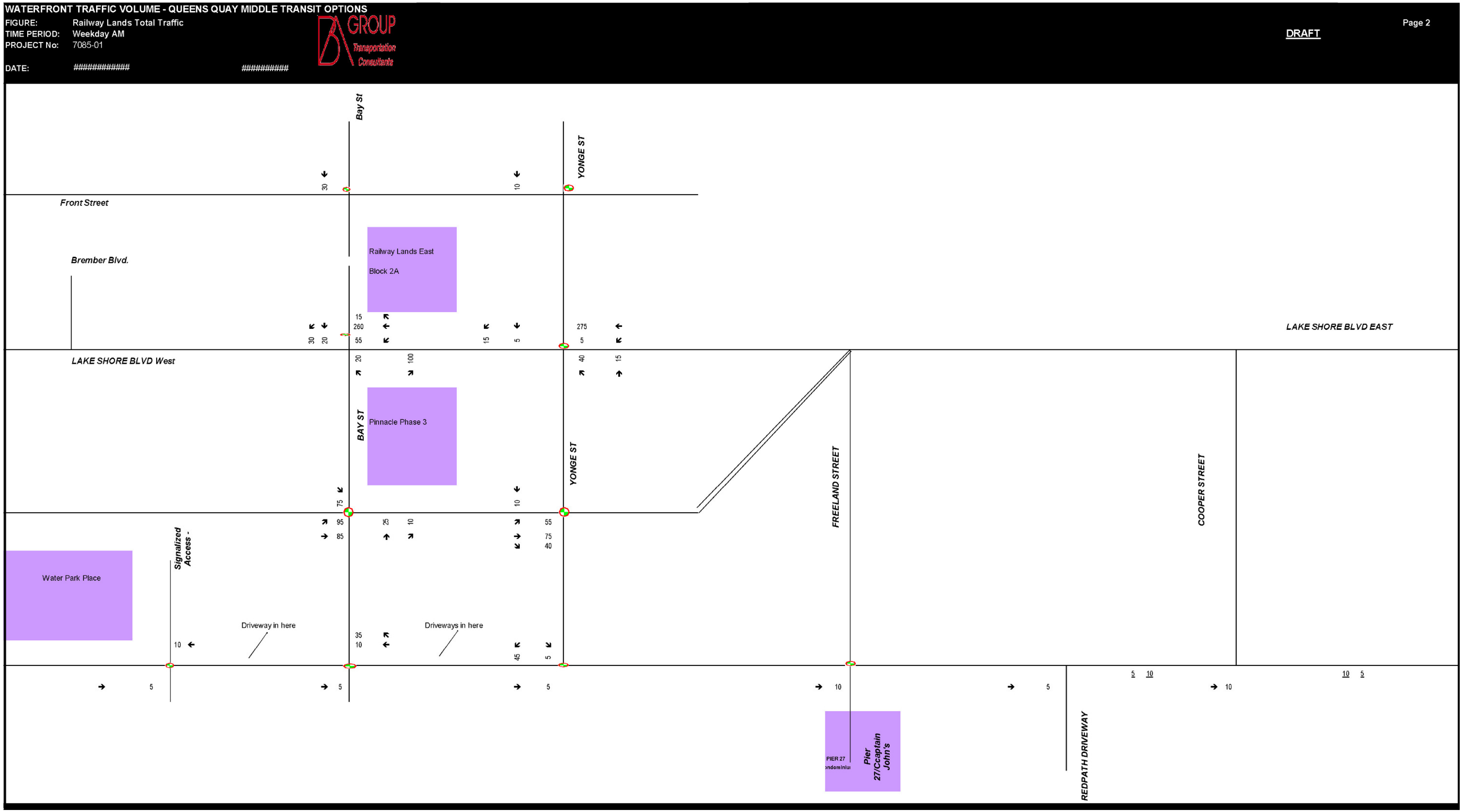


Figure A4- 13: AM Future Centre, West Don Lands, Spadina to York

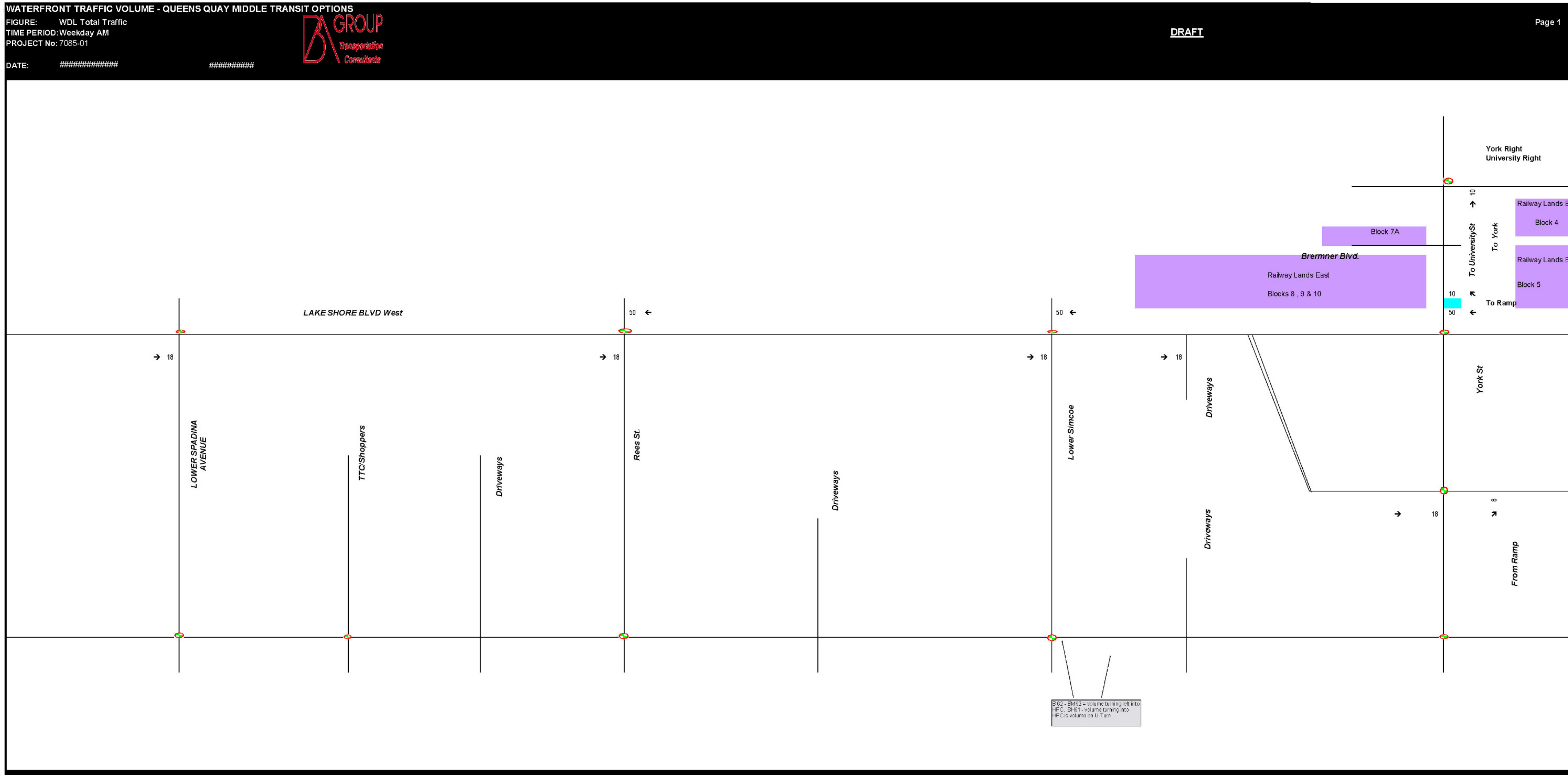


Figure A4- 14: AM Future Centre, West Don Lands, Bay to Cooper

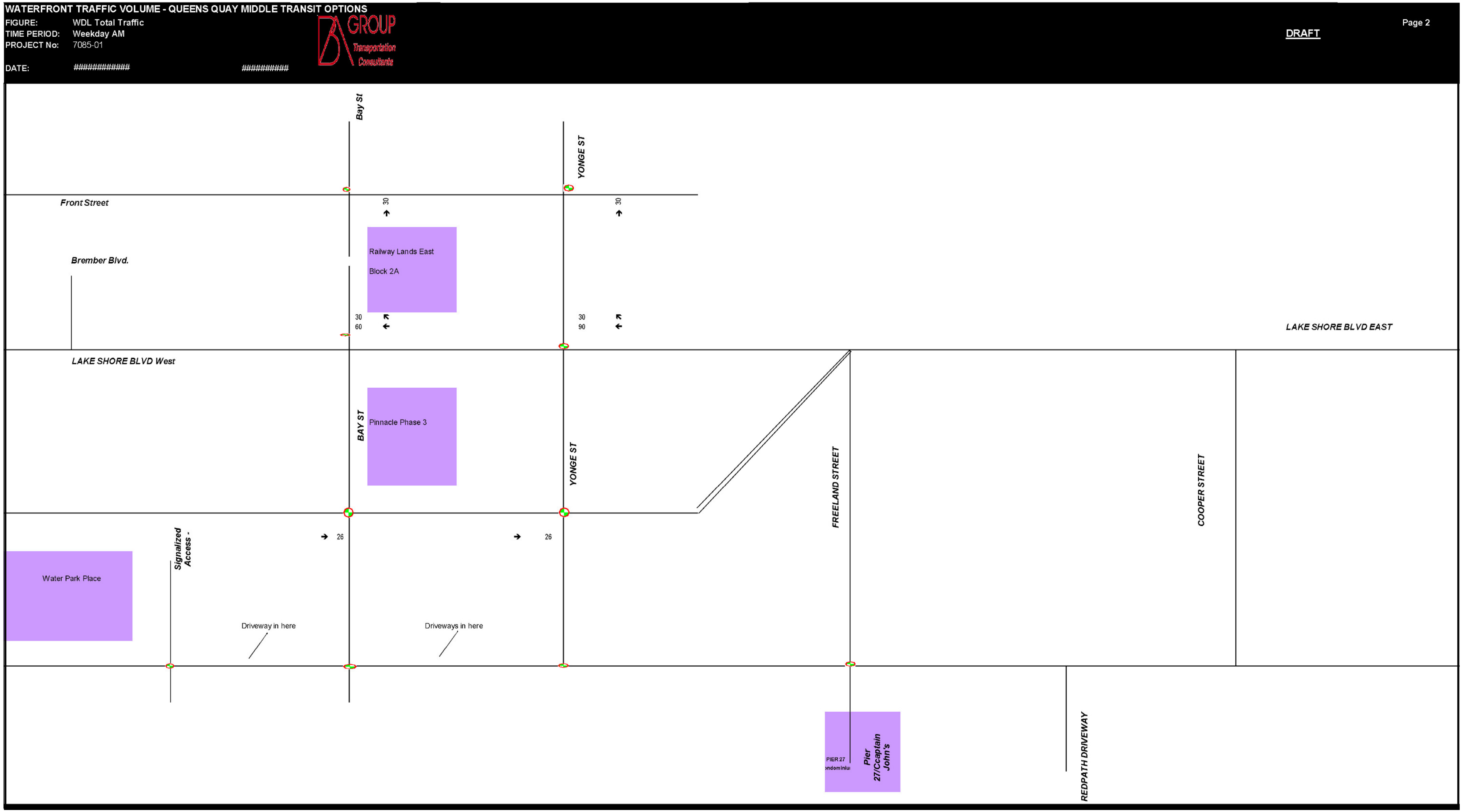


Figure A4- 15: AM Future Centre, Total, Spadina to York

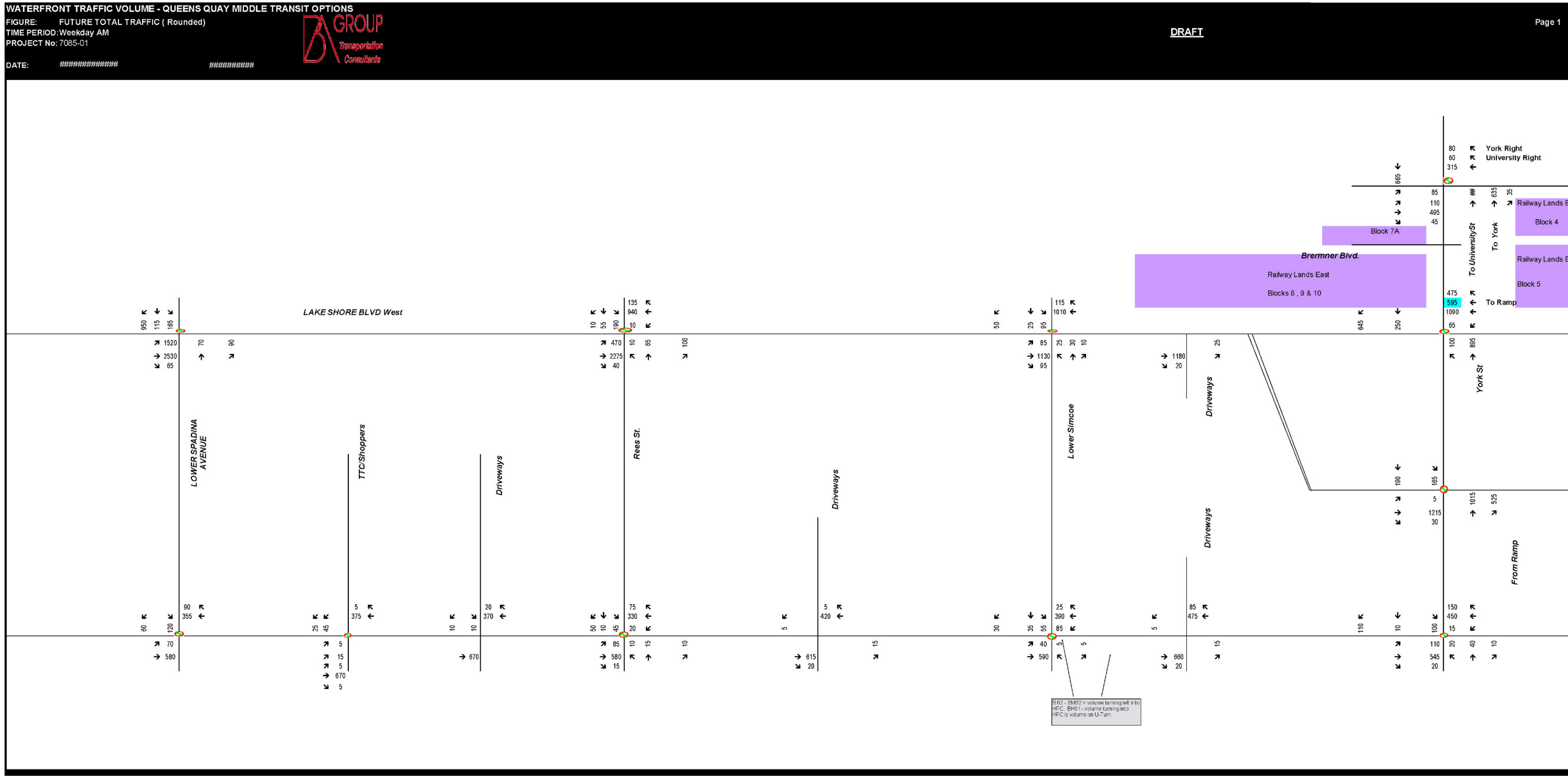


Figure A4- 16: AM Future Centre, Total, Bay to Cooper

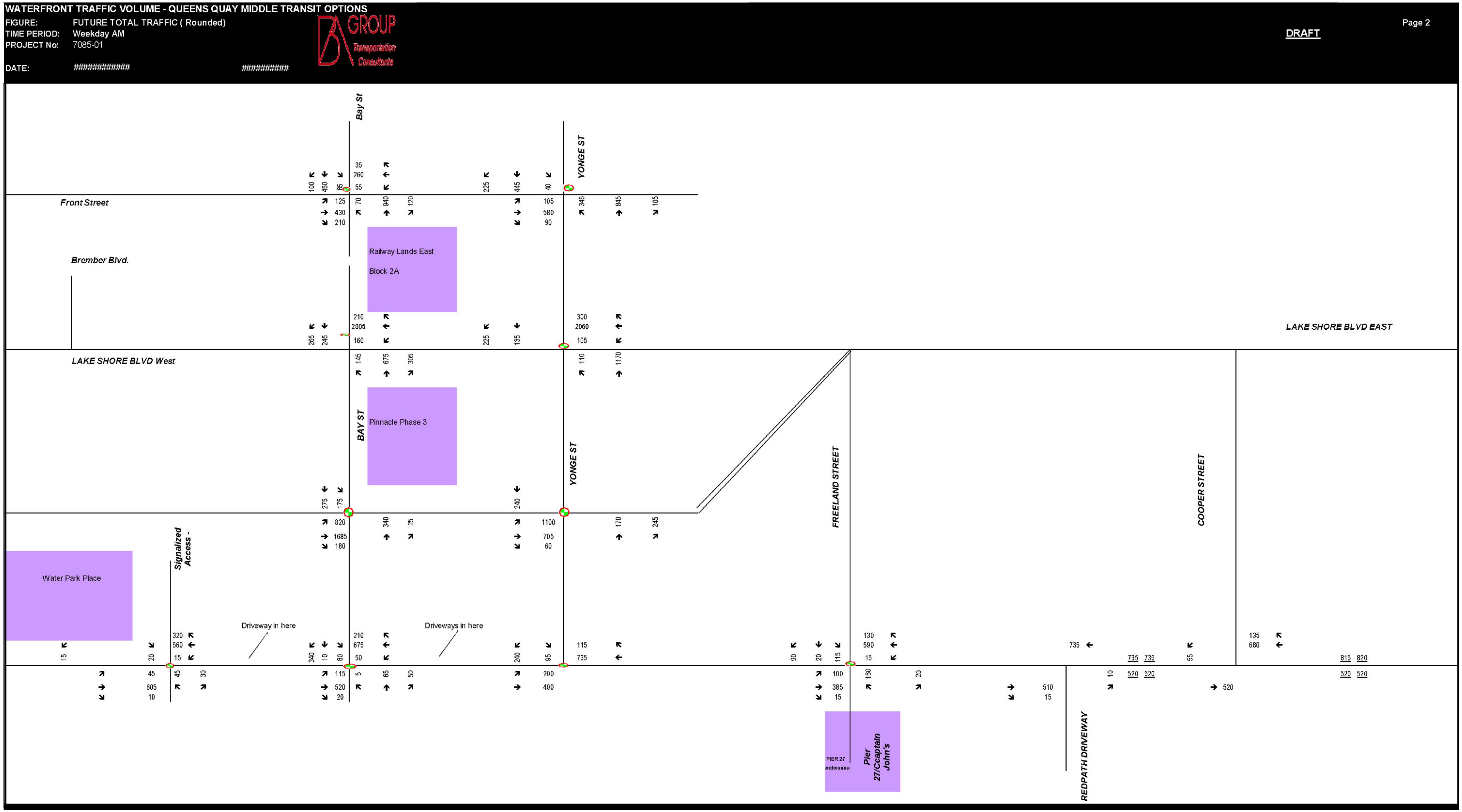


Figure A4- 17: PM Future Centre, Reassigned Existing, Spadina to York

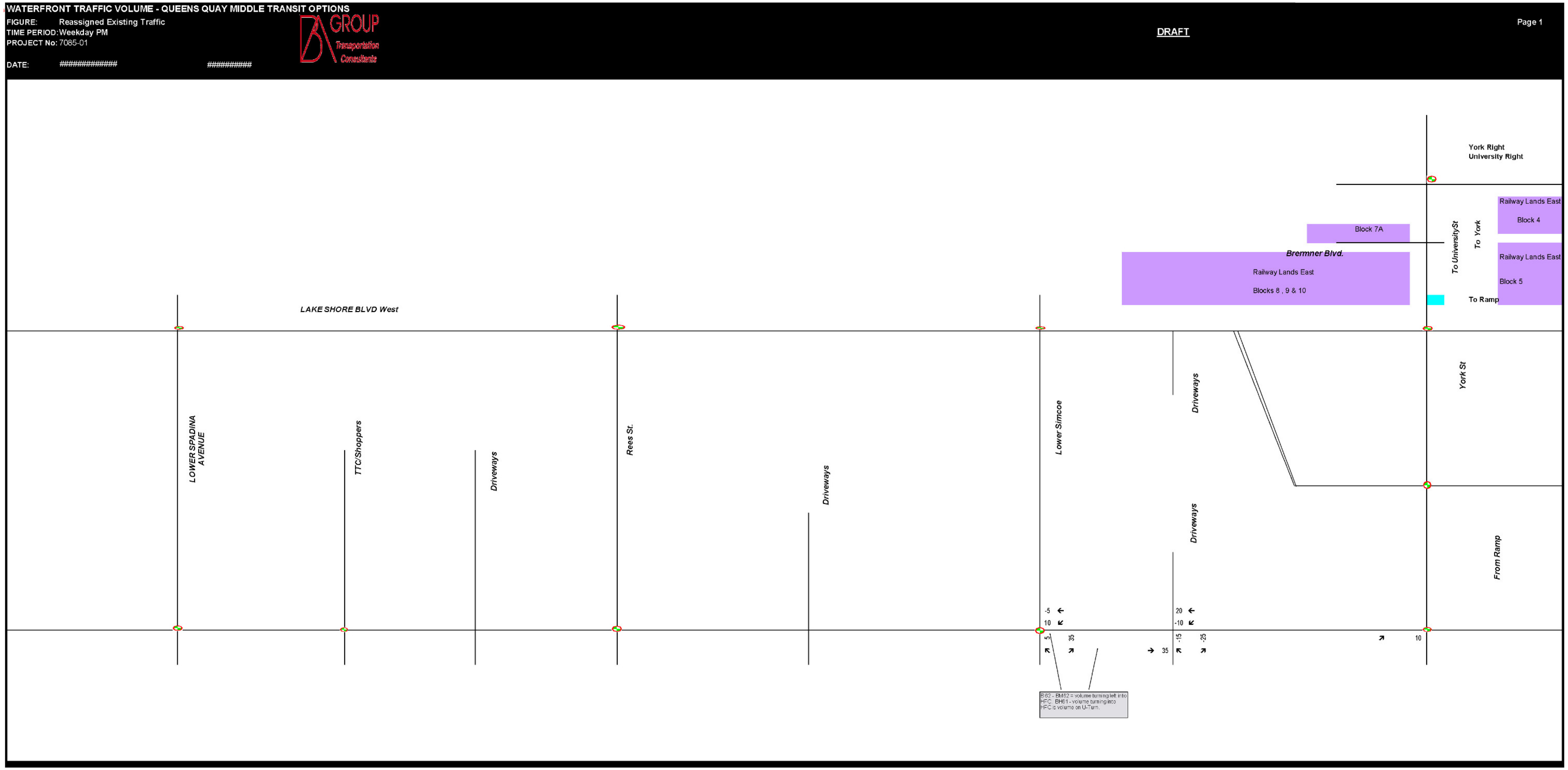


Figure A4- 18: PM Future Centre, Reassigned Existing, Bay to Cooper

WATERFRONT TRAFFIC VOLUME - QUEENS QUAY MIDDLE TRANSIT OPTIONS
FIGURE: Reassigned Existing Traffic
TIME PERIOD: Weekday PM
PROJECT No: 7085-01
DATE: ############ ##########

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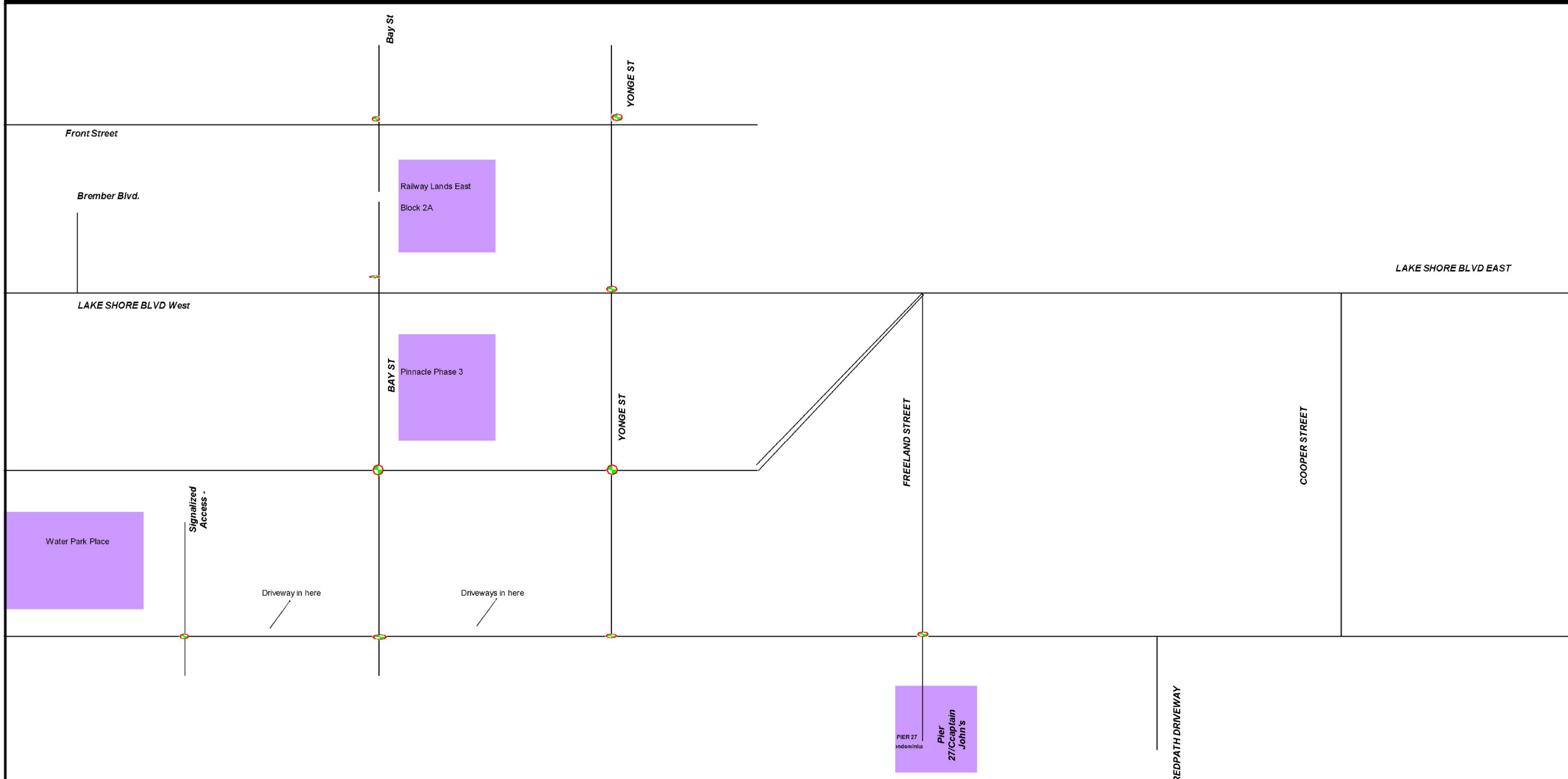


Figure A4- 19: PM Future Centre, Harbourfront Centre, Spadina to York

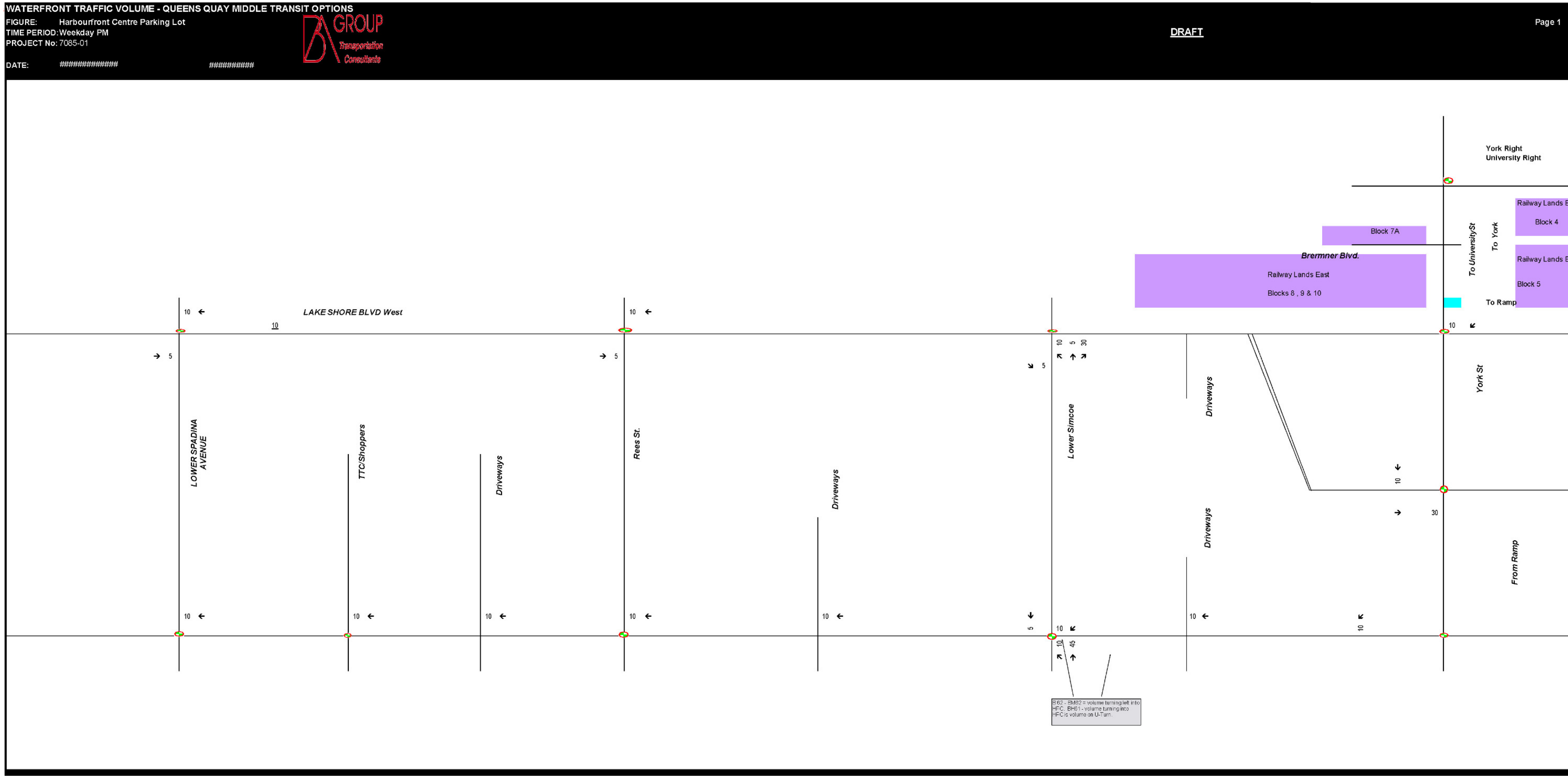


Figure A4- 20: PM Future Centre, Harbourfront Centre, Bay to Cooper

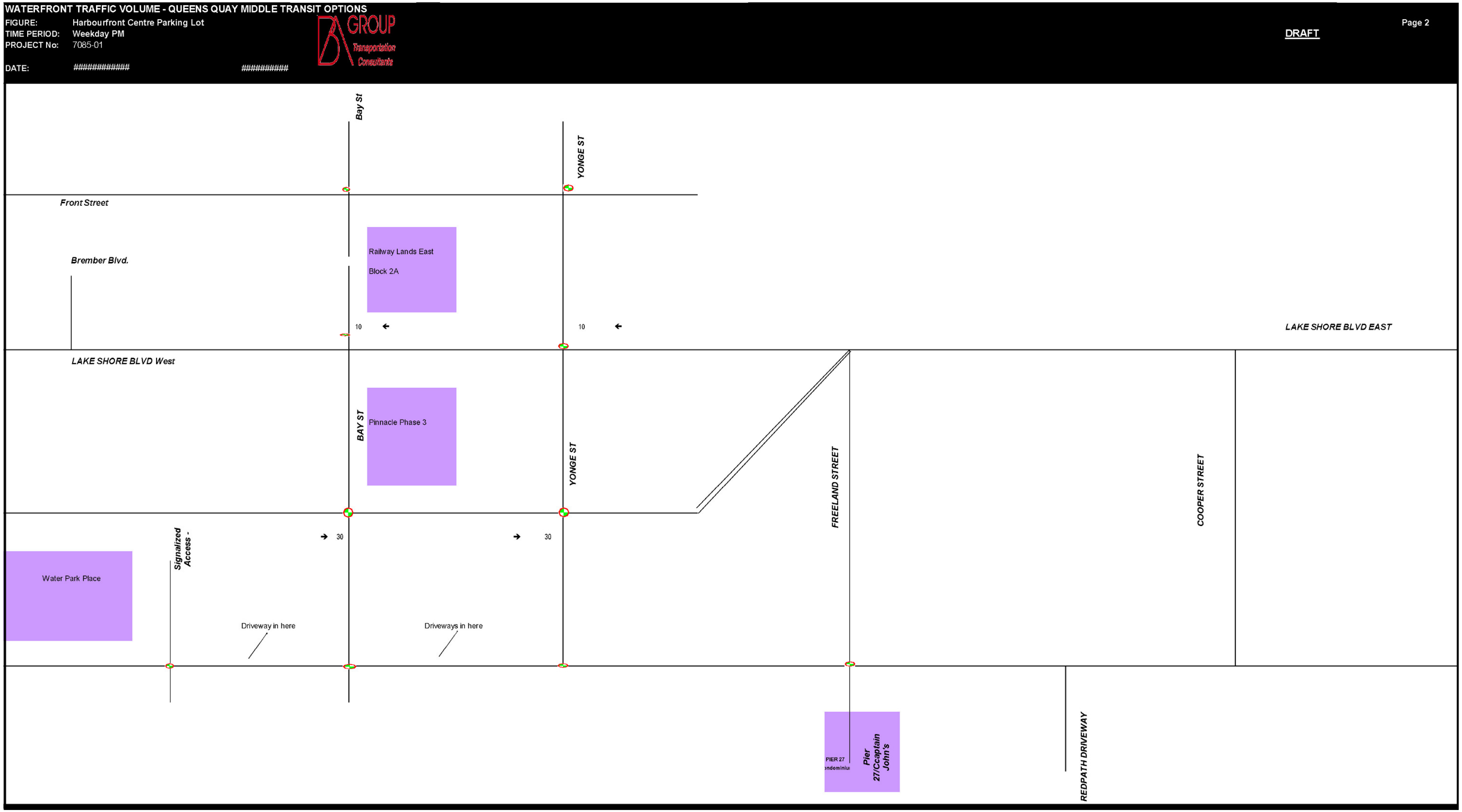


Figure A4- 21: PM Future Centre, Waterpark Place, Spadina to York

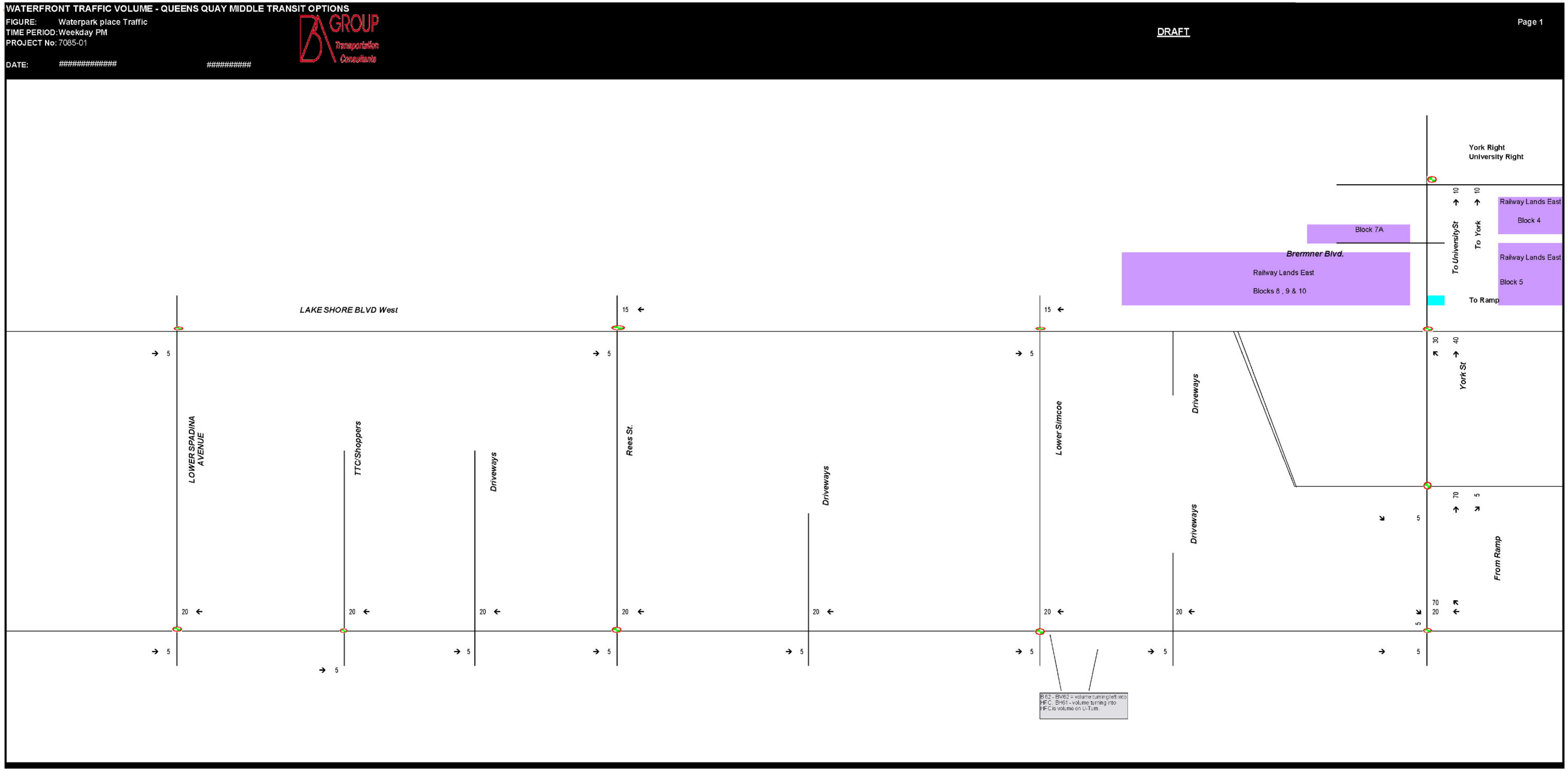


Figure A4- 22: PM Future Centre, Waterpark Place, Bay to Cooper

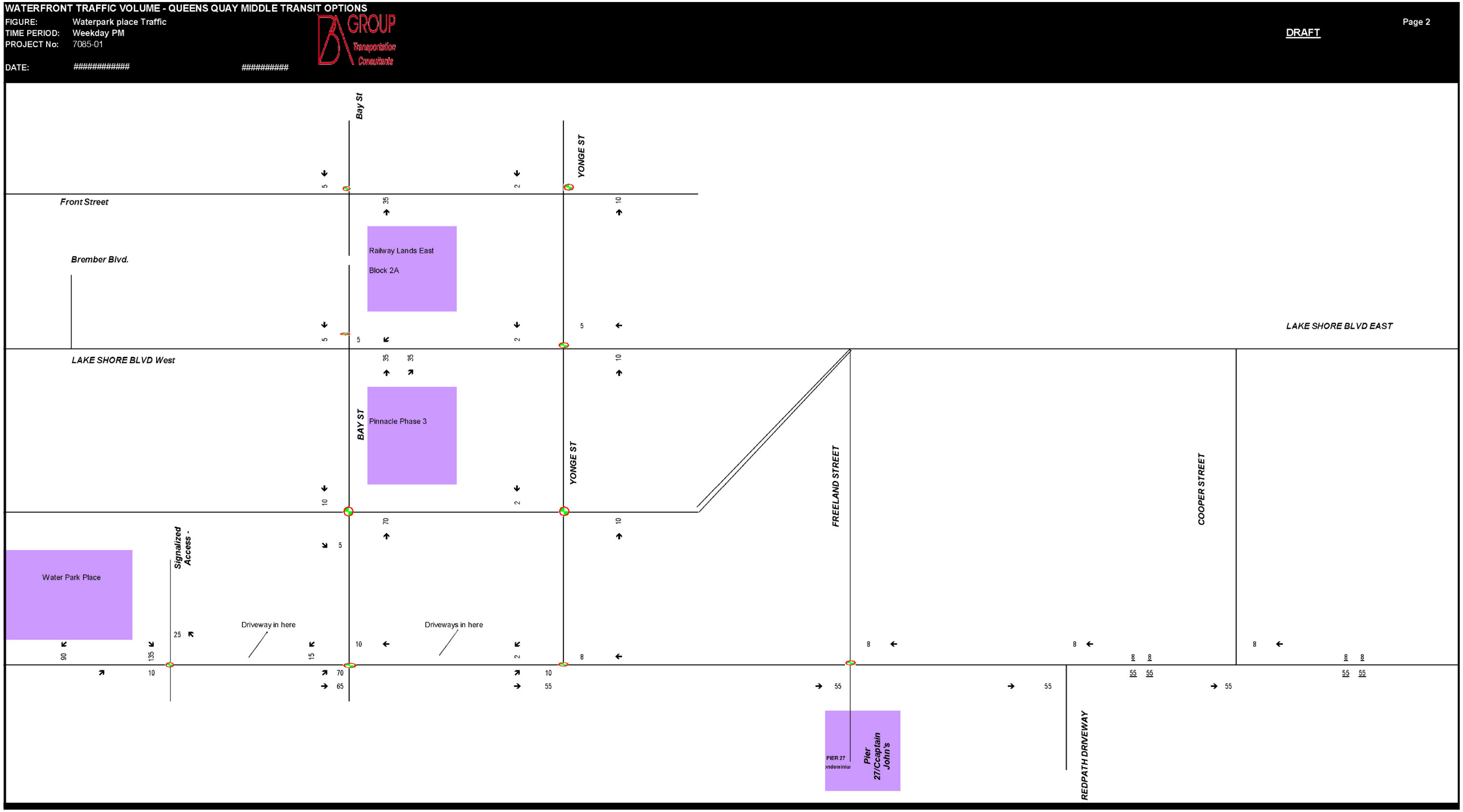


Figure A4- 23: PM Future Centre, Pier 27, Spadina to Bay

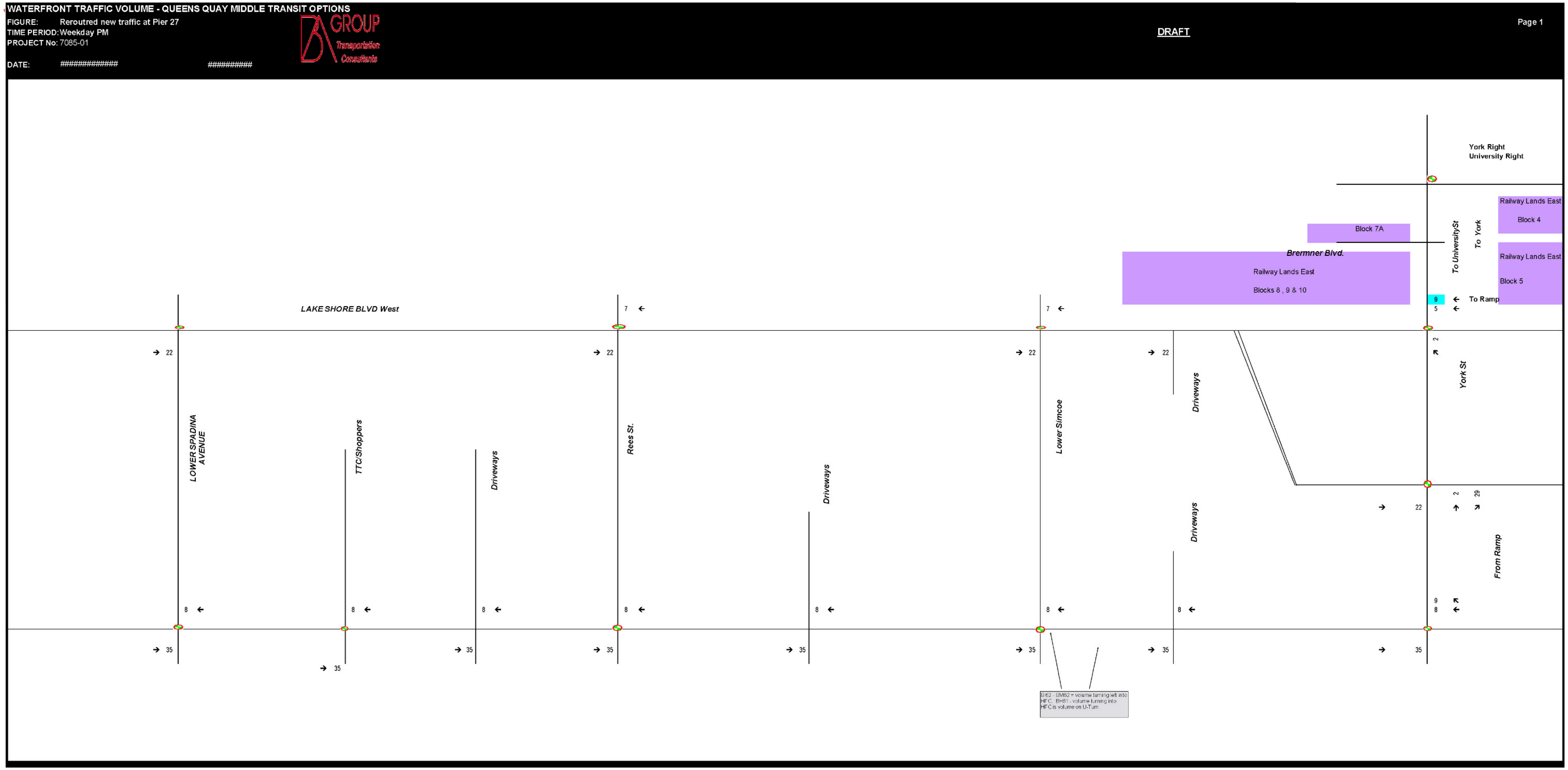


Figure A4- 24: PM Future Centre, Pier 27, Bay to Cooper

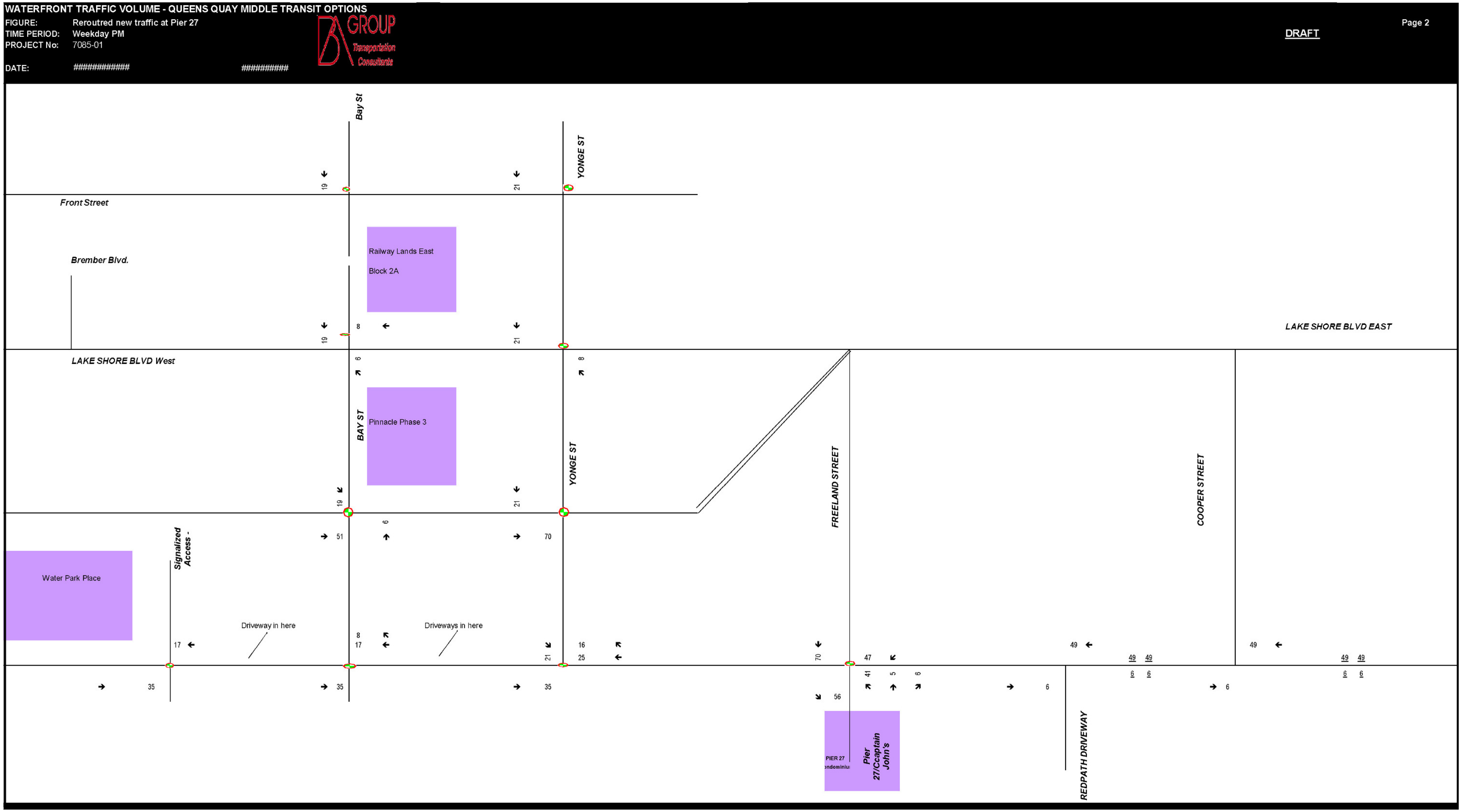


Figure A4- 25: PM Future Centre, East Bayfront, Spadina to York

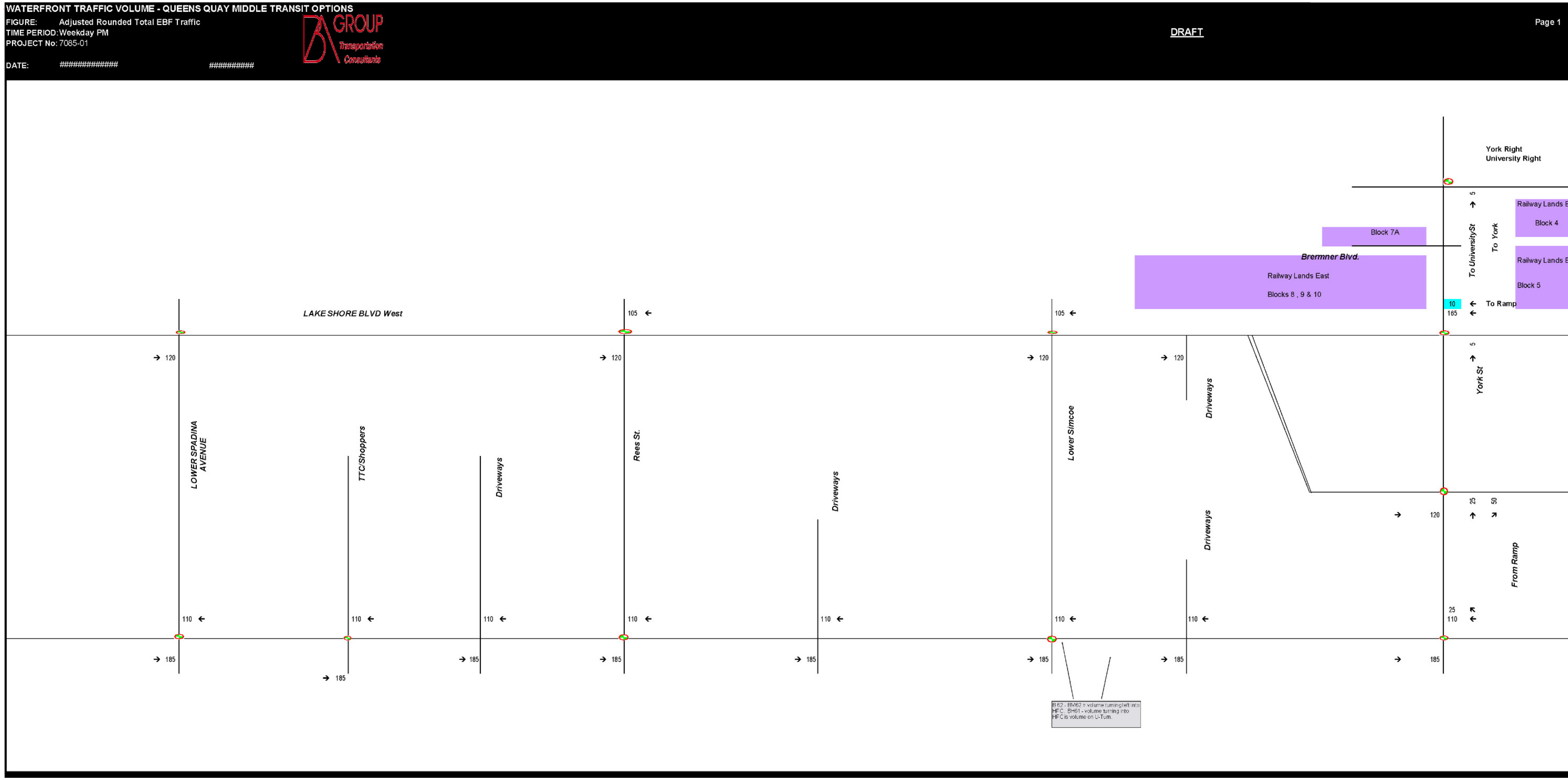


Figure A4- 26: PM Future Centre, East Bayfront, Bay to Cooper

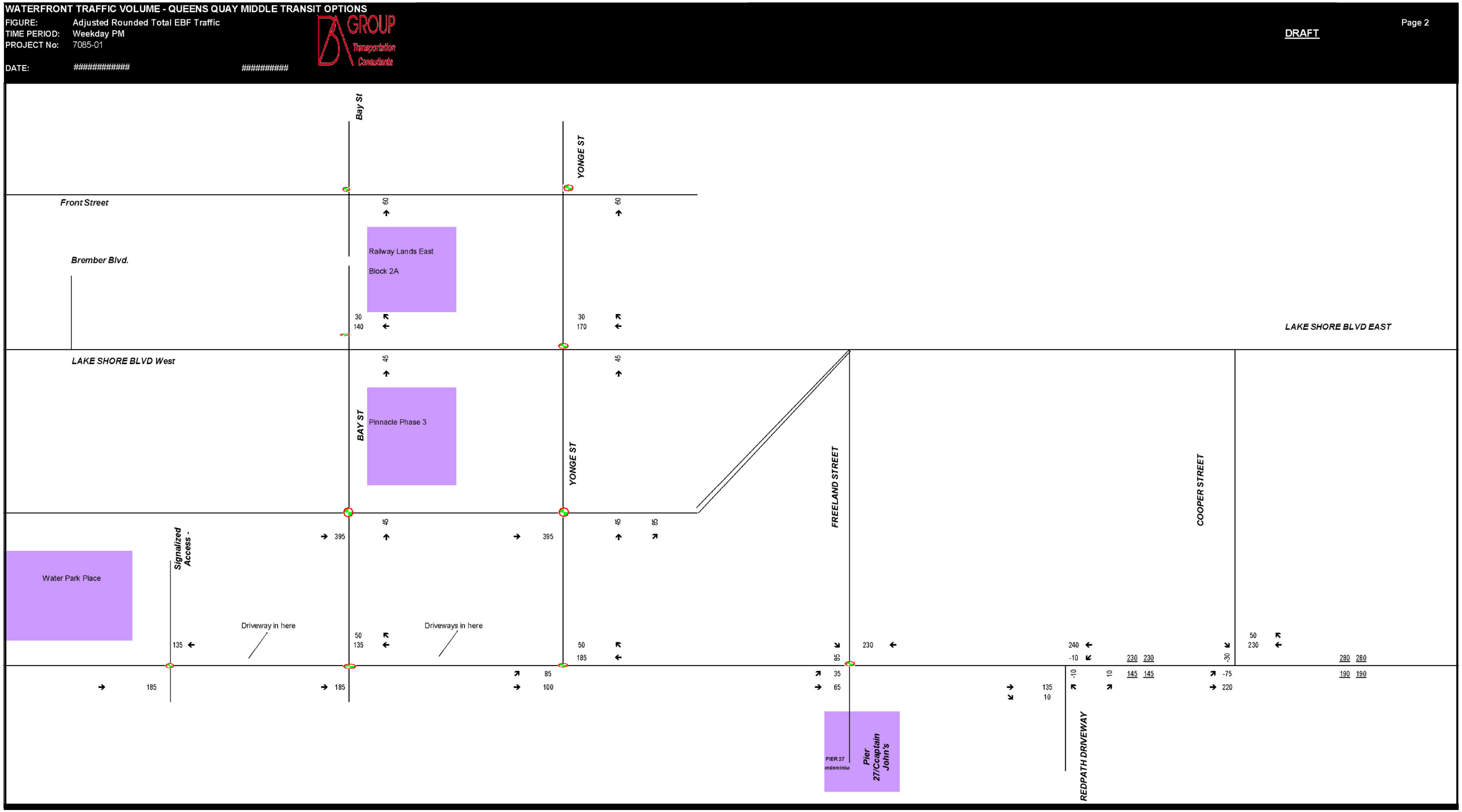


Figure A4- 27: PM Future Centre, Railway Lands, Spadina to York

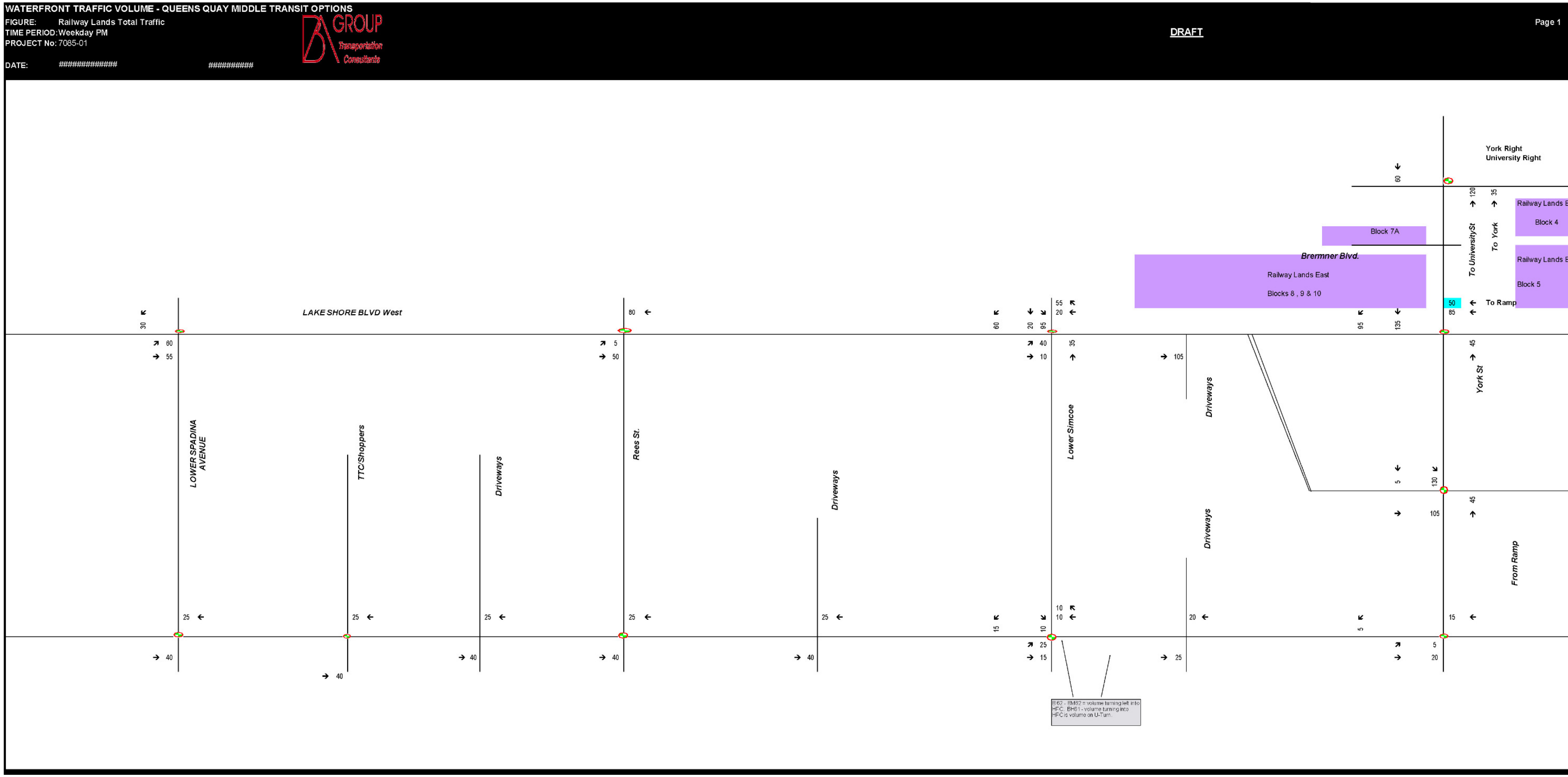


Figure A4- 28: PM Future Centre, Railway Lands, Bay to Cooper

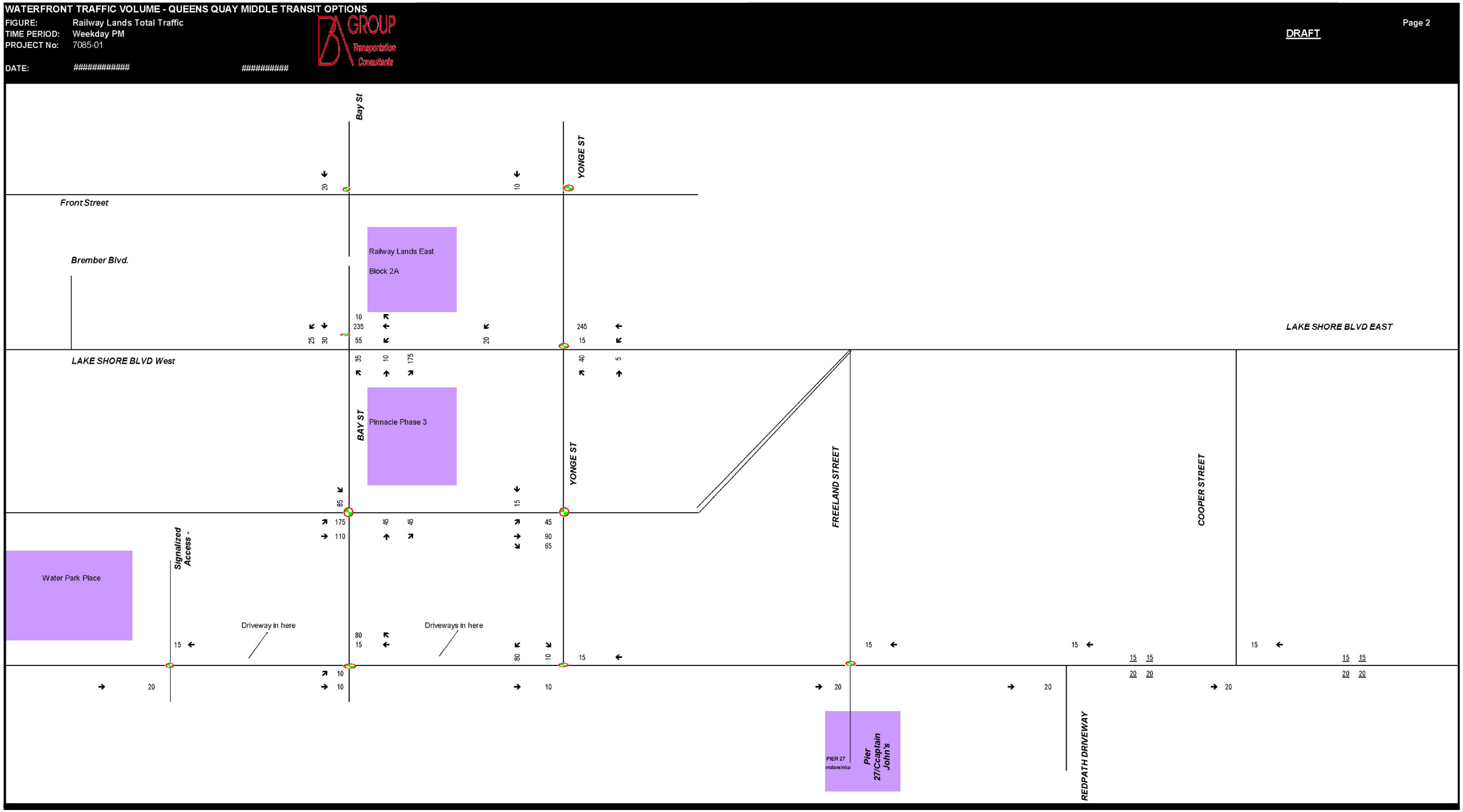


Figure A4- 29: PM Future Centre, West Don Lands, Spadina to York

Figure A4- 30: PM Future Centre, West Don Lands, Bay to Cooper

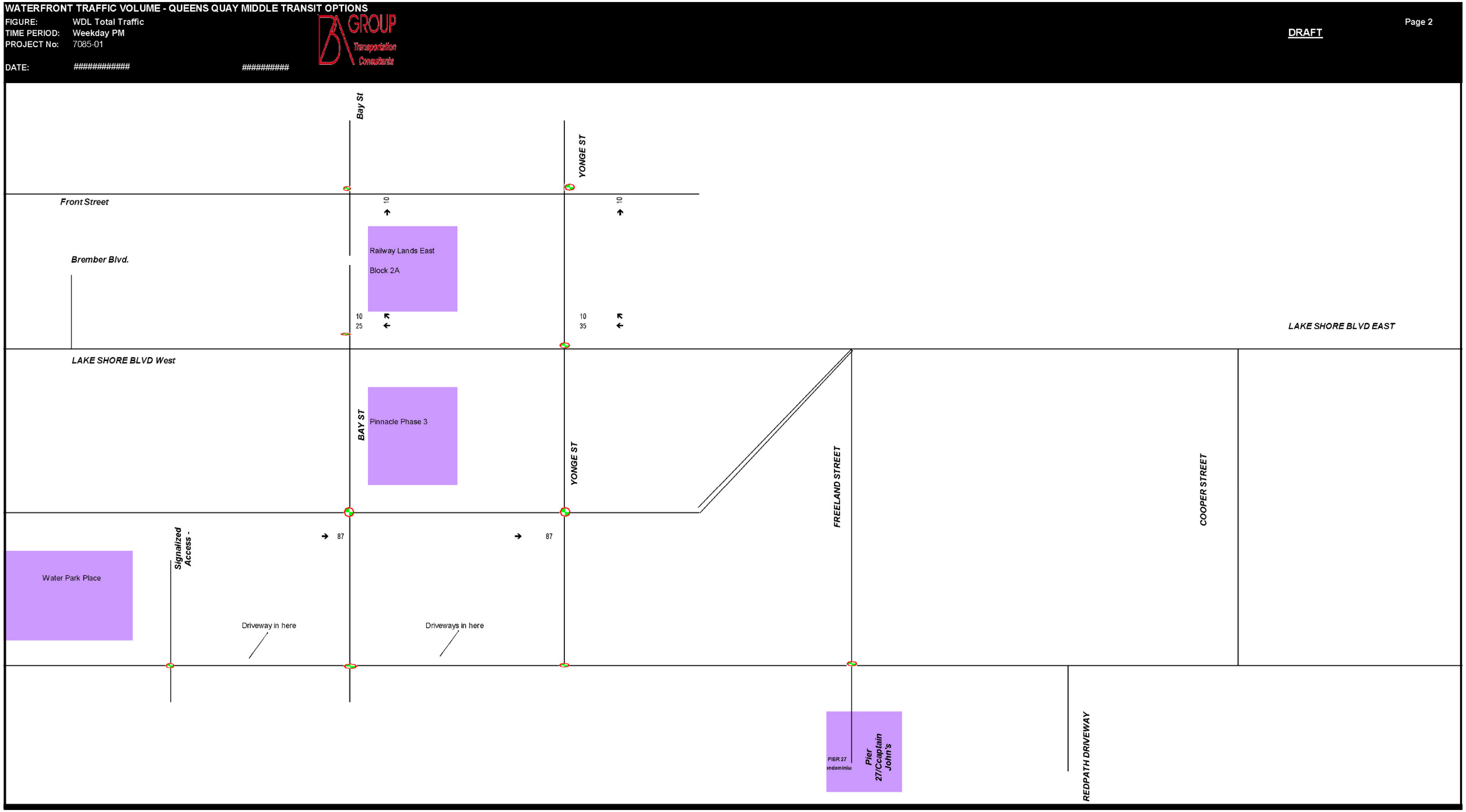


Figure A4- 31: PM Future Centre, Total, Spadina to York

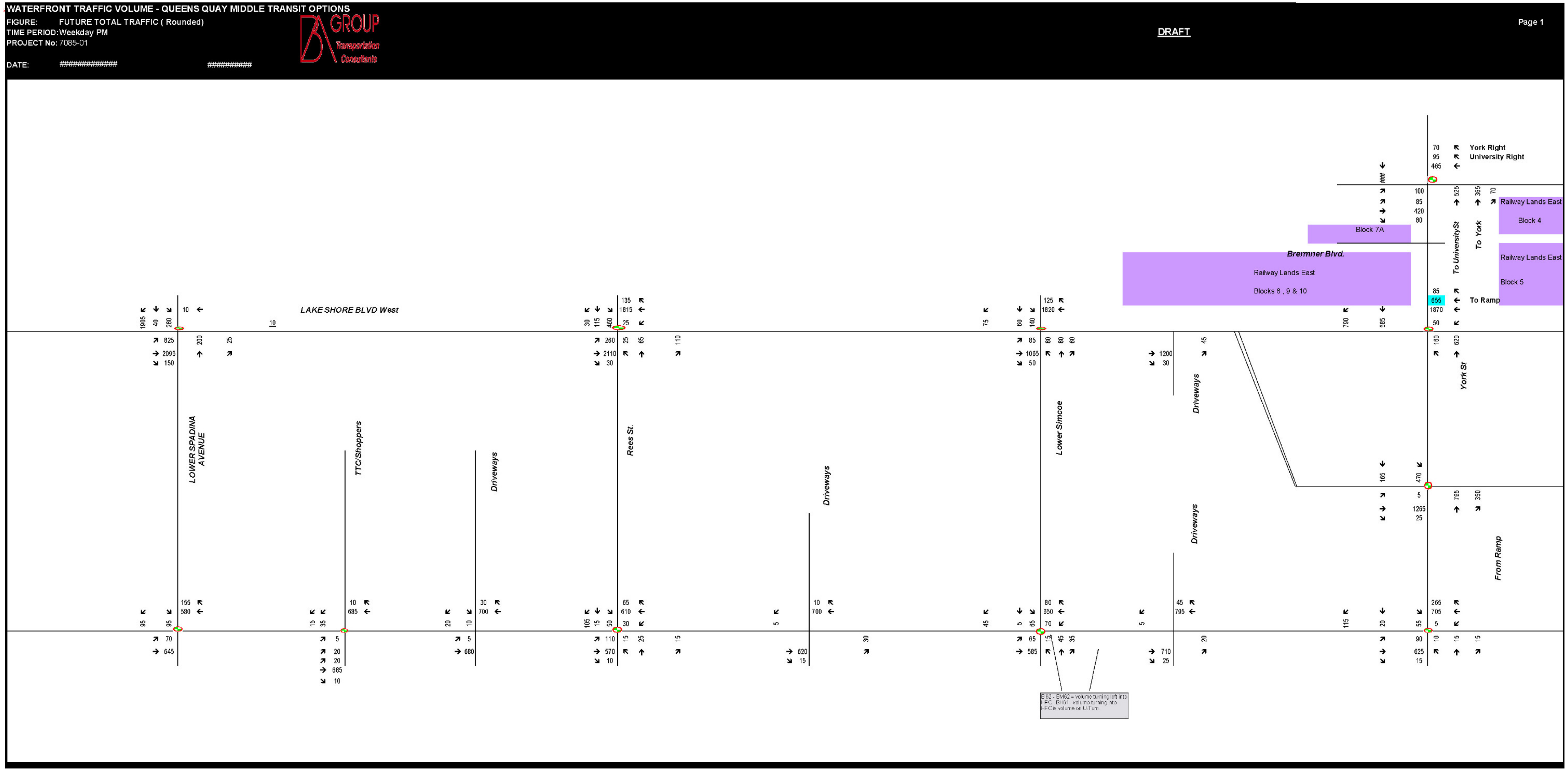
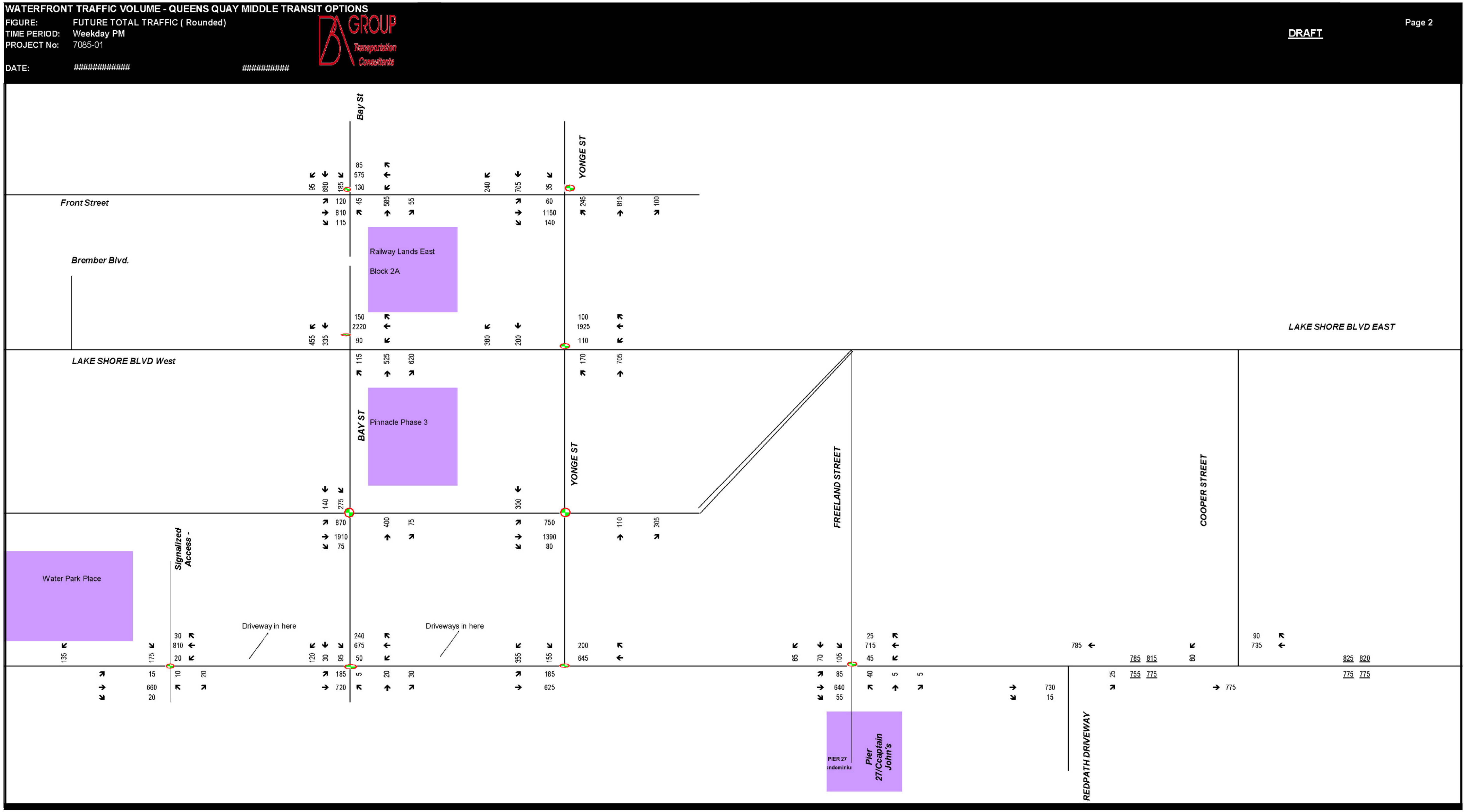


Figure A4- 32: PM Future Centre, Total, Bay to Cooper



A5 Future South Side One-Way Volumes

Figure A5- 1: AM Future South Side One Way, Reassigned Existing, Spadina to York

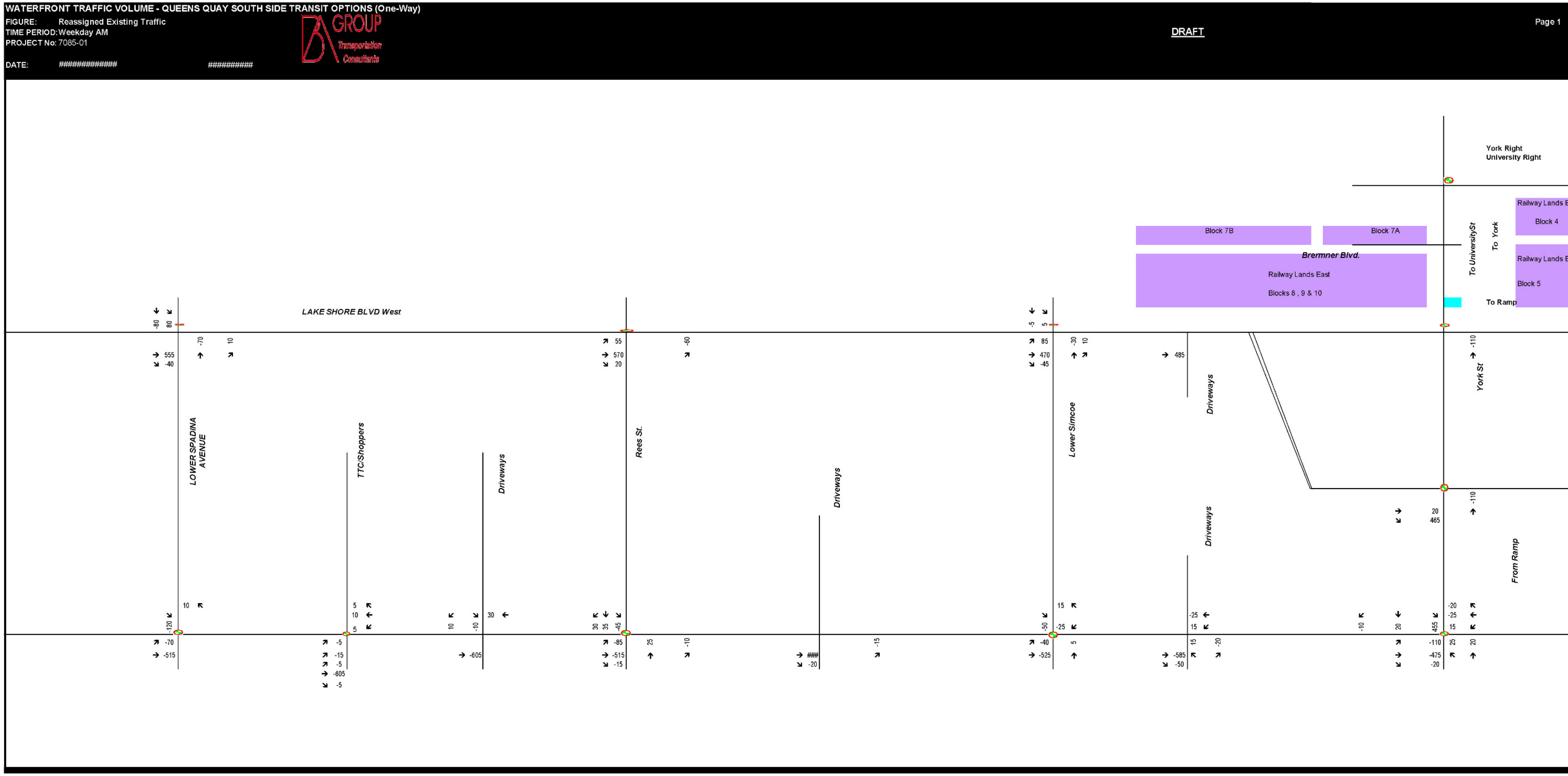


Figure A5- 2: AM Future South Side One Way, Reassigned Existing, Bay to Cooper

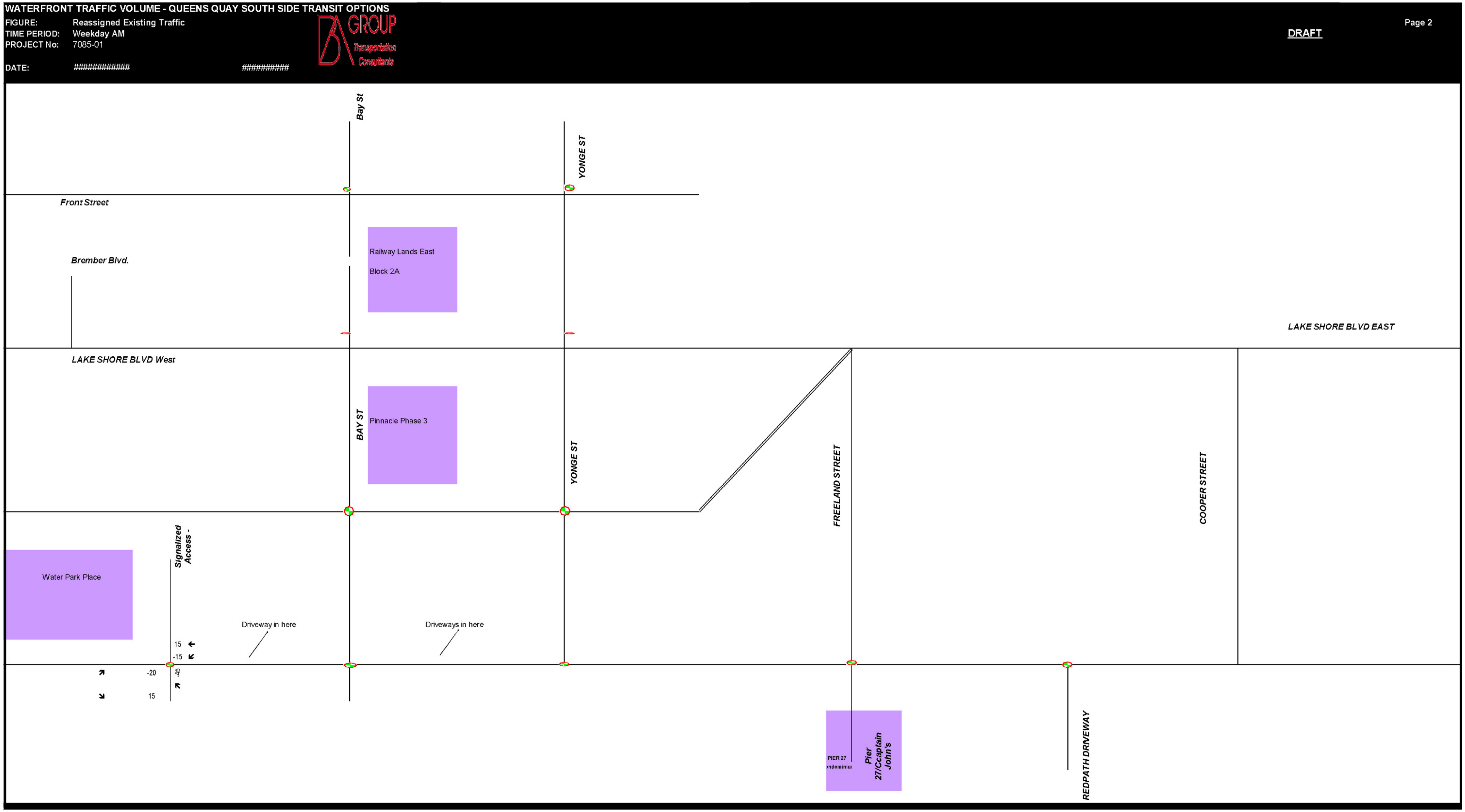


Figure A5- 3: AM Future South Side One Way, Harbourfront Centre, Spadina to York

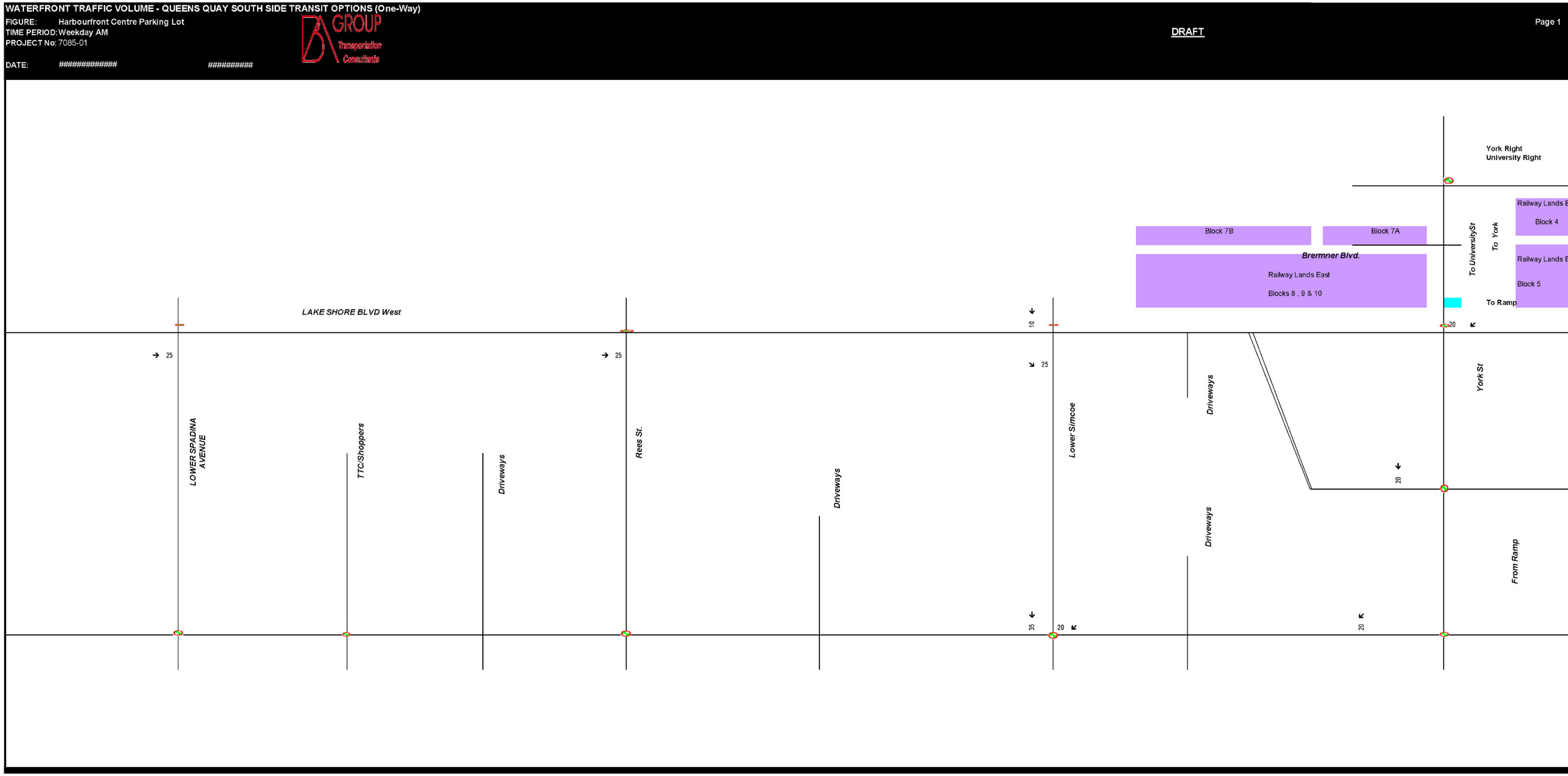


Figure A5- 4: AM Future South Side One Way, Harbourfront Centre, Bay to Cooper

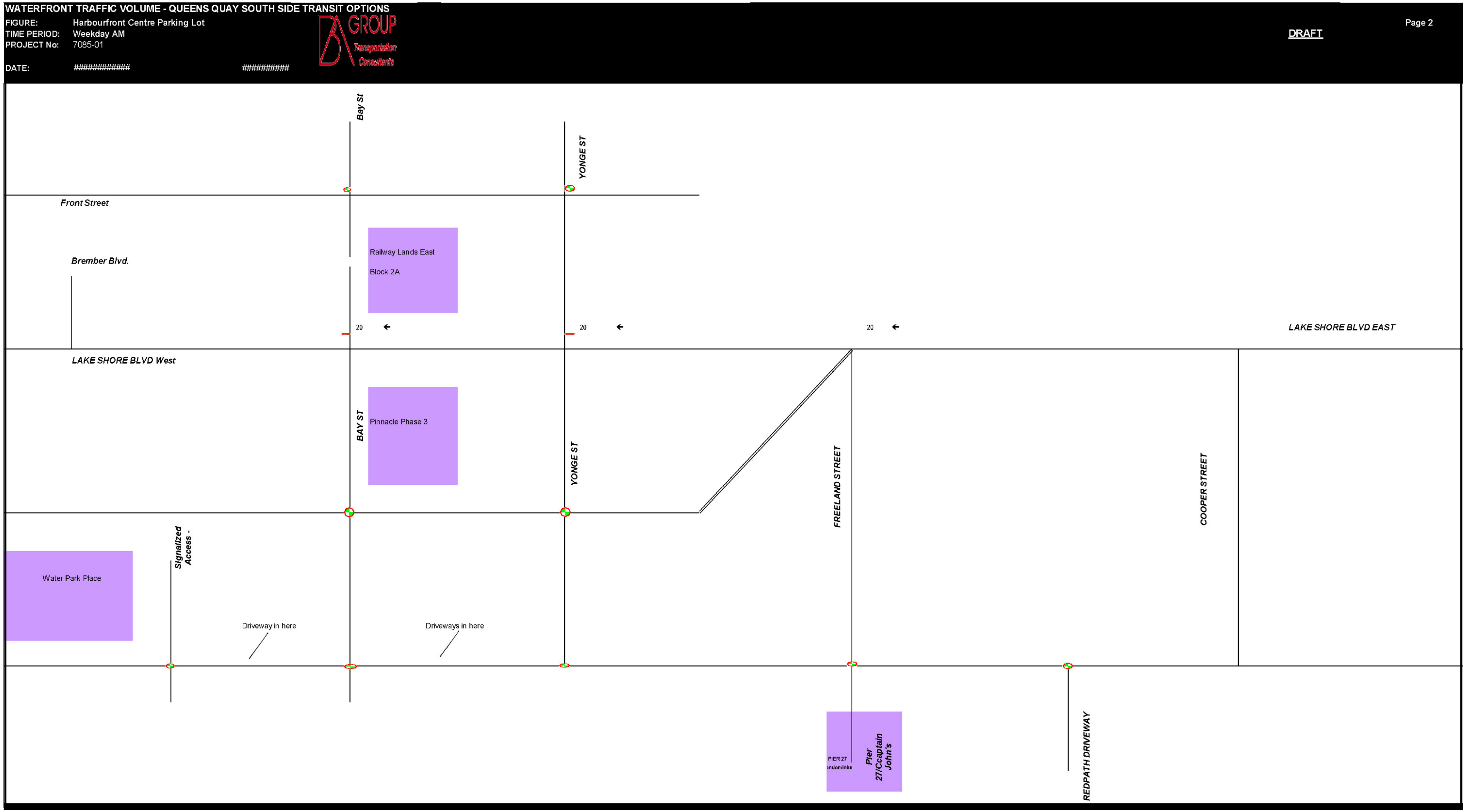


Figure A5- 5: AM Future South Side One Way, Waterpark Place, Spadina to York

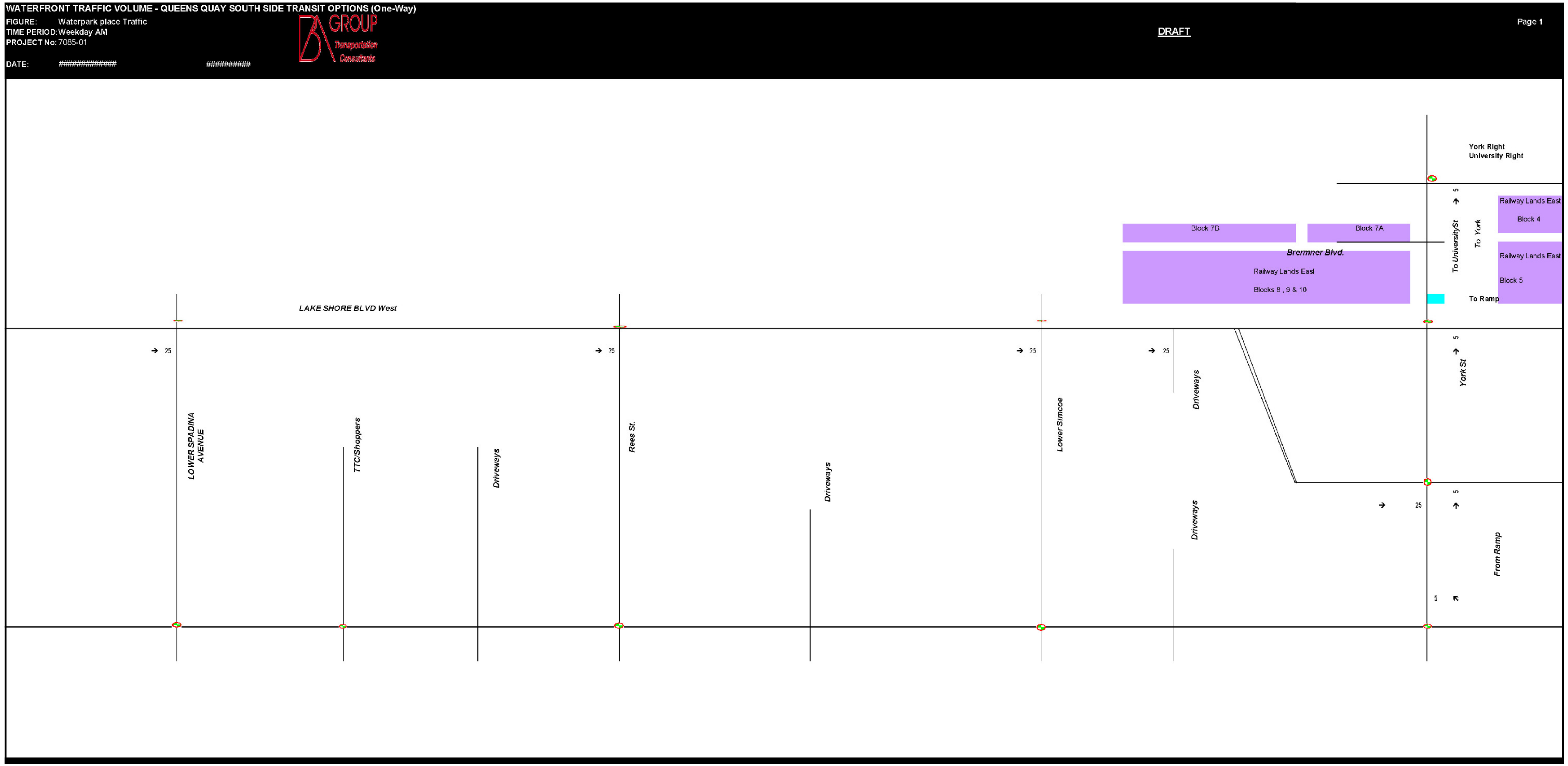


Figure A5- 6: AM Future South Side One Way, Waterpark Place, Bay to Cooper

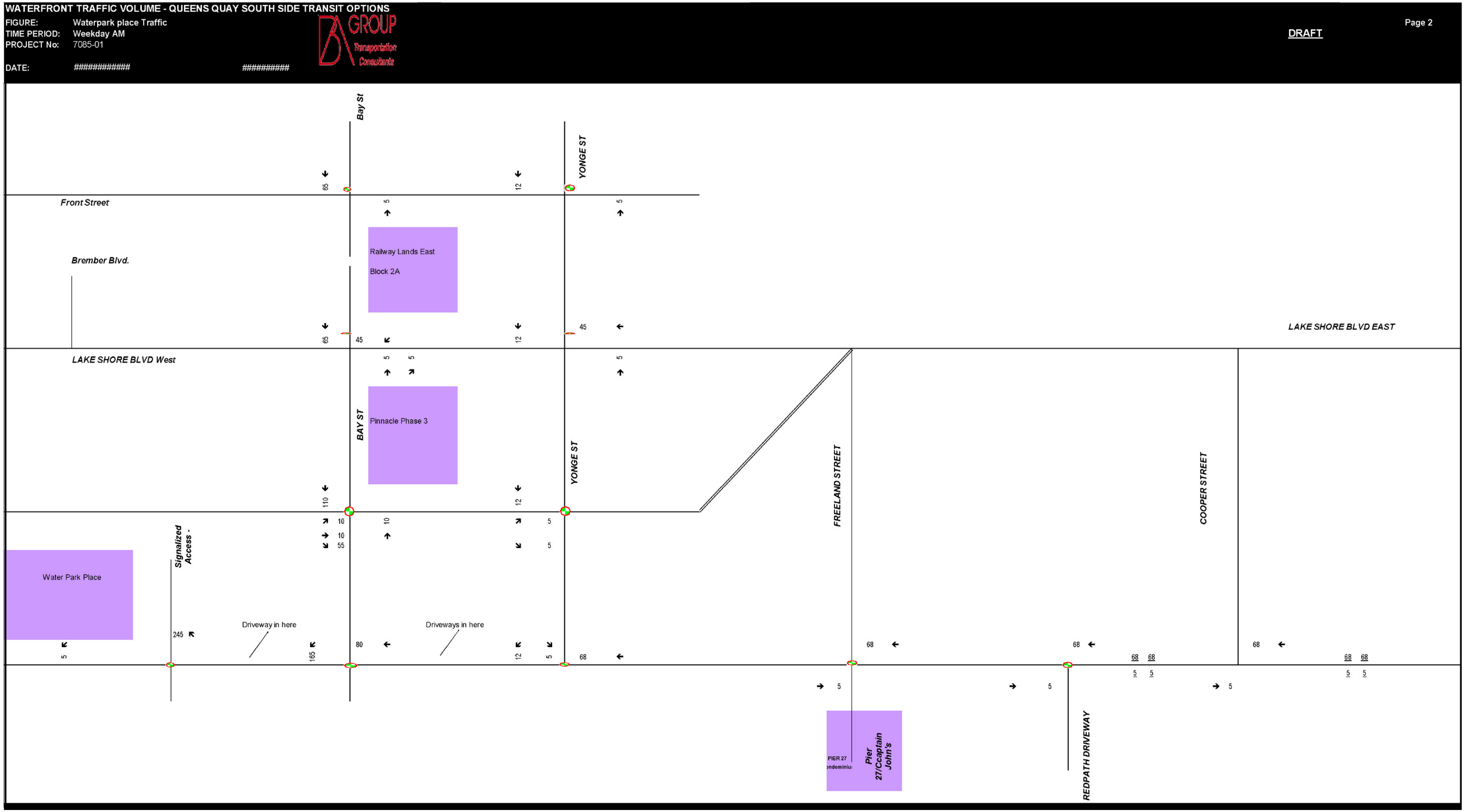


Figure A5- 7: AM Future South Side One Way, Pier 27, Spadina to York

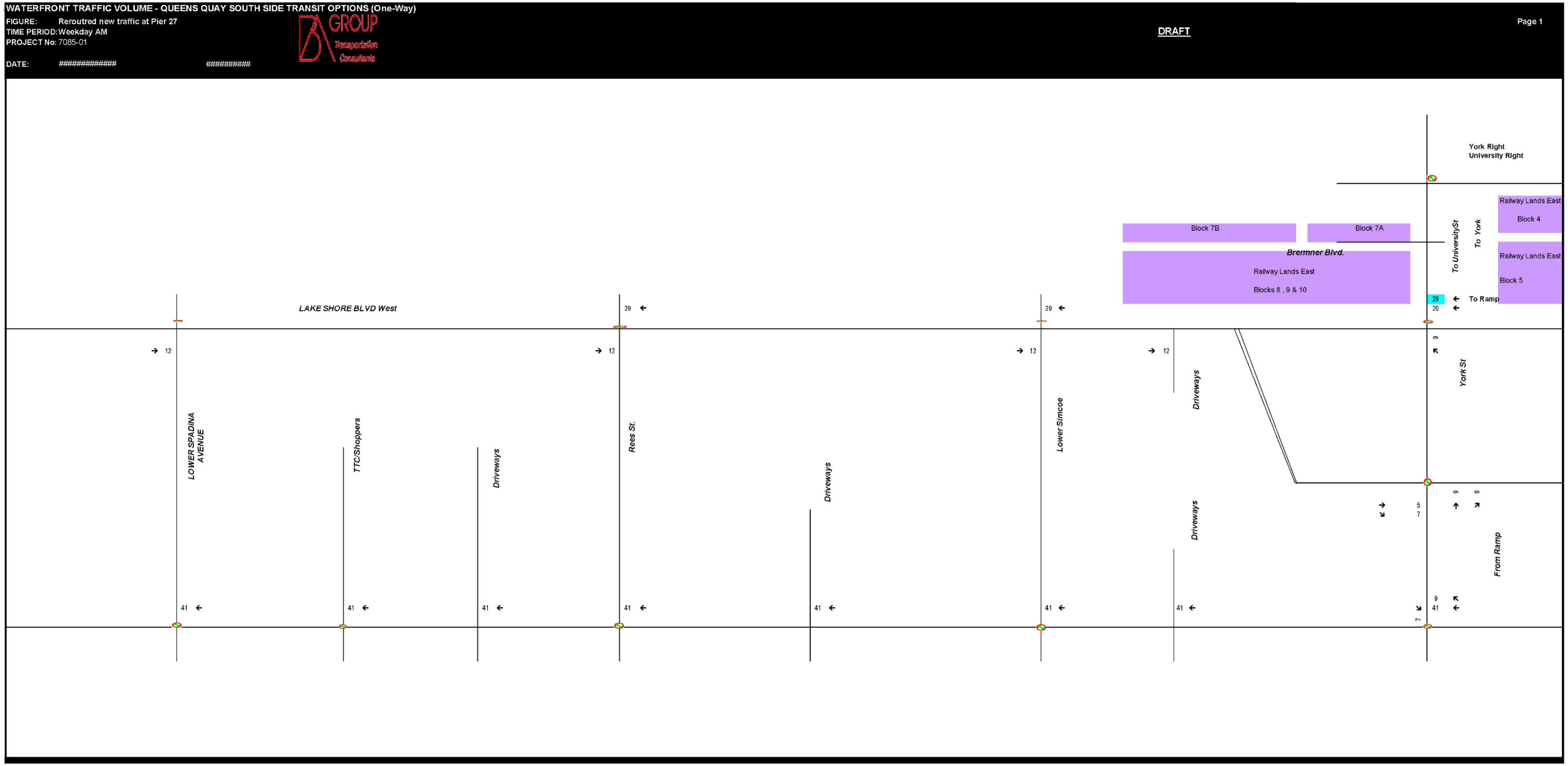


Figure A5- 8: AM Future South Side One Way, Pier 27, Bay to Cooper

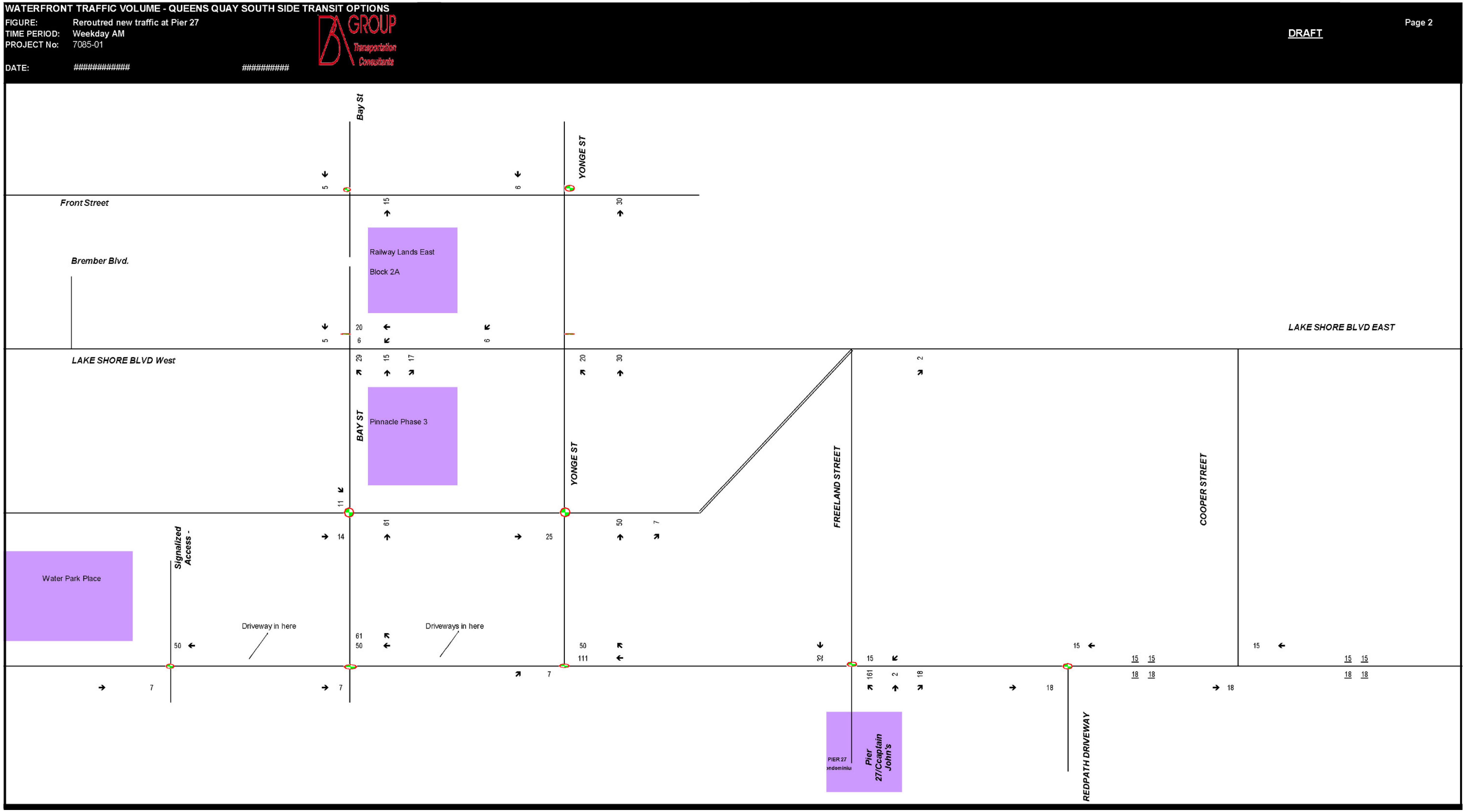


Figure A5- 9: AM Future South Side One Way, East Bayfront, Spadina to York

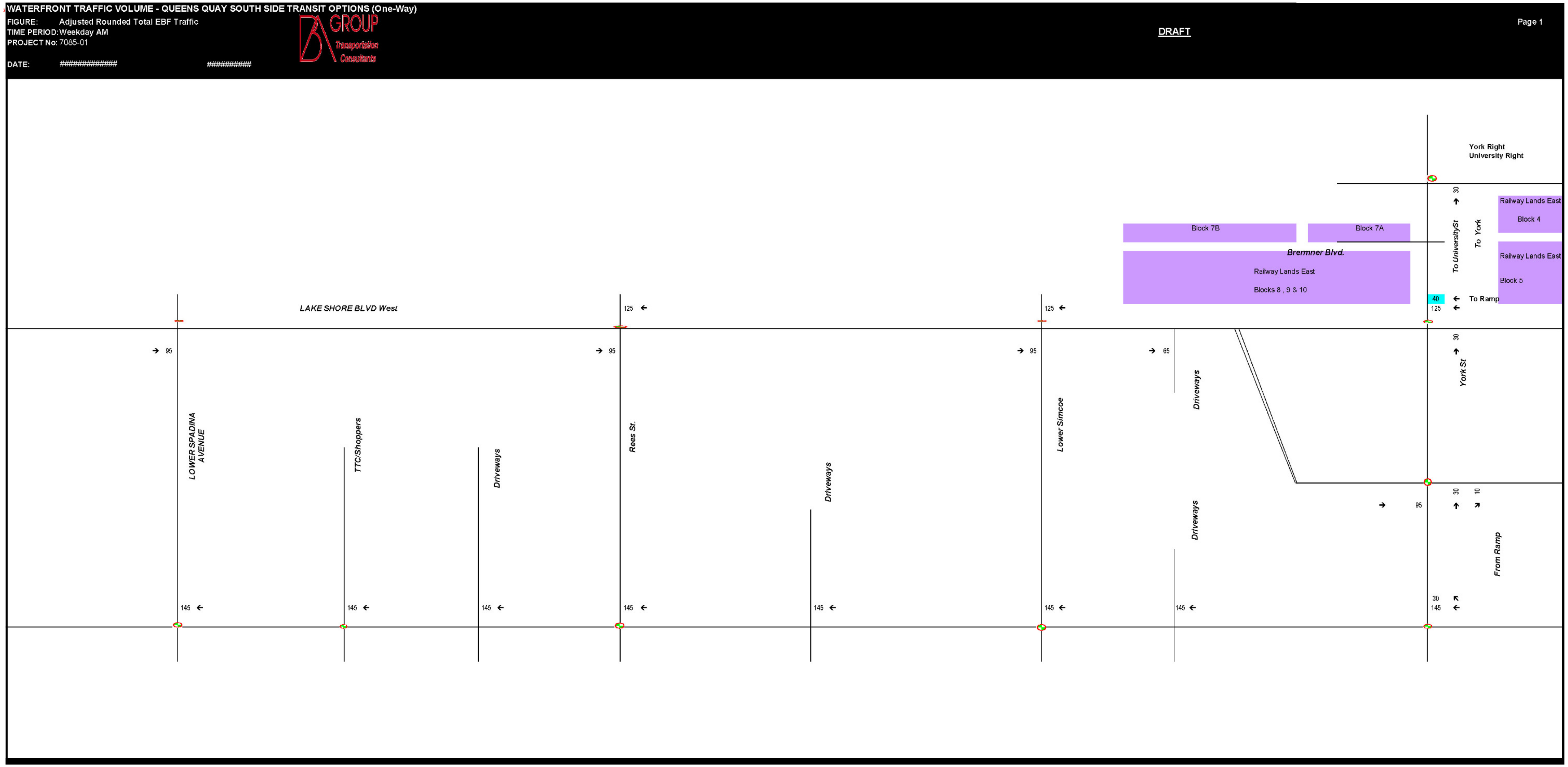


Figure A5- 10: AM Future South Side One Way, East Bayfront, Bay to Cooper

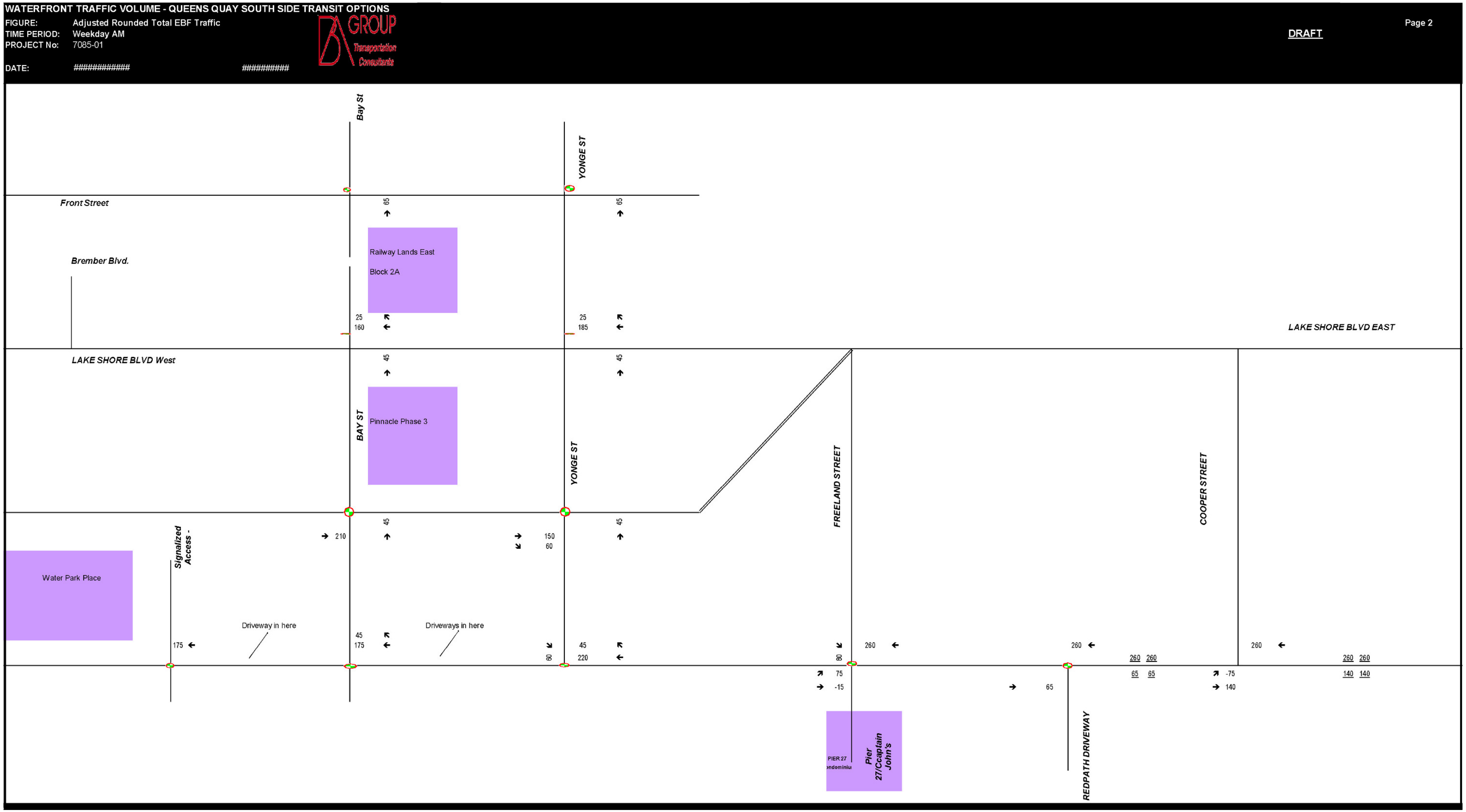


Figure A5- 11: AM Future South Side One Way, Railway Lands, Spadina to York

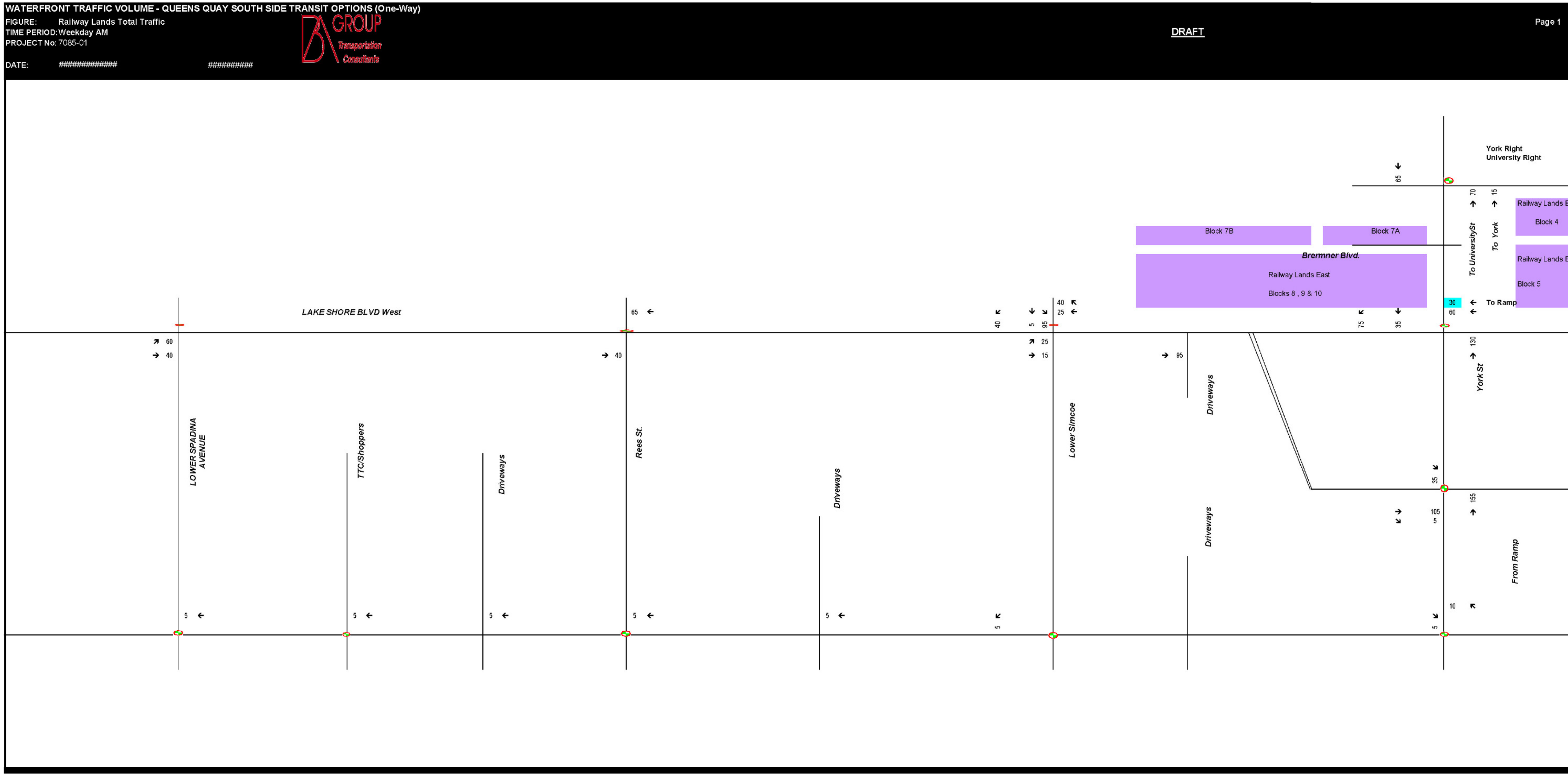


Figure A5- 12: AM Future South Side One Way, Railway Lands, Bay to Cooper

WATERFRONT TRAFFIC VOLUME - QUEENS QUAY SOUTH SIDE TRANSIT OPTIONS
FIGURE: Railway Lands Total Traffic
TIME PERIOD: Weekday AM
PROJECT No: 7085-01
DATE: ############ ##########

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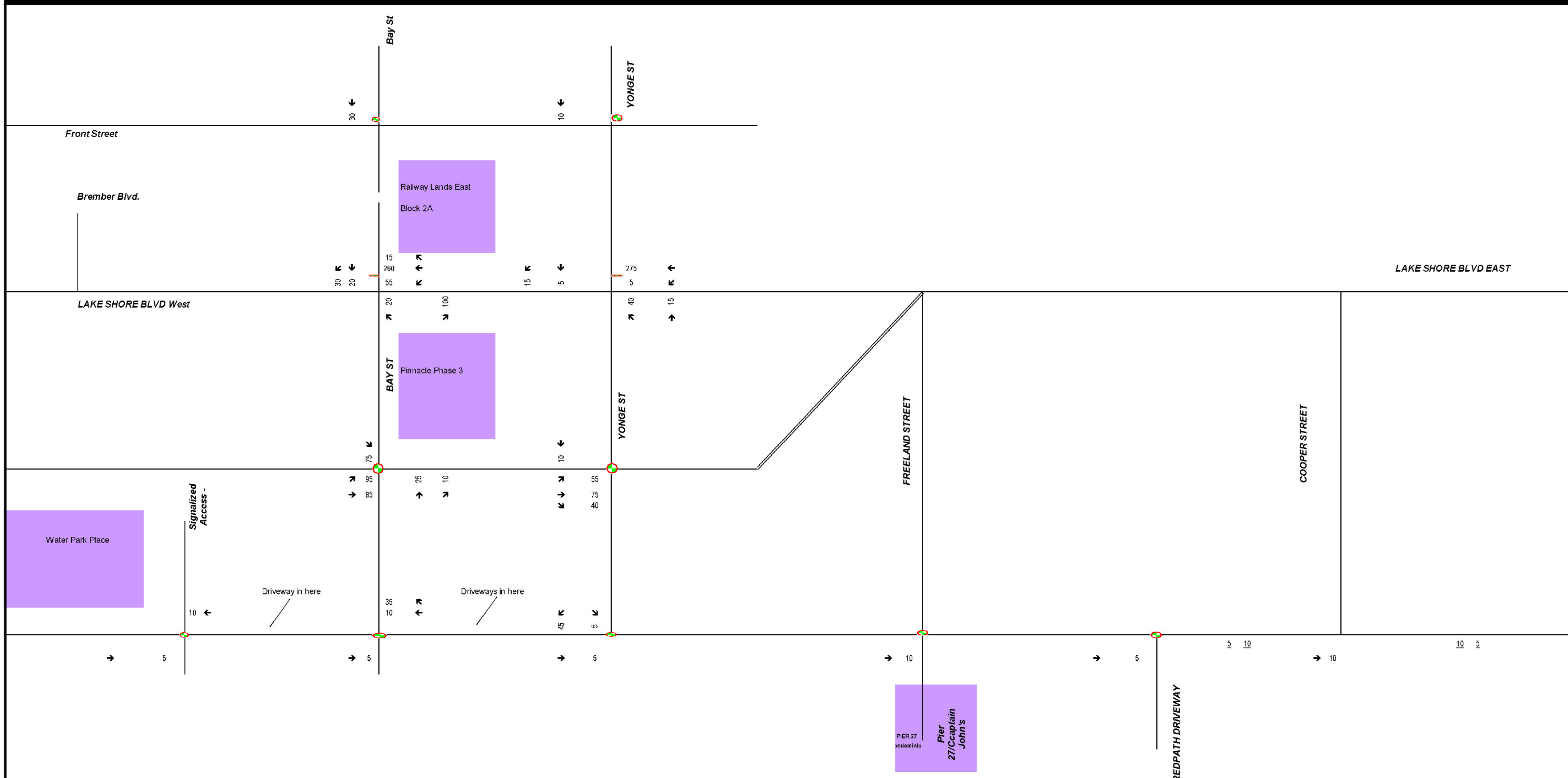


Figure A5- 13: AM Future South Side One Way, West Don Lands, Spadina to York

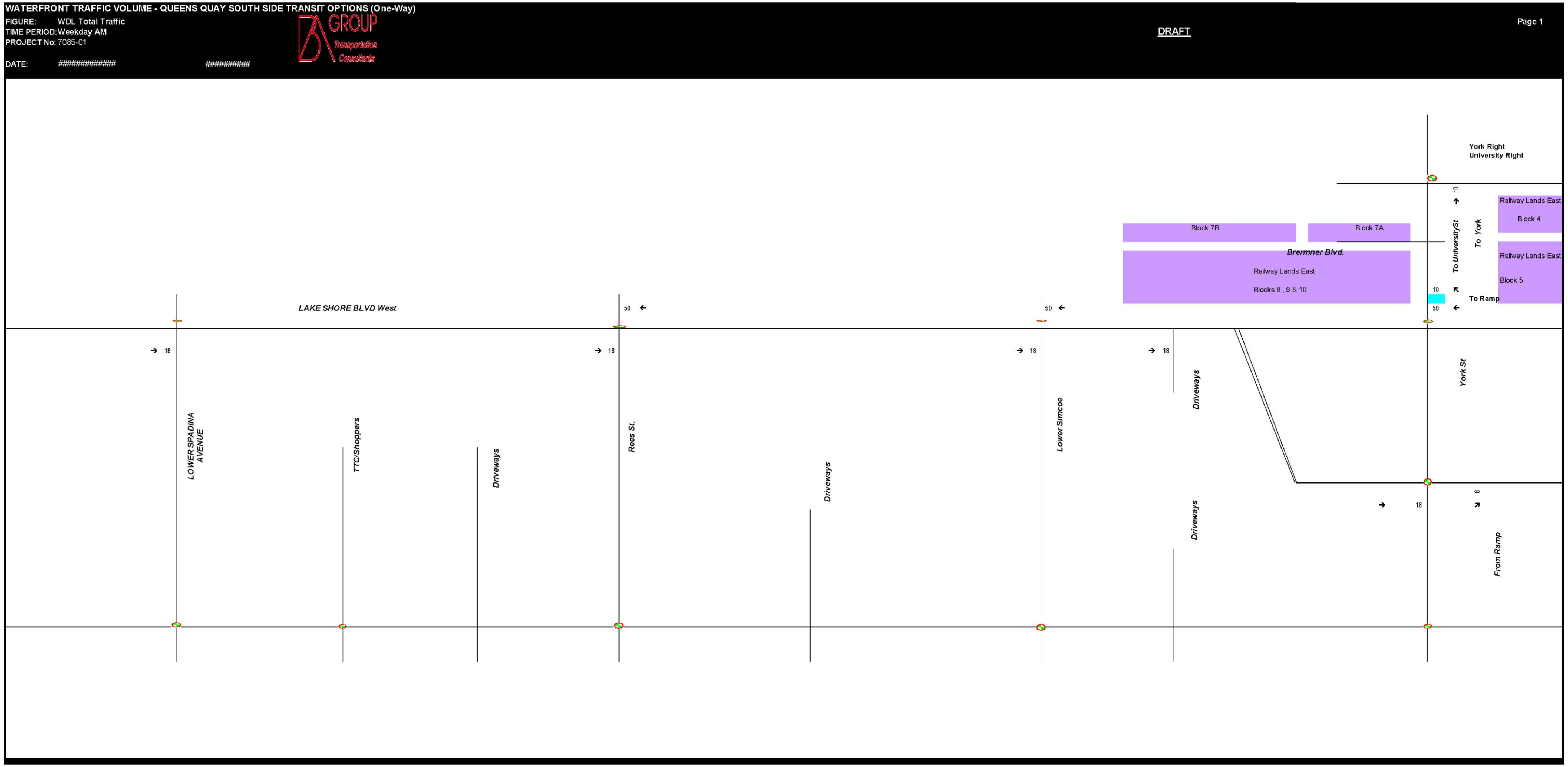


Figure A5- 14: AM Future South Side One Way, West Don Lands, Bay to Cooper

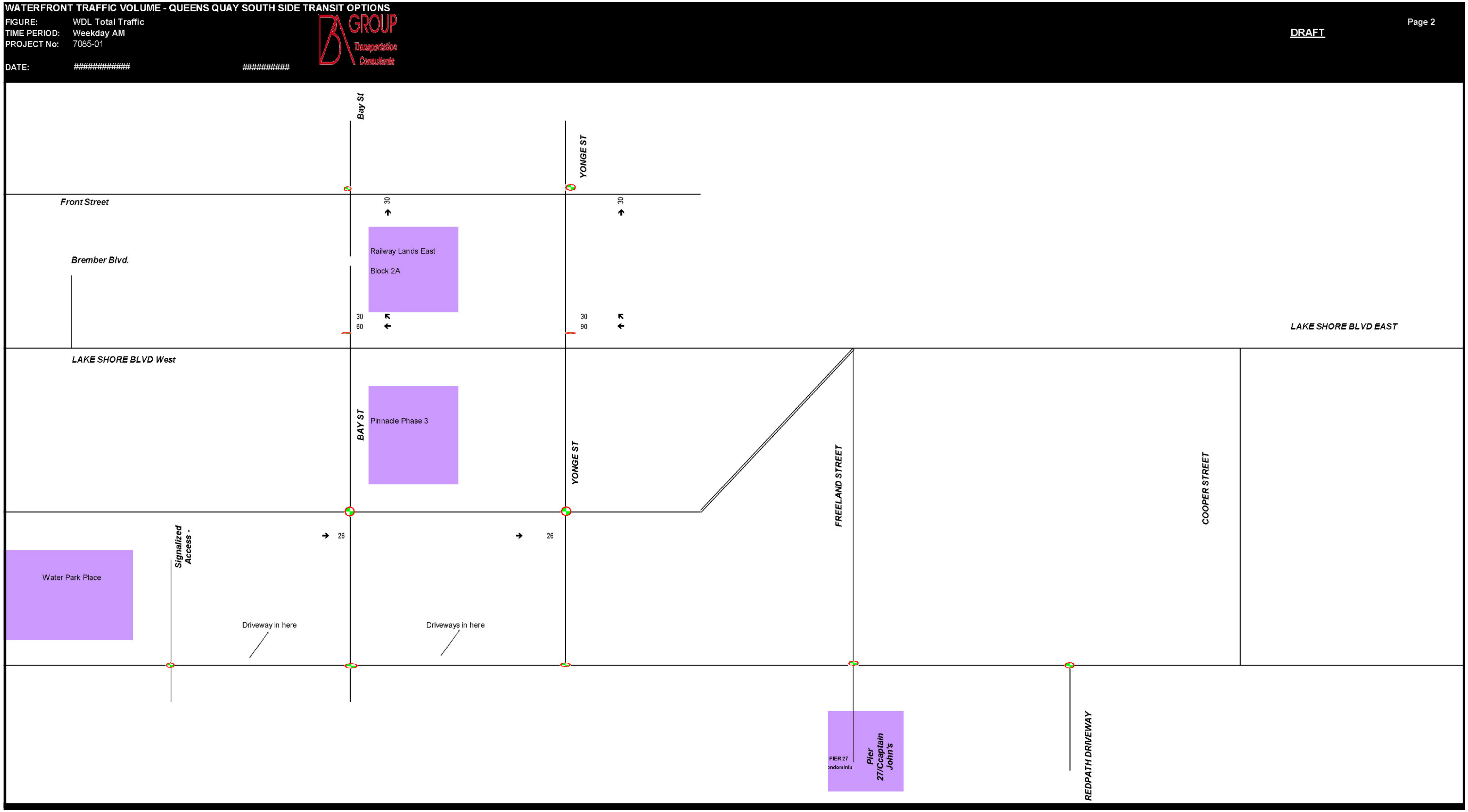


Figure A5- 15: AM Future South Side One Way, Total, Spadina to York

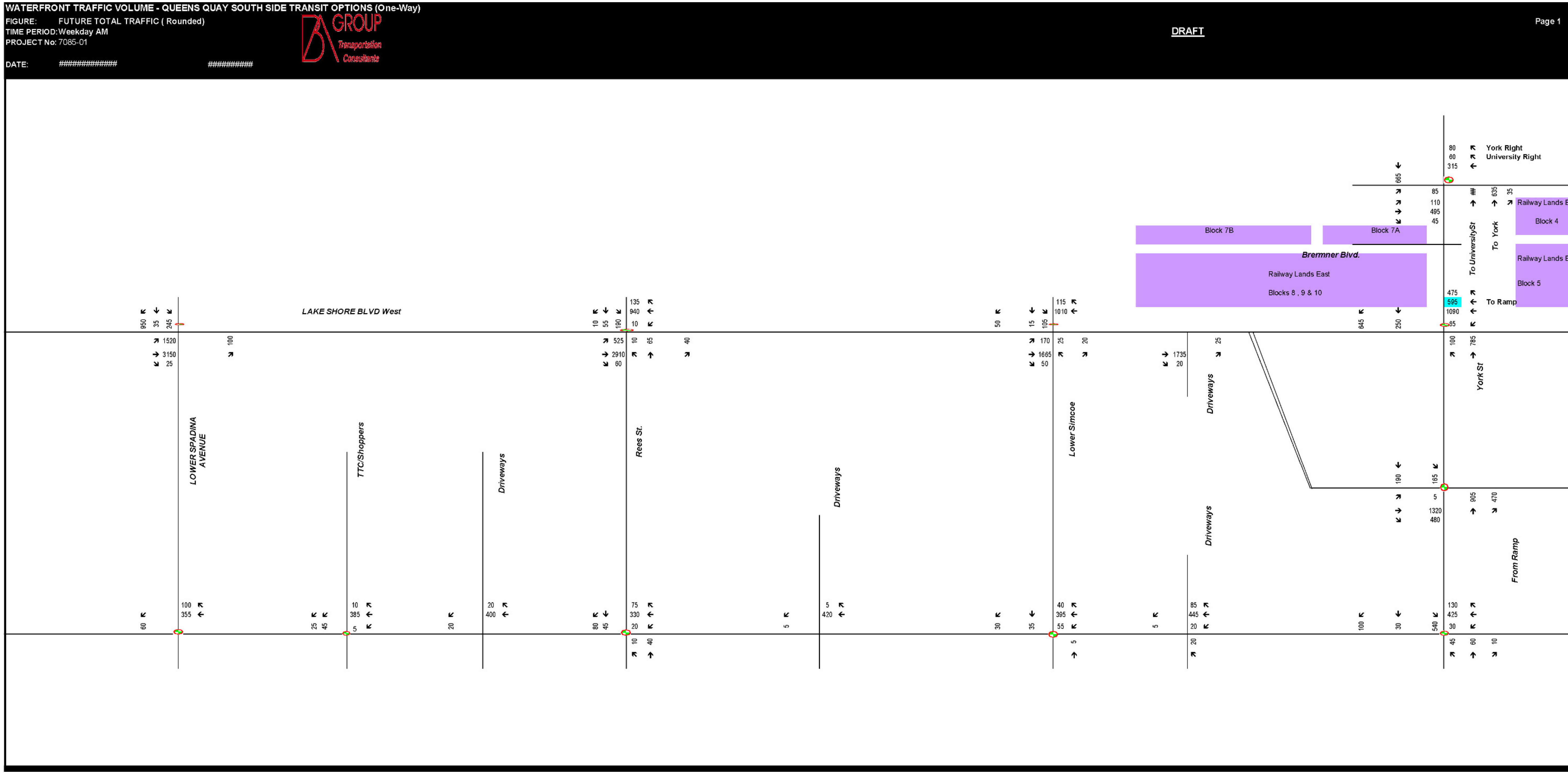


Figure A5- 16: AM Future South Side One Way, Total, Bay to Cooper

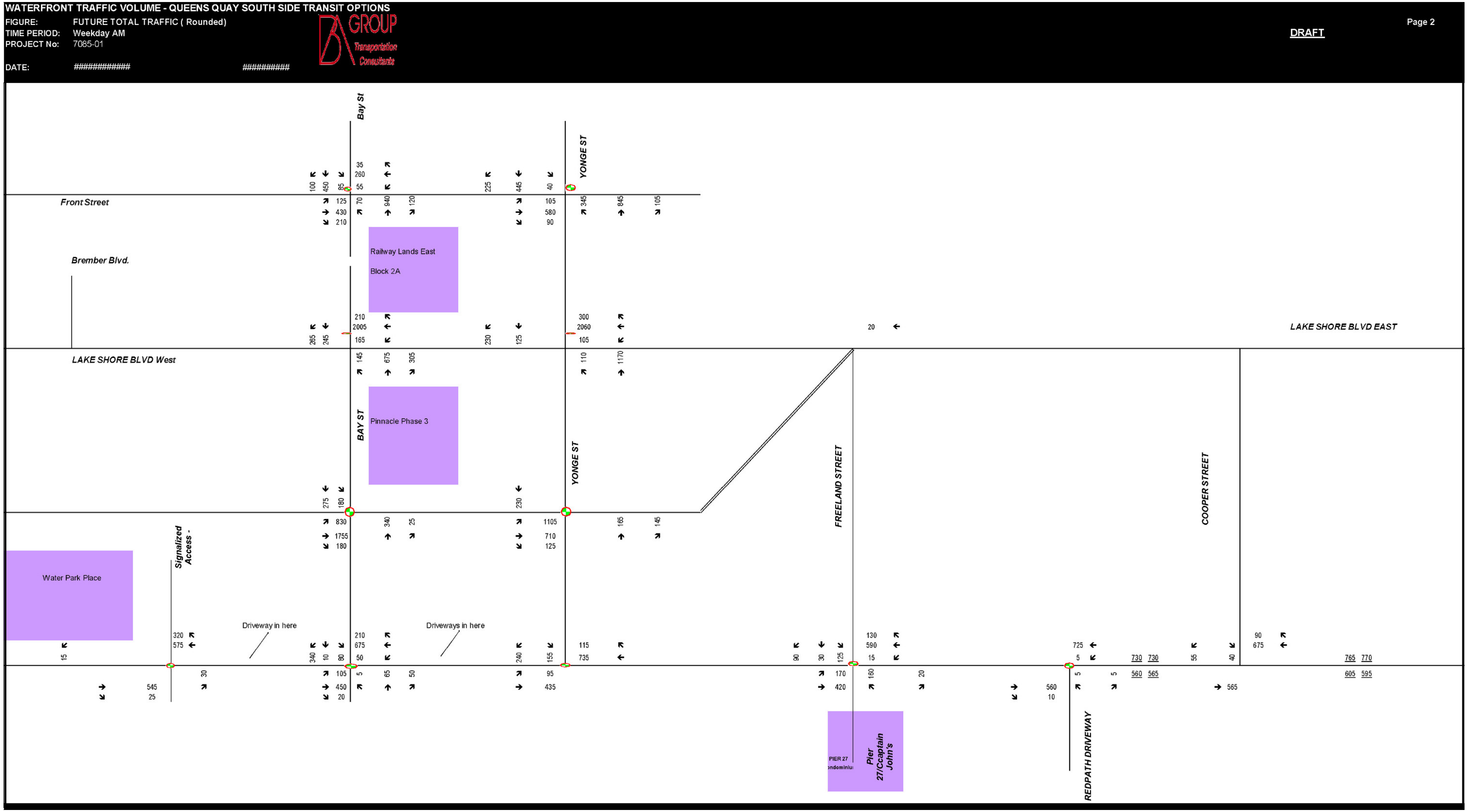


Figure A5- 17: PM Future South Side One Way, Reassigned Existing, Spadina to York

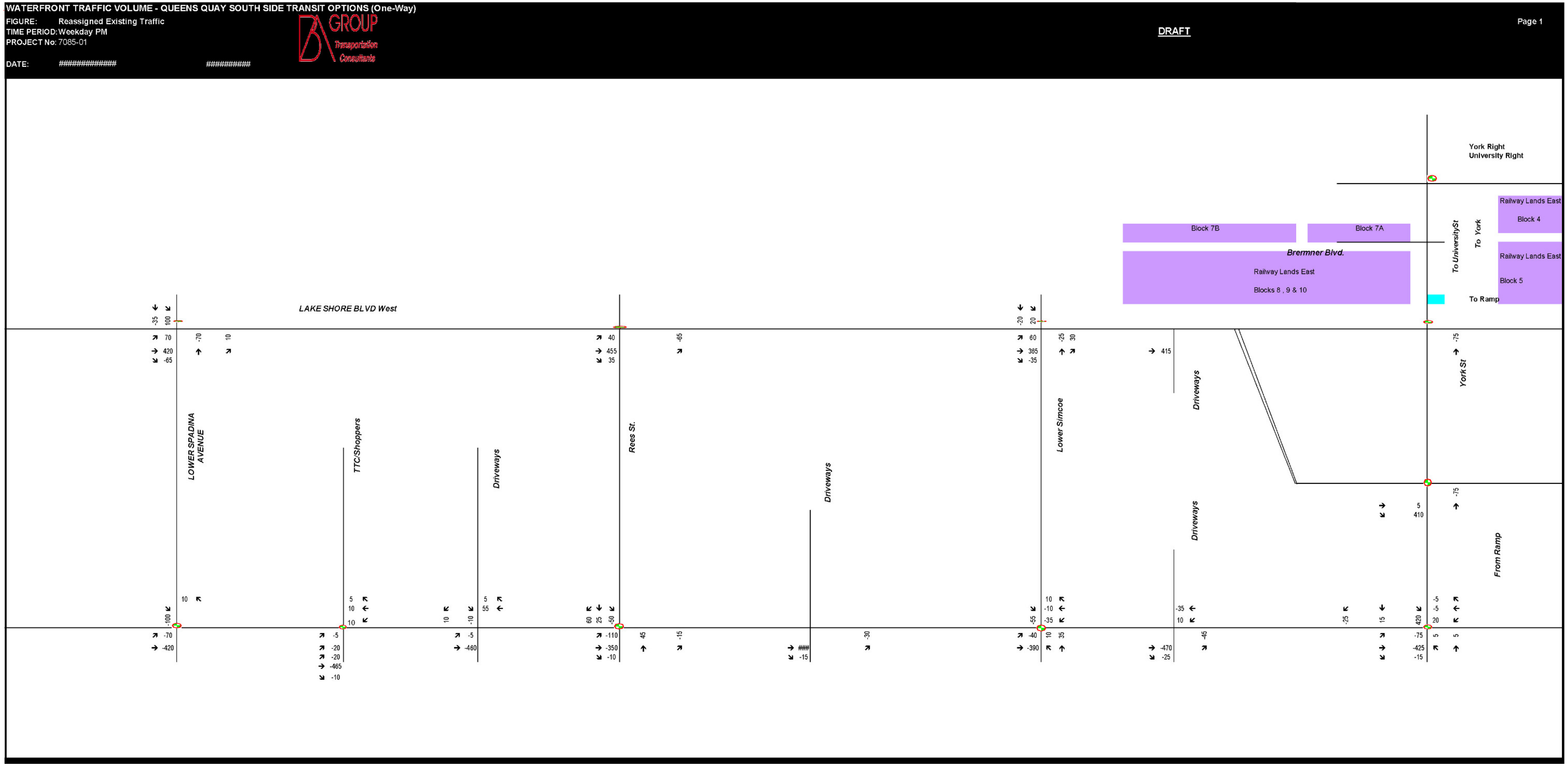


Figure A5- 18: PM Future South Side One Way, Reassigned Existing, Bay to Cooper

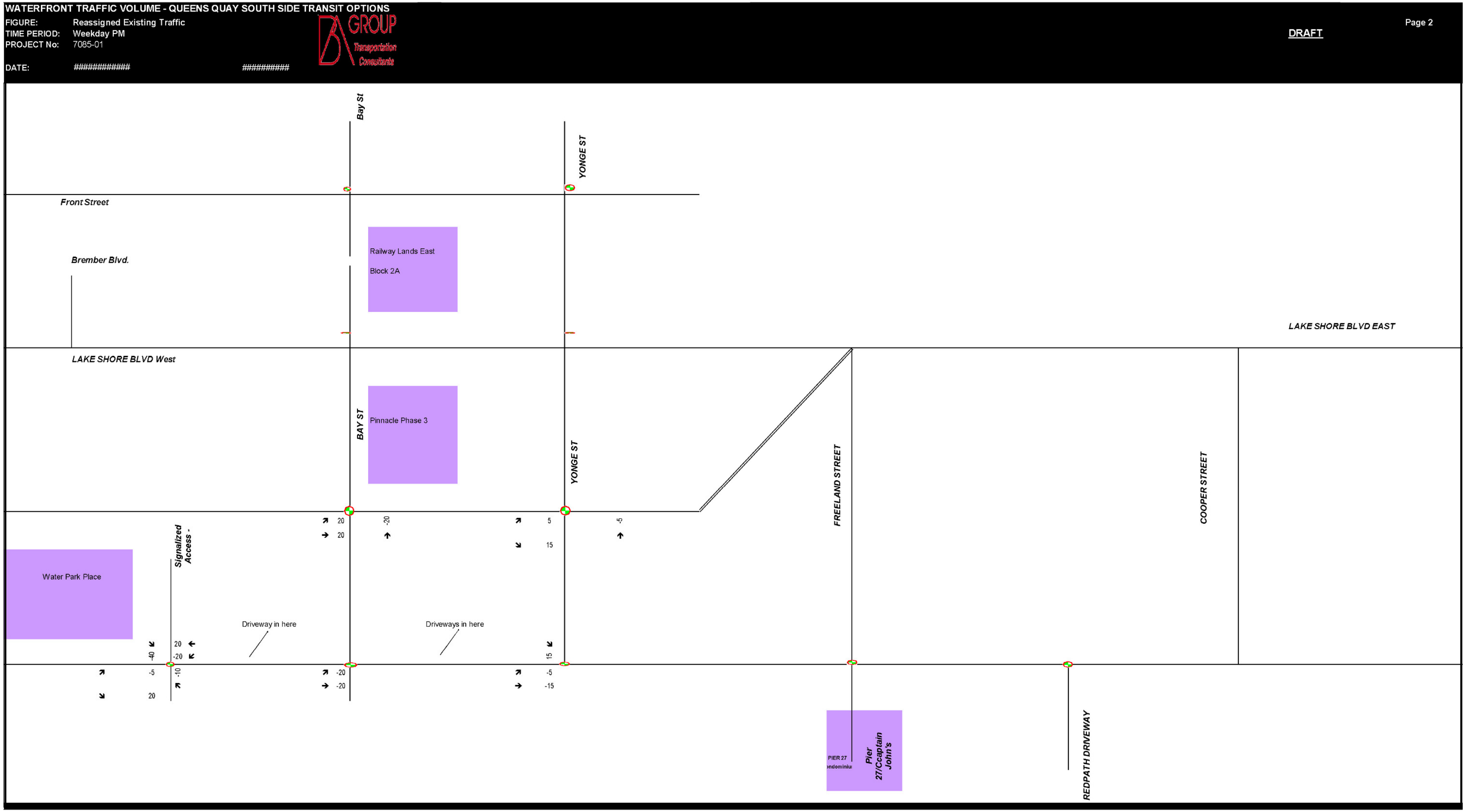


Figure A5- 19: PM Future South Side One Way, Harbourfront Centre, Spadina to York

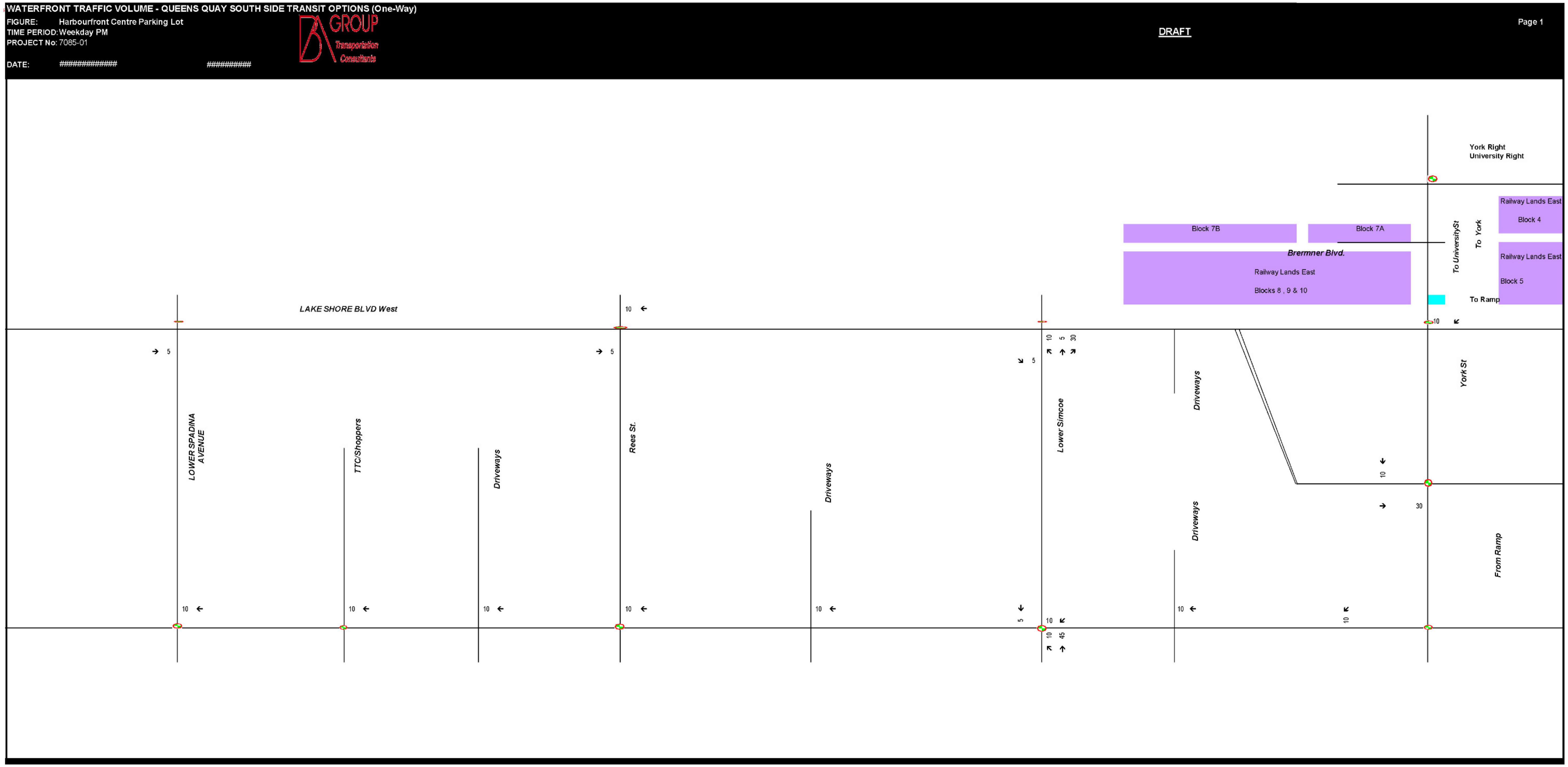


Figure A5- 20: PM Future South Side One Way, Harbourfront Centre, Bay to Cooper

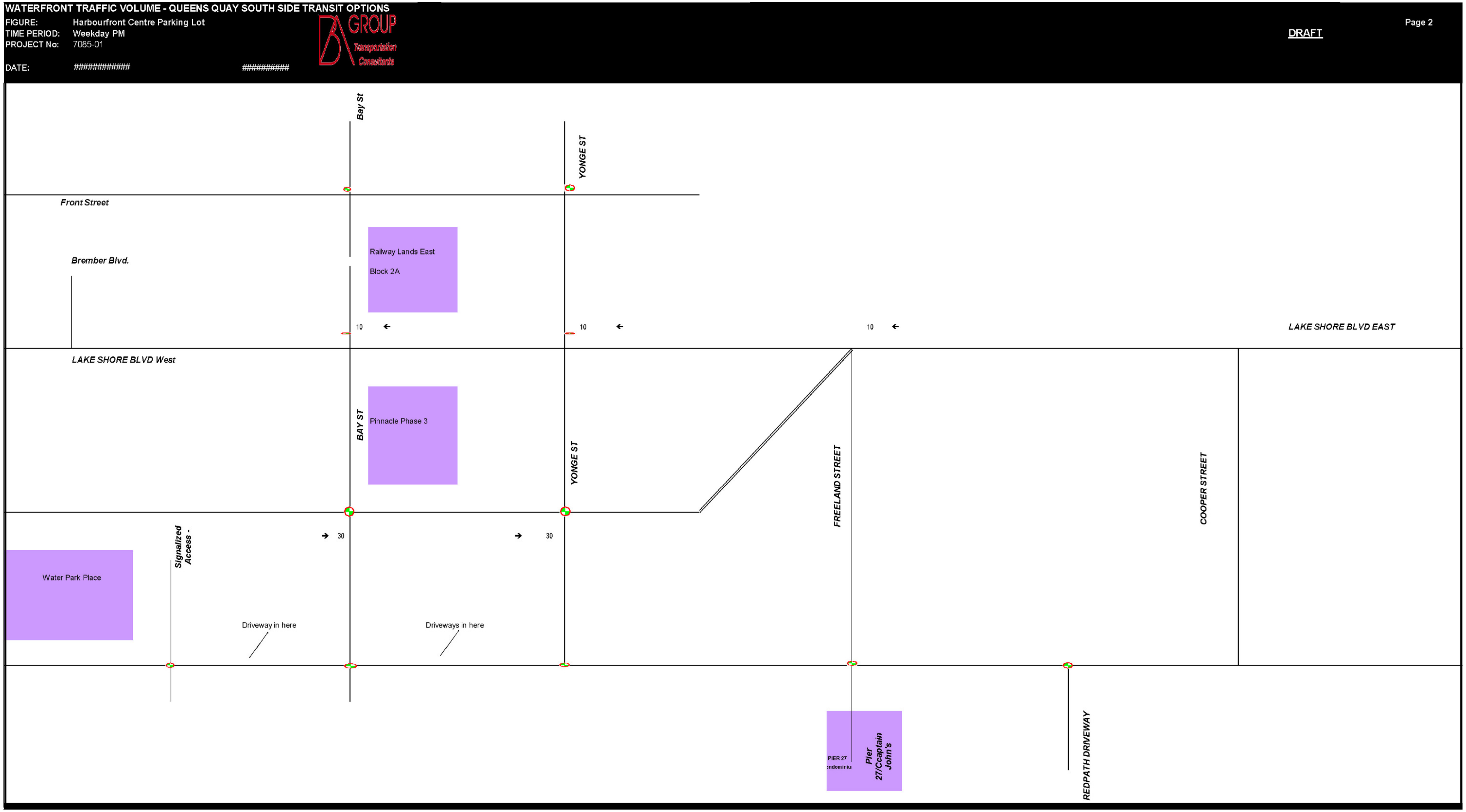


Figure A5- 21: PM Future South Side One Way, Waterpark Place, Spadina to York

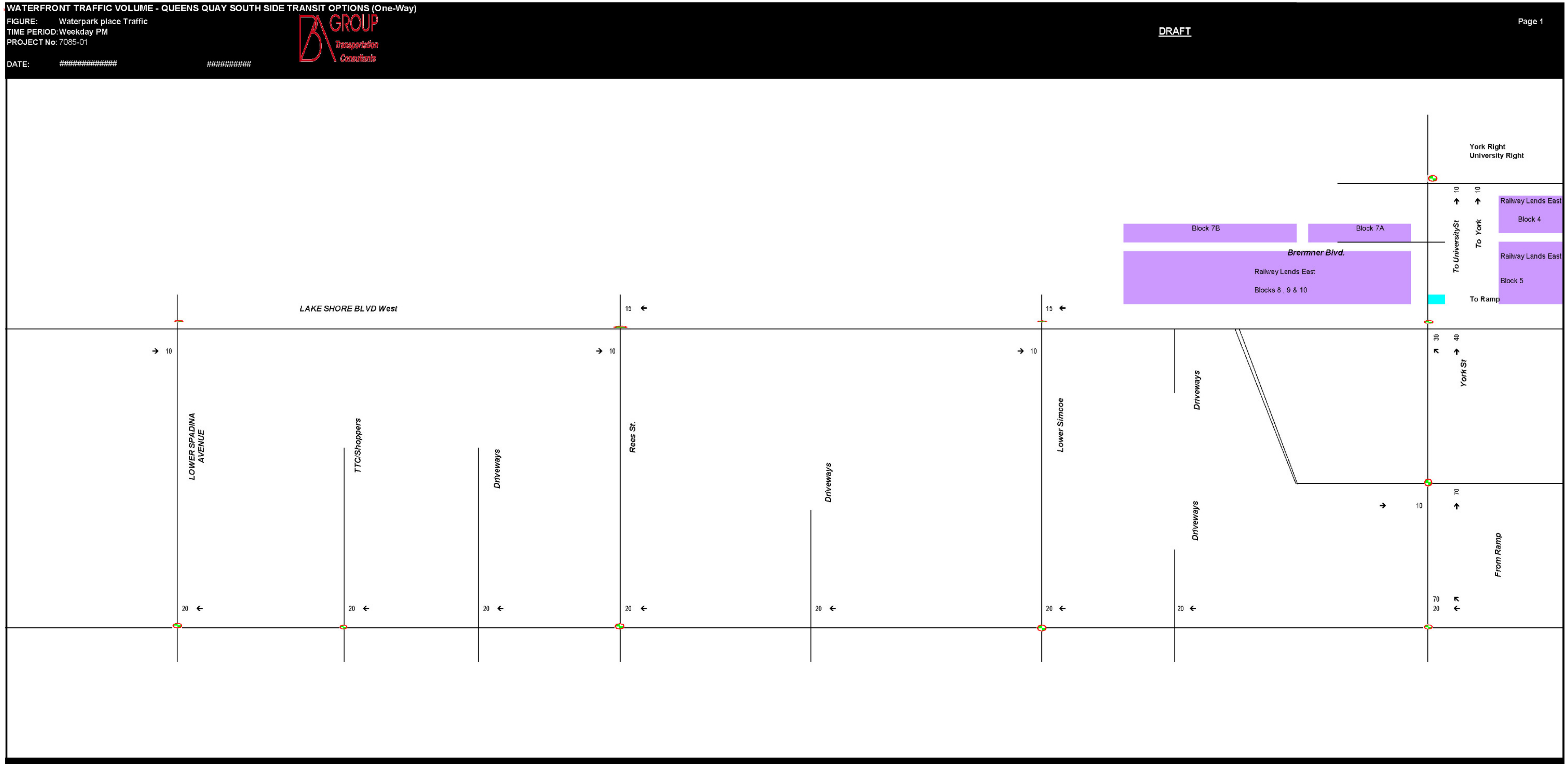


Figure A5- 22: PM Future South Side One Way, Waterpark Place, Bay to Cooper

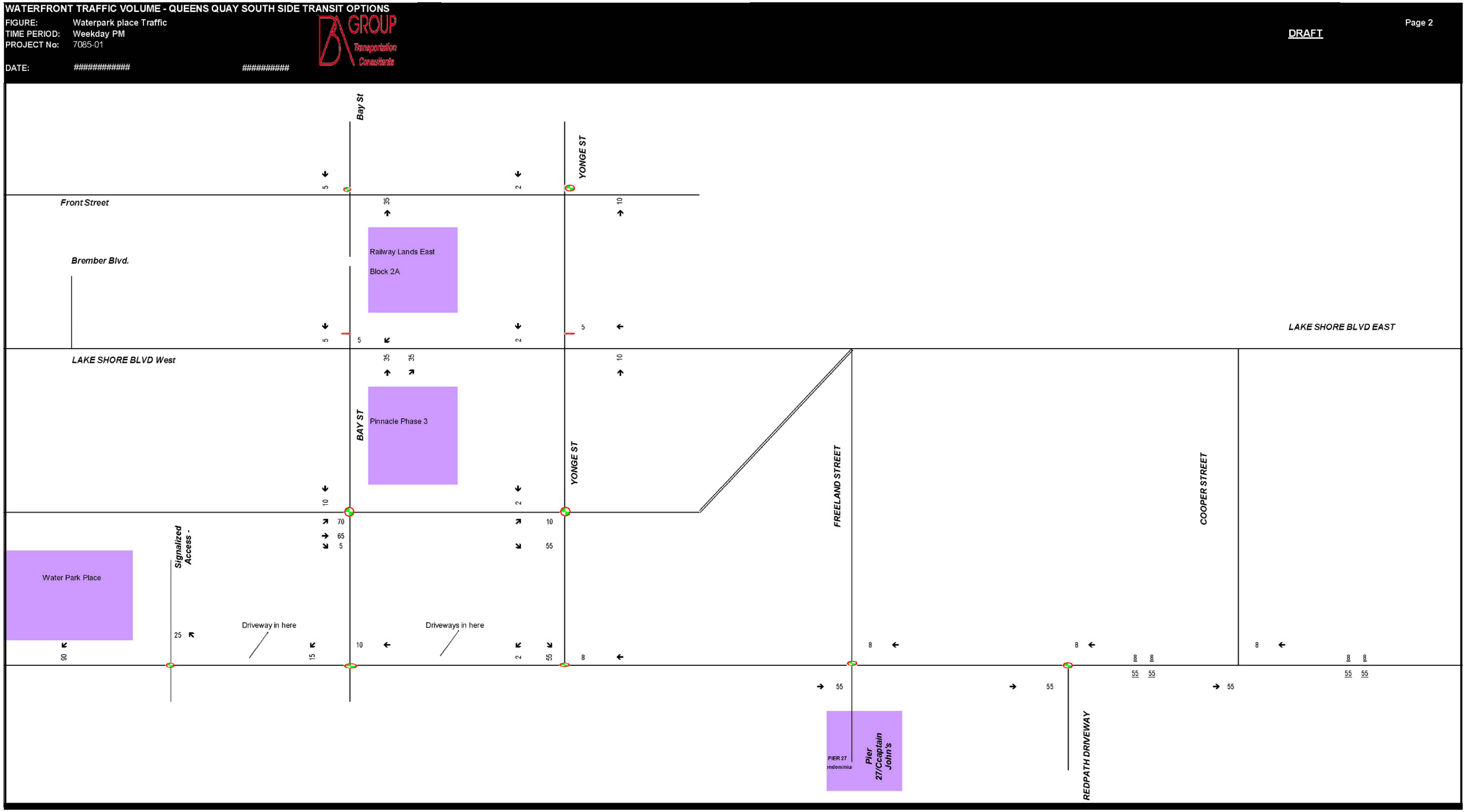


Figure A5- 23: PM Future South Side One Way, Pier 27, Spadina to York

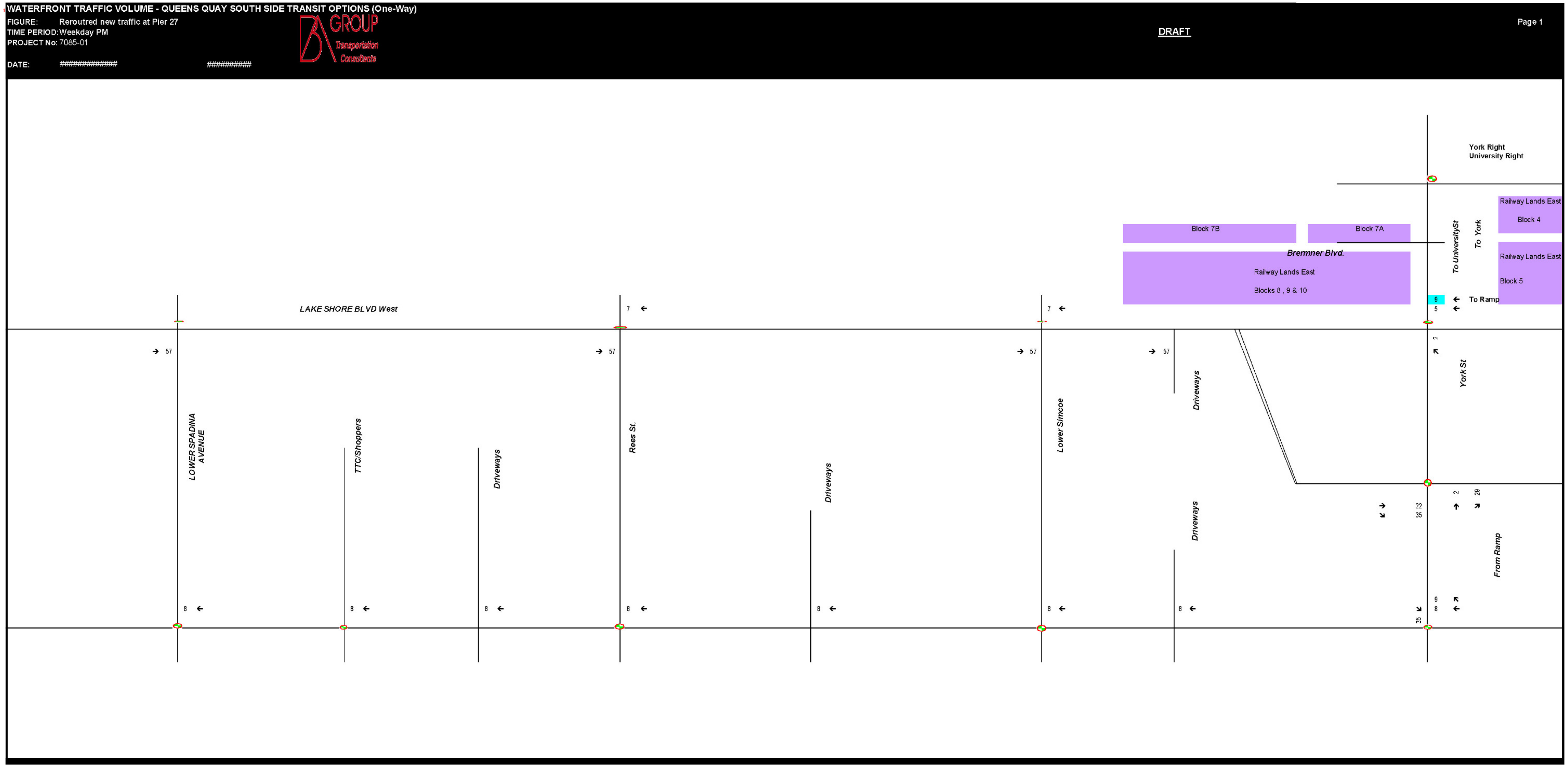


Figure A5- 24: PM Future South Side One Way, Pier 27, Bay to Cooper

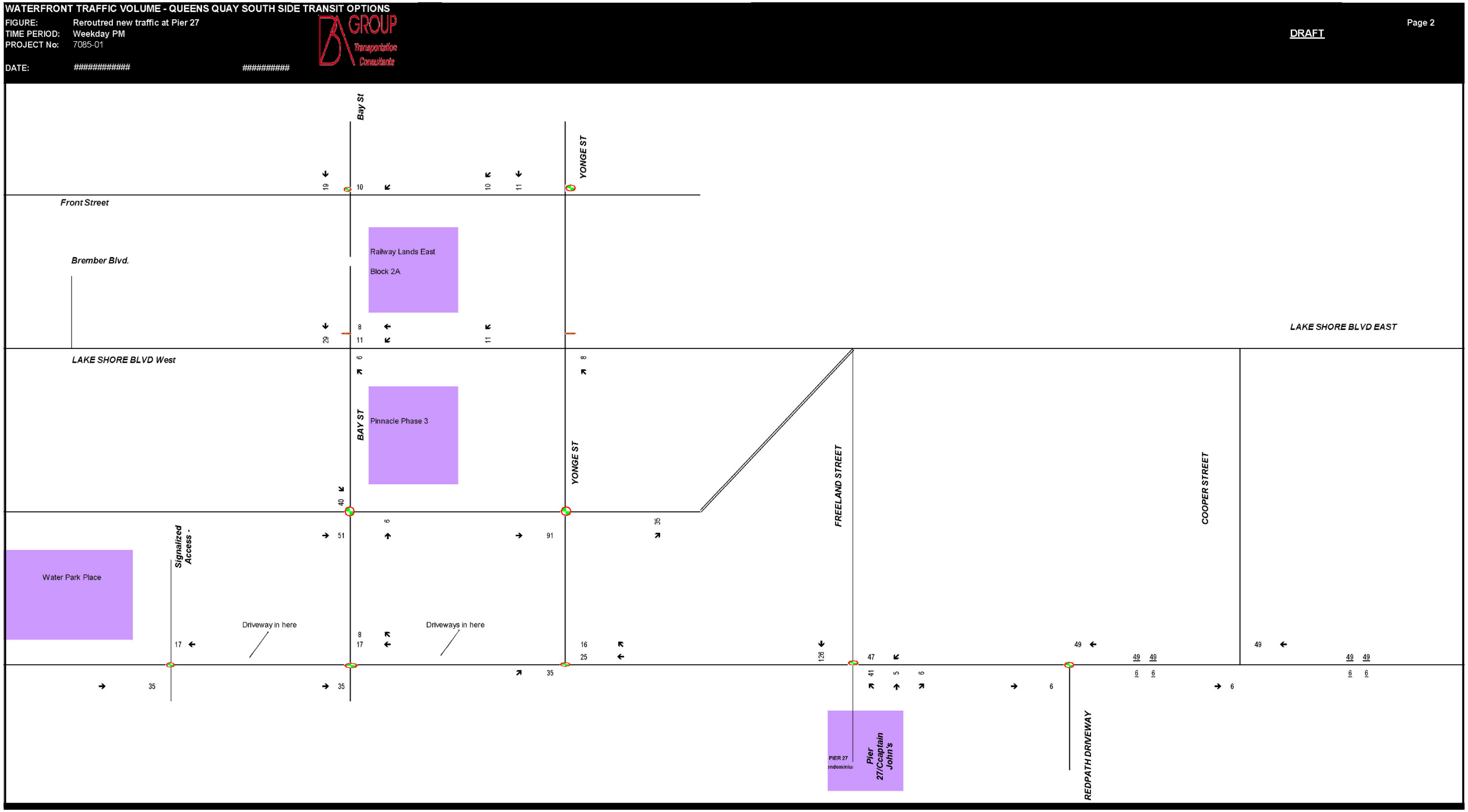


Figure A5- 25: PM Future South Side One Way, East Bayfront, Spadina to York

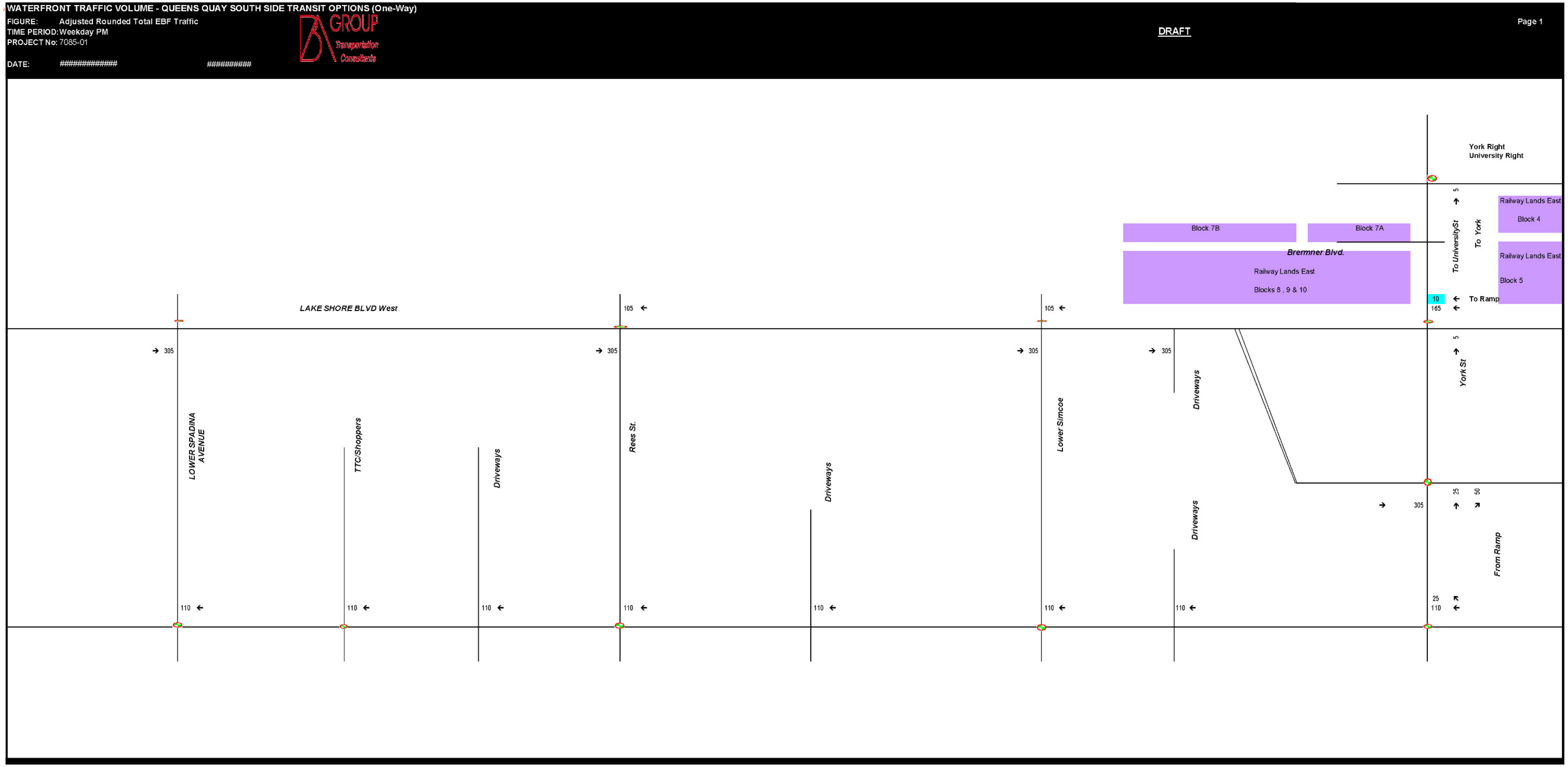


Figure A5- 26: PM Future South Side One Way, East Bayfront, Bay to Cooper

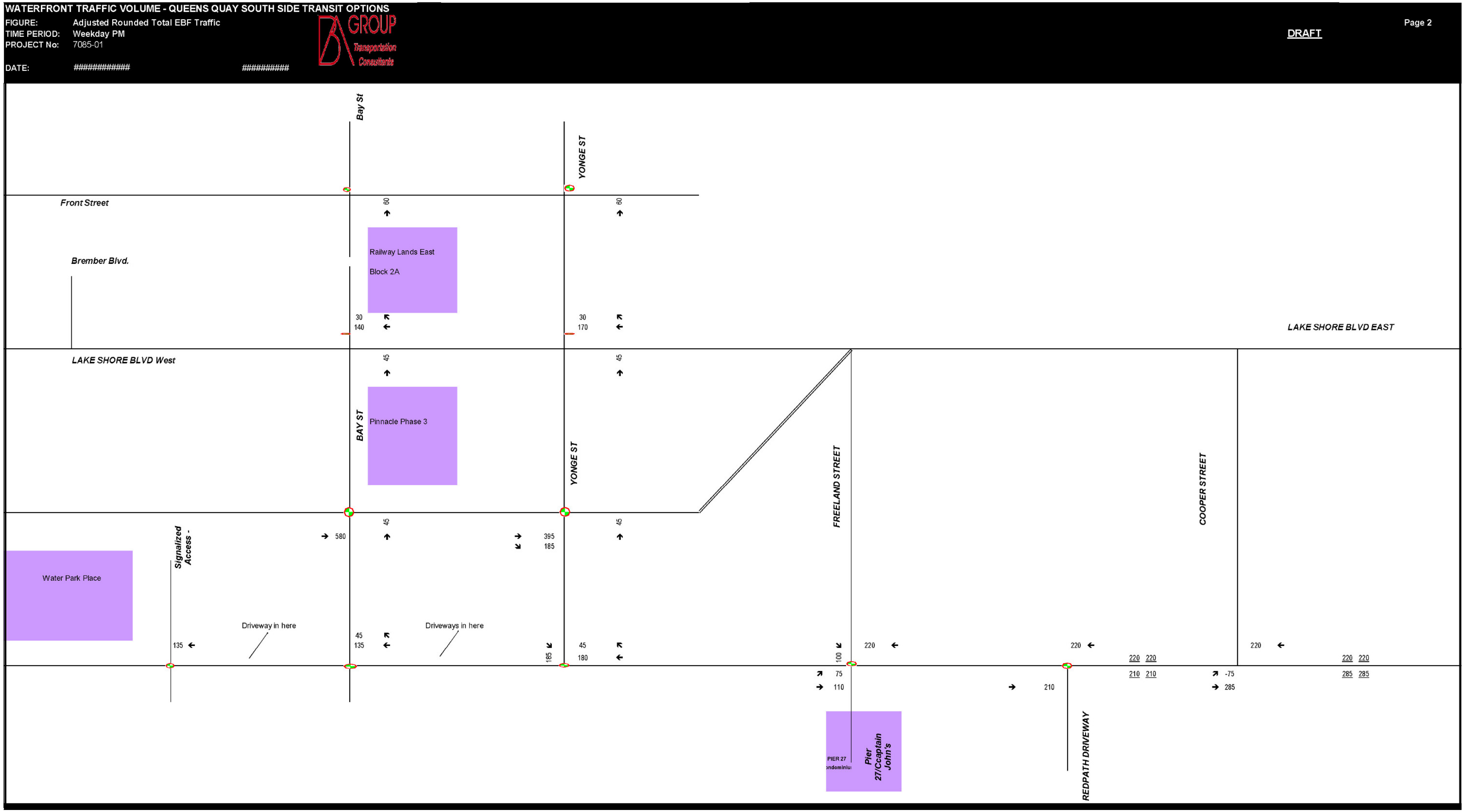


Figure A5- 27: PM Future South Side One Way, Railway Lands, Spadina to York

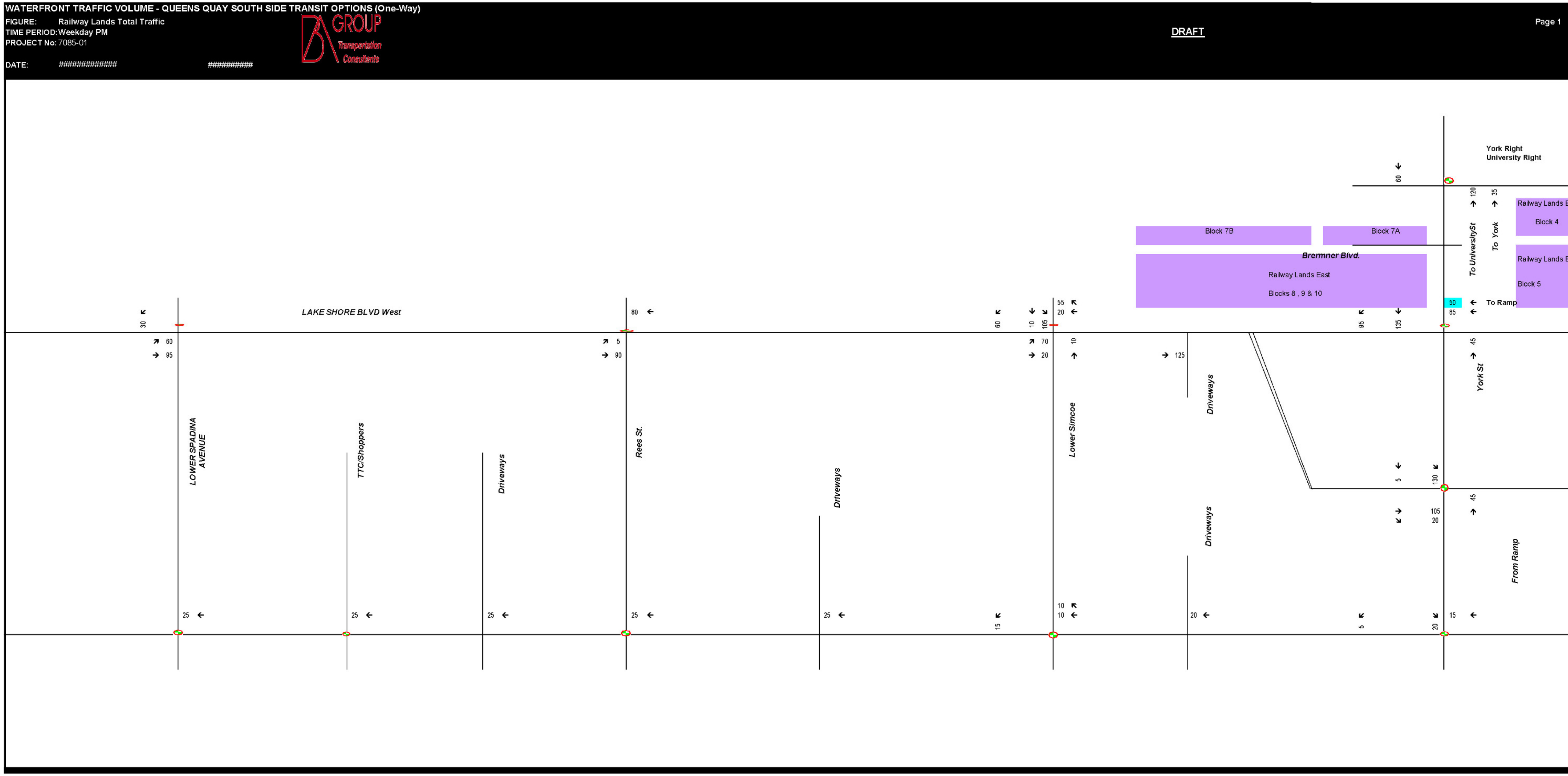


Figure A5- 28: PM Future South Side One Way, Railway Lands, Bay to Cooper

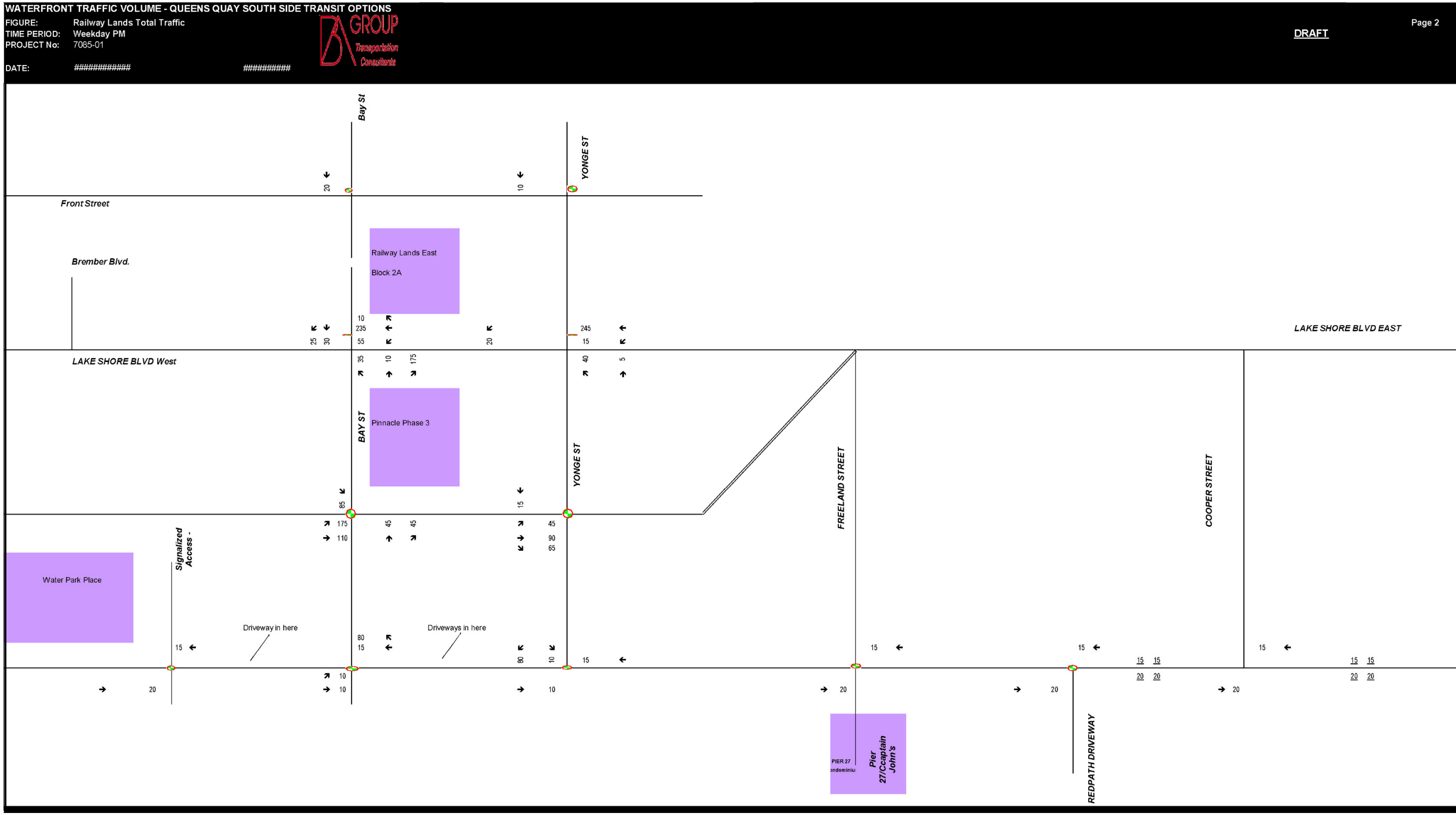


Figure A5- 29: PM Future South Side One Way, West Don Lands, Spadina to York

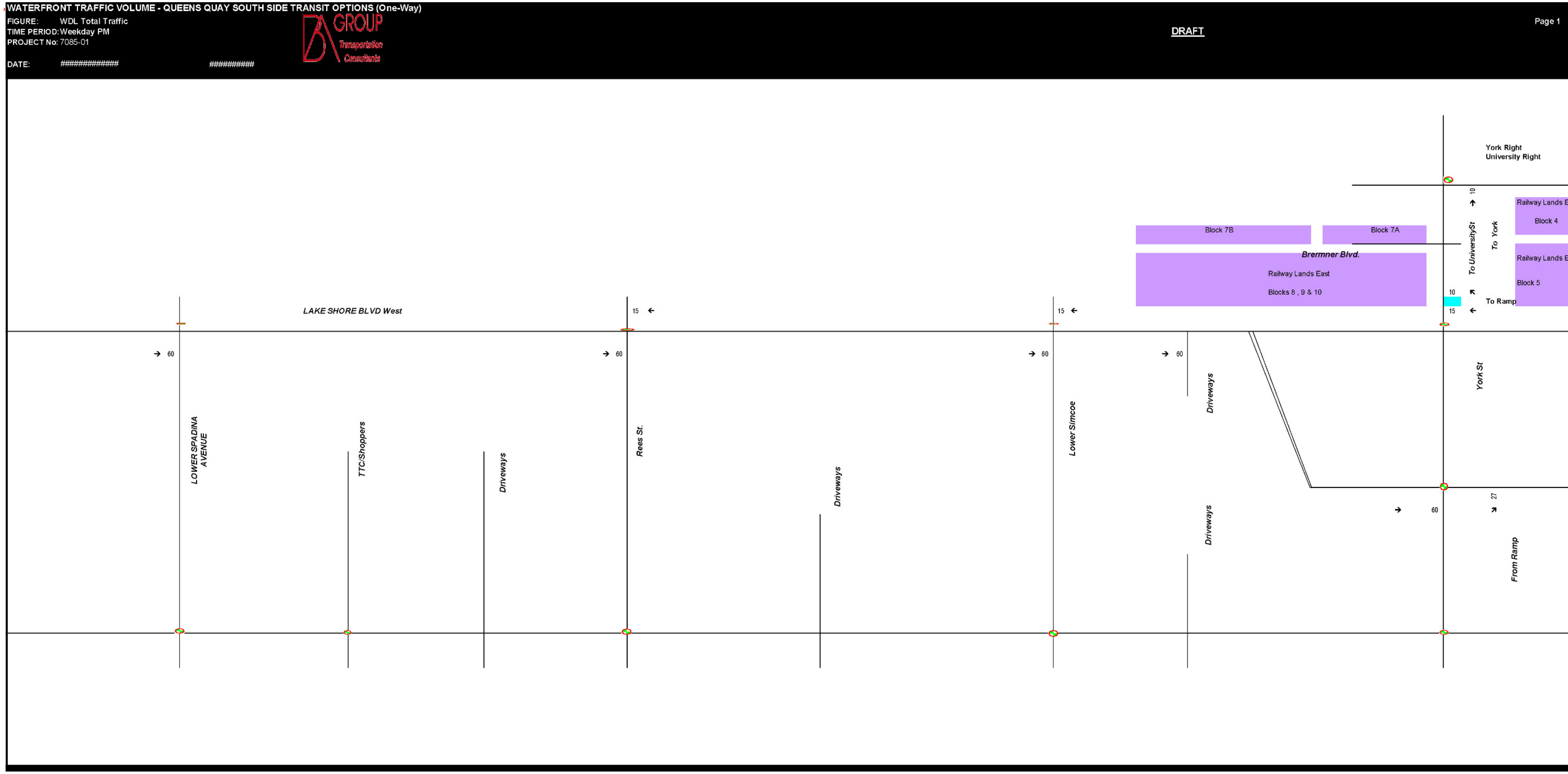


Figure A5- 30: PM Future South Side One Way, West Don Lands, Bay to Cooper

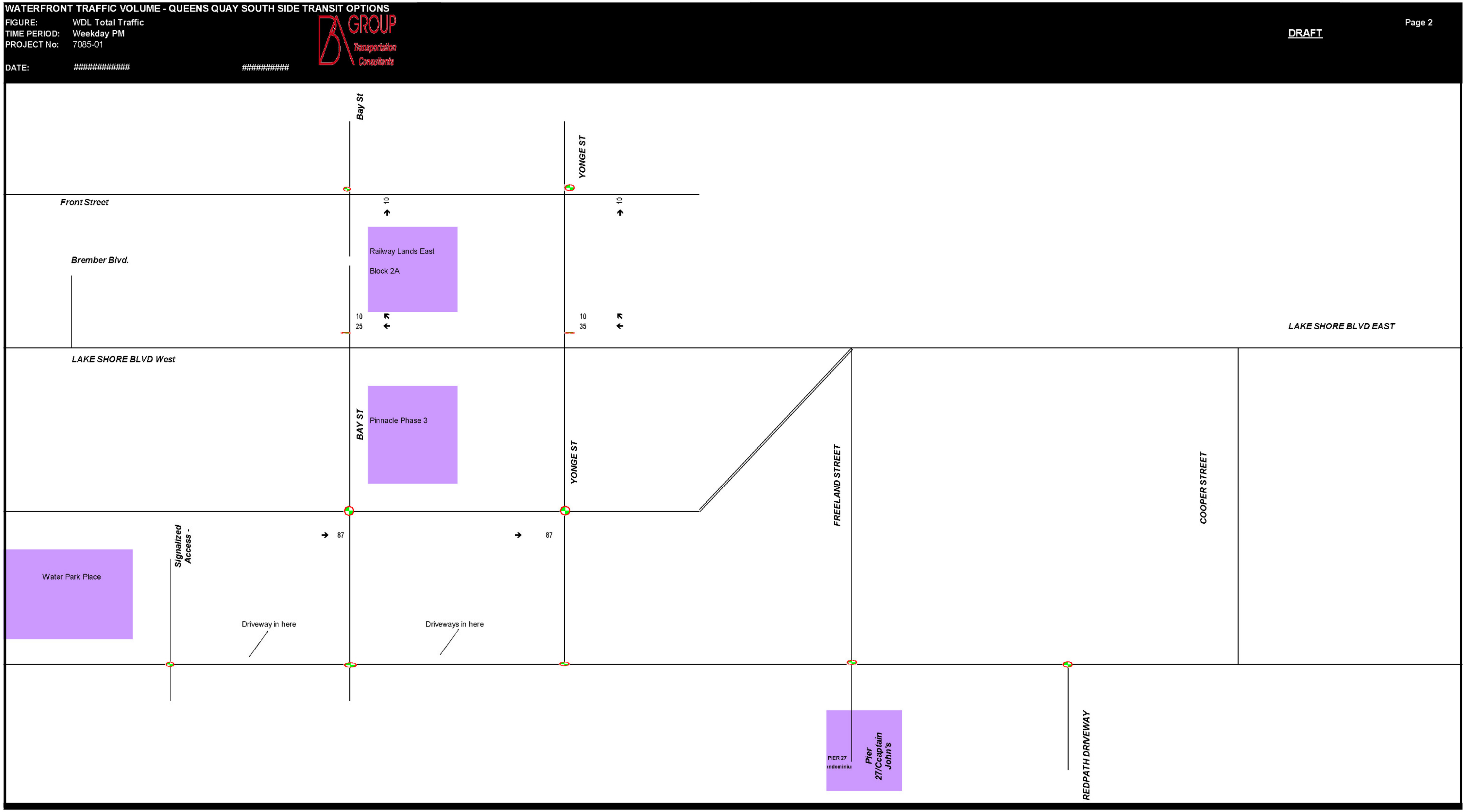


Figure A5- 31: PM Future South Side One Way, Total, Spadina to York

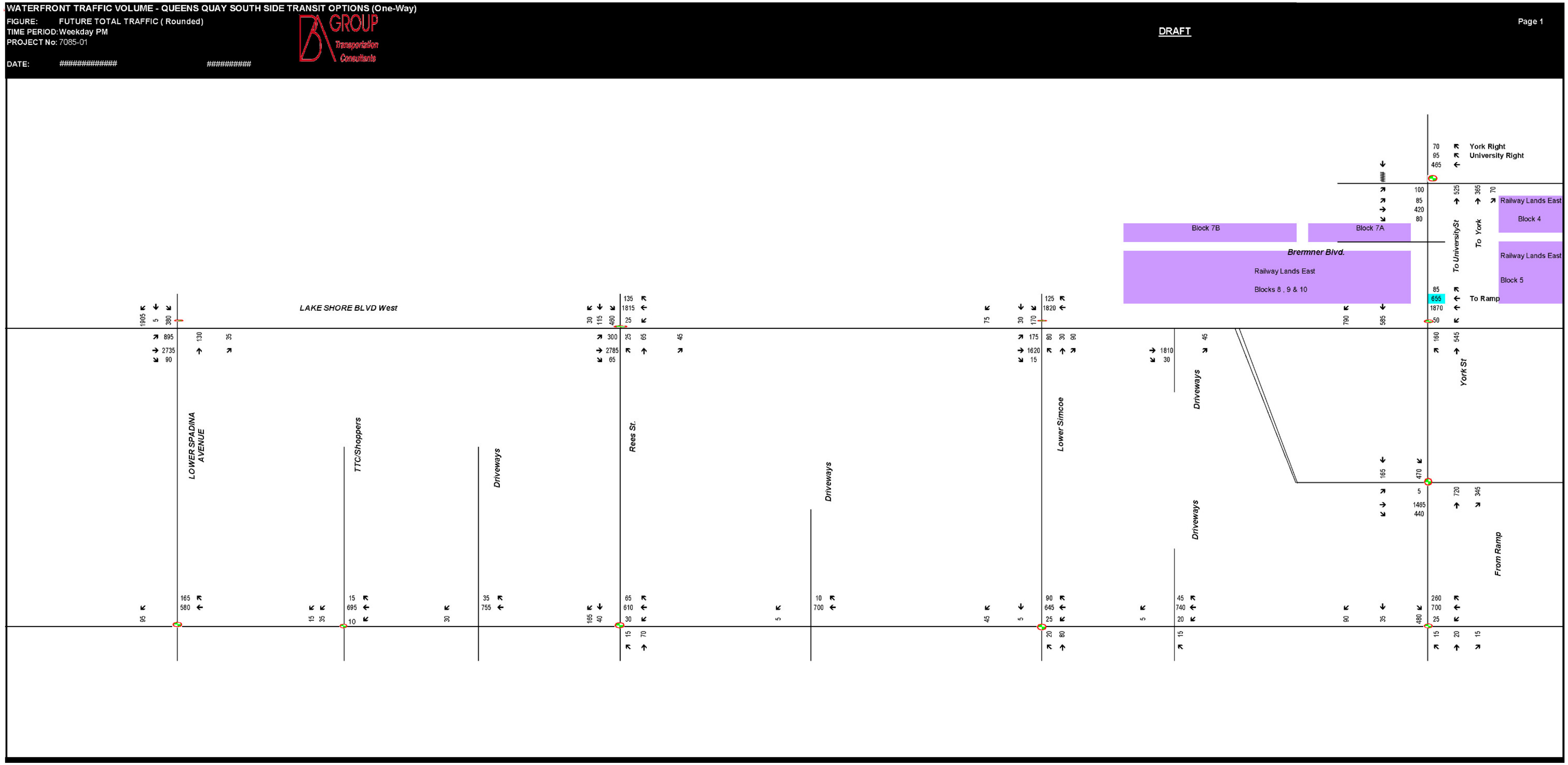
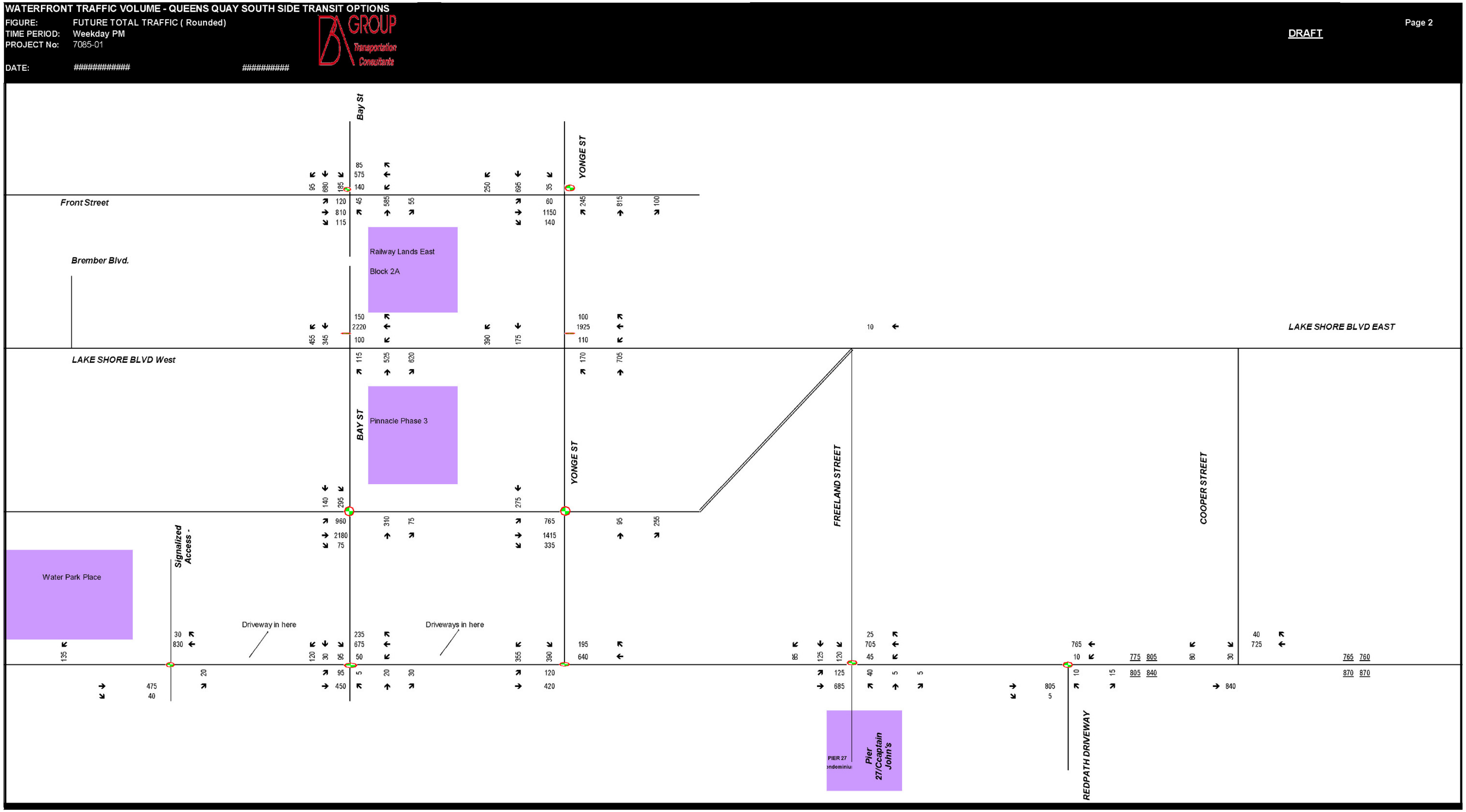


Figure A5- 32: PM Future South Side One Way, Total, Bay to Cooper



A6 Future South Side Two-Way Volumes

Figure A6- 1: AM Future South Side Two Way, Reassigned Existing, Spadina to York

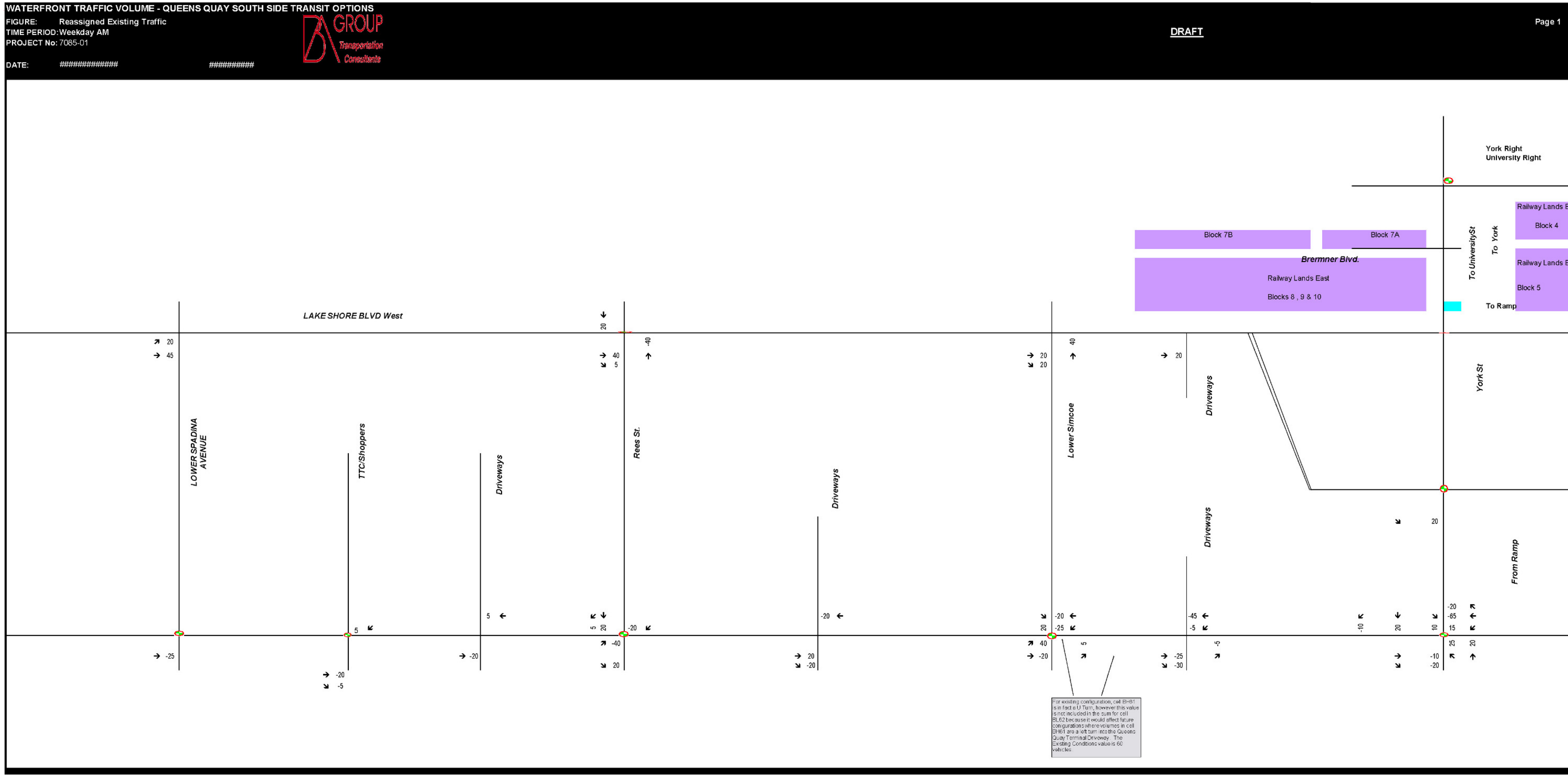


Figure A6- 2: AM Future South Side Two Way, Reassigned Existing, Bay to Cooper

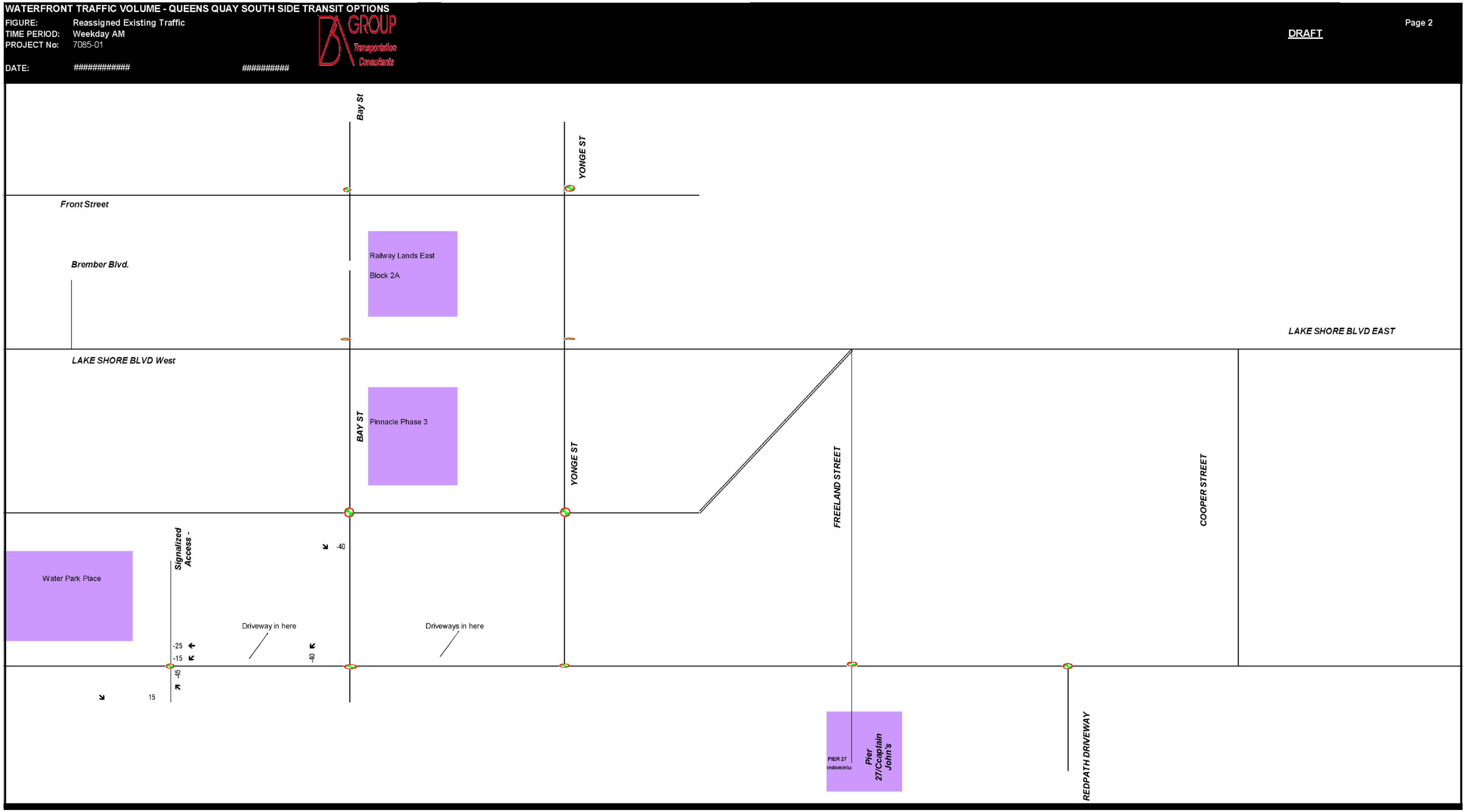


Figure A6- 3: AM Future South Side Two Way, Harbourfront Centre, Spadina to York

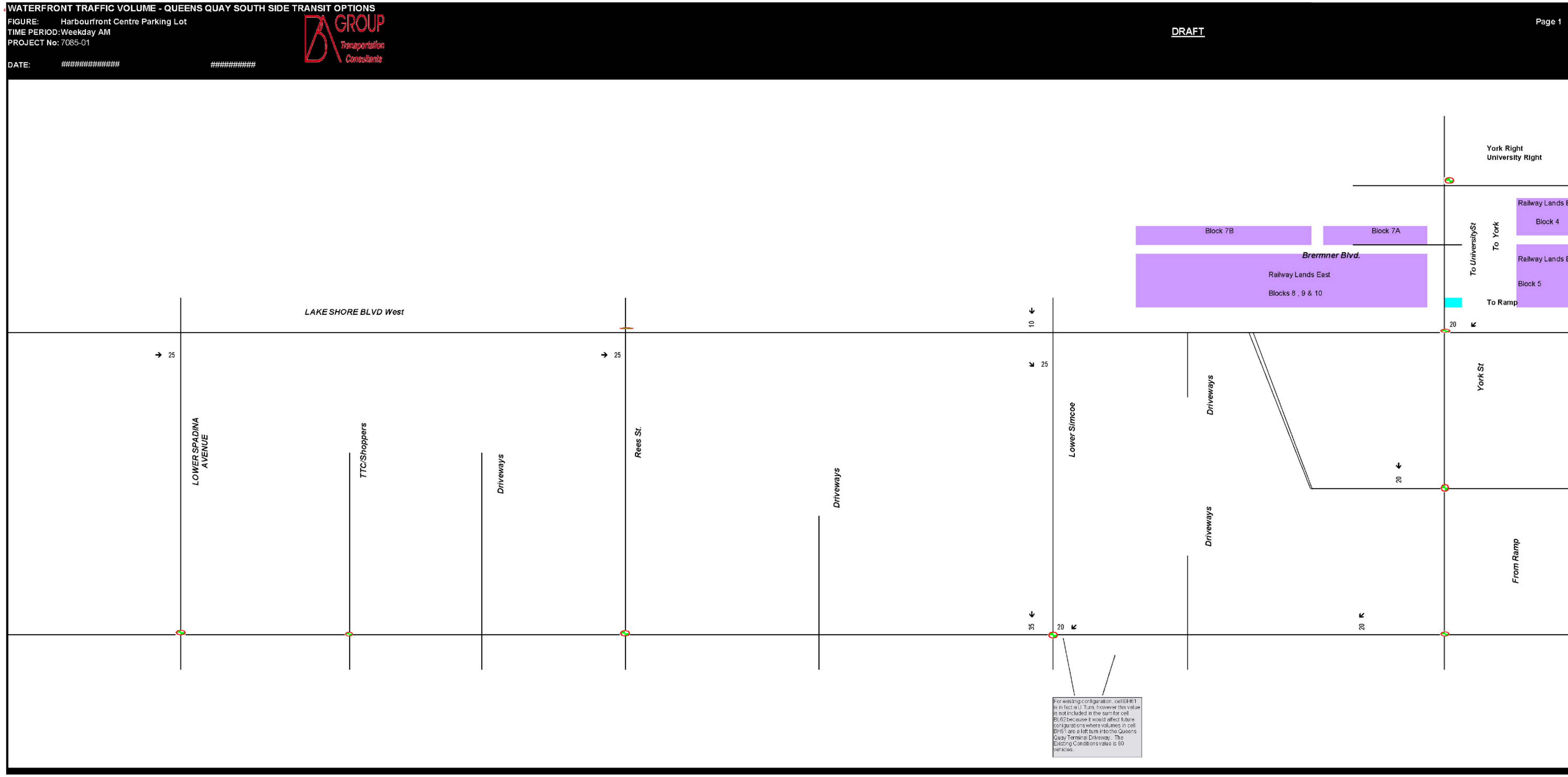


Figure A6- 4: AM Future South Side Two Way, Harbourfront Centre, Bay to Cooper

WATERFRONT TRAFFIC VOLUME - QUEENS QUAY SOUTH SIDE TRANSIT OPTIONS

FIGURE: Harbourfront Centre Parking Lot
TIME PERIOD: Weekday AM
PROJECT No: 7085-01
DATE: ############ ##########

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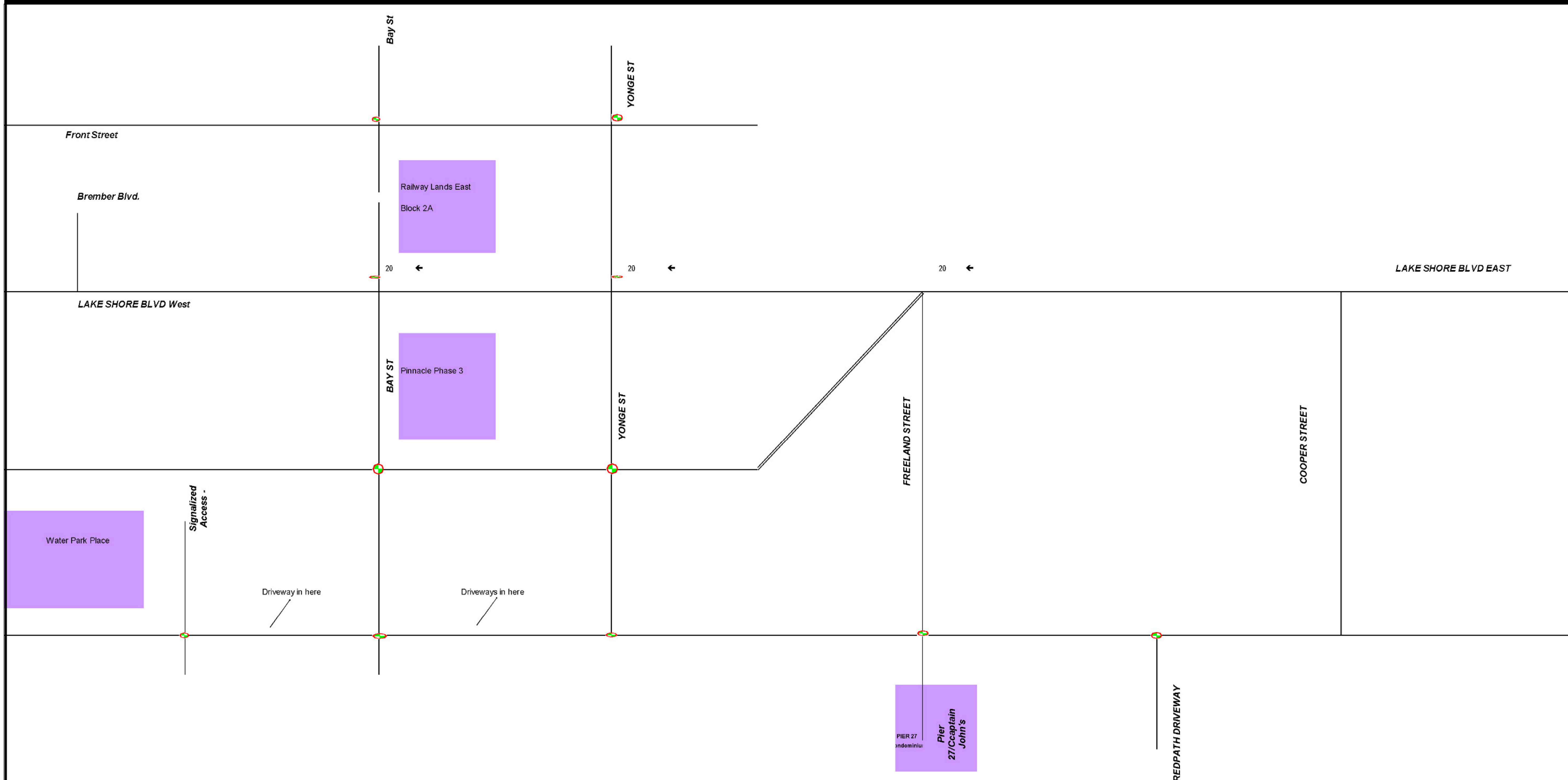

Figure A6- 5: AM Future South Side Two Way, Waterpark Place, Spadina to York

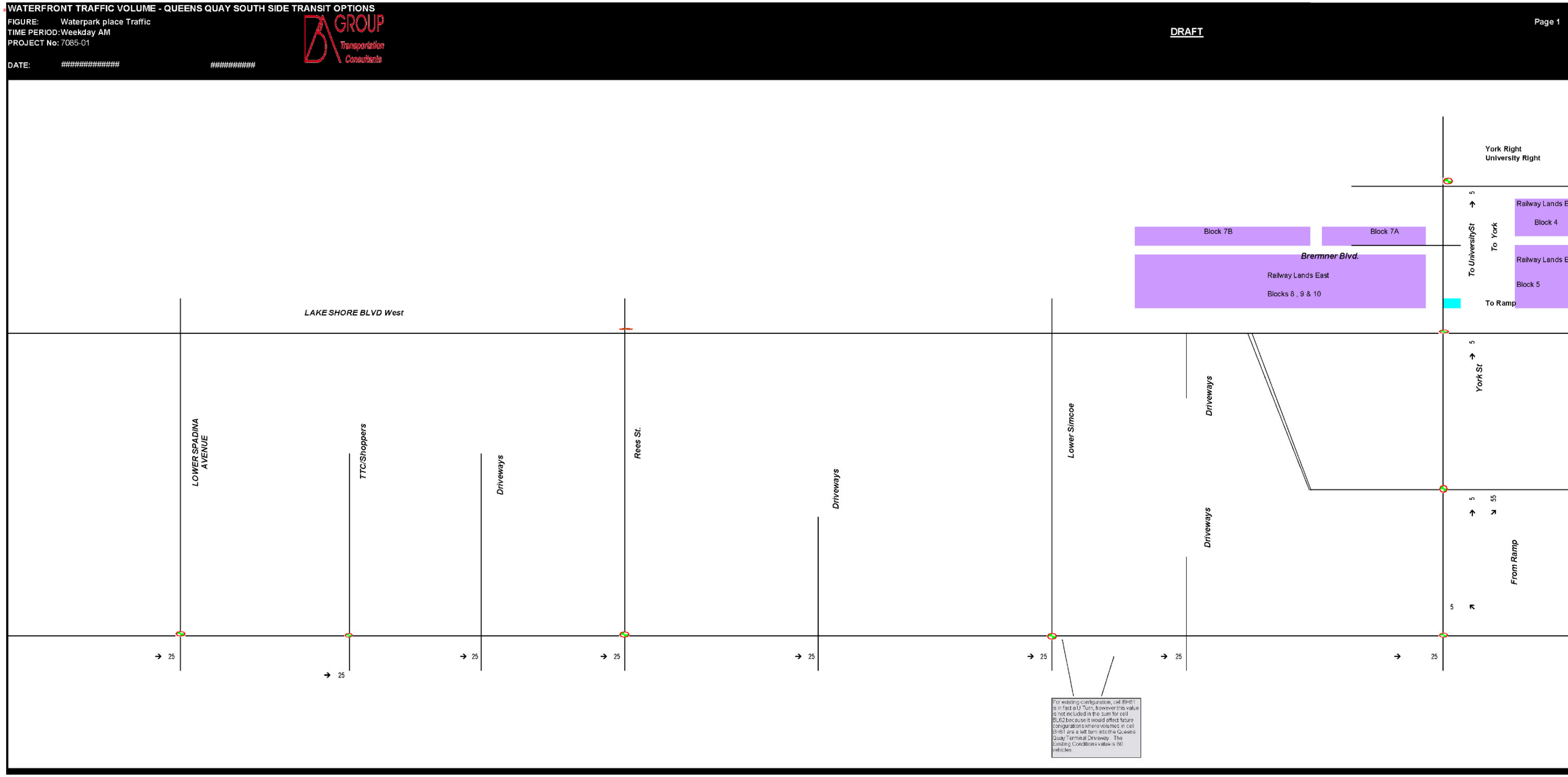

Figure A6- 6: AM Future South Side Two Way, Waterpark Place, Bay to Cooper

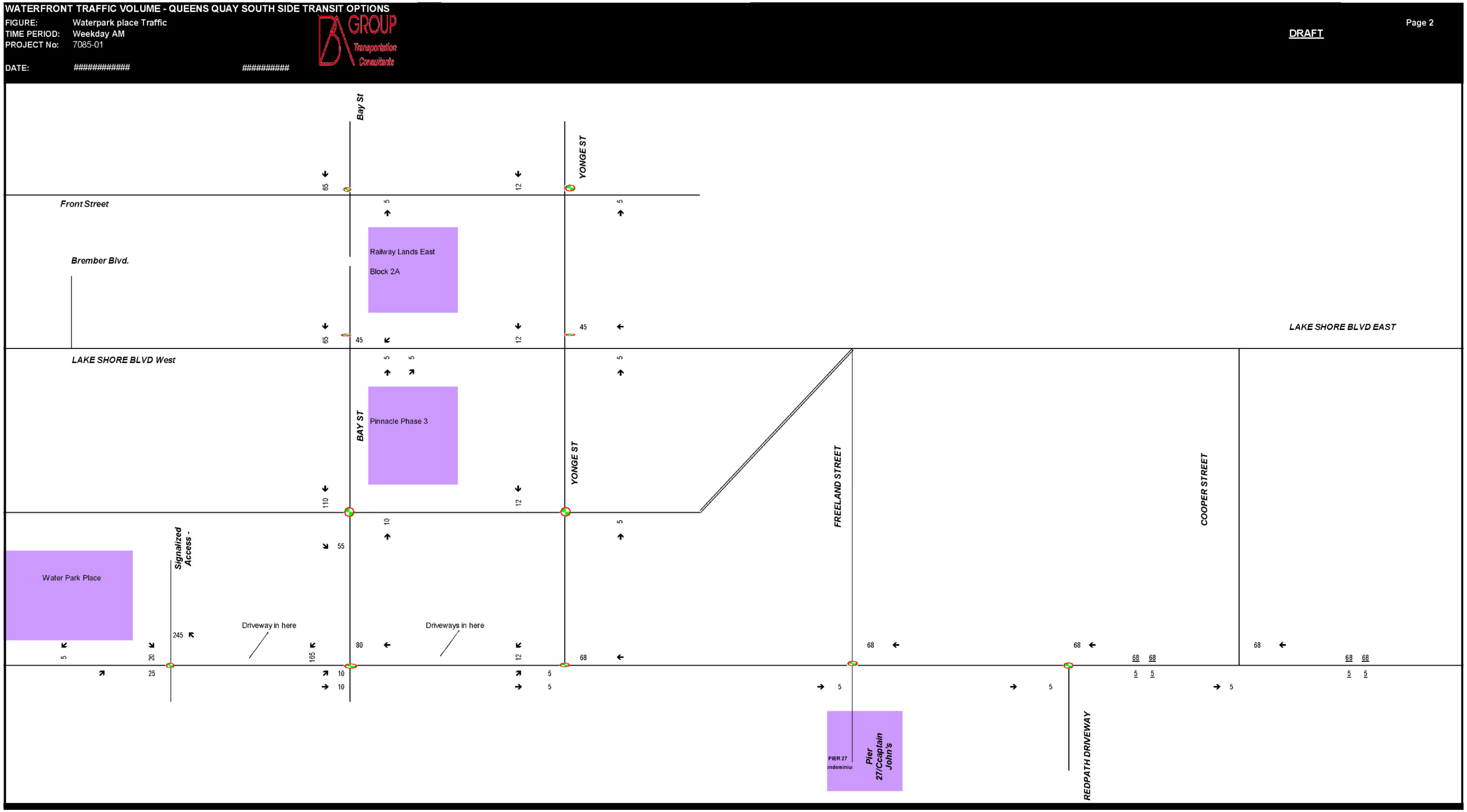

Figure A6- 7: AM Future South Side Two Way, Pier 27, Spadina to York

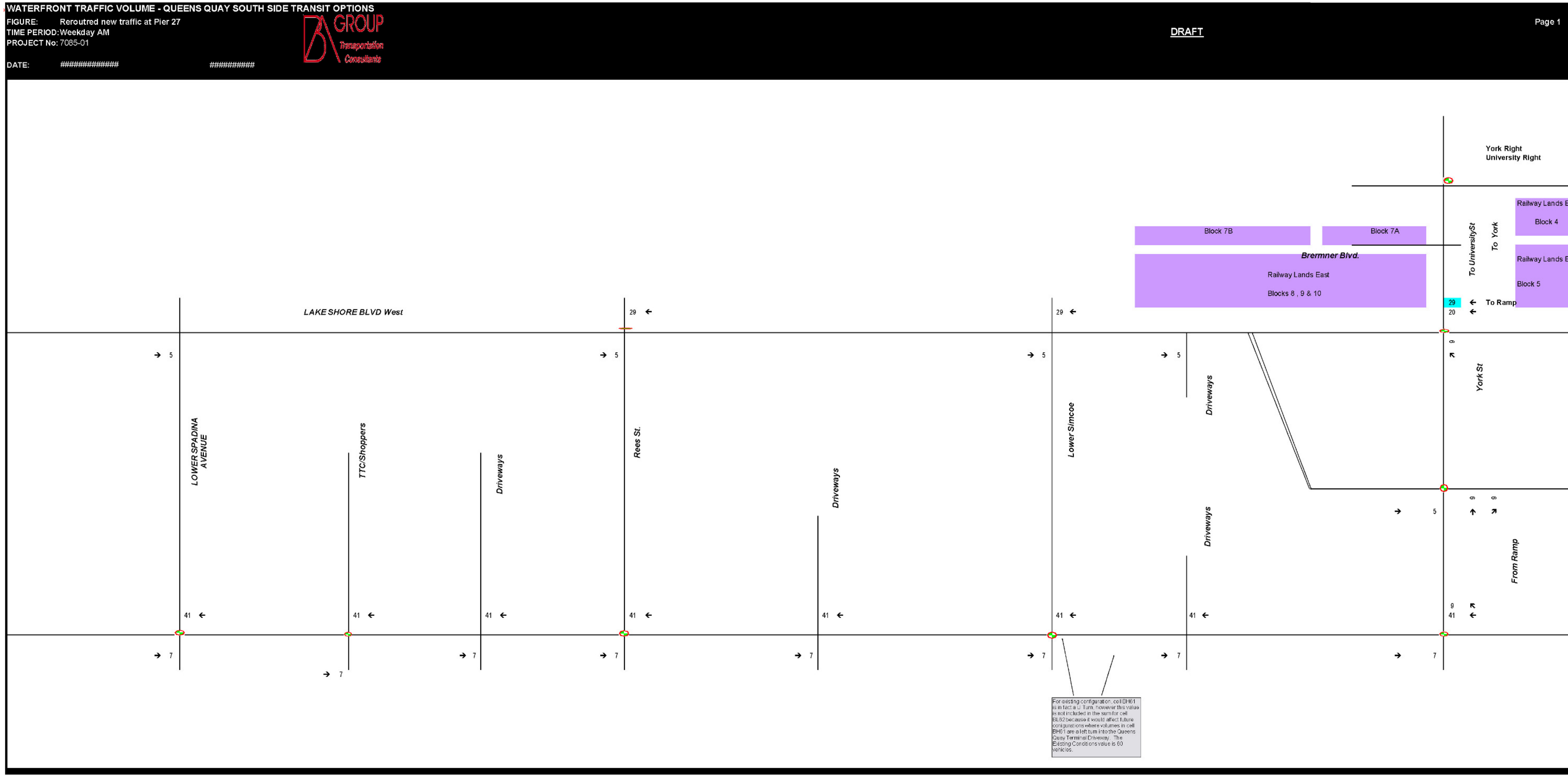

Figure A6- 8: AM Future South Side Two Way, Pier 27, Bay to Cooper

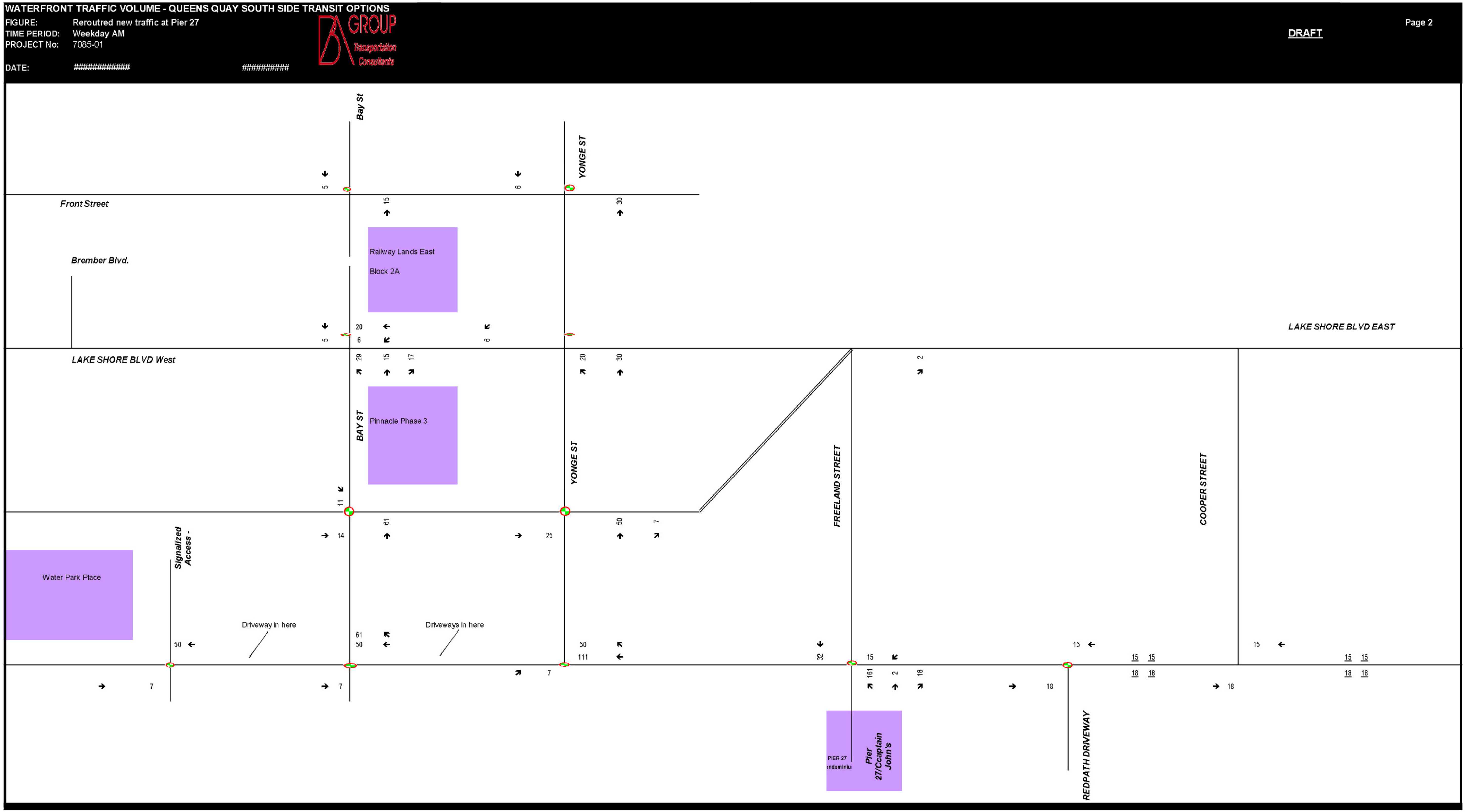

Figure A6- 9: AM Future South Side Two Way, East Bayfront, Spadina to York

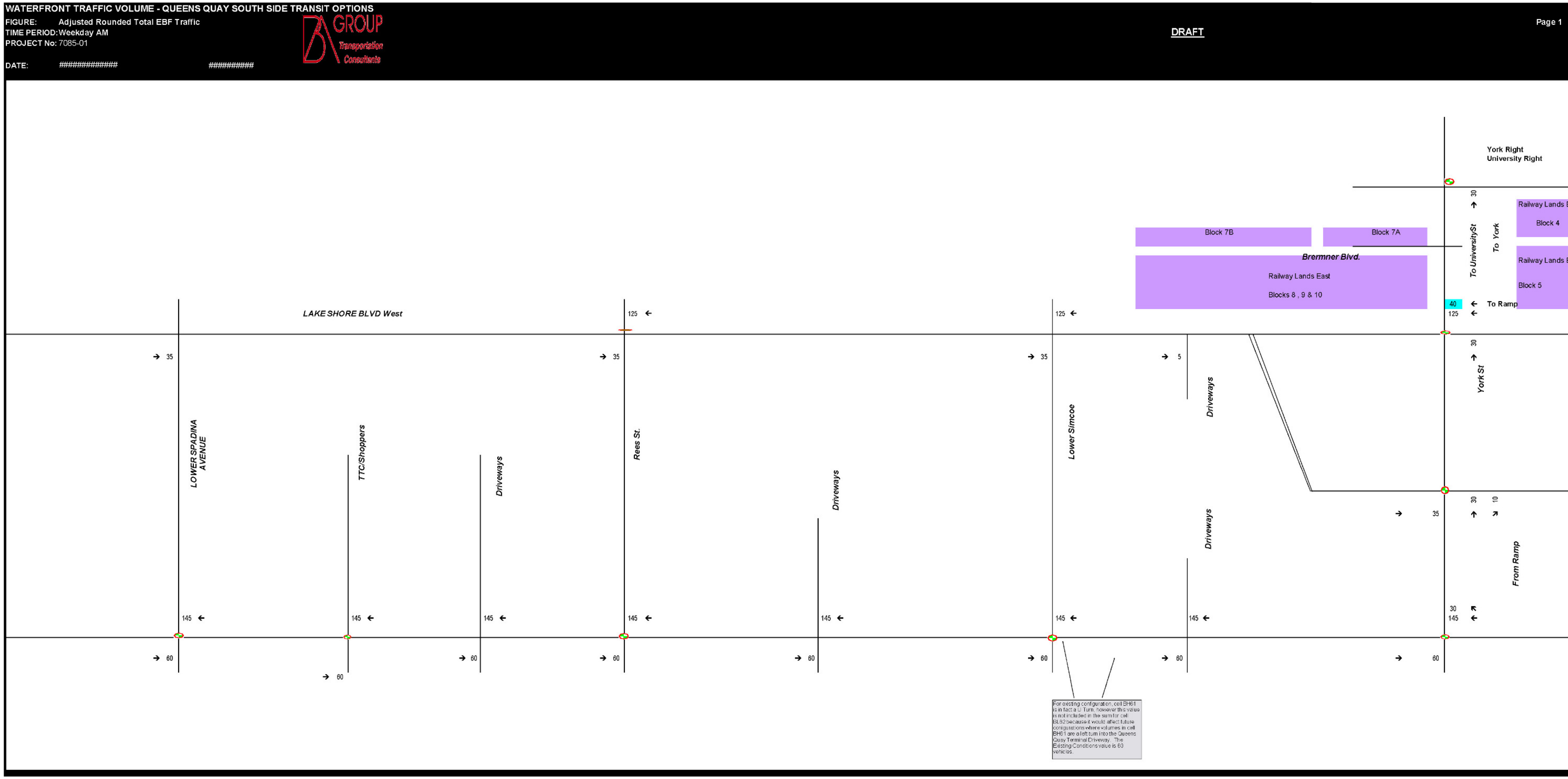

Figure A6- 10: AM Future South Side Two Way, East Bayfront, Bay to Cooper

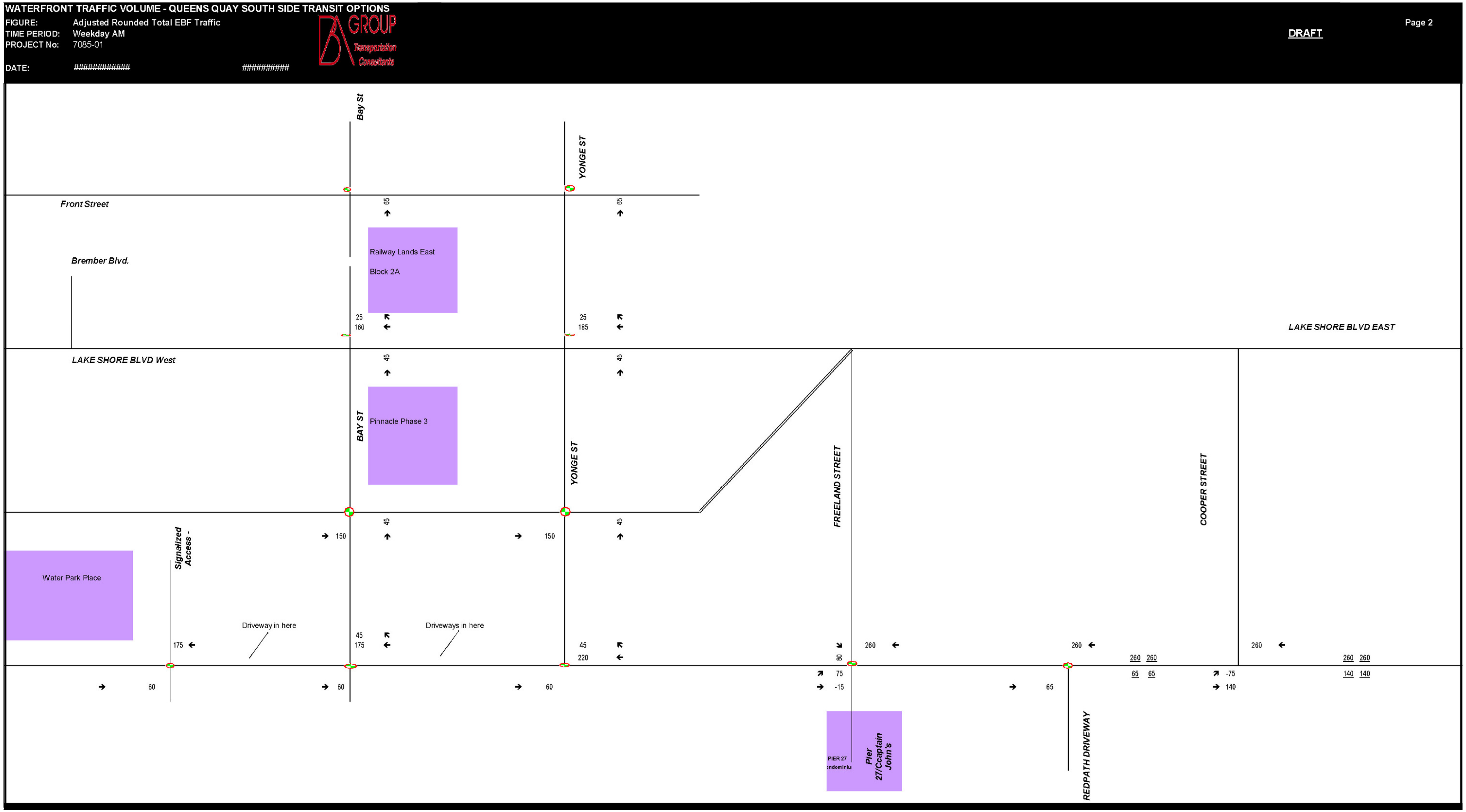

Figure A6- 11: AM Future South Side Two Way, Railway Lands, Spadina to York

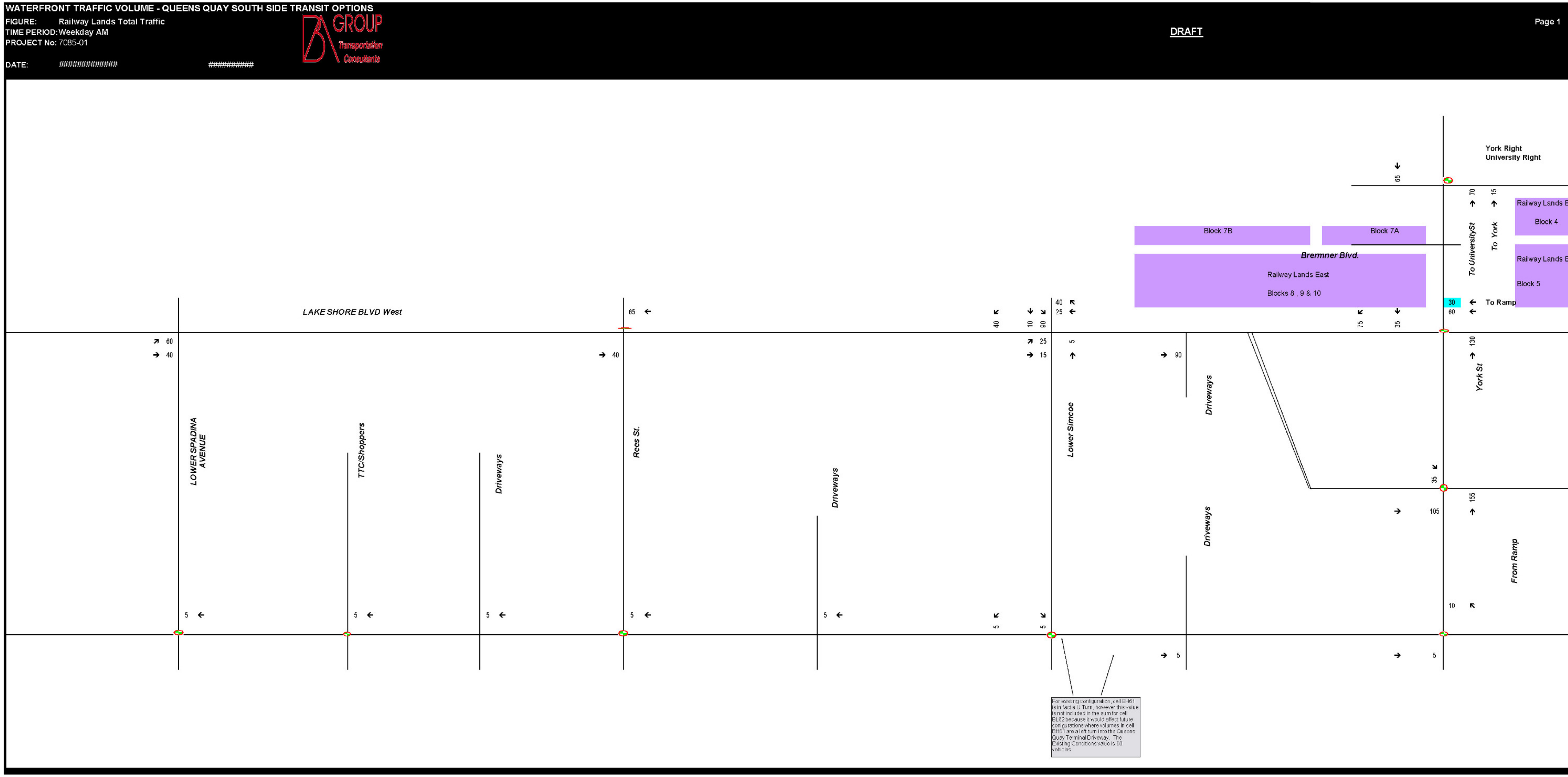

Figure A6- 12: AM Future South Side Two Way, Railway Lands, Bay to Cooper

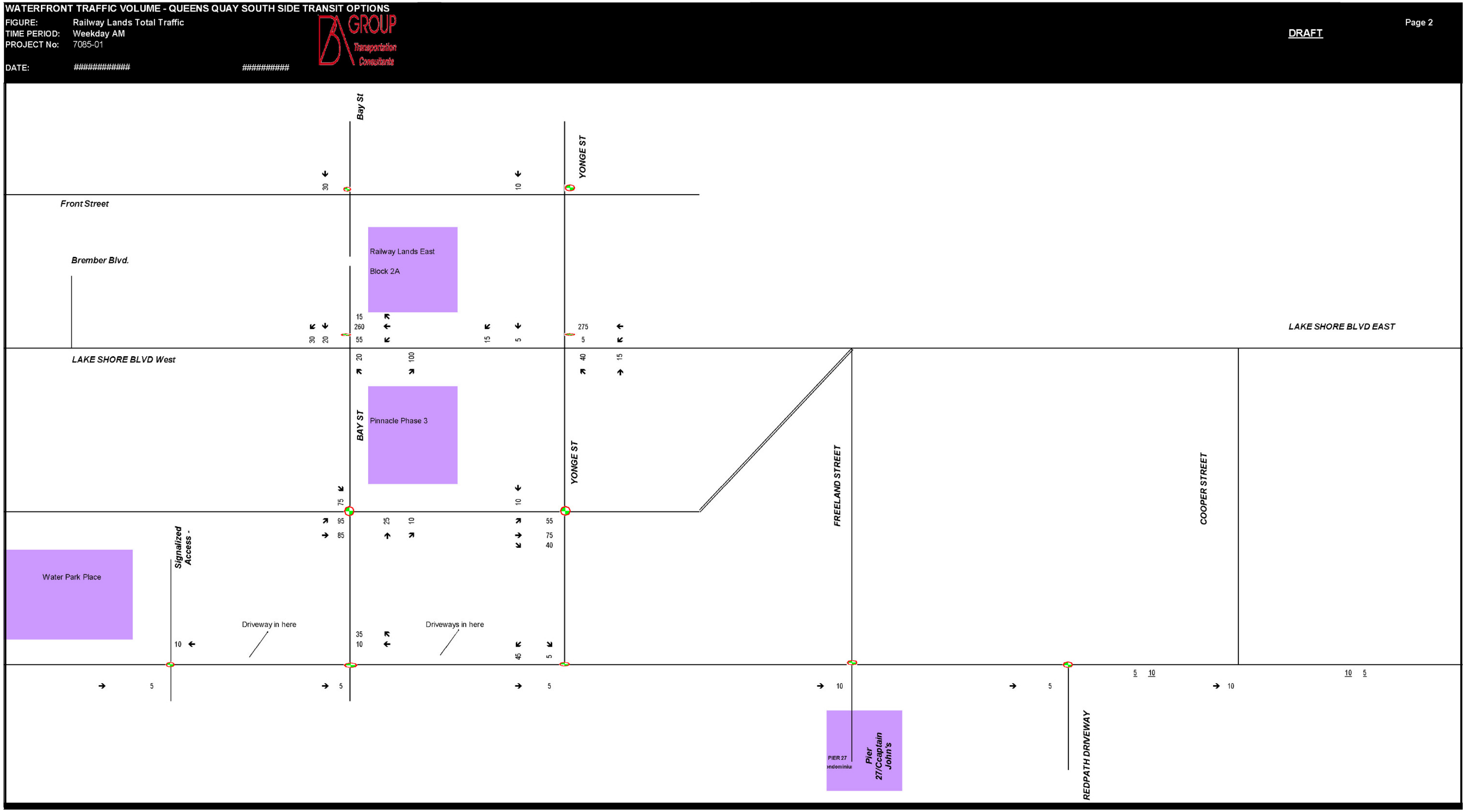

Figure A6- 13: AM Future South Side Two Way, West Don Lands, Spadina to York

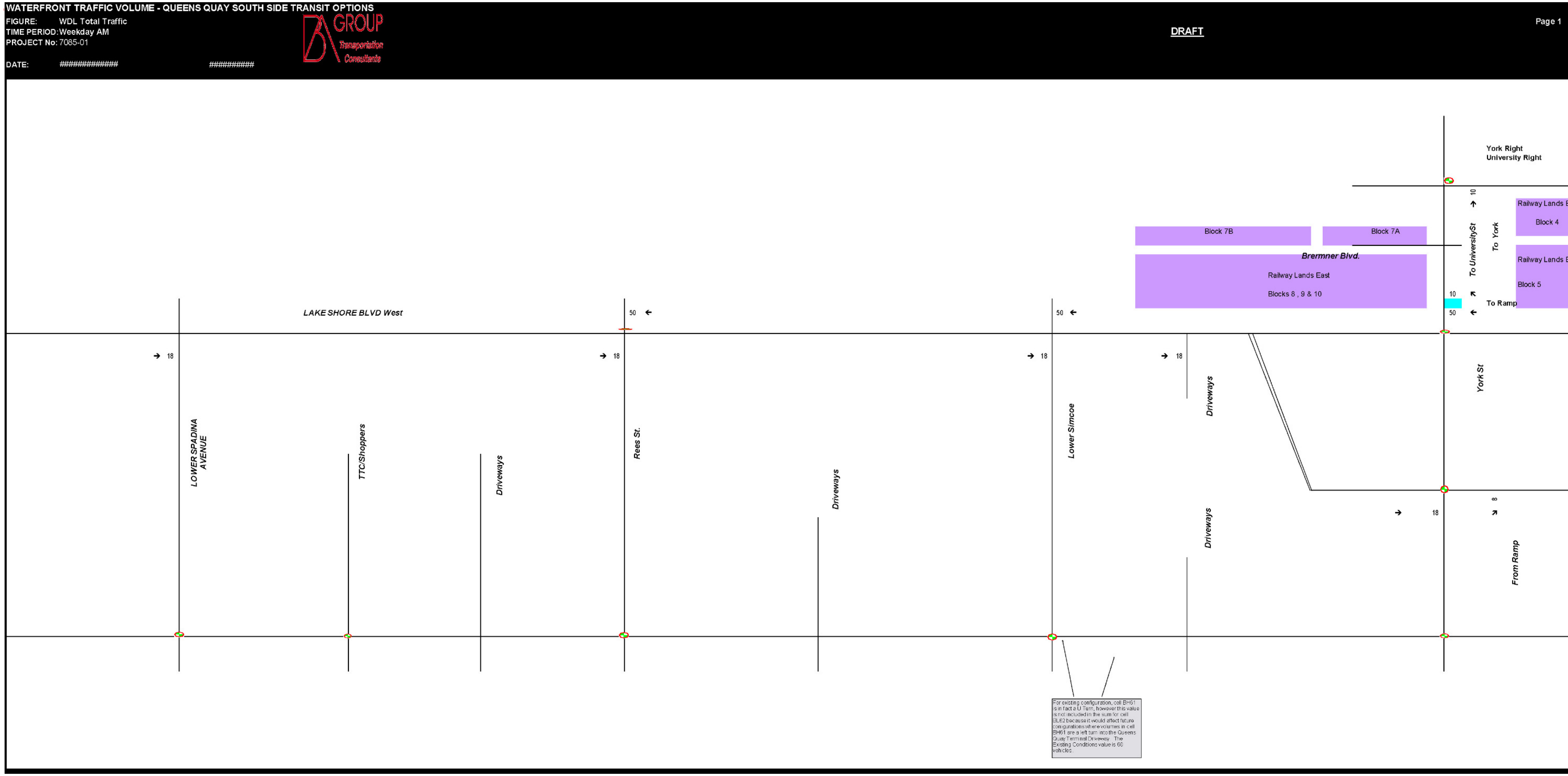

Figure A6- 14: AM Future South Side Two Way, West Don Lands, Bay to Cooper

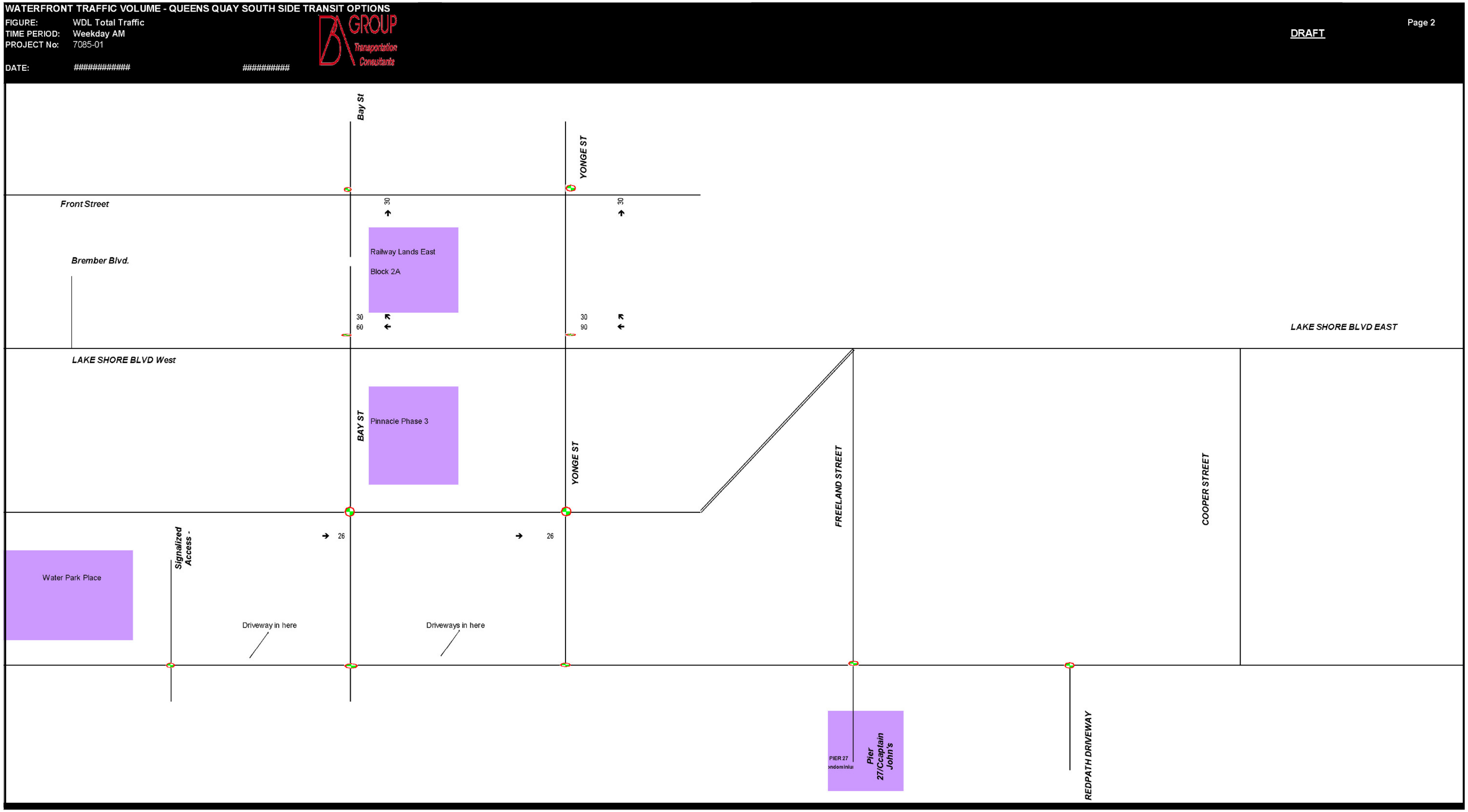

Figure A6- 15: AM Future South Side Two Way, Total, Spadina to York

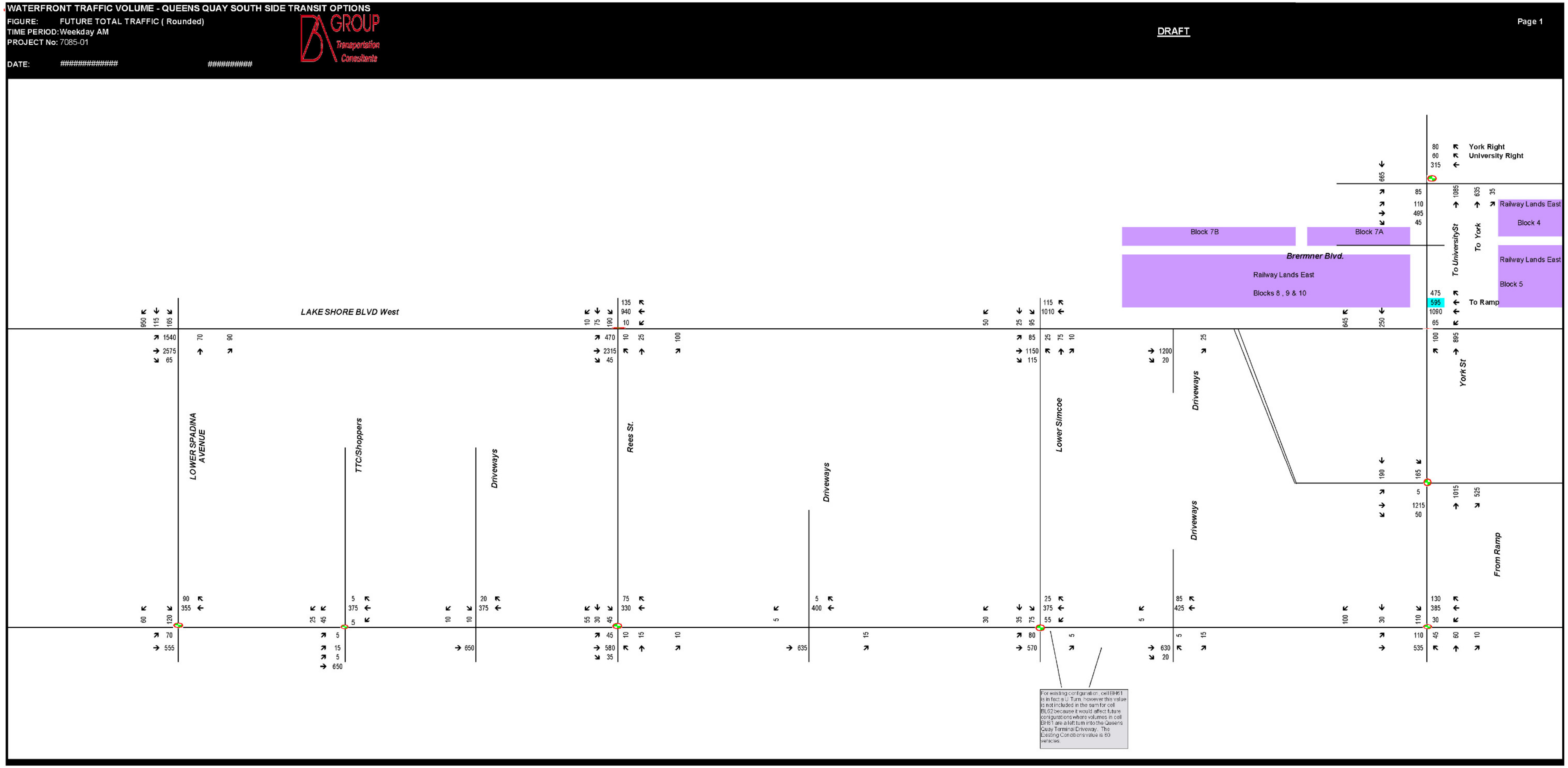

Figure A6- 16: AM Future South Side Two Way, Total, Bay to Cooper

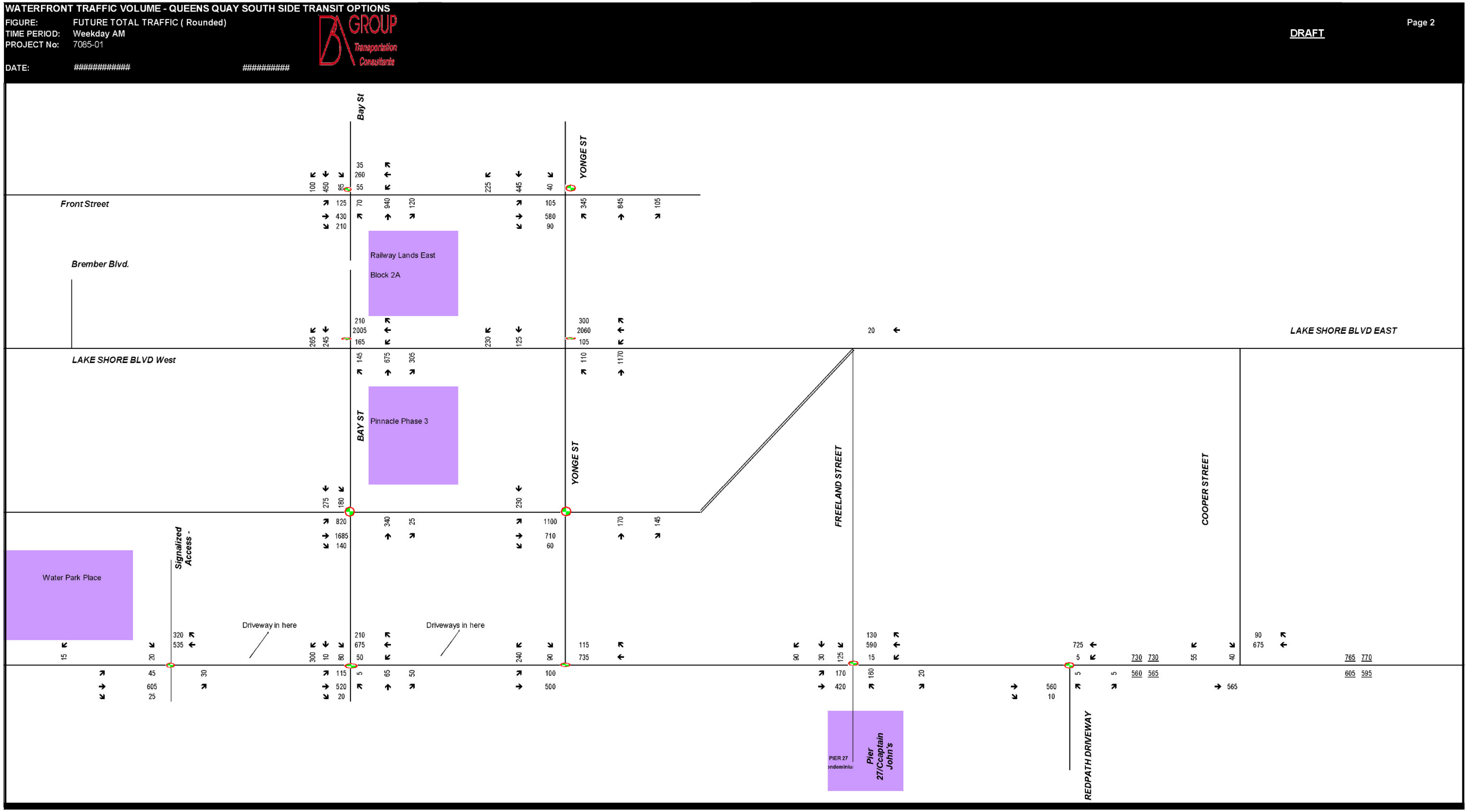

Figure A6- 17: PM Future South Side Two Way, Reassigned Existing, Spadina to York

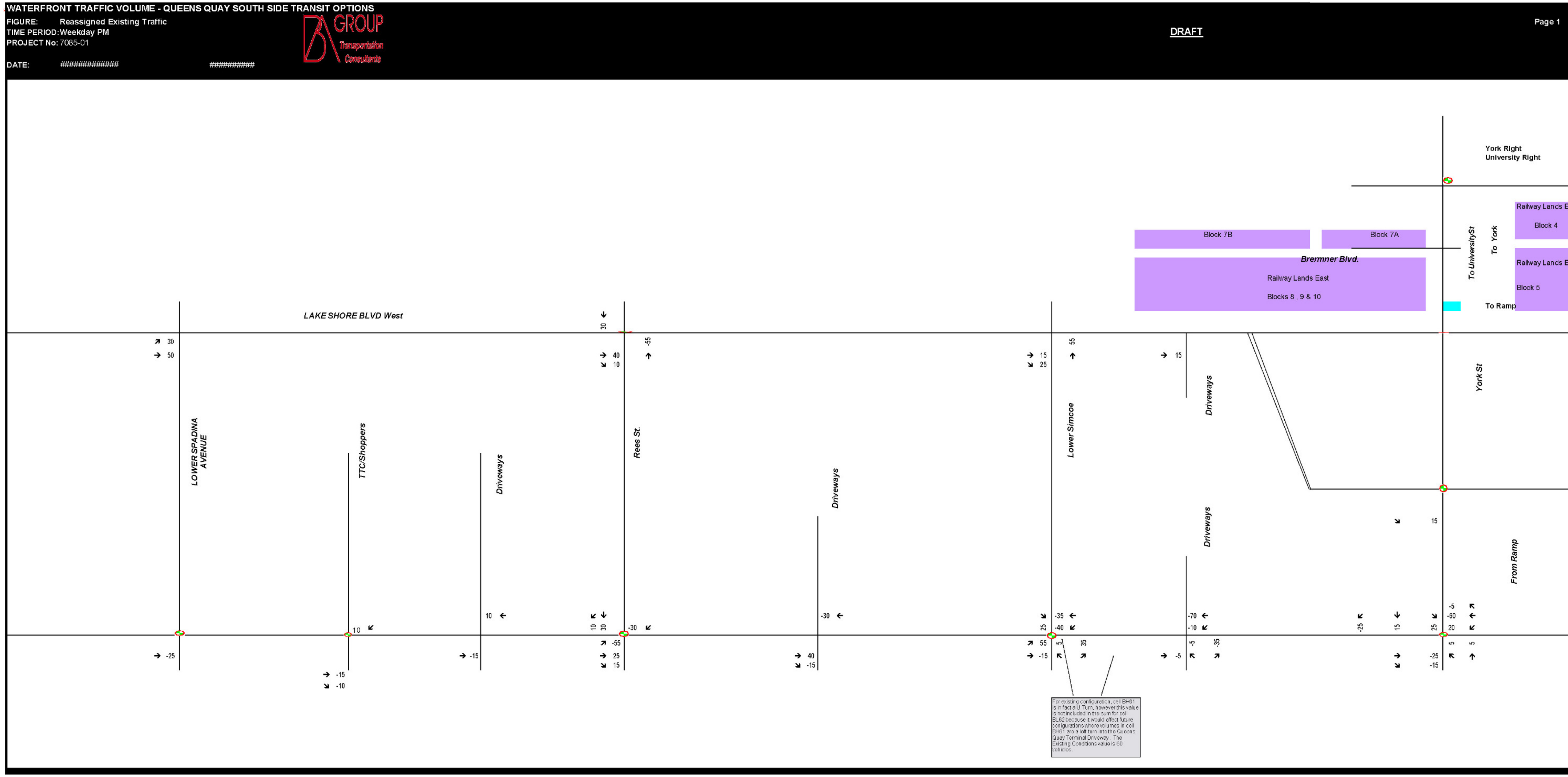

Figure A6- 18: PM Future South Side Two Way, Reassigned Existing, Bay to Cooper

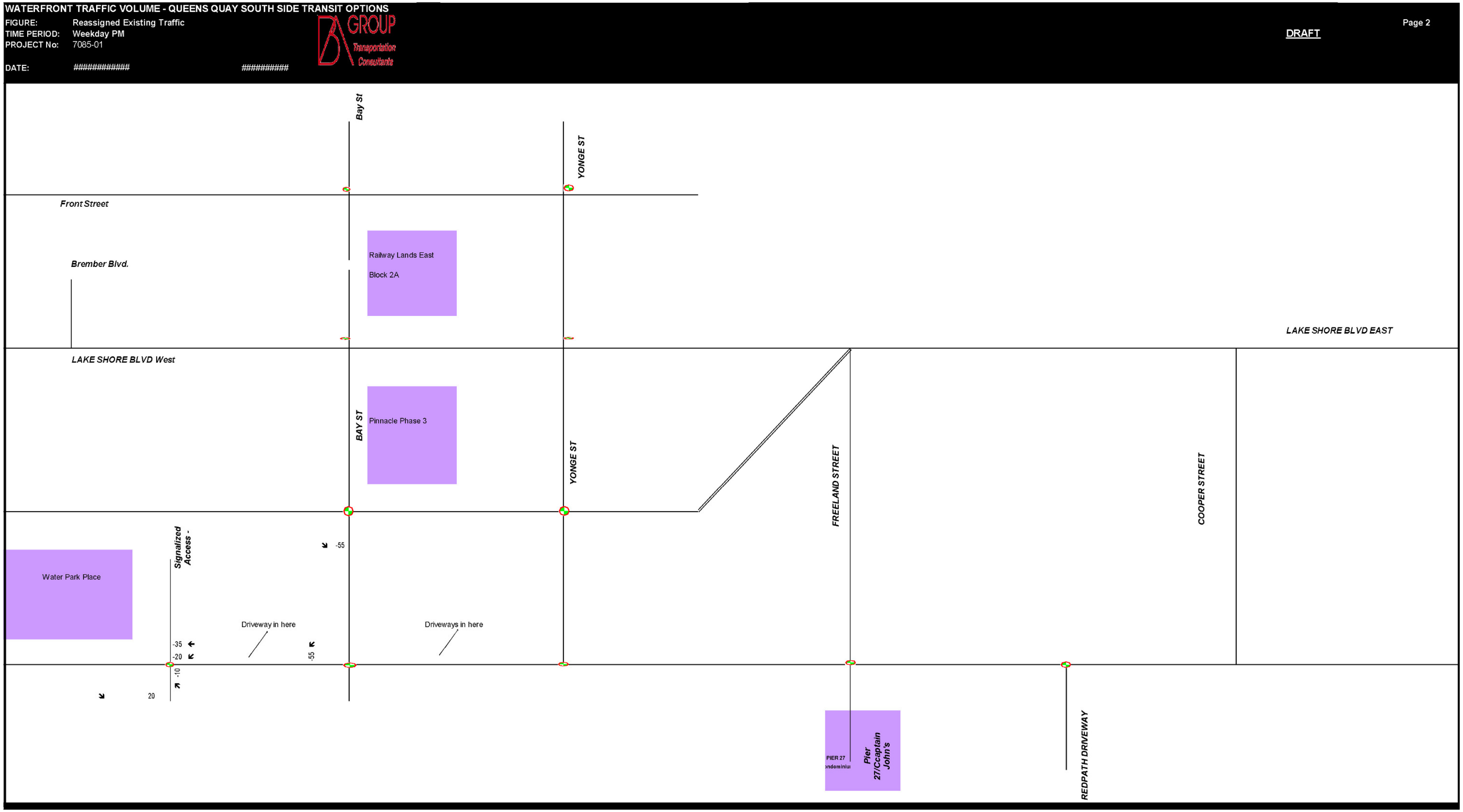

Figure A6- 19: PM Future South Side Two Way, Harbourfront Centre, Spadina to York

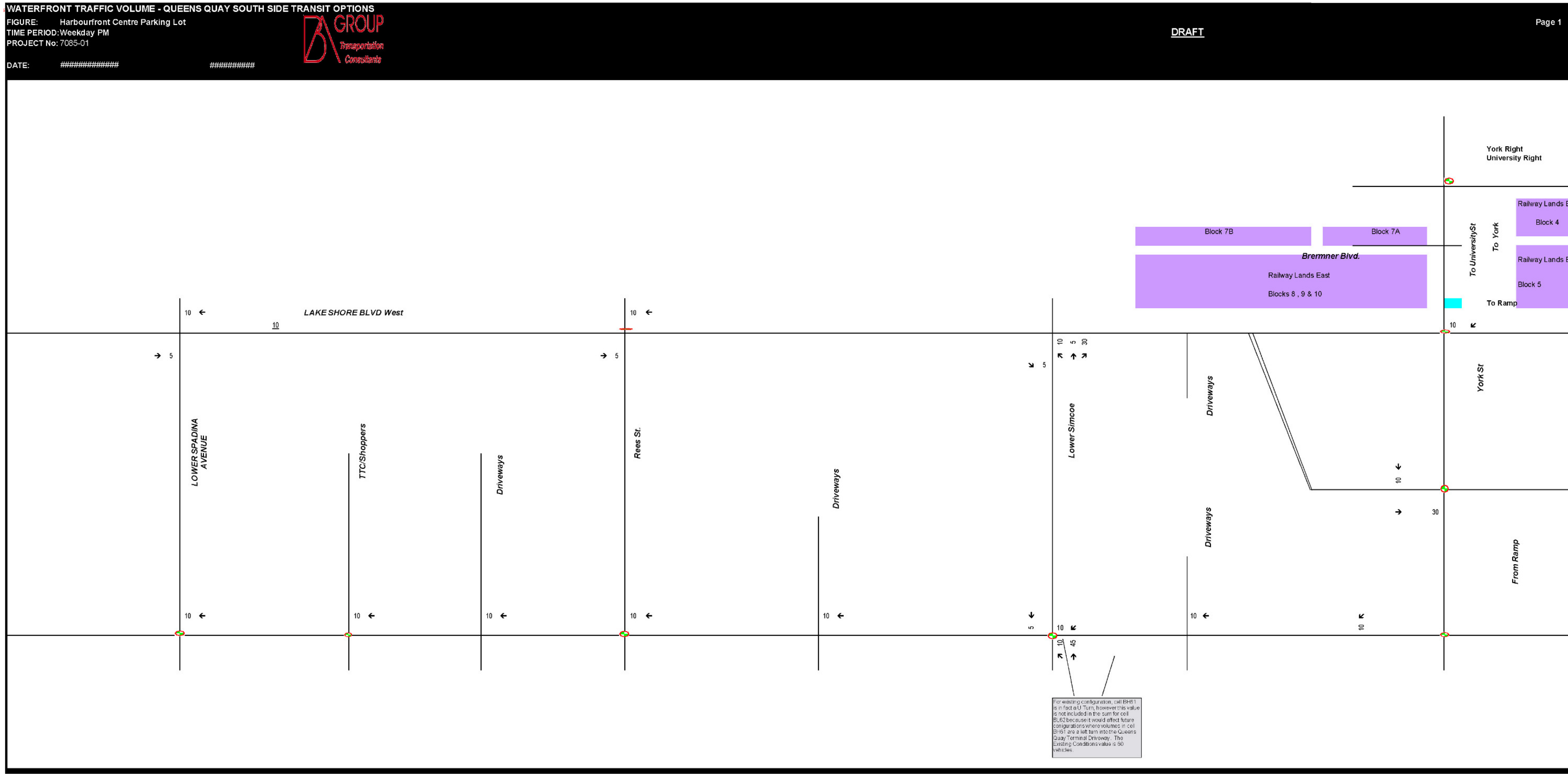

Figure A6- 20: PM Future South Side Two Way, Harbourfront Centre, Bay to Cooper

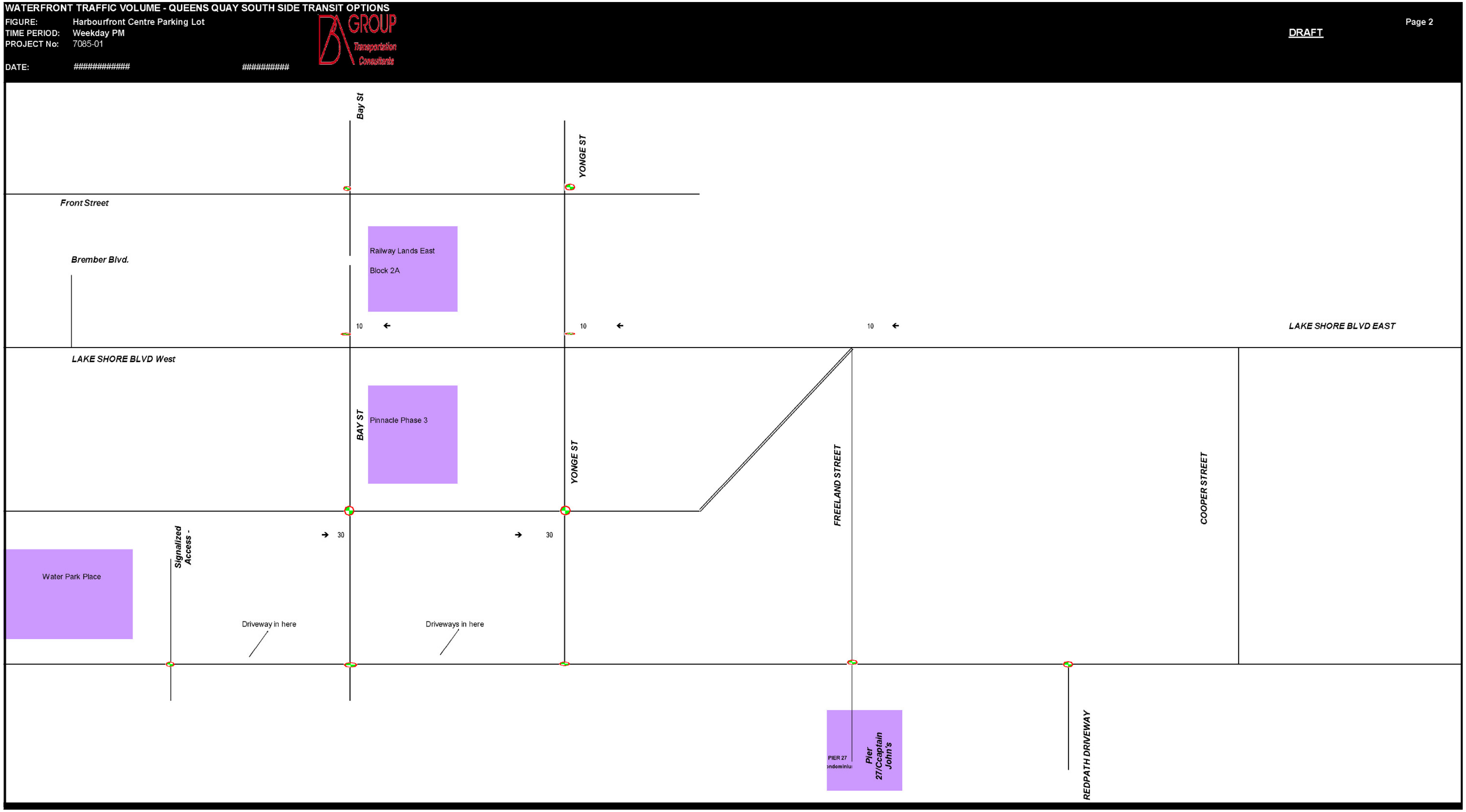

Figure A6- 21: PM Future South Side Two Way, Waterpark Place, Spadina to York

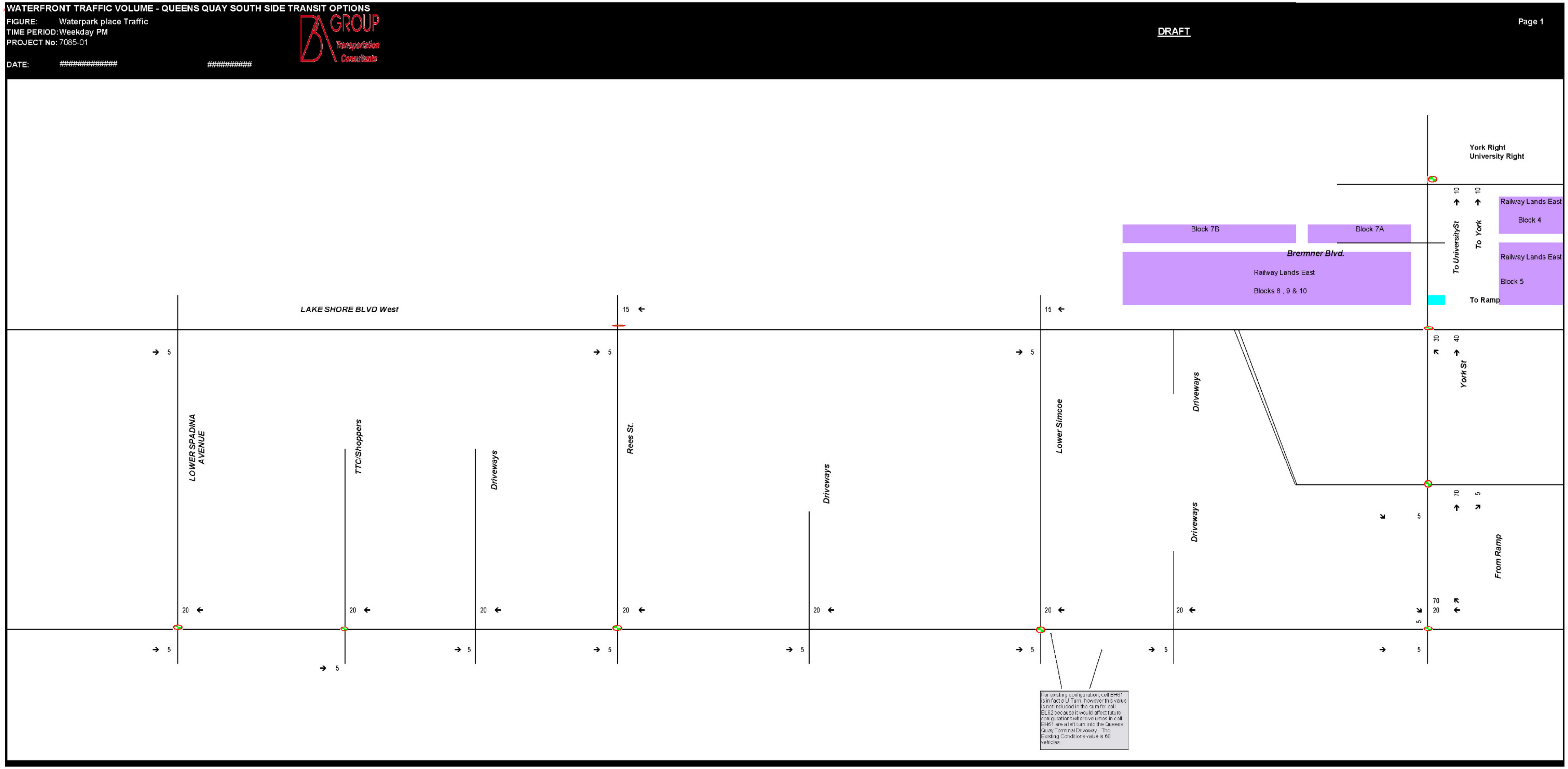

Figure A6- 22: PM Future South Side Two Way, Waterpark Place, Bay to Cooper

WATERFRONT TRAFFIC VOLUME - QUEENS QUAY SOUTH SIDE TRANSIT OPTIONS
FIGURE: Waterpark place Traffic
TIME PERIOD: Weekday PM
PROJECT No: 7085-01
DATE: ############ ##########

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Figure A6- 23: PM Future South Side Two Way, Pier 27, Spadina to York

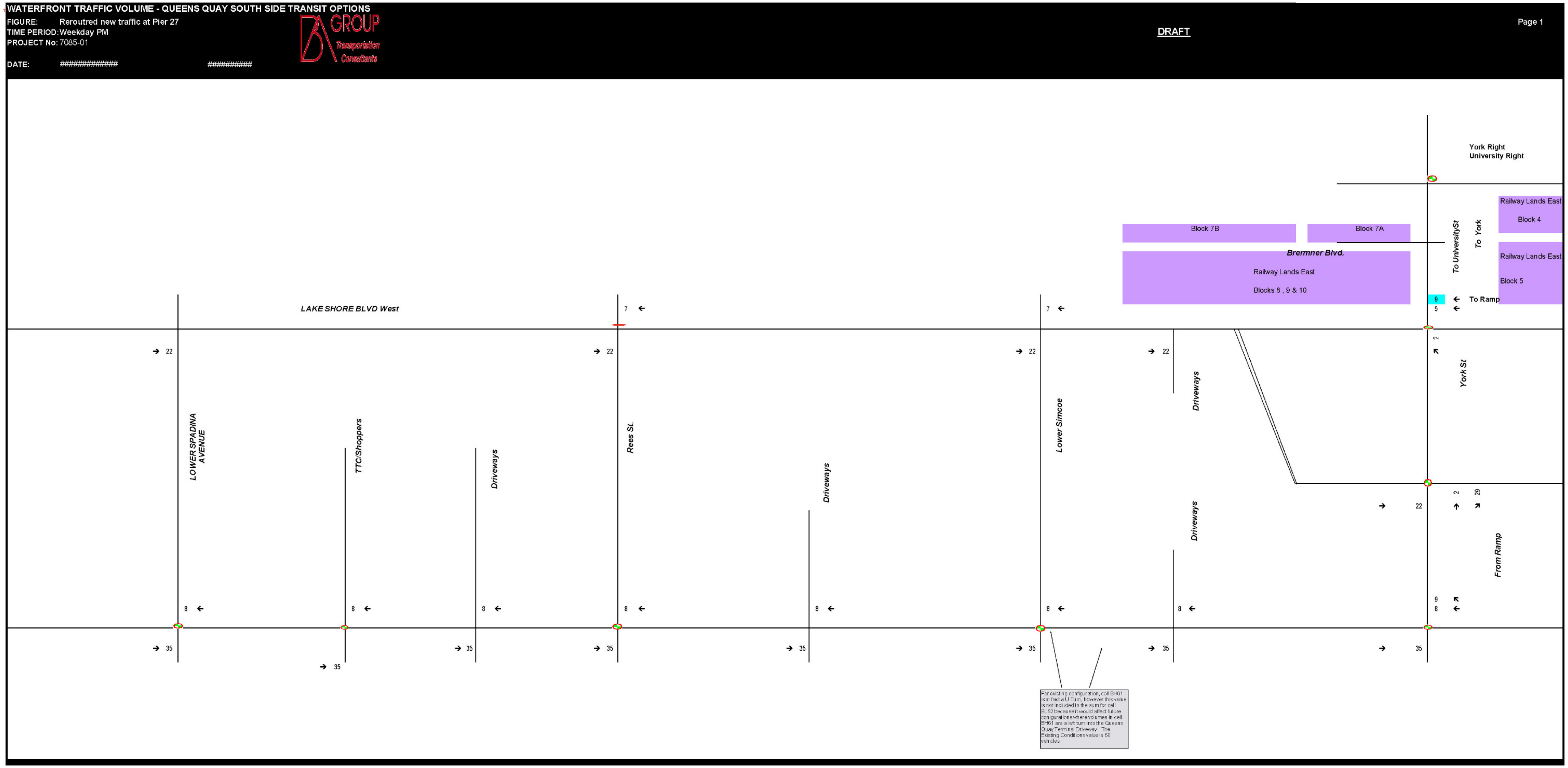

Figure A6- 24: PM Future South Side Two Way, Pier 27, Bay to Cooper

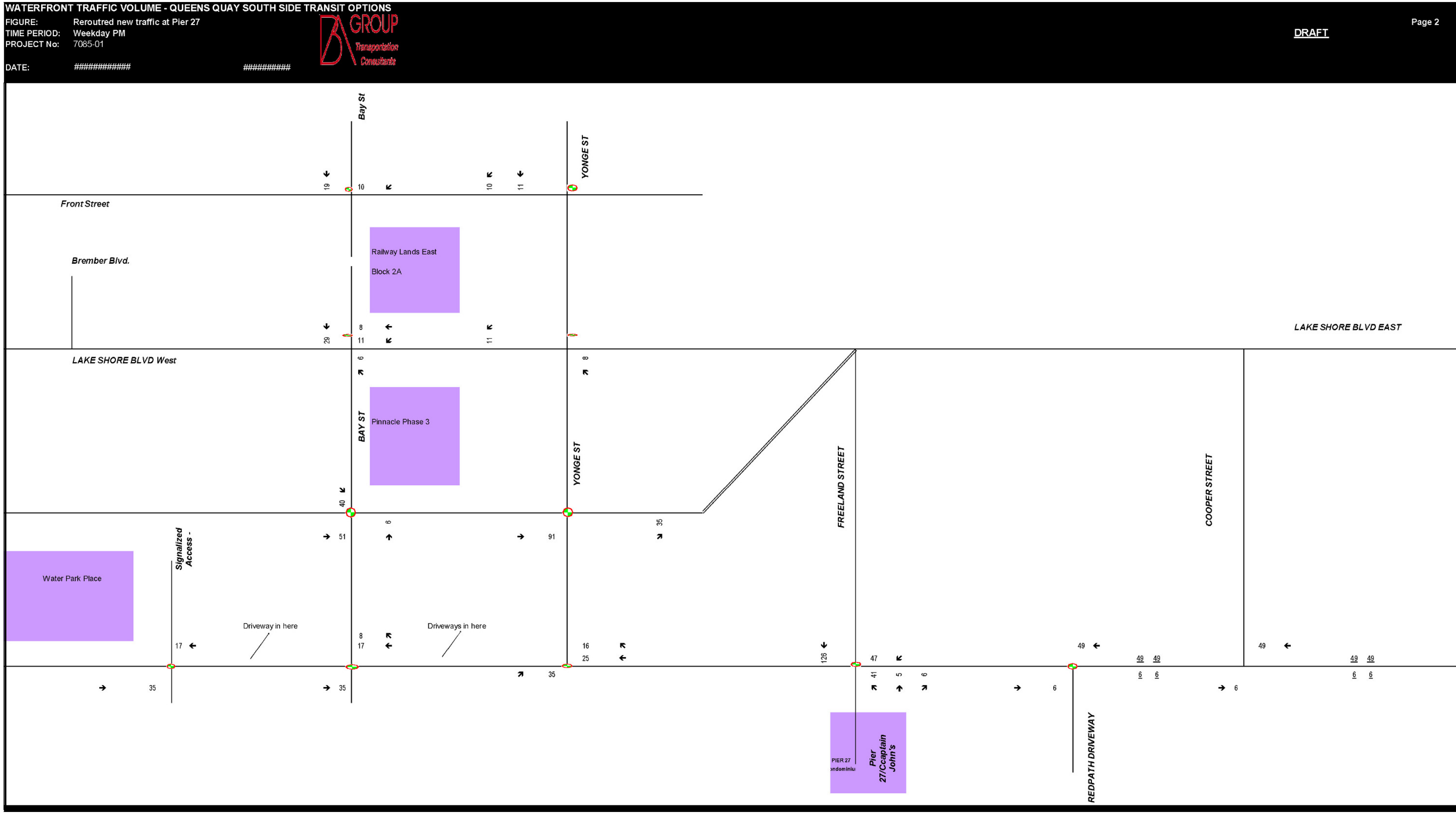

Figure A6- 25: PM Future South Side Two Way, East Bayfront, Spadina to York

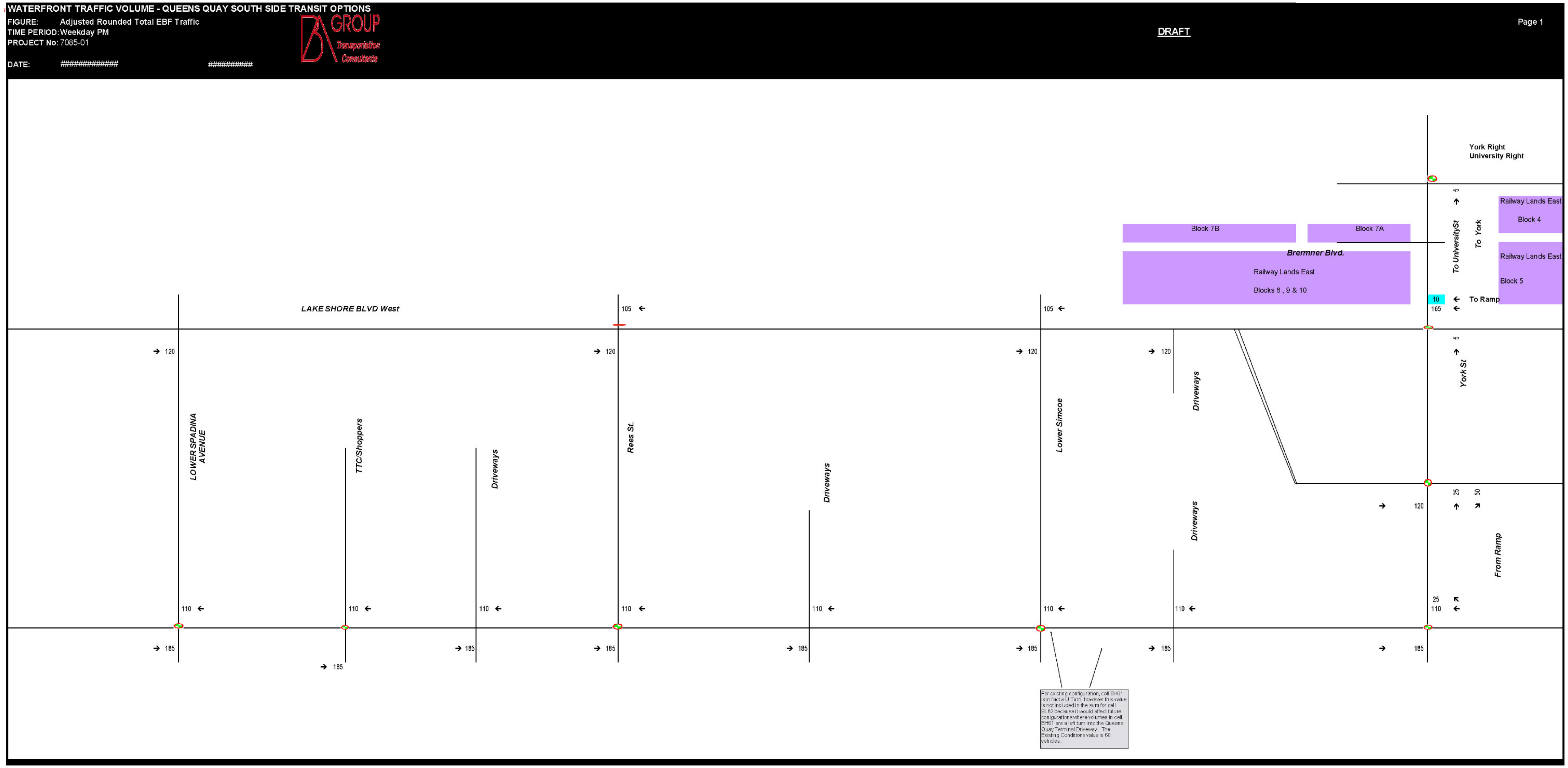

Figure A6- 26: PM Future South Side Two Way, East Bayfront, Bay to Cooper

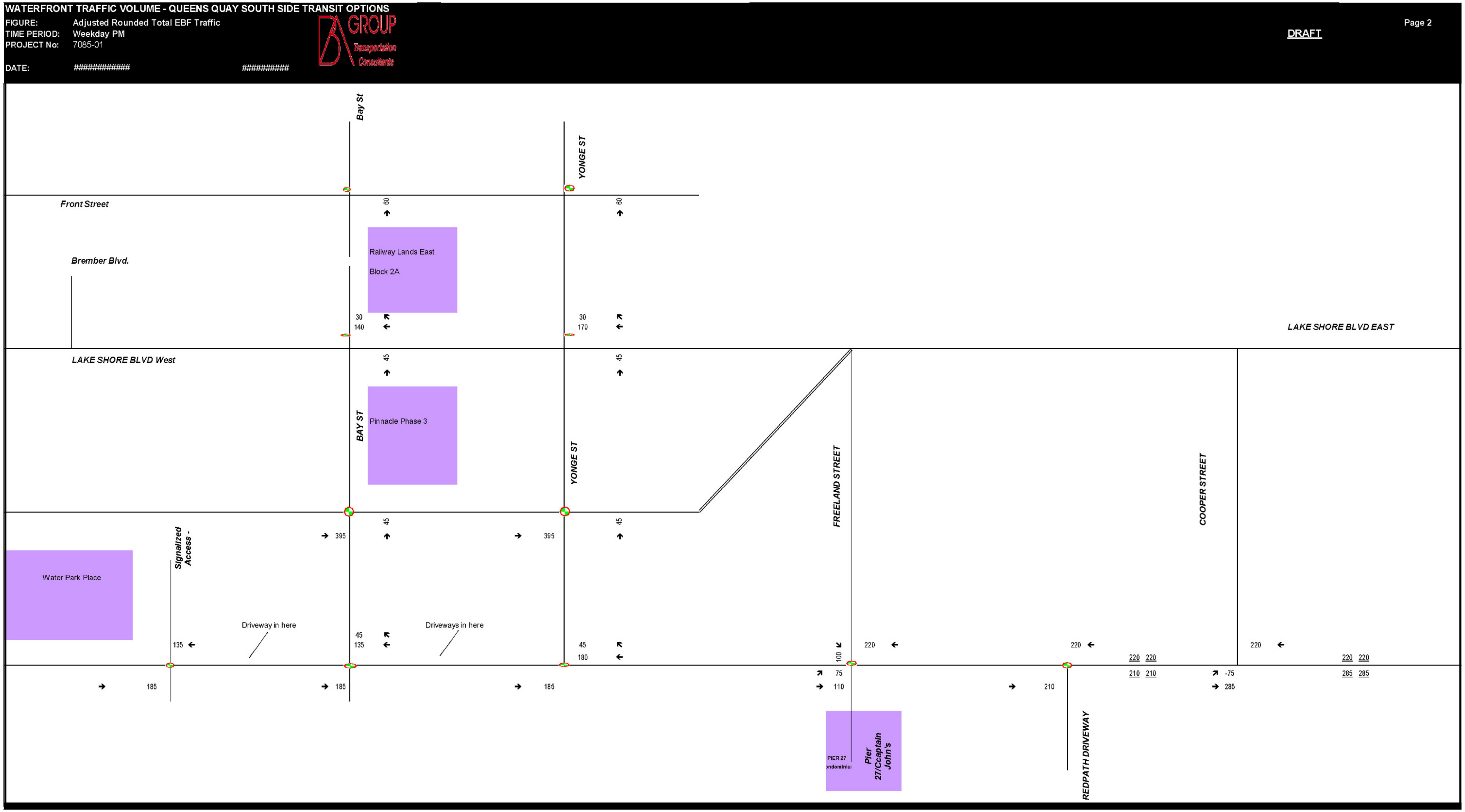

Figure A6- 27: PM Future South Side Two Way, Railway Lands, Spadina to York

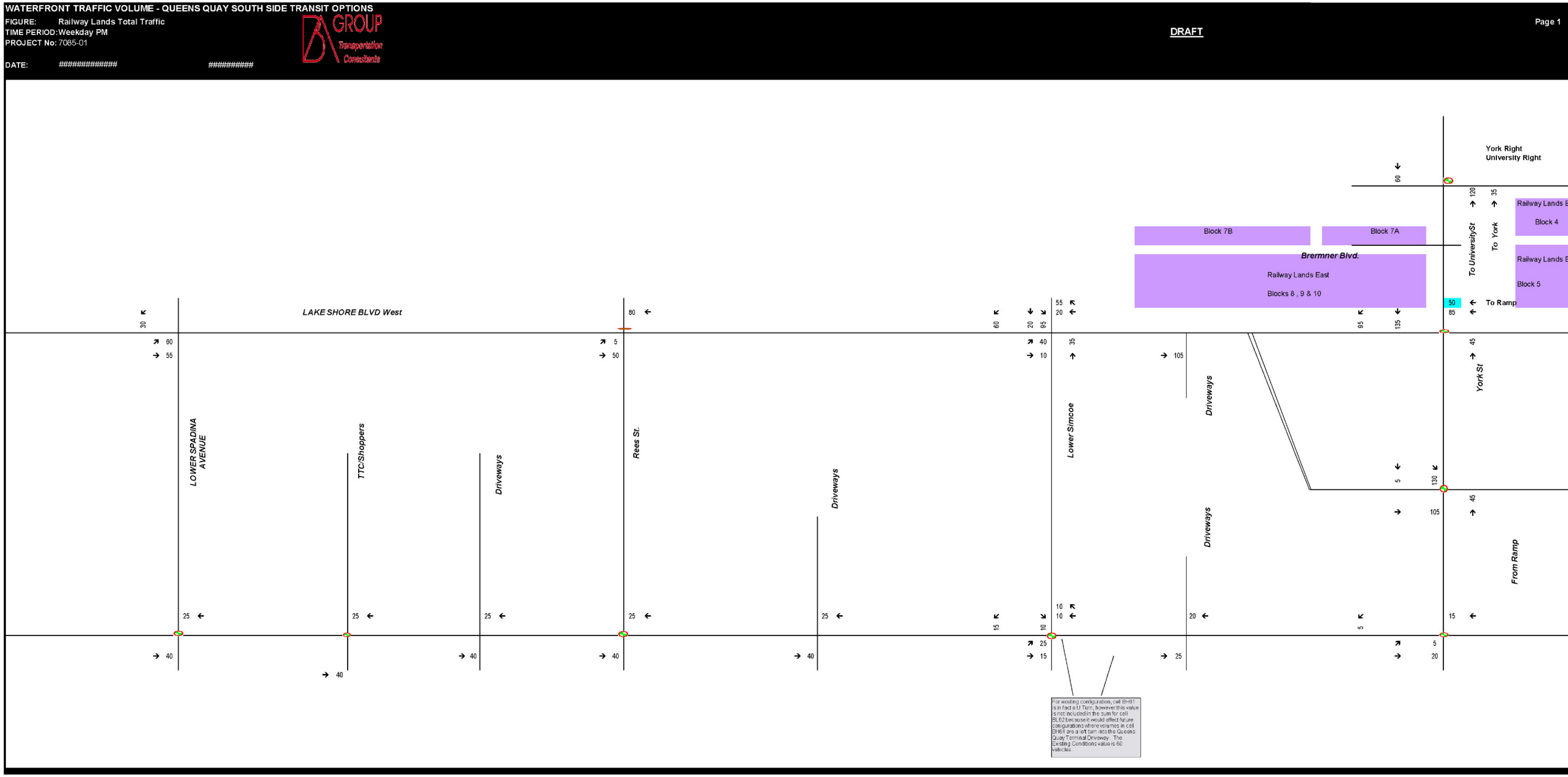

Figure A6- 28: PM Future South Side Two Way, Railway Lands, Bay to Cooper

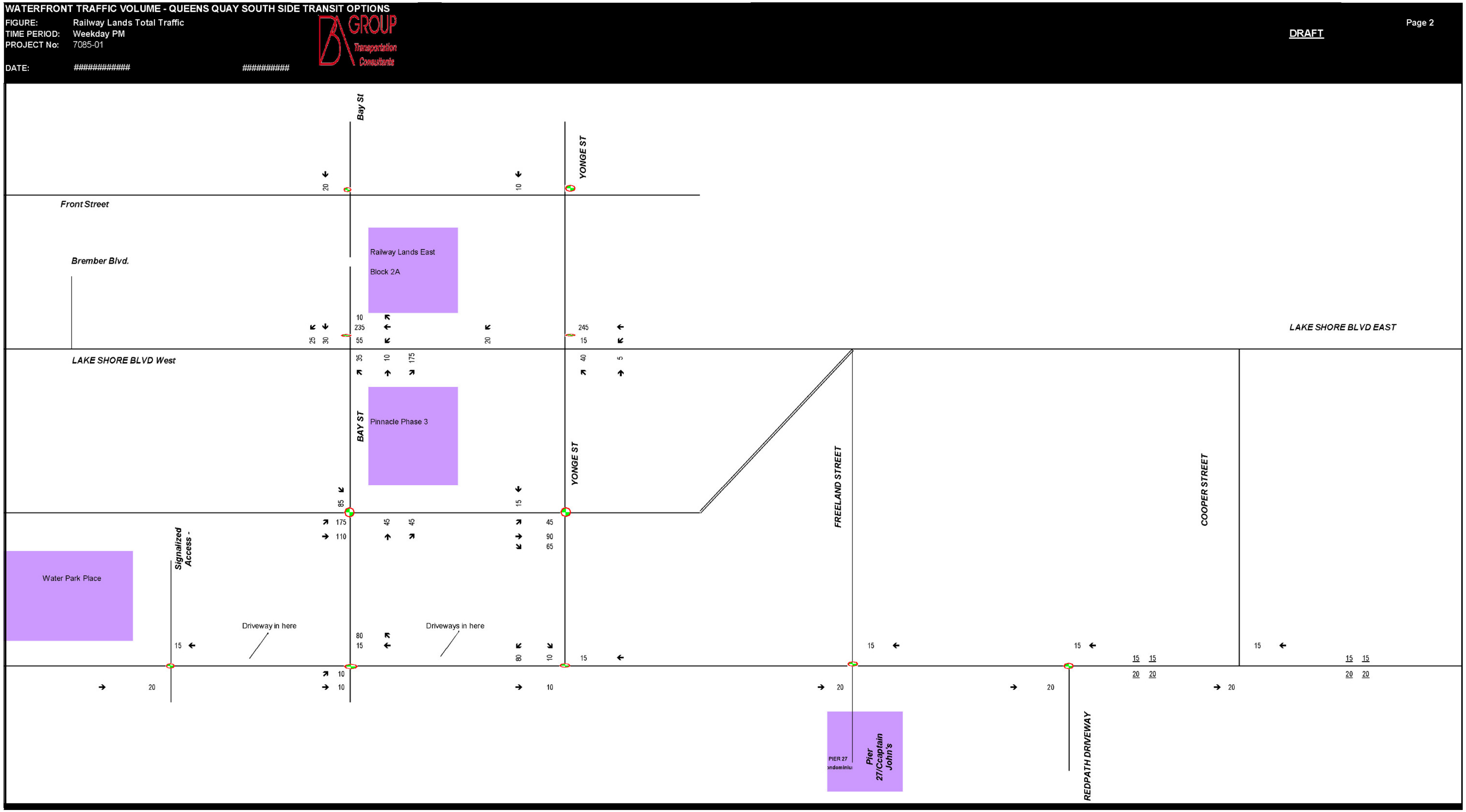

Figure A6- 29: PM Future South Side Two Way, West Don Lands, Spadina to York

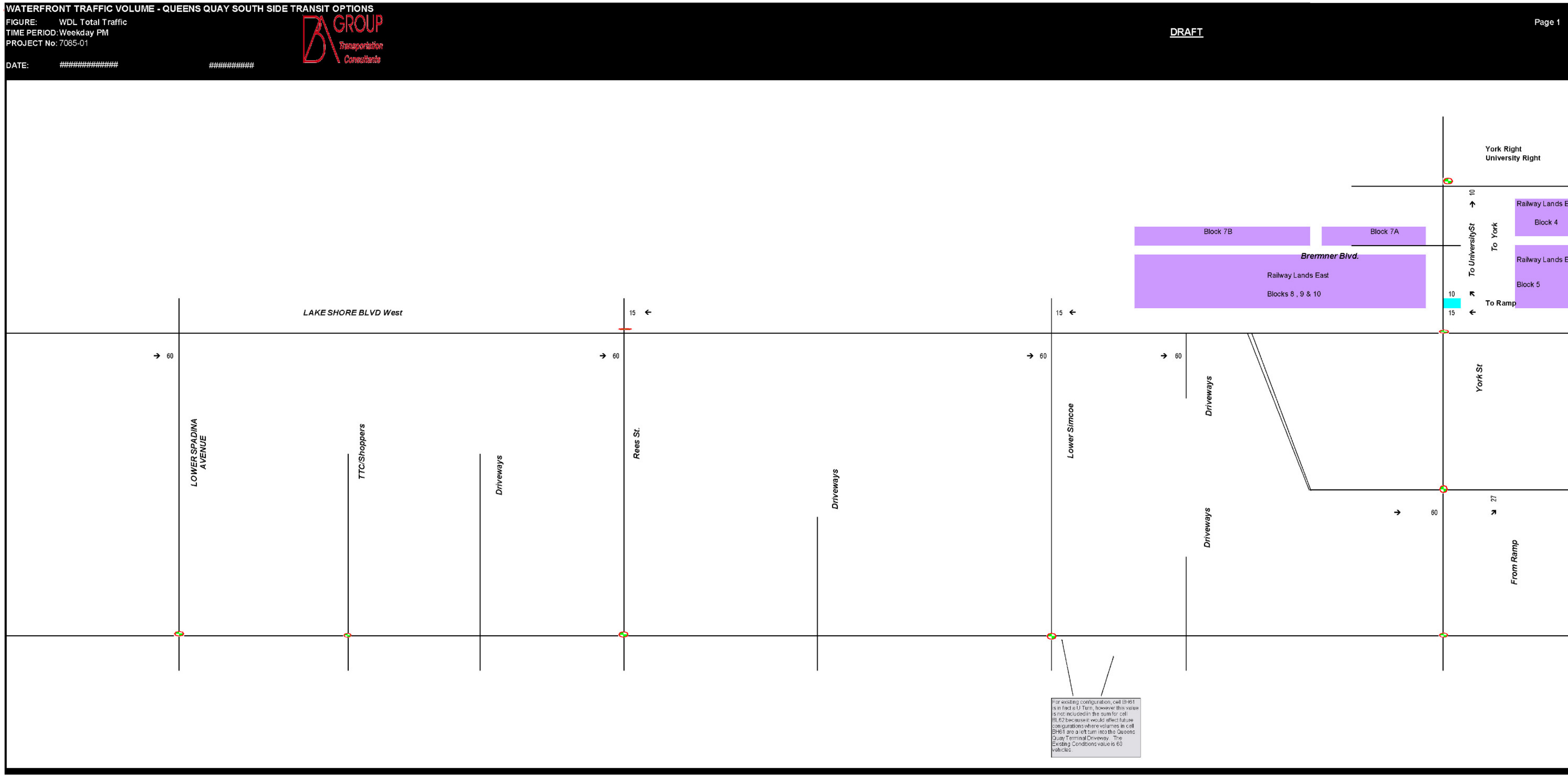

Figure A6- 30: PM Future South Side Two Way, West Don Lands, Bay to Cooper

WATERFRONT TRAFFIC VOLUME - QUEENS QUAY SOUTH SIDE TRANSIT OPTIONS
FIGURE: WDL Total Traffic
TIME PERIOD: Weekday PM
PROJECT No: 7085-01
DATE: ############ ##########

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Figure A6- 31: PM Future South Side Two Way, Total, Spadina to York

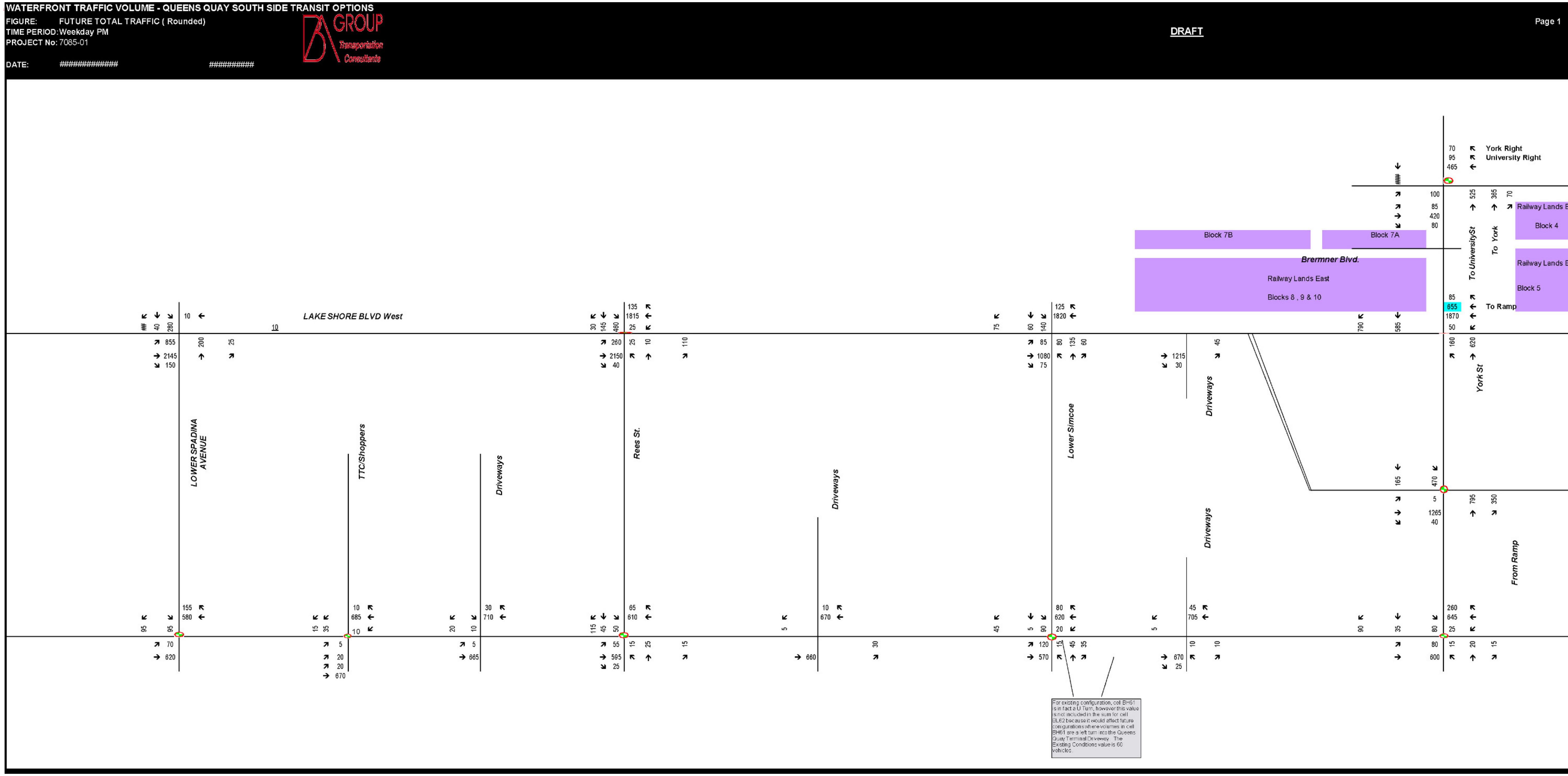
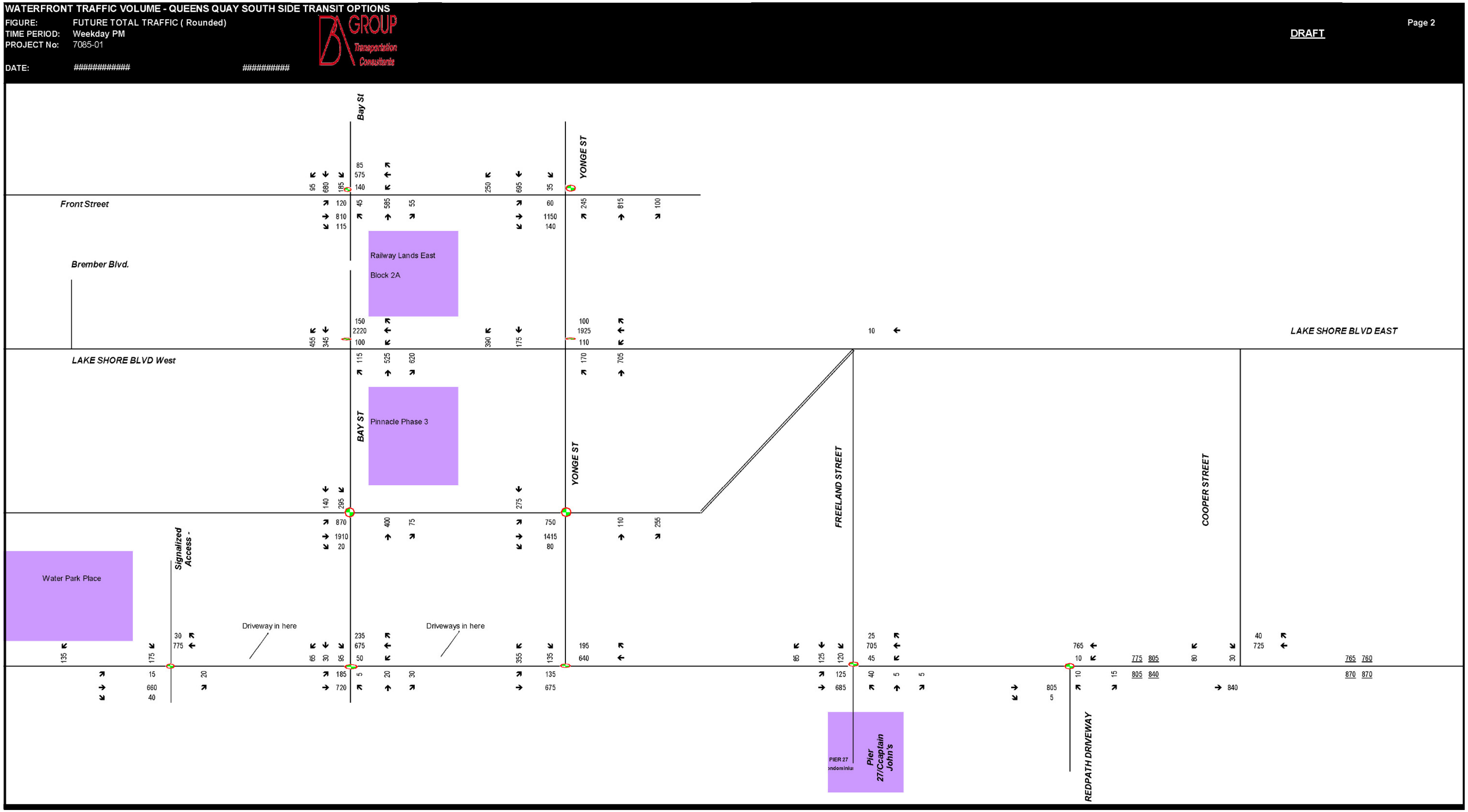


Figure A6- 32: PM Future South Side Two Way, Total, Bay to Cooper



Appendix B

Collision History Data

ARUP

Note: 2007 figure interpolated from data gathered up to end of June based on previous monthly trends

Location	Year 2004	2005	2006	2007	Total	Average per Year	AADT	Vehicles per year	Collisions per Million Vehicles
Harbour - Bay to Yonge	6	2	3	8	19	5	21,351	7,793,297	0.61
Harbour - Lower Simcoe to York	2	2	0	0	4	1	14,922	5,446,704	0.18
Harbour - York to Bay	3	2	8	6	19	5	22,373	8,166,145	0.58
Harbour & Bay	11	15	19	9	54	14	38,781	14,155,173	0.95
Harbour & York	12	9	8	2	31	8	31,831	11,618,245	0.67
Harbour & LakeShore / Yonge	20	19	21	12	72	18	56,633	20,670,880	0.87
LakeShore & Bay	47	40	24	24	135	34	38,033	13,882,029	2.43
LakeShore & Lower Simcoe	5	6	10	3	24	6	30,315	11,064,794	0.54
LakeShore & Lower Spadina	20	17	13	7	57	14	62,042	22,645,329	0.63
LakeShore & Rees	23	7	15	18	63	16	49,867	18,201,360	0.87
LakeShore & York	14	21	21	29	85	21	30,656	11,189,431	1.90
LakeShore EB - Lower Spadina to Rees	2	4	1	1	8	2	26,142	9,541,830	0.21
LakeShore EB - Rees to Lower Simcoe	4	0	2	0	6	2	20,765	7,579,244	0.20
LakeShore WB - Bay to York	2	2	2	1	7	2	25,339	9,248,735	0.19
LakeShore WB - Lower Simcoe to Rees	2	2	0	0	4	1	16,732	6,107,233	0.16
LakeShore WB - Rees to Spadina	2	0	1	0	3	1	35,850	13,085,250	0.06
LakeShore WB - Yonge to Bay	1	1	3	1	6	2	20,730	7,566,351	0.20
LakeShore WB - York to Lower Simcoe	0	0	4	1	5	1	21,020	7,672,300	0.16
Queen's Quay - Bay Harbour Sq. to Yonge	2	4	0	2	8	2	16,496	6,021,040	0.33
Queen's Quay - Lower Simcoe to York	8	8	8	8	32	8	15,969	5,828,685	1.37
Queen's Quay - Lower Spadina to Rees	9	10	9	16	44	11	11,742	4,285,830	2.57
Queen's Quay - Robertson (E) to Lower Simcoe	5	0	2	2	9	2	11,845	4,323,425	0.52
Queen's Quay - York to Bay Harbour Sq.	7	3	6	6	22	6	15,868	5,791,820	0.95
Queen's Quay & Bay Harbour Sq.	4	8	4	2	18	5	19,689	7,186,363	0.63
Queen's Quay & Lower Simcoe	3	4	8	4	19	5	12,519	4,569,403	1.04
Queen's Quay & Lower Spadina	1	1	5	1	8	2	15,384	5,615,274	0.36
Queen's Quay & Rees - Robertson (W)	5	1	2	2	10	3	15,215	5,553,618	0.45
Queen's Quay & Robertson (E)	0	1	1	0	2	1	11,845	4,323,425	0.12
Queen's Quay & Yonge	6	6	7	2	21	5	18,406	6,718,233	0.78
Queen's Quay & York	5	9	10	8	32	8	18,125	6,615,473	1.21
Total	231	204	217	175	827			Average:	**0.72**
Average per Intersection	6	5	5	4	20			85th %ile	**1.15**

Note: 2007 figure interpolated from data gathered up to end of June based on previous monthly trends

Location of Collision sites over 85th %ile	Number of collisions (2004-2007)	Collisions per million vehicles	Class of Collision (%) Turning Movement	Sideswipe	Angle	Rear End	Other	Direction of travel (%) Northbound	Southbound	Eastbound	Westbound	Control Device (%) Traffic Signal	No Control
Lake Shore Boulevard& York Street	85	1.90	28	13	21	32	6	27	18	7	37	76	24
Lake Shore Boulevard & Bay Street	135	2.43	25	20	25	25	5	16	20	16	48	95	5
Queens Quay & York Street	32	1.21	16	18	4	36	26	6	11	30	52	93	7
Queens Quay - Lower Simcoe to York Street	32	1.37	50	18	-	-	32	2	2	30	66	-	100
Queens Quay - Lower Spadina to Rees Street	44	2.57	60	-	-	-	40	5	5	58	32	-	100

Appendix C

Synchro Worksheets

C1 Existing

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	535	190	120	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.75	1.00	0.87
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1530	1626	1610	1050	1487	1208
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1530	1626	1610	1050	1487	1208
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	594	211	133	133	67
RTOR Reduction (vph)	0	0	0	101	0	51
Lane Group Flow (vph)	78	594	211	32	133	16
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	5%	4%	5%	3%	8%	4%
Turn Type	Prot			custom		Perm
Protected Phases	5	2 5 23	6 23		4	
Permitted Phases				6		4
Actuated Green, G (s)	14.1	83.3	62.2	36.4	35.4	35.4
Effective Green, g (s)	14.1	83.3	62.2	36.4	35.4	35.4
Actuated g/C Ratio	0.09	0.55	0.41	0.24	0.23	0.23
Clearance Time (s)	7.0			7.0	7.0	7.0
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Lane Grp Cap (vph)	142	893	660	252	347	282
v/s Ratio Prot	0.05	c0.37	0.13		c0.09	
v/s Ratio Perm				0.03		0.01
v/c Ratio	0.55	0.67	0.32	0.13	0.38	0.06
Uniform Delay, d1	65.8	24.3	30.4	45.2	49.0	45.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.3	1.9	0.3	1.0	3.2	0.4
Delay (s)	70.1	26.2	30.7	46.2	52.1	45.5
Level of Service	E	C	C	D	D	D
Approach Delay (s)		31.3	36.7		49.9	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	151.7	Sum of lost time (s)	33.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	625	245	5	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1610	3082			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1610	3082			1463
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	694	272	6	0	50
RTOR Reduction (vph)	0	0	1	0	0	31
Lane Group Flow (vph)	28	694	277	0	0	19
Heavy Vehicles (%)	0%	5%	4%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	9	2 7 9 10	6			7 9 10
Permitted Phases						
Actuated Green, G (s)	9.9	108.6	46.5			49.1
Effective Green, g (s)	9.9	96.6	46.5			42.1
Actuated g/C Ratio	0.09	0.89	0.43			0.39
Clearance Time (s)	7.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	146	1432	1320			567
v/s Ratio Prot	0.02	c0.43	0.09			0.01
v/s Ratio Perm						
v/c Ratio	0.19	0.48	0.21			0.03
Uniform Delay, d1	45.6	1.2	19.5			20.6
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.6	0.3	0.4			0.0
Delay (s)	46.3	1.4	19.9			20.7
Level of Service	D	A	B			C
Approach Delay (s)		3.2	19.9		20.7	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	42.4%	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												
Volume (vph)	85	540	15	20	215	75	10	15	10	45	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			0.96			0.98			1.00	0.96
Flpb, ped/bikes	0.90	1.00			1.00			0.99			0.95	1.00
Frt	1.00	1.00			0.96			0.96			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99			0.96	1.00
Satd. Flow (prot)	1433	3040			2784			1412			1321	1375
Flt Permitted	0.55	1.00			0.89			0.92			0.74	1.00
Satd. Flow (perm)	822	3040			2495			1313			1015	1375
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	600	17	22	239	83	11	17	11	50	11	56
RTOR Reduction (vph)	0	2	0	0	25	0	0	9	0	0	0	44
Lane Group Flow (vph)	94	615	0	0	319	0	0	30	0	0	61	12
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	5%	0%	10%	5%	8%	15%	7%	10%	20%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	35.3	35.3			35.3			17.0			17.0	17.0
Effective Green, g (s)	35.3	35.3			35.3			17.0			17.0	17.0
Actuated g/C Ratio	0.43	0.43			0.43			0.21			0.21	0.21
Clearance Time (s)	7.0	7.0			7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	353	1304			1070			271			210	284
v/s Ratio Prot		c0.20										
v/s Ratio Perm	0.11				0.13			0.02			c0.06	0.01
v/c Ratio	0.27	0.47			0.30			0.11			0.29	0.04
Uniform Delay, d1	15.2	16.8			15.4			26.5			27.6	26.1
Progression Factor	1.00	1.00			1.00			0.67			1.00	1.00
Incremental Delay, d2	1.8	1.2			0.7			0.2			0.8	0.1
Delay (s)	17.0	18.1			16.1			18.0			28.3	26.2
Level of Service	B	B			B			B			C	C
Approach Delay (s)		17.9			16.1			18.0			27.3	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	82.3	Sum of lost time (s)	30.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			

c Critical Lane Group

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	40	535	60	295	25	50	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99		1.00	0.96
Flpb, ped/bikes	0.92	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1423	3060	1530	2892		1575	1379
Flt Permitted	0.54	1.00	0.38	1.00		0.95	1.00
Satd. Flow (perm)	807	3060	615	2892		1575	1379
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	594	67	328	28	56	28
RTOR Reduction (vph)	0	0	0	5	0	0	22
Lane Group Flow (vph)	44	594	67	351	0	56	6
Confl. Peds. (#/hr)	140				140	100	30
Heavy Vehicles (%)	4%	5%	5%	9%	4%	2%	0%
Turn Type	Perm		Perm				Perm
Protected Phases		2		6		4	
Permitted Phases	2		6				4
Actuated Green, G (s)	41.0	41.0	41.0	41.0		21.5	21.5
Effective Green, g (s)	41.0	41.0	41.0	41.0		21.5	21.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43		0.23	0.23
Clearance Time (s)	7.0	7.0	7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	348	1319	265	1247		356	312
v/s Ratio Prot		c0.19		0.12		c0.04	
v/s Ratio Perm	0.05		0.11				0.00
v/c Ratio	0.13	0.45	0.25	0.28		0.16	0.02
Uniform Delay, d1	16.3	19.1	17.3	17.5		29.5	28.6
Progression Factor	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.7	1.1	2.3	0.6		0.2	0.0
Delay (s)	17.0	20.2	19.6	18.1		29.7	28.6
Level of Service	B	C	B	B		C	C
Approach Delay (s)		20.0		18.3		29.4	
Approach LOS		B		B		C	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	32.6
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	480	20	15	350	140	20	40	10	110	10	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			0.91			0.99		1.00	1.00	0.61
Flpb, ped/bikes	0.98	1.00			1.00			0.89		0.92	1.00	1.00
Frt	1.00	0.99			0.96			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1464	2943			2648			1437		1415	1691	871
Flt Permitted	0.27	1.00			0.92			0.93		0.71	1.00	1.00
Satd. Flow (perm)	422	2943			2450			1352		1053	1691	871
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	533	22	17	389	156	22	44	11	122	11	100
RTOR Reduction (vph)	0	2	0	0	33	0	0	5	0	0	0	72
Lane Group Flow (vph)	122	553	0	0	529	0	0	72	0	122	11	28
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	7%	7%	6%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	40.8	40.8			28.1			28.6		28.6	28.6	28.6
Effective Green, g (s)	40.8	40.8			28.1			28.6		28.6	28.6	28.6
Actuated g/C Ratio	0.40	0.40			0.27			0.28		0.28	0.28	0.28
Clearance Time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	247	1175			674			378		295	473	244
v/s Ratio Prot	0.04	c0.19									0.01	
v/s Ratio Perm	0.16				c0.22			0.05		c0.12		0.03
v/c Ratio	0.49	0.47			0.78			0.19		0.41	0.02	0.11
Uniform Delay, d1	21.1	22.7			34.2			28.0		30.0	26.7	27.4
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	1.4			8.9			1.1		4.2	0.1	1.0
Delay (s)	22.6	24.1			43.1			29.1		34.2	26.8	28.3
Level of Service	C	C			D			C		C	C	C
Approach Delay (s)		23.8			43.1			29.1			31.3	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	32.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	39.8
Intersection Capacity Utilization	85.0%	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												
Volume (vph)	20	570	10	15	455	75	45	0	30	0	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			0.98			0.99			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			1.00	
Frt		1.00			0.98			0.95			0.86	
Flt Protected		1.00			1.00			0.97			1.00	
Satd. Flow (prot)		3008			2918			1507			1429	
Flt Permitted		0.92			0.93			0.81			1.00	
Satd. Flow (perm)		2773			2706			1256			1429	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	22	633	11	17	506	83	50	0	33	0	0	11
RTOR Reduction (vph)	0	1	0	0	9	0	0	23	0	0	10	0
Lane Group Flow (vph)	0	665	0	0	597	0	0	60	0	0	1	0
Confl. Peds. (#/hr)	85		185	185		85	10		15	15		10
Heavy Vehicles (%)	0%	6%	0%	13%	6%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		50.3			50.3			9.3			9.3	
Effective Green, g (s)		50.3			50.3			9.3			9.3	
Actuated g/C Ratio		0.50			0.50			0.09			0.09	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1373			1340			115			131	
v/s Ratio Prot											0.00	
v/s Ratio Perm		c0.24			0.22			c0.05				
v/c Ratio		0.48			0.45			0.52			0.01	
Uniform Delay, d1		17.0			16.6			44.0			42.0	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.2			1.1			4.3			0.0	
Delay (s)		18.3			17.7			48.3			42.0	
Level of Service		B			B			D			D	
Approach Delay (s)		18.3			17.7			48.3			42.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	42.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	475	20	50	490	120	5	65	50	90	10	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.97			0.90			1.00	0.82
Flpb, ped/bikes	0.99	1.00		0.89	1.00			0.99			0.83	1.00
Frt	1.00	0.99		1.00	0.97			0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	1.00
Satd. Flow (prot)	1554	2961		1423	2854			1426			1301	1174
Flt Permitted	0.30	1.00		0.45	1.00			0.99			0.70	1.00
Satd. Flow (perm)	485	2961		668	2854			1410			958	1174
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	528	22	56	544	133	6	72	56	100	11	194
RTOR Reduction (vph)	0	3	0	0	21	0	0	33	0	0	0	144
Lane Group Flow (vph)	117	547	0	56	656	0	0	101	0	0	111	50
Confl. Peds. (#/hr)	180		165	165		180	200		275	275		200
Heavy Vehicles (%)	2%	7%	0%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	45.7	45.7		33.6	33.6			20.7			20.7	20.7
Effective Green, g (s)	45.7	45.7		33.6	33.6			20.7			20.7	20.7
Actuated g/C Ratio	0.57	0.57		0.42	0.42			0.26			0.26	0.26
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	370	1683		279	1193			363			247	302
v/s Ratio Prot	0.03	c0.18			c0.23							
v/s Ratio Perm	0.15			0.08				0.07			c0.12	0.04
v/c Ratio	0.32	0.33		0.20	0.55			0.28			0.45	0.17
Uniform Delay, d1	8.8	9.2		14.9	17.7			23.9			25.1	23.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.5	0.5		1.6	1.8			0.4			1.3	0.3
Delay (s)	9.3	9.7		16.5	19.5			24.3			26.4	23.4
Level of Service	A	A		B	B			C			C	C
Approach Delay (s)		9.6			19.3			24.3			24.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	90	475	515	70	165	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.94
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1515	3031	2935		1545	1312
Flt Permitted	0.37	1.00	1.00		0.95	1.00
Satd. Flow (perm)	596	3031	2935		1545	1312
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	100	528	572	78	183	206
RTOR Reduction (vph)	0	0	13	0	0	108
Lane Group Flow (vph)	100	528	637	0	183	98
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	4%	6%	6%	12%	4%	3%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	41.0	41.0	41.0		27.0	27.0
Effective Green, g (s)	41.0	41.0	41.0		27.0	27.0
Actuated g/C Ratio	0.51	0.51	0.51		0.34	0.34
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	305	1553	1504		521	443
v/s Ratio Prot		0.17	c0.22		c0.12	
v/s Ratio Perm	0.17					0.07
v/c Ratio	0.33	0.34	0.42		0.35	0.22
Uniform Delay, d1	11.4	11.5	12.1		19.9	19.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.6	0.9		1.9	1.2
Delay (s)	14.3	12.1	13.0		21.8	20.1
Level of Service	B	B	B		C	C
Approach Delay (s)		12.5	13.0		20.9	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	420	420	160	100	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.69	1.00	0.92
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1606	1642	1674	985	1545	1300
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1606	1642	1674	985	1545	1300
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	442	442	168	105	100
RTOR Reduction (vph)	0	0	0	88	0	77
Lane Group Flow (vph)	74	442	442	80	105	23
Confl. Peds. (#/hr)	243			243	38	27
Heavy Vehicles (%)	0%	3%	1%	1%	4%	2%
Turn Type	Prot			Perm		Perm
Protected Phases	5	2 5 23	6 23		4	
Permitted Phases				6 23		4
Actuated Green, G (s)	14.1	84.6	63.5	63.5	35.3	35.3
Effective Green, g (s)	14.1	84.6	63.5	63.5	35.3	35.3
Actuated g/C Ratio	0.09	0.55	0.42	0.42	0.23	0.23
Clearance Time (s)	7.0				7.0	7.0
Vehicle Extension (s)	3.0				3.0	3.0
Lane Grp Cap (vph)	148	909	695	409	357	300
v/s Ratio Prot	0.05	c0.27	c0.26		c0.07	
v/s Ratio Perm				0.08		0.02
v/c Ratio	0.50	0.49	0.64	0.19	0.29	0.08
Uniform Delay, d1	66.0	20.9	35.5	28.4	48.5	46.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	0.4	1.9	0.2	2.1	0.5
Delay (s)	68.7	21.3	37.4	28.7	50.6	46.5
Level of Service	E	C	D	C	D	D
Approach Delay (s)		28.1	35.0		48.6	
Approach LOS		C	D		D	

Intersection Summary			
HCM Average Control Delay	34.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	152.9	Sum of lost time (s)	40.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	475	540	25	0	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	0.99			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1642	3132			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1642	3132			1463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	500	568	26	0	37
RTOR Reduction (vph)	0	0	3	0	0	25
Lane Group Flow (vph)	47	500	591	0	0	12
Heavy Vehicles (%)	0%	3%	2%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	9	2 7 9 10	6			7 9 10
Permitted Phases						
Actuated Green, G (s)	9.2	100.8	46.8			41.0
Effective Green, g (s)	9.2	88.8	46.8			34.0
Actuated g/C Ratio	0.09	0.88	0.46			0.34
Clearance Time (s)	7.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	147	1447	1454			493
v/s Ratio Prot	0.03	c0.30	c0.19			0.01
v/s Ratio Perm						
v/c Ratio	0.32	0.35	0.41			0.03
Uniform Delay, d1	42.9	1.0	17.8			22.3
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.3	0.1	0.8			0.0
Delay (s)	44.1	1.2	18.7			22.3
Level of Service	D	A	B			C
Approach Delay (s)		4.9	18.7		22.3	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	35.0%	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												
Volume (vph)	110	350	10	30	455	65	15	25	15	50	15	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00			0.97			0.97			1.00	0.92
Flpb, ped/bikes	0.89	1.00			1.00			0.98			0.94	1.00
Frt	1.00	1.00			0.98			0.96			1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99			0.96	1.00
Satd. Flow (prot)	1420	3013			2991			1533			1437	1318
Flt Permitted	0.40	1.00			0.91			0.91			0.74	1.00
Satd. Flow (perm)	598	3013			2734			1413			1101	1318
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)	116	368	11	32	479	68	16	26	16	53	16	111
RTOR Reduction (vph)	0	2	0	0	9	0	0	13	0	0	0	87
Lane Group Flow (vph)	116	377	0	0	570	0	0	45	0	0	69	24
Confl. Peds. (#/hr)	184		40	40		184	82		101	101		82
Heavy Vehicles (%)	1%	6%	0%	0%	2%	0%	0%	0%	0%	8%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	32.8	32.8			32.8			16.9			16.9	16.9
Effective Green, g (s)	32.8	32.8			32.8			16.9			16.9	16.9
Actuated g/C Ratio	0.41	0.41			0.41			0.21			0.21	0.21
Clearance Time (s)	7.0	7.0			7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	246	1240			1125			300			233	279
v/s Ratio Prot		0.13										
v/s Ratio Perm	0.19				c0.21			0.03			c0.06	0.02
v/c Ratio	0.47	0.30			0.51			0.15			0.30	0.08
Uniform Delay, d1	17.1	15.8			17.4			25.6			26.4	25.2
Progression Factor	1.00	1.00			1.00			0.92			1.00	1.00
Incremental Delay, d2	6.4	0.6			1.6			0.2			0.7	0.1
Delay (s)	23.5	16.4			19.1			23.8			27.1	25.3
Level of Service	C	B			B			C			C	C
Approach Delay (s)		18.1			19.1			23.8			26.0	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	30.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			

c Critical Lane Group

Movement	EBL	EBT	WBU	WBT	WBR	SBL	SBR
Lane Configurations							
Volume (vph)	40	390	50	525	70	55	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	0.95	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.99		1.00	0.96
Flpb, ped/bikes	0.96	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1494	3060	1606	3057		1530	1346
Flt Permitted	0.40	1.00	0.51	1.00		0.95	1.00
Satd. Flow (perm)	624	3060	864	3057		1530	1346
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	411	53	553	74	58	32
RTOR Reduction (vph)	0	0	0	7	0	0	29
Lane Group Flow (vph)	42	411	53	620	0	58	3
Confl. Peds. (#/hr)	138				138	101	30
Heavy Vehicles (%)	3%	5%	0%	2%	1%	5%	3%
Turn Type	Perm		Perm				Perm
Protected Phases		2		6		4	
Permitted Phases	2		6				4
Actuated Green, G (s)	38.4	38.4	38.4	38.4		8.2	8.2
Effective Green, g (s)	38.4	38.4	38.4	38.4		8.2	8.2
Actuated g/C Ratio	0.50	0.50	0.50	0.50		0.11	0.11
Clearance Time (s)	7.0	7.0	7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	312	1530	432	1529		163	144
v/s Ratio Prot		0.13		c0.20		c0.04	
v/s Ratio Perm	0.07		0.06				0.00
v/c Ratio	0.13	0.27	0.12	0.41		0.36	0.02
Uniform Delay, d1	10.3	11.1	10.2	12.0		31.8	30.7
Progression Factor	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.9	0.4	0.6	0.8		1.3	0.1
Delay (s)	11.2	11.5	10.8	12.8		33.2	30.8
Level of Service	B	B	B	B		C	C
Approach Delay (s)		11.5		12.7		32.3	
Approach LOS		B		B		C	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	76.8	Sum of lost time (s)	30.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	425	15	5	570	170	10	15	15	60	20	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98			0.92			0.96		1.00	1.00	0.63
Flpb, ped/bikes	0.99	1.00			1.00			0.91		0.91	1.00	1.00
Frt	1.00	0.99			0.97			0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1593	2991			2817			1386		1420	1691	908
Flt Permitted	0.16	1.00			0.95			0.94		0.73	1.00	1.00
Satd. Flow (perm)	274	2991			2681			1326		1090	1691	908
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)	79	447	16	5	600	179	11	16	16	63	21	105
RTOR Reduction (vph)	0	2	0	0	22	0	0	12	0	0	0	76
Lane Group Flow (vph)	79	461	0	0	762	0	0	31	0	63	21	29
Confl. Peds. (#/hr)	170		333	333		170	559		86	86		559
Heavy Vehicles (%)	0%	5%	0%	0%	1%	0%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	41.9	41.9			31.1			28.6		28.6	28.6	28.6
Effective Green, g (s)	41.9	41.9			31.1			28.6		28.6	28.6	28.6
Actuated g/C Ratio	0.41	0.41			0.30			0.28		0.28	0.28	0.28
Clearance Time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	185	1213			807			367		302	468	251
v/s Ratio Prot	0.02	c0.15									0.01	
v/s Ratio Perm	0.15				c0.28			0.02		c0.06		0.03
v/c Ratio	0.43	0.38			0.94			0.09		0.21	0.04	0.12
Uniform Delay, d1	21.3	21.6			35.2			27.7		28.7	27.3	27.9
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	0.9			20.6			0.5		1.6	0.2	0.9
Delay (s)	22.9	22.5			55.9			28.1		30.2	27.5	28.8
Level of Service	C	C			E			C		C	C	C
Approach Delay (s)		22.5			55.9			28.1			29.2	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	103.3	Sum of lost time (s)	39.8
Intersection Capacity Utilization	89.6%	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												
Volume (vph)	5	475	20	20	675	5	10	0	20	40	0	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.98			0.98	
Flpb, ped/bikes		1.00			1.00			0.99			0.99	
Frt		0.99			1.00			0.91			0.93	
Flt Protected		1.00			1.00			0.98			0.98	
Satd. Flow (prot)		2996			3163			1474			1490	
Flt Permitted		0.95			0.93			0.90			0.84	
Satd. Flow (perm)		2843			2941			1344			1278	
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)	5	500	21	21	711	5	11	0	21	42	0	47
RTOR Reduction (vph)	0	2	0	0	0	0	0	17	0	0	35	0
Lane Group Flow (vph)	0	524	0	0	737	0	0	15	0	0	54	0
Confl. Peds. (#/hr)	143		109	109		143	24		14	14		24
Heavy Vehicles (%)	0%	6%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		55.9			55.9			20.6			20.6	
Effective Green, g (s)		55.9			55.9			20.6			20.6	
Actuated g/C Ratio		0.51			0.51			0.19			0.19	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1457			1507			254			241	
v/s Ratio Prot												
v/s Ratio Perm		0.18			c0.25			0.01			c0.04	
v/c Ratio		0.36			0.49			0.06			0.22	
Uniform Delay, d1		15.9			17.3			36.3			37.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.7			1.1			0.1			0.5	
Delay (s)		16.6			18.4			36.4			38.0	
Level of Service		B			B			D			D	
Approach Delay (s)		16.6			18.4			36.4			38.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	109.1	Sum of lost time (s)	32.6
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	105	480	0	50	530	115	5	20	30	115	30	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.92			1.00	0.81
Flpb, ped/bikes	0.99	1.00		0.90	1.00			0.99			0.91	1.00
Frt	1.00	1.00		1.00	0.97			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	1.00
Satd. Flow (prot)	1578	3060		1443	3016			1421			1428	1167
Flt Permitted	0.27	1.00		0.47	1.00			0.98			0.73	1.00
Satd. Flow (perm)	450	3060		708	3016			1395			1087	1167
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)	111	505	0	53	558	121	5	21	32	121	32	111
RTOR Reduction (vph)	0	0	0	0	20	0	0	21	0	0	0	74
Lane Group Flow (vph)	111	505	0	53	659	0	0	37	0	0	153	37
Confl. Peds. (#/hr)	118		126	126		118	197		142	142		197
Heavy Vehicles (%)	1%	5%	0%	0%	1%	3%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	45.0	45.0		32.6	32.6			29.0			29.0	29.0
Effective Green, g (s)	45.0	45.0		32.6	32.6			29.0			29.0	29.0
Actuated g/C Ratio	0.51	0.51		0.37	0.37			0.33			0.33	0.33
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	325	1565		262	1117			460			358	385
v/s Ratio Prot	0.03	c0.17			c0.22							
v/s Ratio Perm	0.15			0.07				0.03			c0.14	0.03
v/c Ratio	0.34	0.32		0.20	0.59			0.08			0.43	0.10
Uniform Delay, d1	12.2	12.6		18.9	22.3			20.3			23.0	20.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.6	0.5		1.7	2.3			0.3			3.7	0.5
Delay (s)	12.9	13.1		20.6	24.6			20.6			26.7	20.9
Level of Service	B	B		C	C			C			C	C
Approach Delay (s)		13.1			24.3			20.6			24.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	88.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	90	500	455	145	145	275
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.95
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1521	3031	2961		1516	1359
Flt Permitted	0.38	1.00	1.00		0.95	1.00
Satd. Flow (perm)	614	3031	2961		1516	1359
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	526	479	153	153	289
RTOR Reduction (vph)	0	0	38	0	0	123
Lane Group Flow (vph)	95	526	594	0	153	166
Confl. Peds. (#/hr)	106			106	42	49
Heavy Vehicles (%)	3%	6%	2%	5%	6%	0%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	41.0	41.0	41.0		27.0	27.0
Effective Green, g (s)	41.0	41.0	41.0		27.0	27.0
Actuated g/C Ratio	0.51	0.51	0.51		0.34	0.34
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	315	1553	1518		512	459
v/s Ratio Prot		0.17	c0.20		0.10	
v/s Ratio Perm	0.15					c0.12
v/c Ratio	0.30	0.34	0.39		0.30	0.36
Uniform Delay, d1	11.2	11.5	11.9		19.5	20.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.6	0.8		1.5	2.2
Delay (s)	13.7	12.1	12.7		21.0	22.2
Level of Service	B	B	B		C	C
Approach Delay (s)		12.3	12.7		21.8	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1460	2460	65	0	0	0	0	125	35	165	55	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.97		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4911						3257		1767	3433	
Flt Permitted	0.95	1.00						1.00		0.47	1.00	
Satd. Flow (perm)	3395	4911						3257		879	3433	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1505	2536	67	0	0	0	0	139	39	183	61	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	1505	2601	0	0	0	0	0	160	0	183	61	0
Confl. Peds. (#/hr)			20									
Heavy Vehicles (%)	2%	4%	3%	0%	0%	0%	0%	6%	6%	1%	4%	0%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	92.5	92.5						17.0		37.5	37.5	
Effective Green, g (s)	92.5	92.5						17.0		37.5	37.5	
Actuated g/C Ratio	0.64	0.64						0.12		0.26	0.26	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	2181	3155						385		318	894	
v/s Ratio Prot	0.44	c0.53						0.05		c0.06	0.02	
v/s Ratio Perm										c0.09		
v/c Ratio	0.69	0.82						0.42		0.58	0.07	
Uniform Delay, d1	16.5	19.6						58.9		44.1	40.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.8	2.6						0.7		2.5	0.0	
Delay (s)	18.4	22.2						59.6		46.6	40.1	
Level of Service	B	C						E		D	D	
Approach Delay (s)		20.8			0.0			59.6			45.0	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	144.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	120.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	470	2185	15	10	620	135	10	65	100	190	30	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			8.0			8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	0.76			0.95			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97			0.94			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			0.93	1.00
Frt	1.00	1.00		1.00	0.85			0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	1.00
Satd. Flow (prot)	3330	4970		1785	3476			2975			3126	1566
Flt Permitted	0.95	1.00		0.95	1.00			0.93			0.66	1.00
Satd. Flow (perm)	3330	4970		1785	3476			2765			2154	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	485	2253	15	11	681	148	11	72	111	211	33	11
RTOR Reduction (vph)	0	0	0	0	24	0	0	84	0	0	0	8
Lane Group Flow (vph)	485	2268	0	11	805	0	0	110	0	0	244	3
Confl. Peds. (#/hr)	5		40	40		5			80	80		
Heavy Vehicles (%)	4%	3%	13%	0%	2%	2%	2%	5%	1%	2%	4%	2%
Turn Type	Prot			Prot	custom		Perm			Perm		Perm
Protected Phases	5	2		1				8			4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	26.8	60.6		4.4	38.2			27.0			27.0	27.0
Effective Green, g (s)	26.8	60.6		4.4	38.2			27.0			27.0	27.0
Actuated g/C Ratio	0.24	0.54		0.04	0.34			0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0			8.0			8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	797	2689		70	1186			667			519	378
v/s Ratio Prot	c0.15	c0.46		0.01								
v/s Ratio Perm					0.23			0.04			c0.11	0.00
v/c Ratio	0.61	0.84		0.16	0.68			0.16			0.47	0.01
Uniform Delay, d1	37.9	21.7		52.0	31.6			33.6			36.4	32.3
Progression Factor	1.00	1.00		1.15	0.30			1.00			1.00	1.00
Incremental Delay, d2	1.3	3.4		1.0	2.9			0.1			0.7	0.0
Delay (s)	39.3	25.1		61.0	12.5			33.7			37.1	32.3
Level of Service	D	C		E	B			C			D	C
Approach Delay (s)		27.6						33.7			36.8	
Approach LOS		C						C			D	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	60	1090	60	35	45	20	5	5	5	730	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.95		0.97	
Flpb, ped/bikes	1.00	1.00		0.92	1.00		0.97	1.00		1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.93		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1653	3406		1590	1710		1734	1299		3950	
Flt Permitted	0.95	1.00		0.75	1.00		0.71	1.00		1.00	
Satd. Flow (perm)	1653	3406		1255	1710		1296	1299		3950	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91
Adj. Flow (vph)	64	1160	64	39	50	22	6	6	6	802	82
RTOR Reduction (vph)	0	4	0	0	14	0	0	4	0	9	0
Lane Group Flow (vph)	64	1220	0	39	58	0	6	8	0	875	0
Confl. Peds. (#/hr)	5		10	80		30	30		80		5
Heavy Vehicles (%)	8%	4%	2%	3%	5%	0%	0%	15%	40%	6%	3%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	5.6	67.0		32.0	32.0		32.0	32.0		55.4	
Effective Green, g (s)	5.6	67.0		32.0	32.0		32.0	32.0		55.4	
Actuated g/C Ratio	0.05	0.60		0.29	0.29		0.29	0.29		0.49	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	83	2038		359	489		370	371		1954	
v/s Ratio Prot	0.04	c0.36			c0.03			0.01			
v/s Ratio Perm				0.03			0.00			0.22	
v/c Ratio	0.77	0.60		0.11	0.12		0.02	0.02		0.45	
Uniform Delay, d1	52.6	14.1		29.5	29.6		28.7	28.7		18.4	
Progression Factor	0.78	1.20		1.00	1.00		1.00	1.00		0.22	
Incremental Delay, d2	25.7	0.9		0.1	0.1		0.0	0.0		0.6	
Delay (s)	66.8	17.8		29.6	29.7		28.7	28.8		4.7	
Level of Service	E	B		C	C		C	C		A	
Approach Delay (s)		20.3			29.7			28.8			
Approach LOS		C			C			C			

Intersection Summary			
HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	45	785	495	440	90	775	235	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			8.0	8.0	
Lane Util. Factor		0.94	0.95			0.95	0.95	
Frpb, ped/bikes		1.00	0.97			1.00	1.00	
Flpb, ped/bikes		0.89	1.00			1.00	1.00	
Frt		1.00	0.93			1.00	0.89	
Flt Protected		0.95	1.00			0.99	1.00	
Satd. Flow (prot)		4214	3125			3354	3042	
Flt Permitted		0.95	1.00			0.64	1.00	
Satd. Flow (perm)		4214	3125			2173	3042	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	826	521	463	100	861	261	633
RTOR Reduction (vph)	0	0	88	0	0	0	163	0
Lane Group Flow (vph)	0	873	896	0	0	961	731	0
Confl. Peds. (#/hr)	70			45				
Heavy Vehicles (%)	14%	6%	4%	3%	5%	6%	7%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		40.0	40.0			58.0	58.0	
Effective Green, g (s)		40.0	40.0			58.0	58.0	
Actuated g/C Ratio		0.36	0.36			0.52	0.52	
Clearance Time (s)		6.0	6.0			8.0	8.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		1505	1116			1125	1575	
v/s Ratio Prot			c0.29				0.24	
v/s Ratio Perm		0.21				c0.44		
v/c Ratio		0.58	0.80			0.85	0.46	
Uniform Delay, d1		29.2	32.4			23.3	17.1	
Progression Factor		0.24	0.14			0.54	1.00	
Incremental Delay, d2		1.1	4.1			4.8	0.2	
Delay (s)		8.0	8.7			17.4	17.4	
Level of Service		A	A			B	B	
Approach Delay (s)			8.4			17.4	17.4	
Approach LOS			A			B	B	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	97.3%	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												
Volume (vph)	0	0	0	60	1410	115	95	655	0	0	165	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.61	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6058		1022	3400			1634	2703
Flt Permitted					1.00		0.61	1.00			1.00	1.00
Satd. Flow (perm)					6058		658	3400			1634	2703
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	63	1484	121	106	728	0	0	183	261
RTOR Reduction (vph)	0	0	0	0	11	0	0	0	0	0	0	189
Lane Group Flow (vph)	0	0	0	0	1657	0	106	728	0	0	183	72
Confl. Peds. (#/hr)				35		125	1405					1405
Heavy Vehicles (%)	0%	0%	0%	12%	4%	3%	6%	5%	0%	0%	15%	4%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					36.0		62.0	62.0			24.0	31.0
Effective Green, g (s)					36.0		62.0	62.0			24.0	31.0
Actuated g/C Ratio					0.32		0.55	0.55			0.21	0.28
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1947		364	1882			350	748
v/s Ratio Prot								c0.21			c0.11	0.03
v/s Ratio Perm					0.27		0.16					
v/c Ratio					0.85		0.29	0.39			0.52	0.10
Uniform Delay, d1					35.5		13.3	14.2			38.9	30.1
Progression Factor					0.43		0.42	0.41			1.00	1.00
Incremental Delay, d2					3.1		0.4	0.1			1.4	0.3
Delay (s)					18.5		6.0	6.0			40.3	30.4
Level of Service					B		A	A			D	C
Approach Delay (s)		0.0			18.5			6.0			34.5	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.7%	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												
Volume (vph)	0	0	0	100	1345	220	50	1125	0	0	130	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.80	
Flpb, ped/bikes					0.99		0.93	1.00			1.00	
Frt					0.98		1.00	1.00			0.91	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4723		1559	3433			2386	
Flt Permitted					1.00		0.46	1.00			1.00	
Satd. Flow (perm)					4723		755	3433			2386	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	105	1416	232	56	1250	0	0	144	233
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	0	0	1751	0	56	1250	0	0	318	0
Confl. Peds. (#/hr)				130		165	435		290	290		435
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	6%	4%	0%	0%	11%	8%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					48.2		49.8	49.8			41.0	
Effective Green, g (s)					48.2		49.8	49.8			41.0	
Actuated g/C Ratio					0.43		0.44	0.44			0.37	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2033		370	1526			873	
v/s Ratio Prot							0.01	c0.36			0.13	
v/s Ratio Perm					0.37		0.06					
v/c Ratio					0.86		0.15	0.82			0.36	
Uniform Delay, d1					28.9		18.1	27.2			26.0	
Progression Factor					1.00		0.42	0.41			1.00	
Incremental Delay, d2					5.1		0.1	2.8			0.3	
Delay (s)					33.9		7.8	14.0			26.2	
Level of Service					C		A	B			C	
Approach Delay (s)		0.0			33.9			13.7			26.2	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	148.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1075	35	0	0	0	0	860	0	130	180	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0			8.0	
Lane Util. Factor		0.91						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		1.00						1.00			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4852						3610			3243	
Flt Permitted		1.00						1.00			0.53	
Satd. Flow (perm)		4852						3610			1745	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1144	37	0	0	0	0	956	0	144	200	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1178	0	0	0	0	0	956	0	0	344	0
Confl. Peds. (#/hr)	30		30							55		
Heavy Vehicles (%)	17%	5%	8%	2%	2%	2%	0%	0%	0%	8%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		54.9						43.1			43.1	
Effective Green, g (s)		54.9						43.1			43.1	
Actuated g/C Ratio		0.49						0.38			0.38	
Clearance Time (s)		6.0						8.0			8.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2378						1389			672	
v/s Ratio Prot		c0.24						c0.26				
v/s Ratio Perm											0.20	
v/c Ratio		0.50						0.69			1.29dl	
Uniform Delay, d1		19.2						28.8			26.4	
Progression Factor		0.27						1.00			0.80	
Incremental Delay, d2		0.6						1.4			0.6	
Delay (s)		5.9						30.3			21.6	
Level of Service		A						C			C	
Approach Delay (s)		5.9			0.0			30.3			21.6	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	725	880	250	15	75	175	560	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.91		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.82	1.00	1.00	1.00
Frt	1.00	1.00	0.99		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1557	3206	4780		1372	3159	1566	1566
Flt Permitted	0.95	0.99	1.00		0.56	1.00	1.00	1.00
Satd. Flow (perm)	1557	3206	4780		815	3159	1566	1566
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.90	0.90	0.94	0.94
Adj. Flow (vph)	771	936	278	17	83	194	596	133
RTOR Reduction (vph)	0	0	6	0	0	0	0	79
Lane Group Flow (vph)	555	1152	289	0	83	194	596	54
Confl. Peds. (#/hr)	5			310	310			
Heavy Vehicles (%)	4%	6%	5%	0%	7%	13%	2%	2%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8!			4!		
Permitted Phases	2				4		8!	8
Actuated Green, G (s)	59.0	59.0	39.0		39.0	39.0	39.0	39.0
Effective Green, g (s)	59.0	59.0	39.0		39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.53	0.53	0.35		0.35	0.35	0.35	0.35
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	820	1689	1664		284	1100	545	545
v/s Ratio Prot			0.06			0.06		
v/s Ratio Perm	0.36	0.36			0.10		c0.38	0.03
v/c Ratio	0.68	0.68	0.17		0.29	0.18	1.09	0.10
Uniform Delay, d1	19.5	19.6	25.3		26.5	25.3	36.5	24.6
Progression Factor	0.36	0.36	1.00		1.42	1.43	1.00	1.00
Incremental Delay, d2	4.2	2.1	0.1		0.5	0.1	66.5	0.1
Delay (s)	11.2	9.2	25.4		38.2	36.2	103.0	24.7
Level of Service	B	A	C		D	D	F	C
Approach Delay (s)		9.8	25.4			36.8		
Approach LOS		A	C			D		

Intersection Summary			
HCM Average Control Delay	33.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	129.1%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	140	120	0	230	0	1045	460	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.99			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.93			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.97				
Satd. Flow (prot)		2997			3336		1562	3146				
Flt Permitted		1.00			1.00		0.95	0.97				
Satd. Flow (perm)		2997			3336		1562	3146				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	0	156	133	0	256	0	1112	489	0	0	0	0
RTOR Reduction (vph)	0	82	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	207	0	0	256	0	556	1045	0	0	0	0
Confl. Peds. (#/hr)			15									
Heavy Vehicles (%)	0%	12%	7%	0%	7%	0%	4%	8%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		43.0			43.0		55.0	55.0				
Effective Green, g (s)		43.0			43.0		55.0	55.0				
Actuated g/C Ratio		0.38			0.38		0.49	0.49				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		1151			1281		767	1545				
v/s Ratio Prot		0.07			c0.08							
v/s Ratio Perm							c0.36	0.33				
v/c Ratio		0.18			0.20		0.72	0.68				
Uniform Delay, d1		22.8			23.0		22.5	21.7				
Progression Factor		1.00			0.97		0.86	0.85				
Incremental Delay, d2		0.1			0.1		3.6	1.5				
Delay (s)		22.9			22.4		23.1	20.0				
Level of Service		C			C		C	B				
Approach Delay (s)		22.9			22.4			21.1			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	148.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	765	1845	155	0	0	0	0	205	25	280	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.99						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4936						3349		1750	3400	
Flt Permitted	0.95	1.00						1.00		0.44	1.00	
Satd. Flow (perm)	3395	4936						3349		808	3400	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	823	1984	167	0	0	0	0	216	26	295	42	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	823	2142	0	0	0	0	0	234	0	295	42	0
Confl. Peds. (#/hr)	1		60	60		1	15					15
Heavy Vehicles (%)	2%	2%	3%	0%	0%	0%	0%	5%	4%	2%	5%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	57.5	57.5						17.0		40.5	40.5	
Effective Green, g (s)	57.5	57.5						17.0		40.5	40.5	
Actuated g/C Ratio	0.51	0.51						0.15		0.36	0.36	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	1743	2534						508		439	1229	
v/s Ratio Prot	0.24	c0.43						0.07		c0.10	0.01	
v/s Ratio Perm										c0.14		
v/c Ratio	0.47	0.85						0.46		0.67	0.03	
Uniform Delay, d1	17.5	23.4						43.3		27.7	23.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	0.9	3.7						0.7		4.0	0.0	
Delay (s)	18.4	27.1						44.0		31.7	23.1	
Level of Service	B	C						D		C	C	
Approach Delay (s)		24.7			0.0			44.0			30.6	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	141.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	255	1865	30	25	1585	135	25	65	110	460	115	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			8.0		5.0	8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	*0.91			0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97			0.94		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98		0.96	1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3429	5015		1653	4868			2978		1687	1756	1277
Flt Permitted	0.95	1.00		0.95	1.00			0.90		0.52	1.00	1.00
Satd. Flow (perm)	3429	5015		1653	4868			2699		929	1756	1277
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	274	2005	32	26	1668	142	26	68	116	484	121	32
RTOR Reduction (vph)	0	1	0	0	9	0	0	88	0	0	0	19
Lane Group Flow (vph)	274	2036	0	26	1801	0	0	122	0	484	121	13
Confl. Peds. (#/hr)	5		25	25		5	135		85	85		135
Heavy Vehicles (%)	1%	2%	0%	8%	2%	5%	4%	0%	0%	2%	7%	3%
Turn Type	Prot			Prot	custom		Perm			pm+pt		Perm
Protected Phases	5	2		1				8		7	4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	11.4	42.4		3.6	34.6			27.0		46.0	46.0	46.0
Effective Green, g (s)	11.4	42.4		3.6	34.6			27.0		46.0	46.0	46.0
Actuated g/C Ratio	0.10	0.38		0.03	0.31			0.24		0.41	0.41	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0			8.0		5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	349	1899		53	1504			651		476	721	524
v/s Ratio Prot	c0.08	c0.41		0.02						c0.13	0.07	
v/s Ratio Perm					c0.37			0.05		c0.29		0.01
v/c Ratio	0.79	1.07		0.49	1.20			0.19		1.02	0.17	0.03
Uniform Delay, d1	49.1	34.8		53.3	38.7			33.8		31.2	20.9	19.6
Progression Factor	1.06	1.31		0.98	1.43			1.00		1.00	1.00	1.00
Incremental Delay, d2	6.3	38.9		3.4	92.2			0.1		45.5	0.1	0.0
Delay (s)	58.6	84.5		55.5	147.7			33.9		76.7	21.0	19.7
Level of Service	E	F		E	F			C		E	C	B
Approach Delay (s)		81.5						33.9			63.3	
Approach LOS		F						C			E	

Intersection Summary			
HCM Average Control Delay	101.0	HCM Level of Service	F
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	118.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	45	865	45	70	40	30	45	40	15	1660	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.95		0.96	
Flpb, ped/bikes	1.00	1.00		0.84	1.00		0.98	1.00		1.00	
Frt	1.00	0.99		1.00	0.94		1.00	0.96		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1750	3437		1491	1690		1660	1573		4026	
Flt Permitted	0.95	1.00		0.72	1.00		0.71	1.00		1.00	
Satd. Flow (perm)	1750	3437		1129	1690		1238	1573		4026	
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
Adj. Flow (vph)	47	911	47	74	42	32	47	42	16	1747	74
RTOR Reduction (vph)	0	3	0	0	23	0	0	11	0	3	0
Lane Group Flow (vph)	47	955	0	74	51	0	47	47	0	1818	0
Confl. Peds. (#/hr)	20		15	170		25	25		170		20
Heavy Vehicles (%)	2%	3%	3%	0%	4%	0%	5%	5%	18%	2%	5%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	5.6	67.0		32.0	32.0		32.0	32.0		55.4	
Effective Green, g (s)	5.6	67.0		32.0	32.0		32.0	32.0		55.4	
Actuated g/C Ratio	0.05	0.60		0.29	0.29		0.29	0.29		0.49	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	88	2056		323	483		354	449		1991	
v/s Ratio Prot	0.03	c0.28			0.03			0.03			
v/s Ratio Perm				c0.07			0.04			c0.45	
v/c Ratio	0.53	0.46		0.23	0.11		0.13	0.10		0.91	
Uniform Delay, d1	51.9	12.5		30.6	29.5		29.7	29.4		26.1	
Progression Factor	1.04	0.97		1.00	1.00		1.00	1.00		0.42	
Incremental Delay, d2	1.7	0.2		0.4	0.1		0.2	0.1		3.2	
Delay (s)	55.5	12.4		30.9	29.6		29.9	29.5		14.1	
Level of Service	E	B		C	C		C	C		B	
Approach Delay (s)		14.4			30.2			29.7			
Approach LOS		B			C			C			

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	40	1600	585	75	130	540	455	695
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		8.0	8.0	8.0	8.0
Lane Util. Factor		0.94	0.95		1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes		0.90	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.98		1.00	1.00	1.00	0.85
Flt Protected		0.95	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)		4448	3385		1750	1807	1824	1536
Flt Permitted		0.95	1.00		0.34	1.00	1.00	1.00
Satd. Flow (perm)		4448	3385		629	1807	1824	1536
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.95
Adj. Flow (vph)	43	1720	629	81	137	568	479	732
RTOR Reduction (vph)	0	0	9	0	0	0	0	93
Lane Group Flow (vph)	0	1763	701	0	137	568	479	639
Confl. Peds. (#/hr)	45							
Heavy Vehicles (%)	13%	1%	4%	1%	2%	4%	3%	4%
Turn Type	Perm	Split			Perm			Perm
Protected Phases		6	6			8	4	
Permitted Phases	6				8			4
Actuated Green, G (s)		49.0	49.0		49.0	49.0	49.0	49.0
Effective Green, g (s)		49.0	49.0		49.0	49.0	49.0	49.0
Actuated g/C Ratio		0.44	0.44		0.44	0.44	0.44	0.44
Clearance Time (s)		6.0	6.0		8.0	8.0	8.0	8.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		1946	1481		275	791	798	672
v/s Ratio Prot			0.21			0.31	0.26	
v/s Ratio Perm		0.40			0.22			c0.42
v/c Ratio		0.91	0.47		0.50	0.72	0.60	0.95
Uniform Delay, d1		29.4	22.3		22.7	25.8	24.0	30.3
Progression Factor		0.34	0.22		0.42	0.72	1.00	1.00
Incremental Delay, d2		5.0	0.7		1.1	2.4	1.3	23.3
Delay (s)		14.9	5.6		10.6	20.8	25.3	53.6
Level of Service		B	A		B	C	C	D
Approach Delay (s)			12.2			18.8	42.4	
Approach LOS			B			B	D	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.8%	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												
Volume (vph)	0	0	0	30	1800	100	75	445	0	0	295	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.73	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6137		1290	3336			1773	2729
Flt Permitted					1.00		0.45	1.00			1.00	1.00
Satd. Flow (perm)					6137		614	3336			1773	2729
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	32	1935	108	79	468	0	0	311	453
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	371
Lane Group Flow (vph)	0	0	0	0	2068	0	79	468	0	0	311	82
Confl. Peds. (#/hr)				30		135	1370		445			1370
Heavy Vehicles (%)	0%	0%	0%	4%	3%	5%	1%	7%	0%	0%	6%	3%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					45.0		53.0	53.0			25.7	20.3
Effective Green, g (s)					45.0		53.0	53.0			25.7	20.3
Actuated g/C Ratio					0.40		0.47	0.47			0.23	0.18
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2466		291	1579			407	495
v/s Ratio Prot								c0.14			c0.18	0.03
v/s Ratio Perm					0.34		0.13					
v/c Ratio					0.84		0.27	0.30			0.76	0.17
Uniform Delay, d1					30.2		17.8	18.1			40.3	38.7
Progression Factor					0.83		0.47	0.46			1.00	1.00
Incremental Delay, d2					2.6		0.4	0.1			8.3	0.7
Delay (s)					27.7		8.8	8.5			48.6	39.4
Level of Service					C		A	A			D	D
Approach Delay (s)		0.0			27.7			8.5			43.2	
Approach LOS		A			C			A			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	83.2%	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												
Volume (vph)	0	0	0	95	1460	60	120	655	0	0	180	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.75	
Flpb, ped/bikes					0.99		0.97	1.00			1.00	
Frt					0.99		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4926		1662	3433			2238	
Flt Permitted					1.00		0.29	1.00			1.00	
Satd. Flow (perm)					4926		503	3433			2238	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	102	1570	65	126	689	0	0	189	379
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	37	0
Lane Group Flow (vph)	0	0	0	0	1734	0	126	689	0	0	531	0
Confl. Peds. (#/hr)	90		65	65		90	490		290	290		490
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	4%	4%	0%	0%	11%	5%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					55.0		43.0	43.0			33.0	
Effective Green, g (s)					55.0		43.0	43.0			33.0	
Actuated g/C Ratio					0.49		0.38	0.38			0.29	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2419		255	1318			659	
v/s Ratio Prot							0.03	c0.20			c0.24	
v/s Ratio Perm					0.35		0.16					
v/c Ratio					0.72		0.49	0.52			1.00dr	
Uniform Delay, d1					22.4		23.9	26.6			36.5	
Progression Factor					1.00		0.80	0.88			1.00	
Incremental Delay, d2					1.9		1.3	0.3			7.1	
Delay (s)					24.2		20.4	23.9			43.6	
Level of Service					C		C	C			D	
Approach Delay (s)		0.0			24.2			23.3			43.6	
Approach LOS		A			C			C			D	

Intersection Summary			
HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	940	25	0	0	0	0	665	0	340	155	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0		4.0	8.0	
Lane Util. Factor		0.91						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	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4909						3471		1711	1756	
Flt Permitted		1.00						1.00		0.22	1.00	
Satd. Flow (perm)		4909						3471		401	1756	
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)	0	989	26	0	0	0	0	700	0	358	163	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1012	0	0	0	0	0	700	0	358	163	0
Confl. Peds. (#/hr)	35		15	15		35	835		55	55		835
Heavy Vehicles (%)	0%	4%	5%	0%	0%	0%	0%	4%	4%	4%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		39.2						34.0		58.8	58.8	
Effective Green, g (s)		39.2						34.0		58.8	58.8	
Actuated g/C Ratio		0.35						0.30		0.52	0.52	
Clearance Time (s)		6.0						8.0		4.0	8.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1718						1054		454	922	
v/s Ratio Prot		c0.21						0.20		c0.15	0.09	
v/s Ratio Perm										c0.27		
v/c Ratio		0.59						0.66		0.79	0.18	
Uniform Delay, d1		29.8						34.0		18.4	13.9	
Progression Factor		1.25						1.00		1.82	0.33	
Incremental Delay, d2		1.4						1.6		4.9	0.0	
Delay (s)		38.5						35.6		38.2	4.7	
Level of Service		D						D		D	A	
Approach Delay (s)		38.5			0.0			35.6			27.7	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	695	830	250	30	170	145	420	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.91		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.76
Flpb, ped/bikes	0.98	1.00	1.00		0.88	1.00	1.00	1.00
Frt	1.00	1.00	0.98		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1548	3276	4503		1503	3275	1536	1177
Flt Permitted	0.95	0.99	1.00		0.56	1.00	1.00	1.00
Satd. Flow (perm)	1548	3276	4503		893	3275	1536	1177
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	732	874	263	32	179	153	442	79
RTOR Reduction (vph)	0	0	3	0	0	0	0	47
Lane Group Flow (vph)	520	1086	292	0	179	153	442	32
Confl. Peds. (#/hr)	10			290	290			125
Heavy Vehicles (%)	3%	3%	10%	7%	4%	9%	4%	3%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8			4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	46.0	46.0	52.0		52.0	52.0	46.0	46.0
Effective Green, g (s)	46.0	46.0	52.0		52.0	52.0	46.0	46.0
Actuated g/C Ratio	0.41	0.41	0.46		0.46	0.46	0.41	0.41
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	636	1346	2091		415	1521	631	483
v/s Ratio Prot			0.06			0.05		
v/s Ratio Perm	c0.34	0.33			c0.20		0.29	0.03
v/c Ratio	0.82	0.81	0.14		0.43	0.10	0.70	0.07
Uniform Delay, d1	29.3	29.1	17.2		20.1	16.9	27.3	20.0
Progression Factor	0.51	0.48	1.00		0.92	0.59	1.00	1.00
Incremental Delay, d2	9.7	4.6	0.0		0.5	0.0	6.4	0.3
Delay (s)	24.6	18.5	17.2		19.0	10.0	33.7	20.3
Level of Service	C	B	B		B	A	C	C
Approach Delay (s)		20.5	17.2			14.8		
Approach LOS		C	B			B		

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	130.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	65	220	0	275	0	705	720	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.93			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.88			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.99				
Satd. Flow (prot)		2780			3570		1547	3217				
Flt Permitted		1.00			1.00		0.95	0.99				
Satd. Flow (perm)		2780			3570		1547	3217				
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)	0	68	232	0	289	0	742	758	0	0	0	0
RTOR Reduction (vph)	0	164	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	136	0	0	289	0	490	1010	0	0	0	0
Confl. Peds. (#/hr)	90		65	65		90						
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		26.0			26.0		72.0	72.0				
Effective Green, g (s)		26.0			26.0		72.0	72.0				
Actuated g/C Ratio		0.23			0.23		0.64	0.64				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		645			829		995	2068				
v/s Ratio Prot		0.05			c0.08							
v/s Ratio Perm							c0.32	0.31				
v/c Ratio		0.21			0.35		0.49	0.49				
Uniform Delay, d1		34.7			35.9		10.5	10.4				
Progression Factor		1.00			0.96		0.38	0.39				
Incremental Delay, d2		0.2			0.2		1.2	0.6				
Delay (s)		34.9			34.7		5.1	4.6				
Level of Service		C			C		A	A				
Approach Delay (s)		34.9			34.7			4.8			0.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	113.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

C2 Do Nothing

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	580	355	90	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.79	1.00	0.89
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1530	1626	1610	1106	1487	1233
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1530	1626	1610	1106	1487	1233
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	644	394	100	133	67
RTOR Reduction (vph)	0	0	0	71	0	48
Lane Group Flow (vph)	78	644	394	29	133	19
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	5%	4%	5%	3%	8%	4%
Turn Type	Prot			Perm		Perm
Protected Phases	5	2 5	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	14.2	57.7	36.5	36.5	35.5	35.5
Effective Green, g (s)	14.2	57.7	36.5	36.5	35.5	35.5
Actuated g/C Ratio	0.11	0.46	0.29	0.29	0.28	0.28
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	745	466	320	419	347
v/s Ratio Prot	0.05	c0.40	0.24		c0.09	
v/s Ratio Perm				0.03		0.02
v/c Ratio	0.45	0.86	0.85	0.09	0.32	0.05
Uniform Delay, d1	52.3	30.6	42.1	32.6	35.7	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	10.2	17.0	0.6	2.0	0.3
Delay (s)	54.2	40.9	59.1	33.2	37.7	33.3
Level of Service	D	D	E	C	D	C
Approach Delay (s)		42.3	53.8		36.2	
Approach LOS		D	D		D	

Intersection Summary			
HCM Average Control Delay	45.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	32.8
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	675	375	5	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1610	3084			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1610	3084			1463
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	750	417	6	0	78
RTOR Reduction (vph)	0	0	1	0	0	46
Lane Group Flow (vph)	28	750	422	0	0	32
Heavy Vehicles (%)	0%	5%	4%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	9	2 7 9 10	6			7 9 10
Permitted Phases						
Actuated Green, G (s)	10.0	107.5	43.9			50.6
Effective Green, g (s)	10.0	95.5	43.9			43.6
Actuated g/C Ratio	0.09	0.89	0.41			0.41
Clearance Time (s)	7.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	149	1430	1259			593
v/s Ratio Prot	0.02	c0.47	0.14			0.02
v/s Ratio Perm						
v/c Ratio	0.19	0.52	0.34			0.05
Uniform Delay, d1	45.0	1.3	21.8			19.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.6	0.3	0.7			0.0
Delay (s)	45.6	1.6	22.5			19.4
Level of Service	D	A	C			B
Approach Delay (s)		3.2	22.5		19.4	
Approach LOS		A	C		B	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	45.3%	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												
Volume (vph)	85	580	15	20	330	75	10	15	10	45	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			0.95			0.98		1.00	0.96	
Flpb, ped/bikes	0.86	1.00			1.00			0.99		0.94	1.00	
Frt	1.00	1.00			0.97			0.96		1.00	0.87	
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1374	3041			2800			1413		1252	1425	
Flt Permitted	0.47	1.00			0.90			0.92		0.73	1.00	
Satd. Flow (perm)	686	3041			2537			1311		964	1425	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	644	17	22	367	83	11	17	11	50	11	56
RTOR Reduction (vph)	0	2	0	0	15	0	0	9	0	0	44	0
Lane Group Flow (vph)	94	659	0	0	457	0	0	30	0	50	23	0
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	5%	0%	10%	5%	8%	15%	7%	10%	20%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.2	35.2			35.2			17.0		17.0	17.0	
Effective Green, g (s)	35.2	35.2			35.2			17.0		17.0	17.0	
Actuated g/C Ratio	0.43	0.43			0.43			0.21		0.21	0.21	
Clearance Time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	294	1302			1086			271		199	295	
v/s Ratio Prot		c0.22									0.02	
v/s Ratio Perm	0.14				0.18			0.02		c0.05		
v/c Ratio	0.32	0.51			0.42			0.11		0.25	0.08	
Uniform Delay, d1	15.6	17.2			16.4			26.5		27.3	26.3	
Progression Factor	1.00	1.00			1.00			0.65		1.00	1.00	
Incremental Delay, d2	2.9	1.4			1.2			0.2		0.7	0.1	
Delay (s)	18.4	18.6			17.6			17.5		27.9	26.4	
Level of Service	B	B			B			B		C	C	
Approach Delay (s)		18.5			17.6			17.5			27.1	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	30.0
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	590	0	30	55	390	25	5	0	5	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0	7.0		7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	0.95			1.00	0.95		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00		1.00	0.98
Flpb, ped/bikes	0.89	1.00			1.00	1.00		1.00	1.00		0.91	1.00
Frt	1.00	1.00			1.00	0.99		1.00	0.85		1.00	0.93
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1379	3060			1559	2889		1575	1409		1426	1529
Flt Permitted	0.47	1.00			0.34	1.00		0.71	1.00		0.75	1.00
Satd. Flow (perm)	680	3060			558	2889		1177	1409		1131	1529
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	656	0	33	61	433	28	6	0	6	61	39
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	5	0	0	25
Lane Group Flow (vph)	44	656	0	0	94	457	0	6	1	0	61	47
Confl. Peds. (#/hr)	140						140				100	
Heavy Vehicles (%)	4%	5%	2%	5%	2%	9%	4%	2%	2%	2%	2%	2%
Turn Type	Perm			Perm	Perm			Perm			Perm	
Protected Phases		2				6			8			4
Permitted Phases	2			6	6			8			4	
Actuated Green, G (s)	38.0	38.0			38.0	38.0		21.8	21.8		21.8	21.8
Effective Green, g (s)	38.0	38.0			38.0	38.0		21.8	21.8		21.8	21.8
Actuated g/C Ratio	0.41	0.41			0.41	0.41		0.24	0.24		0.24	0.24
Clearance Time (s)	7.0	7.0			7.0	7.0		7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	280	1261			230	1191		278	333		267	362
v/s Ratio Prot		c0.21				0.16			0.00			0.03
v/s Ratio Perm	0.06				0.17			0.01			c0.05	
v/c Ratio	0.16	0.52			0.41	0.38		0.02	0.00		0.23	0.13
Uniform Delay, d1	17.0	20.3			19.2	18.9		27.0	26.9		28.4	27.7
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	1.5			5.3	0.9		0.0	0.0		0.4	0.2
Delay (s)	18.2	21.8			24.5	19.9		27.0	26.9		28.9	27.9
Level of Service	B	C			C	B		C	C		C	C
Approach Delay (s)		21.6				20.6			27.0			28.3
Approach LOS		C				C			C			C

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	92.2	Sum of lost time (s)	32.4
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	545	20	15	450	150	20	40	10	100	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			0.92			0.99		1.00	1.00	0.61
Flpb, ped/bikes	0.99	1.00			1.00			0.89		0.92	1.00	1.00
Frt	1.00	0.99			0.96			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1483	2950			2695			1437		1415	1691	871
Flt Permitted	0.20	1.00			0.93			0.93		0.71	1.00	1.00
Satd. Flow (perm)	306	2950			2497			1352		1053	1691	871
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	606	22	17	500	167	22	44	11	111	11	122
RTOR Reduction (vph)	0	2	0	0	26	0	0	5	0	0	0	88
Lane Group Flow (vph)	122	626	0	0	658	0	0	72	0	111	11	34
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	7%	7%	6%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	40.8	40.8			28.1			28.6		28.6	28.6	28.6
Effective Green, g (s)	40.8	40.8			28.1			28.6		28.6	28.6	28.6
Actuated g/C Ratio	0.40	0.40			0.27			0.28		0.28	0.28	0.28
Clearance Time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	211	1178			687			378		295	473	244
v/s Ratio Prot	0.04	c0.21									0.01	
v/s Ratio Perm	0.19				c0.26			0.05		c0.11		0.04
v/c Ratio	0.58	0.53			0.96			0.19		0.38	0.02	0.14
Uniform Delay, d1	21.8	23.4			36.5			28.0		29.6	26.7	27.6
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	1.7			25.4			1.1		3.6	0.1	1.2
Delay (s)	25.6	25.1			61.9			29.1		33.3	26.8	28.8
Level of Service	C	C			E			C		C	C	C
Approach Delay (s)		25.2			61.9			29.1			30.7	
Approach LOS		C			E			C			C	

Intersection Summary			
HCM Average Control Delay	40.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	39.8
Intersection Capacity Utilization	85.5%	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												
Volume (vph)	45	605	10	15	560	320	45	0	30	20	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		1.00			0.95			0.99			0.99	
Flpb, ped/bikes		1.00			1.00			0.99			0.99	
Frt		1.00			0.95			0.95			0.94	
Flt Protected		1.00			1.00			0.97			0.97	
Satd. Flow (prot)		3011			2774			1508			1520	
Flt Permitted		0.77			0.93			0.79			0.83	
Satd. Flow (perm)		2319			2594			1231			1299	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	672	11	17	622	356	50	0	33	22	0	17
RTOR Reduction (vph)	0	1	0	0	54	0	0	23	0	0	15	0
Lane Group Flow (vph)	0	732	0	0	941	0	0	60	0	0	24	0
Confl. Peds. (#/hr)	85		185	185		85	10		15	15		10
Heavy Vehicles (%)	0%	6%	0%	13%	6%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		50.4			50.4			9.3			9.3	
Effective Green, g (s)		50.4			50.4			9.3			9.3	
Actuated g/C Ratio		0.50			0.50			0.09			0.09	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1149			1286			113			119	
v/s Ratio Prot												
v/s Ratio Perm		0.32			c0.36			c0.05			0.02	
v/c Ratio		0.64			0.73			0.53			0.20	
Uniform Delay, d1		18.9			20.3			44.1			42.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		2.7			3.7			4.8			0.8	
Delay (s)		21.6			24.0			48.9			43.6	
Level of Service		C			C			D			D	
Approach Delay (s)		21.6			24.0			48.9			43.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	42.0
Intersection Capacity Utilization	82.6%	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												
Volume (vph)	115	520	20	50	675	210	5	65	50	80	10	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.96			0.90			1.00	0.83
Flpb, ped/bikes	1.00	1.00		0.89	1.00			0.99			0.84	1.00
Frt	1.00	0.99		1.00	0.96			0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	1.00
Satd. Flow (prot)	1570	2965		1435	2819			1426			1305	1174
Flt Permitted	0.16	1.00		0.43	1.00			0.99			0.71	1.00
Satd. Flow (perm)	269	2965		642	2819			1411			964	1174
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	128	578	22	56	750	233	6	72	56	89	11	378
RTOR Reduction (vph)	0	3	0	0	29	0	0	33	0	0	0	254
Lane Group Flow (vph)	128	597	0	56	954	0	0	101	0	0	100	124
Confl. Peds. (#/hr)	180		165	165		180	200		275	275		200
Heavy Vehicles (%)	2%	7%	0%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	45.7	45.7		33.4	33.4			20.6			20.6	20.6
Effective Green, g (s)	45.7	45.7		33.4	33.4			20.6			20.6	20.6
Actuated g/C Ratio	0.57	0.57		0.42	0.42			0.26			0.26	0.26
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	271	1687		267	1173			362			247	301
v/s Ratio Prot	c0.04	0.20			c0.34							
v/s Ratio Perm	0.23			0.09				0.07			0.10	c0.11
v/c Ratio	0.47	0.35		0.21	0.81			0.28			0.40	0.41
Uniform Delay, d1	10.5	9.3		15.0	20.7			23.9			24.8	24.8
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.3	0.6		1.8	6.2			0.4			1.1	0.9
Delay (s)	11.8	9.9		16.8	26.9			24.3			25.9	25.8
Level of Service	B	A		B	C			C			C	C
Approach Delay (s)		10.3			26.4			24.3			25.8	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	200	400	735	115	95	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.94
Flpb, ped/bikes	0.99	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1526	3031	2923		1545	1312
Flt Permitted	0.24	1.00	1.00		0.95	1.00
Satd. Flow (perm)	381	3031	2923		1545	1312
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	222	444	817	128	106	267
RTOR Reduction (vph)	0	0	16	0	0	56
Lane Group Flow (vph)	222	444	929	0	106	211
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	4%	6%	6%	12%	4%	3%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	41.0	41.0	41.0		27.0	27.0
Effective Green, g (s)	41.0	41.0	41.0		27.0	27.0
Actuated g/C Ratio	0.51	0.51	0.51		0.34	0.34
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	195	1553	1498		521	443
v/s Ratio Prot		0.15	0.32		0.07	
v/s Ratio Perm	c0.58					c0.16
v/c Ratio	1.14	0.29	0.62		0.20	0.48
Uniform Delay, d1	19.5	11.1	13.9		18.9	20.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	106.6	0.5	1.9		0.9	3.7
Delay (s)	126.1	11.6	15.9		19.7	24.6
Level of Service	F	B	B		B	C
Approach Delay (s)		49.8	15.9		23.2	
Approach LOS		D	B		C	

Intersection Summary			
HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	645	580	155	95	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.74	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1606	1642	1674	1050	1545	1314
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1606	1642	1674	1050	1545	1314
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	679	611	163	100	100
RTOR Reduction (vph)	0	0	0	75	0	72
Lane Group Flow (vph)	74	679	611	88	100	28
Confl. Peds. (#/hr)	243			243	38	27
Heavy Vehicles (%)	0%	3%	1%	1%	4%	2%
Turn Type	Prot			Perm		Perm
Protected Phases	5	2 5	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	14.2	57.7	36.5	36.5	35.5	35.5
Effective Green, g (s)	14.2	57.7	36.5	36.5	35.5	35.5
Actuated g/C Ratio	0.11	0.46	0.29	0.29	0.28	0.28
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	181	752	485	304	435	370
v/s Ratio Prot	0.05	c0.41	c0.36		c0.06	
v/s Ratio Perm				0.08		0.02
v/c Ratio	0.41	0.90	1.26	0.29	0.23	0.08
Uniform Delay, d1	52.0	31.6	44.8	34.7	34.8	33.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	14.1	132.8	2.4	1.2	0.4
Delay (s)	53.5	45.7	177.5	37.1	36.0	33.6
Level of Service	D	D	F	D	D	C
Approach Delay (s)		46.5	147.9		34.8	
Approach LOS		D	F		C	

Intersection Summary			
HCM Average Control Delay	90.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	39.8
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	695	685	10	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1642	3144			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1642	3144			1463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	732	721	11	0	53
RTOR Reduction (vph)	0	0	1	0	0	32
Lane Group Flow (vph)	47	732	731	0	0	21
Heavy Vehicles (%)	0%	3%	2%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	9	2 7 9 10	6			7 9 10
Permitted Phases						
Actuated Green, G (s)	10.0	106.9	43.9			50.0
Effective Green, g (s)	10.0	94.9	43.9			43.0
Actuated g/C Ratio	0.09	0.89	0.41			0.40
Clearance Time (s)	7.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	150	1458	1291			588
v/s Ratio Prot	0.03	c0.45	c0.23			0.01
v/s Ratio Perm						
v/c Ratio	0.31	0.50	0.57			0.04
Uniform Delay, d1	45.2	1.2	24.2			19.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	1.2	0.3	1.8			0.0
Delay (s)	46.4	1.5	26.0			19.4
Level of Service	D	A	C			B
Approach Delay (s)		4.2	26.0		19.4	
Approach LOS		A	C		B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	46.5%	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												
Volume (vph)	110	570	10	30	610	65	15	25	15	50	15	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00			0.96			0.97		1.00	0.93	
Flpb, ped/bikes	0.87	1.00			1.00			0.98		0.92	1.00	
Frt	1.00	1.00			0.99			0.96		1.00	0.87	
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1389	3020			2978			1536		1365	1363	
Flt Permitted	0.30	1.00			0.90			0.89		0.72	1.00	
Satd. Flow (perm)	442	3020			2692			1392		1033	1363	
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)	116	600	11	32	642	68	16	26	16	53	16	111
RTOR Reduction (vph)	0	1	0	0	6	0	0	13	0	0	87	0
Lane Group Flow (vph)	116	610	0	0	736	0	0	45	0	53	40	0
Confl. Peds. (#/hr)	184		40	40		184	82		101	101		82
Heavy Vehicles (%)	1%	6%	0%	0%	2%	0%	0%	0%	0%	8%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	32.7	32.7			32.7			16.9		16.9	16.9	
Effective Green, g (s)	32.7	32.7			32.7			16.9		16.9	16.9	
Actuated g/C Ratio	0.41	0.41			0.41			0.21		0.21	0.21	
Clearance Time (s)	7.0	7.0			7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	182	1241			1106			296		219	289	
v/s Ratio Prot		0.20									0.03	
v/s Ratio Perm	0.26				c0.27			0.03		c0.05		
v/c Ratio	0.64	0.49			0.67			0.15		0.24	0.14	
Uniform Delay, d1	18.7	17.3			19.0			25.5		26.0	25.4	
Progression Factor	1.00	1.00			1.00			0.84		1.00	1.00	
Incremental Delay, d2	15.8	1.4			3.2			0.2		0.6	0.2	
Delay (s)	34.6	18.7			22.2			21.7		26.6	25.7	
Level of Service	C	B			C			C		C	C	
Approach Delay (s)		21.2			22.2			21.7			25.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	30.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	65	585	0	50	20	650	80	15	45	35	65	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0		7.0		7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	0.95		1.00		0.95		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00		0.98		1.00	1.00		1.00	0.97
Flpb, ped/bikes	0.95	1.00		1.00		1.00		1.00	1.00		0.93	1.00
Frt	1.00	1.00		1.00		0.98		1.00	0.93		1.00	0.86
Flt Protected	0.95	1.00		0.95		1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1479	3060		1606		3038		1575	1548		1423	1376
Flt Permitted	0.30	1.00		0.40		0.93		0.72	1.00		0.70	1.00
Satd. Flow (perm)	475	3060		674		2823		1199	1548		1052	1376
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)	68	616	0	53	21	684	84	16	47	37	68	5
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	32	0	0	41
Lane Group Flow (vph)	68	616	0	53	0	782	0	16	52	0	68	11
Confl. Peds. (#/hr)	138						138				101	
Heavy Vehicles (%)	3%	5%	2%	0%	2%	2%	1%	2%	2%	2%	5%	2%
Turn Type	Perm			Perm	Perm			Perm			Perm	
Protected Phases		2				6			8			4
Permitted Phases	2			6	6			8			4	
Actuated Green, G (s)	35.7	35.7		35.7		35.7		9.6	9.6		9.6	9.6
Effective Green, g (s)	35.7	35.7		35.7		35.7		9.6	9.6		9.6	9.6
Actuated g/C Ratio	0.47	0.47		0.47		0.47		0.13	0.13		0.13	0.13
Clearance Time (s)	7.0	7.0		7.0		7.0		7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	225	1451		320		1338		153	197		134	175
v/s Ratio Prot		0.20							0.03			0.01
v/s Ratio Perm	0.14			0.08		c0.28		0.01			c0.06	
v/c Ratio	0.30	0.42		0.17		0.58		0.10	0.26		0.51	0.06
Uniform Delay, d1	12.2	13.0		11.3		14.4		29.0	29.7		30.6	28.9
Progression Factor	1.00	1.00		1.00		1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.9		1.1		1.9		0.3	0.7		3.0	0.2
Delay (s)	15.6	13.9		12.4		16.3		29.4	30.4		33.6	29.0
Level of Service	B	B		B		B		C	C		C	C
Approach Delay (s)		14.1				16.0			30.2			31.7
Approach LOS		B				B			C			C

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	75.3	Sum of lost time (s)	30.0
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	625	15	5	705	265	10	15	15	55	20	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	0.95			0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			0.90			0.96		1.00	1.00	0.63
Flpb, ped/bikes	1.00	1.00			1.00			0.91		0.91	1.00	1.00
Frt	1.00	1.00			0.96			0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00			1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	1606	3013			2753			1386		1420	1691	908
Flt Permitted	0.11	1.00			0.95			0.94		0.73	1.00	1.00
Satd. Flow (perm)	188	3013			2619			1326		1090	1691	908
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)	95	658	16	5	742	279	11	16	16	58	21	121
RTOR Reduction (vph)	0	1	0	0	31	0	0	12	0	0	0	87
Lane Group Flow (vph)	95	673	0	0	995	0	0	31	0	58	21	34
Confl. Peds. (#/hr)	170		333	333		170	559		86	86		559
Heavy Vehicles (%)	0%	5%	0%	0%	1%	0%	0%	0%	0%	3%	0%	0%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	41.8	41.8			30.9			28.6		28.6	28.6	28.6
Effective Green, g (s)	41.8	41.8			30.9			28.6		28.6	28.6	28.6
Actuated g/C Ratio	0.41	0.41			0.30			0.28		0.28	0.28	0.28
Clearance Time (s)	5.0	7.0			7.0			7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	157	1220			784			367		302	469	252
v/s Ratio Prot	0.03	c0.22									0.01	
v/s Ratio Perm	0.21				c0.38			0.02		c0.05		0.04
v/c Ratio	0.61	0.55			1.27			0.09		0.19	0.04	0.13
Uniform Delay, d1	23.9	23.5			36.2			27.6		28.5	27.3	28.0
Progression Factor	1.00	1.00			1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	1.8			131.2			0.5		1.4	0.2	1.1
Delay (s)	30.4	25.3			167.4			28.1		29.9	27.5	29.1
Level of Service	C	C			F			C		C	C	C
Approach Delay (s)		25.9			167.4			28.1			29.2	
Approach LOS		C			F			C			C	

Intersection Summary			
HCM Average Control Delay	97.5	HCM Level of Service	F
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	103.2	Sum of lost time (s)	39.8
Intersection Capacity Utilization	97.4%	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												
Volume (vph)	15	660	20	20	810	30	10	0	20	175	0	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0			7.0			7.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			0.99			0.98			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			0.99	
Frt		1.00			0.99			0.91			0.94	
Flt Protected		1.00			1.00			0.98			0.97	
Satd. Flow (prot)		3004			3132			1479			1506	
Flt Permitted		0.92			0.92			0.87			0.81	
Satd. Flow (perm)		2772			2896			1308			1250	
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)	16	695	21	21	853	32	11	0	21	184	0	142
RTOR Reduction (vph)	0	2	0	0	2	0	0	16	0	0	23	0
Lane Group Flow (vph)	0	730	0	0	904	0	0	16	0	0	303	0
Confl. Peds. (#/hr)	143		109	109		143	24		14	14		24
Heavy Vehicles (%)	0%	6%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		50.9			50.9			27.5			27.5	
Effective Green, g (s)		50.9			50.9			27.5			27.5	
Actuated g/C Ratio		0.46			0.46			0.25			0.25	
Clearance Time (s)		7.0			7.0			7.0			7.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		1269			1326			323			309	
v/s Ratio Prot												
v/s Ratio Perm		0.26			c0.31			0.01			c0.24	
v/c Ratio		0.58			0.68			0.05			0.98	
Uniform Delay, d1		22.2			23.8			31.9			41.6	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.9			2.8			0.1			46.0	
Delay (s)		24.1			26.6			32.0			87.6	
Level of Service		C			C			C			F	
Approach Delay (s)		24.1			26.6			32.0			87.6	
Approach LOS		C			C			C			F	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	111.2	Sum of lost time (s)	32.8
Intersection Capacity Utilization	81.5%	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												
Volume (vph)	185	720	0	50	675	240	5	20	30	95	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97			0.92			1.00	0.81
Flpb, ped/bikes	1.00	1.00		0.93	1.00			0.99			0.91	1.00
Frt	1.00	1.00		1.00	0.96			0.93			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.96	1.00
Satd. Flow (prot)	1588	3060		1493	2941			1422			1440	1170
Flt Permitted	0.12	1.00		0.36	1.00			0.98			0.74	1.00
Satd. Flow (perm)	200	3060		572	2941			1398			1106	1170
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)	195	758	0	53	711	253	5	21	32	100	32	126
RTOR Reduction (vph)	0	0	0	0	40	0	0	21	0	0	0	84
Lane Group Flow (vph)	195	758	0	53	924	0	0	37	0	0	132	42
Confl. Peds. (#/hr)	118		126	126		118	197		142	142		197
Heavy Vehicles (%)	1%	5%	0%	0%	1%	3%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		4
Actuated Green, G (s)	44.0	44.0		28.4	28.4			29.0			29.0	29.0
Effective Green, g (s)	44.0	44.0		28.4	28.4			29.0			29.0	29.0
Actuated g/C Ratio	0.51	0.51		0.33	0.33			0.33			0.33	0.33
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0			7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	270	1548		187	960			466			369	390
v/s Ratio Prot	c0.09	0.25			c0.31							
v/s Ratio Perm	0.28			0.09				0.03			c0.12	0.04
v/c Ratio	0.72	0.49		0.28	0.96			0.08			0.36	0.11
Uniform Delay, d1	16.1	14.1		21.7	28.8			19.9			22.0	20.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	9.2	1.1		3.8	21.2			0.3			2.7	0.6
Delay (s)	25.3	15.2		25.5	50.0			20.2			24.6	20.6
Level of Service	C	B		C	D			C			C	C
Approach Delay (s)		17.3			48.7			20.2			22.7	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	185	625	645	200	155	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.95
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1534	3031	2965		1516	1359
Flt Permitted	0.26	1.00	1.00		0.95	1.00
Satd. Flow (perm)	419	3031	2965		1516	1359
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	658	679	211	163	374
RTOR Reduction (vph)	0	0	37	0	0	72
Lane Group Flow (vph)	195	658	853	0	163	302
Confl. Peds. (#/hr)	106			106	42	49
Heavy Vehicles (%)	3%	6%	2%	5%	6%	0%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	41.0	41.0	41.0		27.0	27.0
Effective Green, g (s)	41.0	41.0	41.0		27.0	27.0
Actuated g/C Ratio	0.51	0.51	0.51		0.34	0.34
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	215	1553	1520		512	459
v/s Ratio Prot		0.22	0.29		0.11	
v/s Ratio Perm	c0.47					c0.22
v/c Ratio	0.91	0.42	0.56		0.32	0.66
Uniform Delay, d1	17.8	12.1	13.3		19.7	22.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	41.2	0.8	1.5		1.6	7.2
Delay (s)	58.9	13.0	14.8		21.3	29.8
Level of Service	E	B	B		C	C
Approach Delay (s)		23.5	14.8		27.2	
Approach LOS		C	B		C	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1520	2530	65	0	0	0	0	70	90	165	115	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.92		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4912						3084		1767	3433	
Flt Permitted	0.95	1.00						1.00		0.47	1.00	
Satd. Flow (perm)	3395	4912						3084		879	3433	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1567	2608	67	0	0	0	0	78	100	183	128	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	1567	2673	0	0	0	0	0	137	0	183	128	0
Confl. Peds. (#/hr)			20									
Heavy Vehicles (%)	2%	4%	3%	0%	0%	0%	0%	6%	6%	1%	4%	0%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	92.5	92.5						17.0		37.5	37.5	
Effective Green, g (s)	92.5	92.5						17.0		37.5	37.5	
Actuated g/C Ratio	0.64	0.64						0.12		0.26	0.26	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	2181	3155						364		318	894	
v/s Ratio Prot	0.46	c0.54						0.04		c0.06	0.04	
v/s Ratio Perm										c0.09		
v/c Ratio	0.72	0.85						0.38		0.58	0.14	
Uniform Delay, d1	17.1	20.2						58.6		44.1	40.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.1	3.0						0.7		2.5	0.1	
Delay (s)	19.2	23.2						59.3		46.6	41.0	
Level of Service	B	C						E		D	D	
Approach Delay (s)		21.7			0.0			59.3			44.3	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	144.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	120.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	470	2275	40	10	940	135	10	65	100	190	55	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	0.76		1.00	1.00			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	1.00		1.00	0.85		1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	3330	4953		1785	3476		1750	1554			3160	1566
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00			0.66	1.00
Satd. Flow (perm)	3330	4953		1785	3476		1076	1554			2182	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	485	2345	41	11	1033	148	11	72	111	211	61	11
RTOR Reduction (vph)	0	1	0	0	14	0	0	49	0	0	0	8
Lane Group Flow (vph)	485	2385	0	11	1167	0	11	134	0	0	272	3
Confl. Peds. (#/hr)	5		40	40		5			80	80		
Heavy Vehicles (%)	4%	3%	13%	0%	2%	2%	2%	5%	1%	2%	4%	2%
Turn Type	Prot			Prot	custom		Perm			Perm		Perm
Protected Phases	5	2		1				8			4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Effective Green, g (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.24	0.54		0.04	0.34		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	797	2680		70	1186		259	375			526	378
v/s Ratio Prot	c0.15	c0.48		0.01				0.09				
v/s Ratio Perm					c0.34		0.01				c0.12	0.00
v/c Ratio	0.61	0.89		0.16	0.98		0.04	0.36			0.52	0.01
Uniform Delay, d1	37.9	22.7		52.0	36.6		32.6	35.3			36.8	32.3
Progression Factor	1.00	1.00		0.99	0.27		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	4.9		0.8	19.8		0.1	0.6			0.9	0.0
Delay (s)	39.3	27.7		52.2	29.6		32.7	35.9			37.7	32.3
Level of Service	D	C		D	C		C	D			D	C
Approach Delay (s)		29.6						35.7			37.5	
Approach LOS		C						D			D	

Intersection Summary			
HCM Average Control Delay	30.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1130	95	25	30	10	95	25	50	1010	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.94		0.97	
Flpb, ped/bikes	1.00	1.00		0.93	1.00		0.97	1.00		1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.90		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1653	3390		1603	1724		1732	1204		3951	
Flt Permitted	0.95	1.00		0.70	1.00		0.73	1.00		1.00	
Satd. Flow (perm)	1653	3390		1186	1724		1328	1204		3951	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91
Adj. Flow (vph)	90	1202	101	28	33	11	106	28	56	1110	126
RTOR Reduction (vph)	0	6	0	0	8	0	0	40	0	10	0
Lane Group Flow (vph)	90	1297	0	28	36	0	106	44	0	1226	0
Confl. Peds. (#/hr)	5		10	80		30	30		80		5
Heavy Vehicles (%)	8%	4%	2%	3%	5%	0%	0%	15%	40%	6%	3%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.06	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	103	2028		339	493		379	344		1905	
v/s Ratio Prot	0.05	c0.38			0.02			0.04			
v/s Ratio Perm				0.02			c0.08			0.31	
v/c Ratio	0.87	0.64		0.08	0.07		0.28	0.13		0.64	
Uniform Delay, d1	52.1	14.6		29.3	29.2		31.1	29.7		21.8	
Progression Factor	0.75	1.43		1.00	1.00		1.00	1.00		0.15	
Incremental Delay, d2	36.6	1.0		0.1	0.1		0.4	0.2		0.7	
Delay (s)	75.3	22.0		29.4	29.2		31.5	29.8		3.9	
Level of Service	E	C		C	C		C	C		A	
Approach Delay (s)		25.4			29.3			30.7			
Approach LOS		C			C			C			

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	65	1090	595	475	100	895	250	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			8.0	8.0	
Lane Util. Factor		0.94	0.95			0.95	0.95	
Frpb, ped/bikes		1.00	0.98			1.00	1.00	
Flpb, ped/bikes		0.89	1.00			1.00	1.00	
Frt		1.00	0.93			1.00	0.89	
Flt Protected		0.95	1.00			1.00	1.00	
Satd. Flow (prot)		4214	3142			3354	3038	
Flt Permitted		0.95	1.00			0.63	1.00	
Satd. Flow (perm)		4214	3142			2110	3038	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	1147	626	500	111	994	278	711
RTOR Reduction (vph)	0	0	68	0	0	0	140	0
Lane Group Flow (vph)	0	1215	1058	0	0	1105	849	0
Confl. Peds. (#/hr)	70			45				
Heavy Vehicles (%)	14%	6%	4%	3%	5%	6%	7%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		36.0	36.0			62.0	62.0	
Effective Green, g (s)		36.0	36.0			62.0	62.0	
Actuated g/C Ratio		0.32	0.32			0.55	0.55	
Clearance Time (s)		6.0	6.0			8.0	8.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		1355	1010			1168	1682	
v/s Ratio Prot			c0.34				0.28	
v/s Ratio Perm		0.29				c0.52		
v/c Ratio		0.90	1.05			0.95	0.50	
Uniform Delay, d1		36.2	38.0			23.4	15.5	
Progression Factor		0.23	0.16			0.77	1.00	
Incremental Delay, d2		1.0	24.5			10.1	0.2	
Delay (s)		9.4	30.6			28.1	15.7	
Level of Service		A	C			C	B	
Approach Delay (s)			19.6			28.1	15.7	
Approach LOS			B			C	B	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	160	2005	210	145	675	0	0	245	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.70	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6004		1173	3400			1634	2703
Flt Permitted					1.00		0.51	1.00			1.00	1.00
Satd. Flow (perm)					6004		629	3400			1634	2703
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	168	2111	221	161	750	0	0	272	294
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	213
Lane Group Flow (vph)	0	0	0	0	2486	0	161	750	0	0	272	81
Confl. Peds. (#/hr)				35		125	1405					1405
Heavy Vehicles (%)	0%	0%	0%	12%	4%	3%	6%	5%	0%	0%	15%	4%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					36.0		62.0	62.0			24.0	31.0
Effective Green, g (s)					36.0		62.0	62.0			24.0	31.0
Actuated g/C Ratio					0.32		0.55	0.55			0.21	0.28
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1930		348	1882			350	748
v/s Ratio Prot								0.22			c0.17	0.03
v/s Ratio Perm					0.41		c0.26					
v/c Ratio					1.29		0.46	0.40			0.78	0.11
Uniform Delay, d1					38.0		15.0	14.3			41.5	30.2
Progression Factor					0.36		0.44	0.41			1.00	1.00
Incremental Delay, d2					130.0		0.8	0.1			10.4	0.3
Delay (s)					143.7		7.4	6.0			51.8	30.5
Level of Service					F		A	A			D	C
Approach Delay (s)		0.0			143.7			6.3			40.8	
Approach LOS		A			F			A			D	

Intersection Summary			
HCM Average Control Delay	97.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.2%	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												
Volume (vph)	0	0	0	105	2060	300	110	1170	0	0	135	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.80	
Flpb, ped/bikes					1.00		0.93	1.00			1.00	
Frt					0.98		1.00	1.00			0.91	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4747		1569	3433			2377	
Flt Permitted					1.00		0.44	1.00			1.00	
Satd. Flow (perm)					4747		732	3433			2377	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	111	2168	316	122	1300	0	0	150	250
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	0	0	0	2593	0	122	1300	0	0	361	0
Confl. Peds. (#/hr)				130		165	435		290	290		435
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	6%	4%	0%	0%	11%	8%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					47.0		51.0	51.0			41.0	
Effective Green, g (s)					47.0		51.0	51.0			41.0	
Actuated g/C Ratio					0.42		0.46	0.46			0.37	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					1992		378	1563			870	
v/s Ratio Prot							0.02	c0.38			0.15	
v/s Ratio Perm					0.55		0.13					
v/c Ratio					1.30		0.32	0.83			0.42	
Uniform Delay, d1					32.5		18.2	26.7			26.5	
Progression Factor					1.00		0.33	0.37			1.00	
Incremental Delay, d2					139.6		0.3	2.7			0.3	
Delay (s)					172.1		6.4	12.5			26.9	
Level of Service					F		A	B			C	
Approach Delay (s)		0.0			172.1			12.0			26.9	
Approach LOS		A			F			B			C	

Intersection Summary			
HCM Average Control Delay	107.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	30	0	0	0	0	1015	0	155	190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0			8.0	
Lane Util. Factor		0.91						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		1.00						1.00			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4860						3610			3240	
Flt Permitted		1.00						1.00			0.54	
Satd. Flow (perm)		4860						3610			1792	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1293	32	0	0	0	0	1128	0	172	211	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1323	0	0	0	0	0	1128	0	0	383	0
Confl. Peds. (#/hr)	30		30							55		
Heavy Vehicles (%)	17%	5%	8%	2%	2%	2%	0%	0%	0%	8%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		53.8						44.2			44.2	
Effective Green, g (s)		53.8						44.2			44.2	
Actuated g/C Ratio		0.48						0.39			0.39	
Clearance Time (s)		6.0						8.0			8.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2335						1425			707	
v/s Ratio Prot		c0.27						c0.31				
v/s Ratio Perm											0.21	
v/c Ratio		0.57						0.79			2.36dl	
Uniform Delay, d1		20.8						29.8			26.1	
Progression Factor		0.38						1.00			0.81	
Incremental Delay, d2		0.8						3.1			0.7	
Delay (s)		8.6						32.9			22.0	
Level of Service		A						C			C	
Approach Delay (s)		8.6			0.0			32.9			22.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	820	1075	340	25	175	275	605	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.91		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.85	1.00	1.00	1.00
Frt	1.00	1.00	0.99		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1557	3209	4759		1415	3159	1566	1566
Flt Permitted	0.95	0.99	1.00		0.50	1.00	1.00	1.00
Satd. Flow (perm)	1557	3209	4759		751	3159	1566	1566
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.90	0.90	0.94	0.94
Adj. Flow (vph)	872	1144	378	28	194	306	644	191
RTOR Reduction (vph)	0	0	7	0	0	0	0	105
Lane Group Flow (vph)	654	1362	399	0	194	306	644	86
Confl. Peds. (#/hr)	5			310	310			
Heavy Vehicles (%)	4%	6%	5%	0%	7%	13%	2%	2%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8!			4!		
Permitted Phases	2				4		8!	8
Actuated Green, G (s)	59.0	59.0	39.0		39.0	39.0	39.0	39.0
Effective Green, g (s)	59.0	59.0	39.0		39.0	39.0	39.0	39.0
Actuated g/C Ratio	0.53	0.53	0.35		0.35	0.35	0.35	0.35
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	820	1690	1657		262	1100	545	545
v/s Ratio Prot			0.08			0.10		
v/s Ratio Perm	0.42	0.42			0.26		c0.41	0.05
v/c Ratio	0.80	0.81	0.24		0.74	0.28	1.18	0.16
Uniform Delay, d1	21.6	21.8	26.0		32.1	26.3	36.5	25.2
Progression Factor	0.45	0.44	1.00		1.39	1.43	1.00	1.00
Incremental Delay, d2	7.5	4.0	0.1		5.5	0.1	99.4	0.1
Delay (s)	17.1	13.5	26.0		50.1	37.8	135.9	25.3
Level of Service	B	B	C		D	D	F	C
Approach Delay (s)		14.7	26.0			42.6		
Approach LOS		B	C			D		

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	138.7%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	170	245	0	240	0	1100	705	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.99			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.91			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.98				
Satd. Flow (prot)		2943			3336		1562	3150				
Flt Permitted		1.00			1.00		0.95	0.98				
Satd. Flow (perm)		2943			3336		1562	3150				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	0	189	272	0	267	0	1170	750	0	0	0	0
RTOR Reduction (vph)	0	90	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	371	0	0	267	0	632	1288	0	0	0	0
Confl. Peds. (#/hr)			15									
Heavy Vehicles (%)	0%	12%	7%	0%	7%	0%	4%	8%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		43.0			43.0		55.0	55.0				
Effective Green, g (s)		43.0			43.0		55.0	55.0				
Actuated g/C Ratio		0.38			0.38		0.49	0.49				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		1130			1281		767	1547				
v/s Ratio Prot		c0.13			0.08							
v/s Ratio Perm							0.40	0.41				
v/c Ratio		0.33			0.21		0.82	0.83				
Uniform Delay, d1		24.3			23.1		24.4	24.5				
Progression Factor		1.00			1.07		0.96	0.96				
Incremental Delay, d2		0.2			0.0		4.1	2.2				
Delay (s)		24.5			24.7		27.6	25.8				
Level of Service		C			C		C	C				
Approach Delay (s)		24.5			24.7			26.4			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	825	2095	150	0	0	0	0	200	25	280	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.99						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4949						3347		1750	3400	
Flt Permitted	0.95	1.00						1.00		0.44	1.00	
Satd. Flow (perm)	3395	4949						3347		819	3400	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	887	2253	161	0	0	0	0	211	26	295	42	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	887	2407	0	0	0	0	0	229	0	295	42	0
Confl. Peds. (#/hr)	1		60	60		1	15					15
Heavy Vehicles (%)	2%	2%	3%	0%	0%	0%	0%	5%	4%	2%	5%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	57.5	57.5						17.0		40.5	40.5	
Effective Green, g (s)	57.5	57.5						17.0		40.5	40.5	
Actuated g/C Ratio	0.51	0.51						0.15		0.36	0.36	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	1743	2541						508		442	1229	
v/s Ratio Prot	0.26	c0.49						0.07		c0.10	0.01	
v/s Ratio Perm										c0.14		
v/c Ratio	0.51	0.95						0.45		0.67	0.03	
Uniform Delay, d1	17.9	25.8						43.2		27.7	23.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.1	9.2						0.6		3.8	0.0	
Delay (s)	19.0	35.0						43.9		31.5	23.1	
Level of Service	B	C						D		C	C	
Approach Delay (s)		30.7			0.0			43.9			30.4	
Approach LOS		C			A			D			C	

Intersection Summary			
HCM Average Control Delay	31.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	147.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	260	2110	30	25	1815	135	25	65	110	460	115	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	*0.91		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.93		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.86	1.00		0.97	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3429	5015		1653	4869		1473	1577		1689	1756	1277
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.51	1.00	1.00
Satd. Flow (perm)	3429	5015		1653	4869		1053	1577		903	1756	1277
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	280	2269	32	26	1911	142	26	68	116	484	121	32
RTOR Reduction (vph)	0	1	0	0	8	0	0	55	0	0	0	19
Lane Group Flow (vph)	280	2300	0	26	2045	0	26	129	0	484	121	13
Confl. Peds. (#/hr)	5		25	25		5	135		85	85		135
Heavy Vehicles (%)	1%	2%	0%	8%	2%	5%	4%	0%	0%	2%	7%	3%
Turn Type	Prot			Prot	custom		Perm			pm+pt		Perm
Protected Phases	5	2		1				8		7	4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	11.4	42.4		3.6	34.6		27.0	27.0		46.0	46.0	46.0
Effective Green, g (s)	11.4	42.4		3.6	34.6		27.0	27.0		46.0	46.0	46.0
Actuated g/C Ratio	0.10	0.38		0.03	0.31		0.24	0.24		0.41	0.41	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	349	1899		53	1504		254	380		469	721	524
v/s Ratio Prot	c0.08	c0.46		0.02				0.08		c0.13	0.07	
v/s Ratio Perm					c0.42		0.02			c0.29		0.01
v/c Ratio	0.80	1.21		0.49	1.36		0.10	0.34		1.03	0.17	0.03
Uniform Delay, d1	49.2	34.8		53.3	38.7		33.1	35.1		31.5	20.9	19.6
Progression Factor	0.81	0.55		0.73	0.36		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	97.1		1.7	163.0		0.2	0.5		50.0	0.1	0.0
Delay (s)	45.1	116.3		40.4	177.0		33.2	35.7		81.5	21.0	19.7
Level of Service	D	F		D	F		C	D		F	C	B
Approach Delay (s)		108.6						35.4			66.9	
Approach LOS		F						D			E	

Intersection Summary			
HCM Average Control Delay	126.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1065	50	80	80	60	140	60	75	1820	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.90		0.96	
Flpb, ped/bikes	1.00	1.00		0.85	1.00		0.98	1.00		1.00	
Frt	1.00	0.99		1.00	0.94		1.00	0.92		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1750	3437		1523	1691		1664	1375		4023	
Flt Permitted	0.95	1.00		0.67	1.00		0.66	1.00		1.00	
Satd. Flow (perm)	1750	3437		1069	1691		1158	1375		4023	
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
Adj. Flow (vph)	89	1121	53	84	84	63	147	63	79	1916	132
RTOR Reduction (vph)	0	3	0	0	24	0	0	40	0	6	0
Lane Group Flow (vph)	89	1171	0	84	123	0	147	102	0	2042	0
Confl. Peds. (#/hr)	20		15	170		25	25		170		20
Heavy Vehicles (%)	2%	3%	3%	0%	4%	0%	5%	5%	18%	2%	5%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.06	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	109	2056		305	483		331	393		1940	
v/s Ratio Prot	0.05	c0.34			0.07			0.07			
v/s Ratio Perm				0.08			c0.13			c0.51	
v/c Ratio	0.82	0.57		0.28	0.25		0.44	0.26		1.05	
Uniform Delay, d1	51.9	13.7		31.0	30.8		32.7	30.9		29.0	
Progression Factor	0.58	1.76		1.00	1.00		1.00	1.00		0.26	
Incremental Delay, d2	4.4	0.1		0.5	0.3		1.0	0.4		25.3	
Delay (s)	34.2	24.3		31.5	31.1		33.7	31.2		32.8	
Level of Service	C	C		C	C		C	C		C	
Approach Delay (s)		25.0			31.2			32.5			
Approach LOS		C			C			C			

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	50	1870	655	85	160	620	585	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		8.0	8.0	8.0	
Lane Util. Factor		0.94	0.95		1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		0.90	1.00		1.00	1.00	1.00	
Frt		1.00	0.98		1.00	1.00	0.91	
Flt Protected		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		4447	3385		1750	1807	3150	
Flt Permitted		0.95	1.00		0.08	1.00	1.00	
Satd. Flow (perm)		4447	3385		150	1807	3150	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.95
Adj. Flow (vph)	54	2011	704	91	168	653	616	832
RTOR Reduction (vph)	0	0	9	0	0	0	74	0
Lane Group Flow (vph)	0	2065	786	0	168	653	1374	0
Confl. Peds. (#/hr)	45							
Heavy Vehicles (%)	13%	1%	4%	1%	2%	4%	3%	4%
Turn Type	Perm	Split			Perm			
Protected Phases		6	6			8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		49.0	49.0		49.0	49.0	49.0	
Effective Green, g (s)		49.0	49.0		49.0	49.0	49.0	
Actuated g/C Ratio		0.44	0.44		0.44	0.44	0.44	
Clearance Time (s)		6.0	6.0		8.0	8.0	8.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1946	1481		66	791	1378	
v/s Ratio Prot			0.23			0.36	0.44	
v/s Ratio Perm		0.46			c1.12			
v/c Ratio		1.06	0.53		2.55	0.83	1.10dr	
Uniform Delay, d1		31.5	23.1		31.5	27.7	31.4	
Progression Factor		0.20	0.20		1.37	1.14	1.00	
Incremental Delay, d2		31.6	0.4		720.7	4.2	23.4	
Delay (s)		38.0	5.1		763.9	35.9	54.9	
Level of Service		D	A		F	D	D	
Approach Delay (s)			28.9			184.8	54.9	
Approach LOS			C			F	D	

Intersection Summary			
HCM Average Control Delay	61.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.81		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	105.3%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	90	2220	150	115	525	0	0	335	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.76	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6102		1352	3336			1773	2729
Flt Permitted					1.00		0.41	1.00			1.00	1.00
Satd. Flow (perm)					6102		578	3336			1773	2729
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	97	2387	161	121	553	0	0	353	479
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	396
Lane Group Flow (vph)	0	0	0	0	2637	0	121	553	0	0	353	83
Confl. Peds. (#/hr)				30		135	1370		445			1370
Heavy Vehicles (%)	0%	0%	0%	4%	3%	5%	1%	7%	0%	0%	6%	3%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					45.0		53.0	53.0			26.5	19.5
Effective Green, g (s)					45.0		53.0	53.0			26.5	19.5
Actuated g/C Ratio					0.40		0.47	0.47			0.24	0.17
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2452		274	1579			420	475
v/s Ratio Prot								0.17			c0.20	0.03
v/s Ratio Perm					0.43		c0.21					
v/c Ratio					1.08		0.44	0.35			0.84	0.18
Uniform Delay, d1					33.5		19.6	18.6			40.7	39.4
Progression Factor					0.51		0.36	0.35			1.00	1.00
Incremental Delay, d2					37.4		0.6	0.1			14.0	0.8
Delay (s)					54.5		7.7	6.5			54.8	40.2
Level of Service					D		A	A			D	D
Approach Delay (s)		0.0			54.5			6.7			46.4	
Approach LOS		A			D			A			D	

Intersection Summary			
HCM Average Control Delay	45.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.0%	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												
Volume (vph)	0	0	0	110	1925	100	170	705	0	0	200	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.75	
Flpb, ped/bikes					0.99		0.97	1.00			1.00	
Frt					0.99		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4915		1669	3433			2255	
Flt Permitted					1.00		0.28	1.00			1.00	
Satd. Flow (perm)					4915		485	3433			2255	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	118	2070	108	179	742	0	0	211	400
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	0	0	0	2292	0	179	742	0	0	586	0
Confl. Peds. (#/hr)	90		65	65		90	490		290	290		490
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	4%	4%	0%	0%	11%	5%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					52.4		45.6	45.6			35.6	
Effective Green, g (s)					52.4		45.6	45.6			35.6	
Actuated g/C Ratio					0.47		0.41	0.41			0.32	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2300		261	1398			717	
v/s Ratio Prot							c0.04	0.22			c0.26	
v/s Ratio Perm					0.47		0.24					
v/c Ratio					1.00		0.69	0.53			1.02dr	
Uniform Delay, d1					29.7		26.0	25.1			35.2	
Progression Factor					1.00		0.96	1.04			1.00	
Incremental Delay, d2					17.9		5.3	0.3			7.2	
Delay (s)					47.6		30.2	26.5			42.4	
Level of Service					D		C	C			D	
Approach Delay (s)		0.0			47.6			27.2			42.4	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	41.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	138.5%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↱						↑↑		↰	↑	
Volume (vph)	0	1265	25	0	0	0	0	795	0	470	165	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0		4.0	8.0	
Lane Util. Factor		0.91						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	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4915						3471		1714	1756	
Flt Permitted		1.00						1.00		0.15	1.00	
Satd. Flow (perm)		4915						3471		268	1756	
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)	0	1332	26	0	0	0	0	837	0	495	174	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1356	0	0	0	0	0	837	0	495	174	0
Confl. Peds. (#/hr)	35		15	15		35	835		55	55		835
Heavy Vehicles (%)	0%	4%	5%	0%	0%	0%	0%	4%	4%	4%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		38.0						34.0		60.0	60.0	
Effective Green, g (s)		38.0						34.0		60.0	60.0	
Actuated g/C Ratio		0.34						0.30		0.54	0.54	
Clearance Time (s)		6.0						8.0		4.0	8.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1668						1054		428	941	
v/s Ratio Prot		c0.28						0.24		c0.23	0.10	
v/s Ratio Perm										c0.39		
v/c Ratio		0.81						0.79		1.16	0.18	
Uniform Delay, d1		33.8						35.8		29.9	13.4	
Progression Factor		0.47						1.00		1.45	0.21	
Incremental Delay, d2		3.9						4.2		73.1	0.0	
Delay (s)		19.9						40.0		116.4	2.8	
Level of Service		B						D		F	A	
Approach Delay (s)		19.9			0.0			40.0			86.9	
Approach LOS		B			A			D			F	

Intersection Summary			
HCM Average Control Delay	41.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	101.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	870	1215	400	75	275	140	695	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.91		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.76
Flpb, ped/bikes	0.98	1.00	1.00		0.91	1.00	1.00	1.00
Frt	1.00	1.00	0.98		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1548	3289	4431		1556	3275	1536	1177
Flt Permitted	0.95	0.99	1.00		0.46	1.00	1.00	1.00
Satd. Flow (perm)	1548	3289	4431		751	3275	1536	1177
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	916	1279	421	79	289	147	732	79
RTOR Reduction (vph)	0	0	0	0	0	0	0	38
Lane Group Flow (vph)	714	1481	500	0	289	147	732	41
Confl. Peds. (#/hr)	10			290	290			125
Heavy Vehicles (%)	3%	3%	10%	7%	4%	9%	4%	3%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8			4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	46.0	46.0	52.0		52.0	52.0	46.0	46.0
Effective Green, g (s)	46.0	46.0	52.0		52.0	52.0	46.0	46.0
Actuated g/C Ratio	0.41	0.41	0.46		0.46	0.46	0.41	0.41
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	636	1351	2057		349	1521	631	483
v/s Ratio Prot			0.11			0.04		
v/s Ratio Perm	0.46	0.45			c0.38		c0.48	0.03
v/c Ratio	1.12	1.10	0.24		0.83	0.10	1.16	0.08
Uniform Delay, d1	33.0	33.0	18.1		26.1	16.8	33.0	20.1
Progression Factor	0.58	0.59	1.00		1.34	1.14	1.00	1.00
Incremental Delay, d2	68.6	51.5	0.1		7.8	0.0	88.8	0.3
Delay (s)	87.9	70.8	18.2		42.7	19.3	121.8	20.5
Level of Service	F	E	B		D	B	F	C
Approach Delay (s)		76.4	18.2			34.8		
Approach LOS		E	B			C		

Intersection Summary			
HCM Average Control Delay	71.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	110	305	0	300	0	750	1390	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.93			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.89			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	1.00				
Satd. Flow (prot)		2809			3570		1547	3248				
Flt Permitted		1.00			1.00		0.95	1.00				
Satd. Flow (perm)		2809			3570		1547	3248				
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)	0	116	321	0	316	0	789	1463	0	0	0	0
RTOR Reduction (vph)	0	33	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	404	0	0	316	0	710	1542	0	0	0	0
Confl. Peds. (#/hr)	90		65	65		90						
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		26.4			26.4		71.6	71.6				
Effective Green, g (s)		26.4			26.4		71.6	71.6				
Actuated g/C Ratio		0.24			0.24		0.64	0.64				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		662			842		989	2076				
v/s Ratio Prot		c0.14			0.09							
v/s Ratio Perm							0.46	0.47				
v/c Ratio		0.86dr			0.38		0.72	0.74				
Uniform Delay, d1		38.2			35.9		13.5	13.9				
Progression Factor		1.00			1.06		0.27	0.25				
Incremental Delay, d2		1.7			0.2		0.4	0.2				
Delay (s)		39.9			38.4		4.1	3.7				
Level of Service		D			D		A	A				
Approach Delay (s)		39.9			38.4			3.8			0.0	
Approach LOS		D			D			A			A	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	138.5%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

C3 Centre Transit

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	580	355	90	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.78	1.00	0.88
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.73	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1530	1626	1610	1092	1089	1215
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1530	1626	1610	1092	1089	1215
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	644	394	100	133	67
RTOR Reduction (vph)	0	0	0	62	0	51
Lane Group Flow (vph)	78	644	394	38	133	16
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	5%	4%	5%	3%	8%	4%
Turn Type	Prot			Perm		custom
Protected Phases	5	2 5	6			
Permitted Phases				6	4	4
Actuated Green, G (s)	10.2	69.4	52.2	52.2	33.0	33.0
Effective Green, g (s)	10.2	69.4	52.2	52.2	33.0	33.0
Actuated g/C Ratio	0.07	0.51	0.38	0.38	0.24	0.24
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	115	830	618	419	264	295
v/s Ratio Prot	0.05	c0.40	0.24			
v/s Ratio Perm				0.04	c0.12	0.01
v/c Ratio	0.68	0.78	0.64	0.09	0.50	0.06
Uniform Delay, d1	61.3	27.0	34.2	26.8	44.4	39.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	4.6	5.0	0.4	1.5	0.1
Delay (s)	76.0	31.6	39.2	27.2	45.9	39.6
Level of Service	E	C	D	C	D	D
Approach Delay (s)		36.4	36.7		43.8	
Approach LOS		D	D		D	

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	33.6
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	25	675	375	5	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1610	3084			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1610	3084			1463
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	750	417	6	0	78
RTOR Reduction (vph)	0	0	0	0	0	57
Lane Group Flow (vph)	28	750	423	0	0	21
Heavy Vehicles (%)	0%	5%	4%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	5	2 4 9 10	8			5 9 10
Permitted Phases						
Actuated Green, G (s)	6.2	100.0	60.4			26.6
Effective Green, g (s)	6.2	93.0	60.4			26.6
Actuated g/C Ratio	0.06	0.93	0.60			0.27
Clearance Time (s)	6.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	100	1497	1863			389
v/s Ratio Prot	0.02	c0.47	0.14			0.01
v/s Ratio Perm						
v/c Ratio	0.28	0.50	0.23			0.05
Uniform Delay, d1	44.8	0.5	9.1			27.3
Progression Factor	1.00	1.00	0.34			1.00
Incremental Delay, d2	1.5	0.3	0.3			0.1
Delay (s)	46.3	0.7	3.3			27.4
Level of Service	D	A	A			C
Approach Delay (s)		2.4	3.3		27.4	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	44.5%	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												
Volume (vph)	0	670	0	0	370	20	0	0	0	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0						7.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		1.00			0.99						0.93	
Flt Protected		1.00			1.00						0.98	
Satd. Flow (prot)		1610			1614						1472	
Flt Permitted		1.00			1.00						0.84	
Satd. Flow (perm)		1610			1614						1270	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	744	0	0	411	22	0	0	0	11	0	11
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	11	0
Lane Group Flow (vph)	0	744	0	0	432	0	0	0	0	0	11	0
Heavy Vehicles (%)	5%	5%	50%	50%	4%	4%	50%	50%	50%	5%	5%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)		83.0			83.0						4.0	
Effective Green, g (s)		83.0			83.0						4.0	
Actuated g/C Ratio		0.83			0.83						0.04	
Clearance Time (s)		6.0			6.0						7.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		1336			1340						51	
v/s Ratio Prot		c0.46			0.27							
v/s Ratio Perm											c0.01	
v/c Ratio		0.56			0.32						0.22	
Uniform Delay, d1		2.7			2.0						46.5	
Progression Factor		0.89			0.16						1.00	
Incremental Delay, d2		1.5			0.5						2.2	
Delay (s)		3.9			0.9						48.7	
Level of Service		A			A						D	
Approach Delay (s)		3.9			0.9			0.0			48.7	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	580	15	20	330	75	10	15	10	45	10	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.97			0.96		1.00	0.94	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.99		0.88	1.00	
Frt	1.00	1.00		1.00	0.97			0.96		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1591	1603		1460	1516			1377		1180	1384	
Flt Permitted	0.95	1.00		0.95	1.00			0.93		0.73	1.00	
Satd. Flow (perm)	1591	1603		1460	1516			1303		909	1384	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	644	17	22	367	83	11	17	11	50	11	56
RTOR Reduction (vph)	0	1	0	0	8	0	0	8	0	0	39	0
Lane Group Flow (vph)	94	660	0	22	442	0	0	31	0	50	28	0
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	5%	0%	10%	5%	8%	15%	7%	10%	20%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	7.0	47.2		2.8	43.0			30.0		30.0	30.0	
Effective Green, g (s)	7.0	47.2		2.8	43.0			30.0		30.0	30.0	
Actuated g/C Ratio	0.07	0.47		0.03	0.43			0.30		0.30	0.30	
Clearance Time (s)	7.0	6.0		7.0	6.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	111	757		41	652			391		273	415	
v/s Ratio Prot	c0.06	c0.41		0.02	0.29						0.02	
v/s Ratio Perm								0.02		c0.06		
v/c Ratio	0.85	0.87		0.54	0.68			0.08		0.18	0.07	
Uniform Delay, d1	46.0	23.7		48.0	22.9			25.1		25.9	25.0	
Progression Factor	0.83	1.34		1.17	0.46			0.60		1.00	1.00	
Incremental Delay, d2	37.8	11.8		10.7	4.7			0.4		1.5	0.3	
Delay (s)	76.0	43.4		67.0	15.2			15.5		27.4	25.3	
Level of Service	E	D		E	B			B		C	C	
Approach Delay (s)		47.5			17.6			15.5			26.2	
Approach LOS		D			B			B			C	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	40	590	0	30	55	390	25	5	0	5	55	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0		7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99		1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00		0.83	1.00
Frt	1.00	1.00			1.00	0.99		1.00	0.85		1.00	0.93
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1545	1610			1559	1525		1575	1409		1315	1509
Flt Permitted	0.95	1.00			0.95	1.00		0.71	1.00		0.75	1.00
Satd. Flow (perm)	1545	1610			1559	1525		1177	1409		1043	1509
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	656	0	33	61	433	28	6	0	6	61	39
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	4	0	0	23
Lane Group Flow (vph)	44	656	0	0	94	459	0	6	2	0	61	49
Confl. Peds. (#/hr)	140						140				100	
Heavy Vehicles (%)	4%	5%	2%	5%	2%	9%	4%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot	Prot			Perm			Perm	
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	4.2	43.0			7.0	45.8		30.0	30.0		30.0	30.0
Effective Green, g (s)	4.2	43.0			7.0	45.8		30.0	30.0		30.0	30.0
Actuated g/C Ratio	0.04	0.43			0.07	0.46		0.30	0.30		0.30	0.30
Clearance Time (s)	7.0	6.0			7.0	6.0		7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	65	692			109	698		353	423		313	453
v/s Ratio Prot	0.03	c0.41			c0.06	c0.30			0.00			0.03
v/s Ratio Perm								0.01			c0.06	
v/c Ratio	0.68	0.95			0.86	0.66		0.02	0.00		0.19	0.11
Uniform Delay, d1	47.2	27.4			46.0	21.0		24.6	24.5		26.0	25.3
Progression Factor	0.81	1.07			0.57	1.54		1.00	1.00		1.00	1.00
Incremental Delay, d2	17.1	17.9			35.7	3.4		0.0	0.0		1.4	0.5
Delay (s)	55.4	47.2			61.8	35.8		24.6	24.5		27.4	25.8
Level of Service	E	D			E	D		C	C		C	C
Approach Delay (s)		47.7				40.2			24.6			26.5
Approach LOS		D				D			C			C

Intersection Summary			
HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	545	20	15	450	150	20	40	10	100	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.67		0.98		1.00	1.00	0.37
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.83		0.88	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1501	1552		1606	1595	931		1322		1360	1691	532
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.93		0.71	1.00	1.00
Satd. Flow (perm)	1501	1552		1606	1595	931		1248		1012	1691	532
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	606	22	17	500	167	22	44	11	111	11	122
RTOR Reduction (vph)	0	1	0	0	0	58	0	6	0	0	0	83
Lane Group Flow (vph)	122	627	0	17	500	109	0	71	0	111	11	39
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	7%	7%	6%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	10.0	45.2		2.8	38.0	38.0		32.0		32.0	32.0	32.0
Effective Green, g (s)	10.0	45.2		2.8	38.0	38.0		32.0		32.0	32.0	32.0
Actuated g/C Ratio	0.10	0.45		0.03	0.38	0.38		0.32		0.32	0.32	0.32
Clearance Time (s)	7.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	150	702		45	606	354		399		324	541	170
v/s Ratio Prot	c0.08	c0.40		0.01	0.31						0.01	
v/s Ratio Perm						0.12		0.06		c0.11		0.07
v/c Ratio	0.81	0.89		0.38	0.83	0.31		0.18		0.34	0.02	0.23
Uniform Delay, d1	44.1	25.2		47.7	28.0	21.8		24.5		26.0	23.3	25.0
Progression Factor	1.12	0.50		1.25	0.55	0.45		1.00		1.00	1.00	1.00
Incremental Delay, d2	15.1	8.8		3.8	9.0	1.6		1.0		2.9	0.1	3.1
Delay (s)	64.4	21.5		63.3	24.4	11.5		25.5		28.8	23.3	28.1
Level of Service	E	C		E	C	B		C		C	C	C
Approach Delay (s)		28.5			22.2			25.5			28.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.6%	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												
Volume (vph)	45	605	10	15	560	320	45	0	30	20	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0	6.0		7.0			7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.73		0.98			0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99			0.99	
Frt	1.00	1.00		1.00	1.00	0.85		0.95			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97			0.97	
Satd. Flow (prot)	1606	1580		1422	1595	1056		1495			1506	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.81			0.84	
Satd. Flow (perm)	1606	1580		1422	1595	1056		1245			1295	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	672	11	17	622	356	50	0	33	22	0	17
RTOR Reduction (vph)	0	0	0	0	0	182	0	25	0	0	13	0
Lane Group Flow (vph)	50	683	0	17	622	174	0	58	0	0	26	0
Confl. Peds. (#/hr)	85		185	185		85	10		15	15		10
Heavy Vehicles (%)	0%	6%	0%	13%	6%	0%	2%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	5.6	51.6		2.8	48.8	48.8		25.6			25.6	
Effective Green, g (s)	5.6	51.6		2.8	48.8	48.8		25.6			25.6	
Actuated g/C Ratio	0.06	0.52		0.03	0.49	0.49		0.26			0.26	
Clearance Time (s)	7.0	6.0		7.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	90	815		40	778	515		319			332	
v/s Ratio Prot	c0.03	c0.43		0.01	0.39							
v/s Ratio Perm						0.16		c0.05			0.02	
v/c Ratio	0.56	0.84		0.42	0.80	0.34		0.18			0.08	
Uniform Delay, d1	46.0	20.6		47.8	21.5	15.7		29.0			28.3	
Progression Factor	1.30	0.47		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	4.9	6.9		7.1	8.4	1.8		0.3			0.1	
Delay (s)	64.7	16.6		54.9	29.9	17.5		29.3			28.4	
Level of Service	E	B		D	C	B		C			C	
Approach Delay (s)		19.8			25.9			29.3			28.4	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	67.9%	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												
Volume (vph)	115	520	20	50	675	210	5	65	50	80	10	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.81	1.00	0.81		1.00	0.69	
Flpb, ped/bikes	1.00	1.00		0.89	1.00	1.00	0.85	1.00		0.64	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1575	1559		1431	1595	1122	1369	1277		993	980	
Flt Permitted	0.09	1.00		0.38	1.00	1.00	0.34	1.00		0.67	1.00	
Satd. Flow (perm)	151	1559		578	1595	1122	494	1277		705	980	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	128	578	22	56	750	233	6	72	56	89	11	378
RTOR Reduction (vph)	0	1	0	0	0	58	0	31	0	0	82	0
Lane Group Flow (vph)	128	599	0	56	750	175	6	97	0	89	307	0
Confl. Peds. (#/hr)	180		165	165		180	200		275	275		200
Heavy Vehicles (%)	2%	7%	0%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	48.2	48.2		38.0	38.0	38.0	29.8	29.8		29.8	29.8	
Effective Green, g (s)	48.2	48.2		38.0	38.0	38.0	29.8	29.8		29.8	29.8	
Actuated g/C Ratio	0.54	0.54		0.42	0.42	0.42	0.33	0.33		0.33	0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	147	835		244	673	474	164	423		233	324	
v/s Ratio Prot	0.04	c0.38			c0.47			0.08			c0.31	
v/s Ratio Perm	0.43			0.10		0.16	0.01			0.13		
v/c Ratio	0.87	0.72		0.23	1.11	0.37	0.04	0.23		0.38	0.95	
Uniform Delay, d1	19.4	15.8		16.6	26.0	17.8	20.4	21.8		23.0	29.4	
Progression Factor	1.00	1.00		0.85	0.64	0.71	1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.1	5.2		1.7	66.8	1.7	0.1	0.3		1.0	36.2	
Delay (s)	58.5	21.0		15.9	83.5	14.3	20.5	22.1		24.1	65.5	
Level of Service	E	C		B	F	B	C	C		C	E	
Approach Delay (s)		27.6			64.4			22.0			57.8	
Approach LOS		C			E			C			E	

Intersection Summary			
HCM Average Control Delay	49.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	200	400	735	115	95	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1542	1595	2920		1545	1304
Flt Permitted	0.19	1.00	1.00		0.95	1.00
Satd. Flow (perm)	309	1595	2920		1545	1304
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	222	444	817	128	106	267
RTOR Reduction (vph)	0	0	14	0	0	134
Lane Group Flow (vph)	222	444	931	0	106	133
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	4%	6%	6%	12%	4%	3%
Turn Type	pm+pt					Perm
Protected Phases	5	2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	51.0	51.0	41.0		27.0	27.0
Effective Green, g (s)	51.0	51.0	41.0		27.0	27.0
Actuated g/C Ratio	0.57	0.57	0.46		0.30	0.30
Clearance Time (s)	4.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	257	904	1330		464	391
v/s Ratio Prot	c0.06	0.28	0.32		0.07	
v/s Ratio Perm	c0.43					c0.10
v/c Ratio	0.86	0.49	0.70		0.23	0.34
Uniform Delay, d1	13.9	11.7	19.6		23.7	24.5
Progression Factor	1.61	0.65	1.00		1.00	1.00
Incremental Delay, d2	19.9	1.5	3.1		0.3	0.5
Delay (s)	42.2	9.1	22.7		23.9	25.1
Level of Service	D	A	C		C	C
Approach Delay (s)		20.1	22.7		24.7	
Approach LOS		C	C		C	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	645	580	155	95	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.73	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	0.92	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1606	1642	1674	1032	1424	1304
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1606	1642	1674	1032	1424	1304
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	679	611	163	100	100
RTOR Reduction (vph)	0	0	0	74	0	76
Lane Group Flow (vph)	74	679	611	89	100	24
Confl. Peds. (#/hr)	243			243	38	27
Heavy Vehicles (%)	0%	3%	1%	1%	4%	2%
Turn Type	Prot			Perm		custom
Protected Phases	5	2 5	6			
Permitted Phases				6	4	4
Actuated Green, G (s)	10.4	69.4	52.0	52.0	33.0	33.0
Effective Green, g (s)	10.4	69.4	52.0	52.0	33.0	33.0
Actuated g/C Ratio	0.08	0.51	0.38	0.38	0.24	0.24
Clearance Time (s)	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	123	838	640	395	346	316
v/s Ratio Prot	0.05	c0.41	c0.36			
v/s Ratio Perm				0.09	c0.07	0.02
v/c Ratio	0.60	0.81	0.95	0.23	0.29	0.08
Uniform Delay, d1	60.8	27.8	40.9	28.4	41.9	39.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.0	6.0	26.0	1.3	0.5	0.1
Delay (s)	68.8	33.8	66.9	29.7	42.4	39.8
Level of Service	E	C	E	C	D	D
Approach Delay (s)		37.2	59.1		41.1	
Approach LOS		D	E		D	

Intersection Summary			
HCM Average Control Delay	47.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	40.6
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	45	695	685	10	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	7.0			6.0
Lane Util. Factor	1.00	1.00	0.95			1.00
Frt	1.00	1.00	1.00			0.86
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	1606	1642	3144			1463
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	1606	1642	3144			1463
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	732	721	11	0	53
RTOR Reduction (vph)	0	0	1	0	0	38
Lane Group Flow (vph)	47	732	731	0	0	15
Heavy Vehicles (%)	0%	3%	2%	0%	0%	0%
Turn Type	Prot					custom
Protected Phases	5	2 4 9 10	8			5 9 10
Permitted Phases						
Actuated Green, G (s)	7.3	100.0	59.3			27.7
Effective Green, g (s)	7.3	93.0	59.3			27.7
Actuated g/C Ratio	0.07	0.93	0.59			0.28
Clearance Time (s)	6.0		7.0			
Vehicle Extension (s)	3.0		3.0			
Lane Grp Cap (vph)	117	1527	1864			405
v/s Ratio Prot	0.03	c0.45	0.23			0.01
v/s Ratio Perm						
v/c Ratio	0.40	0.48	0.39			0.04
Uniform Delay, d1	44.3	0.4	10.8			26.4
Progression Factor	1.00	1.00	1.14			1.00
Incremental Delay, d2	2.3	0.2	0.4			0.0
Delay (s)	46.5	0.7	12.7			26.4
Level of Service	D	A	B			C
Approach Delay (s)		3.4	12.7		26.4	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	45.6%	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												
Volume (vph)	5	680	0	0	700	30	0	0	0	10	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			6.0						7.0	
Lane Util. Factor	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.99						0.91	
Flt Protected	0.95	1.00			1.00						0.98	
Satd. Flow (prot)	1606	1642			1649						1515	
Flt Permitted	0.95	1.00			1.00						0.93	
Satd. Flow (perm)	1606	1642			1649						1427	
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)	5	716	0	0	737	32	0	0	0	11	0	21
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	16	0
Lane Group Flow (vph)	5	716	0	0	768	0	0	0	0	0	16	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	1.4	64.6			56.2						22.4	
Effective Green, g (s)	1.4	64.6			56.2						22.4	
Actuated g/C Ratio	0.01	0.65			0.56						0.22	
Clearance Time (s)	7.0	6.0			6.0						7.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	22	1061			927						320	
v/s Ratio Prot	0.00	c0.44			c0.47							
v/s Ratio Perm											c0.01	
v/c Ratio	0.23	0.67			0.83						0.05	
Uniform Delay, d1	48.8	11.1			17.9						30.4	
Progression Factor	1.00	1.00			1.36						1.00	
Incremental Delay, d2	4.8	3.1			4.1						0.1	
Delay (s)	53.5	14.2			28.5						30.5	
Level of Service	D	B			C						C	
Approach Delay (s)		14.5			28.5			0.0			30.5	
Approach LOS		B			C			A			C	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	570	10	30	610	65	15	25	15	50	15	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98			0.95		1.00	0.87	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97		0.84	1.00	
Frt	1.00	1.00		1.00	0.99			0.96		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1591	1591		1606	1601			1476		1256	1272	
Flt Permitted	0.95	1.00		0.95	1.00			0.91		0.72	1.00	
Satd. Flow (perm)	1591	1591		1606	1601			1366		951	1272	
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)	116	600	11	32	642	68	16	26	16	53	16	111
RTOR Reduction (vph)	0	1	0	0	4	0	0	11	0	0	78	0
Lane Group Flow (vph)	116	610	0	32	706	0	0	47	0	53	49	0
Confl. Peds. (#/hr)	184		40	40		184	82		101	101		82
Heavy Vehicles (%)	1%	6%	0%	0%	2%	0%	0%	0%	0%	8%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	7.0	45.8		4.2	43.0			30.0		30.0	30.0	
Effective Green, g (s)	7.0	45.8		4.2	43.0			30.0		30.0	30.0	
Actuated g/C Ratio	0.07	0.46		0.04	0.43			0.30		0.30	0.30	
Clearance Time (s)	7.0	6.0		7.0	6.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	111	729		67	688			410		285	382	
v/s Ratio Prot	c0.07	c0.38		0.02	c0.44						0.04	
v/s Ratio Perm								0.03		c0.06		
v/c Ratio	1.05	0.84		0.48	1.03			0.11		0.19	0.13	
Uniform Delay, d1	46.5	23.8		46.8	28.5			25.4		25.9	25.5	
Progression Factor	1.31	0.42		1.21	0.58			0.79		1.00	1.00	
Incremental Delay, d2	87.2	8.7		1.7	26.4			0.1		0.3	0.2	
Delay (s)	148.3	18.7		58.5	42.8			20.3		26.3	25.6	
Level of Service	F	B		E	D			C		C	C	
Approach Delay (s)		39.4			43.4			20.3			25.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Volume (vph)	65	585	0	50	20	650	80	15	45	35	65	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0			7.0	6.0		7.0	7.0		7.0	7.0
Lane Util. Factor	1.00	1.00			1.00	1.00		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.98		1.00	1.00		1.00	0.94
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00		0.85	1.00
Frt	1.00	1.00			1.00	0.98		1.00	0.93		1.00	0.86
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1560	1610			1542	1601		1575	1549		1302	1332
Flt Permitted	0.95	1.00			0.95	1.00		0.72	1.00		0.70	1.00
Satd. Flow (perm)	1560	1610			1542	1601		1199	1549		959	1332
Peak-hour factor, PHF	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.90	0.90	0.90	0.95	0.95
Adj. Flow (vph)	68	616	0	56	22	684	84	17	50	39	68	5
RTOR Reduction (vph)	0	0	0	0	0	4	0	0	27	0	0	33
Lane Group Flow (vph)	68	616	0	0	78	764	0	17	62	0	68	19
Confl. Peds. (#/hr)	138						138				101	
Heavy Vehicles (%)	3%	5%	2%	5%	2%	2%	1%	2%	2%	2%	5%	2%
Turn Type	Prot			Prot	Prot			Perm			Perm	
Protected Phases	5	2		1	1	6			8			4
Permitted Phases								8			4	
Actuated Green, G (s)	5.6	44.4			5.6	44.4		30.0	30.0		30.0	30.0
Effective Green, g (s)	5.6	44.4			5.6	44.4		30.0	30.0		30.0	30.0
Actuated g/C Ratio	0.06	0.44			0.06	0.44		0.30	0.30		0.30	0.30
Clearance Time (s)	7.0	6.0			7.0	6.0		7.0	7.0		7.0	7.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	87	715			86	711		360	465		288	400
v/s Ratio Prot	0.04	0.38			c0.05	c0.48			0.04			0.01
v/s Ratio Perm								0.01			c0.07	
v/c Ratio	0.78	0.86			0.91	1.07		0.05	0.13		0.24	0.05
Uniform Delay, d1	46.6	25.0			46.9	27.8		24.9	25.5		26.4	24.9
Progression Factor	0.71	1.48			1.07	0.79		1.00	1.00		1.00	1.00
Incremental Delay, d2	26.9	9.6			37.2	44.5		0.1	0.1		1.9	0.2
Delay (s)	59.8	46.7			87.4	66.4		24.9	25.6		28.3	25.1
Level of Service	E	D			F	E		C	C		C	C
Approach Delay (s)		48.0				68.3			25.5			26.9
Approach LOS		D				E			C			C

Intersection Summary			
HCM Average Control Delay	55.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	625	15	5	705	265	10	15	15	55	20	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.78		0.94		1.00	1.00	0.40
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.85		0.86	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1606	1592		1606	1674	1117		1269		1342	1691	574
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.95		0.73	1.00	1.00
Satd. Flow (perm)	1606	1592		1606	1674	1117		1216		1030	1691	574
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)	95	658	16	5	742	279	11	16	16	58	21	121
RTOR Reduction (vph)	0	1	0	0	0	67	0	11	0	0	0	86
Lane Group Flow (vph)	95	673	0	5	742	212	0	32	0	58	21	35
Confl. Peds. (#/hr)	170		333	333		170	559		86	86		559
Heavy Vehicles (%)	0%	5%	0%	0%	1%	0%	0%	0%	0%	3%	0%	0%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases						8	2			6		6
Actuated Green, G (s)	7.0	49.6		1.4	44.0	44.0		29.0		29.0	29.0	29.0
Effective Green, g (s)	7.0	49.6		1.4	44.0	44.0		29.0		29.0	29.0	29.0
Actuated g/C Ratio	0.07	0.50		0.01	0.44	0.44		0.29		0.29	0.29	0.29
Clearance Time (s)	7.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	112	790		22	737	491		353		299	490	166
v/s Ratio Prot	c0.06	c0.42		0.00	c0.44						0.01	
v/s Ratio Perm						0.19		0.03		0.06		c0.06
v/c Ratio	0.85	0.85		0.23	1.01	0.43		0.09		0.19	0.04	0.21
Uniform Delay, d1	46.0	22.0		48.8	28.0	19.4		25.9		26.7	25.5	26.9
Progression Factor	1.09	0.95		1.17	0.65	0.45		1.00		1.00	1.00	1.00
Incremental Delay, d2	38.8	7.9		2.3	23.7	1.2		0.5		1.4	0.2	2.9
Delay (s)	89.0	28.7		59.5	42.0	9.9		26.4		28.2	25.7	29.7
Level of Service	F	C		E	D	A		C		C	C	C
Approach Delay (s)		36.2			33.4			26.4			28.8	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	660	20	20	810	30	10	0	20	175	0	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	6.0		7.0	6.0	6.0		7.0			7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.83		0.97			0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		0.99			0.99	
Frt	1.00	1.00		1.00	1.00	0.85		0.91			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98			0.97	
Satd. Flow (prot)	1606	1585		1606	1674	1190		1459			1484	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.87			0.81	
Satd. Flow (perm)	1606	1585		1606	1674	1190		1293			1232	
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)	16	695	21	21	853	32	11	0	21	184	0	142
RTOR Reduction (vph)	0	1	0	0	0	13	0	16	0	0	28	0
Lane Group Flow (vph)	16	715	0	21	853	19	0	16	0	0	298	0
Confl. Peds. (#/hr)	143		109	109		143	24		14	14		24
Heavy Vehicles (%)	0%	6%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		
Actuated Green, G (s)	2.8	51.8		2.8	51.8	51.8		25.4			25.4	
Effective Green, g (s)	2.8	51.8		2.8	51.8	51.8		25.4			25.4	
Actuated g/C Ratio	0.03	0.52		0.03	0.52	0.52		0.25			0.25	
Clearance Time (s)	7.0	6.0		7.0	6.0	6.0		7.0			7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)	45	821		45	867	616		328			313	
v/s Ratio Prot	0.01	0.45		c0.01	c0.51							
v/s Ratio Perm						0.02		0.01			c0.24	
v/c Ratio	0.36	0.87		0.47	0.98	0.03		0.05			0.95	
Uniform Delay, d1	47.7	21.2		47.9	23.7	11.8		28.2			36.7	
Progression Factor	1.30	0.48		1.00	1.00	1.00		1.00			1.00	
Incremental Delay, d2	3.3	8.9		7.5	26.9	0.1		0.1			37.8	
Delay (s)	65.4	19.1		55.3	50.6	11.9		28.2			74.5	
Level of Service	E	B		E	D	B		C			E	
Approach Delay (s)		20.1			49.3			28.2			74.5	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	42.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.8%	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												
Volume (vph)	185	720	0	50	675	240	5	20	30	95	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.87		0.87		1.00	0.75	
Flpb, ped/bikes	1.00	1.00		0.94	1.00	1.00		0.98		0.80	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.93		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1591	1610		1518	1674	1217		1327		1231	1109	
Flt Permitted	0.10	1.00		0.24	1.00	1.00		0.98		0.72	1.00	
Satd. Flow (perm)	159	1610		381	1674	1217		1302		932	1109	
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)	195	758	0	53	711	253	5	21	32	100	32	126
RTOR Reduction (vph)	0	0	0	0	0	152	0	22	0	0	85	0
Lane Group Flow (vph)	195	758	0	53	711	101	0	36	0	100	73	0
Confl. Peds. (#/hr)	118		126	126		118	197		142	142		197
Heavy Vehicles (%)	1%	5%	0%	0%	1%	3%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm		Perm	Perm			Perm		
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	47.0	47.0		36.0	36.0	36.0		29.0		29.0	29.0	
Effective Green, g (s)	47.0	47.0		36.0	36.0	36.0		29.0		29.0	29.0	
Actuated g/C Ratio	0.52	0.52		0.40	0.40	0.40		0.32		0.32	0.32	
Clearance Time (s)	6.0	7.0		7.0	7.0	7.0		7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)	163	841		152	670	487		420		300	357	
v/s Ratio Prot	0.07	c0.47			0.42						0.07	
v/s Ratio Perm	c0.56			0.14		0.08		0.03		c0.11		
v/c Ratio	1.20	0.90		0.35	1.06	0.21		0.09		0.33	0.20	
Uniform Delay, d1	20.0	19.4		18.8	27.0	17.7		21.3		23.2	22.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	133.0	14.7		6.2	52.1	1.0		0.1		0.7	0.3	
Delay (s)	153.0	34.1		25.0	79.1	18.6		21.4		23.8	22.4	
Level of Service	F	C		C	E	B		C		C	C	
Approach Delay (s)		58.4			61.3			21.4			23.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	185	625	645	200	155	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.94
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1556	1595	2959		1516	1351
Flt Permitted	0.20	1.00	1.00		0.95	1.00
Satd. Flow (perm)	331	1595	2959		1516	1351
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	658	679	211	163	374
RTOR Reduction (vph)	0	0	33	0	0	120
Lane Group Flow (vph)	195	658	857	0	163	254
Confl. Peds. (#/hr)	106			106	42	49
Heavy Vehicles (%)	3%	6%	2%	5%	6%	0%
Turn Type	pm+pt					Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Actuated Green, G (s)	51.0	51.0	41.0		27.0	27.0
Effective Green, g (s)	51.0	51.0	41.0		27.0	27.0
Actuated g/C Ratio	0.57	0.57	0.46		0.30	0.30
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Lane Grp Cap (vph)	242	904	1348		455	405
v/s Ratio Prot	0.04	c0.41	0.29		0.11	
v/s Ratio Perm	c0.42					c0.19
v/c Ratio	0.81	0.73	0.64		0.36	0.63
Uniform Delay, d1	16.0	14.4	18.8		24.7	27.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	24.2	5.1	2.3		2.2	7.2
Delay (s)	40.2	19.5	21.1		26.9	34.4
Level of Service	D	B	C		C	C
Approach Delay (s)		24.2	21.1		32.1	
Approach LOS		C	C		C	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.1%	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												
Volume (vph)	1520	2530	65	0	0	0	0	70	90	165	115	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.92		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4912						3084		1767	3433	
Flt Permitted	0.95	1.00						1.00		0.47	1.00	
Satd. Flow (perm)	3395	4912						3084		879	3433	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1567	2608	67	0	0	0	0	78	100	183	128	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	1567	2673	0	0	0	0	0	137	0	183	128	0
Confl. Peds. (#/hr)			20									
Heavy Vehicles (%)	2%	4%	3%	0%	0%	0%	0%	6%	6%	1%	4%	0%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	92.5	92.5						17.0		37.5	37.5	
Effective Green, g (s)	92.5	92.5						17.0		37.5	37.5	
Actuated g/C Ratio	0.64	0.64						0.12		0.26	0.26	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	2181	3155						364		318	894	
v/s Ratio Prot	0.46	c0.54						0.04		c0.06	0.04	
v/s Ratio Perm										c0.09		
v/c Ratio	0.72	0.85						0.38		0.58	0.14	
Uniform Delay, d1	17.1	20.2						58.6		44.1	40.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.1	3.0						0.7		2.5	0.1	
Delay (s)	19.2	23.2						59.3		46.6	41.0	
Level of Service	B	C						E		D	D	
Approach Delay (s)		21.7			0.0			59.3			44.3	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	144.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	137.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	470	2275	40	10	940	135	10	65	100	190	55	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	0.76		1.00	1.00			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.93			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.91			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	3330	4953		1785	4089		1750	1554			3160	1566
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00			0.66	1.00
Satd. Flow (perm)	3330	4953		1785	4089		1076	1554			2182	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	485	2345	41	11	1033	148	11	72	111	211	61	11
RTOR Reduction (vph)	0	1	0	0	14	0	0	49	0	0	0	8
Lane Group Flow (vph)	485	2385	0	11	1167	0	11	134	0	0	272	3
Confl. Peds. (#/hr)	5		40	40		5			80	80		
Heavy Vehicles (%)	4%	3%	13%	0%	2%	2%	2%	5%	1%	2%	4%	2%
Turn Type	Prot			Prot	custom		Perm			Perm		Perm
Protected Phases	5	2		1				8			4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Effective Green, g (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.24	0.54		0.04	0.34		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	797	2680		70	1395		259	375			526	378
v/s Ratio Prot	c0.15	c0.48		0.01				0.09				
v/s Ratio Perm					0.29		0.01				c0.12	0.00
v/c Ratio	0.61	0.89		0.16	0.84		0.04	0.36			0.52	0.01
Uniform Delay, d1	37.9	22.7		52.0	34.0		32.6	35.3			36.8	32.3
Progression Factor	1.00	1.00		1.08	0.31		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	4.9		0.9	5.0		0.1	0.6			0.9	0.0
Delay (s)	39.3	27.7		56.9	15.5		32.7	35.9			37.7	32.3
Level of Service	D	C		E	B		C	D			D	C
Approach Delay (s)		29.6						35.7			37.5	
Approach LOS		C						D			D	

Intersection Summary			
HCM Average Control Delay	26.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1130	95	25	30	10	95	25	50	1010	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.94		0.97	
Flpb, ped/bikes	1.00	1.00		0.93	1.00		0.97	1.00		1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.90		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1648	3390		1603	1724		1732	1204		3951	
Flt Permitted	0.95	1.00		0.70	1.00		0.73	1.00		1.00	
Satd. Flow (perm)	1648	3390		1186	1724		1328	1204		3951	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91
Adj. Flow (vph)	90	1202	101	28	33	11	106	28	56	1110	126
RTOR Reduction (vph)	0	6	0	0	8	0	0	40	0	10	0
Lane Group Flow (vph)	90	1297	0	28	36	0	106	44	0	1226	0
Confl. Peds. (#/hr)	5		10	80		30	30		80		5
Heavy Vehicles (%)	8%	4%	2%	3%	5%	0%	0%	15%	40%	6%	3%
Turn Type	pm+pt			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases	2			8			4			6	
Actuated Green, G (s)	67.0	67.0		32.0	32.0		32.0	32.0		55.4	
Effective Green, g (s)	67.0	67.0		32.0	32.0		32.0	32.0		55.4	
Actuated g/C Ratio	0.60	0.60		0.29	0.29		0.29	0.29		0.49	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	986	2028		339	493		379	344		1954	
v/s Ratio Prot	0.00	c0.38			0.02			0.04			
v/s Ratio Perm	0.05			0.02			c0.08			0.31	
v/c Ratio	0.09	0.64		0.08	0.07		0.28	0.13		0.63	
Uniform Delay, d1	9.6	14.6		29.3	29.2		31.1	29.7		20.7	
Progression Factor	0.93	1.28		1.00	1.00		1.00	1.00		0.27	
Incremental Delay, d2	0.0	1.0		0.1	0.1		0.4	0.2		0.6	
Delay (s)	9.0	19.7		29.4	29.2		31.5	29.8		6.2	
Level of Service	A	B		C	C		C	C		A	
Approach Delay (s)		19.0			29.3			30.7			
Approach LOS		B			C			C			

Intersection Summary			
HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	65	1090	595	475	100	895	250	640
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			8.0	8.0	
Lane Util. Factor		0.94	0.95			0.95	0.95	
Frpb, ped/bikes		1.00	0.98			1.00	1.00	
Flpb, ped/bikes		0.89	1.00			1.00	1.00	
Frt		1.00	0.93			1.00	0.89	
Flt Protected		0.95	1.00			1.00	1.00	
Satd. Flow (prot)		4214	3142			3354	3038	
Flt Permitted		0.95	1.00			0.63	1.00	
Satd. Flow (perm)		4214	3142			2110	3038	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	1147	626	500	111	994	278	711
RTOR Reduction (vph)	0	0	68	0	0	0	140	0
Lane Group Flow (vph)	0	1215	1058	0	0	1105	849	0
Confl. Peds. (#/hr)	70			45				
Heavy Vehicles (%)	14%	6%	4%	3%	5%	6%	7%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		36.0	36.0			62.0	62.0	
Effective Green, g (s)		36.0	36.0			62.0	62.0	
Actuated g/C Ratio		0.32	0.32			0.55	0.55	
Clearance Time (s)		6.0	6.0			8.0	8.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		1355	1010			1168	1682	
v/s Ratio Prot			c0.34				0.28	
v/s Ratio Perm		0.29				c0.52		
v/c Ratio		0.90	1.05			0.95	0.50	
Uniform Delay, d1		36.2	38.0			23.4	15.5	
Progression Factor		0.23	0.16			0.77	1.00	
Incremental Delay, d2		1.0	24.5			10.1	0.2	
Delay (s)		9.5	30.7			28.1	15.7	
Level of Service		A	C			C	B	
Approach Delay (s)			19.7			28.1	15.7	
Approach LOS			B			C	B	

Intersection Summary			
HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	106.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	160	2005	210	145	675	0	0	245	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.70	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6004		1173	3400			1634	2703
Flt Permitted					1.00		0.51	1.00			1.00	1.00
Satd. Flow (perm)					6004		629	3400			1634	2703
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	168	2111	221	161	750	0	0	272	294
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	213
Lane Group Flow (vph)	0	0	0	0	2486	0	161	750	0	0	272	81
Confl. Peds. (#/hr)				35		125	1405					1405
Heavy Vehicles (%)	0%	0%	0%	12%	4%	3%	6%	5%	0%	0%	15%	4%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					36.0		62.0	62.0			24.0	31.0
Effective Green, g (s)					36.0		62.0	62.0			24.0	31.0
Actuated g/C Ratio					0.32		0.55	0.55			0.21	0.28
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1930		348	1882			350	748
v/s Ratio Prot								0.22			c0.17	0.03
v/s Ratio Perm					0.41		c0.26					
v/c Ratio					1.29		0.46	0.40			0.78	0.11
Uniform Delay, d1					38.0		15.0	14.3			41.5	30.2
Progression Factor					0.36		0.51	0.48			1.00	1.00
Incremental Delay, d2					130.0		0.7	0.1			10.4	0.3
Delay (s)					143.5		8.3	6.9			51.8	30.5
Level of Service					F		A	A			D	C
Approach Delay (s)		0.0			143.5			7.2			40.8	
Approach LOS		A			F			A			D	

Intersection Summary			
HCM Average Control Delay	97.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.2%	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												
Volume (vph)	0	0	0	105	2060	300	110	1170	0	0	135	225
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.80	
Flpb, ped/bikes					1.00		0.93	1.00			1.00	
Frt					0.98		1.00	1.00			0.91	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4747		1569	3433			2377	
Flt Permitted					1.00		0.44	1.00			1.00	
Satd. Flow (perm)					4747		732	3433			2377	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	111	2168	316	122	1300	0	0	150	250
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	0	0	0	2593	0	122	1300	0	0	361	0
Confl. Peds. (#/hr)				130		165	435		290	290		435
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	6%	4%	0%	0%	11%	8%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					47.0		51.0	51.0			41.0	
Effective Green, g (s)					47.0		51.0	51.0			41.0	
Actuated g/C Ratio					0.42		0.46	0.46			0.37	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					1992		378	1563			870	
v/s Ratio Prot							0.02	c0.38			0.15	
v/s Ratio Perm					0.55		0.13					
v/c Ratio					1.30		0.32	0.83			0.42	
Uniform Delay, d1					32.5		18.2	26.7			26.5	
Progression Factor					1.00		0.67	0.57			1.00	
Incremental Delay, d2					139.6		0.3	2.7			0.3	
Delay (s)					172.1		12.6	18.0			26.9	
Level of Service					F		B	B			C	
Approach Delay (s)		0.0			172.1			17.5			26.9	
Approach LOS		A			F			B			C	

Intersection Summary			
HCM Average Control Delay	109.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	30	0	0	0	0	1015	0	155	190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0			8.0	
Lane Util. Factor		0.91						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		1.00						1.00			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4860						3610			3240	
Flt Permitted		1.00						1.00			0.54	
Satd. Flow (perm)		4860						3610			1792	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1293	32	0	0	0	0	1128	0	172	211	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1323	0	0	0	0	0	1128	0	0	383	0
Confl. Peds. (#/hr)	30		30							55		
Heavy Vehicles (%)	17%	5%	8%	2%	2%	2%	0%	0%	0%	8%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		53.8						44.2			44.2	
Effective Green, g (s)		53.8						44.2			44.2	
Actuated g/C Ratio		0.48						0.39			0.39	
Clearance Time (s)		6.0						8.0			8.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2335						1425			707	
v/s Ratio Prot		c0.27						c0.31				
v/s Ratio Perm											0.21	
v/c Ratio		0.57						0.79			2.36dl	
Uniform Delay, d1		20.8						29.8			26.1	
Progression Factor		0.34						1.00			0.81	
Incremental Delay, d2		0.8						3.1			0.7	
Delay (s)		8.0						32.9			22.0	
Level of Service		A						C			C	
Approach Delay (s)		8.0			0.0			32.9			22.0	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	88.6%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	820	1075	340	25	175	275	605	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.85	1.00	1.00	1.00
Frt	1.00	1.00	0.99		1.00	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1557	3209	3312		1424	3159	1842	1566
Flt Permitted	0.95	0.99	1.00		0.48	1.00	1.00	1.00
Satd. Flow (perm)	1557	3209	3312		714	3159	1842	1566
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.90	0.90	0.94	0.94
Adj. Flow (vph)	872	1144	378	28	194	306	644	191
RTOR Reduction (vph)	0	0	5	0	0	0	0	90
Lane Group Flow (vph)	654	1362	401	0	194	306	644	101
Confl. Peds. (#/hr)	5			310	310			
Heavy Vehicles (%)	4%	6%	5%	0%	7%	13%	2%	2%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8			4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Effective Green, g (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Actuated g/C Ratio	0.53	0.53	0.35		0.35	0.35	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	820	1690	1153		249	1100	970	825
v/s Ratio Prot			0.12			0.10		
v/s Ratio Perm	0.42	0.42			c0.27		0.35	0.06
v/c Ratio	0.80	0.81	0.35		0.78	0.28	0.66	0.12
Uniform Delay, d1	21.6	21.8	27.1		32.6	26.3	19.3	13.4
Progression Factor	0.48	0.47	1.00		1.40	1.43	1.00	1.00
Incremental Delay, d2	7.5	4.0	0.2		7.4	0.1	3.6	0.3
Delay (s)	17.9	14.3	27.3		53.1	37.7	22.9	13.7
Level of Service	B	B	C		D	D	C	B
Approach Delay (s)		15.5	27.3			43.6		
Approach LOS		B	C			D		

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	138.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	170	245	0	240	0	1100	705	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.99			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.91			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.98				
Satd. Flow (prot)		2943			3336		1562	3150				
Flt Permitted		1.00			1.00		0.95	0.98				
Satd. Flow (perm)		2943			3336		1562	3150				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	0	189	272	0	267	0	1170	750	0	0	0	0
RTOR Reduction (vph)	0	90	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	371	0	0	267	0	632	1288	0	0	0	0
Confl. Peds. (#/hr)			15									
Heavy Vehicles (%)	0%	12%	7%	0%	7%	0%	4%	8%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		43.0			43.0		55.0	55.0				
Effective Green, g (s)		43.0			43.0		55.0	55.0				
Actuated g/C Ratio		0.38			0.38		0.49	0.49				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		1130			1281		767	1547				
v/s Ratio Prot		c0.13			0.08							
v/s Ratio Perm							0.40	0.41				
v/c Ratio		0.33			0.21		0.82	0.83				
Uniform Delay, d1		24.3			23.1		24.4	24.5				
Progression Factor		1.00			1.02		0.43	0.43				
Incremental Delay, d2		0.2			0.0		6.5	3.5				
Delay (s)		24.5			23.6		17.0	14.0				
Level of Service		C			C		B	B				
Approach Delay (s)		24.5			23.6			15.0			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	825	2095	150	0	0	0	0	200	25	280	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.99						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4949						3347		1750	3400	
Flt Permitted	0.95	1.00						1.00		0.44	1.00	
Satd. Flow (perm)	3395	4949						3347		819	3400	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	887	2253	161	0	0	0	0	211	26	295	42	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	887	2407	0	0	0	0	0	229	0	295	42	0
Confl. Peds. (#/hr)	1		60	60		1	15					15
Heavy Vehicles (%)	2%	2%	3%	0%	0%	0%	0%	5%	4%	2%	5%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	61.0	61.0						17.0		37.0	37.0	
Effective Green, g (s)	61.0	61.0						17.0		37.0	37.0	
Actuated g/C Ratio	0.54	0.54						0.15		0.33	0.33	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	1849	2695						508		387	1123	
v/s Ratio Prot	0.26	c0.49						0.07		c0.10	0.01	
v/s Ratio Perm										c0.16		
v/c Ratio	0.48	0.89						0.45		0.76	0.04	
Uniform Delay, d1	15.7	22.6						43.2		30.9	25.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	0.9	5.0						0.6		8.6	0.0	
Delay (s)	16.6	27.7						43.9		39.5	25.4	
Level of Service	B	C						D		D	C	
Approach Delay (s)		24.7			0.0			43.9			37.8	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	147.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	260	2110	30	25	1815	135	25	65	110	460	115	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	*0.91		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.93		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.86	1.00		0.97	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3429	5015		1653	4869		1473	1577		1689	1756	1277
Flt Permitted	0.95	1.00		0.95	1.00		0.68	1.00		0.51	1.00	1.00
Satd. Flow (perm)	3429	5015		1653	4869		1053	1577		903	1756	1277
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	280	2269	32	26	1911	142	26	68	116	484	121	32
RTOR Reduction (vph)	0	1	0	0	7	0	0	55	0	0	0	19
Lane Group Flow (vph)	280	2300	0	26	2046	0	26	129	0	484	121	13
Confl. Peds. (#/hr)	5		25	25		5	135		85	85		135
Heavy Vehicles (%)	1%	2%	0%	8%	2%	5%	4%	0%	0%	2%	7%	3%
Turn Type	Prot			Prot	custom		Perm			pm+pt		Perm
Protected Phases	5	2		1				8		7	4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	9.4	42.4		3.6	36.6		27.0	27.0		46.0	46.0	46.0
Effective Green, g (s)	9.4	42.4		3.6	36.6		27.0	27.0		46.0	46.0	46.0
Actuated g/C Ratio	0.08	0.38		0.03	0.33		0.24	0.24		0.41	0.41	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	288	1899		53	1591		254	380		469	721	524
v/s Ratio Prot	c0.08	c0.46		0.02				0.08		c0.13	0.07	
v/s Ratio Perm					0.42		0.02			c0.29		0.01
v/c Ratio	0.97	1.21		0.49	1.29		0.10	0.34		1.03	0.17	0.03
Uniform Delay, d1	51.2	34.8		53.3	37.7		33.1	35.1		31.5	20.9	19.6
Progression Factor	0.86	0.63		0.70	0.35		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.1	97.4		1.7	129.8		0.2	0.5		50.0	0.1	0.0
Delay (s)	73.2	119.2		39.1	142.9		33.2	35.7		81.5	21.0	19.7
Level of Service	E	F		D	F		C	D		F	C	B
Approach Delay (s)		114.2						35.4			66.9	
Approach LOS		F						D			E	

Intersection Summary			
HCM Average Control Delay	116.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1065	50	80	80	60	140	60	75	1820	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.90		0.96	
Flpb, ped/bikes	1.00	1.00		0.85	1.00		0.98	1.00		1.00	
Frt	1.00	0.99		1.00	0.94		1.00	0.92		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1750	3437		1523	1691		1664	1375		4023	
Flt Permitted	0.95	1.00		0.67	1.00		0.66	1.00		1.00	
Satd. Flow (perm)	1750	3437		1069	1691		1158	1375		4023	
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
Adj. Flow (vph)	89	1121	53	84	84	63	147	63	79	1916	132
RTOR Reduction (vph)	0	3	0	0	24	0	0	40	0	6	0
Lane Group Flow (vph)	89	1171	0	84	123	0	147	102	0	2042	0
Confl. Peds. (#/hr)	20		15	170		25	25		170		20
Heavy Vehicles (%)	2%	3%	3%	0%	4%	0%	5%	5%	18%	2%	5%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.06	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	109	2056		305	483		331	393		1940	
v/s Ratio Prot	0.05	c0.34			0.07			0.07			
v/s Ratio Perm				0.08			c0.13			c0.51	
v/c Ratio	0.82	0.57		0.28	0.25		0.44	0.26		1.05	
Uniform Delay, d1	51.9	13.7		31.0	30.8		32.7	30.9		29.0	
Progression Factor	0.60	1.86		1.00	1.00		1.00	1.00		0.23	
Incremental Delay, d2	4.4	0.1		0.5	0.3		1.0	0.4		25.3	
Delay (s)	35.6	25.6		31.5	31.1		33.7	31.2		31.9	
Level of Service	D	C		C	C		C	C		C	
Approach Delay (s)		26.3			31.2			32.5			
Approach LOS		C			C			C			

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	50	1870	655	85	160	620	585	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	8.0	8.0	
Lane Util. Factor		0.94	0.95		1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		0.89	1.00		1.00	1.00	1.00	
Frt		1.00	0.98		1.00	1.00	0.91	
Flt Protected		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		4399	3385		1750	1807	3150	
Flt Permitted		0.95	1.00		0.09	1.00	1.00	
Satd. Flow (perm)		4399	3385		160	1807	3150	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.95
Adj. Flow (vph)	54	2011	704	91	168	653	616	832
RTOR Reduction (vph)	0	0	9	0	0	0	128	0
Lane Group Flow (vph)	0	2065	786	0	168	653	1320	0
Confl. Peds. (#/hr)	45							
Heavy Vehicles (%)	13%	1%	4%	1%	2%	4%	3%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		48.0	48.0		50.0	50.0	40.0	
Effective Green, g (s)		48.0	48.0		50.0	50.0	40.0	
Actuated g/C Ratio		0.43	0.43		0.45	0.45	0.36	
Clearance Time (s)		6.0	6.0		6.0	8.0	8.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1885	1451		128	807	1125	
v/s Ratio Prot			0.23		0.05	c0.36	0.42	
v/s Ratio Perm		0.47			c0.54			
v/c Ratio		1.10	0.54		1.31	0.81	1.21dr	
Uniform Delay, d1		32.0	23.8		31.5	26.9	36.0	
Progression Factor		0.29	0.22		2.96	1.66	1.00	
Incremental Delay, d2		47.0	0.6		162.3	2.6	87.7	
Delay (s)		56.3	5.9		255.5	47.3	123.7	
Level of Service		E	A		F	D	F	
Approach Delay (s)			42.3			89.9	123.7	
Approach LOS			D			F	F	

Intersection Summary			
HCM Average Control Delay	72.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	90	2220	150	115	525	0	0	335	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.77	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6102		1359	3336			1773	2729
Flt Permitted					1.00		0.39	1.00			1.00	1.00
Satd. Flow (perm)					6102		554	3336			1773	2729
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	97	2387	161	121	553	0	0	353	479
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	373
Lane Group Flow (vph)	0	0	0	0	2638	0	121	553	0	0	353	106
Confl. Peds. (#/hr)				30		135	1370		445			1370
Heavy Vehicles (%)	0%	0%	0%	4%	3%	5%	1%	7%	0%	0%	6%	3%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					49.0		49.0	49.0			24.0	18.0
Effective Green, g (s)					49.0		49.0	49.0			24.0	18.0
Actuated g/C Ratio					0.44		0.44	0.44			0.21	0.16
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2670		242	1460			380	439
v/s Ratio Prot								0.17			c0.20	0.04
v/s Ratio Perm					0.43		c0.22					
v/c Ratio					0.99		0.50	0.38			0.93	0.24
Uniform Delay, d1					31.2		22.7	21.2			43.2	41.0
Progression Factor					0.55		0.68	0.65			1.00	1.00
Incremental Delay, d2					8.3		0.7	0.1			28.5	1.3
Delay (s)					25.4		16.0	13.9			71.7	42.4
Level of Service					C		B	B			E	D
Approach Delay (s)		0.0			25.4			14.3			54.8	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.0%	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												
Volume (vph)	0	0	0	110	1925	100	170	705	0	0	200	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.75	
Flpb, ped/bikes					0.99		0.98	1.00			1.00	
Frt					0.99		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4915		1677	3433			2255	
Flt Permitted					1.00		0.24	1.00			1.00	
Satd. Flow (perm)					4915		428	3433			2255	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	118	2070	108	179	742	0	0	211	400
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	17	0
Lane Group Flow (vph)	0	0	0	0	2292	0	179	742	0	0	594	0
Confl. Peds. (#/hr)	90		65	65		90	490		290	290		490
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	4%	4%	0%	0%	11%	5%
Turn Type	custom			Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases	2			6			8					
Actuated Green, G (s)					56.3		41.7	41.7			30.7	
Effective Green, g (s)					56.3		41.7	41.7			30.7	
Actuated g/C Ratio					0.50		0.37	0.37			0.27	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2471		237	1278			618	
v/s Ratio Prot							c0.05	0.22			c0.26	
v/s Ratio Perm					0.47		0.23					
v/c Ratio					0.93		0.76	0.58			1.19dr	
Uniform Delay, d1					26.0		28.1	28.1			40.1	
Progression Factor					1.00		0.84	0.88			1.00	
Incremental Delay, d2					7.6		9.3	0.5			26.6	
Delay (s)					33.5		32.8	25.2			66.6	
Level of Service					C		C	C			E	
Approach Delay (s)		0.0			33.5			26.7			66.6	
Approach LOS		A			C			C			E	

Intersection Summary			
HCM Average Control Delay	37.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1265	25	0	0	0	0	795	0	470	165	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0		4.0	8.0	
Lane Util. Factor		0.91						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	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4914						3610		1716	1756	
Flt Permitted		1.00						1.00		0.12	1.00	
Satd. Flow (perm)		4914						3610		222	1756	
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)	0	1332	26	0	0	0	0	837	0	495	174	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1356	0	0	0	0	0	837	0	495	174	0
Confl. Peds. (#/hr)	35		15	15		35	835		55	55		835
Heavy Vehicles (%)	0%	4%	5%	0%	0%	0%	0%	0%	0%	4%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		35.5						28.5		62.5	62.5	
Effective Green, g (s)		35.5						28.5		62.5	62.5	
Actuated g/C Ratio		0.32						0.25		0.56	0.56	
Clearance Time (s)		6.0						8.0		4.0	8.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1558						919		524	980	
v/s Ratio Prot		c0.28						0.23		c0.25	0.10	
v/s Ratio Perm										c0.27		
v/c Ratio		0.87						0.91		0.94	0.18	
Uniform Delay, d1		36.1						40.5		31.2	12.1	
Progression Factor		0.51						1.00		1.43	0.28	
Incremental Delay, d2		6.0						12.9		4.1	0.0	
Delay (s)		24.4						53.5		48.6	3.5	
Level of Service		C						D		D	A	
Approach Delay (s)		24.4			0.0			53.5			36.9	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	870	1215	400	75	275	140	695	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95		1.00	1.00	1.00	0.76
Flpb, ped/bikes	0.98	1.00	1.00		0.98	1.00	1.00	1.00
Frt	1.00	1.00	0.98		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1548	3289	3007		1690	3275	1536	1177
Flt Permitted	0.95	0.99	1.00		0.19	1.00	1.00	1.00
Satd. Flow (perm)	1548	3289	3007		336	3275	1536	1177
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	916	1279	421	79	289	147	732	79
RTOR Reduction (vph)	0	0	14	0	0	0	0	37
Lane Group Flow (vph)	714	1481	486	0	289	147	732	42
Confl. Peds. (#/hr)	10			290	290			125
Heavy Vehicles (%)	3%	3%	10%	7%	4%	9%	4%	3%
Turn Type	Perm				pm+pt		custom	custom
Protected Phases		2	8		7	4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.0	59.0	19.0		39.0	39.0	59.0	59.0
Effective Green, g (s)	59.0	59.0	19.0		39.0	39.0	59.0	59.0
Actuated g/C Ratio	0.53	0.53	0.17		0.35	0.35	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	815	1733	510		286	1140	809	620
v/s Ratio Prot			0.16		c0.13	0.04		
v/s Ratio Perm	0.46	0.45			c0.23		c0.48	0.04
v/c Ratio	0.88	0.85	0.95		1.01	0.13	0.90	0.07
Uniform Delay, d1	23.3	22.8	46.1		31.0	24.9	24.0	13.0
Progression Factor	0.54	0.54	1.00		1.24	1.13	1.00	1.00
Incremental Delay, d2	8.8	3.8	28.2		33.6	0.0	15.5	0.2
Delay (s)	21.4	16.1	74.2		72.2	28.2	39.5	13.2
Level of Service	C	B	E		E	C	D	B
Approach Delay (s)		17.8	74.2			57.3		
Approach LOS		B	E			E		

Intersection Summary			
HCM Average Control Delay	33.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	135.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	110	305	0	300	0	750	1390	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.93			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.89			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	1.00				
Satd. Flow (prot)		2809			3570		1547	3248				
Flt Permitted		1.00			1.00		0.95	1.00				
Satd. Flow (perm)		2809			3570		1547	3248				
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)	0	116	321	0	316	0	789	1463	0	0	0	0
RTOR Reduction (vph)	0	40	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	397	0	0	316	0	710	1542	0	0	0	0
Confl. Peds. (#/hr)	90		65	65		90						
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		26.0			26.0		72.0	72.0				
Effective Green, g (s)		26.0			26.0		72.0	72.0				
Actuated g/C Ratio		0.23			0.23		0.64	0.64				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		652			829		995	2088				
v/s Ratio Prot		c0.14			0.09							
v/s Ratio Perm							0.46	0.47				
v/c Ratio		0.86dr			0.38		0.71	0.74				
Uniform Delay, d1		38.5			36.2		13.2	13.6				
Progression Factor		1.00			0.95		0.26	0.26				
Incremental Delay, d2		1.6			0.1		1.9	1.0				
Delay (s)		40.1			34.5		5.3	4.5				
Level of Service		D			C		A	A				
Approach Delay (s)		40.1			34.5			4.8			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

C4 South Side One-Way

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	0	355	100	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			7.0	7.0		7.0
Lane Util. Factor			1.00	1.00		1.00
Frpb, ped/bikes			1.00	0.80		0.90
Flpb, ped/bikes			1.00	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			1610	1119		1260
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			1610	1119		1260
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	394	111	0	67
RTOR Reduction (vph)	0	0	0	63	0	47
Lane Group Flow (vph)	0	0	394	48	0	20
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	5%	4%	5%	3%	8%	4%
Turn Type				Perm		custom
Protected Phases			6			
Permitted Phases				6		4
Actuated Green, G (s)			51.4	51.4		35.0
Effective Green, g (s)			51.4	51.4		35.0
Actuated g/C Ratio			0.43	0.43		0.29
Clearance Time (s)			7.0	7.0		7.0
Vehicle Extension (s)			3.0	3.0		3.0
Lane Grp Cap (vph)			690	479		368
v/s Ratio Prot			c0.24			
v/s Ratio Perm				0.04		c0.02
v/c Ratio			0.57	0.10		0.05
Uniform Delay, d1			26.0	20.5		30.6
Progression Factor			0.64	0.36		1.00
Incremental Delay, d2			3.4	0.4		0.1
Delay (s)			20.1	7.7		30.6
Level of Service			C	A		C
Approach Delay (s)		0.0	17.4		30.6	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	33.6
Intersection Capacity Utilization	70.8%	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												
Volume (vph)	0	0	0	5	385	10	5	0	0	0	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0		7.0					6.0
Lane Util. Factor				1.00	0.95		1.00					1.00
Frt				1.00	1.00		1.00					0.86
Flt Protected				0.95	1.00		0.95					1.00
Satd. Flow (prot)				1575	3081		1575					1463
Flt Permitted				0.95	1.00		0.95					1.00
Satd. Flow (perm)				1575	3081		1575					1463
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	6	428	11	6	0	0	0	0	78
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	68
Lane Group Flow (vph)	0	0	0	6	438	0	6	0	0	0	0	10
Heavy Vehicles (%)	0%	5%	2%	2%	4%	0%	2%	2%	2%	0%	2%	0%
Turn Type				Prot			Prot					custom
Protected Phases				1	6		8					4 10
Permitted Phases												
Actuated Green, G (s)				1.4	77.0		2.0					16.0
Effective Green, g (s)				1.4	77.0		2.0					16.0
Actuated g/C Ratio				0.01	0.64		0.02					0.13
Clearance Time (s)				7.0	6.0		7.0					
Vehicle Extension (s)				3.0	3.0		3.0					
Lane Grp Cap (vph)				18	1977		26					195
v/s Ratio Prot				0.00	c0.14		c0.00					c0.01
v/s Ratio Perm												
v/c Ratio				0.33	0.22		0.23					0.05
Uniform Delay, d1				58.8	9.0		58.2					45.4
Progression Factor				1.09	0.39		1.00					1.00
Incremental Delay, d2				10.5	0.3		4.5					0.1
Delay (s)				74.9	3.7		62.8					45.5
Level of Service				E	A		E					D
Approach Delay (s)		0.0			4.7			62.8			45.5	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.19		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	37.2%	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												
Volume (vph)	0	0	0	0	400	20	0	0	0	0	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0						7.0	
Lane Util. Factor					0.95						1.00	
Frt					0.99						0.86	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3067						1406	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3067						1406	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	444	22	0	0	0	0	0	22
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	19	0
Lane Group Flow (vph)	0	0	0	0	464	0	0	0	0	0	3	0
Heavy Vehicles (%)	5%	5%	50%	50%	4%	4%	50%	50%	50%	5%	5%	4%
Turn Type				Prot			Perm					
Protected Phases				1	6			8			4	
Permitted Phases							8					
Actuated Green, G (s)					89.0						18.0	
Effective Green, g (s)					89.0						18.0	
Actuated g/C Ratio					0.74						0.15	
Clearance Time (s)					6.0						7.0	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2275						211	
v/s Ratio Prot					c0.15						c0.00	
v/s Ratio Perm												
v/c Ratio					0.20						0.02	
Uniform Delay, d1					4.7						43.5	
Progression Factor					0.70						1.00	
Incremental Delay, d2					0.2						0.0	
Delay (s)					3.5						43.5	
Level of Service					A						D	
Approach Delay (s)		0.0			3.5			0.0			43.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	5.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.17		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

AM Future South Side One-Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	20	330	75	10	40	0	0	45	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0			7.0			7.0	
Lane Util. Factor				1.00	0.95			1.00			1.00	
Frpb, ped/bikes				1.00	0.93			1.00			0.96	
Flpb, ped/bikes				1.00	1.00			0.99			1.00	
Frt				1.00	0.97			1.00			0.90	
Flt Protected				0.95	1.00			0.99			1.00	
Satd. Flow (prot)				1460	2741			1530			1472	
Flt Permitted				0.95	1.00			0.93			1.00	
Satd. Flow (perm)				1460	2741			1443			1472	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	22	367	83	11	44	0	0	50	89
RTOR Reduction (vph)	0	0	0	0	16	0	0	0	0	0	53	0
Lane Group Flow (vph)	0	0	0	22	434	0	0	55	0	0	86	0
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	5%	0%	10%	5%	8%	15%	7%	10%	20%	0%	0%
Turn Type				Prot			Perm					
Protected Phases				1	6			8			4	
Permitted Phases							8					
Actuated Green, G (s)				4.2	80.0			27.0			27.0	
Effective Green, g (s)				4.2	80.0			27.0			27.0	
Actuated g/C Ratio				0.04	0.67			0.22			0.22	
Clearance Time (s)				7.0	6.0			7.0			7.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				51	1827			325			331	
v/s Ratio Prot				0.02	c0.16						c0.06	
v/s Ratio Perm								0.04				
v/c Ratio				0.43	0.24			0.17			0.26	
Uniform Delay, d1				56.7	7.9			37.5			38.3	
Progression Factor				1.14	0.36			1.00			1.00	
Incremental Delay, d2				5.7	0.3			0.2			0.4	
Delay (s)				70.3	3.2			37.7			38.7	
Level of Service				E	A			D			D	
Approach Delay (s)		0.0			6.3			37.7			38.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	55	395	40	0	5	0	0	35	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0			7.0			7.0	
Lane Util. Factor				1.00	0.95			1.00			1.00	
Frpb, ped/bikes				1.00	0.97			1.00			0.98	
Flpb, ped/bikes				1.00	1.00			1.00			1.00	
Frt				1.00	0.99			1.00			0.93	
Flt Protected				0.95	1.00			1.00			1.00	
Satd. Flow (prot)				1575	2844			1658			1523	
Flt Permitted				0.95	1.00			1.00			1.00	
Satd. Flow (perm)				1575	2844			1658			1523	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	61	439	44	0	6	0	0	39	33
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	25	0
Lane Group Flow (vph)	0	0	0	61	477	0	0	6	0	0	47	0
Confl. Peds. (#/hr)	140					140				100		30
Heavy Vehicles (%)	4%	5%	2%	2%	9%	4%	2%	2%	2%	2%	2%	0%
Turn Type				Prot			Perm					
Protected Phases				1	6			8			4	
Permitted Phases							8					
Actuated Green, G (s)				7.7	78.0			29.0			29.0	
Effective Green, g (s)				7.7	78.0			29.0			29.0	
Actuated g/C Ratio				0.06	0.65			0.24			0.24	
Clearance Time (s)				7.0	6.0			7.0			7.0	
Vehicle Extension (s)				3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)				101	1849			401			368	
v/s Ratio Prot				c0.04	c0.17			0.00			c0.03	
v/s Ratio Perm												
v/c Ratio				0.60	0.26			0.01			0.13	
Uniform Delay, d1				54.7	8.8			34.6			35.6	
Progression Factor				1.45	0.22			1.00			1.00	
Incremental Delay, d2				9.6	0.3			0.0			0.2	
Delay (s)				88.9	2.3			34.6			35.8	
Level of Service				F	A			C			D	
Approach Delay (s)		0.0			12.0			34.6			35.8	
Approach LOS		A			B			C			D	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	20	530	20	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			7.0	6.0	7.0	
Lane Util. Factor			1.00	0.95	1.00	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			1606	2975	1606	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			1606	2975	1606	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	22	589	22	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	22	589	22	0
Heavy Vehicles (%)	5%	0%	0%	8%	0%	0%
Turn Type			Prot			
Protected Phases			1	6	8	
Permitted Phases						
Actuated Green, G (s)			4.9	89.0	18.0	
Effective Green, g (s)			4.9	89.0	18.0	
Actuated g/C Ratio			0.04	0.74	0.15	
Clearance Time (s)			7.0	6.0	7.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			66	2206	241	
v/s Ratio Prot			0.01	c0.20	c0.01	
v/s Ratio Perm						
v/c Ratio			0.33	0.27	0.09	
Uniform Delay, d1			56.0	5.0	44.0	
Progression Factor			1.42	0.40	1.00	
Incremental Delay, d2			2.3	0.2	0.2	
Delay (s)			81.5	2.2	44.1	
Level of Service			F	A	D	
Approach Delay (s)	0.0			5.1	44.1	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	35.4%	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												
Volume (vph)	0	0	0	30	425	130	45	60	10	540	30	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			7.0		6.0	7.0	7.0
Lane Util. Factor				1.00	0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes				1.00	0.91			0.98		1.00	1.00	0.59
Flpb, ped/bikes				0.59	1.00			0.85		0.93	1.00	1.00
Frt				1.00	0.96			0.99		1.00	1.00	0.85
Flt Protected				0.95	1.00			0.98		0.95	1.00	1.00
Satd. Flow (prot)				951	2682			1366		1433	1691	836
Flt Permitted				0.95	1.00			0.87		0.60	1.00	1.00
Satd. Flow (perm)				951	2682			1205		904	1691	836
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	33	472	144	50	67	11	600	33	111
RTOR Reduction (vph)	0	0	0	0	24	0	0	3	0	0	0	12
Lane Group Flow (vph)	0	0	0	33	592	0	0	125	0	600	33	99
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	7%	7%	6%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type				Perm			Perm			pm+pt		Perm
Protected Phases					6			8		7	4	
Permitted Phases				6			8			4		4
Actuated Green, G (s)				35.0	35.0			28.0		72.0	72.0	72.0
Effective Green, g (s)				35.0	35.0			28.0		72.0	72.0	72.0
Actuated g/C Ratio				0.29	0.29			0.23		0.60	0.60	0.60
Clearance Time (s)				6.0	6.0			7.0		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)				277	782			281		710	1015	502
v/s Ratio Prot					c0.22					c0.27	0.02	
v/s Ratio Perm				0.03				0.10		c0.24		0.12
v/c Ratio				0.12	0.76			0.44		0.85	0.03	0.20
Uniform Delay, d1				31.2	38.6			39.3		17.3	9.8	10.9
Progression Factor				1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2				0.9	6.8			1.1		9.1	0.0	0.2
Delay (s)				32.1	45.4			40.5		26.4	9.8	11.1
Level of Service				C	D			D		C	A	B
Approach Delay (s)		0.0			44.7			40.5			23.4	
Approach LOS		A			D			D			C	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.2%	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												
Volume (vph)	105	450	20	50	675	210	5	65	50	80	10	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.95			0.79		1.00	0.79	
Flpb, ped/bikes	1.00	1.00		0.85	1.00			1.00		0.61	1.00	
Frt	1.00	0.99		1.00	0.96			0.94		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1569	1553		1362	2788			1255		943	1124	
Flt Permitted	0.16	1.00		0.47	1.00			0.98		0.69	1.00	
Satd. Flow (perm)	270	1553		674	2788			1231		681	1124	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	117	500	22	56	750	233	6	72	56	89	11	378
RTOR Reduction (vph)	0	1	0	0	28	0	0	25	0	0	134	0
Lane Group Flow (vph)	117	521	0	56	955	0	0	109	0	89	255	0
Confl. Peds. (#/hr)	180		165	165		180	200		275	275		200
Heavy Vehicles (%)	2%	7%	0%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.0	57.0		44.3	44.3			32.0		32.0	32.0	
Effective Green, g (s)	57.0	57.0		44.3	44.3			32.0		32.0	32.0	
Actuated g/C Ratio	0.55	0.55		0.43	0.43			0.31		0.31	0.31	
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	247	859		290	1199			382		212	349	
v/s Ratio Prot	0.04	c0.34			c0.34						c0.23	
v/s Ratio Perm	0.23			0.08				0.09		0.13		
v/c Ratio	0.47	0.61		0.19	0.80			0.29		0.42	0.73	
Uniform Delay, d1	14.1	15.5		18.2	25.4			26.9		28.1	31.6	
Progression Factor	1.00	1.00		0.76	0.71			1.00		1.00	1.00	
Incremental Delay, d2	1.4	3.2		1.3	4.8			1.9		6.0	12.6	
Delay (s)	15.5	18.6		15.1	22.8			28.7		34.1	44.2	
Level of Service	B	B		B	C			C		C	D	
Approach Delay (s)		18.1			22.4			28.7			42.4	
Approach LOS		B			C			C			D	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	95	435	735	115	155	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.93
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1521	1595	2917		1545	1293
Flt Permitted	0.26	1.00	1.00		0.95	1.00
Satd. Flow (perm)	416	1595	2917		1545	1293
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	106	483	817	128	172	267
RTOR Reduction (vph)	0	0	11	0	0	92
Lane Group Flow (vph)	106	483	934	0	172	175
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	4%	6%	6%	12%	4%	3%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	63.7	63.7	63.7		27.3	27.3
Effective Green, g (s)	63.7	63.7	63.7		27.3	27.3
Actuated g/C Ratio	0.62	0.62	0.62		0.27	0.27
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	257	986	1804		410	343
v/s Ratio Prot		0.30	c0.32		0.11	
v/s Ratio Perm	0.25					c0.14
v/c Ratio	0.41	0.49	0.52		0.42	0.51
Uniform Delay, d1	10.1	10.8	11.0		31.3	32.2
Progression Factor	0.52	0.51	1.00		1.00	1.00
Incremental Delay, d2	4.1	1.5	1.1		0.7	1.3
Delay (s)	9.3	7.0	12.1		32.0	33.5
Level of Service	A	A	B		C	C
Approach Delay (s)		7.4	12.1		32.9	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	105.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	0	580	165	0	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			7.0	7.0		7.0
Lane Util. Factor			1.00	1.00		1.00
Frpb, ped/bikes			1.00	0.75		0.93
Flpb, ped/bikes			1.00	1.00		1.00
Frt			1.00	0.85		0.86
Flt Protected			1.00	1.00		1.00
Satd. Flow (prot)			1674	1067		1340
Flt Permitted			1.00	1.00		1.00
Satd. Flow (perm)			1674	1067		1340
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	611	174	0	100
RTOR Reduction (vph)	0	0	0	83	0	71
Lane Group Flow (vph)	0	0	611	91	0	29
Confl. Peds. (#/hr)	243			243	38	27
Heavy Vehicles (%)	0%	3%	1%	1%	4%	2%
Turn Type				Perm		custom
Protected Phases			6			
Permitted Phases				6		4
Actuated Green, G (s)			51.4	51.4		35.0
Effective Green, g (s)			51.4	51.4		35.0
Actuated g/C Ratio			0.43	0.43		0.29
Clearance Time (s)			7.0	7.0		7.0
Vehicle Extension (s)			3.0	3.0		3.0
Lane Grp Cap (vph)			717	457		391
v/s Ratio Prot			c0.36			
v/s Ratio Perm				0.08		c0.02
v/c Ratio			0.85	0.20		0.07
Uniform Delay, d1			30.9	21.4		30.8
Progression Factor			1.06	1.21		1.00
Incremental Delay, d2			11.8	0.9		0.1
Delay (s)			44.7	27.0		30.9
Level of Service			D	C		C
Approach Delay (s)		0.0	40.8		30.9	
Approach LOS		A	D		C	

Intersection Summary			
HCM Average Control Delay	39.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	33.6
Intersection Capacity Utilization	74.8%	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												
Volume (vph)	0	0	0	10	695	15	5	0	0	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0		7.0					6.0
Lane Util. Factor				1.00	0.95		1.00					1.00
Frt				1.00	1.00		1.00					0.86
Flt Protected				0.95	1.00		0.95					1.00
Satd. Flow (prot)				1575	3082		1575					1463
Flt Permitted				0.95	1.00		0.95					1.00
Satd. Flow (perm)				1575	3082		1575					1463
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)	0	0	0	11	732	16	5	0	0	0	0	53
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	0	46
Lane Group Flow (vph)	0	0	0	11	747	0	5	0	0	0	0	7
Heavy Vehicles (%)	0%	5%	2%	2%	4%	0%	2%	2%	2%	0%	2%	0%
Turn Type				Prot			Prot					custom
Protected Phases				1	6		8					4 10
Permitted Phases												
Actuated Green, G (s)				1.6	77.0		2.0					16.0
Effective Green, g (s)				1.6	77.0		2.0					16.0
Actuated g/C Ratio				0.01	0.64		0.02					0.13
Clearance Time (s)				7.0	6.0		7.0					
Vehicle Extension (s)				3.0	3.0		3.0					
Lane Grp Cap (vph)				21	1978		26					195
v/s Ratio Prot				0.01	c0.24		c0.00					c0.00
v/s Ratio Perm												
v/c Ratio				0.52	0.38		0.19					0.04
Uniform Delay, d1				58.8	10.2		58.2					45.3
Progression Factor				1.19	0.65		1.00					1.00
Incremental Delay, d2				20.7	0.5		3.6					0.1
Delay (s)				90.9	7.1		61.8					45.4
Level of Service				F	A		E					D
Approach Delay (s)		0.0			8.3			61.8			45.4	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	46.9%	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												
Volume (vph)	0	0	0	0	755	35	0	0	0	0	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0						7.0	
Lane Util. Factor					0.95						1.00	
Frt					0.99						0.86	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3132						1463	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3132						1463	
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)	0	0	0	0	795	37	0	0	0	0	0	32
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	0	0	0	830	0	0	0	0	0	5	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type				Prot			Perm					
Protected Phases				1	6			8			4	
Permitted Phases							8					
Actuated Green, G (s)					89.0						18.0	
Effective Green, g (s)					89.0						18.0	
Actuated g/C Ratio					0.74						0.15	
Clearance Time (s)					6.0						7.0	
Vehicle Extension (s)					3.0						3.0	
Lane Grp Cap (vph)					2323						219	
v/s Ratio Prot					c0.27						c0.00	
v/s Ratio Perm												
v/c Ratio					0.36						0.02	
Uniform Delay, d1					5.4						43.5	
Progression Factor					0.42						1.00	
Incremental Delay, d2					0.4						0.0	
Delay (s)					2.7						43.5	
Level of Service					A						D	
Approach Delay (s)		0.0			2.7			0.0			43.5	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	4.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	43.6%	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												
Volume (vph)	0	0	0	30	610	65	15	70	0	0	40	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0			7.0			7.0	7.0
Lane Util. Factor				1.00	0.95			1.00			1.00	1.00
Frpb, ped/bikes				1.00	0.95			1.00			1.00	0.88
Flpb, ped/bikes				1.00	1.00			0.98			1.00	1.00
Frt				1.00	0.99			1.00			1.00	0.85
Flt Protected				0.95	1.00			0.99			1.00	1.00
Satd. Flow (prot)				1606	2950			1645			1691	1266
Flt Permitted				0.95	1.00			0.95			1.00	1.00
Satd. Flow (perm)				1606	2950			1576			1691	1266
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)	0	0	0	32	642	68	16	74	0	0	42	174
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	115
Lane Group Flow (vph)	0	0	0	32	703	0	0	90	0	0	42	59
Confl. Peds. (#/hr)	184		40	40		184	82		101	101		82
Heavy Vehicles (%)	1%	6%	0%	0%	2%	0%	0%	0%	0%	8%	0%	0%
Turn Type				Prot			Perm					Perm
Protected Phases				1	6			8			4	
Permitted Phases							8					4
Actuated Green, G (s)				4.2	80.0			27.0			27.0	27.0
Effective Green, g (s)				4.2	80.0			27.0			27.0	27.0
Actuated g/C Ratio				0.04	0.67			0.22			0.22	0.22
Clearance Time (s)				7.0	6.0			7.0			7.0	7.0
Vehicle Extension (s)				3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)				56	1967			355			380	285
v/s Ratio Prot				0.02	c0.24						0.02	
v/s Ratio Perm								c0.06				0.05
v/c Ratio				0.57	0.36			0.25			0.11	0.21
Uniform Delay, d1				57.0	8.8			38.2			37.0	37.8
Progression Factor				0.99	1.31			1.00			1.00	1.00
Incremental Delay, d2				12.6	0.5			0.4			0.1	0.4
Delay (s)				68.9	12.0			38.6			37.1	38.1
Level of Service				E	B			D			D	D
Approach Delay (s)		0.0			14.4			38.6			37.9	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	25	645	90	20	80	0	0	5	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				7.0	6.0		7.0	7.0			7.0	
Lane Util. Factor				1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes				1.00	0.97		1.00	1.00			0.96	
Flpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	
Frt				1.00	0.98		1.00	1.00			0.86	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1575	2989		1575	1658			1358	
Flt Permitted				0.95	1.00		0.72	1.00			1.00	
Satd. Flow (perm)				1575	2989		1199	1658			1358	
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)	0	0	0	26	679	95	21	84	0	0	5	47
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	36	0
Lane Group Flow (vph)	0	0	0	26	765	0	21	84	0	0	16	0
Confl. Peds. (#/hr)	138					138				101		30
Heavy Vehicles (%)	3%	5%	2%	2%	2%	1%	2%	2%	2%	5%	2%	3%
Turn Type				Prot			Perm			Perm		
Protected Phases				1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)				5.2	78.0		29.0	29.0			29.0	
Effective Green, g (s)				5.2	78.0		29.0	29.0			29.0	
Actuated g/C Ratio				0.04	0.65		0.24	0.24			0.24	
Clearance Time (s)				7.0	6.0		7.0	7.0			7.0	
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)				68	1943		290	401			328	
v/s Ratio Prot				0.02	c0.26			c0.05			0.01	
v/s Ratio Perm							0.02					
v/c Ratio				0.38	0.39		0.07	0.21			0.05	
Uniform Delay, d1				55.8	9.9		35.1	36.3			34.9	
Progression Factor				1.21	0.40		1.00	1.00			1.00	
Incremental Delay, d2				3.4	0.6		0.1	0.3			0.1	
Delay (s)				70.8	4.5		35.2	36.6			35.0	
Level of Service				E	A		D	D			C	
Approach Delay (s)		0.0			6.7			36.3			35.0	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	0	0	20	785	15	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			7.0	6.0	7.0	
Lane Util. Factor			1.00	0.95	1.00	
Frt			1.00	1.00	1.00	
Flt Protected			0.95	1.00	0.95	
Satd. Flow (prot)			1606	3181	1606	
Flt Permitted			0.95	1.00	0.95	
Satd. Flow (perm)			1606	3181	1606	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	21	826	16	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	21	826	16	0
Heavy Vehicles (%)	3%	0%	0%	1%	0%	0%
Turn Type			Prot			
Protected Phases			1	6	8	
Permitted Phases						
Actuated Green, G (s)			3.4	89.0	18.0	
Effective Green, g (s)			3.4	89.0	18.0	
Actuated g/C Ratio			0.03	0.74	0.15	
Clearance Time (s)			7.0	6.0	7.0	
Vehicle Extension (s)			3.0	3.0	3.0	
Lane Grp Cap (vph)			46	2359	241	
v/s Ratio Prot			0.01	c0.26	c0.01	
v/s Ratio Perm						
v/c Ratio			0.46	0.35	0.07	
Uniform Delay, d1			57.4	5.4	43.8	
Progression Factor			1.28	0.14	1.00	
Incremental Delay, d2			3.6	0.2	0.1	
Delay (s)			76.9	1.0	43.9	
Level of Service			E	A	D	
Approach Delay (s)	0.0			2.9	43.9	
Approach LOS	A			A	D	

Intersection Summary			
HCM Average Control Delay	3.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	43.3%	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												
Volume (vph)	0	0	0	25	700	260	15	20	15	480	35	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0			7.0		6.0	7.0	7.0
Lane Util. Factor				1.00	0.95			1.00		1.00	1.00	1.00
Frpb, ped/bikes				1.00	0.89			0.94		1.00	1.00	0.61
Flpb, ped/bikes				0.44	1.00			0.89		0.90	1.00	1.00
Frt				1.00	0.96			0.96		1.00	1.00	0.85
Flt Protected				0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)				707	2712			1336		1403	1691	880
Flt Permitted				0.95	1.00			0.92		0.68	1.00	1.00
Satd. Flow (perm)				707	2712			1249		998	1691	880
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)	0	0	0	26	737	274	16	21	16	505	37	95
RTOR Reduction (vph)	0	0	0	0	32	0	0	12	0	0	0	12
Lane Group Flow (vph)	0	0	0	26	979	0	0	41	0	505	37	83
Confl. Peds. (#/hr)	170		333	333		170	559		86	86		559
Heavy Vehicles (%)	0%	5%	0%	0%	1%	0%	0%	0%	0%	3%	0%	0%
Turn Type				Perm			Perm			pm+pt		Perm
Protected Phases					6			8		7	4	
Permitted Phases				6			8			4		4
Actuated Green, G (s)				46.0	46.0			28.0		61.0	61.0	61.0
Effective Green, g (s)				46.0	46.0			28.0		61.0	61.0	61.0
Actuated g/C Ratio				0.38	0.38			0.23		0.51	0.51	0.51
Clearance Time (s)				6.0	6.0			7.0		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)				271	1040			291		598	860	447
v/s Ratio Prot					c0.36					c0.19	0.02	
v/s Ratio Perm				0.04				0.03		c0.24		0.09
v/c Ratio				0.10	0.94			0.14		0.84	0.04	0.19
Uniform Delay, d1				23.7	35.7			36.5		23.9	14.8	16.0
Progression Factor				1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2				0.7	16.9			0.2		10.6	0.0	0.2
Delay (s)				24.4	52.6			36.7		34.5	14.8	16.2
Level of Service				C	D			D		C	B	B
Approach Delay (s)		0.0			51.9			36.7			30.6	
Approach LOS		A			D			D			C	

Intersection Summary			
HCM Average Control Delay	43.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	96.1%	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												
Volume (vph)	95	450	0	50	675	235	5	20	30	95	30	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	7.0		7.0	7.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.96			0.85		1.00	0.83	
Flpb, ped/bikes	1.00	1.00		0.88	1.00			0.99		0.77	1.00	
Frt	1.00	1.00		1.00	0.96			0.93		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1585	1610		1407	2929			1309		1185	1230	
Flt Permitted	0.19	1.00		0.49	1.00			0.98		0.72	1.00	
Satd. Flow (perm)	316	1610		728	2929			1284		897	1230	
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)	100	474	0	53	711	247	5	21	32	100	32	126
RTOR Reduction (vph)	0	0	0	0	32	0	0	23	0	0	91	0
Lane Group Flow (vph)	100	474	0	53	926	0	0	35	0	100	67	0
Confl. Peds. (#/hr)	118		126	126		118	197		142	142		197
Heavy Vehicles (%)	1%	5%	0%	0%	1%	3%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	60.0	60.0		48.0	48.0			29.0		29.0	29.0	
Effective Green, g (s)	60.0	60.0		48.0	48.0			29.0		29.0	29.0	
Actuated g/C Ratio	0.58	0.58		0.47	0.47			0.28		0.28	0.28	
Clearance Time (s)	5.0	7.0		7.0	7.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	270	938		339	1365			362		253	346	
v/s Ratio Prot	0.03	c0.29			c0.32						0.05	
v/s Ratio Perm	0.19			0.07				0.03		c0.11		
v/c Ratio	0.37	0.51		0.16	0.68			0.10		0.40	0.20	
Uniform Delay, d1	11.9	12.7		15.8	21.5			27.3		29.9	28.1	
Progression Factor	1.00	1.00		1.09	1.12			1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.9		0.8	2.3			0.5		4.6	1.3	
Delay (s)	12.7	14.7		18.1	26.3			27.9		34.5	29.4	
Level of Service	B	B		B	C			C		C	C	
Approach Delay (s)		14.3			25.9			27.9			31.4	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	23.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	120	420	640	195	390	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	0.93
Flpb, ped/bikes	0.98	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1527	1595	2955		1516	1341
Flt Permitted	0.27	1.00	1.00		0.95	1.00
Satd. Flow (perm)	434	1595	2955		1516	1341
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	442	674	205	411	374
RTOR Reduction (vph)	0	0	25	0	0	76
Lane Group Flow (vph)	126	442	854	0	411	298
Confl. Peds. (#/hr)	106			106	42	49
Heavy Vehicles (%)	3%	6%	2%	5%	6%	0%
Turn Type	Perm					Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	58.0	58.0	58.0		33.0	33.0
Effective Green, g (s)	58.0	58.0	58.0		33.0	33.0
Actuated g/C Ratio	0.56	0.56	0.56		0.32	0.32
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	244	898	1664		486	430
v/s Ratio Prot		0.28	0.29		c0.27	
v/s Ratio Perm	c0.29					0.22
v/c Ratio	0.52	0.49	0.51		0.85	0.69
Uniform Delay, d1	13.9	13.6	13.8		32.6	30.6
Progression Factor	1.78	1.86	1.00		1.00	1.00
Incremental Delay, d2	7.0	1.8	1.1		12.8	4.8
Delay (s)	31.7	27.1	15.0		45.4	35.4
Level of Service	C	C	B		D	D
Approach Delay (s)		28.1	15.0		40.6	
Approach LOS		C	B		D	

Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1510	3150	25	0	0	0	0	0	100	245	35	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.85		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4925						2863		3429	1807	
Flt Permitted	0.95	1.00						1.00		0.50	1.00	
Satd. Flow (perm)	3395	4925						2863		1819	1807	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1557	3247	26	0	0	0	0	0	111	272	39	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	31	0	0	0	0
Lane Group Flow (vph)	1557	3273	0	0	0	0	0	80	0	272	39	0
Confl. Peds. (#/hr)			20									
Heavy Vehicles (%)	2%	4%	3%	0%	0%	0%	0%	6%	6%	1%	4%	0%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	91.3	91.3						17.0		38.7	38.7	
Effective Green, g (s)	91.3	91.3						17.0		38.7	38.7	
Actuated g/C Ratio	0.63	0.63						0.12		0.27	0.27	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	2153	3123						338		664	486	
v/s Ratio Prot	0.46	c0.66						0.03		c0.04	0.02	
v/s Ratio Perm										c0.07		
v/c Ratio	0.72	1.05						0.24		0.41	0.08	
Uniform Delay, d1	17.8	26.4						57.6		42.0	39.3	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.1	30.5						0.4		0.4	0.1	
Delay (s)	20.0	56.8						58.0		42.4	39.4	
Level of Service	B	E						E		D	D	
Approach Delay (s)		44.9			0.0			58.0			42.0	
Approach LOS		D			A			E			D	

Intersection Summary			
HCM Average Control Delay	45.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	144.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	137.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	525	2910	60	10	940	135	10	65	40	190	55	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	0.76		1.00	1.00			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.96			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.93	1.00
Frt	1.00	1.00		1.00	0.85		1.00	0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.96	1.00
Satd. Flow (prot)	3330	4948		1785	3476		1750	1641			3134	1566
Flt Permitted	0.95	1.00		0.95	1.00		0.58	1.00			0.71	1.00
Satd. Flow (perm)	3330	4948		1785	3476		1076	1641			2307	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	541	3000	62	11	1033	148	11	72	44	211	61	11
RTOR Reduction (vph)	0	1	0	0	14	0	0	20	0	0	0	8
Lane Group Flow (vph)	541	3061	0	11	1167	0	11	96	0	0	272	3
Confl. Peds. (#/hr)	5		40	40		5			80	80		
Heavy Vehicles (%)	4%	3%	13%	0%	2%	2%	2%	5%	1%	2%	4%	2%
Turn Type	Prot			Prot	custom		Perm			Perm		Perm
Protected Phases	5	2		1				8			4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Effective Green, g (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.24	0.54		0.04	0.34		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	797	2677		70	1186		259	396			556	378
v/s Ratio Prot	c0.16	c0.62		0.01				0.06				
v/s Ratio Perm					0.34		0.01				c0.12	0.00
v/c Ratio	0.68	1.14		0.16	0.98		0.04	0.24			0.49	0.01
Uniform Delay, d1	38.7	25.7		52.0	36.6		32.6	34.3			36.6	32.3
Progression Factor	1.00	1.00		1.26	0.55		1.00	1.00			1.00	1.00
Incremental Delay, d2	2.3	69.5		0.8	19.8		0.1	0.3			0.7	0.0
Delay (s)	41.0	95.2		66.4	40.0		32.7	34.6			37.2	32.3
Level of Service	D	F		E	D		C	C			D	C
Approach Delay (s)		87.0						34.4			37.1	
Approach LOS		F						C			D	

Intersection Summary			
HCM Average Control Delay	72.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	170	1665	50	25	0	20	105	10	50	1010	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.96		1.00	0.92		0.97	
Flpb, ped/bikes	1.00	1.00		0.92	1.00		0.97	1.00		1.00	
Frt	1.00	1.00		1.00	0.85		1.00	0.87		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1648	3417		1600	1529		1730	1114		3951	
Flt Permitted	0.95	1.00		0.71	1.00		0.74	1.00		1.00	
Satd. Flow (perm)	1648	3417		1202	1529		1353	1114		3951	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91
Adj. Flow (vph)	181	1771	53	28	0	22	117	11	56	1110	126
RTOR Reduction (vph)	0	2	0	0	13	0	0	40	0	10	0
Lane Group Flow (vph)	181	1822	0	28	9	0	117	27	0	1226	0
Confl. Peds. (#/hr)	5		10	80		30	30		80		5
Heavy Vehicles (%)	8%	4%	2%	3%	5%	0%	0%	15%	40%	6%	3%
Turn Type	pm+pt			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases	2			8			4			6	
Actuated Green, G (s)	67.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	67.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.60	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	986	2044		343	437		387	318		1905	
v/s Ratio Prot	0.01	c0.53			0.01			0.02			
v/s Ratio Perm	0.10			0.02			c0.09			0.31	
v/c Ratio	0.18	0.89		0.08	0.02		0.30	0.08		0.64	
Uniform Delay, d1	10.2	19.4		29.3	28.7		31.3	29.3		21.8	
Progression Factor	0.60	0.94		1.00	1.00		1.00	1.00		0.14	
Incremental Delay, d2	0.0	1.8		0.1	0.0		0.4	0.1		0.8	
Delay (s)	6.1	20.0		29.4	28.8		31.7	29.4		4.0	
Level of Service	A	C		C	C		C	C		A	
Approach Delay (s)		18.8			29.1			30.9			
Approach LOS		B			C			C			

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	65	1090	595	475	100	785	250	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			8.0	8.0	
Lane Util. Factor		0.94	0.95			0.95	0.95	
Frpb, ped/bikes		1.00	0.98			1.00	1.00	
Flpb, ped/bikes		0.89	1.00			1.00	1.00	
Frt		1.00	0.93			1.00	0.89	
Flt Protected		0.95	1.00			0.99	1.00	
Satd. Flow (prot)		4214	3142			3352	3037	
Flt Permitted		0.95	1.00			0.61	1.00	
Satd. Flow (perm)		4214	3142			2051	3037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	1147	626	500	111	872	278	717
RTOR Reduction (vph)	0	0	89	0	0	0	145	0
Lane Group Flow (vph)	0	1215	1037	0	0	983	850	0
Confl. Peds. (#/hr)	70			45				
Heavy Vehicles (%)	14%	6%	4%	3%	5%	6%	7%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		37.8	37.8			60.2	60.2	
Effective Green, g (s)		37.8	37.8			60.2	60.2	
Actuated g/C Ratio		0.34	0.34			0.54	0.54	
Clearance Time (s)		6.0	6.0			8.0	8.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		1422	1060			1102	1632	
v/s Ratio Prot			c0.33				0.28	
v/s Ratio Perm		0.29				c0.48		
v/c Ratio		0.85	0.98			0.89	0.52	
Uniform Delay, d1		34.5	36.7			23.0	16.6	
Progression Factor		0.23	0.13			0.70	1.00	
Incremental Delay, d2		0.7	4.6			6.6	0.3	
Delay (s)		8.7	9.4			22.7	16.9	
Level of Service		A	A			C	B	
Approach Delay (s)			9.0			22.7	16.9	
Approach LOS			A			C	B	

Intersection Summary			
HCM Average Control Delay	14.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	165	2005	210	145	675	0	0	245	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.70	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6003		1173	3400			1634	2703
Flt Permitted					1.00		0.51	1.00			1.00	1.00
Satd. Flow (perm)					6003		629	3400			1634	2703
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	174	2111	221	161	750	0	0	272	289
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	209
Lane Group Flow (vph)	0	0	0	0	2492	0	161	750	0	0	272	80
Confl. Peds. (#/hr)				35		125	1405					1405
Heavy Vehicles (%)	0%	0%	0%	12%	4%	3%	6%	5%	0%	0%	15%	4%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					36.0		62.0	62.0			24.0	31.0
Effective Green, g (s)					36.0		62.0	62.0			24.0	31.0
Actuated g/C Ratio					0.32		0.55	0.55			0.21	0.28
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1930		348	1882			350	748
v/s Ratio Prot								0.22			c0.17	0.03
v/s Ratio Perm					0.42		c0.26					
v/c Ratio					1.29		0.46	0.40			0.78	0.11
Uniform Delay, d1					38.0		15.0	14.3			41.5	30.2
Progression Factor					0.36		0.51	0.48			1.00	1.00
Incremental Delay, d2					131.3		0.7	0.1			10.4	0.3
Delay (s)					145.0		8.3	7.0			51.8	30.5
Level of Service					F		A	A			D	C
Approach Delay (s)		0.0			145.0			7.2			40.8	
Approach LOS		A			F			A			D	

Intersection Summary			
HCM Average Control Delay	98.8	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.3%	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												
Volume (vph)	0	0	0	105	2060	300	110	1170	0	0	125	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.79	
Flpb, ped/bikes					1.00		0.93	1.00			1.00	
Frt					0.98		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4747		1567	3433			2348	
Flt Permitted					1.00		0.45	1.00			1.00	
Satd. Flow (perm)					4747		737	3433			2348	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	111	2168	316	122	1300	0	0	139	256
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	0	0	0	2593	0	122	1300	0	0	356	0
Confl. Peds. (#/hr)				130		165	435		290	290		435
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	6%	4%	0%	0%	11%	8%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					47.0		51.0	51.0			41.0	
Effective Green, g (s)					47.0		51.0	51.0			41.0	
Actuated g/C Ratio					0.42		0.46	0.46			0.37	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					1992		380	1563			860	
v/s Ratio Prot							0.02	c0.38			0.15	
v/s Ratio Perm					0.55		0.13					
v/c Ratio					1.30		0.32	0.83			0.41	
Uniform Delay, d1					32.5		18.2	26.7			26.5	
Progression Factor					1.00		0.59	0.51			1.00	
Incremental Delay, d2					139.6		0.3	2.7			0.3	
Delay (s)					172.1		11.1	16.3			26.9	
Level of Service					F		B	B			C	
Approach Delay (s)		0.0			172.1			15.8			26.9	
Approach LOS		A			F			B			C	

Intersection Summary			
HCM Average Control Delay	108.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1320	480	0	0	0	0	905	0	165	195	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0			8.0	
Lane Util. Factor		0.91						0.95			0.95	
Frpb, ped/bikes		0.99						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.96						1.00			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4608						3610			3236	
Flt Permitted		1.00						1.00			0.53	
Satd. Flow (perm)		4608						3610			1768	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1404	511	0	0	0	0	1006	0	183	217	0
RTOR Reduction (vph)	0	46	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1869	0	0	0	0	0	1006	0	0	400	0
Confl. Peds. (#/hr)	30		30							55		
Heavy Vehicles (%)	17%	5%	8%	2%	2%	2%	0%	0%	0%	8%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		54.6						43.4			43.4	
Effective Green, g (s)		54.6						43.4			43.4	
Actuated g/C Ratio		0.49						0.39			0.39	
Clearance Time (s)		6.0						8.0			8.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2246						1399			685	
v/s Ratio Prot		c0.41						c0.28				
v/s Ratio Perm											0.23	
v/c Ratio		0.83						0.72			1.81dl	
Uniform Delay, d1		24.7						29.1			27.2	
Progression Factor		0.64						1.00			0.82	
Incremental Delay, d2		2.0						1.8			1.1	
Delay (s)		17.8						30.9			23.3	
Level of Service		B						C			C	
Approach Delay (s)		17.8			0.0			30.9			23.3	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	830	1120	340	25	180	275	635	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.85	1.00	1.00	1.00
Frt	1.00	1.00	0.99		1.00	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1557	3210	3312		1424	3159	1842	1566
Flt Permitted	0.95	0.99	1.00		0.48	1.00	1.00	1.00
Satd. Flow (perm)	1557	3210	3312		714	3159	1842	1566
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.90	0.90	0.94	0.94
Adj. Flow (vph)	883	1191	378	28	200	306	676	191
RTOR Reduction (vph)	0	0	5	0	0	0	0	90
Lane Group Flow (vph)	671	1403	401	0	200	306	676	101
Confl. Peds. (#/hr)	5			310	310			
Heavy Vehicles (%)	4%	6%	5%	0%	7%	13%	2%	2%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8			4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Effective Green, g (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Actuated g/C Ratio	0.53	0.53	0.35		0.35	0.35	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	820	1691	1153		249	1100	970	825
v/s Ratio Prot			0.12			0.10		
v/s Ratio Perm	0.43	0.44			c0.28		0.37	0.06
v/c Ratio	0.82	0.83	0.35		0.80	0.28	0.70	0.12
Uniform Delay, d1	22.0	22.3	27.1		33.0	26.3	19.8	13.4
Progression Factor	0.61	0.61	1.00		1.40	1.43	1.00	1.00
Incremental Delay, d2	7.3	4.0	0.2		8.8	0.1	4.1	0.3
Delay (s)	20.8	17.6	27.3		55.1	37.8	24.0	13.7
Level of Service	C	B	C		E	D	C	B
Approach Delay (s)		18.6	27.3			44.7		
Approach LOS		B	C			D		

Intersection Summary			
HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	141.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	165	145	0	230	0	1100	700	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.99			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.93			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.98				
Satd. Flow (prot)		2994			3336		1562	3150				
Flt Permitted		1.00			1.00		0.95	0.98				
Satd. Flow (perm)		2994			3336		1562	3150				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	0	183	161	0	256	0	1170	745	0	0	0	0
RTOR Reduction (vph)	0	91	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	253	0	0	256	0	632	1283	0	0	0	0
Confl. Peds. (#/hr)			15									
Heavy Vehicles (%)	0%	12%	7%	0%	7%	0%	4%	8%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		43.0			43.0		55.0	55.0				
Effective Green, g (s)		43.0			43.0		55.0	55.0				
Actuated g/C Ratio		0.38			0.38		0.49	0.49				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		1149			1281		767	1547				
v/s Ratio Prot		c0.08			0.08							
v/s Ratio Perm							0.40	0.41				
v/c Ratio		0.22			0.20		0.82	0.83				
Uniform Delay, d1		23.2			23.0		24.4	24.5				
Progression Factor		1.00			1.01		0.45	0.45				
Incremental Delay, d2		0.1			0.0		6.2	3.3				
Delay (s)		23.3			23.2		17.2	14.3				
Level of Service		C			C		B	B				
Approach Delay (s)		23.3			23.2			15.3			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	895	2735	90	0	0	0	0	130	35	380	5	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.97		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4982						3298		3395	1789	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	3395	4982						3298		3395	1789	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	962	2941	97	0	0	0	0	137	37	400	5	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	1	0	0	0	0
Lane Group Flow (vph)	962	3035	0	0	0	0	0	173	0	400	5	0
Confl. Peds. (#/hr)	1		60	60		1	15					15
Heavy Vehicles (%)	2%	2%	3%	0%	0%	0%	0%	5%	4%	2%	5%	2%
Turn Type	Split									Prot		
Protected Phases	2	2						8		7	4	
Permitted Phases												
Actuated Green, G (s)	64.0	64.0						17.0		11.0	34.0	
Effective Green, g (s)	64.0	64.0						17.0		11.0	34.0	
Actuated g/C Ratio	0.57	0.57						0.15		0.10	0.30	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	1940	2847						501		333	543	
v/s Ratio Prot	0.28	c0.61						c0.05		c0.12	0.00	
v/s Ratio Perm												
v/c Ratio	0.50	1.07						0.35		1.20	0.01	
Uniform Delay, d1	14.4	24.0						42.5		50.5	27.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	0.9	37.7						0.4		115.8	0.0	
Delay (s)	15.3	61.7						42.9		166.3	27.2	
Level of Service	B	E						D		F	C	
Approach Delay (s)		50.6			0.0			42.9			164.6	
Approach LOS		D			A			D			F	

Intersection Summary			
HCM Average Control Delay	60.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	158.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	300	2785	65	25	1815	135	25	65	45	460	115	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			8.0		5.0	8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	*0.91			0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97			0.96		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.97		0.96	1.00	1.00
Frt	1.00	1.00		1.00	1.00			0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3429	5006		1653	4869			3123		1676	1756	1277
Flt Permitted	0.95	1.00		0.95	1.00			0.88		0.56	1.00	1.00
Satd. Flow (perm)	3429	5006		1653	4869			2771		986	1756	1277
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	323	2995	70	26	1911	142	26	68	47	484	121	32
RTOR Reduction (vph)	0	2	0	0	8	0	0	36	0	0	0	21
Lane Group Flow (vph)	323	3063	0	26	2045	0	0	105	0	484	121	11
Confl. Peds. (#/hr)	5		25	25		5	135		85	85		135
Heavy Vehicles (%)	1%	2%	0%	8%	2%	5%	4%	0%	0%	2%	7%	3%
Turn Type	Prot			Prot	custom		Perm			pm+pt		Perm
Protected Phases	5	2		1				8		7	4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	9.4	49.4		3.6	43.6			27.0		39.0	39.0	39.0
Effective Green, g (s)	9.4	49.4		3.6	43.6			27.0		39.0	39.0	39.0
Actuated g/C Ratio	0.08	0.44		0.03	0.39			0.24		0.35	0.35	0.35
Clearance Time (s)	6.0	6.0		6.0	6.0			8.0		5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	288	2208		53	1895			668		386	611	445
v/s Ratio Prot	c0.09	c0.61		0.02						c0.08	0.07	
v/s Ratio Perm					0.42			0.04		c0.36		0.01
v/c Ratio	1.12	1.39		0.49	1.08			0.16		1.25	0.20	0.03
Uniform Delay, d1	51.3	31.3		53.3	34.2			33.5		36.5	25.6	24.0
Progression Factor	1.07	1.23		0.85	1.17			1.00		1.00	1.00	1.00
Incremental Delay, d2	59.5	174.5		1.7	38.5			0.1		133.9	0.2	0.0
Delay (s)	114.3	213.1		46.9	78.6			33.6		170.4	25.7	24.0
Level of Service	F	F		D	E			C		F	C	C
Approach Delay (s)		203.7						33.6			135.6	
Approach LOS		F						C			F	

Intersection Summary			
HCM Average Control Delay	151.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	108.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	175	1620	15	80	30	90	170	30	75	1820	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.87		0.96	
Flpb, ped/bikes	1.00	1.00		0.85	1.00		0.98	1.00		1.00	
Frt	1.00	1.00		1.00	0.89		1.00	0.89		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1750	3460		1512	1605		1663	1274		4023	
Flt Permitted	0.95	1.00		0.69	1.00		0.68	1.00		1.00	
Satd. Flow (perm)	1750	3460		1091	1605		1182	1274		4023	
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
Adj. Flow (vph)	184	1705	16	84	32	95	179	32	79	1916	132
RTOR Reduction (vph)	0	0	0	0	15	0	0	56	0	6	0
Lane Group Flow (vph)	184	1721	0	84	112	0	179	55	0	2042	0
Confl. Peds. (#/hr)	20		15	170		25	25		170		20
Heavy Vehicles (%)	2%	3%	3%	0%	4%	0%	5%	5%	18%	2%	5%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.06	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	109	2070		312	459		338	364		1940	
v/s Ratio Prot	c0.11	0.50			0.07			0.04			
v/s Ratio Perm				0.08			c0.15			c0.51	
v/c Ratio	1.69	0.83		0.27	0.24		0.53	0.15		1.05	
Uniform Delay, d1	52.5	18.0		31.0	30.7		33.7	29.9		29.0	
Progression Factor	0.99	1.11		1.00	1.00		1.00	1.00		0.59	
Incremental Delay, d2	313.2	0.4		0.5	0.3		1.5	0.2		25.3	
Delay (s)	365.3	20.3		31.4	31.0		35.2	30.0		42.4	
Level of Service	F	C		C	C		D	C		D	
Approach Delay (s)		53.6			31.2			33.2			
Approach LOS		D			C			C			

Intersection Summary			
HCM Average Control Delay	46.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	50	1870	655	85	160	545	585	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	8.0	8.0	
Lane Util. Factor		0.94	0.95		1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		0.89	1.00		1.00	1.00	1.00	
Frt		1.00	0.98		1.00	1.00	0.91	
Flt Protected		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		4399	3385		1750	1807	3150	
Flt Permitted		0.95	1.00		0.09	1.00	1.00	
Satd. Flow (perm)		4399	3385		160	1807	3150	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.95
Adj. Flow (vph)	54	2011	704	91	168	574	616	832
RTOR Reduction (vph)	0	0	9	0	0	0	128	0
Lane Group Flow (vph)	0	2065	786	0	168	574	1320	0
Confl. Peds. (#/hr)	45							
Heavy Vehicles (%)	13%	1%	4%	1%	2%	4%	3%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		48.0	48.0		50.0	50.0	40.0	
Effective Green, g (s)		48.0	48.0		50.0	50.0	40.0	
Actuated g/C Ratio		0.43	0.43		0.45	0.45	0.36	
Clearance Time (s)		6.0	6.0		6.0	8.0	8.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1885	1451		128	807	1125	
v/s Ratio Prot			0.23		c0.05	0.32	0.42	
v/s Ratio Perm		0.47			c0.54			
v/c Ratio		1.10	0.54		1.31	0.71	1.21dr	
Uniform Delay, d1		32.0	23.8		31.5	25.1	36.0	
Progression Factor		0.28	0.21		3.02	1.44	1.00	
Incremental Delay, d2		46.8	0.5		145.8	0.3	87.7	
Delay (s)		55.8	5.6		240.8	36.4	123.7	
Level of Service		E	A		F	D	F	
Approach Delay (s)			41.8			82.7	123.7	
Approach LOS			D			F	F	

Intersection Summary			
HCM Average Control Delay	71.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	100	2220	150	115	525	0	0	345	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.78	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6100		1371	3336			1773	2729
Flt Permitted					1.00		0.38	1.00			1.00	1.00
Satd. Flow (perm)					6100		550	3336			1773	2729
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	108	2387	161	121	553	0	0	363	479
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	390
Lane Group Flow (vph)	0	0	0	0	2649	0	121	553	0	0	363	89
Confl. Peds. (#/hr)				30		135	1370		445			1370
Heavy Vehicles (%)	0%	0%	0%	4%	3%	5%	1%	7%	0%	0%	6%	3%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					48.0		50.0	50.0			24.8	18.2
Effective Green, g (s)					48.0		50.0	50.0			24.8	18.2
Actuated g/C Ratio					0.43		0.45	0.45			0.22	0.16
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2614		246	1489			393	443
v/s Ratio Prot								0.17			c0.20	0.03
v/s Ratio Perm					0.43		c0.22					
v/c Ratio					1.01		0.49	0.37			0.92	0.20
Uniform Delay, d1					32.0		22.0	20.6			42.7	40.6
Progression Factor					0.55		0.89	0.84			1.00	1.00
Incremental Delay, d2					14.3		0.6	0.1			27.0	1.0
Delay (s)					31.9		20.2	17.4			69.7	41.6
Level of Service					C		C	B			E	D
Approach Delay (s)		0.0			31.9			17.9			53.7	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.1%	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												
Volume (vph)	0	0	0	110	1925	100	170	705	0	0	175	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.74	
Flpb, ped/bikes					0.99		0.98	1.00			1.00	
Frt					0.99		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4915		1674	3433			2205	
Flt Permitted					1.00		0.25	1.00			1.00	
Satd. Flow (perm)					4915		445	3433			2205	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	118	2070	108	179	742	0	0	184	411
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	0	0	0	2292	0	179	742	0	0	577	0
Confl. Peds. (#/hr)	90		65	65		90	490		290	290		490
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	4%	4%	0%	0%	11%	5%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					56.4		41.6	41.6			30.6	
Effective Green, g (s)					56.4		41.6	41.6			30.6	
Actuated g/C Ratio					0.50		0.37	0.37			0.27	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2475		242	1275			602	
v/s Ratio Prot							c0.05	0.22			c0.26	
v/s Ratio Perm					0.47		0.23					
v/c Ratio					0.93		0.74	0.58			1.25dr	
Uniform Delay, d1					25.9		28.0	28.2			40.1	
Progression Factor					1.00		0.77	0.82			1.00	
Incremental Delay, d2					7.4		8.1	0.5			26.3	
Delay (s)					33.3		29.8	23.7			66.4	
Level of Service					C		C	C			E	
Approach Delay (s)		0.0			33.3			24.9			66.4	
Approach LOS		A			C			C			E	

Intersection Summary			
HCM Average Control Delay	36.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	139.2%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1465	440	0	0	0	0	720	0	470	165	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0		4.0	8.0	
Lane Util. Factor		0.91						0.95		1.00	1.00	
Frpb, ped/bikes		0.99						1.00		1.00	1.00	
Flpb, ped/bikes		1.00						1.00		1.00	1.00	
Frt		0.97						1.00		1.00	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4712						3471		1716	1756	
Flt Permitted		1.00						1.00		0.15	1.00	
Satd. Flow (perm)		4712						3471		268	1756	
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)	0	1542	463	0	0	0	0	758	0	495	174	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2003	0	0	0	0	0	758	0	495	174	0
Confl. Peds. (#/hr)	35		15	15		35	835		55	55		835
Heavy Vehicles (%)	0%	4%	5%	0%	0%	0%	0%	4%	4%	4%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		47.0						23.0		51.0	51.0	
Effective Green, g (s)		47.0						23.0		51.0	51.0	
Actuated g/C Ratio		0.42						0.21		0.46	0.46	
Clearance Time (s)		6.0						8.0		4.0	8.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1977						713		432	800	
v/s Ratio Prot		c0.43						0.22		c0.25	0.10	
v/s Ratio Perm										c0.28		
v/c Ratio		1.01						1.06		1.15	0.22	
Uniform Delay, d1		32.5						44.5		32.7	18.4	
Progression Factor		0.96						1.00		1.54	0.51	
Incremental Delay, d2		19.4						51.7		68.4	0.0	
Delay (s)		50.6						96.2		118.7	9.5	
Level of Service		D						F		F	A	
Approach Delay (s)		50.6			0.0			96.2			90.3	
Approach LOS		D			A			F			F	

Intersection Summary			
HCM Average Control Delay	68.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	960	1420	310	75	295	140	760	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.93		1.00	1.00	1.00	0.76
Flpb, ped/bikes	0.98	1.00	1.00		0.97	1.00	1.00	1.00
Frt	1.00	1.00	0.97		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1548	3293	2952		1658	3275	1536	1177
Flt Permitted	0.95	0.99	1.00		0.28	1.00	1.00	1.00
Satd. Flow (perm)	1548	3293	2952		497	3275	1536	1177
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1011	1495	326	79	311	147	800	79
RTOR Reduction (vph)	0	0	17	0	0	0	0	35
Lane Group Flow (vph)	809	1697	388	0	311	147	800	44
Confl. Peds. (#/hr)	10			290	290			125
Heavy Vehicles (%)	3%	3%	10%	7%	4%	9%	4%	3%
Turn Type	Perm				pm+pt		custom	custom
Protected Phases		2	8		7	4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.4	59.4	19.6		38.6	38.6	59.4	59.4
Effective Green, g (s)	59.4	59.4	19.6		38.6	38.6	59.4	59.4
Actuated g/C Ratio	0.53	0.53	0.18		0.34	0.34	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	821	1746	517		306	1129	815	624
v/s Ratio Prot			0.13		c0.12	0.04		
v/s Ratio Perm	c0.52	0.52			c0.23		0.52	0.04
v/c Ratio	0.99	0.97	0.75		1.02	0.13	0.98	0.07
Uniform Delay, d1	25.9	25.5	43.9		33.2	25.2	25.8	12.8
Progression Factor	0.69	0.69	1.00		1.09	0.93	1.00	1.00
Incremental Delay, d2	19.1	10.1	5.9		34.3	0.0	27.4	0.2
Delay (s)	37.1	27.5	49.8		70.4	23.4	53.1	13.1
Level of Service	D	C	D		E	C	D	B
Approach Delay (s)		30.6	49.8			55.4		
Approach LOS		C	D			E		

Intersection Summary			
HCM Average Control Delay	39.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	146.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	95	255	0	275	0	765	1415	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.93			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.89			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	1.00				
Satd. Flow (prot)		2813			3570		1547	3248				
Flt Permitted		1.00			1.00		0.95	1.00				
Satd. Flow (perm)		2813			3570		1547	3248				
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)	0	100	268	0	289	0	805	1489	0	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	330	0	0	289	0	724	1570	0	0	0	0
Confl. Peds. (#/hr)	90		65	65		90						
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		26.0			26.0		72.0	72.0				
Effective Green, g (s)		26.0			26.0		72.0	72.0				
Actuated g/C Ratio		0.23			0.23		0.64	0.64				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		653			829		995	2088				
v/s Ratio Prot		c0.12			0.08							
v/s Ratio Perm							0.47	0.48				
v/c Ratio		0.51			0.35		0.73	0.75				
Uniform Delay, d1		37.4			35.9		13.4	13.8				
Progression Factor		1.00			0.90		0.30	0.30				
Incremental Delay, d2		0.6			0.1		1.3	0.7				
Delay (s)		38.0			32.6		5.4	4.9				
Level of Service		D			C		A	A				
Approach Delay (s)		38.0			32.6			5.0			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	139.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

C5 South Side Two-Way

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	555	355	90	120	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.72	1.00	0.89
Flpb, ped/bikes	0.88	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1344	1626	1610	1005	1487	1223
Flt Permitted	0.42	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	598	1626	1610	1005	1487	1223
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	617	394	100	133	67
RTOR Reduction (vph)	0	0	0	52	0	50
Lane Group Flow (vph)	78	617	394	48	133	17
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	5%	4%	5%	3%	8%	4%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	57.4	57.4	57.4	57.4	31.0	31.0
Effective Green, g (s)	57.4	57.4	57.4	57.4	31.0	31.0
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	286	778	770	481	384	316
v/s Ratio Prot		c0.38	0.24		c0.09	
v/s Ratio Perm	0.13			0.05		0.01
v/c Ratio	0.27	0.79	0.51	0.10	0.35	0.05
Uniform Delay, d1	18.8	26.3	21.6	17.1	36.2	33.5
Progression Factor	1.00	1.00	0.38	0.13	1.00	1.00
Incremental Delay, d2	2.3	8.2	2.3	0.4	0.5	0.1
Delay (s)	21.1	34.5	10.4	2.6	36.8	33.6
Level of Service	C	C	B	A	D	C
Approach Delay (s)		33.0	8.9		35.7	
Approach LOS		C	A		D	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	31.6
Intersection Capacity Utilization	68.3%	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												
Volume (vph)	25	650	0	5	375	5	0	0	5	0	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		7.0	6.0			7.0			6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1606	1610		1575	1623			1434			1463	
Flt Permitted	0.46	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (perm)	771	1610		1575	1623			1434			1463	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	722	0	6	417	6	0	0	6	0	0	78
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	68	0
Lane Group Flow (vph)	28	722	0	6	423	0	0	6	0	0	10	0
Heavy Vehicles (%)	0%	5%	2%	2%	4%	0%	2%	2%	2%	0%	2%	0%
Turn Type	pm+pt			Prot			Split			Split		
Protected Phases	5	2		1	6		8	8		4 10	4 10	
Permitted Phases	2											
Actuated Green, G (s)	72.6	68.6		1.4	70.0			2.0			16.0	
Effective Green, g (s)	72.6	68.6		1.4	70.0			2.0			16.0	
Actuated g/C Ratio	0.60	0.57		0.01	0.58			0.02			0.13	
Clearance Time (s)	3.0	6.0		7.0	6.0			7.0				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				
Lane Grp Cap (vph)	494	920		18	947			24			195	
v/s Ratio Prot	0.00	c0.45		c0.00	0.26			c0.00			c0.01	
v/s Ratio Perm	0.03											
v/c Ratio	0.06	0.78		0.33	0.45			0.25			0.05	
Uniform Delay, d1	9.8	20.0		58.8	14.1			58.3			45.4	
Progression Factor	0.54	0.63		0.73	1.62			1.00			1.00	
Incremental Delay, d2	0.0	5.3		10.0	1.4			5.4			0.1	
Delay (s)	5.3	17.9		53.0	24.2			63.7			45.5	
Level of Service	A	B		D	C			E			D	
Approach Delay (s)		17.4			24.6			63.7			45.5	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	32.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	650	0	0	375	20	0	0	0	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0						7.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		1.00			0.99						0.93	
Flt Protected		1.00			1.00						0.98	
Satd. Flow (prot)		1610			1614						1472	
Flt Permitted		1.00			1.00						0.89	
Satd. Flow (perm)		1610			1614						1348	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	722	0	0	417	22	0	0	0	11	0	11
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	722	0	0	438	0	0	0	0	0	13	0
Heavy Vehicles (%)	5%	5%	50%	50%	4%	4%	50%	50%	50%	5%	5%	4%
Turn Type	Perm			Prot			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		84.0			84.0						23.0	
Effective Green, g (s)		84.0			84.0						23.0	
Actuated g/C Ratio		0.70			0.70						0.19	
Clearance Time (s)		6.0			6.0						7.0	
Vehicle Extension (s)		3.0			3.0						3.0	
Lane Grp Cap (vph)		1127			1130						258	
v/s Ratio Prot		c0.45			0.27							
v/s Ratio Perm											c0.01	
v/c Ratio		0.64			0.39						0.05	
Uniform Delay, d1		9.8			7.4						39.6	
Progression Factor		0.85			0.56						1.00	
Incremental Delay, d2		2.1			0.9						0.1	
Delay (s)		10.5			5.0						39.7	
Level of Service		B			A						D	
Approach Delay (s)		10.5			5.0			0.0			39.7	
Approach LOS		B			A			A			D	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	580	35	0	330	75	10	15	10	45	30	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	7.0		6.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	1.00		0.95		1.00	0.92		1.00	0.93	
Flpb, ped/bikes		0.99	1.00		1.00		0.92	1.00		0.81	1.00	
Frt		1.00	0.85		0.98		1.00	0.94		1.00	0.90	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1600	1437		1482		1285	1349		1087	1418	
Flt Permitted		0.92	1.00		1.00		0.70	1.00		0.74	1.00	
Satd. Flow (perm)		1472	1437		1482		942	1349		845	1418	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	50	644	39	0	367	83	11	17	11	50	33	61
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	49	0
Lane Group Flow (vph)	0	694	39	0	444	0	11	28	0	50	45	0
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	5%	0%	10%	5%	8%	15%	7%	10%	20%	0%	0%
Turn Type	Perm		custom				Perm			Perm		
Protected Phases		2	5		6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		84.0	4.8		72.2		23.0	23.0		23.0	23.0	
Effective Green, g (s)		84.0	4.8		72.2		23.0	23.0		23.0	23.0	
Actuated g/C Ratio		0.70	0.04		0.60		0.19	0.19		0.19	0.19	
Clearance Time (s)		6.0	7.0		6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		1030	57		892		181	259		162	272	
v/s Ratio Prot			0.03		0.30			0.02			0.03	
v/s Ratio Perm		c0.47					0.01			c0.06		
v/c Ratio		0.67	0.68		0.50		0.06	0.11		0.31	0.16	
Uniform Delay, d1		10.2	56.9		13.6		39.7	40.0		41.7	40.5	
Progression Factor		0.57	1.34		1.43		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.7	23.1		1.9		0.1	0.2		1.1	0.3	
Delay (s)		8.5	99.1		21.4		39.8	40.2		42.8	40.8	
Level of Service		A	F		C		D	D		D	D	
Approach Delay (s)		13.3			21.4			40.1			41.5	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	635	0	0	405	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0		7.0
Lane Util. Factor	1.00			1.00		1.00
Frt	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	1610			1610		975
Flt Permitted	1.00			1.00		1.00
Satd. Flow (perm)	1610			1610		975
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	706	0	0	450	0	17
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	706	0	0	450	0	17
Heavy Vehicles (%)	5%	0%	0%	5%	0%	50%
Turn Type						custom
Protected Phases	2			6		8
Permitted Phases						
Actuated Green, G (s)	102.8			102.8		4.2
Effective Green, g (s)	102.8			102.8		4.2
Actuated g/C Ratio	0.86			0.86		0.04
Clearance Time (s)	6.0			6.0		7.0
Vehicle Extension (s)	3.0			3.0		3.0
Lane Grp Cap (vph)	1379			1379		34
v/s Ratio Prot	c0.44			0.28		c0.02
v/s Ratio Perm						
v/c Ratio	0.51			0.33		0.50
Uniform Delay, d1	2.2			1.7		56.9
Progression Factor	1.01			0.25		1.00
Incremental Delay, d2	1.1			0.6		11.1
Delay (s)	3.3			1.0		68.0
Level of Service	A			A		E
Approach Delay (s)	3.3			1.0	68.0	
Approach LOS	A			A	E	

Intersection Summary			
HCM Average Control Delay	3.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Queens Quay / Robertson Crescent East			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	570	0	55	375	25	0	0	5	75	35	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	6.0			7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98			1.00		1.00	0.96	
Flpb, ped/bikes	0.80	1.00		1.00	1.00			1.00		0.74	1.00	
Frt	1.00	1.00		1.00	0.99			0.85		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1241	1610		1575	1505			1409		1168	1489	
Flt Permitted	0.51	1.00		0.95	1.00			1.00		0.75	1.00	
Satd. Flow (perm)	660	1610		1575	1505			1409		926	1489	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	89	633	0	61	417	28	0	0	6	83	39	33
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	25	0
Lane Group Flow (vph)	89	633	0	61	443	0	0	6	0	83	47	0
Confl. Peds. (#/hr)	140					140				100		30
Heavy Vehicles (%)	4%	5%	2%	2%	9%	4%	2%	2%	2%	2%	2%	0%
Turn Type	Perm			Prot			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)	69.3	69.3		7.7	84.0			23.0		23.0	23.0	
Effective Green, g (s)	69.3	69.3		7.7	84.0			23.0		23.0	23.0	
Actuated g/C Ratio	0.58	0.58		0.06	0.70			0.19		0.19	0.19	
Clearance Time (s)	6.0	6.0		7.0	6.0			7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	381	930		101	1054			270		177	285	
v/s Ratio Prot		c0.39		0.04	c0.29			0.00			0.03	
v/s Ratio Perm	0.13									c0.09		
v/c Ratio	0.23	0.68		0.60	0.42			0.02		0.47	0.16	
Uniform Delay, d1	12.4	17.6		54.7	7.7			39.4		43.1	40.5	
Progression Factor	0.38	0.46		0.80	1.25			1.00		1.00	1.00	
Incremental Delay, d2	1.1	3.1		8.1	1.0			0.0		2.0	0.3	
Delay (s)	5.8	11.2		51.9	10.6			39.4		45.0	40.8	
Level of Service	A	B		D	B			D		D	D	
Approach Delay (s)		10.5			15.5			39.4			43.0	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	630	20	0	510	5	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0		6.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1610	1437		1566	1606	1437
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1610	1437		1566	1606	1437
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	700	22	0	567	6	17
RTOR Reduction (vph)	0	4	0	0	0	14
Lane Group Flow (vph)	700	18	0	567	6	3
Heavy Vehicles (%)	5%	0%	0%	8%	0%	0%
Turn Type		custom				Perm
Protected Phases	2	5		6	8	
Permitted Phases						8
Actuated Green, G (s)	84.0	4.8		72.2	23.0	23.0
Effective Green, g (s)	84.0	4.8		72.2	23.0	23.0
Actuated g/C Ratio	0.70	0.04		0.60	0.19	0.19
Clearance Time (s)	6.0	7.0		6.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1127	57		942	308	275
v/s Ratio Prot	c0.43	0.01		0.36	c0.00	
v/s Ratio Perm						0.00
v/c Ratio	0.62	0.32		0.60	0.02	0.01
Uniform Delay, d1	9.6	56.0		14.9	39.4	39.3
Progression Factor	0.69	1.22		0.76	1.00	1.00
Incremental Delay, d2	2.0	2.5		2.6	0.0	0.0
Delay (s)	8.6	70.6		14.0	39.4	39.3
Level of Service	A	E		B	D	D
Approach Delay (s)	10.5			14.0	39.3	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	535	0	30	385	130	45	60	10	110	30	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.63		0.98		1.00	1.00	0.28
Flpb, ped/bikes	0.80	1.00		1.00	1.00	1.00		0.73		0.84	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	1.00	1.00
Satd. Flow (prot)	1203	1580		1606	1595	867		1180		1304	1691	398
Flt Permitted	0.51	1.00		0.95	1.00	1.00		0.86		0.66	1.00	1.00
Satd. Flow (perm)	650	1580		1606	1595	867		1039		906	1691	398
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	594	0	33	428	144	50	67	11	122	33	111
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	0	0	0	86
Lane Group Flow (vph)	122	594	0	33	428	96	0	128	0	122	33	25
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	7%	7%	6%	0%	6%	4%	0%	0%	0%	4%	0%	1%
Turn Type	Perm			Prot		Perm	Perm			Perm		Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2					6	8			4		4
Actuated Green, G (s)	68.6	68.6		4.8	80.4	80.4		26.6		26.6	26.6	26.6
Effective Green, g (s)	68.6	68.6		4.8	80.4	80.4		26.6		26.6	26.6	26.6
Actuated g/C Ratio	0.57	0.57		0.04	0.67	0.67		0.22		0.22	0.22	0.22
Clearance Time (s)	6.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	372	903		64	1069	581		230		201	375	88
v/s Ratio Prot		c0.38		0.02	c0.27						0.02	
v/s Ratio Perm	0.19					0.11		0.12		c0.13		0.06
v/c Ratio	0.33	0.66		0.52	0.40	0.17		0.56		0.61	0.09	0.28
Uniform Delay, d1	13.5	17.6		56.5	8.9	7.4		41.5		42.0	37.1	38.7
Progression Factor	0.31	0.45		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	3.0		6.9	1.1	0.6		2.9		5.1	0.1	1.7
Delay (s)	6.0	11.0		63.3	10.0	8.0		44.4		47.1	37.2	40.5
Level of Service	A	B		E	B	A		D		D	D	D
Approach Delay (s)		10.1			12.5			44.4			43.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	80.8%	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												
Volume (vph)	115	520	20	50	675	210	5	65	50	80	10	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.75	1.00	0.77		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.82	1.00		0.58	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.93		1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1486	1553		1575	1595	1038	1310	1224		892	1418	
Flt Permitted	0.15	1.00		0.42	1.00	1.00	0.32	1.00		0.67	1.00	
Satd. Flow (perm)	229	1553		696	1595	1038	437	1224		634	1418	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	128	578	22	56	750	233	6	72	56	89	11	333
RTOR Reduction (vph)	0	1	0	0	0	77	0	28	0	0	165	0
Lane Group Flow (vph)	128	599	0	56	750	156	6	100	0	89	179	0
Confl. Peds. (#/hr)	180		165			180	200		275	275		
Heavy Vehicles (%)	2%	7%	0%	2%	6%	4%	0%	0%	0%	4%	0%	2%
Turn Type	pm+pt			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	63.4	63.4		51.7	51.7	51.7	27.6	27.6		27.6	27.6	
Effective Green, g (s)	63.4	63.4		51.7	51.7	51.7	27.6	27.6		27.6	27.6	
Actuated g/C Ratio	0.62	0.62		0.50	0.50	0.50	0.27	0.27		0.27	0.27	
Clearance Time (s)	3.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	956		349	801	521	117	328		170	380	
v/s Ratio Prot	0.04	c0.39			c0.47			0.08			0.13	
v/s Ratio Perm	0.27			0.08		0.15	0.01			c0.14		
v/c Ratio	0.52	0.63		0.16	0.94	0.30	0.05	0.31		0.52	0.47	
Uniform Delay, d1	15.3	12.4		13.9	24.1	15.0	28.0	30.1		32.1	31.6	
Progression Factor	1.00	1.00		1.36	1.28	1.90	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	3.1		0.6	13.8	0.9	0.2	0.5		2.9	0.9	
Delay (s)	17.2	15.5		19.5	44.6	29.4	28.2	30.6		35.0	32.5	
Level of Service	B	B		B	D	C	C	C		C	C	
Approach Delay (s)		15.8			39.9			30.5			33.0	
Approach LOS		B			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	100	500	735	115	90	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.93	1.00	0.88
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1523	1595	1595	1187	1545	1224
Flt Permitted	0.21	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	337	1595	1595	1187	1545	1224
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	111	556	817	128	100	267
RTOR Reduction (vph)	0	0	0	27	0	99
Lane Group Flow (vph)	111	556	817	101	100	168
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	4%	6%	6%	12%	4%	3%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	64.0	64.0	64.0	64.0	27.0	27.0
Effective Green, g (s)	64.0	64.0	64.0	64.0	27.0	27.0
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	209	991	991	738	405	321
v/s Ratio Prot		0.35	c0.51		0.06	
v/s Ratio Perm	0.33			0.08		c0.14
v/c Ratio	0.53	0.56	0.82	0.14	0.25	0.52
Uniform Delay, d1	11.0	11.3	15.1	8.1	30.0	32.5
Progression Factor	1.04	1.03	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	1.9	7.8	0.4	0.3	1.5
Delay (s)	19.1	13.6	22.9	8.5	30.3	34.0
Level of Service	B	B	C	A	C	C
Approach Delay (s)		14.5	20.9		33.0	
Approach LOS		B	C		C	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	70	620	580	155	95	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.72	1.00	0.89
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1606	1642	1674	1024	1545	1247
Flt Permitted	0.24	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	399	1642	1674	1024	1545	1247
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	653	611	163	100	100
RTOR Reduction (vph)	0	0	0	68	0	74
Lane Group Flow (vph)	74	653	611	95	100	26
Confl. Peds. (#/hr)	190			190	130	50
Heavy Vehicles (%)	0%	3%	1%	1%	4%	2%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	57.4	57.4	57.4	57.4	31.0	31.0
Effective Green, g (s)	57.4	57.4	57.4	57.4	31.0	31.0
Actuated g/C Ratio	0.48	0.48	0.48	0.48	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	191	785	801	490	399	322
v/s Ratio Prot		c0.40	0.36		c0.06	
v/s Ratio Perm	0.19			0.09		0.02
v/c Ratio	0.39	0.83	0.76	0.19	0.25	0.08
Uniform Delay, d1	20.0	27.1	25.7	18.0	35.3	33.7
Progression Factor	1.00	1.00	0.97	1.27	1.00	1.00
Incremental Delay, d2	5.8	10.0	5.3	0.7	0.3	0.1
Delay (s)	25.9	37.1	30.2	23.5	35.6	33.8
Level of Service	C	D	C	C	D	C
Approach Delay (s)		36.0	28.8		34.7	
Approach LOS		D	C		C	

Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	31.6
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												
Volume (vph)	45	670	0	10	685	10	0	0	5	0	0	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		7.0	6.0			7.0				6.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00				1.00
Frt	1.00	1.00		1.00	1.00			0.86				0.86
Flt Protected	0.95	1.00		0.95	1.00			1.00				1.00
Satd. Flow (prot)	1606	1642		1606	1655			1463				1463
Flt Permitted	0.22	1.00		0.95	1.00			1.00				1.00
Satd. Flow (perm)	374	1642		1606	1655			1463				1463
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)	47	705	0	11	721	11	0	0	5	0	0	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	46
Lane Group Flow (vph)	47	705	0	11	732	0	0	5	0	0	0	7
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			Prot			Split					custom
Protected Phases	5	2		1	6		8	8				
Permitted Phases	2											4 10
Actuated Green, G (s)	74.0	68.4		1.6	68.4			2.0				16.0
Effective Green, g (s)	74.0	68.4		1.6	68.4			2.0				16.0
Actuated g/C Ratio	0.62	0.57		0.01	0.57			0.02				0.13
Clearance Time (s)	3.0	6.0		7.0	6.0			7.0				
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0				
Lane Grp Cap (vph)	288	936		21	943			24				195
v/s Ratio Prot	c0.01	0.43		0.01	c0.44			c0.00				
v/s Ratio Perm	0.09											c0.00
v/c Ratio	0.16	0.75		0.52	0.78			0.21				0.04
Uniform Delay, d1	13.0	19.4		58.8	19.9			58.2				45.3
Progression Factor	0.41	0.49		0.99	0.83			1.00				1.00
Incremental Delay, d2	0.2	4.2		16.5	4.7			4.3				0.1
Delay (s)	5.5	13.8		74.8	21.1			62.5				45.4
Level of Service	A	B		E	C			E				D
Approach Delay (s)		13.3			21.9			62.5			45.4	
Approach LOS		B			C			E			D	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	28.0
Intersection Capacity Utilization	73.2%	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												
Volume (vph)	5	665	0	0	710	30	0	0	0	10	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0						6.0	
Lane Util. Factor	1.00	1.00			1.00						1.00	
Frt	1.00	1.00			0.99						0.91	
Flt Protected	0.95	1.00			1.00						0.98	
Satd. Flow (prot)	1606	1642			1649						1515	
Flt Permitted	0.28	1.00			1.00						0.93	
Satd. Flow (perm)	467	1642			1649						1432	
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)	5	700	0	0	747	32	0	0	0	11	0	21
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	17	0
Lane Group Flow (vph)	5	700	0	0	778	0	0	0	0	0	15	0
Heavy Vehicles (%)	0%	3%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Prot			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)	84.0	84.0			84.0						24.0	
Effective Green, g (s)	84.0	84.0			84.0						24.0	
Actuated g/C Ratio	0.70	0.70			0.70						0.20	
Clearance Time (s)	6.0	6.0			6.0						6.0	
Vehicle Extension (s)	3.0	3.0			3.0						3.0	
Lane Grp Cap (vph)	327	1149			1154						286	
v/s Ratio Prot		0.43			c0.47							
v/s Ratio Perm	0.01										c0.01	
v/c Ratio	0.02	0.61			0.67						0.05	
Uniform Delay, d1	5.5	9.4			10.2						38.8	
Progression Factor	0.14	0.81			1.57						1.00	
Incremental Delay, d2	0.1	1.9			2.4						0.1	
Delay (s)	0.8	9.5			18.4						38.9	
Level of Service	A	A			B						D	
Approach Delay (s)		9.4			18.4			0.0			38.9	
Approach LOS		A			B			A			D	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	595	25	0	610	65	15	25	15	50	45	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	7.0		6.0		7.0	7.0		7.0	7.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	1.00		0.97		1.00	0.92		1.00	0.92	
Flpb, ped/bikes		1.00	1.00		1.00		0.93	1.00		0.82	1.00	
Frt		1.00	0.85		0.99		1.00	0.94		1.00	0.89	
Flt Protected		1.00	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1595	1437		1596		1498	1466		1213	1389	
Flt Permitted		0.70	1.00		1.00		0.57	1.00		0.73	1.00	
Satd. Flow (perm)		1115	1437		1596		893	1466		932	1389	
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)	58	626	26	0	642	68	16	26	16	53	47	121
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	78	0
Lane Group Flow (vph)	0	684	26	0	707	0	16	42	0	53	90	0
Confl. Peds. (#/hr)	110		50	50		110	35		75	75		35
Heavy Vehicles (%)	1%	6%	0%	0%	2%	0%	0%	0%	0%	8%	0%	0%
Turn Type	Perm		custom				Perm			Perm		
Protected Phases		2	5		6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)		84.0	4.2		72.8		23.0	23.0		23.0	23.0	
Effective Green, g (s)		84.0	4.2		72.8		23.0	23.0		23.0	23.0	
Actuated g/C Ratio		0.70	0.04		0.61		0.19	0.19		0.19	0.19	
Clearance Time (s)		6.0	7.0		6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		781	50		968		171	281		179	266	
v/s Ratio Prot			0.02		0.44			0.03			c0.07	
v/s Ratio Perm		c0.61					0.02			0.06		
v/c Ratio		0.88	0.52		0.73		0.09	0.15		0.30	0.34	
Uniform Delay, d1		14.0	56.9		16.7		39.9	40.4		41.6	41.9	
Progression Factor		2.54	0.68		0.43		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.9	7.6		4.3		0.2	0.2		0.9	0.8	
Delay (s)		46.4	46.1		11.4		40.2	40.6		42.5	42.7	
Level of Service		D	D		B		D	D		D	D	
Approach Delay (s)		46.4			11.4			40.5			42.6	
Approach LOS		D			B			D			D	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		
Description: Queen's Quay / Rees / Radisson West			
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	660	0	0	675	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0		7.0
Lane Util. Factor	1.00			1.00		1.00
Frt	1.00			1.00		0.86
Flt Protected	1.00			1.00		1.00
Satd. Flow (prot)	1610			1610		975
Flt Permitted	1.00			1.00		1.00
Satd. Flow (perm)	1610			1610		975
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	695	0	0	711	0	32
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	695	0	0	711	0	32
Heavy Vehicles (%)	5%	0%	0%	5%	0%	50%
Turn Type						custom
Protected Phases	2			6		8
Permitted Phases						
Actuated Green, G (s)	99.9			99.9		7.1
Effective Green, g (s)	99.9			99.9		7.1
Actuated g/C Ratio	0.83			0.83		0.06
Clearance Time (s)	6.0			6.0		7.0
Vehicle Extension (s)	3.0			3.0		3.0
Lane Grp Cap (vph)	1340			1340		58
v/s Ratio Prot	0.43			c0.44		c0.03
v/s Ratio Perm						
v/c Ratio	0.52			0.53		0.55
Uniform Delay, d1	3.0			3.0		54.9
Progression Factor	0.35			0.37		1.00
Incremental Delay, d2	0.8			1.2		10.9
Delay (s)	1.8			2.3		65.8
Level of Service	A			A		E
Approach Delay (s)	1.8			2.3	65.8	
Approach LOS	A			A	E	

Intersection Summary			
HCM Average Control Delay	3.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	570	0	20	620	80	15	45	35	90	5	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	6.0		7.0	7.0		7.0	7.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.96		1.00	1.00		1.00	0.91	
Flpb, ped/bikes	0.89	1.00		1.00	1.00		1.00	1.00		0.77	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	0.93		1.00	0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1395	1610		1606	1561		1606	1579		1175	1299	
Flt Permitted	0.34	1.00		0.95	1.00		0.72	1.00		0.70	1.00	
Satd. Flow (perm)	496	1610		1606	1561		1223	1579		869	1299	
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)	126	600	0	21	653	84	16	47	37	95	5	47
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	38	0
Lane Group Flow (vph)	126	600	0	21	733	0	16	84	0	95	14	0
Confl. Peds. (#/hr)	140					140				100		30
Heavy Vehicles (%)	3%	5%	0%	0%	2%	1%	0%	0%	0%	5%	0%	3%
Turn Type	Perm			Prot			Perm			Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2						8			4		
Actuated Green, G (s)	73.8	73.8		3.0	83.8		23.2	23.2		23.2	23.2	
Effective Green, g (s)	73.8	73.8		3.0	83.8		23.2	23.2		23.2	23.2	
Actuated g/C Ratio	0.61	0.61		0.02	0.70		0.19	0.19		0.19	0.19	
Clearance Time (s)	6.0	6.0		7.0	6.0		7.0	7.0		7.0	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	305	990		40	1090		236	305		168	251	
v/s Ratio Prot		0.37		0.01	c0.47			0.05			0.01	
v/s Ratio Perm	0.25						0.01			c0.11		
v/c Ratio	0.41	0.61		0.53	0.67		0.07	0.28		0.57	0.06	
Uniform Delay, d1	11.9	14.2		57.8	10.3		39.6	41.2		43.8	39.5	
Progression Factor	1.13	1.06		0.73	1.50		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	1.9		9.0	2.5		0.1	0.5		4.3	0.1	
Delay (s)	16.4	17.0		51.3	18.0		39.7	41.7		48.1	39.6	
Level of Service	B	B		D	B		D	D		D	D	
Approach Delay (s)		16.9			18.9			41.4			45.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
Description: Queen's Quay / Lower Simcoe / Harbourfront East			

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	670	25	0	750	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	7.0		6.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	0.85
Flt Protected	1.00	1.00		1.00	0.95	1.00
Satd. Flow (prot)	1842	1597		1879	1785	1597
Flt Permitted	1.00	1.00		1.00	0.95	1.00
Satd. Flow (perm)	1842	1597		1879	1785	1597
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	705	26	0	789	11	11
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	705	26	0	789	11	11
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type		custom				Perm
Protected Phases	2	5		6	8	
Permitted Phases						8
Actuated Green, G (s)	84.0	4.2		72.8	23.0	23.0
Effective Green, g (s)	84.0	4.2		72.8	23.0	23.0
Actuated g/C Ratio	0.70	0.04		0.61	0.19	0.19
Clearance Time (s)	6.0	7.0		6.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	1289	56		1140	342	306
v/s Ratio Prot	c0.38	0.02		c0.42	0.01	
v/s Ratio Perm						c0.01
v/c Ratio	0.55	0.46		0.69	0.03	0.04
Uniform Delay, d1	8.7	56.8		16.0	39.4	39.5
Progression Factor	0.83	1.04		0.58	1.00	1.00
Incremental Delay, d2	1.4	5.0		2.8	0.0	0.0
Delay (s)	8.7	64.1		12.2	39.5	39.5
Level of Service	A	E		B	D	D
Approach Delay (s)	10.6			12.2	39.5	
Approach LOS	B			B	D	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	600	0	25	645	260	15	20	15	80	35	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.63		0.93		1.00	1.00	0.28
Flpb, ped/bikes	0.88	1.00		1.00	1.00	1.00		0.80		0.81	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	1.00	1.00
Satd. Flow (prot)	1407	1610		1606	1674	902		1186		1264	1691	402
Flt Permitted	0.37	1.00		0.95	1.00	1.00		0.92		0.72	1.00	1.00
Satd. Flow (perm)	553	1610		1606	1674	902		1104		961	1691	402
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)	84	632	0	26	679	274	16	21	16	84	37	95
RTOR Reduction (vph)	0	0	0	0	0	87	0	0	0	0	0	75
Lane Group Flow (vph)	84	632	0	26	679	187	0	53	0	84	37	20
Confl. Peds. (#/hr)	150		170	170		150	655		85	85		655
Heavy Vehicles (%)	0%	5%	0%	0%	1%	0%	0%	0%	0%	3%	0%	0%
Turn Type	Perm			Prot		Perm	Perm			Perm		Perm
Protected Phases		2		1	6			8			4	
Permitted Phases	2					6	8			4		4
Actuated Green, G (s)	70.8	70.8		4.2	82.0	82.0		25.0		25.0	25.0	25.0
Effective Green, g (s)	70.8	70.8		4.2	82.0	82.0		25.0		25.0	25.0	25.0
Actuated g/C Ratio	0.59	0.59		0.04	0.68	0.68		0.21		0.21	0.21	0.21
Clearance Time (s)	6.0	6.0		7.0	6.0	6.0		7.0		7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	326	950		56	1144	616		230		200	352	84
v/s Ratio Prot		c0.39		0.02	c0.41						0.02	
v/s Ratio Perm	0.15					0.21		0.05		c0.09		0.05
v/c Ratio	0.26	0.67		0.46	0.59	0.30		0.23		0.42	0.11	0.24
Uniform Delay, d1	11.9	16.6		56.8	10.1	7.6		39.5		41.2	38.4	39.5
Progression Factor	0.37	0.55		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	3.1		6.0	2.3	1.3		0.5		1.4	0.1	1.4
Delay (s)	6.1	12.3		62.8	12.4	8.9		40.0		42.6	38.6	41.0
Level of Service	A	B		E	B	A		D		D	D	D
Approach Delay (s)		11.6			12.7			40.0			41.2	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
Description: Queens Quay / York Street			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	185	720	0	50	675	235	5	20	30	95	30	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Total Lost time (s)	3.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.75	1.00	0.69		1.00	0.73	
Flpb, ped/bikes	1.00	1.00		0.90	1.00	1.00	0.67	1.00		0.53	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1501	1610		1442	1674	1048	1073	1060		820	1112	
Flt Permitted	0.17	1.00		0.31	1.00	1.00	0.69	1.00		0.72	1.00	
Satd. Flow (perm)	263	1610		466	1674	1048	782	1060		624	1112	
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)	195	758	0	53	711	247	5	21	32	100	32	68
RTOR Reduction (vph)	0	0	0	0	0	64	0	24	0	0	50	0
Lane Group Flow (vph)	195	758	0	53	711	183	5	29	0	100	50	0
Confl. Peds. (#/hr)	180		165	165		180	200		275	275		200
Heavy Vehicles (%)	1%	5%	0%	0%	1%	3%	0%	0%	0%	4%	0%	0%
Turn Type	pm+pt			Perm		Perm	Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6		6	8			4		
Actuated Green, G (s)	63.8	63.8		50.8	50.8	50.8	27.2	27.2		27.2	27.2	
Effective Green, g (s)	63.8	63.8		50.8	50.8	50.8	27.2	27.2		27.2	27.2	
Actuated g/C Ratio	0.62	0.62		0.49	0.49	0.49	0.26	0.26		0.26	0.26	
Clearance Time (s)	3.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	283	997		230	826	517	207	280		165	294	
v/s Ratio Prot	0.07	c0.47			c0.42			0.03			0.04	
v/s Ratio Perm	0.36			0.11		0.17	0.01			c0.16		
v/c Ratio	0.69	0.76		0.23	0.86	0.35	0.02	0.11		0.61	0.17	
Uniform Delay, d1	15.4	14.1		14.9	23.0	16.0	28.1	28.7		33.2	29.2	
Progression Factor	1.00	1.00		1.15	1.04	1.24	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	5.5		1.7	8.8	1.4	0.0	0.2		6.2	0.3	
Delay (s)	22.2	19.5		18.9	32.6	21.4	28.1	28.9		39.4	29.5	
Level of Service	C	B		B	C	C	C	C		D	C	
Approach Delay (s)		20.1			29.1			28.8			34.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	98.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	135	675	640	195	135	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.89	1.00	0.88
Flpb, ped/bikes	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1518	1595	1658	1217	1516	1261
Flt Permitted	0.30	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	476	1595	1658	1217	1516	1261
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	142	711	674	205	142	374
RTOR Reduction (vph)	0	0	0	53	0	136
Lane Group Flow (vph)	142	711	674	152	142	238
Confl. Peds. (#/hr)	85			85	60	55
Heavy Vehicles (%)	3%	6%	2%	5%	6%	0%
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Actuated Green, G (s)	64.0	64.0	64.0	64.0	27.0	27.0
Effective Green, g (s)	64.0	64.0	64.0	64.0	27.0	27.0
Actuated g/C Ratio	0.62	0.62	0.62	0.62	0.26	0.26
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296	991	1030	756	397	331
v/s Ratio Prot		c0.45	0.41		0.09	
v/s Ratio Perm	0.30			0.13		c0.19
v/c Ratio	0.48	0.72	0.65	0.20	0.36	0.72
Uniform Delay, d1	10.5	13.3	12.4	8.4	30.9	34.6
Progression Factor	0.88	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.0	3.3	3.2	0.6	0.6	7.3
Delay (s)	13.2	16.6	15.7	9.0	31.5	41.9
Level of Service	B	B	B	A	C	D
Approach Delay (s)		16.0	14.1		39.0	
Approach LOS		B	B		D	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.3%	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												
Volume (vph)	1540	2575	65	0	0	0	0	70	90	165	115	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	1.00						0.92		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4912						3084		1767	3433	
Flt Permitted	0.95	1.00						1.00		0.47	1.00	
Satd. Flow (perm)	3395	4912						3084		879	3433	
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1588	2655	67	0	0	0	0	78	100	183	128	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	41	0	0	0	0
Lane Group Flow (vph)	1588	2720	0	0	0	0	0	137	0	183	128	0
Confl. Peds. (#/hr)			20									
Heavy Vehicles (%)	2%	4%	3%	0%	0%	0%	0%	6%	6%	1%	4%	0%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	92.5	92.5						17.0		37.5	37.5	
Effective Green, g (s)	92.5	92.5						17.0		37.5	37.5	
Actuated g/C Ratio	0.64	0.64						0.12		0.26	0.26	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	2181	3155						364		318	894	
v/s Ratio Prot	0.47	c0.55						0.04		c0.06	0.04	
v/s Ratio Perm										c0.09		
v/c Ratio	0.73	0.86						0.38		0.58	0.14	
Uniform Delay, d1	17.3	20.6						58.6		44.1	40.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.2	3.4						0.7		2.5	0.1	
Delay (s)	19.5	24.0						59.3		46.6	41.0	
Level of Service	B	C						E		D	D	
Approach Delay (s)		22.3			0.0			59.3			44.3	
Approach LOS		C			A			E			D	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	144.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	137.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	470	2315	45	10	940	135	10	25	100	190	75	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	0.76		1.00	1.00			0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.91			1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00			0.94	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.88			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.97	1.00
Satd. Flow (prot)	3330	4950		1785	4089		1750	1482			3162	1566
Flt Permitted	0.95	1.00		0.95	1.00		0.57	1.00			0.71	1.00
Satd. Flow (perm)	3330	4950		1785	4089		1054	1482			2322	1566
Peak-hour factor, PHF	0.97	0.97	0.97	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	485	2387	46	11	1033	148	11	28	111	211	83	11
RTOR Reduction (vph)	0	1	0	0	14	0	0	84	0	0	0	8
Lane Group Flow (vph)	485	2432	0	11	1167	0	11	55	0	0	294	3
Confl. Peds. (#/hr)	5		40	40		5			80	80		
Heavy Vehicles (%)	4%	3%	13%	0%	2%	2%	2%	5%	1%	2%	4%	2%
Turn Type	Prot			Prot	custom		Perm			Perm		Perm
Protected Phases	5	2		1				8			4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Effective Green, g (s)	26.8	60.6		4.4	38.2		27.0	27.0			27.0	27.0
Actuated g/C Ratio	0.24	0.54		0.04	0.34		0.24	0.24			0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0			8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	797	2678		70	1395		254	357			560	378
v/s Ratio Prot	c0.15	c0.49		0.01				0.04				
v/s Ratio Perm					0.29		0.01				c0.13	0.00
v/c Ratio	0.61	0.91		0.16	0.84		0.04	0.15			0.52	0.01
Uniform Delay, d1	37.9	23.2		52.0	34.0		32.6	33.5			36.9	32.3
Progression Factor	1.00	1.00		1.11	0.36		1.00	1.00			1.00	1.00
Incremental Delay, d2	1.3	5.8		0.9	5.0		0.1	0.2			0.9	0.0
Delay (s)	39.3	29.0		58.7	17.3		32.7	33.7			37.8	32.3
Level of Service	D	C		E	B		C	C			D	C
Approach Delay (s)		30.7						33.6			37.6	
Approach LOS		C						C			D	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1150	115	25	70	10	95	25	50	1010	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.94		0.97	
Flpb, ped/bikes	1.00	1.00		0.93	1.00		0.97	1.00		1.00	
Frt	1.00	0.99		1.00	0.98		1.00	0.90		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1648	3383		1603	1757		1735	1204		3951	
Flt Permitted	0.95	1.00		0.70	1.00		0.70	1.00		1.00	
Satd. Flow (perm)	1648	3383		1186	1757		1277	1204		3951	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91
Adj. Flow (vph)	90	1223	122	28	78	11	106	28	56	1110	126
RTOR Reduction (vph)	0	7	0	0	4	0	0	40	0	10	0
Lane Group Flow (vph)	90	1338	0	28	85	0	106	44	0	1226	0
Confl. Peds. (#/hr)	5		10	80		30	30		80		5
Heavy Vehicles (%)	8%	4%	2%	3%	5%	0%	0%	15%	40%	6%	3%
Turn Type	pm+pt			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases	2			8			4			6	
Actuated Green, G (s)	67.0	67.0		32.0	32.0		32.0	32.0		55.4	
Effective Green, g (s)	67.0	67.0		32.0	32.0		32.0	32.0		55.4	
Actuated g/C Ratio	0.60	0.60		0.29	0.29		0.29	0.29		0.49	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	986	2024		339	502		365	344		1954	
v/s Ratio Prot	0.00	c0.40			0.05			0.04			
v/s Ratio Perm	0.05			0.02			c0.08			0.31	
v/c Ratio	0.09	0.66		0.08	0.17		0.29	0.13		0.63	
Uniform Delay, d1	9.6	15.0		29.3	30.0		31.2	29.7		20.7	
Progression Factor	0.93	1.31		1.00	1.00		1.00	1.00		0.50	
Incremental Delay, d2	0.0	1.1		0.1	0.2		0.4	0.2		0.7	
Delay (s)	9.0	20.6		29.4	30.2		31.6	29.8		11.1	
Level of Service	A	C		C	C		C	C		B	
Approach Delay (s)		19.9			30.0			30.8			
Approach LOS		B			C			C			

Intersection Summary			
HCM Average Control Delay	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	65	1090	595	475	100	895	250	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0			8.0	8.0	
Lane Util. Factor		0.94	0.95			0.95	0.95	
Frpb, ped/bikes		1.00	0.98			1.00	1.00	
Flpb, ped/bikes		0.89	1.00			1.00	1.00	
Frt		1.00	0.93			1.00	0.89	
Flt Protected		0.95	1.00			1.00	1.00	
Satd. Flow (prot)		4214	3142			3354	3037	
Flt Permitted		0.95	1.00			0.62	1.00	
Satd. Flow (perm)		4214	3142			2104	3037	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.90	0.90	0.90	0.90
Adj. Flow (vph)	68	1147	626	500	111	994	278	717
RTOR Reduction (vph)	0	0	68	0	0	0	140	0
Lane Group Flow (vph)	0	1215	1058	0	0	1105	855	0
Confl. Peds. (#/hr)	70			45				
Heavy Vehicles (%)	14%	6%	4%	3%	5%	6%	7%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		36.0	36.0			62.0	62.0	
Effective Green, g (s)		36.0	36.0			62.0	62.0	
Actuated g/C Ratio		0.32	0.32			0.55	0.55	
Clearance Time (s)		6.0	6.0			8.0	8.0	
Vehicle Extension (s)		3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		1355	1010			1165	1681	
v/s Ratio Prot			c0.34				0.28	
v/s Ratio Perm		0.29				c0.53		
v/c Ratio		0.90	1.05			0.95	0.51	
Uniform Delay, d1		36.2	38.0			23.5	15.5	
Progression Factor		0.24	0.16			0.77	1.00	
Incremental Delay, d2		1.0	24.5			10.4	0.2	
Delay (s)		9.5	30.7			28.5	15.8	
Level of Service		A	C			C	B	
Approach Delay (s)			19.7			28.5	15.8	
Approach LOS			B			C	B	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	165	2005	210	145	675	0	0	245	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.70	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6003		1173	3400			1634	2703
Flt Permitted					1.00		0.51	1.00			1.00	1.00
Satd. Flow (perm)					6003		629	3400			1634	2703
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	174	2111	221	161	750	0	0	272	294
RTOR Reduction (vph)	0	0	0	0	14	0	0	0	0	0	0	213
Lane Group Flow (vph)	0	0	0	0	2492	0	161	750	0	0	272	81
Confl. Peds. (#/hr)				35		125	1405					1405
Heavy Vehicles (%)	0%	0%	0%	12%	4%	3%	6%	5%	0%	0%	15%	4%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					36.0		62.0	62.0			24.0	31.0
Effective Green, g (s)					36.0		62.0	62.0			24.0	31.0
Actuated g/C Ratio					0.32		0.55	0.55			0.21	0.28
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					1930		348	1882			350	748
v/s Ratio Prot								0.22			c0.17	0.03
v/s Ratio Perm					0.42		c0.26					
v/c Ratio					1.29		0.46	0.40			0.78	0.11
Uniform Delay, d1					38.0		15.0	14.3			41.5	30.2
Progression Factor					0.36		0.49	0.46			1.00	1.00
Incremental Delay, d2					131.3		0.7	0.1			10.4	0.3
Delay (s)					145.0		8.0	6.7			51.8	30.5
Level of Service					F		A	A			D	C
Approach Delay (s)		0.0			145.0			7.0			40.8	
Approach LOS		A			F			A			D	

Intersection Summary			
HCM Average Control Delay	98.6	HCM Level of Service	F
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	87.3%	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												
Volume (vph)	0	0	0	105	2060	300	110	1170	0	0	125	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.98		1.00	1.00			0.79	
Flpb, ped/bikes					1.00		0.93	1.00			1.00	
Frt					0.98		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4747		1567	3433			2348	
Flt Permitted					1.00		0.45	1.00			1.00	
Satd. Flow (perm)					4747		737	3433			2348	
Peak-hour factor, PHF	0.90	0.90	0.90	0.95	0.95	0.95	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	111	2168	316	122	1300	0	0	139	256
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	0	0	0	2593	0	122	1300	0	0	356	0
Confl. Peds. (#/hr)				130		165	435		290	290		435
Heavy Vehicles (%)	0%	0%	0%	2%	4%	3%	6%	4%	0%	0%	11%	8%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					47.0		51.0	51.0			41.0	
Effective Green, g (s)					47.0		51.0	51.0			41.0	
Actuated g/C Ratio					0.42		0.46	0.46			0.37	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					1992		380	1563			860	
v/s Ratio Prot							0.02	c0.38			0.15	
v/s Ratio Perm					0.55		0.13					
v/c Ratio					1.30		0.32	0.83			0.41	
Uniform Delay, d1					32.5		18.2	26.7			26.5	
Progression Factor					1.00		0.60	0.51			1.00	
Incremental Delay, d2					139.6		0.3	2.7			0.3	
Delay (s)					172.1		11.2	16.4			26.9	
Level of Service					F		B	B			C	
Approach Delay (s)		0.0			172.1			15.9			26.9	
Approach LOS		A			F			B			C	

Intersection Summary			
HCM Average Control Delay	108.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1215	50	0	0	0	0	1015	0	165	190	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0			8.0	
Lane Util. Factor		0.91						0.95			0.95	
Frpb, ped/bikes		1.00						1.00			1.00	
Flpb, ped/bikes		1.00						1.00			1.00	
Frt		0.99						1.00			1.00	
Flt Protected		1.00						1.00			0.98	
Satd. Flow (prot)		4844						3610			3237	
Flt Permitted		1.00						1.00			0.54	
Satd. Flow (perm)		4844						3610			1799	
Peak-hour factor, PHF	0.94	0.94	0.94	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1293	53	0	0	0	0	1128	0	183	211	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1343	0	0	0	0	0	1128	0	0	394	0
Confl. Peds. (#/hr)	30		30							55		
Heavy Vehicles (%)	17%	5%	8%	2%	2%	2%	0%	0%	0%	8%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		53.8						44.2			44.2	
Effective Green, g (s)		53.8						44.2			44.2	
Actuated g/C Ratio		0.48						0.39			0.39	
Clearance Time (s)		6.0						8.0			8.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2327						1425			710	
v/s Ratio Prot		c0.28						c0.31				
v/s Ratio Perm											0.22	
v/c Ratio		0.58						0.79			2.51dl	
Uniform Delay, d1		20.9						29.8			26.3	
Progression Factor		0.31						1.00			0.82	
Incremental Delay, d2		0.8						3.1			0.8	
Delay (s)		7.3						32.9			22.3	
Level of Service		A						C			C	
Approach Delay (s)		7.3			0.0			32.9			22.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	820	1085	340	25	180	275	615	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		0.85	1.00	1.00	1.00
Frt	1.00	1.00	0.99		1.00	1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1557	3209	3312		1424	3159	1842	1566
Flt Permitted	0.95	0.99	1.00		0.48	1.00	1.00	1.00
Satd. Flow (perm)	1557	3209	3312		714	3159	1842	1566
Peak-hour factor, PHF	0.94	0.94	0.90	0.90	0.90	0.90	0.94	0.94
Adj. Flow (vph)	872	1154	378	28	200	306	654	149
RTOR Reduction (vph)	0	0	5	0	0	0	0	71
Lane Group Flow (vph)	654	1372	401	0	200	306	654	78
Confl. Peds. (#/hr)	5			310	310			
Heavy Vehicles (%)	4%	6%	5%	0%	7%	13%	2%	2%
Turn Type	Perm				Perm		custom	custom
Protected Phases		2	8			4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Effective Green, g (s)	59.0	59.0	39.0		39.0	39.0	59.0	59.0
Actuated g/C Ratio	0.53	0.53	0.35		0.35	0.35	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	820	1690	1153		249	1100	970	825
v/s Ratio Prot			0.12			0.10		
v/s Ratio Perm	0.42	0.43			c0.28		0.36	0.05
v/c Ratio	0.80	0.81	0.35		0.80	0.28	0.67	0.10
Uniform Delay, d1	21.6	21.9	27.1		33.0	26.3	19.4	13.2
Progression Factor	0.47	0.46	1.00		1.41	1.43	1.00	1.00
Incremental Delay, d2	7.4	4.1	0.2		8.8	0.1	3.7	0.2
Delay (s)	17.5	14.1	27.3		55.2	37.8	23.2	13.4
Level of Service	B	B	C		E	D	C	B
Approach Delay (s)		15.2	27.3			44.7		
Approach LOS		B	C			D		

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	139.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	170	145	0	230	0	1100	710	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.99			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.93			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	0.98				
Satd. Flow (prot)		2997			3336		1562	3150				
Flt Permitted		1.00			1.00		0.95	0.98				
Satd. Flow (perm)		2997			3336		1562	3150				
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Adj. Flow (vph)	0	189	161	0	256	0	1170	755	0	0	0	0
RTOR Reduction (vph)	0	89	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	261	0	0	256	0	632	1293	0	0	0	0
Confl. Peds. (#/hr)			15									
Heavy Vehicles (%)	0%	12%	7%	0%	7%	0%	4%	8%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		43.0			43.0		55.0	55.0				
Effective Green, g (s)		43.0			43.0		55.0	55.0				
Actuated g/C Ratio		0.38			0.38		0.49	0.49				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		1151			1281		767	1547				
v/s Ratio Prot		c0.09			0.08							
v/s Ratio Perm							0.40	0.41				
v/c Ratio		0.23			0.20		0.82	0.84				
Uniform Delay, d1		23.3			23.0		24.4	24.6				
Progression Factor		1.00			1.01		0.44	0.44				
Incremental Delay, d2		0.1			0.0		6.5	3.6				
Delay (s)		23.4			23.2		17.3	14.4				
Level of Service		C			C		B	B				
Approach Delay (s)		23.4			23.2			15.3			0.0	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	164.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	855	2145	150	0	0	0	0	200	25	280	40	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0						7.0		6.0	7.0	
Lane Util. Factor	0.97	0.91						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.99						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	3395	4951						3347		1750	3400	
Flt Permitted	0.95	1.00						1.00		0.44	1.00	
Satd. Flow (perm)	3395	4951						3347		819	3400	
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	919	2306	161	0	0	0	0	211	26	295	42	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	919	2460	0	0	0	0	0	229	0	295	42	0
Confl. Peds. (#/hr)	1		60	60		1	15					15
Heavy Vehicles (%)	2%	2%	3%	0%	0%	0%	0%	5%	4%	2%	5%	2%
Turn Type	Split									pm+pt		
Protected Phases	2	2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)	61.0	61.0						17.0		37.0	37.0	
Effective Green, g (s)	61.0	61.0						17.0		37.0	37.0	
Actuated g/C Ratio	0.54	0.54						0.15		0.33	0.33	
Clearance Time (s)	7.0	7.0						7.0		6.0	7.0	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	1849	2697						508		387	1123	
v/s Ratio Prot	0.27	c0.50						0.07		c0.10	0.01	
v/s Ratio Perm										c0.16		
v/c Ratio	0.50	0.91						0.45		0.76	0.04	
Uniform Delay, d1	15.9	23.1						43.2		30.9	25.4	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.0	6.0						0.6		8.6	0.0	
Delay (s)	16.9	29.1						43.9		39.5	25.4	
Level of Service	B	C						D		D	C	
Approach Delay (s)		25.8			0.0			43.9			37.8	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	148.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBR	WBR2	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Volume (vph)	260	2150	40	25	1815	135	25	10	110	460	145	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Lane Util. Factor	0.97	0.91		1.00	*0.91		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.97		1.00	0.89		1.00	1.00	0.82
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.86	1.00		0.96	1.00	1.00
Frt	1.00	1.00		1.00	1.00		1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3429	5010		1653	4869		1483	1450		1673	1756	1277
Flt Permitted	0.95	1.00		0.95	1.00		0.66	1.00		0.57	1.00	1.00
Satd. Flow (perm)	3429	5010		1653	4869		1030	1450		1004	1756	1277
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	280	2312	43	26	1911	142	26	11	116	484	153	32
RTOR Reduction (vph)	0	2	0	0	7	0	0	88	0	0	0	19
Lane Group Flow (vph)	280	2353	0	26	2046	0	26	39	0	484	153	13
Confl. Peds. (#/hr)	5		25	25		5	135		85	85		135
Heavy Vehicles (%)	1%	2%	0%	8%	2%	5%	4%	0%	0%	2%	7%	3%
Turn Type	Prot			Prot	custom		Perm			pm+pt		Perm
Protected Phases	5	2		1				8		7	4	
Permitted Phases					6		8			4		4
Actuated Green, G (s)	9.4	42.4		3.6	36.6		27.0	27.0		46.0	46.0	46.0
Effective Green, g (s)	9.4	42.4		3.6	36.6		27.0	27.0		46.0	46.0	46.0
Actuated g/C Ratio	0.08	0.38		0.03	0.33		0.24	0.24		0.41	0.41	0.41
Clearance Time (s)	6.0	6.0		6.0	6.0		8.0	8.0		5.0	8.0	8.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	288	1897		53	1591		248	350		496	721	524
v/s Ratio Prot	c0.08	c0.47		0.02				0.03		c0.12	0.09	
v/s Ratio Perm					0.42		0.03			c0.28		0.01
v/c Ratio	0.97	1.24		0.49	1.29		0.10	0.11		0.98	0.21	0.03
Uniform Delay, d1	51.2	34.8		53.3	37.7		33.1	33.1		31.2	21.3	19.6
Progression Factor	0.85	0.61		0.71	0.35		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	28.3	110.3		1.8	129.9		0.2	0.1		33.9	0.1	0.0
Delay (s)	71.7	131.5		39.6	143.1		33.3	33.3		65.1	21.5	19.7
Level of Service	E	F		D	F		C	C		E	C	B
Approach Delay (s)		125.2						33.3			52.9	
Approach LOS		F						C			D	

Intersection Summary			
HCM Average Control Delay	120.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	101.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL2	EBT	EBR	NBL	NBT	NBR2	SBL	SBT	SBR	SWR	SWR2
Lane Configurations											
Volume (vph)	85	1080	75	80	135	60	140	60	75	1820	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	1.00		0.76	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.90		0.96	
Flpb, ped/bikes	1.00	1.00		0.85	1.00		0.98	1.00		1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.92		1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		1.00	
Satd. Flow (prot)	1750	3424		1523	1724		1668	1375		4023	
Flt Permitted	0.95	1.00		0.67	1.00		0.56	1.00		1.00	
Satd. Flow (perm)	1750	3424		1069	1724		992	1375		4023	
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
Adj. Flow (vph)	89	1137	79	84	142	63	147	63	79	1916	132
RTOR Reduction (vph)	0	4	0	0	14	0	0	40	0	6	0
Lane Group Flow (vph)	89	1212	0	84	191	0	147	102	0	2042	0
Confl. Peds. (#/hr)	20		15	170		25	25		170		20
Heavy Vehicles (%)	2%	3%	3%	0%	4%	0%	5%	5%	18%	2%	5%
Turn Type	Prot			Perm			Perm			custom	
Protected Phases	5	2			8			4			
Permitted Phases				8			4			6	
Actuated Green, G (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Effective Green, g (s)	7.0	67.0		32.0	32.0		32.0	32.0		54.0	
Actuated g/C Ratio	0.06	0.60		0.29	0.29		0.29	0.29		0.48	
Clearance Time (s)	6.0	6.0		7.0	7.0		7.0	7.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	109	2048		305	493		283	393		1940	
v/s Ratio Prot	0.05	c0.35			0.11			0.07			
v/s Ratio Perm				0.08			c0.15			c0.51	
v/c Ratio	0.82	0.59		0.28	0.39		0.52	0.26		1.05	
Uniform Delay, d1	51.9	14.0		31.0	32.1		33.6	30.9		29.0	
Progression Factor	0.60	1.89		1.00	1.00		1.00	1.00		0.28	
Incremental Delay, d2	4.4	0.1		0.5	0.5		1.6	0.4		25.3	
Delay (s)	35.3	26.5		31.5	32.6		35.2	31.2		33.4	
Level of Service	D	C		C	C		D	C		C	
Approach Delay (s)		27.1			32.3			33.2			
Approach LOS		C			C			C			

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	113.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL2	WBL	WBT	WBR	NBL2	NBT	SBT	SBR2
Lane Configurations								
Volume (vph)	50	1870	655	85	160	620	585	790
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0		6.0	8.0	8.0	
Lane Util. Factor		0.94	0.95		1.00	1.00	0.95	
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	
Flpb, ped/bikes		0.89	1.00		1.00	1.00	1.00	
Frt		1.00	0.98		1.00	1.00	0.91	
Flt Protected		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		4399	3385		1750	1807	3150	
Flt Permitted		0.95	1.00		0.09	1.00	1.00	
Satd. Flow (perm)		4399	3385		164	1807	3150	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.95	0.95	0.95	0.95
Adj. Flow (vph)	54	2011	704	91	168	653	616	832
RTOR Reduction (vph)	0	0	9	0	0	0	132	0
Lane Group Flow (vph)	0	2065	786	0	168	653	1316	0
Confl. Peds. (#/hr)	45							
Heavy Vehicles (%)	13%	1%	4%	1%	2%	4%	3%	4%
Turn Type	Perm	Split			pm+pt			
Protected Phases		6	6		3	8	4	
Permitted Phases	6				8			
Actuated Green, G (s)		49.0	49.0		49.0	49.0	39.0	
Effective Green, g (s)		49.0	49.0		49.0	49.0	39.0	
Actuated g/C Ratio		0.44	0.44		0.44	0.44	0.35	
Clearance Time (s)		6.0	6.0		6.0	8.0	8.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		1925	1481		128	791	1097	
v/s Ratio Prot			0.23		0.05	c0.36	0.42	
v/s Ratio Perm		0.47			c0.53			
v/c Ratio		1.07	0.53		1.31	0.83	1.23dr	
Uniform Delay, d1		31.5	23.1		32.0	27.7	36.5	
Progression Factor		0.28	0.22		2.84	1.61	1.00	
Incremental Delay, d2		37.5	0.5		161.9	3.1	98.7	
Delay (s)		46.2	5.6		252.7	47.8	135.2	
Level of Service		D	A		F	D	F	
Approach Delay (s)			34.9			89.7	135.2	
Approach LOS			C			F	F	

Intersection Summary			
HCM Average Control Delay	72.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	103.6%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	100	2220	150	115	525	0	0	345	455
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		7.0	7.0			7.0	7.0
Lane Util. Factor					0.86		1.00	0.95			1.00	0.88
Frpb, ped/bikes					0.99		1.00	1.00			1.00	1.00
Flpb, ped/bikes					1.00		0.78	1.00			1.00	1.00
Frt					0.99		1.00	1.00			1.00	0.85
Flt Protected					1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)					6100		1374	3336			1773	2729
Flt Permitted					1.00		0.38	1.00			1.00	1.00
Satd. Flow (perm)					6100		543	3336			1773	2729
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	108	2387	161	121	553	0	0	363	479
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	373
Lane Group Flow (vph)	0	0	0	0	2649	0	121	553	0	0	363	106
Confl. Peds. (#/hr)				30		135	1370		445			1370
Heavy Vehicles (%)	0%	0%	0%	4%	3%	5%	1%	7%	0%	0%	6%	3%
Turn Type				Perm			Perm					custom
Protected Phases					6			8			4	3
Permitted Phases				6			8					
Actuated Green, G (s)					49.0		49.0	49.0			24.0	18.0
Effective Green, g (s)					49.0		49.0	49.0			24.0	18.0
Actuated g/C Ratio					0.44		0.44	0.44			0.21	0.16
Clearance Time (s)					7.0		7.0	7.0			7.0	7.0
Vehicle Extension (s)					3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					2669		238	1460			380	439
v/s Ratio Prot								0.17			c0.20	0.04
v/s Ratio Perm					0.43		c0.22					
v/c Ratio					0.99		0.51	0.38			0.96	0.24
Uniform Delay, d1					31.3		22.8	21.2			43.5	41.0
Progression Factor					0.56		0.69	0.66			1.00	1.00
Incremental Delay, d2					9.2		0.8	0.1			34.4	1.3
Delay (s)					26.6		16.4	14.2			77.8	42.4
Level of Service					C		B	B			E	D
Approach Delay (s)		0.0			26.6			14.6			57.7	
Approach LOS		A			C			B			E	

Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.1%	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												
Volume (vph)	0	0	0	110	1925	100	170	705	0	0	175	390
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					7.0		4.0	7.0			7.0	
Lane Util. Factor					0.91		1.00	0.95			0.95	
Frpb, ped/bikes					0.99		1.00	1.00			0.74	
Flpb, ped/bikes					0.99		0.98	1.00			1.00	
Frt					0.99		1.00	1.00			0.90	
Flt Protected					1.00		0.95	1.00			1.00	
Satd. Flow (prot)					4915		1674	3433			2205	
Flt Permitted					1.00		0.25	1.00			1.00	
Satd. Flow (perm)					4915		445	3433			2205	
Peak-hour factor, PHF	0.95	0.95	0.95	0.93	0.93	0.93	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	118	2070	108	179	742	0	0	184	411
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	18	0
Lane Group Flow (vph)	0	0	0	0	2292	0	179	742	0	0	577	0
Confl. Peds. (#/hr)	90		65	65		90	490		290	290		490
Heavy Vehicles (%)	0%	0%	0%	0%	2%	7%	4%	4%	0%	0%	11%	5%
Turn Type				Perm			pm+pt					
Protected Phases					6		3	8			4	
Permitted Phases				6			8					
Actuated Green, G (s)					56.4		41.6	41.6			30.6	
Effective Green, g (s)					56.4		41.6	41.6			30.6	
Actuated g/C Ratio					0.50		0.37	0.37			0.27	
Clearance Time (s)					7.0		4.0	7.0			7.0	
Vehicle Extension (s)					3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)					2475		242	1275			602	
v/s Ratio Prot							c0.05	0.22			c0.26	
v/s Ratio Perm					0.47		0.23					
v/c Ratio					0.93		0.74	0.58			1.25dr	
Uniform Delay, d1					25.9		28.0	28.2			40.1	
Progression Factor					1.00		0.82	0.86			1.00	
Incremental Delay, d2					7.4		8.3	0.5			26.3	
Delay (s)					33.3		31.3	24.9			66.4	
Level of Service					C		C	C			E	
Approach Delay (s)		0.0			33.3			26.1			66.4	
Approach LOS		A			C			C			E	

Intersection Summary			
HCM Average Control Delay	36.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	138.9%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1265	40	0	0	0	0	795	0	470	165	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5
Total Lost time (s)		6.0						8.0		4.0	8.0	
Lane Util. Factor		0.91						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	1.00	
Flt Protected		1.00						1.00		0.95	1.00	
Satd. Flow (prot)		4903						3471		1716	1756	
Flt Permitted		1.00						1.00		0.12	1.00	
Satd. Flow (perm)		4903						3471		216	1756	
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)	0	1332	42	0	0	0	0	837	0	495	174	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1371	0	0	0	0	0	837	0	495	174	0
Confl. Peds. (#/hr)	35		15	15		35	835		55	55		835
Heavy Vehicles (%)	0%	4%	5%	0%	0%	0%	0%	4%	4%	4%	7%	0%
Turn Type										pm+pt		
Protected Phases		2						8		7	4	
Permitted Phases										4		
Actuated Green, G (s)		35.5						29.5		62.5	62.5	
Effective Green, g (s)		35.5						29.5		62.5	62.5	
Actuated g/C Ratio		0.32						0.26		0.56	0.56	
Clearance Time (s)		6.0						8.0		4.0	8.0	
Vehicle Extension (s)		3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)		1554						914		509	980	
v/s Ratio Prot		c0.28						0.24		c0.25	0.10	
v/s Ratio Perm										c0.29		
v/c Ratio		0.88						0.92		0.97	0.18	
Uniform Delay, d1		36.3						40.0		32.1	12.1	
Progression Factor		0.47						1.00		1.46	0.29	
Incremental Delay, d2		6.4						13.5		6.9	0.0	
Delay (s)		23.5						53.6		53.6	3.6	
Level of Service		C						D		D	A	
Approach Delay (s)		23.5			0.0			53.6			40.6	
Approach LOS		C			A			D			D	

Intersection Summary			
HCM Average Control Delay	36.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	NBT	NBR	SBL	SBT	NER	NER2
Lane Configurations								
Volume (vph)	870	1215	400	75	295	140	660	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Lane Util. Factor	0.91	0.91	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95		1.00	1.00	1.00	0.76
Flpb, ped/bikes	0.98	1.00	1.00		0.98	1.00	1.00	1.00
Frt	1.00	1.00	0.98		1.00	1.00	0.85	0.85
Flt Protected	0.95	0.99	1.00		0.95	1.00	1.00	1.00
Satd. Flow (prot)	1548	3289	3007		1688	3275	1536	1177
Flt Permitted	0.95	0.99	1.00		0.20	1.00	1.00	1.00
Satd. Flow (perm)	1548	3289	3007		355	3275	1536	1177
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	916	1279	421	79	311	147	695	21
RTOR Reduction (vph)	0	0	14	0	0	0	0	10
Lane Group Flow (vph)	714	1481	486	0	311	147	695	11
Confl. Peds. (#/hr)	10			290	290			125
Heavy Vehicles (%)	3%	3%	10%	7%	4%	9%	4%	3%
Turn Type	Perm				pm+pt		custom	custom
Protected Phases		2	8		7	4		
Permitted Phases	2				4		2	2
Actuated Green, G (s)	59.2	59.2	19.8		38.8	38.8	59.2	59.2
Effective Green, g (s)	59.2	59.2	19.8		38.8	38.8	59.2	59.2
Actuated g/C Ratio	0.53	0.53	0.18		0.35	0.35	0.53	0.53
Clearance Time (s)	7.0	7.0	7.0		6.0	7.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	818	1738	532		278	1135	812	622
v/s Ratio Prot			0.16		c0.13	0.04		
v/s Ratio Perm	c0.46	0.45			c0.26		0.45	0.01
v/c Ratio	0.87	0.85	0.91		1.12	0.13	0.86	0.02
Uniform Delay, d1	23.1	22.6	45.3		31.6	25.0	22.7	12.6
Progression Factor	0.54	0.54	1.00		1.25	1.13	1.00	1.00
Incremental Delay, d2	8.4	3.6	20.2		67.7	0.0	11.2	0.1
Delay (s)	20.9	15.9	65.4		107.1	28.4	34.0	12.6
Level of Service	C	B	E		F	C	C	B
Approach Delay (s)		17.5	65.4			81.8		
Approach LOS		B	E			F		

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	134.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	110	255	0	275	0	750	1415	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		7.0			7.0		7.0	7.0				
Lane Util. Factor		0.95			0.95		0.91	0.91				
Frpb, ped/bikes		0.93			1.00		1.00	1.00				
Flpb, ped/bikes		1.00			1.00		1.00	1.00				
Frt		0.90			1.00		1.00	1.00				
Flt Protected		1.00			1.00		0.95	1.00				
Satd. Flow (prot)		2835			3570		1547	3249				
Flt Permitted		1.00			1.00		0.95	1.00				
Satd. Flow (perm)		2835			3570		1547	3249				
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)	0	116	268	0	289	0	789	1489	0	0	0	0
RTOR Reduction (vph)	0	38	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	346	0	0	289	0	710	1568	0	0	0	0
Confl. Peds. (#/hr)	90		65	65		90						
Heavy Vehicles (%)	0%	6%	5%	0%	0%	0%	5%	5%	0%	0%	0%	0%
Turn Type							Perm					
Protected Phases		8			4			2				
Permitted Phases							2					
Actuated Green, G (s)		26.0			26.0		72.0	72.0				
Effective Green, g (s)		26.0			26.0		72.0	72.0				
Actuated g/C Ratio		0.23			0.23		0.64	0.64				
Clearance Time (s)		7.0			7.0		7.0	7.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		658			829		995	2089				
v/s Ratio Prot		c0.12			0.08							
v/s Ratio Perm							0.46	0.48				
v/c Ratio		0.53			0.35		0.71	0.75				
Uniform Delay, d1		37.6			35.9		13.2	13.8				
Progression Factor		1.00			0.94		0.28	0.27				
Incremental Delay, d2		0.8			0.1		1.9	1.1				
Delay (s)		38.4			33.7		5.5	4.9				
Level of Service		D			C		A	A				
Approach Delay (s)		38.4			33.7			5.1			0.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	138.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Appendix D

Transit Analysis - VISSIM Modelling

D1 Technical Assumptions Memo

MEMO

TO:	TTC
PREPARED BY:	MRC / ARUP
DATE:	May 7, 2008
SUBJECT:	Queens Quay Transit in the Middle VISSIM Assumptions

---

The assumptions and parameters stated below are identical to the transit in the south side options.

Transit

Acceleration Rates (Streetcar)
Max = $1.8 m/s^2$
Desired = $1.4 m/s^2$

Deceleration Rates (Streetcar)
Max = $-2.6 m/s^2$
Desired = $-1.6 m/s^2$

- Acceleration and Deceleration rates are for all speeds

Speed Profile (Streetcar)
48-53km/h (linear curve)

Transit Stop Data
Boarding Time = 0.5s / passenger (assuming 4 doors proof of payment)
Alighting Time = 0.5s / passenger (assuming 4 doors)
Door Cycle Time = 5s
Skipping is possible at all stops

Dummy Stops

- A dwell time of 45s with standard deviation of 30s
- Dummy stops occur at the beginning of streetcar lines to provide a randomness entering the system
- Skipping is possible at dummy stops

Streetcar Length = 28m

Queens Quay west transit inputs are provided by Jim Sinikas from TTC on April 15, 2008 (see tables below). The occupancy rate (persons per vehicle) is calculated by the initial onboard number divided by the number of street cars.

Queens Quay West – Spadina Route (turns north on Spadina)

Eastbound - 10 minute headway (6 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				387
Spadina	27	44	11.4%	351
Rees	123	5	1.4%	383
Simcoe	122	5	1.3%	415
York	135	31	7.5%	425
Bay	406*	31	7.3%	

*Transit riders will board the first arriving streetcar

Westbound - 10 minute headway (6 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				802
Bay	40	71	8.9%	771
York	20	17	2.2%	774
Simcoe	20	17	2.2%	777
Rees	14	22	2.8%	769
Spadina	47	24	3.1%	792

Queens Quay West – Waterfront West Route (continues west through Spadina)

Eastbound - 4 minute headway (15 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				902
Spadina	27	102	11.3%	819
Rees	123	11	1.3%	894
Simcoe	122	11	1.2%	968
York	135	72	7.4%	990
Bay	406*	72	7.3%	

*Transit riders will board the first arriving streetcar

Westbound - 4 minute headway (15 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				1870
Bay	93	165	8.8%	1798
York	46	41	2.3%	1803
Simcoe	46	41	2.3%	1808
Rees	31	50	2.8%	1879
Spadina	109	56	3.0%	1842

East Bay Front – Waterfront East Route

Eastbound - 1 minute 43 second headways (35 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				3128
Bay	105	808	25.8%	2425
Freeland	45	679	28.0%	1791
Jarvis	3	170	9.5%	1624
Sherbourne	34	376	23.2%	1282
Small	46	90	7.0%	1238
Trinity	9	12	1.0%	1235
Cherry	11	23	1.9%	

Westbound -1 minute 43 second headways (35 streetcars per hour)

	Ons	Offs	Offs as % of load	Onboard
				3010
Cherry	405	18	0.6%	3397
Trinity	43	10	0.3%	3430
Small	354	35	1.0%	3749
Sherbourne	311	26	0.7%	4034
Jarvis	309	36	0.9%	4307
Freeland	217	41	1.0%	4483
Bay	406*	417	9.3%	

Signal Phasing

NEMA files attached and built in the models do not reflect the proposed signal phasing plan. Signal phasing plan is provide in hard copy in a separate file.

Signal head and stop sign locations reflect proposed configuration of the project area.

Traffic

Car and Truck Speed Profile = 50 – 60 km/h
Car length = 4.11 to 4.76m (default)
Truck length = 10.2m (default)

Left turn reduced speed area = 25km/h (car)
= 20km/h (truck)
Right turn reduced speed area = 15km/h (car)
= 12km/h (truck)

Truck percentage is assumed to be 5% for the entire model.

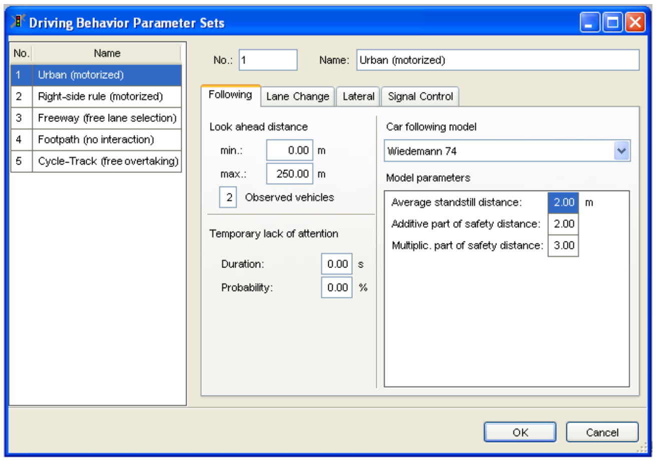
Balanced traffic volumes provided by BA Group and Arup

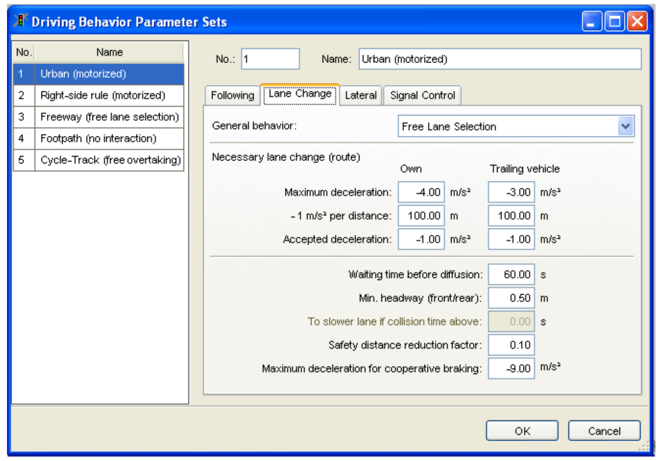
Signal timings provided by BA Group and Arup

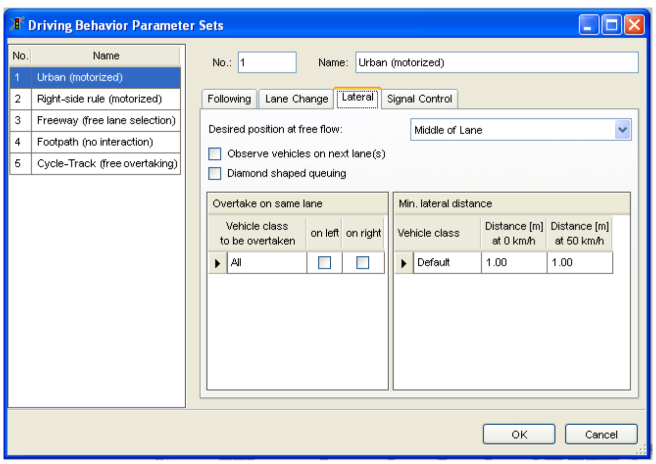
Travel Time Measurement Setup

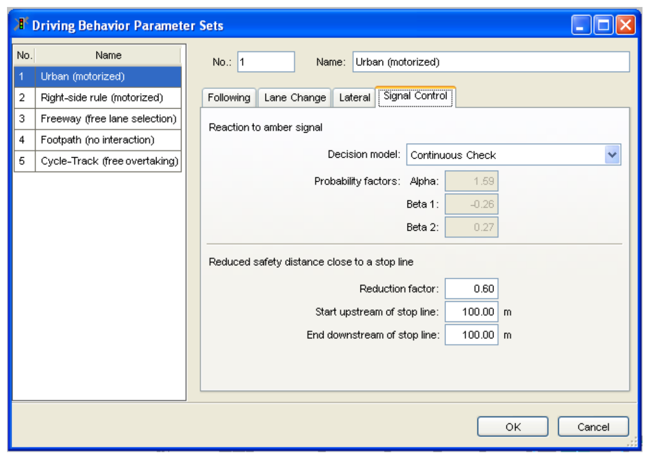
Travel time measurements have been setup from intersection to intersection, station to station stop, and full length for the four transit lines (see attached travel time segments.xls for exact locations).

Settings
Driving Behaviour (Default)



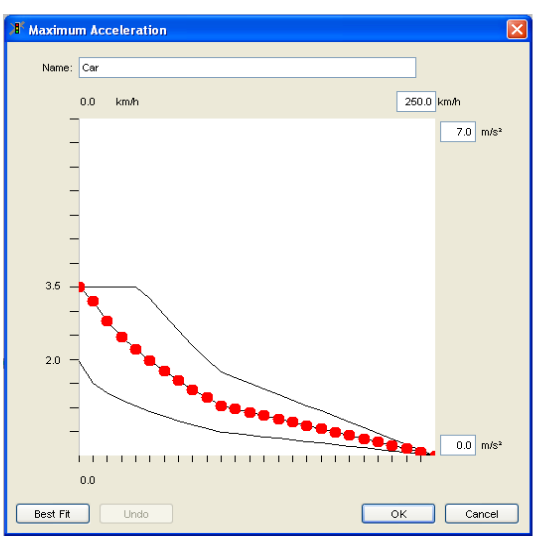




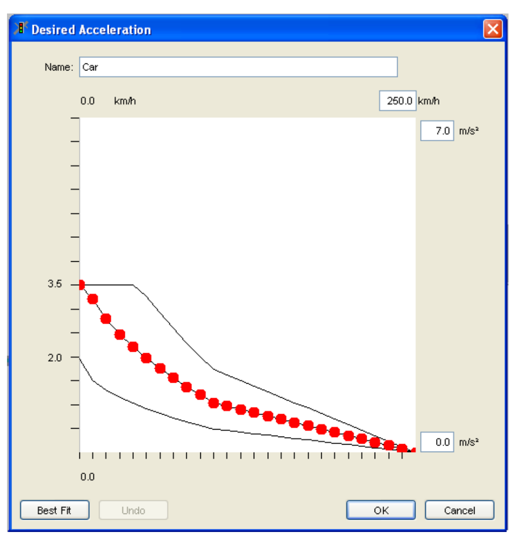


Car Acceleration Rates (Default)

Maximum Acceleration

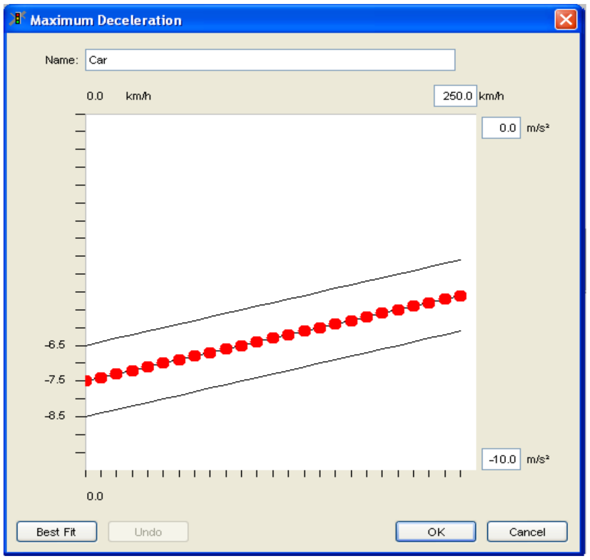


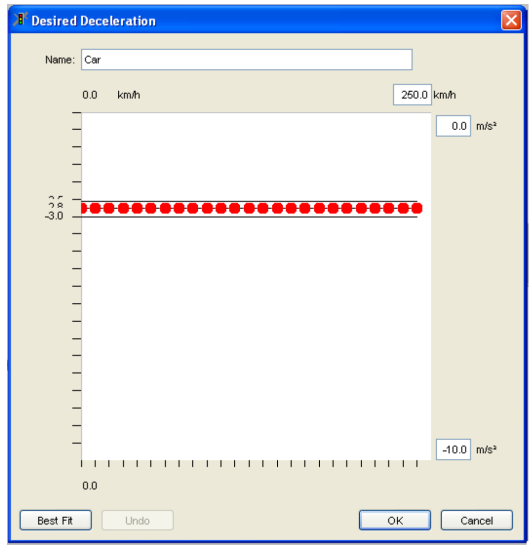
Desired Acceleration



Maximum Deceleration

Desired Deceleration

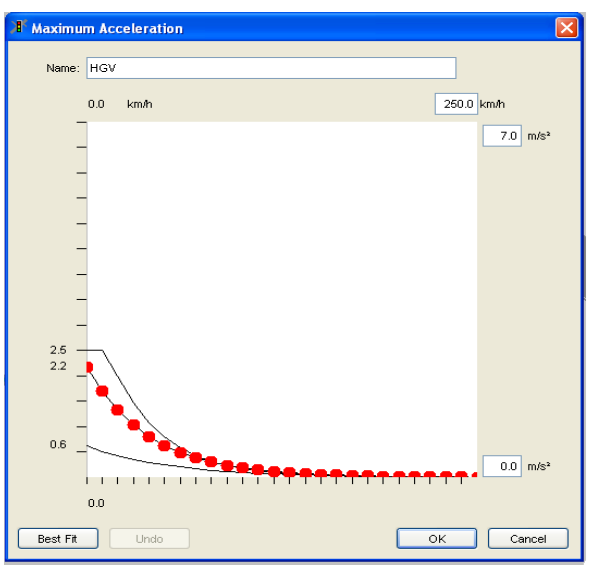


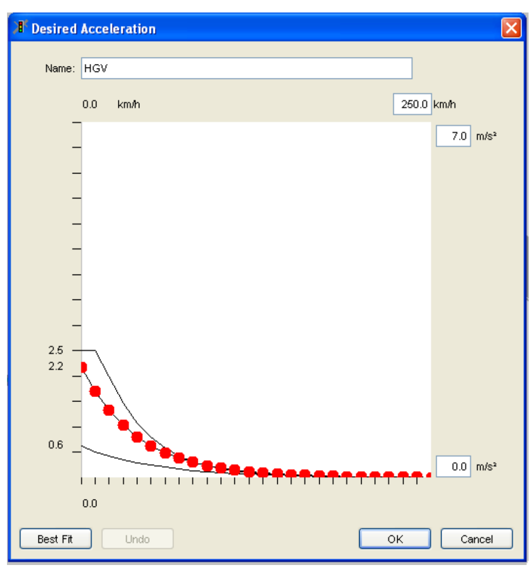


HGV Acceleration Rates (Default)

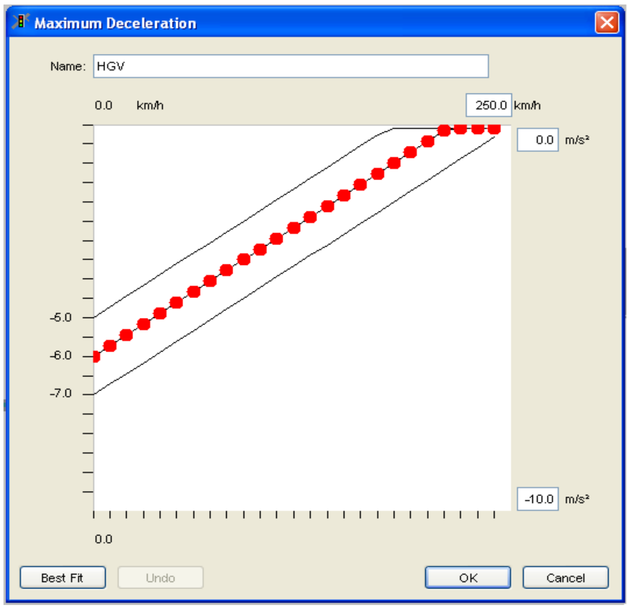
Maximum Acceleration

Desired Acceleration

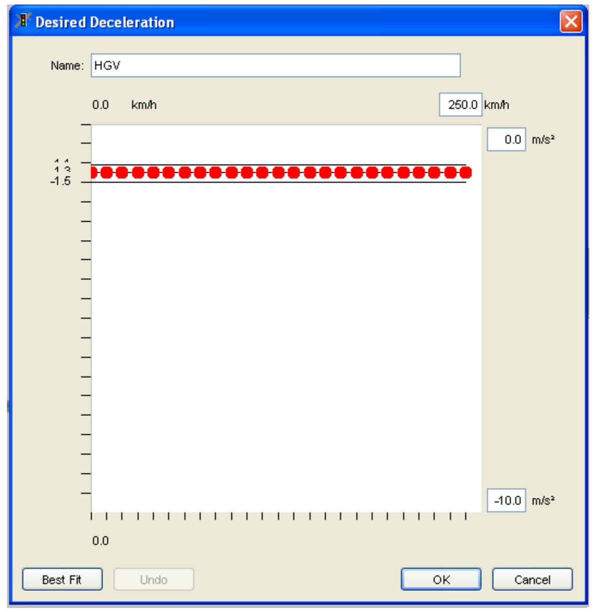




Maximum Deceleration



Desired Deceleration



D2 Transit Signal Priority Analysis

Transit Signal Priority Analysis
Queens Quay Corridor

Toronto, ON

Prepared by:

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May 15, 2008

traffic mobility logistics.

Document Control Information

Short title	TSP Analysis Results – Queens Quay Corridor
Client:	Prime Consultant – McCormick Rankin Corporation
Contractor:	PTV America, Inc. (subconsultant to McCormick Rankin Corporation)
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Reviewed by:	Jim Dale, PE
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Author:	Thomas Bauer, PE, PTOE
Created on:	5/15/2008
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Table of Contents

1 Introduction

Transit signal priority (TSP) is designed to provide a preferential treatment to light rail trains at signalized intersections. If properly designed, TSP can expedite the passage of trains through signalized intersections, thereby reducing delays and travel times. Consequently, TSP has the potential to increase delays for other roadway users such as pedestrians and automobile traffic. And, in some cases, TSP can increase signal delays for trains travelling in the opposite direction. These benefits and impacts will vary from one signal to another according to track alignment, transit frequency, station location, levels of congestion, signal timing plans, TSP logic and a number of other factors that influence TSP performance. In summary, every location is different. Therefore, it is essential to analyze TSP in order to understand its benefits as well as impacts.

This report documents the analysis of TSP along Queens Quay between Spadina Avenue and Cherry Street. The analysis is conducted in the PM-peak hour using the VISSIM multi-modal microscopic simulation software. VISSIM has been used extensively throughout the world to assess the benefits and impacts of TSP under a variety of transportation conditions.

The following sections provide the context for which TSP was analyzed along Queens Quay. Critical to understanding the results of any TSP analysis is the explanation of how TSP is coded in the analysis. A section is devoted to discussing the LRT signal control strategy implemented in the VISSIM simulation models. Next, descriptions of the two geometric scenarios are provided. The performance measures analyzed in this study and the corresponding results are then presented. The final section presents the study conclusions.

2 LRT Signal Control Strategy

2.1 Control Strategy Recommendation

Recommendations for the proposed signal control strategy for the Queens Quay corridor are based on three control objectives represented below in order of importance:

1. Minimize LRT travel time
2. Maximize pedestrian crossing opportunities
3. Preserve vehicular access to Queens Quay area

Based on their experience working on over 30 LRT projects in North America, PTV considered the application of three potential LRT control strategies. Each strategy is described as follows:

- Full signal priority without fixed background signal cycle — this strategy was dismissed because of the combination of short blocks, very high train frequency and short cycle lengths with LRT-opposing phases only being served their minimum times. Full priority without a background cycle is especially unsuited for high train frequencies as arranging the phase sequence for one train almost certainly results in blocking the oncoming train.

- Full signal preemption without fixed background signal cycle — this strategy was dismissed because of the very high train frequency. The highly disruptive nature of this LRT control strategy would result in numerous skipped phases which in turn would significantly diminish vehicular access and pedestrian service.

- Partial signal priority with fixed background signal cycle optimized for LRT progression — this strategy was selected and is described in detail below.

2.2 Proposed LRT Signal Control Philosophy

The proposed LRT signal control strategy for the Queens Quay corridor is based on a fixed background signal cycle. The recommended background cycle time is defined by the LRT headway and thus different for the East (103 seconds) and West (120 seconds) sides of the corridor. Signal offsets are determined based on the expected LRT progression including LRT operating speed, service acceleration and deceleration as well as anticipated dwell times at each LRT station. However, excessive auto traffic queuing as observed during the initial simulation runs resulted in a compromise between LRT and auto traffic signal progression for the final recommended signal coordination plan. Figures 1 through 4 on the following pages depict the proposed background signal timing plans.

The background signal timing plan ensures the light rail vehicles progress through the entire corridor without major signal delay if their station dwell times are as planned. Realistically, dwell times will vary from one train to the next and thus the LRT signal control system needs to be flexible enough to deal with those dwell time variations. However, any cycle modification for one train has to ensure that it does not come at the expense of another, possibly oncoming train. Furthermore, a special signal control treatment is only recommended for trains with longer than anticipated dwell times. Trains with shorter dwell times will simply have to wait the time between actual dwell and anticipated dwell so that they can take advantage of the progression green band to the next station. This is also important for maintaining regular train headways and thus avoiding train bunching. Therefore, only extending the LRT green by up to10 seconds is recommended as the LRT priority treatment for extraordinary long dwell times. However, as all LRT-conflicting phases are only served to their minimum times, any LRT green extension in one cycle results in shortening the potential LRT green window in the following cycle.

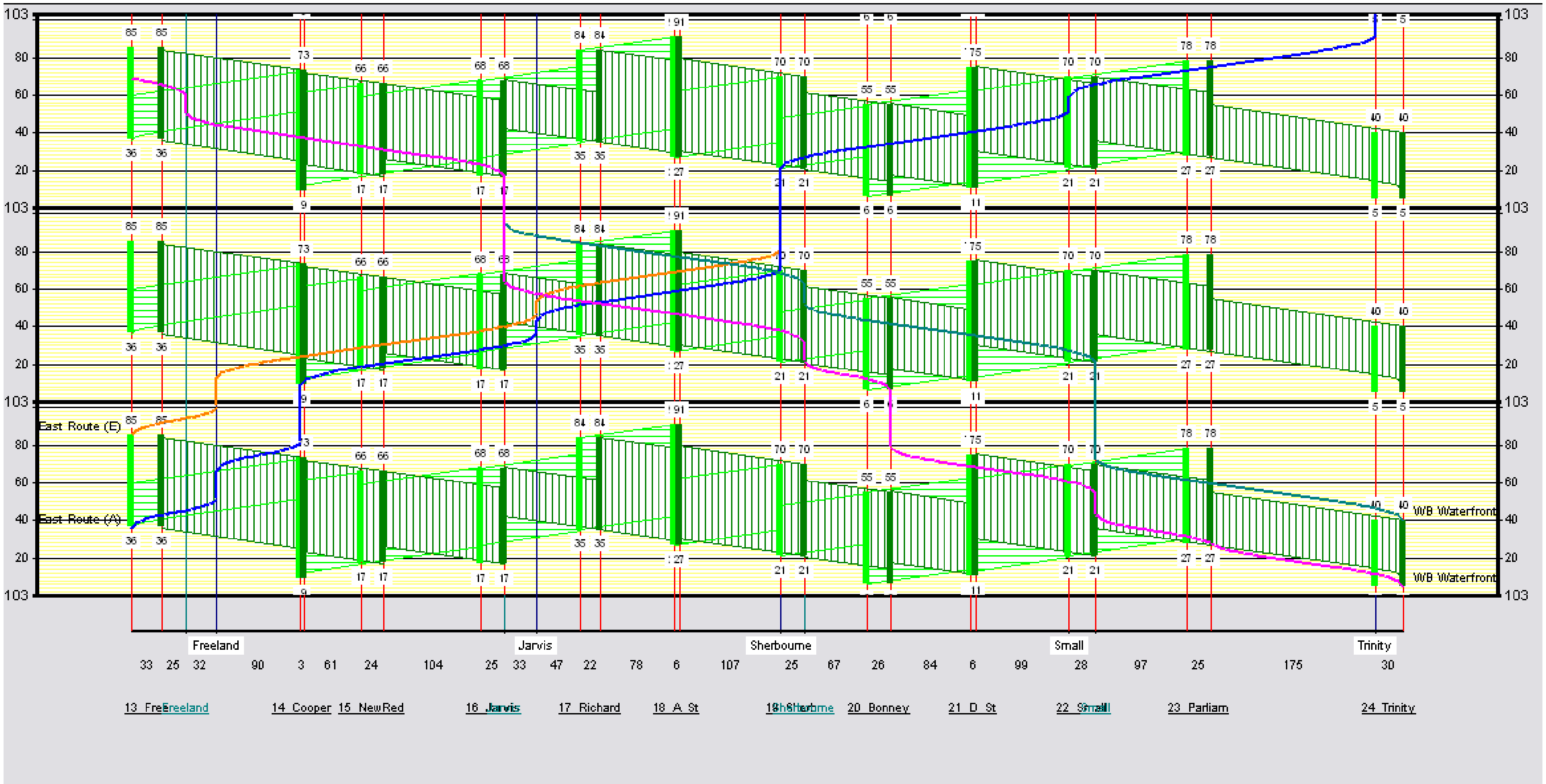

Figure 1: LRT Time-Space Diagram for Background Signal Timing Plan for East Section (Queens Quay Portals Scenario)[1]

[1] Cycle length 103 seconds; eastbound LRT in blue and orange; westbound LRT in purple and green; eastbound LRT green band in light green; westbound LRT green band in dark green; mid-block LRT stations vertical blue lines

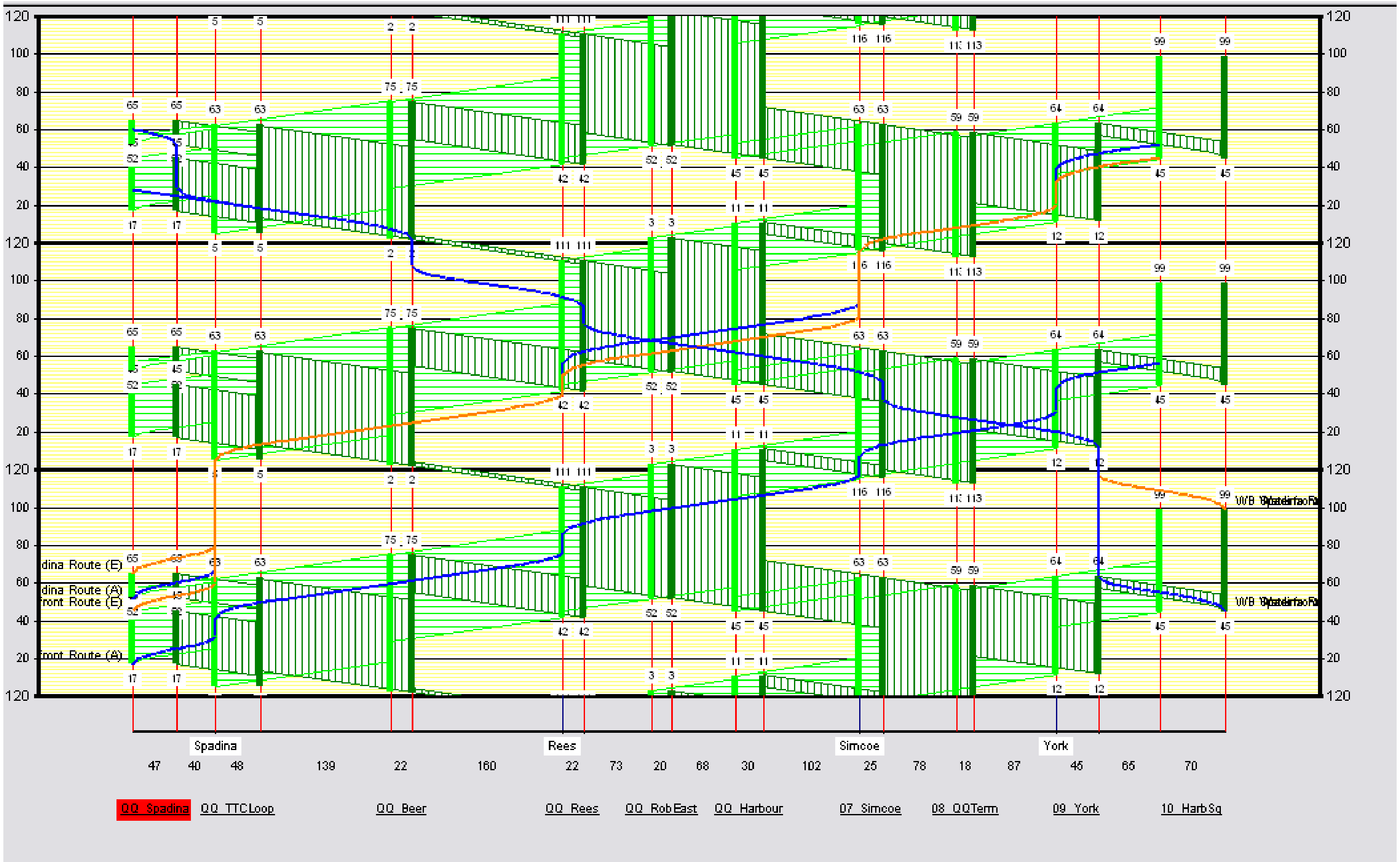

Figure 2: LRT Time-Space Diagram for Background Signal Timing Plan for West Section (Queens Quay Portals Scenario)[2]

[2] Cycle length 120 seconds; eastbound LRT in blue; westbound LRT in orange and blue; eastbound LRT green band in light green; westbound LRT green band in dark green; mid-block LRT stations vertical blue lines

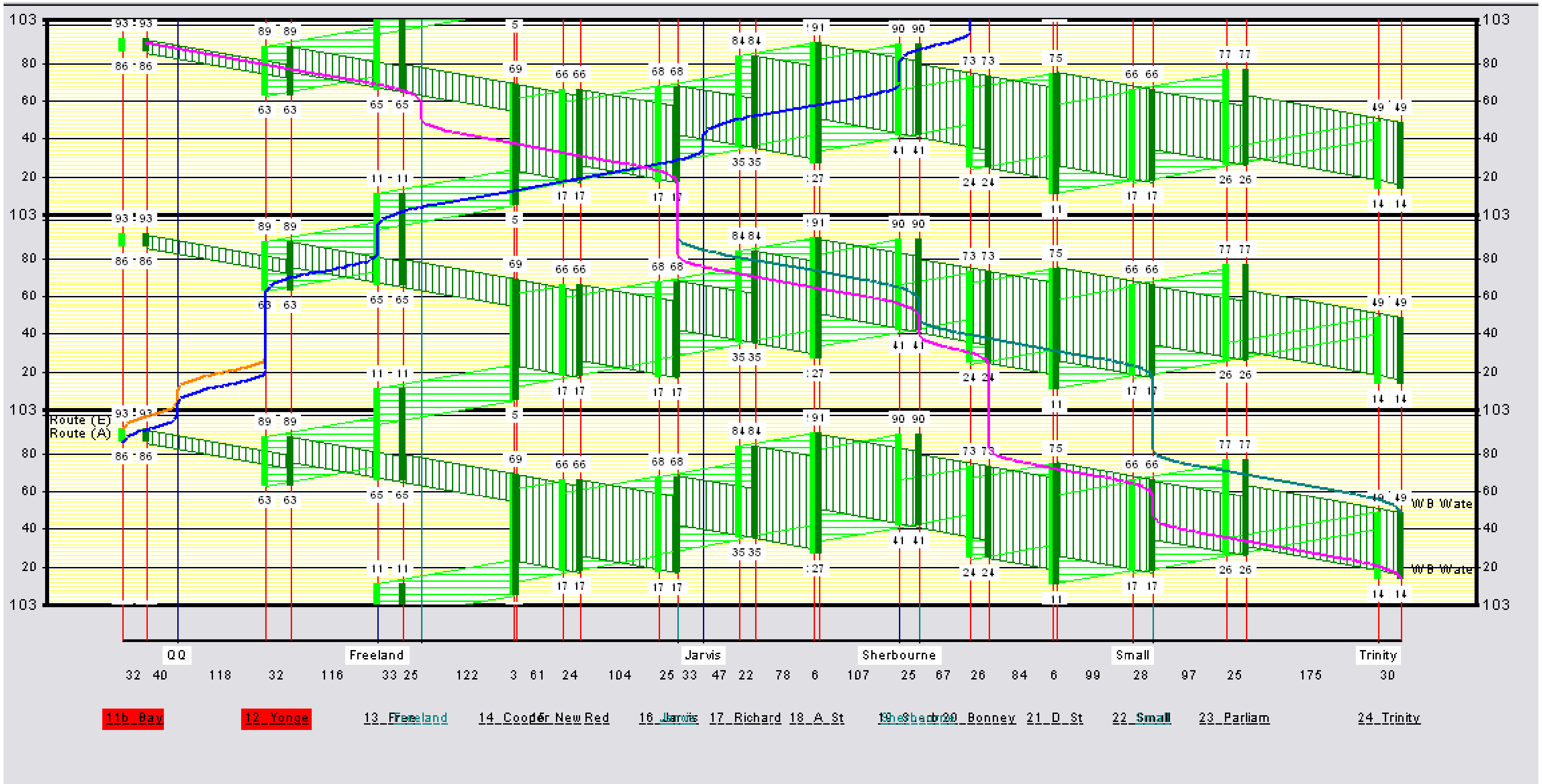

Figure 3: LRT Time-Space Diagram for Background Signal Timing Plan for East Section (Bay Street Portal Scenario)[3]

[3] Cycle length 103 seconds; eastbound LRT in blue and orange; westbound LRT in purple and green; eastbound LRT green band in light green; westbound LRT green band in dark green; mid-block LRT stations vertical blue lines

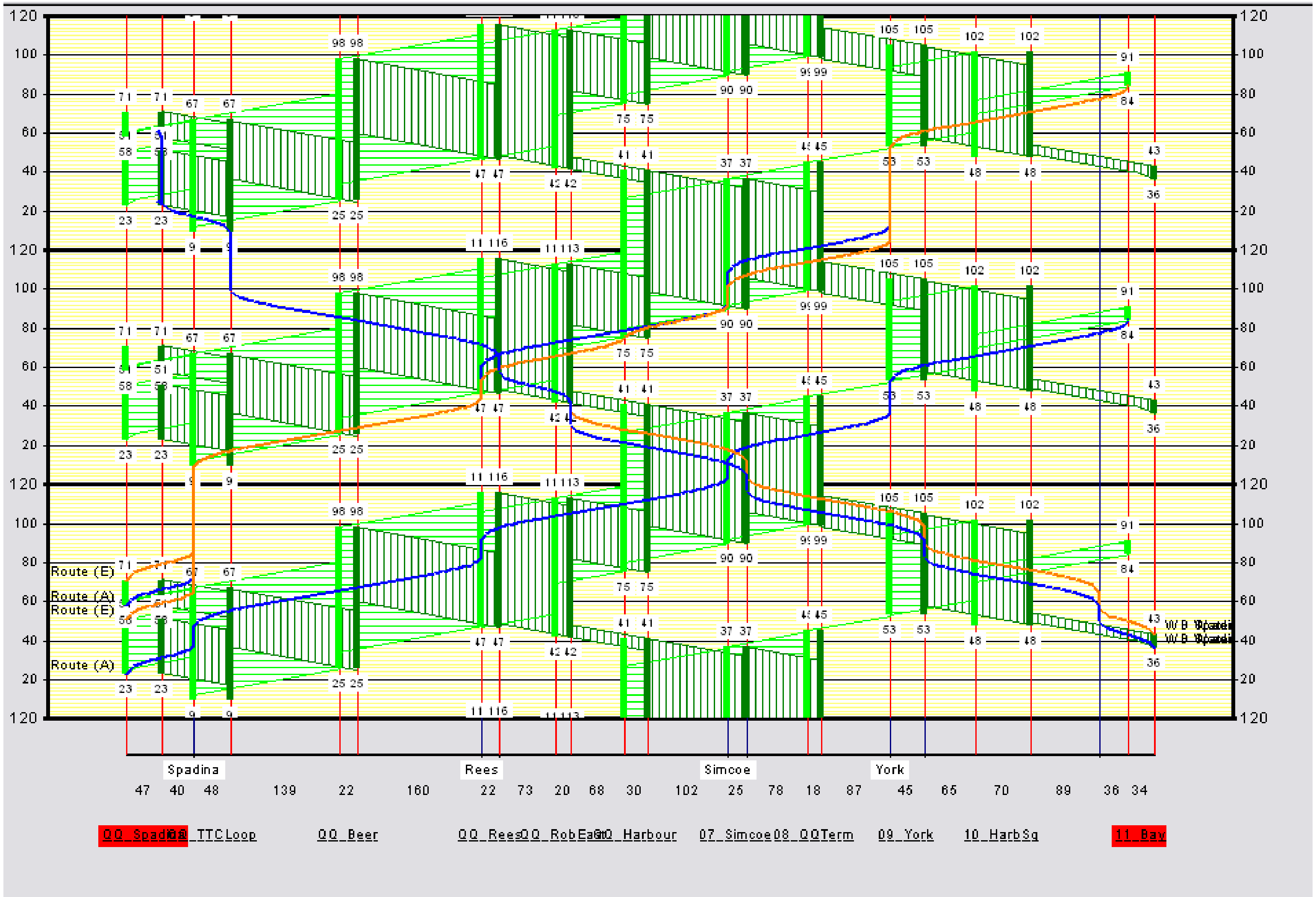

Figure 4: LRT Time-Space Diagram for Background Signal Timing Plan for West Section (Bay Street Portal Scenario)[4]

[4] Cycle length 120 seconds; eastbound LRT in blue; westbound LRT in orange and blue; eastbound LRT green band in light green; westbound LRT green band in dark green; mid-block LRT stations vertical blue lines

3 Analysis Scenarios

The following scenarios were analyzed and modeled in VISSIM for the PM-peak hour using the timing plans from above:

- Scenario 1. Queens Quay Portals
- Scenario 2. Bay Street Portal

3.1 Scenario 1 – Queens Quay Portals

Scenario 1 incorporates at-grade, side-running LRT tracks to the south of Queens Quay. Access to the new LRT tracks is provided by extending the Bay Street tunnel under the intersection of Queens Quay at Bay Street with tunnel portals to the north and south of the Bay Street intersection. The underground LRT junction under the Bay Street intersection is simulated with the switch area protected by LRT signal control.

3.2 Scenario 2 – Bay Street Portal

Scenario 2 incorporates the same side-running LRT alignment as Scenario 1, but does not feature the Bay Street intersection grade separation. LRT tracks exit the Bay Street tunnel just north of the Bay Street at Harbour Street intersection. The LRT switch area is protected by the traffic signal at Bay Street and Queens Quay.

The VISSIM microscopic simulation for Scenario 2 shows that the proposed at-grade LRT junction does not provide enough train capacity for the proposed train schedule and thus long back-ups for southbound trains were observed during the simulation (see Figure 5 below). As a result, all reported LRT and auto traffic measures of effectiveness for this scenario have to be interpreted with that upstream junction bottleneck in mind and thus all output interpretation is focused on the Queens Quay Portals scenario.

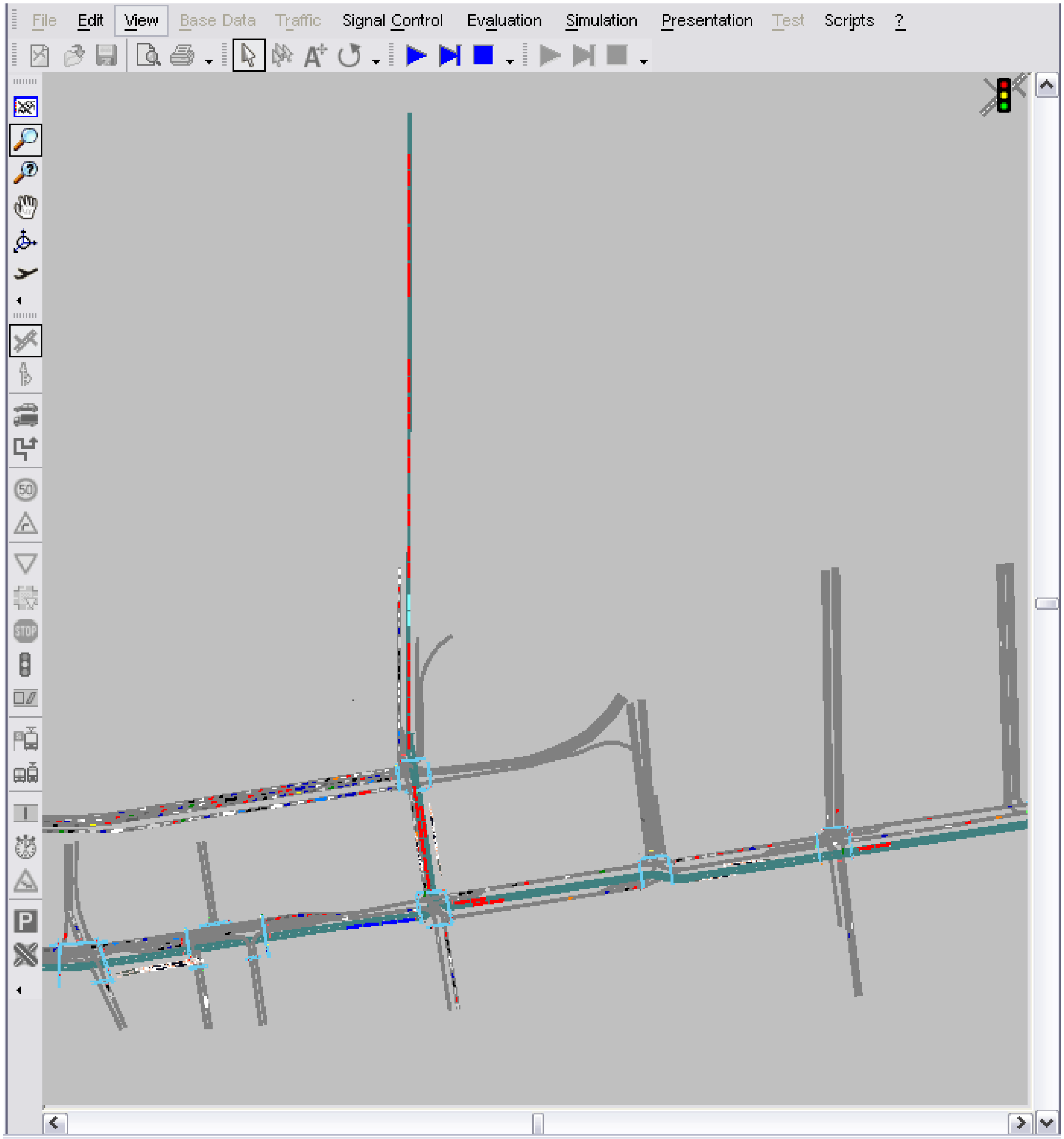

Figure 5: Southbound train back-up at Bay Street/Queens Quay intersection for Bay Street Portal scenario

4 Evaluation Approach

Three primary measures of effectiveness (MOEs) were selected to evaluate the benefits and impacts of LRT signal priority along Queens Quay. The following MOEs for the simulation time period from 900 seconds to 4500 seconds are reported for each scenario and averaged over 10 VISSIM runs with different random seeds (seed numbers 60 through 69).

1. LRT Travel Time and Speed
2. LRT Delay
3. Traffic Intersection Movement Delay

LRT Travel Time and Speed is measured by computing the mean, minimum, maximum and standard deviation in LRT travel times. Travel times are reported in the eastbound and westbound directions for each intersection as well as for larger analysis sections. Travel time results are converted into speed for the longer analysis sections.

LRT Delay is intended to assess the impact of signal control on LRT operations. The mean, minimum, maximum and standard deviation in LRT intersection delay values are reported.

Traffic Intersection Movement Delay describes the expected service quality of signalized intersections for general purpose auto traffic. The primary purpose of this MOE is to report any locations where expected traffic delays exceed the acceptably minimum service levels. Mean, minimum and maximum traffic movement delay values are reported.

The above MOEs are presented in the next two sections. Section 5 describes the analysis results for transit operations, while Section 6 describes the analysis results for automobile traffic. All numeric VISSIM simulation output can be found in the appendices.

5 Transit Results

5.1 LRT Travel Time and Speed

The VISSIM simulation analysis shows that the proposed LRT signal control strategy results in relatively low LRT travel times for both analysis scenarios. LRT speeds range between 13.4 and 17.5 km/h for the Queens Quay (QQ) Portals scenario and 9.0 and 20.3 km/h for the Bay Street Portal scenario.

The comparison of segment speeds between the two scenarios shows the impacts of train bunching and the assumed one-block train separation rule on LRT travel time and speeds. As mentioned above, the Bay Street Portal scenario does not provide adequate LRT crossing capacity at the intersection of Bay Street at Queens Quay. Therefore, this intersection effectively meters LRT flow in southbound direction into the study area (the same is of course true for trains leaving the study area in the northbound direction). Six of the eight travel time sections listed below include this capacity constraint and thus show higher travel time (lower speeds) for the Bay Street Portal scenario (refer to Table 1 below). However, travel time segments #10000 (Cherry stop to QQ Portal) and #10001 (QQ Portal to Cherry stop) do not include the Bay Street bottleneck. Even though both scenarios maintain the exact same geometry and signal control for these two travel time segments, the travel time and speed results are better for the Bay Street Portal scenario than the Queens Quay Portals scenario. The only difference between both scenarios in this segment is the higher number of trains served for the Queens Quay Portals scenario (13% higher for segment #10000 and 27% higher for segment #10001). This is a clear indication of the impact of train bunching on LRT travel speeds along Queens Quay.

Table 1: Average LRT Travel Time and Speed for Main Corridor Segments

Segment	*QQ Portals*		*Bay Street Portal*	
Cherry stop to QQ Portal (west of Freeland)	354.6 sec	16.8 km/h	349.9 sec	17.0 km/h
QQ Portal (west of Freeland) to Cherry stop	358.5 sec	16.6 km/h	293.5 sec	20.3 km/h
Cherry to north of Harbour	434.8 sec	13.7 km/h	544.1 sec	10.9 km/h
North of Harbour to Cherry	444.6 sec	13.4 km/h	660.5 sec	9.0 km/h
West of Spadina and QQ to north of Harbour	340.1 sec	17.5 km/h	546.5 sec	10.9 km/h
North of Harbour to west of Spadina and QQ	366.1 sec	16.2 km/h	421.5 sec	14.1 km/h
North of Spadina and QQ to north of Harbour	404.3 sec	14.7 km/h	470.2 sec	12.6 km/h
North of Harbour to north of Spadina and QQ	352.9 sec	16.9 km/h	563.0 sec	10.6 km/h

In addition to average speed and travel time, travel time variation is very important for the LRT operator. This measure of effectiveness provides a good indicator of expected schedule reliability. Using Scenario 1 (Queens Quay Portals) as the evaluation basis, travel time standard deviation for the main corridor travel time segments ranges from 9.0 to 23.7 seconds. This is well below the planned train headway and thus in an acceptable range. Figure 6 below shows travel time histograms of observed travel times along the two corridor segments.

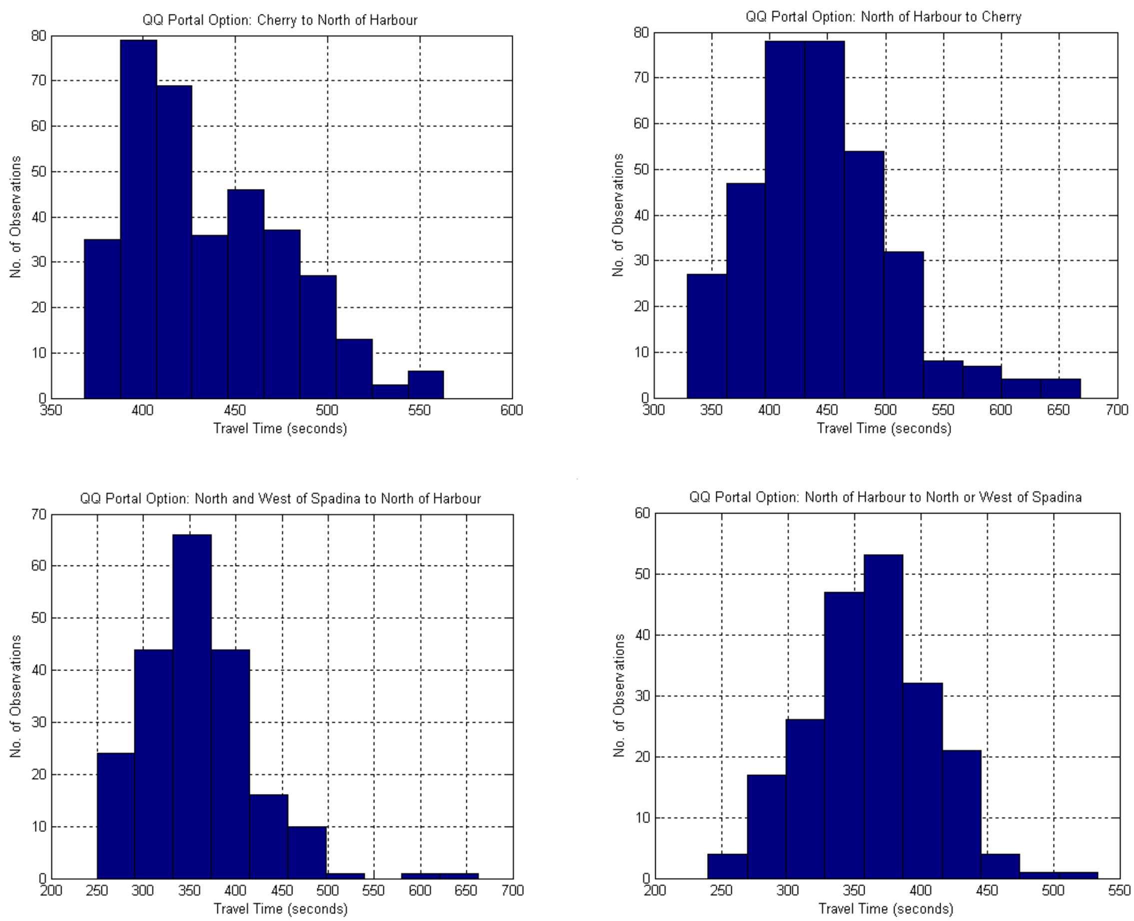

Figure 6: Observation-based LRT travel time histograms for Queens Quay Portals scenario

5.2 LRT Delay

In addition to train bunching, LRT signal delay is a primary contributor to LRT corridor travel time and thus the objective of the proposed LRT signal control strategy is to minimize LRT signal delay. The simulation analysis results in an average LRT signal delay of 21.5 seconds for the Queens Quay Portals scenario.

Traffic signal offset coordination fully optimized for LRT progression proved to result in unacceptable automobile traffic queuing and congestion. Therefore, the initial offset progression plans were adjusted to maintain reasonable traffic operation. As a result, certain intersections cause longer LRT signal delays as trains have to wait for the next progression band. However, the proposed signal offset plans are designed to place these designated signal waiting locations at nearside stops to avoid an additional LRT stop and thus minimize the impact on LRT ride comfort. The Sherborne station nearside of the intersection of Queens Quay at Sherborne in the eastbound direction is a good example for such a designated signal waiting location. VISSIM reports an average LRT signal delay at that intersection of 41.6 seconds, double the overall LRT signal delay.

6 Traffic Results

6.1 Traffic Intersection Movement Delay

The VISSIM microscopic simulation models result in an average intersection movement delay of 27 seconds for the Queens Quay Portals scenario. This result indicates reasonably good automobile traffic operations. The following three intersections are the worst performing intersections from an traffic delay perspective:

- Queens Quay at Spadina Avenue
- Queens Quay at Bay Street
- Bay Street at Harbour Street

7 Conclusion

The transit signal priority analysis for the Queens Quay corridor reveals that the recommended LRT signal control strategy for this corridor consists of a train progression optimized fixed-time signal timing plan combined with LRT green extension capability.

Analyzing the proposed LRT signal control strategy with VISSIM results in the following conclusions:

- The Bay Street Portal scenario is not feasible because of severe LRT crossing capacity constraints at the Bay Street/Queens Quay intersection.
- LRT operating speeds are expected to fall in a range between 13.4 km/h and 17.5 km/h.

- LRT travel time standard deviation is expected to be in an acceptable range from 9.0 to 23.7 seconds, well below the planned train headway and thus good for schedule reliability.

- An assumed one-block train separation rule to avoid train bunching results in LRT operating speed reduction.

- Compromises in the favorable LRT progression signal offsets due to excessive automobile traffic queuing result in increased LRT delay at specific intersections where trains are expected to fall out of the signal progression band. The signal timing plan is designed to have this occur preferably at nearside stops to avoid additional LRT stops.

- There are no severe traffic hotspots along Queens Quay.

Appendix A

VISSIM Simulation Output Data for Queens Quay Portals Scenario

Intersection Delay			Length	No. of	Travel Time				Delay				Speed (km/h)		
Inbound Eastbound (Spadina to Union)			(m)	Vehicles	Average	Std. Dev.	Max.	Min.	Average	St. Dev	Max	Min	Average	Min	Max
Travel Time Segment	From Exit of	To Exit of													
4001	Lower Spadina	Rees		21	103.2	4.1	108.5	95.3	44.2	3.7	49.3	37.0			
4003	Rees	Lower Simroe		21	53.6	0.8	55.0	52.7	19.6	0.9	21.4	18.8			
4003	Lower Simroe	York		21	67.2	5.5	79.8	60.0	36.5	5.2	48.6	29.8			
4004	York	Bay		20	54.2	3.4	59.7	49.5	22.1	3.5	28.0	17.3			
Inbound Westbound (Cherry to Union)															
Travel Time Segment	From Exit of	To Exit of													
212	Bay	Harbour		55.5	38.8	0.3	39.3	38.4	14.2	0.2	14.7	14.0			
201	Yonge	Bay		35	30.5	1.1	32.7	28.9	9.1	1.1	11.2	7.7			
202	Freeland	Yonge		35	10.9	0.1	11.0	10.8	0.4	0.0	0.4	0.3			
203	Redpath/New Cooper	Freeland		34	52.8	2.4	55.7	49.7	27.0	2.5	30.0	23.8			
204	Jarvis	Redpath/New Cooper		35	19.1	0.9	20.1	17.2	9.7	0.9	10.7	7.7			
205	Richardson	Jarvis		35	39.6	1.3	41.3	37.3	22.2	1.1	23.4	20.0			
206	Sherborne	Richardson		35	22.8	1.8	25.4	20.1	7.7	1.9	10.4	4.8			
207	Bonnycastle	Sherborne		35	32.4	1.4	35.4	30.9	15.7	1.4	18.7	14.3			
208	Small	Bonnycastle		35	42.2	3.5	47.7	38.1	27.0	3.5	32.5	22.7			
209	Parliament	Small		35	40.6	1.4	42.5	38.9	21.3	1.3	23.3	19.8			
210	Trinity	Parliament		35	28.7	2.7	35.0	26.0	14.4	2.7	20.6	11.5			
211	Cherry	Trinity		35	74.9	2.9	80.3	71.5	37.4	3.0	42.7	34.1			
Outbound Westbound (Union to Spadina)															
Travel Time Segment	From Exit of	To Exit of													
3004	Rees	Lower Spadina		15	58.5	6.8	71.9	47.3	25.8	6.8	39.3	14.6			
3003	Lower Simroe	Rees		21	67.7	5.5	79.7	62.5	37.3	5.6	49.4	32.1			
3002	York	Lower Simroe		21	51.5	2.9	57.7	48.0	29.2	2.9	35.2	25.8			
3001	Bay	York		21	89.8	7.9	102.4	78.2	46.1	8.0	59.1	34.1			
Outbound Eastbound (Union to Cherry)															
Travel Time Segment	From Exit of	To Exit of													
112	Union	Harbour		56	30.2	0.5	31.3	29.7	2.7	0.6	4.0	2.1			
101	Harbour	Bay		34.5	55.4	1.1	57.2	54.1	20.4	1.0	21.9	18.9			
102	Bay	Yonge		34.5	15.5	0.1	15.6	15.4	0.1	0.0	0.1	0.1			
103	Yonge	Freeland		35	36.3	5.3	47.2	26.5	25.8	5.3	36.8	16.0			
104	Freeland	Redpath/New Cooper		34.5	72.9	1.9	76.1	70.6	41.0	1.9	44.2	38.5			
105	Redpath/New Cooper	Jarvis		34	18.8	1.8	22.0	15.5	9.6	1.8	12.9	6.3			
106	Jarvis	Richardson		34.5	31.1	2.0	34.8	28.7	16.3	2.0	20.0	13.9			
107	Richardson	Sherborne		34.5	67.8	2.3	71.2	63.3	41.6	2.3	45.1	37.1			
108	Sherborne	Bonnycastle		34	13.5	2.5	18.1	9.8	6.9	2.5	11.5	3.2			
109	Bonnycastle	Small		33.5	42.6	2.4	45.5	37.9	20.4	2.4	23.3	15.6			
110	Small	Parliament		34	22.8	12.7	49.6	10.4	14.0	12.8	40.9	1.6			
111	Parliament	Trinity		34.5	37.5	5.4	43.5	28.9	22.0	5.4	28.0	13.1			
Delay Between Stops															
Inbound Eastbound (Spadina to Union)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
2002	Spadina	Rees		21	44.2	3.0	48.1	39.1	20.2	3.1	23.9	15.0			
2003	Rees	Simcoe		21	28.1	1.0	29.6	26.4	8.1	1.0	9.6	6.5			
2004	Simcoe	York		21	19.5	1.0	22.1	18.7	7.3	1.0	9.8	6.5			
2005	York	Spadina		20	62.2	3.4	67.7	57.5	26.2	3.5	32.0	21.4			
Inbound Westbound (Chrerry to Union)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
401	Bay	Union		56	32.5	0.1	32.6	32.4	4.6	0.1	4.7	4.5			
402	Freeland	Bay		35	54.1	1.7	57.2	51.3	16.7	1.7	19.7	13.6			
403	Jarvis	Freeland		35	52.3	2.2	54.5	47.9	30.6	2.3	32.8	26.0			
404	Sherborne	Jarvis		35	32.8	2.1	36.7	29.9	12.8	2.1	16.7	9.8			

405	Small	Sherborne		35	52.0	3.5	57.5	47.8	32.3	3.6	37.9	28.0			
406	Trinity	Small		35	40.2	2.6	46.3	37.5	19.4	2.6	25.4	16.5			
407	Cherry	Trinity		35	21.4	0.3	21.8	21.0	6.8	0.3	7.3	6.4			
Outbound Westbound (Union to Spadina)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
1005	Rees	West of Spadina and Queens Quay		15	63.4	6.8	76.9	52.2	28.9	6.8	42.5	17.7			
1004	Rees	North of Spadina and Queens Quay		6	95.0	5.2	100.5	82.1	51.2	5.2	56.8	38.7			
1003	Simcoe	Rees		21	46.0	4.0	54.9	41.5	25.7	4.1	34.7	21.1			
1002	York	Simcoe		21	29.0	3.6	32.3	21.5	22.7	6.4	30.8	14.4			
1001	Bay	York		21	53.0	6.4	61.0	44.4	22.7	6.4	30.8	14.4			
Outbound Eastbound (Union to Cherry)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
301	Union	Bay		56	30.8	0.5	32.0	30.3	2.9	0.6	4.3	2.3			
302	Bay	Freeland		35	73.5	5.2	83.9	64.4	33.8	5.2	44.3	24.5			
303	Freeland	Jarvis		34	61.5	1.9	64.6	57.9	39.9	2.0	43.1	36.2			
304	Jarvis	Sherborne		34.5	26.5	2.7	30.2	22.5	10.7	2.7	14.4	6.5			
305	Sherborne	Small		34	57.2	3.3	63.8	51.7	37.2	3.3	43.9	31.7			
306	Small	Trinity		34	43.7	12.4	66.7	28.5	22.8	12.5	45.9	7.6			
307	Trinity	Cherry		34.5	23.5	0.5	24.2	22.8	4.6	0.4	5.2	4.0			
Full Length															
Travel Time Segment	From	To													
10000	Before Cherry Stop	QQ Portal (west of Freeland)	1652.2	35	354.6	9.0	368.6	340.2	182.5	9.4	197.3	167.8	16.8	16.1	17.5
10001	QQ Portal (west of Freeland)	Before Cherry Stop	1649.1	34	358.5	22.8	383.8	324.6	197.6	23.1	223.9	162.7	16.6	15.5	18.3
10010	Cherry	North of Harbour	2091.6	35	434.8	9.6	450.3	419.6	205.8	10.1	222.2	189.7	13.7	13.2	14.2
10011	North of Harbour	Cherry	2093.3	34	444.6	23.7	473.6	409.1	222.6	24.1	252.6	186.0	13.4	12.6	14.5
20000	West of Spadina and Queens Quay	North of Harbour	1508.8	15	340.1	13.4	369.2	323.3	172.9	13.4	201.5	155.6	17.5	16.1	18.4
20001	North of Harbour	West of Spadina and Queens Quay	1516.3	14	366.1	11.4	383.7	353.2	189.1	11.6	206.7	175.3	16.2	15.5	16.8
20010	North of Spadina and Queens Quay	North of Harbour	1470.8	6	404.3	23.4	446.3	377.6	186.1	21.0	224.9	160.8	14.7	13.3	15.8
20011	North of Harbour	North of Spadina and Queens Quay	1459.2	6	352.9	14.6	389.0	335.8	174.8	14.3	209.8	159.3	16.9	15.3	17.7

Queens Quay Portals

Node	Intersection	Average Delay in Seconds											
		Eastbound			Westbound			Southbound			Northbound		
Node	Intersection	L	T	R	L	T	R	L	T	R	L	T	R
1	Spadina	121	99			11	3	73		4			
2	TTC Loop	70	5	0	60	9	11			107			40
3	EMS		1	0		11				39	0	0	0
4	Rees	18	22	81		5	4	48	45	51	43	36	44
5	Robertson East		15		54	9	4	29		0	0		48
6	Harbourfront/Ped		5			8				0			
7	Simcoe	13	14	83		2	3	39	35	24	43	31	41
8	QQ Terminal		4		69	7	7	9			31	0	35
9	York	12	8	80	62	9	7	40	37	6	37	35	39
10	Harbour Square	11	8	70	72	18	16	45		46	47		43
11	Bay Street	23	7	8	18	20	18	193	186	128	18	48	18
12	Yonge	20	8			13	11	81		40			
13	Freeland	17	13		59	6	4	28	28	30	40	0	5
14	Cooper		5			4	3	0		12			
15	New Redpath	15	5		71	20	0	27	0	6	32	0	30
16	Jarvis St.	26	8			12	9	25		7			
17	Richardson St	14	4	60		5	5	67	48	49	48	0	40
18	Street 'A'	11	4	4		10	7	11	15	39			
19	Sherbourne	56	14		57	12	6	47	33	16	34	31	35
20	Bonnycastle	19	10	62		20	19	28	0	16	34	0	27
21	Street 'D'		3			20							
22	Small St.	13	3		49	17	0	29	0	10	46	0	32
23	Parliament St.	19	4			19	7	27		25			
24	Trinity St.	19	17	40	47	8	6	39	0	5	28	0	34
25	Harbour	23	23	147				30	149			15	5

Appendix B

VISSIM Simulation Output Data for Bay Street Portal Scenario

Intersection Delay															
			Length	No. of	Average Travel Time				Average Delay				Speed (km/h)		
Inbound Eastbound (Spadina to Union)			(m)	Vehicles	Mean	Std. Dev.	Max.	Min.	Average	St. Dev	Max	Min	Average	Min	Max
Travel Time Segment	From Exit of	To Exit of													
4001	Lower Spadina	Rees		20	97.6	4.0	102.7	91.6	32.0	4.1	38.5	26.4			
4003	Rees	Lower Simroe		21	62.4	3.9	67.3	56.0	23.3	4.5	29.5	15.9			
4003	Lower Simroe	York		20	51.6	3.4	57.2	47.1	17.2	3.0	22.4	13.5			
4004	York	Bay		21	93.7	12.1	113.1	75.4	60.0	12.0	78.1	40.6			
Inbound Westbound (Cherry to Union)															
Travel Time Segment	From Exit of	To Exit of													
212	Bay	Harbour		55	48.3	0.7	49.2	47.3	23.4	0.8	24.5	22.0			
201	Yonge	Bay		34	140.7	22.3	176.3	111.8	120.2	24.3	154.1	89.5			
202	Freeland	Yonge		35	20.2	3.0	24.1	13.5	7.0	3.1	10.8	0.0			
203	Redpath/New Cooper	Freeland		34	44.2	2.5	47.5	38.9	14.2	2.5	17.8	8.8			
204	Jarvis	Redpath/New Cooper		35	15.2	1.5	17.2	12.8	3.3	1.7	5.4	0.1			
205	Richardson	Jarvis		35	48.6	1.8	52.1	45.7	29.5	2.1	34.0	26.4			
206	Sherborne	Richardson		34	24.3	2.3	27.5	20.2	5.4	2.5	8.6	0.1			
207	Bonnycastle	Sherborne		35	27.0	0.4	27.5	26.2	8.6	0.1	8.6	8.3			
208	Small	Bonnycastle		35	52.8	1.7	56.2	50.1	33.6	1.7	37.1	31.0			
209	Parliament	Small		34	37.4	1.2	40.0	35.8	15.9	1.1	18.3	14.7			
210	Trinity	Parliament		35	30.0	3.4	35.7	25.0	12.0	3.6	17.8	6.1			
211	Cherry	Trinity		34	68.2	2.3	71.5	64.2	24.9	2.5	28.2	20.2			
Outbound Westbound (Union to Spadina)															
Travel Time Segment	From Exit of	To Exit of													
3004	Rees	Lower Spadina		12	71.8	2.1	76.0	68.7	30.9	2.2	35.3	27.9			
3003	Lower Simroe	Rees		17	73.9	3.7	78.0	64.8	37.9	2.9	41.4	31.4			
3002	York	Lower Simroe		17	41.8	1.6	44.9	38.9	15.3	1.3	17.2	12.9			
3001	Bay	York		16	128.3	2.2	131.5	124.9	65.7	2.3	69.4	62.8			
Outbound Eastbound (Union to Cherry)															
Travel Time Segment	From Exit of	To Exit of													
112	Union	Harbour		41.5	490.9	47.1	544.2	396.8	441.8	59.2	509.8	336.0			
101	Harbour	Bay		27	180.2	2.6	182.5	174.1	160.7	2.6	163.1	154.5			
102	Bay	Yonge		27	78.8	0.6	79.7	77.4	43.1	0.5	43.6	41.8			
103	Yonge	Freeland		28	41.2	0.7	42.6	40.3	12.7	1.0	14.5	11.5			
104	Freeland	Redpath/New Cooper		28	24.6	0.7	25.8	23.4	4.1	0.9	5.8	2.7			
105	Redpath/New Cooper	Jarvis		28	11.6	0.1	11.7	11.5	0.2	0.0	0.2	0.1			
106	Jarvis	Richardson		27	25.1	0.1	25.2	25.1	8.4	0.0	8.5	8.4			
107	Richardson	Sherborne		28	69.2	2.3	73.7	66.3	39.2	2.4	43.7	36.2			
108	Sherborne	Bonnycastle		28	11.0	1.4	13.2	8.3	2.9	1.4	5.0	0.1			
109	Bonnycastle	Small		28	46.3	3.5	53.0	42.3	20.3	3.6	26.9	16.0			
110	Small	Parliament		28	17.9	1.5	20.4	16.6	6.9	1.5	9.4	5.6			
111	Parliament	Trinity		29	27.1	2.5	33.2	24.7	7.9	2.2	13.0	5.3			
Delay Between Stops															
Inbound Eastbound (Spadina to Union)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
2002	Spadina	Rees		21	32.6	0.9	34.0	31.8	3.0	0.9	4.3	2.2			
2003	Rees	Simcoe		21	34.1	2.4	39.1	31.2	9.8	3.9	20.0	6.3			
2004	Simcoe	York		20	18.4	0.5	19.6	17.7	3.0	0.6	4.2	2.3			
2005	York	Spadina		21	100.3	12.1	119.7	82.0	61.8	12.0	80.0	42.5			
Inbound Westbound (Cherry to Union)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
401	Bay	Union		55	50.8	0.8	51.9	49.6	16.2	0.8	17.2	14.9			
402	Freeland	Bay		33	169.2	23.4	208.3	137.1	131.2	24.8	168.6	97.4			
403	Jarvis	Freeland		35	58.8	1.3	60.8	56.0	29.3	1.3	31.4	26.5			

404	Sherborne	Jarvis		34	32.5	2.3	35.7	28.3	7.4	2.6	10.7	2.0			
405	Small	Sherborne		35	60.6	1.8	64.1	57.6	35.8	1.7	39.4	32.9			
406	Trinity	Small		35	40.1	3.3	45.5	35.0	13.9	3.5	19.4	8.2			
407	Cherry	Trinity		34.5	20.5	0.3	21.1	20.3	2.3	0.3	2.8	2.0			
Outbound Westbound (Union to Spadina)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
1005	Rees	West of Spadina and Queens Quay		15	12.0	75.9	2.1	80.1	72.8	32.6	2.2	37.1			
1004	Rees	North of Spadina and Queens Quay		5	116.6	2.6	120.9	113.1	65.8	2.1	68.5	62.9			
1003	Simcoe	Rees		17	56.1	3.6	60.2	47.5	31.2	2.9	34.9	25.0			
1002	York	Simcoe		17	25.6	1.6	28.8	23.2	9.3	2.0	13.8	6.4			
1001	Bay	York		16	25.6	1.7	29.1	22.8	9.3	2.0	13.8	6.4			
Outbound Eastbound (Union to Cherry)															
Travel Time Segment	From End of Stop	To Beginning of Stop													
301	Union	Bay		25	668.4	48.4	733.1	572.7	599.6	59.2	677.6	499.3			
302	Bay	Freeland		27	56.7	0.6	57.5	55.3	36.6	0.5	37.1	35.2			
303	Freeland	Jarvis		28	41.3	0.7	42.5	39.9	6.3	0.9	8.0	4.7			
304	Jarvis	Sherborne		28	21.6	0.0	21.6	21.5	1.8	0.0	1.8	1.8			
305	Sherborne	Small		28	60.2	2.0	64.5	58.2	35.6	2.2	39.7	33.3			
306	Small	Trinity		28	46.7	4.1	55.1	42.4	20.9	4.1	29.0	16.4			
307	Trinity	Cherry		29	24.4	0.2	24.8	24.1	0.8	0.2	1.2	0.6			
Full Length															
Travel Time Segment	From	To													
10000	Before Cherry Stop	QQ Portal (west of Freeland)	1652.2	31	349.9	9.0	365.4	338.6	147.0	10.8	163.8	127.7	17.0	16.3	17.6
10001	QQ Portal (west of Freeland)	Before Cherry Stop	1649.1	27	293.5	7.3	306.1	285.2	103.4	7.4	114.6	93.8	20.3	19.4	20.9
10010	Cherry	North of Harbour	2090.0	29.5	544.1	29.4	582.4	497.4	281.0	29.6	320.6	234.8	10.9	10.2	12.0
10011	North of Harbour	Cherry	2092.2	24	660.5	8.5	671.5	646.1	401.4	8.3	411.7	388.4	9.0	8.9	9.2
20000	West of Spadina and Queens Quay	North of Harbour	1508.0	10	546.5	6.1	552.8	538.4	348.6	9.1	357.4	329.4	10.9	10.8	11.0
20001	North of Harbour	West of Spadina and Queens Quay	1515.0	13	421.5	20.5	460.2	395.6	225.5	18.9	260.5	199.3	14.1	12.9	15.0
20010	North of Spadina and Queens Quay	North of Harbour	1469.5	5	470.2	32.2	519.1	428.7	238.9	41.5	331.2	196.0	12.6	11.5	13.9
20011	North of Harbour	North of Spadina and Queens Quay	1458.4	4	563.0	15.2	600.7	545.9	356.6	16.5	398.5	340.2	10.6	9.9	10.9

Node	Intersection	Average Delay in Seconds											
		Eastbound			Westbound			Southbound			Northbound		
		L	T	R	L	T	R	L	T	R	L	T	R
1	Spadina	136	92			11	2	161		15			
2	TTC Loop	83	5	0	51	17	25			102			45
3	EMS		3	32		7				36	0	0	0
4	Rees	18	20	72		6	5	49	62	66	44	37	55
5	Robertson East		19		49	11	5	36		0	0		51
6	Harbourfront/Ped		8			7				0			
7	Simcoe	13	16	106		6	6	49	37	23	37	42	56
8	QQ Terminal		24		51	16	15	7			0	33	45
9	York	11	27	60	67	13	8	44	36	8	42	39	45
10	Harbour Square	21	14	98	76	24	23	50		46	49		46
11	Bay Street		36	35	50	55		115	114	93	0		0
12	Yonge	24	28			48	40	129		64			
13	Freeland	36	29		103	62	52	37	38	47	94	0	9
14	Cooper		22			35	26	1094		54			
15	New Redpath	28	13		63	82	0	34	0	14	56	0	29
16	Jarvis St.	27	16			44	26	37		32			
17	Richardson St	12	12	56		43	36	171	171	161	76	0	62
18	Street 'A'	34	14	15		55	47	84	37	145			
19	Sherbourne	29	17		63	52	21	102	52	52	70	94	100
20	Bonnycastle	25	18	66		75	68	54	0	60	140	0	58
21	Street 'D'		30			95							
22	Small St.	46	30		97	116	0	76	0	110	133	0	70
23	Parliament St.	59	16			208	94	311		381			
24	Trinity St.	29	19	49	147	241	224	60	0	239	330	0	46
25	Harbour	59	61	150				186	197				

5 Transit Results

5.1 LRT Travel Time and Speed

The VISSIM simulation analysis shows that the proposed LRT signal control strategy results in relatively low LRT travel times for both analysis scenarios. LRT speeds range between 13.4 and 17.5 km/h for the Queens Quay (QQ) Portals scenario and 9.0 and 20.3 km/h for the Bay Street Portal scenario.

The comparison of segment speeds between the two scenarios shows the impacts of train bunching and the assumed one-block train separation rule on LRT travel time and speeds. As mentioned above, the Bay Street Portal scenario does not provide adequate LRT crossing capacity at the intersection of Bay Street at Queens Quay. Therefore, this intersection effectively meters LRT flow in southbound direction into the study area (the same is of course true for trains leaving the study area in the northbound direction). Six of the eight travel time sections listed below include this capacity constraint and thus show higher travel time (lower speeds) for the Bay Street Portal scenario (refer to Table 1 below). However, travel time segments #10000 (Cherry stop to QQ Portal) and #10001 (QQ Portal to Cherry stop) do not include the Bay Street bottleneck. Even though both scenarios maintain the exact same geometry and signal control for these two travel time segments, the travel time and speed results are better for the Bay Street Portal scenario than the Queens Quay Portals scenario. The only difference between both scenarios in this segment is the higher number of trains served for the Queens Quay Portals scenario (13% higher for segment #10000 and 27% higher for segment #10001). This is a clear indication of the impact of train bunching on LRT travel speeds along Queens Quay.

Table 1: Average LRT Travel Time and Speed for Main Corridor Segments

Segment	*QQ Portals*		*Bay Street Portal*	
Cherry stop to QQ Portal (west of Freeland)	354.6 sec	16.8 km/h	349.9 sec	17.0 km/h
QQ Portal (west of Freeland) to Cherry stop	358.5 sec	16.6 km/h	293.5 sec	~~20.3 km/h~~ 20.2
Cherry to north of Harbour	434.8 sec	~~13.7 km/h~~ 17.3	544.1 sec	~~10.9 km/h~~ 13.8
North of Harbour to Cherry	444.6 sec	~~13.4 km/h~~ 16.9	660.5 sec	~~9.0 km/h~~ 11.4
West of Spadina and QQ to north of Harbour	340.1 sec	~~17.5 km/h~~ 16.0	546.5 sec	~~10.9 km/h~~ 9.9
North of Harbour to west of Spadina and QQ	366.1 sec	~~16.2 km/h~~ 14.9	421.5 sec	~~14.1 km/h~~ 12.9
North of Spadina and QQ to north of Harbour	404.3 sec	~~14.7 km/h~~ 13.1	470.2 sec	~~12.6 km/h~~ 11.3
North of Harbour to north of Spadina and QQ	352.9 sec	~~16.9 km/h~~ 14.9	563.0 sec	~~10.6 km/h~~ 9.3

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Queens Quay Corridor TSP Analysis

Presentation of Results

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Agenda

- **PTV Scope of Services**
- **LRT Signal Control Strategy**
- **Evaluation**
- **Sensitivity Analysis**
- **Conclusions**

PTV Scope of Services

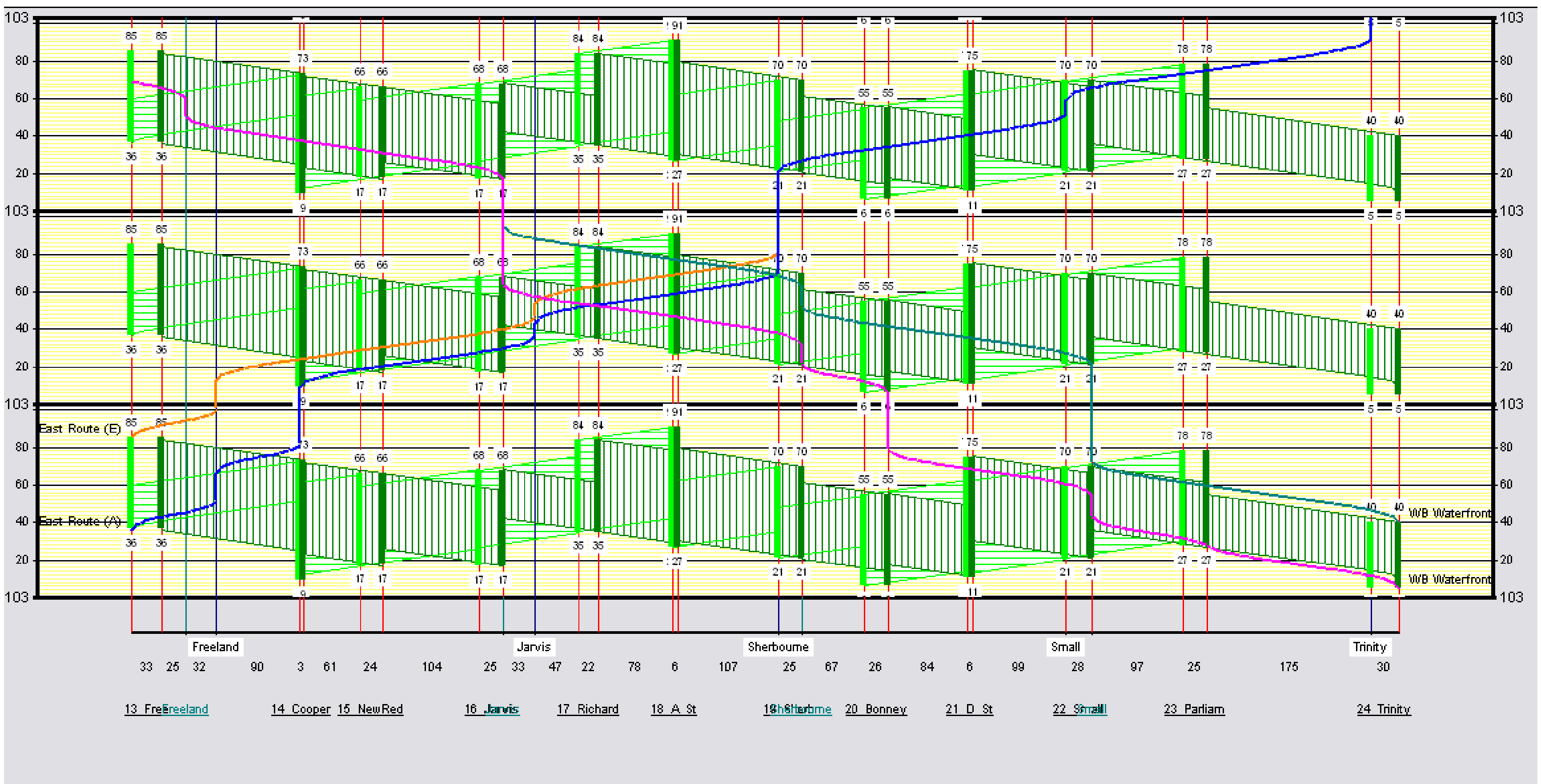
1. **Develop a signal control strategy to**
   - Minimize LRT travel time (Std. Deviation as important as Mean)
   - Maximize pedestrian crossing opportunities
   - Preserve vehicular access to Queens Quay area
2. **Implement signal control in two VISSIM models**
   - Scenario 1. Queens Quay Portals
   - Scenario 2. Bay Street Portal
3. **Perform VISSIM simulation analysis**
4. **Analyze system's sensitivity to**
   - Transit headway
   - Signal and stop density
   - Offset optimization compromise in response to traffic queuing

LRT Signal Control Strategy

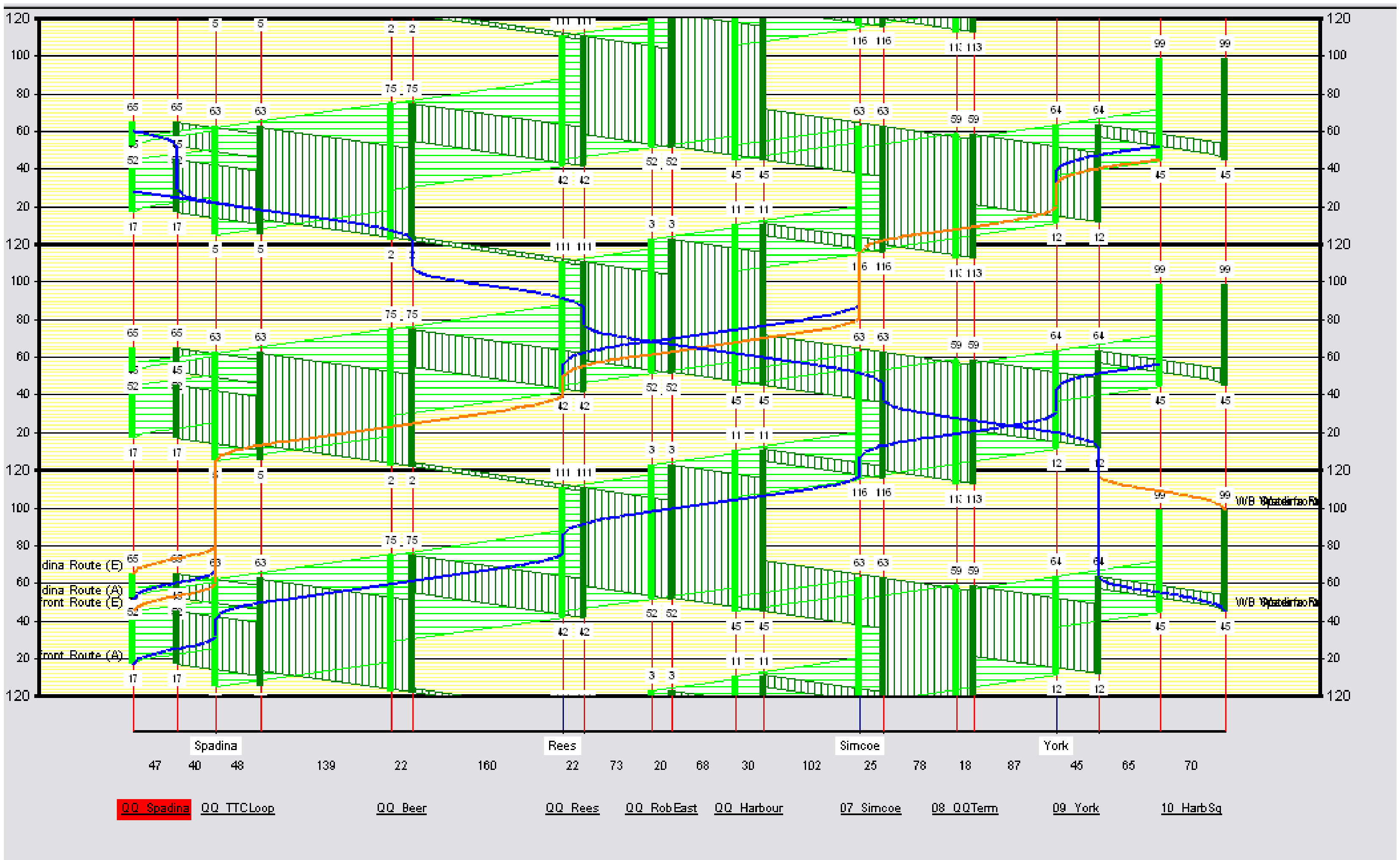
Partial signal priority with fixed background signal cycle optimized for LRT progression

- Cycle length even factor of LRT headway (west 120”, east 103”)
- Offsets optimized for LRT progression including anticipated station dwell times (ideal offsets compromised to avoid excessive traffic queuing)
- Wide bandwidth preference to lower LRT travel time std. deviation
- LRT green extension TSP of 10” to accommodate long dwells

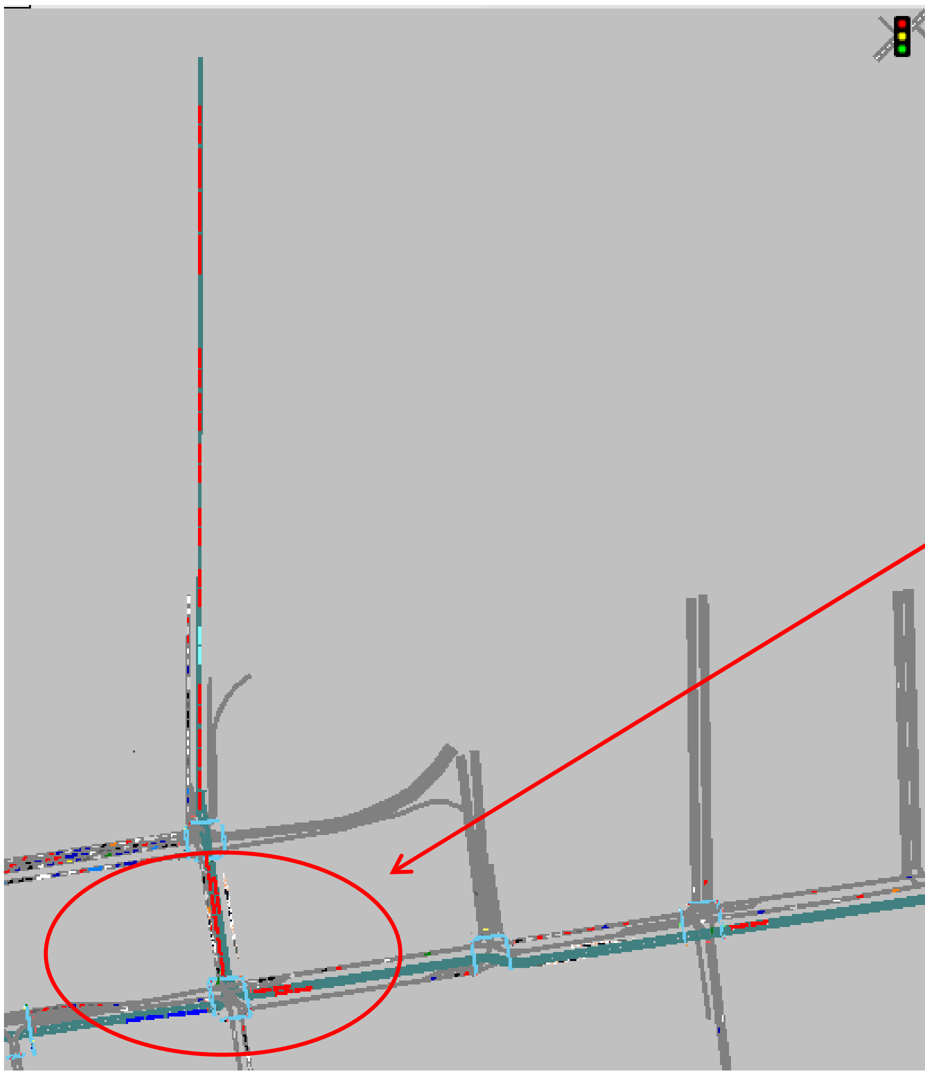
LRT Time-Space Diagram (QQ Portals – East)



LRT Time-Space Diagram (QQ Portals – West)



Bay Street Portal Option



- Insufficient crossing capacity at Bay Street at Queens Quay
- Design is infeasible for projected built-out train headways

Evaluation

- **Measures of Effectiveness**
  - LRT travel time and speed
  - LRT delay
  - Traffic intersection movement delay
- **Results**
  - Segment LRT mean speed between 13.9 km/h and 18.2 km/h
  - Segment LRT travel time between 331 sec and 389 sec
  - Segment LRT travel time std. deviation between 39 sec and 55 sec
  - Most LRT signal delay incurred at nearby stations while waiting for progression band
  - No severe traffic hotspots along Queens Quay corridor

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Sensitivity Analysis

- **Purpose to test system's sensitivity to**
  - LRT headway and its correlation to base cycle length
  - Removal of pedestrian signals and LRT stops
  - Offset optimization compromise to avoid excessive traffic queuing
- **Evaluation MOEs**
  - Segment LRT travel time (mean, min, max and std. dev.)
  - Segment LRT speed (mean, min, max and std. dev.)

Travel Time Segments

Segment Name	*Section*	*Direction*	*Segment #*
Cherry stop to QQ Portal (west of Freeland)	East	WB	10000
QQ Portal (west of Freeland) to Cherry stop	East	EB	10001
West of Spadina to north of Harbour	West	EB	20000
North of Harbour to west of Spadina	West	WB	20001
North of Spadina to north of Harbour	West	EB	20010
North of Harbour to north of Spadina	West	WB	20011

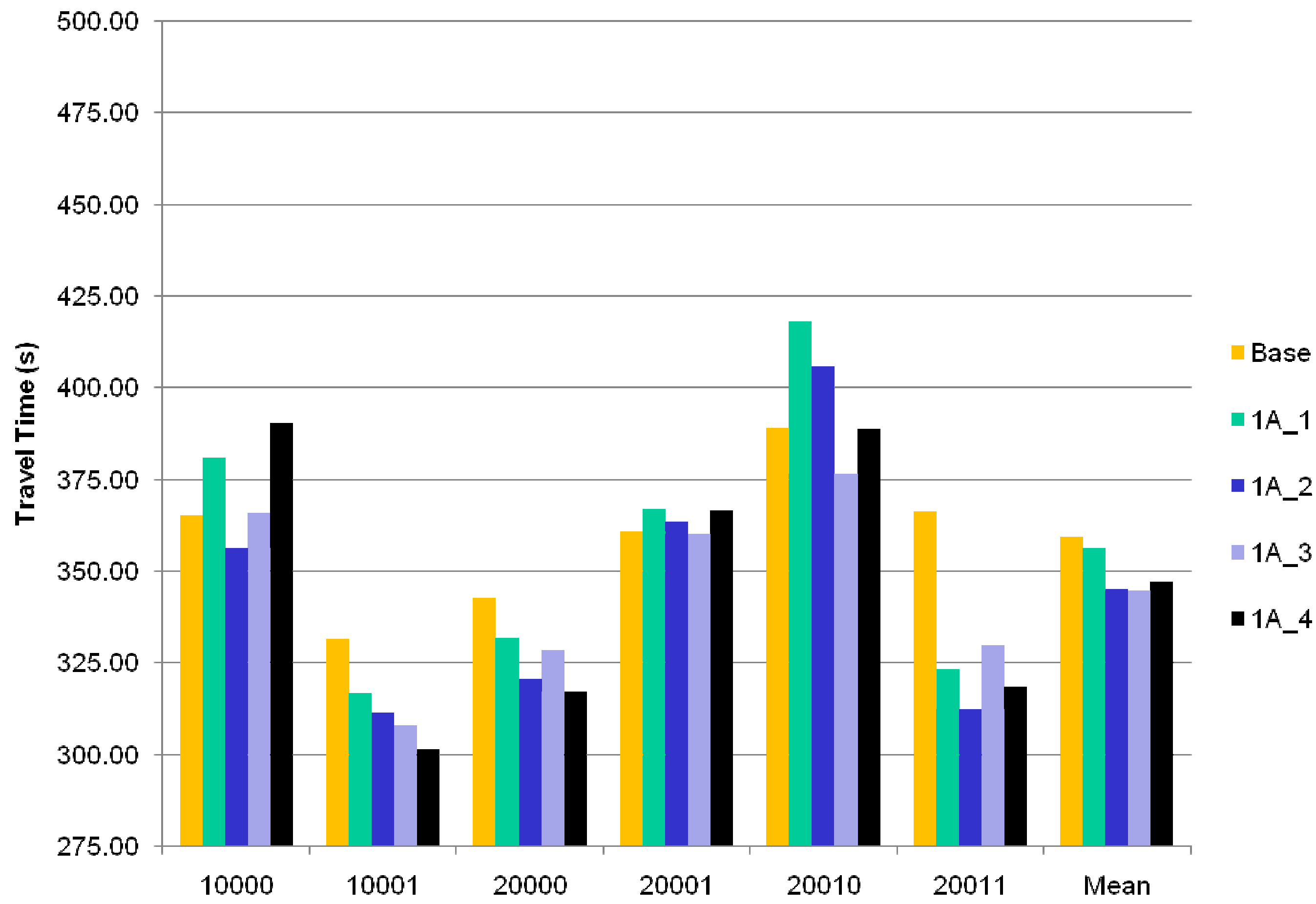
Sensitivity to LRT Headway

How robust is LRT signal system in regards to different LRT headways?

- Timing plan based on 100” cycle length for east and west sections

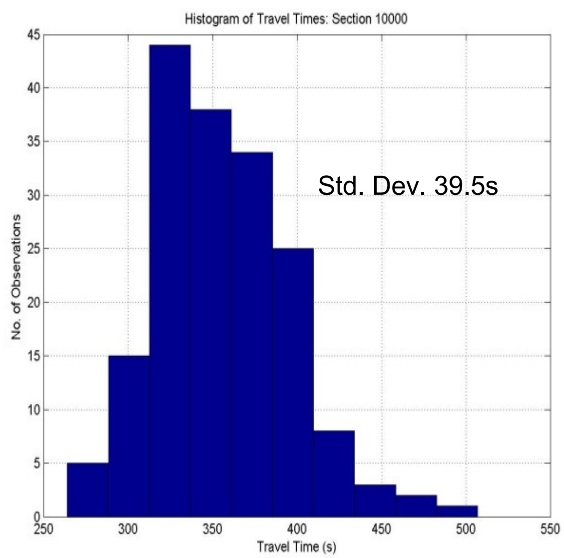
Scenario	*Train Length [m] (E – W)*	*Headway [s] (E - W)*	*# of Trains (E - W)*
1A_1	30 - 30	103 – 240/600	35 – 15/6
1A_2	60 - 30	206 – 240/600	17 – 15/6
1A_3	60 - 30	265 – 260/450	14 – 14/8
1A_4	30 - 30	158 – 369/450	23 – 10/8

Sensitivity to LRT Headway (Travel Time)

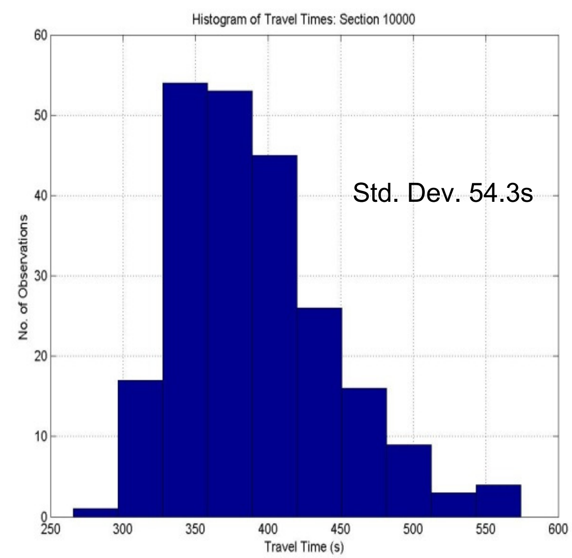


Sensitivity to LRT Headway (Standard Deviation)

1A_2



1A_4



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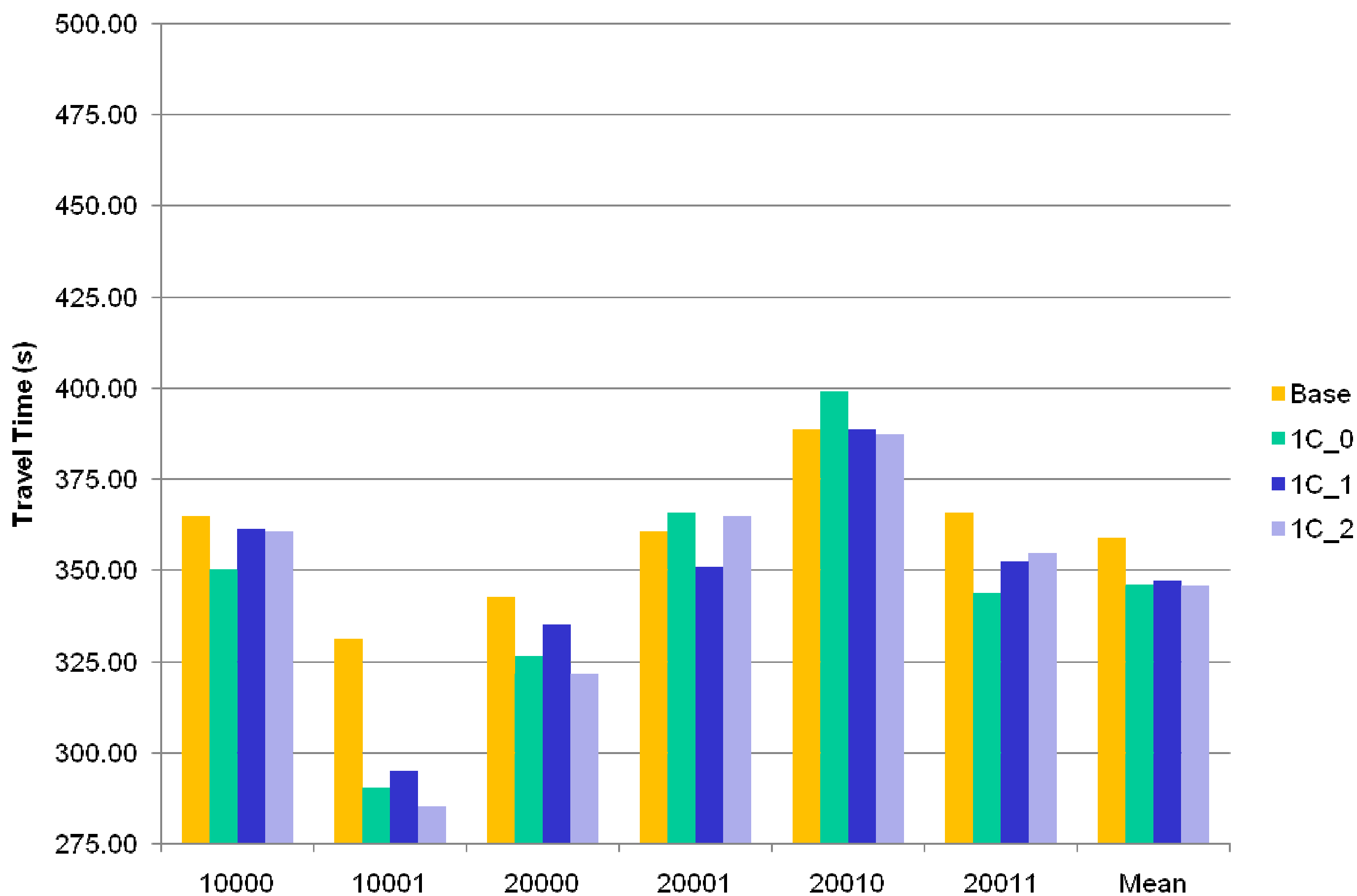
Sensitivity to Signal Offset Optimization

How much better is train operation if offsets can be optimized without regard to auto queuing?

- Timing plan based on 120” cycle length for east and west sections

Scenario	*Train Length [m] (E – W)*	*Headway [s] (E - W)*	*# of Trains (E - W)*
1C_0	30 - 30	103 – 240/600	35 – 15/6
1C_1	60 - 30	265 – 260/450	14 – 14/8
1C_2	30 - 30	158 – 369/450	23 – 10/8

Sensitivity to Signal Offset Optimization (Travel Time)



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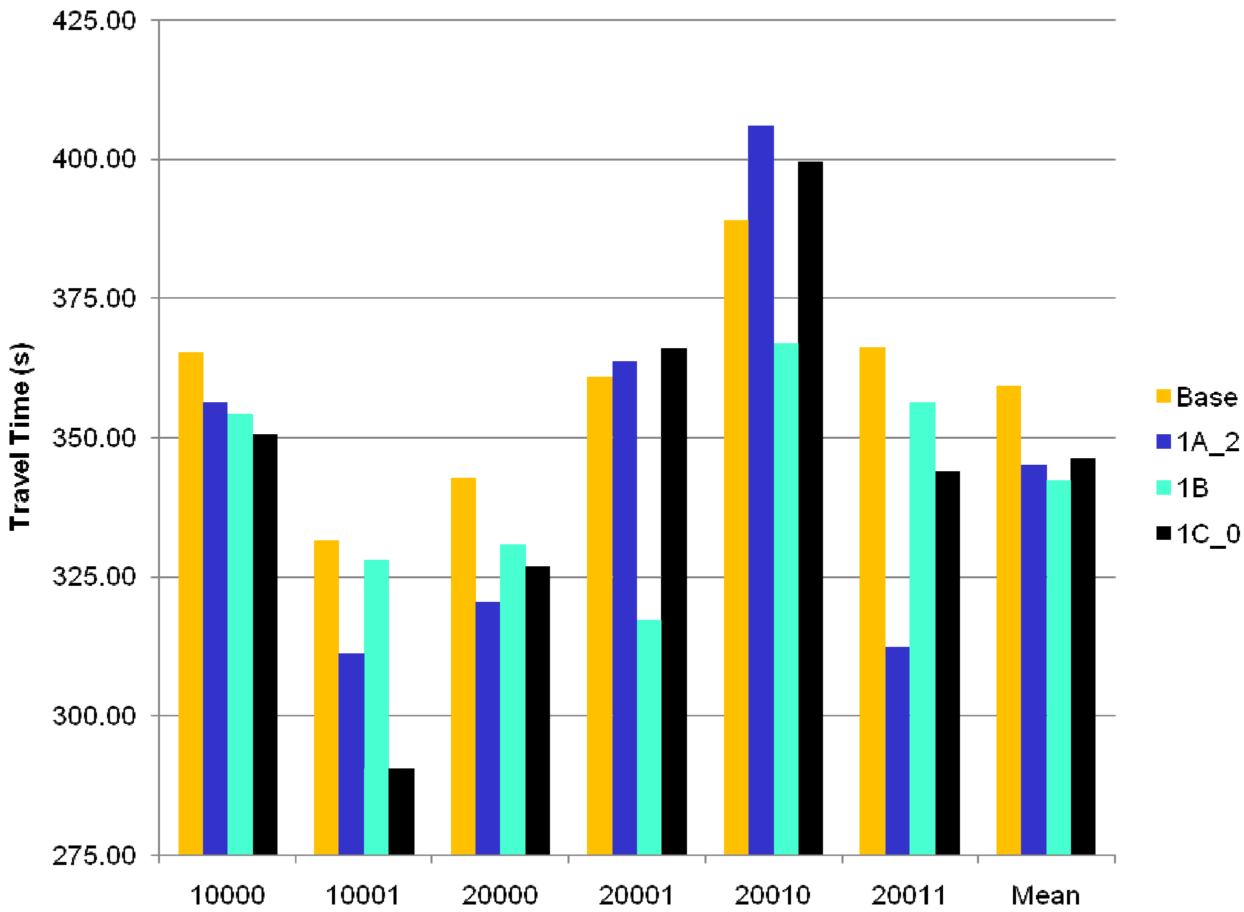
Sensitivity to Reduction of Ped Signals and LRT Stops

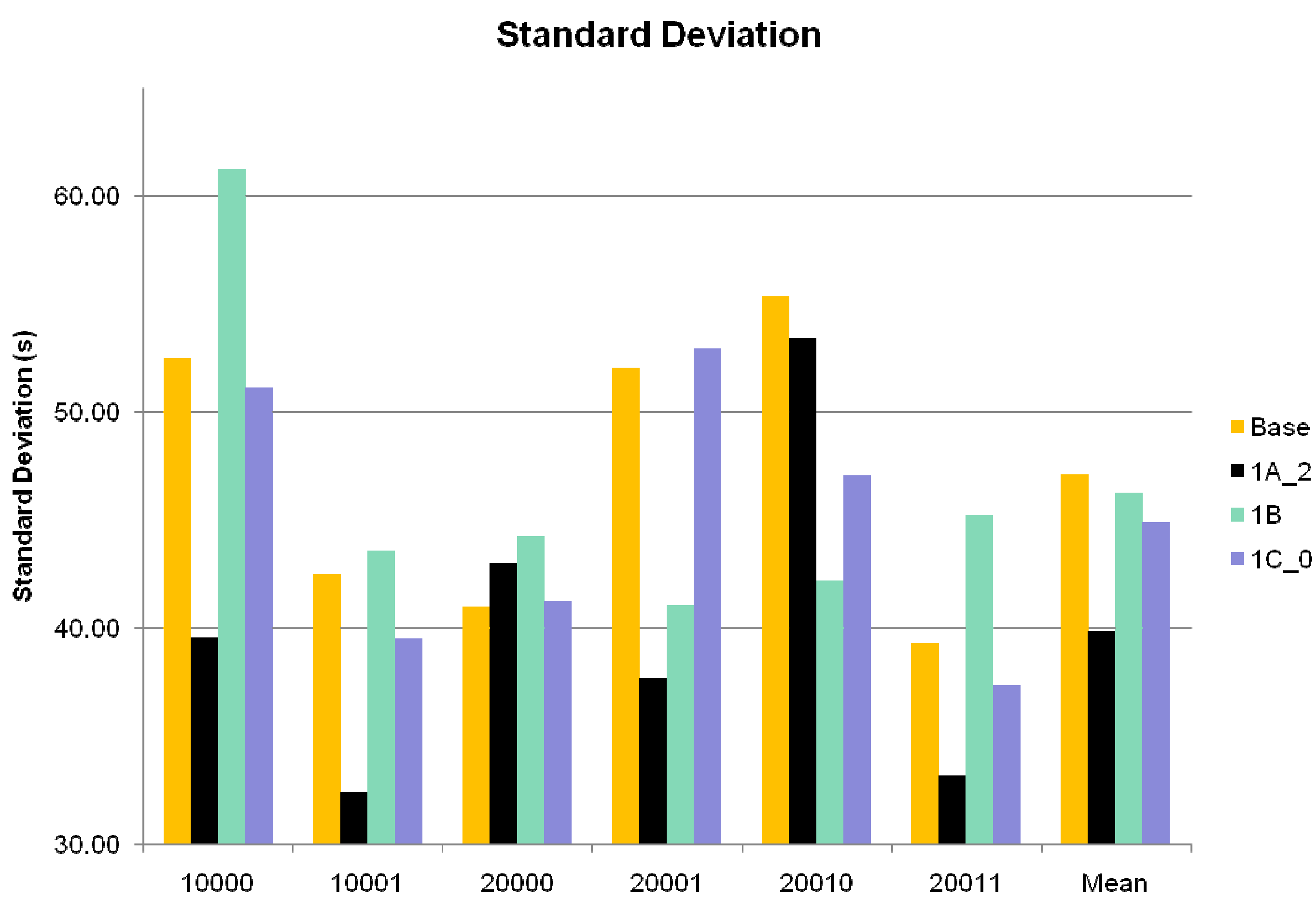
How much better is train operation if some ped signals and one LRT stop is removed?

Section	*Signals Removed*	*LRT Stops Removed*
East	Cooper Street	None
	Street ‘A’	
	Street ‘D’	
West	Harbourfront Centre	Lower Simcoe Street

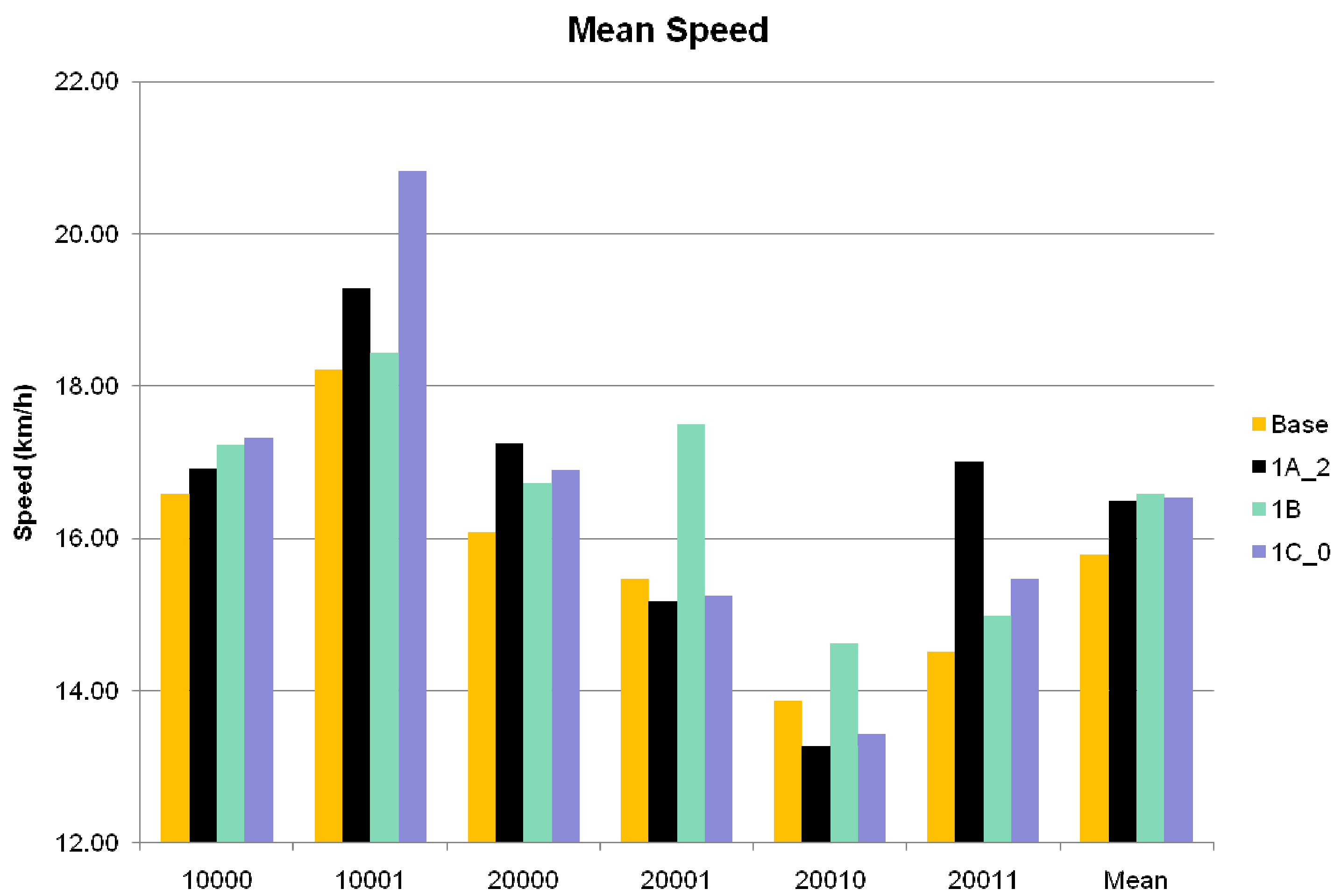
Mean Travel Time Comparison



Travel Time Standard Deviation Comparison



Mean Speed Comparison



Conclusions

- **Proposed Queens Quay Portals system can handle built-out train capacities**
- **System performance improves with**
  - Reduced number of trains
  - Reduced number of signals and stops
  - Traffic queuing not being a concern
- **Anticipated LRT speeds (incl. stops) are**
  - between 17 and 21 km/h for east section
  - between 13 and 17 km/h for west section
- **Anticipated LRT standard deviation is**
  - between 33 and 57 seconds for both sections

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D3 Comparison of Southside and Centre Transit Options Model Results Memo

ARUP

To	Pina Mallozzi (WT)	Reference number	96116_00/MPG
cc	David Pratt (Arup) Brent Raymond (DTAH)	File reference	
From	Marc-Paul Gauthier x 24581 (Toronto) Colin Wong (Arup)	Date	June 5, 2008
Subject	Queens Quay Revitalization EA Comparison of South Side and Centre Transit Options Model Results		

Introduction

Two alternatives for Queens Quay were simulated using VISSIM microsimulation software to test their viability from a transit operations perspective:

- Option 2 - Centre transit operation (14 signalized intersections).
- Option 4 - South side transit operation (22 signalized intersections)

Transit operation is one of several variables for determining the preferred alternative design concept. The two options represent the extremes and will help the EA project team evaluate a wider range of alternatives. The modeling exercise provides a comparative understanding of the two arrangements, but does not represent the final corridor design or signal locations. Schematic plans of the alternatives are included.

Purpose

The purpose of this analysis is to understand the operating characteristics of the two alternatives with regard to two key transit service quality measures:

- Speed of service (including travel time and variability)
- Service reliability (adherence to scheduled headways)

These measures were used to evaluate whether these systems can provide adequate transit access to the waterfront. A technical memorandum outlining all technical assumptions used in the simulation can be provided, however this document is intended to provide a summary of the results and what they mean.

Scenarios – Option 2

Centre transit scenario tested the Queens Quay portal system with 100 second cycle lengths for the entire corridor with two train configurations:

- 30 metres trains for the entire corridor; and,
- 30 metre trains west of Bay Street and 60 metre trains east of Bay Street.

Scenarios – Option 4

Base case scenario tested the Queens Quay portal system with 120 second cycle lengths west of Bay Street and 103 second cycle lengths east of Bay Street with no block separation rule for streetcars (i.e. only one streetcar allowed per block). Initially there were two models one of which tested a Bay Street portal which the modelling determined was not feasible from a transit operations perspective. Once preliminary results were received, the team decided to do further "sensitivity" tests in order to explore different control strategies, train headways/lengths and number of signalized intersections.

Sensitivity Scenario 1A tested system robustness against various LRT headway options. A new 100 second cycle length was used for the entire system with offsets determined with disregard to traffic queuing.

- 1A1 assumes 30 metre trains at a 103 second headway for east section, no change to the west
- 1A2 assumes 60 metre trains at a 206 second headway for east section, no change to the west

Sensitivity Scenario 1B tested system sensitivity to the removal of three pedestrian signals (19 total signals from 22) and consolidation of the Lower Simcoe and York Street transit stops to a single stop at Queens Quay Terminal. Assume 120 second cycle length west of Bay Street and 100 second cycle length east of Bay Street.

Sensitivity Scenario 1C tested system sensitivity with regard to offset optimization solely for transit. A new 120 second cycle length was used for the entire system with offsets determined with disregard to traffic queuing.

Travel Speed
To achieve a transit modal split that supports planned development along Queens Quay east of Bay Street and into the Port Lands, average tram speeds would need to be in the order of 17 km/h with combined average headways of 103 seconds. The transit speeds and headways are based on work undertaken by the TTC and documented in the TTC-TWRC Waterfront Transit EAs Demand Forecasting Report and Addendum.

Table 1 outlines average travel speeds of each route segment by direction. The peak travel demand is in the westbound direction for all routes.

Option 2

- Peak direction travel speeds for the centre of the road option 20.1 to 21.0 km/h. These travel speeds exceed those used within the demand forecasting report (17 km/h) and should provide adequate service to attract a good transit mode split for the waterfront.

Option 4

- Peak direction travel speeds for the East Bayfront sections range from 15.9 to 17.3 km/h for the sensitivity test scenarios. The slowest travel speed, produced by Scenario 1A1, falls short of the demand forecasting report target of 17 km/h by 1.1 km/h. Over a distance of 1650 metres, the approximate distance from Cherry Street to the portal, this 1.1 km/h difference would translate to an approximate 23 second increase in travel time from Cherry Street to the portal. Peak direction travel speeds under Scenario 1B and 1C are 17.2 and 17.3 km/h, respectively.

- Peak direction travel speeds for the west of Bay Street range from 14.5 to 17.5 seconds. The slowest travel speed, again produced in Scenario 1A1, falls short of the demand forecasting report target of 17km/h by 2.5 km/h. Over an approximate distance of 1500 metres, Lower Spadina Avenue to portal, this 2.5 km/h difference would mean an additional 54 seconds of travel time from Lower Spadina Avenue to the portal. Peak direction travel speeds under Scenario 1B is 17.5 km/h for the 509 Harbourfront streetcar route.

For both alternatives, peak direction travel has a more consistent travel speed than the off-peak direction of travel. This could be attributed to signals being coordinated for peak direction travel. Under the configurations tested in the model, the centre transit option would generally operate at speeds 15 to 25 percent faster than the south side option. Based upon the summary of travel times in Table 2, the centre transit option would be faster by approximately 50 to 80 seconds in the east, and 15 to 55 seconds in the west.

Travel Time Variability
Average travel time and standard deviation of travel times were also measured to understand the variability in trip time for the corridor. Results are outlined in Table 2.

Standard deviation of travel times could be characterized as follows:

- Travel time will be within one standard deviation faster or slower than average 68 percent of the time.
- Travel time will be within two standard deviations faster or slower than average 95 percent of the time.

Option 2

- Based on the model results, the variability of service for the centre transit alternative can be summarized as follows.
    - Travel time will be within 45 seconds faster or slower than average 68 percent of the time.
    - Travel time will be within 90 seconds faster or slower than average 95 percent of the time.

Option 4

- Based on the model results, the variability of service for the south side transit alternative can be summarized as follows.
    - Travel time will be within 60 seconds faster or slower than average 68 percent of the time.
    - Travel time will be within 120 seconds faster or slower than average 95 percent of the time.

Based on the results in Table 2, centre transit generally offers a more consistent travel time than the south side option, by 30 to 60 seconds.

Table 1 Average Travel Speed

Route and Direction of Travel	South Side Transit					Centre Transit	
	Base	1A1	1A2	1B	1C		
	30m Trains	30m Trains	60m Trains	30m Trains	30m Trains	30m Trains	60m Trains
Westbound (Peak)							
509 Harbourfront	15.5	15.0	15.1	17.5	15.2	20.6	20.6
510 Spadina	14.5	16.5	17.0	16.0	15.5	21.0	20.7
East Bayfront	16.6	15.9	16.9	17.2	17.3	20.1	20.6
Eastbound							
509 Harbourfront	16.1	16.7	17.3	17.5	16.9	21.3	20.9
510 Spadina	13.9	12.9	13.2	14.3	13.4	17.2	17.2
East Bayfront	18.2	19.1	19.3	18.3	20.8	21.7	23.1

Notes:
1. All values are in kilometers per hour.

Table 2 Average Travel Time and Standard Deviation

Route and Direction of Travel	South Side Transit										Centre Transit			
	Base		1A1		1A2		1B		1C					
	30m Trains		30m Trains		60m Trains		30m Trains		30m Trains		30m Trains		60m Trains	
	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]	Avg.[2]	St.Dev.[3]
Westbound (Peak)														
509 Harbourfront	361	52	367	42	363	38	316	39	366	53	268	32	265	30
510 Spadina	366	39	323	36	312	33	332	40	344	37	254	32	258	28
East Bayfront	365	52	381	48	356	40	354	58	351	51	300	32	316	30
Eastbound														
509 Harbourfront	343	41	331	46	320	43	317	39	327	41	259	31	266	36
510 Spadina	389	55	418	58	405	53	373	44	399	47	312	43	308	34
East Bayfront	331	42	317	42	311	32	331	45	290	39	277	33	287	35

Notes:
1. All values are in seconds.
2. Average travel time over entire route segment.
3. Standard deviation of travel times over entire route segment.

Headways
The Transportation Research Board (TRB) TCRP Report 100 considers transit headways of less than 10 minutes to be level of service A. The TTC does not post headways of less than 10 minutes on schedules located at stops. Where headways are less than 10 minutes, the TTC posts F.S. (frequent service). By this measure, all service along Queens Quay, south side or centre, could be considered LOS A.

Service Reliability (Headway Adherence)
Measuring the variation in headway adherence is a common method to evaluate the service reliability of transit systems operating at headways of 10 minutes or less. The measure is based on the coefficient of headway variation of transit vehicles serving a particular route, and is calculated as follows:

$$c_{vh} = \frac{\text{standard deviation of headway deviations}}{\text{mean scheduled headway}}$$

where:

$$c_{vh} = \text{coefficient of variation of headways}$$

The coefficient of headway variation can be defined as the proportion of the average headway by which the transit vehicle can be ahead of or behind schedule, 68 percent of the time. The higher the coefficient, the more irregular the service.

It is evident within Table 3 that service reliability Level of Service is comparable for both alternatives. Sixty metre trains tend to adhere better to scheduled headways. This is due to more time between trains which results in fewer opportunities for "bunching". Both typologies have similar service characteristics in terms of headway adherence with different levels of service east and west of Bay Street:

- West of Bay Street, headway adherence levels of service range from LOS A to D
- East of Bay Street, headway adherence levels of service range from LOS A to F

We should note that the models have a "dummy stop" built in which creates randomness for streetcars entering the system. We can see that many streetcars enter the system already off of their scheduled headway. In these circumstances, the vehicles remain off of their scheduled headway throughout the Queens Quay corridor and in some instances can degrade in level of service. This is illustrated in the differences in Arrival (Arr.) and Departure (Dep.) Levels of Service.

Summary Statement
Both transit configurations have similar characteristics in terms of service reliability and both can offer acceptable service. Both scenarios would operate "better" with 60 metre trains and headways greater than ±200 seconds east of Bay Street.

While Option 2 provides a transit service that is 15 to 25 percent faster than Option 4, the corridor is relatively short and the total difference in travel time is quite small. Actual differences in travel time, taking into account the length of the corridor, are:

- 50 to 80 seconds on an approximate trip time of 300 to 360 seconds (5 to 6 minutes) east of Bay Street; and,
- 15 to 55 seconds on an approximate trip time of 300 to 360 seconds (5 to 6 minutes) west of Bay Street.

Option 4 is capable of providing peak direction service speeds of 16.0 to 17.5 km/h under Scenario 1B; comparable to those used in the TTC- TWRC demand forecasting report.

Both transit configurations will be able to serve the future travel demand needs of the Toronto Waterfront.

Table 3 Coefficient of Headway Variation and Level of Service (LOS) (Service Reliability)

Route and Direction of Travel	South Side Transit										Centre Transit			
	Base		1A1		1A2		1B		1C					
	30m Trains		30m Trains		60m Trains		30m Trains		30m Trains		30m Trains		60m Trains	
	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]	Arr.[3]	Dep.[4]
Westbound (Peak)														
509 Harbourfront														
C_{vh}[1]	0.18	0.46	0.18	0.36	0.18	0.32	0.18	0.33	0.18	0.45	0.18	0.28	0.18	0.29
LOS[2]	A	D	A	C	A	C	A	C	A	D	A	B	A	B
510 Spadina														
C_{vh}[1]	0.14	0.15	0.14	0.18	0.07	0.11	0.14	0.15	0.14	0.16	0.14	0.17	0.07	0.10
LOS[2]	A	A	A	A	A	A	A	A	A	A	A	A	A	A
East Bayfront														
C_{vh}[1]	0.42	0.63	0.42	0.65	0.21	0.38	0.43	0.73	0.42	0.82	0.3	0.49	0.19	0.27
LOS[2]	D	E	D	E	B	C	D	E	D	F	C	D	A	B
Eastbound														
509 Harbourfront														
C_{vh}[1]	0.38	0.43	0.38	0.43	0.30	0.39	0.38	0.44	0.38	0.45	0.30	0.36	0.23	0.35
LOS[2]	C	D	C	D	B	C	C	D	C	D	C	C	B	C
510 Spadina														
C_{vh}[1]	0.10	0.21	0.10	0.20	0.10	0.17	0.10	0.16	0.10	0.19	0.10	0.15	0.10	0.13
LOS[2]	A	A	A	A	A	A	A	A	A	A	A	A	A	A
East Bayfront														
C_{vh}[1]	0.58	0.60	0.57	0.56	0.28	0.34	0.58	0.60	0.56	0.57	0.54	0.65	0.26	0.32
LOS[2]	E	E	E	E	B	C	E	E	E	E	E	E	B	C
Range	**A to E**		**A to E**		**A to C**		**A to E**		**A to F**		**A to E**		**A to C**	

Notes:

1. C_{vh} = coefficient of variation of headway (standard deviation / average)
2. LOS = Level of Service of coefficient of variation (TRB TCRP Report 100, attached)
3. Headway coefficient of variation arriving into corridor
4. Headway coefficient of variation departing from corridor

Appendix E

Travel Demand Forecasts

E1 BA Group Traffic Volume Forecasts

4. Traffic Volume Forecasts

BA Group has developed, in conjunction with Arup Canada Inc., a comprehensive series of future traffic volume forecasts for the Queens Quay and Lakeshore Boulevard corridors for use in the evaluation of the Queens Quay East configuration options.

Forecast volumes incorporate assignments of new traffic related to emerging and planned new development within the waterfront areas of Toronto (East Bayfront, West Don Lands and Lower Don Lands), the Railway Lands and other approved development proposals along the Queens Quay East and Lake Shore Boulevard corridors.

Forecasts have been developed for the following concept options under evaluation reflecting the cross-sectional characteristics, intersection locations and turn restriction / prohibitions inherent to each option.

- Transit in the middle of Queens Quay East ("*Centre Transit*" option)
- Transit on the south side of Queens Quay East ("*South Side Transit*" option)

4.1 Approach

4.1.1 Road Network Assumptions

The traffic volumes forecasts have been developed for the two configuration options for Queens Quay East incorporating the planned road modifications outlined in Section 2.3 of this study including, notably, the planned extension of Queens Quay East to Cherry Street and the specific lane configurations and turning movement restrictions / prohibitions inherent to each option.

4.1.2 Traffic Volume Forecasting Methodology

Traffic volume forecasts have been developed for the weekday morning and afternoon peak hour periods based upon a 4 step approach as outlined below.

1. Establish existing traffic volumes on the study area road network..

2. Adjust existing traffic volumes and patterns to take into account routing opportunities / constraints inherent within the planned area future road network. These include the following:
   - New road network connections including, principally, the planned extension of Queens Quay East to Cherry Street.
   - A diversion of a proportion of the existing westbound volume from the Queens Quay East corridor (i.e. currently turning at Parliament Street) to the Lake Shore Boulevard East corridor recognizing its reduced attractiveness for commuter use.
   - Turn restrictions and specific intersection arrangements along the Queens Quay East corridor inherent to each design option under consideration.

3. Establish a comprehensive series of net new traffic volume allowances for the Lake Shore Boulevard East and Queens Quay East corridors related to the build-out of emerging and committed area development across the Central Waterfront area. These net additional traffic allowances reflect:
   - the planned future area road network including the planned extension of Queens Quay East to Cherry Street; and
   - the intersection configurations and turn restrictions incorporated into the two alternatives under evaluation.

4. Development of future total traffic forecasts for the two options under evaluation (*Centre Transit* and *South Side Transit* options) incorporating:
   - adjusted existing baseline volumes (item 2); and
   - new area development traffic volumes (item 3).

4.1.3 Coordination with Queens Quay Revitalization EA

The East Bayfront Transit Environmental Assessment project team has worked closely with Waterfront Toronto and its consulting team working on the Queens Quay Revitalization Environmental Assessment.

Key in this regard has been the development of a common set of comprehensive forecasts of traffic activity across the Toronto waterfront area for use in both studies. These forecasts have been developed jointly in conjunction with Arup Canada Inc. adopting the forecasting methodology outlined in Section 4.1.2 and the following sections to ensure that the traffic volume base considered in each study is consistent and reflects:

- the same level of existing traffic activity on the area road network;
- the same level of future development activity and related allowances; and
- road network assumptions and related reassignments of existing traffic activity.

4.2 Existing Baseline Traffic Volumes

4.2.1 Intersection / Driveway Traffic Count Information

Existing traffic volumes were established for the morning and afternoon peak hours at the area intersections on Queens Quay East and Lake Shore Boulevard East corridors within the study area based upon recent traffic count information collected by the City of Toronto and Arup Canada Inc.

The morning and afternoon peak hour periods were adopted for evaluation / analysis purposes as they typically reflect the busiest periods of activity on the Study Area road network given prevailing and anticipated area land-uses in and around the East Bayfront Precinct and typical commuter traffic patterns.

The following existing intersection turning movement count information was adopted for the public street intersections and private driveways within the Study Area:

Queens Quay East Intersections

- Freeland Street (Arup Canada Inc., October 11, 2007)
- Cooper Street (Arup Canada Inc., October 11, 2007)
- Lower Jarvis Street (City of Toronto, June 25, 2007)
- Lower Sherbourne Street (City of Toronto, December 1, 2003)
- Redpath Sugar Plant driveways (Arup Canada Inc. October 11, 2007)
- Loblaws Food store driveway (Arup Canada Inc. October 11, 2007)

Lake Shore Boulevard East

- Lower Jarvis Street (City of Toronto, December 19, 2006)
- Lower Sherbourne Street (City of Toronto, August 8, 2007)
- Parliament Street / Queens Quay East (City of Toronto, June 21, 2007)

Existing area traffic volumes for the morning and afternoon peak hours are provided on Figure 6.

4.2.2 Volume Balancing – Queens Quay East Corridor

The existing traffic count information along the Queens Quay East corridor was also reviewed in detail to ensure a general consistency between intersections.

Modest adjustments were made to the through volumes on Queens Quay East to provide a balanced and representative traffic volume base for the intersections along this corridor that forms the focus of traffic operations analyses undertaken in the evaluation of the two design options being considered (as outlined in Section 5).

The Queens Quay West / York Street intersection (located within Queens Quay Revitalization EA Study Area) was identified, based upon a comparison of historical traffic counts information, as the 'master' area intersection to which volumes along the Queens Quay corridor are balanced.

Existing balanced traffic volumes are provided for the morning and afternoon peak hours in Figures A1(i) and A1(ii) in Appendix A, respectively.

4.2.3 Existing Traffic Redistribution: Planned Area Road Network

Existing traffic volumes are redistributed on the planned future area road network to reflect, notably, the extension of Queens Quay East eastwards to connect with Cherry Street.

This notably includes a diversion of existing traffic volumes orientated to / from the east that currently connects between the Lake Shore Boulevard East and Queens Quay East corridors using the Parliament Street and Sherbourne Street intersections onto the Queens Quay East extension. This assumes that such traffic will take advantage of the additional capacity and utility of this connection in routing to / from the Queens Quay East corridor.

4.2.4 Existing Traffic Diversion: Queens Quay East to Lake Shore Boulevard East

Substantial volumes turn from the Lake Shore Boulevard East corridor at the Parliament Street / Queens Quay East intersection during the morning peak hour period to use Queens Quay East as a routing alternative into the downtown areas of Toronto. Existing westbound left turn volumes exceed 400 vehicles during the morning peak hour.

This level of turning activity reflects the availability of capacity on the existing and under-utilized 4-lane wide section of Queens Quay East linking through the East Bayfront precinct area and that there is only one traffic signal between Parliament Street and Yonge Street (i.e. the Lower Jarvis Street signal).

The attractiveness of the Queens Quay East corridor as a commuter routing will be reduced over time as the East Bayfront Precinct develops and due to:

a) the logical reduction in through movement capacity on Queens Quay East compared to today given the planned reduction from the existing 4-lane cross-section (2 in each direction) to a basic 2 lane cross-section under both of the design options under evaluation;
b) the rationalization of the Lake Shore Boulevard East / Parliament Street / Queens Quay East intersection;
c) the introduction of a number of new traffic signals along the Queens Quay East corridor in both options;
d) the increase in turning traffic activity levels at intersections along the corridor and consequential reduction in available through capacity; and
e) the ability of Lakeshore Boulevard to handle additional existing traffic

Given the above, a proportion of the heavy existing westbound left turn volume currently turning onto Queens Quay East at Parliament Street during the morning peak hour has been diverted to remain on Lake Shore Boulevard East and access downtown Toronto utilizing that corridor in preference to using Queens Quay East.

Some 125 existing westbound left turn vehicles have been ‘diverted’ during the morning peak hour at the Lake Shore Boulevard East / Parliament Street / Queens Quay East intersection to remain on Lake Shore Boulevard East. These trips have been routed to travel into downtown Toronto via the Bay Street and Yonge Street corridors directly from the Lake Shore Boulevard East corridor rather than using Queens Quay East.

No diversion has, however, been adopted for the afternoon peak hour given that westbound turning volumes at the Lake Shore Boulevard / Parliament Street / Queens Quay East intersection are lower during this period and that traffic operations at the Lakeshore Boulevard East / Lower Jarvis Street intersection are more constrained during that period.

4.2.5. Baseline (Adjusted) Existing Volumes

Reassigned and balanced existing morning and afternoon peak hour traffic volumes on the planned future area road network within the Study Area are shown on Figure 7.

4.3 New Development Related Traffic Allowances

A comprehensive series of traffic volume allowances have been made to account for the construction of a number of emerging and approved area development proposals across the City of Toronto waterfront.

These include the following planned developments.

- Build-Out of the East Bayfront Precinct.
- Build-Out of the West Don Lands Precinct.
- Development of the portion of Lower Don Lands between Parliament Street and Cherry Street that is reliant upon the extension of Queens Quay East for access.
- Blocks with the Railway Lands east and west of York Street.
- The Water Park Place development proposal located just west of Bay Street.
- The Pier 27 condominium building on the MT27 lands located on the south side of Queens Quay East opposite Freeland Street.
- The Pinnacle Centre (Phase 3) proposal at 33 Bay Street.

Net new traffic volume allowances for the above mentioned waterfront and area development proposals were established, where possible, based upon prior traffic studies prepared as part of the municipal approvals processes for these development applications as noted in Section 4.3.

Prior traffic volume allowances for the East Bayfront Precinct and the western portions of the Lower Don Lands Precinct have been modified and refined to reflect the current development plans being considered for these lands and, notably, intersection locations and turn restrictions inherent in the two options under evaluation for the Queens Quay East corridor.

No allowances were made for new traffic activity related to new development within the Port Lands and eastern areas of the Lower Don Lands. Key in this regard is that Queens Quay East is not anticipated to play a notable role in the accommodating traffic activity related to these areas.

The location of the planned area development proposals considered within the forecasting outlined herein are shown on Figures 8a and 8b. Figure 8a shows approved development considered across the Central Waterfront area. Figure 8b shows the parcel and block areas considered within the East Bayfront Precinct, the West Don Lands Precinct and the westerly portions of the Lower Don Lands Precinct.

A discussion related to the key development programme and traffic generation parameters considered for area development within the future traffic volume forecasts established as part of this study is provided in the following sections.

4.3.1 Traffic Allowances - East Bayfront Precinct

Travel demand forecasts developed as part of this study for the East Bayfront Precinct are based upon those outlined in the *East Bayfront Precinct Plan of Subdivision Transportation Analysis* report prepared by BA Group in May 2007 and the *East Bayfront Precinct, Traffic Operations Analysis Update* report prepared by BA Group in January 2006.

The volume forecasts outlined in these reports have been refined to reflect:

- current development plan for the emerging Dock Side development area (i.e. the Corus and George Brown College developments in the Jarvis Slip to Sherbourne Park area); and
- the intersection locations and turn restrictions inherent in each of the two design options under evaluation.

Forecasts have, as before, been developed on a block by block basis from first principles using person trip making characteristics adopted by the City for the anticipated uses within the Precinct.

The derivation of the traffic volume forecasts for the East Bayfront Precinct is outlined below.

4.3.1.1 Development Plans

Dock Side – Plan of Sub-Division Area

The Plan of Subdivision application for the Dock Side development area relates to the lands south of Queens Quay East between the Jarvis Slip and planned Sherbourne Park.

Traffic volume allowances have been developed for the development parcels identified in the Plan of Subdivision application (Blocks 1 to 5) and reflect the emerging development of the Corus Entertainment building (Block 4) and the George Brown College campus (Blocks 3 and 5). Development allowances on the remaining land parcels (Blocks 1 and 2) reflect density permissions outlined in the Zoning By-Law for the Dock Side area and, notably, an assumed commercial land-use scenario.

Balance of the East Bayfront Precinct

Development parameters for the balance of the blocks and development parcels within the East Bayfront Precinct reflect those established within the East Bayfront Precinct Plan and, notably, those adopted in prior transportation assessment studies prepared for the Precinct.

It is assumed, consistent with prior general assumptions, that three-quarters of the total floor area proposed within each block / development parcel will be developed for residential purposes with the remaining one-quarter developed for non-residential or commercial purposes. The Precinct Plan development allowances adopted herein contemplate a build-out of approximately 671,825 sq. metres of total new floor area within the Precinct between Lower Jarvis Street and Small Street). Of this, approximately 167,955 sq. metres is assumed to be developed for commercial uses.

Development Statistics

A breakdown of the proposed floor areas and equivalent assumed number of residential units within the East Bayfront Precinct by each of the 9 development parcels is provided in Table 1.

Table 1
East Bayfront Precinct Plan, Development Floor Areas

Dock Side (1st Plan of Sub-Division Lands)				
Parcels between Jarvis Street and Sherbourne Street [1]	**Block Area Sq. Metres**	**Commercial Area Sq. Metres**		
Corus Building Block 4	9,960	42,500		
George Brown College-Block 3 & 5	8,295	46,450		
Block 1	1,284	15,410		
Block 2	3,313	39,755		
Balance of East Bayfront Precinct				
Parcels between Sherbourne Street & Parliament Street [2]	**Total GFA Sq. Metres**	**Residential**		**Commercial GFA Sq. Metres**
		GFA Sq. Metres	**Equiv. No. Units [3,5]**	
A1	102,168	76,626	807	25,542
A2	185,651	139,238	1466	46,413
B1	51,102	38,327	404	12,775
B2	111,505	83,629	881	27,876
B3	58,760	44,070	464	14,690
F	26, 812	20,109	212	6,703
G	47,683	35,762	377	11,921
H	56,125	42,094	443	14,031
J	32,017	24,013	253	8,004
Total [4]	671,825	503,870	5310	167,955

Notes
1. Based upon latest statistics available for Dock Side lands.
2. Development statistics are based upon *East Bayfront Precinct, Traffic Operations Analysis Update* report prepared by BA Group, January 2006.
3. Based upon 95 sq. metre average unit size consistent with trip generation assumptions.
4. Rounded to nearest 5 sq. metres or units.
5. Equivalent number of units rounded up to the nearest unit.

4.3.1.2 Vehicular Trip Generation

A brief description of the traffic generation assumptions and parameters adopted in establishing traffic volume forecasts for new development within the East Bayfront Precinct is outlined below.

A. Dock Side

Forecasts for the Corus and George Brown College proposals within the Dock Side area are based upon the use of parking discharge factors and the total proposed parking supply currently contemplated to support these facilities.

A traffic generation allowance is made to account for new traffic related to prospective commercial development on Blocks 1 and 2.

The following assumptions are made in establishing the traffic generation forecasts:

Block 4 - Corus Building

- 150 parking spaces.
- Parking discharge factor of 0.40 and 0.55 two-way trips / stall during the morning and afternoon peak hours respectively based upon typical discharge rates for commercial / office building parking facilities.

Blocks 3 and 5 - George Brown College

- Up to 500 parking spaces are expected to be provided on Blocks 3 and 5 for George Brown College and public parking use, of which 150 spaces are assumed for school residence use.
- Parking discharge factor of 0.40 and 0.55 two-way trips / stall during the morning and afternoon peak hours respectively for public parking and College parking based upon typical discharge rates for commercial / office building parking facilities.
- Parking discharge factor of 0.10 trips/stall was assumed for school residence peak outbound trips during the morning peak hour. Since inbound traffic activity assumed to be negligible, an allowance of 5 trips were made for the inbound trips during morning peak hour , which translates in to discharge factor of 0.03 trips/stall. Parking discharge factor of 0.10 trips/stall were assumed during the afternoon peak hour for peak inbound/outbound trips, which translate in to 0.20 two-way trips / stall for residence parking. These discharge rates are reflective of a relatively low level of activity at residence facilities given that students are, for the most part, will attend classes at this site.

Blocks 1 and 2 - commercial use to be determined

- A total volume allowance of 60 two-way trips for both of these blocks is assumed.

The trip generation characteristics for the Dock Side development blocks is summarized in Table 2.

B. Balance of East Bayfront Precinct

Forecasts of new traffic generated by development within the balance of the East Bayfront Precinct have been established consistent with the previously adopted trip generation parameters outlined in the *East Bayfront Precinct Traffic Operations Analysis Update* report prepared by BA Group in January 2006.

C. Consolidated Forecasts

New traffic volumes generated by emerging and planned development within the East Bayfront Precinct (Lower Jarvis Street to Small Street) during the morning and afternoon peak hours are outlined in Table 3.

Table 2
Trip Generation
Dock Side (South of Queens Quay East, Lower Jarvis Street to Sherbourne Park)

Parcel	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	2-Way	In	Out	2-Way
Block 4 – Corus • Underground Parking (150 stalls) ▪ Discharge Rate / Stall ▪ Total Trips	0.35 50	0.05 10	0.40 60	0.20 30	0.35 50	0.55 80
Block 3 & 5 –George Brown College • School / Public Parking (350 Stalls) ▪ Discharge Rate / Stall ▪ Total Trips	0.35 120	0.05 20	0.40 140	0.20 70	0.35 120	0.55 190
• School Residence Parking (150 stalls) ▪ Discharge Rate / Stall ▪ Total Trips	0.03 5	0.10 15	0.13 20	0.10 15	0.10 15	0.20 30
Blocks 1 & 2 ▪ Total Trips	50	10	60	10	50	60
Total Trips	**225**	**55**	**280**	**125**	**235**	**360**

Notes:
1. Site statistics for George Brown College are based upon Staff Report dated October 24, 2008

Table 3
Traffic Volumes – East Bayfront Precinct

Parcel	Trip Generation					
	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Dock Side (1st Plan of Sub-Division Lands)						
Corus Building	50	10	60	30	50	80
George Brown College	125	35	160	85	135	220
Block 1 & 2	50	10	60	10	50	60
Subtotal	225	55	280	125	235	360
Balance of East Bayfront Precinct						
A1	68	127	195	193	153	346
A2	124	231	355	352	279	631
B1	34	63	97	97	77	174
B2	74	139	213	211	167	378
B3	39	73	112	111	88	199
F	18	33	51	51	40	91
G	32	59	91	90	72	162
H	38	70	108	106	84	190
J	21	40	61	61	48	109
Subtotal	448	835	1283	1272	1008	2280
Total	**673**	**890**	**1563**	**1397**	**1243**	**2640**

4.3.1.3 Traffic Assignment

Forecast traffic volumes generated by emerging and new development within the East Bayfront Precinct are assigned to the area road system based on directional assignment parameters outlined in prior studies undertaken within the Precinct and, notably, as outlined in the *East Bayfront Precinct, Traffic Operations Analysis Update report* prepared by BA Group in January 2006.

Link assignment parameters established as part of this previous report are outlined in Table 4.

Table 4
Traffic Distribution Patterns – East Bayfront Precinct

Street	Morning Peak Hour		Afternoon Peak Hour	
	Inbound	Outbound	Inbound	Outbound
To / from the North				
Jarvis Street	4%	10%	5%	6%
Sherbourne Street	10%	12%	11%	15%
Parliament Street	13%	22%	12%	28%
Cherry Street	10%	0%	9%	0%
To / from the South				
Cherry Street	0%	0%	0%	0%
To / from the West				
Gardiner Expressway Westbound On-Ramp @ Jarvis Street	0%	16%	0%	18%
Gardiner Expressway Eastbound Off-Ramp @ Jarvis Street	19%	0%	17%	0%
Lake Shore Boulevard East	11%	16%	13%	13%
Queens Quay East	16%	23%	20%	15%
To / from the East				
Gardiner Expressway Eastbound On-Ramp @ Jarvis Street	0%	0%	0%	0%
Gardiner Expressway Westbound Off-Ramp @ Sherbourne Street	0%	0%	0%	0%
Lake Shore Boulevard East	17%	1%	13%	5%
Total	100%	100%	100%	100%

Traffic assignments for East Bayfront Precinct total traffic have been prepared for both options under consideration as part of this evaluation reflecting intersection locations, lane provisions and turn restrictions inherent and specific to each option. Traffic volume assignments for the *South Side Transit* option are shown on Figures B1(i) and B1(ii) for the morning and afternoon peak hours respectively attached in Appendix B. Traffic volume assignments for *Centre Transit* option are summarized on Figures C1(i) and C1(ii) for the morning and afternoon peak hours respectively attached in Appendix C.

4.3.1.4 Existing Land-Use Traffic Volumes Eliminated

Allowances have been made to account for the elimination of traffic activity related to current uses situated on lands to be redeveloped within the East Bayfront Precinct that is included in the base existing traffic count information outlined in Section 4.2.

This includes traffic activity on development lands located on the north and south side of Queens Quay East within the East Bayfront Precinct between Lower Jarvis Street and Parliament Street. For analysis purposes, all existing traffic activity turning to / from private driveways serving these lands and the local streets within the Precinct (Richardson Street, Bonnycastle Street and Small Street) are assumed to be predominantly related to existing local development and have been assumed to be eliminated with redevelopment of the East Bayfront Precinct.

Existing land-use related traffic volumes removed from the area road network for the morning and afternoon peak hours are illustrated in Figures A2(i) and A2(ii) respectively and are attached in Appendix A.

4.3.2 Travel Demand Forecasts – Western Portions of Lower Don Lands

Travel demand forecasts have been developed for the westerly portions of the Lower Don Lands area between Parliament Street and Cherry Street. Forecasts have been incorporated into this analysis in that these development parcels are expected to be reliant, for the most part, upon the Queens Quay East extension for access. A proportion of the traffic related to this section of the Lower Don Lands, as distinct from the broader Lower Don Lands and Port Lands areas which are not anticipated to rely upon Queens Quay East to any significant degree for access, is likely to route along the Queens Quay East corridor through the East Bayfront Precinct under consideration as part of this study.

For the purposes of this study, forecasts for the Lower Don Lands parcels west of Cherry Street (which were previously part of the East Bayfront Precinct) are based upon those outlined in the *East Bayfront Precinct, Transportation Assessment – Status Report* prepared by BA Group in March 2004 as part of the assessment of the then current East Bayfront Precinct Plan.

A breakdown of the floor areas and number of residential units assumed for the purposes of this analysis within the western portions of the Lower Don Lands is provided in Table 5.

The established trip generation parameters and forecasts of travel demands related to development within the Lower Don Lands Precinct west of Cherry Street for the morning and afternoon peak hours are outlined in Table 6.

Traffic Distribution

Directional traffic distribution parameters adopted in the assignment of traffic from the westerly portions of the Lower Don Lands are consistent with those adopted in *East Bayfront Precinct, Transportation Assessment – Status Report* prepared by BA Group in March 2004 which considered these lands. This distribution is similar to that adopted for the East

Bayfront Precinct west of Parliament Street (see Section 4.3.1.3) but reflects the differing locational characteristics of this Precinct area compared to the lands located further west.

Table 5
Lower Don Lands- West of Cherry Street- Development Floor Areas

Parcel [1]	Total GFA Sq. Metres [1]	Residential		Commercial GFA Sq. Metres
		GFA Sq. Metres	Equiv. No. Units [2 4]	
D1	34,248	25,686	286	8,562
D2	19,170	14,378	312	4,793
E	89,362	67,022	264	22,341
J1	26,796	29,097	201	6,699
J2 [3]	9,200	-	-	10,219
K	29,082	21,812	218	7,271
Total	**207,858**	**157,995**	**1,281**	**59,885**

Notes
1. Based upon statistics outlined in the East Bayfront Precinct, Transportation Assessment – Status Report prepared by BA Group in March 2004.
2. Based upon 95 sq. metre average unit size consistent with trip generation assumptions.
3. Commercial floor areas include elementary school on Block J1 (10,219 sq. metres or 109,995 sq. ft).
4. Equivalent number of units rounded up to the nearest unit.

Table 6
Trip Generation – Lower Don Lands – West of Cherry Street

Parcel	Residential Units	Commercial GFA Sq. Metres	Trip Generation					
			Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
D1	286	8,562	22	41	63	15	25	40
D2	312	4,793	13	23	36	22	17	39
E	264	22,341	59	106	165	100	25	125
J1	201	6,699	18	32	50	50	75	125
J2	-	10,219	0	0	0	0	0	0
K	218	7,271	19	35	54	20	15	35
Total	**1,281**	**59,885**	**131**	**237**	**368**	**207**	**157**	**364**

Link assignment parameters established as part of the March 2004 report are outlined in Table 7.

Assignments of traffic generated by the western portions of the Lower Don Lands Precinct for both options under evaluation (same assignment) and for the morning and afternoon peak hours are outlined in Figures A3(i) and A3(ii) attached in Appendix A.

Table 7
Traffic Distribution Patterns – Western Portions of Lower Don Lands Precinct

Street	Morning Peak Hour		Afternoon Peak Hour	
	Inbound	Outbound	Inbound	Outbound
To / from the North				
Jarvis Street	0%	0%	0%	0%
Sherbourne Street	0%	0%	0%	0%
Parliament Street	19%	22%	19%	25%
Cherry Street	18%	22%	18%	24%
To / from the South				
Cherry Street	0%	0%	0%	0%
To / from the West				
Gardiner Expressway Westbound On-Ramp @ Jarvis Street	0%	16%	0%	18%
Gardiner Expressway Eastbound Off-Ramp @ Jarvis Street	19%	0%	17%	0%
Lake Shore Boulevard East	11%	16%	13%	13%
Queens Quay East	16%	23%	20%	15%
To / from the East				
Gardiner Expressway Eastbound On-Ramp @ Jarvis Street	0%	0%	0%	0%
Gardiner Expressway Westbound Off-Ramp @ Sherbourne Street	0%	0%	0%	0%
Lake Shore Boulevard East	17%	1%	13%	5%
Total	100%	100%	100%	100%

4.3.3 Travel Demand Forecasts – West Don Lands

Travel demand forecasts adopted within this assessment for new development within the West Don Lands Precinct are based upon those outlined in the *West Don Lands, Plan of Subdivision Phase 2, Transportation Analysis* report prepared by BA Group in December 2008.

The report provides a detailed breakdown of the forecast future build-out traffic activity levels in the area considering full build-out of the West Don Lands area.

A breakdown of planned floor area and development programme allowances is provided on a block-by-block basis in Table 8. Traffic generation forecasts for each block are provided in Table 9.

Traffic assignments for the morning and afternoon peak hours for the West Don Lands Precinct extracted from the December 2008 report within the East Bayfront Transit Class EA Study Area are outlined in Figures A4(i) and A4(ii) attached in Appendix A.

Table 8
West Don Lands – Block Statistics Development Floor Area / Units

Block Reference	Residential GLA		Retail	Office
	Sq. ft.	Equivalent Units	Sq. ft.	Sq. ft.
Phase 1 Plan of Subdivision Lands (prior application)				
19	139,446	152		
20	311,511	341	9,756	4,878
21	71,483	78	-	-
22	203,535	222	-	-
23	87,435	96	10,258	5,129
24	175,258	192	11,477	5,739
Sub-total Phase 1	***988,708***	***1,081***	***31,491***	***15,745***
Phase 2 Plan of Subdivision Lands (current application)				
8	628,645	584	35,867	17,933
9	-	-	66,353	33,177
10	331,098	362	16,499	8,249
11	330,452	361	17,073	8,536
12	303,542	332	16,212	8,106
13	434,216	475	14,921	7,460
14	352,615	328	15,708	7,854
15	152,105	141	10,111	5,055
15n	108,511	101	-	-
16e	475,617	425	32,113	16,056
16w	152,105	141	10,104	5,052
17	-	-	55,723	27,861
18	-	-	10,330	5,165
P2	184,278	162	-	-
P3	129,824	138	-	-
Sub-total Phase 2	***3,583,008***	***3,549***	***301,011***	***150,506***
Phase 3 Plan of Subdivision Lands (future application)				
1	508,057	555	23,529	11,764
2	255,105	279	10,545	5,272
3	210,650	230	8,608	4,304
4	107,639	118	103,439	51,720
5	159,844	175	14,203	7,102
6	-	-	19,368	9,684
7	54,465	60	4,806	2,403
Sub-total Phase 3	***1,295,760***	***1,416***	***184,498***	***92,249***
Grand Total	**5,867,476**	**6,046**	**517,000**	**258,500**

Notes
1. Based upon statistics in *West Don Lands Phase 2 Transportation Analysis* report prepared by BA Group in December 2008

Table 9
West Don Lands Precinct – Forecast Traffic Volumes

Block Reference	**Morning Peak Hour (Vehicles)**			**Afternoon Peak Hour (Vehicles)**		
	In	**Out**	**2-Way**	**In**	**Out**	**2-Way**
Phase 1 Plan of Subdivision Lands (prior application)						
19	5	16	21	16	8	24
20	13	42	55	40	17	54
21	2	9	12	8	2	10
22	7	29	36	24	7	31
23	5	12	18	16	10	26
24	8	25	33	24	11	35
Sub-total Phase 1	***40***	***131***	***176***	***128***	***55***	***183***
Phase 2 Plan of Subdivision Lands (current application)						
8	30	87	117	92	47	139
9	-	-	-	-	-	-
10	15	45	59	46	23	69
11	15	45	59	46	23	70
12	14	41	55	43	22	65
13	18	58	76	57	25	81
14	16	51	67	51	24	74
15	7	21	28	23	12	35
15n	4	14	18	12	4	15
16e	21	62	83	66	34	100
16w	7	21	28	23	12	35
17	13	4	17	34	40	74
18	-	-	-	-	-	-
P2	6	24	30	20	6	26
P3	4	17	21	14	4	18
Sub-total Phase 2	***170***	***489***	***659***	***527***	***275***	***802***
Phase 3 Plan of Subdivision Lands (future application)						
1	22	68	91	70	33	103
2	11	34	45	34	16	50
3	9	28	37	28	13	41
4	28	22	50	75	78	152
5	9	22	31	26	15	42
6	5	1	6	12	14	26
7	3	7	10	9	5	14
Sub-total Phase 3	***87***	***183***	***270***	***254***	***175***	***429***
Grand Total ***Rounded***	**297** ***300***	**803** ***805***	**1105** ***1105***	**909** ***910***	**505** ***505***	**1414** ***1415***

Notes
1. Based upon statistics in *West Don Lands Phase 2 Transportation Analysis* report prepared by BA Group in December 2008

4.3.4 Travel Demand Forecasts – Other Central Waterfront Area Developments

A series of allowances have been made for the purposes of this analysis to account for net new traffic activity related to a number of planned development proposals within the Central Waterfront area.

These are outlined in the following.

4.3.4.1 Waterpark Place Phase 3

The Waterpark Place Phase 3 proposal is located on the north side of Queens Quay East to the east of the York Street Gardiner Expressway access ramp. The site is currently occupied by a parking lot.

Traffic volumes allowances are incorporated into the traffic volume forecasts adopted for the purposes of this assessment based upon forecasts and assignments of net new traffic for the proposal outlined in the *Waterpark Place Phase 3 Traffic Impact Analysis* report prepared by BA Group in April 2002 for the now approved development proposal. The following provides a summary of the basis upon which site related traffic volumes have established for the purposes of this evaluation:

- It is assumed that the existing commercial parking lot (approximately 325 spaces) is retained and relocated underground on the site.
- Site volumes reflect development of approximately 52,045 sq. metres (560, 200 sq. ft.) of office use on the site and supporting 450 space parking garage facility.
- The Phase 3 development site is assumed to be served by one (existing) signalized access onto Queens Quay West. There may be an opportunity to inter-connect the existing Waterpark Place Phase 1 / 2 (10 and 20 Bay Street buildings) and the Phase 3 garages which will better distribute site related traffic. No inter-connection has been assumed in these analyses.

Traffic generation characteristics for the Waterpark Place Phase 3 development proposal considered as part of this evaluation are outlined in Table 10. It is noteworthy that volumes considered reflect a 'worst case' 'office' development scenario for the Waterpark Place Phase 3 lands retaining public parking uses on the property.

Table 10
Trip Generation – Waterpark Place Phase 3

Development Site	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	2 Way	In	Out	2 Way
Waterpark Place Phase 3 450 Parking Spaces • Office ▪ Trip rates ▪ Net New Trips	 0.60 270	 0.05 25	 0.18 295	 0.08 35	 0.50 225	 0.58 260

Notes.

1. Source: Waterpark Place Phase 3 Traffic Impact Study prepared by BA Group in April 2002

Traffic assignments for the morning and afternoon peak hours related to development of the Waterpark Place Phase 3 proposal are outlined in Figures A5(i) and A5(ii) attached in Appendix A.

4.3.4.2 Railway Lands East Blocks

Traffic generated by approved new and proposed development within the Railway Lands area located generally between Yonge Street and Simcoe Street were considered within the traffic forecasts adopted for evaluation of the Queens Quay East design alternatives.

Net new traffic volume forecasts for each of the blocks within the Railway Lands were based upon transportation study reports prepared by BA Group and others as part of approvals processes for development applications within the area.

Net new traffic volume assignments were most recently developed for the build-out of the Railway Lands as part of the *Proposed development York Centre, 16 York Street City of Toronto, Urban Transportation Considerations* report prepared by BA Group in January 2008 for the redevelopment of the 16 York Street property (Block 9A & 9B). These assignments are incorporated into the forecasts considered for the purposes of this analyses and incorporate net new traffic activity related to following development proposals that were either under construction of not yet built at the time of the traffic surveys used as a basis for all analyses:

- Development of Blocks 4 and 5 on the east side of York Street (now under construction).
- Development of the final phase of the Pinnacle Centre east of Bay Street (now under construction).
- Development of Block 7A (now under construction).
- Development of Block 7B (proposal).
- Full occupancy of Block 8 (existing condominium development).
- Development of Blocks 7B and Block 10 (proposals).
- Development of Blocks 9A and 9B on the west side of York Street (proposal).

Trip generation characteristics and net new traffic volumes generated by proposed development within the Railway Lands area (as noted above) are summarized in Table 11.

Morning and afternoon street peak hour traffic assignments of net new traffic related to new development within the Railway Lands East are outlined on Figures A6(i) and A6(ii) attached in Appendix A respectively. These net traffic volume changes take into account the elimination of existing traffic activity related to current land-uses that will be replaced by the new development proposals.

4.3.4.3 MT27 Condominium Proposal

New traffic generated by a proposed redevelopment of the MT27 land parcel located on the south side of Queens Quay East opposite the Freeland Street intersection has been incorporated into the traffic volumes forecasts used for the purposes of this evaluation.

Development of a 1250 unit condominium development proposal has been considered on the site with access being provided from Queens Quay East via a driveway connection located opposite Freeland Street. The site is currently occupied by a surface parking lot.

Table 11
Trip Generation – Railway Lands Blocks, Yonge Street to Simcoe Street

Block	Development Programme	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	2-Way	In	Out	2-Way
Block 5 – Maple Leaf Square	• Residential (890 Units)						
	▪ Trip Rates	0.04	0.12	0.16	0.12	0.07	0.19
	▪ Total Trips	35	105	140	105	60	165
	• Hotel (172 Rooms)						
	▪ Trip Rates	0.09	0.09	0.18	0.12	0.12	0.24
	▪ Total Trips	15	15	30	20	20	40
	• Commercial Parking (369 Stalls)						
	▪ Trip Rates	0.35	0.05	0.40	0.20	0.35	0.55
	▪ Total Trips	130	20	150	75	130	205
	• Total Site Traffic	180	140	320	200	210	410
	• Existing Parking Lot Traffic	60	0	60	40	60	100
	• Net Site Traffic	120	140	260	160	150	310
Block 4 – 25 York Street	Retail (GFA 2,464 sq. m)						
	Office (GFA 58,925 sq. m)						
	• Commercial Parking (259 Stalls)	90	15	105	50	90	140
	▪ Trip Rates	0.35	0.05	0.40	0.2	0.35	0.55
	▪ Total Site Traffic	90	15	105	50	90	140
Pinnacle Centre – 33 Bay Street	• Residential (1770 Units – 799 Units constructed/occupied net 971 Units)						
	▪ Trip Rates	0.04	0.12	0.16	0.12	0.07	0.19
	▪ Total Trips	40	115	155	95	55	150
	• Commercial Parking (548 Stalls)						
	▪ Trip Rates	0.35	0.05	0.40	0.20	0.35	0.55
	▪ Total Trips	190	25	215	110	190	300
	• Total Site Traffic	220	120	340	205	245	450
Block 7A – 18 York Street	Office (GFA 56, 839 sq. m)						
	Retail (GFA 1,006 sq. m)						
	• Commercial Parking (191 Stalls)						
	▪ Total Site Traffic	115	5	120	20	95	115
Block 7B	Office (GFA 46,450 sq. m)						
	Hotel (560 Rooms)						
	Commercial Parking (155 Stalls)						
	▪ Total Site Traffic	105	55	160	95	125	220
Block 8 – 185 Bremner Blvd	• Residential (639 Units)						
	▪ Trip Rates	0.04	0.12	0.16	0.12	0.07	0.19
	▪ Total Site Traffic	25	75	100	75	45	120
Block 9A & 9B – 16 York Street	• Residential (1,096 Units)						
	▪ Trip Rates	0.04	0.12	0.16	0.12	0.07	0.19
	▪ Total Trips	45	130	175	130	80	210
	• Commercial Parking (377 Stalls)						
	▪ Trip Rates	0.35	0.05	0.40	0.15	0.25	0.40
	▪ Total Trips	130	20	150	55	95	150
	• Total Site Traffic	175	150	325	185	175	360
	• Existing Parking Lot Traffic	60	5	65	5	70	75
	• Net Site Traffic	115	145	260	180	105	285
Block 10 – 25 Lower Simcoe St.	• Residential (715 Units)						
	▪ Trip Rates	0.04	0.12	0.16	0.12	0.07	0.19
	▪ Total Site Traffic	30	85	115	85	50	135

Notes

1. Source: Traffic Impact Study report prepared by BA Group in January 2008 for the redevelopment of Blocks 9A and 9B (16 York Street)

Traffic generation characteristics and related volumes for the proposed condominium development considered as part of this evaluation are outlined in Table 12. Existing traffic activity levels related to the existing parking lot operation on the site that will be eliminated with redevelopment of the site are also shown.

Table 12
Trip Generation – MT27 Condominium Development

Development Site	Morning Peak Hour			Afternoon Peak Hour		
	In	Out	2 Way	In	Out	2 Way
MT27						
• Residential (1250 Units)						
▪ Trip rates	0.036	0.144	0.18	0.138	0.041	0.18
▪ Total Trips	45	180	225	175	50	225
Existing Traffic Removed [1]	242	50	292	105	260	365

Notes
1. Volumes reflect review of the existing driveway volumes recorded by Arup Canada Inc. (October 11, 2007) and available traffic counts on both the sides of the existing parking lot for traffic volume balancing.

Directional traffic distribution patterns for new condominium building related traffic are based upon those established for the East Bayfront Precinct as outlined in Section 4.3.1.3.

Traffic assignments of new traffic volumes generated by the MT27 condominium proposal for the morning and afternoon peak hours are summarized for the *South Side Transit* option on Figures B2(i) and B2(ii) respectively attached in Appendix B. Traffic volume assignments for *Centre Transit* option are summarized on Figures C2(i) and C2(ii) for the morning and afternoon peak hours respectively attached in Appendix C.

Appendix F

Signal Timing Plans

F1 Existing (City of Toronto)

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Fascimile: 416-397-5777

Location:	Lakeshore Blvd W & Spadina Ave
PX/SCN:	215 / 30511
Our Ref:	09022
Staff:	AKB/MQ
Date (YY/MM/DD):	09/02/18
Controller Type:	SP40
Mode of Control:	FXT
Design Walk Speed:	1.0 m/s
E/W FDW Duration:	18 secs
N/S FDW Duration:	9 secs
Issued To:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**				**SCOOT**				
Plan	A.M. Peak	OFF Peak	P.M. Peak	Friday Nigh	A.M. Peak 1	A.M. Peak 2	OFF Peak	P.M. Peak	Friday Night
Time of Operation	06:30-10:00, M-F	All Other Times	15:00-19:00, M-F	19:00-23:00, Fri	06:30-09:30, M-F	09:30-10:00, M-F	All Other Times	15:00-19:00, M-F	19:00-23:00
Signal Aspect									
East-West Phase									
EBG/EBLA(Ramp Only)/EWWK(South side)	71	16	26	25	12 - 83	12 - 51	12 - 83	12 - 51	12 - 83
EBG/EBLA(Ramp Only)/EWFD(South side)	18	18	18	18	18	18	18	18	18
EBY/EBLY(Ramp Only)/EWDW(South side)	4	4	4	4	4	4	4	4	4
ALLR	3	3	3	3	3	3	3	3	3
North-South Phase									
SBLA/SBG(Through)/NSDW(East side)/NSR(Transit)	18	9	31	32	6 - 77	6 - 45	6 - 77	6 - 45	6 - 77
SBYA/SBG(Through)/NSDW(East side)/NSR(Transit)	3	3	3	3	3	3	3	3	3
ALLR/SBG(Through)/NSDW(East side)/NSR(Transit)	3	3	3	3	3	3	3	3	3
NBG/SBG(Straight Thru Only)/NSWK(East side)/NSGA(Transit)	8	8	8	8	8 - 79	8 - 47	8 - 79	8 - 47	8 - 79
NBG/SBG(Straight Thru Only)/NSFD(East side)/NSGA(Transit)	9	9	9	9	9	9	9	9	9
NSY or NSDW/NSY(Transit)	4	4	4	4	4	4	4	4	4
ALLR	3	3	3	3	3	3	3	3	3
Cycle Length/Range	144	80	112	112	104 - 144	104 - 112	80 - 144	88 - 112	104-144

NOTES

SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Facsimile: 416-397-5777

Location:	Lake Shore Blvd W (EB) & Rees St
PX/SCN:	1408 / 30611
Our Ref:	09019
Staff:	NS / MQ
Date (YY/MM/DD):	09/02/16
Controller Type:	Novax
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
N/S FDW Duration:	16 sec
E/W FDW Duration:	15 sec
Issued to:	Transportation Infrastructure Planning (Penelope Palmer, P.Eng.)

Control Level	**TYPICAL**			**SCOOT**		
Plan	**AM**	**OFF**	**PM**	**AM**	**OFF**	**PM**
Time of Operation	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F
Signal Aspect						
North-South Phase						
*SBG/SBLA/NSWK (West Side)	-	-	14	-	-	14-26
*SBG/NSWK (West Side)	-	-	5	-	-	5
NSG/NSWK	11	16	11	11-42	11-34	11-23
NSG/NSFD	16	16	16	16	16	16
NSY/NSDW	4	4	4	4	4	4
ALLR	4	4	4	4	4	4
East-West Phase						
EBG/WBG/EWWK OR EWG/EWWK	28	28	25	13-44	13-36	13-25
EBG/WBG/EWFD OR EWG/EWFD	15	15	15	15	15	15
EBG/WBY/EWDW OR EBY/WBG/EWDW OR EWY/EWDW	4	4	4	4	4	4
EBG/WBR/EWDW OR EBR/WBG/EWDW OR ALLR	2	2	2	2	2	2
**EBG/EBLA/EWDW OR WBLA/WBG/EWDW OR EWLA/EWDW	22	9	6	6-37	6-29	6-18
**EBY/EBYA/EWDW; OR WBYA/WBY/EWDW OR EWYA/EWDW	3	3	3	3	3	3
**ALLR	3	3	3	3	3	3
Cycle Length/Range	112	104	112	96 - 112	88 - 104	88 - 112

NOTE
*SBLA callable 15:30-18:30 Mon-Fri. Unused time allocated to NSG.
**EB and WB lagging left-turn arrows can be called independently.
**EBLA served if no EW left-turn demand
SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments.
SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Facsimile: 416-397-5777

Location:	Lake Shore Boulevard W & Simcoe Street
PX/SCN:	1747 / 30621
Our Ref:	09022
Staff:	ML/PV
Date (Y/M/D):	2009/02/20
Controller Type:	NOVAX 18 cct
Mode of Control:	SA2-VMG
Design Walk Speed:	1.0 m/s
E/W FDW Duration:	12 sec
N/S FDW Duration:	18 sec
Issued to:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**			**SCOOT**	
Plan	A.M. Peak	OFF Peak	P.M. Peak	A.M. Peak	OFF Peak
Time of Operation	6:30-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15-10:00,M-F	All Other Times
Signal Aspect					
East-West Phase					
*EBLA/EBG/EWWK (South Leg Only)	7	7	7	7 - 41	7 - 33
*EBYA/EBG/EWWK or EBYA/EBG/EWWK(South Leg Only)	3	3	3	3	3
*EBLR/EBG/EWWK (South Leg Only)	3	3	3	3	3
EWG/EWWK or WBG/EBG/EWWK (Both Sides)	42	34	42	8 - 42	8 - 34
EWG/EWWK or WBG/EBG/EWFD (Both Sides) or EWG/EWFD	12	12	12	12	12
EWG/EWWK or WBY/EBG/EWDW or EWY/EWDW	4	4	4	4	4
ALLR	2	2	2	2	2
North-South Phase					
*NSG/NSDW or NSG/NSWK	14	14	14	14 - 48	14 - 40
NSG/NSDW or NSG or NSFD	18	18	18	0 - 18	0 - 18
NSY/NSDW	4	4	4	4	4
ALLR	3	3	3	3	3
Cycle Length/Range	112	104	112	96 - 112	88 - 104

NOTE

*EBLA callable 24 hours.Unused time allocated to EWG.

*EBLA phase and NS (Simcoe St.) phase can be called independently of each other.

NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is 14 seconds. If ongoing vehicle demand exists on the stopbar loop,the NSG is capable of providing vehicle extensions up to a maximum of 32 seconds. If a pedestrian call is received, the minimum NSG is 32 seconds.

SCOOT is capable of optimizing the NSG and providing up to 48 seconds during AM,PM peaks and 40 seconds during all other times (excluding the l vehicle extension of 18 seconds).

The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received.

SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128, by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Fascimile: 416-397-5777

Location:	Lake Shore Blvd Westbound & York St
PX/SCN:	205 / 30721
Our Ref:	09022
Staff:	NS/MQ
Date (Y/M/D):	09/02/26
Controller/Cabinet Type:	LS180
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
E/W FDW Duration:	15 seconds
N/S FDW Duration:	30 seconds
Issued To:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**				**SCOOT**			
Plan	**Post A.M. Peak**	**A.M. Peak**	**OFF Peak**	**P.M. Peak**	**Post A.M. Peak**	**A.M. Peak**	**OFF Peak**	**P.M. Peak**
Time of Operation	01:00-06:15, M-F	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F	01:00-06:15, M-F	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F
Signal Aspect								
East-West Phase								
WBG/WBSA/EWWK	17	21	17	26	4-35	4-29	4-21	9-43
WBG/WBSA/EWFD	15	15	15	15	15	15	15	15
WBY/EWDW	4	4	4	4	4	4	4	4
ALLR	2	2	2	2	2	2	2	2
North-South Phase								
* NBFG/NSDW	-	12	12	-	-	11-36	11-28	-
* NBSG/NSDW	-	3	3	-	-	3	3	-
NSG/NSWK	28	17	13	27	10-41	10-35	10-27	10-44
NSG/NSFD	30	30	30	30	30	30	30	30
NSY/NSDW	4	4	4	4	4	4	4	4
ALLR	4	4	4	4	4	4	4	4
Cycle Length/Range	104	112	104	112	88-104	96-112	88-104	88-112

NOTE
* NBFG is callable all times except 1:00 - 6:15 and 15:00 -19:00 daily. Unused time allocated to NSG/NSWK.
Double-intersection SCOOT node: York St at Lakeshore Blvd EB & WB.
SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: (416) 397-5770
Fascimile: (416) 397-5777

Location:	Lake Shore Boulevard (Westbound) & Bay Street
PX/SCN:	0212 / 30741
Our Ref.:	9022
Staff:	ML/MQ
Date (Y/M/D):	09/02/09
Controller Type:	LS180
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
N/S FDW Duration:	10 secs (West side), 11 secs (East side)
E/W FDW Duration:	11 secs (North side)
Issued To:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**			**SCOOT**		
Plan						
Time of Operation	6:30-10:00, M-F	All Other Times	15:00-19:00, M-F	6:15-10:00, M-F	All Other Times	15:00-19:00, M-F
Signal Aspect						
East-West Phase						
WBG/EWWK	25	25	26	7-38	10-30	10-38
WBG/EWFD	11	11	11	11	11	11
WBY/EWDW	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
North-South Phase						
*NBG/SBSA/NSWK (East side only.)	14	14	14	14	14	14
*NBG/SBSA/NSWK (East Side)/NSFD (West side only.)	10	10	10	10	10	10
*NBG/SBSA/NSWK (East Side)/NSDW (West side only.)	7	7	7	7	7	7
NBG/SBSA/SBRA/NSWK (East side only.)	20	12	19	7-38	7-27	7-35
NBG/SBSA/SBRA/NSFD (East side only.)	11	11	11	11	11	11
NBY/SBY/NSDW (East side only.)	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
Cycle Length/Range	112	104	112	96-112	88-104	88-112

NOTE:

Double-intersection SCOOT node: Bay at Lakeshore EB & WB

SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

*NSWK on West side is Fixed 18:30-23:00 M-F and 18:00-23:00 Weekends and callable all other times. If NSWK on West side is not called, unused time is allocated to NBG/SBSA/SBRA/NSWK (East Side Only)

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Facsimile: 416-397-5777

Location:	Lake Shore Blvd WB & Yonge St
PX/SCN:	211/30761
Our Ref:	9022
Staff:	ML/MQ
Date (Y/M/D):	09/02/20
Controller Type:	Econolite ASC-2100
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
N/S FDW Duration:	7 secs
E/W FDW Duration:	14 secs
Issued To:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**			**SCOOT**		
Plan	**AM**	**OFF**	**PM**	**AM**	**OFF**	**PM**
Time of Operation	06:30-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15-10:00, M-F	All Other times	15:00-19:00, M-F
Signal Aspect						
East-West Phase						
WBG/EWWK (South Side)	33	34	33	8-50	8-42	8-50
WBG/EWFD (South Side)	14	14	14	14	14	14
WBY	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
North-South Phase						
NBLA/NBG/NSWK (East Side Only)	6	6	6	6	6	6
NBYA//NBG/NSWK (East Side Only)	3	3	3	3	3	3
NBG/NSWK (East Side Only)	1	1	1	1	1	1
NSG/NSWK (Both Sides)	34	25	34	17-59	17-51	17-59
NSG/NSFD (Both Sides)	7	7	7	7	7	7
NSY	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
Cycle Length/Range	112	104	112	96-112	88-104	88-112

NOTE
Double intersection SCOOT node: Yonge & Lakeshore EB & WB
SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd., Fifth Floor, Toronto ON M3C 3N3
Telephone: (416) 397-5770
Facsimile: (416) 397-5777

Location:	Lake Shore Boulevard (Eastbound) & Bay Street
PX / SCN:	0213 / 30731
Our Ref.:	09022
Staff:	AKB/MQ
Date (Y/M/D):	09/02/18
Controller Type:	SP40
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
N/S FDW Duration:	12 seconds
E/W FDW Duration:	9 seconds
Issued to:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**			**SCOOT**		
Plan	**AM**	**OFF**	**PM**	**AM**	**OFF**	**PM**
Time of Operation	06:30-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F
Signal Aspect						
East-West Phase						
EBSA/EBLA/EBRA/EWWK (South Side)	50	25	27	37-65	9-29	9-37
EBSA/EBLA/EBRA/EWFD (South Side)	9	9	9	9	9	9
EBY/EWDW	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
North-South Phase						
NSG/NSWK (West Side)	27	44	50	12-40	40-60	40-68
NSG/NSFD (West Side)	12	12	12	12	12	12
NSY/NSDW	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
Cycle Length/Range	112	104	112	96-112	88-104	88-112

NOTE:

Double-intersection SCOOT node: Bay at Lakeshore EB & WB.

SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Facsimile: 416-397-5777

Location:	Lake Shore Boulevard (Eastbound) & Yonge Street / Harbour Street
PX/SCN:	1541/30751
Our Ref:	09022
Staff:	NS/MQ
Date (Y/M/D):	09/02/26
Controller Type:	SP40
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s
N/S FDW Duration:	11 sec
E/W FDW Duration:	16 sec
Issued To:	ARUP (Marc-Paul Gauthier)

Control Level	TYPICAL			SCOOT		
Plan	AM	OFF	PM	AM	OFF	PM
Time of Operation	06:30-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15 - 10:00, M-F	All Other Times	15:00 - 19:00, M-F
Signal Aspect						
Easbound Phase						
EBG/EWWK (South Side Only)	39	39	39	21-56	21-48	21-56
EBG/EWFD (South Side Only)	16	16	16	16	16	16
EBY/EWDW	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
North-South Phase						
SBSA/NBG/NSWK	32	24	32	15-50	15-42	15-50
SBSA/NBG/NSFD	11	11	11	11	11	11
SBY/NBY/NSDW	4	4	4	4	4	4
ALLR	3	3	3	3	3	3
Cycle Length/Range	112	104	112	96 - 112	88 - 104	88 - 112

NOTE

SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above 128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Fifth Floor, Toronto ON M3C 3N3
Telephone: 416-397-5770
Fascimile: 416-397-5777

Location:	Lake Shore Blvd.Eastbound & York Street
PX/SCN:	204 / 30711
Our Ref:	9022
Staff:	ML/MQ
Date (Y/M/D):	2009/02/20
Controller Type:	SP40
Mode of Control:	FXT
Design Walk Speed:	1.2 m/s (FDW based on full crossing)
E/W FDW Duration:	14 sec
N/S FDW Duration:	12 sec
Issued to:	ARUP (Marc-Paul Gauthier)

Control Level	**TYPICAL**			**SCOOT**		
Plan	AM Peak	OFF Peak	PM Peak	AM Peak	OFF Peak	PM Peak
Time of Operation	06:15-10:00, M-F	All Other Times	15:00-19:00, M-F	06:15-10:00, M -F	All Other Times	15:00-19:00, M-F
Signal Aspect						
East-West Phase						
EBG/EWWK	25	18	24	22 - 52	18 - 44	23 - 47
EBG/EWFD	14	14	14	14	14	14
EBY/EWDW	4	4	4	4	4	4
ALLR	2	2	2	2	2	2
North-South Phase						
*SBLA/SBG/NSWK (West Side)	12	12	22	7 -37	7 - 33	12 - 36
*SBYA/SBG/NSWK (West Side)	2	2	2	2	2	2
*SBG/NSWK (West Side)	2	2	2	2	2	2
NSG/NSWK(Both Sides)	31	30	22	9 - 39	9 - 35	9 - 33
NSG/NSFD	12	12	12	12	12	12
NSY/NSDW	4	4	4	4	4	4
ALLR	4	4	4	4	4	4
Cycle Length/Range	112	104	112	96-112	88-104	88-112

NOTE
*SBLA Callable 24 hours.Unused time allocated to NSG.
SCOOT cycle lengths between 32-64 may change by 4 second increments, between 64-128 by 8 second increments and above
128 by 16 second increments. SCOOT may change the cycle length by one increment at a time every 150 seconds.

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777

CURRENT SIGNAL TIMING INFORMATION

Intersection: Queen's Quay & Spadina Avenue
PX: 4001
Date (Y/M/D): 2009/02/10
Our Ref: 09019
Staff: ML/MQ
System: AMSS
Mode of Control: FXT
Design Walk Speed: 1.0 m/s
Issued to: ARUP (Marc-Paul Gauthier)
Controller Type: Econolite ASC2

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
	SBRT (TTC) SBLT (TTC) WBRT (TTC)	SBRT (Vehicle) SBLR (Vehicle) NS (Pedestrian Both Side)	SBRT (TTC) SBLT (TTC) EBRT (TTC)	EB (Vehicle) EBLT (Vehicle)	EB (Vehicle) EBLT (TTC)	EW (TTC & Vehicle) EW (Pedestrian North Side)
Minimum Green	7	35	7	8	7	36
Maximum Green	8	35	8	14	20	36
Amber	-	4	-	4	-	4
All Red	7	3	7	3	7 (EBTR)	3
Walk	-	20	-	-	-	17
Flashing Don't Walk	-	15	-	-	-	19

Comments:
Phase 1 & 3 are callable by SB & WB transit loops.
Phase 2 & 6 are the fixed phases.
Phase 3 is callable by SB & WB transit loop.
Phase 4 is callable by EBLT vehicle.
Phase 5 is callable by EB transit loop.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES

TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS

703 Don Mills Rd, Toronto ON M3C 3N3

Phone: (416) 397-5770

Fascimile: (416) 397-5777

Intersection:	**Queens Quay & Rees Street**	**Our Ref.:**	**9022**	**PX:**	**4003**
Date (Y/M/D):	**2009/02/20**	**M.O.C.:**	**SAP**	**Staff:**	**ML/MQ**
System:	**A.M.S.S.**			**Design Walk Speed:**	**1.0 m/s**
Issued To:	**ARUP (Marc-Paul Gauthier)**			**Controller Type:**	**Econolite ASC2**

	Phase 1	Phase 2	Phase 3	Phase 4
	E/W	EW - Transit	N/S	EW - Transit
Minimum Green	17	7	27	7
Maximum Green	27	8	27	8
Amber	4	4	4	4
All Red	3	3	3	3
Walk	7	-	10	-
Flashing Don't Walk	10	-	17	-

Comments: Phase 1 is fixed.

Phase 2 & 4 are callable by EW transit loops.

Phase 3 is callable by NS stop-bar loops.

Signal maintains Phase 1 until EW transit or NS mixed traffic demanded.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397-5770
Fascimile: (416) 397-5777

Intersection:	**Queens Quay & Simcoe Street**	**Our Ref.:**	**9022**	**PX:**	**4004**
Date (yy/mm/dd):	**09/02/20**	**M.O.C.:**	**SAP**	**Staff:**	**ML**
System:	**A.M.S.S.**			**Design Walk Speed:**	**1.0 m/s**
Issued To:	**ARUP (Marc-Paul Gauthier)**			**Controller Type:**	**Econolite ASC2**

	Phase 1	Phase 2	Phase 3	Phase 4
	E/W	Transit Only	N/S	Transit Only
Minimum Green	31	7	29	7
Maximum Green	31	8	29	8
Amber	4	4	4	4
All Red	3	3	3	3
Walk	20	-	11	-
Flashing Don't Walk	11	-	18	-

Comments: Phase 2, 3 & 4 are callable.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES

TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS

703 Don Mills Rd, Toronto ON M3C 3N3

Phone: (416) 397-5770

Fascimile: (416) 397-5777

Intersection: Queens Quay & York Street | **Our Ref.:** 09022 | **PX:** 4005

Date (yy/mm/dd): 09/02/20 | **M.O.C.:** FXT | **Staff:** ML

System: A.M.S.S. | **Design Walk Speed:** 1.0 m/s

Issued To: ARUP (Marc-Paul Gauthier) | **Controller Type:** Econolite ASC2

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 7
	E/W	E/W - Transit	N/S	E/W - Transit	EB - EBLT
Minimum Green	25	7	28	7	6
Maximum Green	25	8	28	8	10
Amber	4	4	4	4	3
All Red	3	3	3	3	2
Walk	9	-	10	-	-
Flashing Don't Walk	16	-	18	-	-

Comments: Phase 2 & 4 are callable by E/W transit loop

Phase 7 - callable by stopbar loop (7:00-9:00,M-F)

If no EW transit demand, signal cycles between phases 1 & 3.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397-5770
Fascimile: (416) 397-5777

Intersection:	**Queens Quay & Waterpark Place**	**Our Ref.:**	**09022**	**PX:**	**4006**
Date (YY/MM/DD):	**09/02/26**	**M.O.C.:**	**SAP**	**Staff:**	**NS / JS**
System:	**A.M.S.S.**			**Design Walk Speed:**	**1.0 m/s**
Issued To:	**ARUP (Marc-Paul Gauthier)**			**Controller Type:**	**Econolite ASC2**

	Phase 1	Phase 2	Phase 3	Phase 4
	E/W	EW - Transit	N/S	EW - Transit
Minimum Green	36	7	27	7
Maximum Green	50	8	27	8
Amber	4	4	4	4
All Red	3	3	3	3
Walk	27	-	10	-
Flashing Don't Walk	9	-	17	-

Comments: Phase 2 & 4 are callable by E/W transit loops.
Phase 3 is callable by N/S stop-bar loops.
Signal maintains Phase 1 until EW transit or NS mixed traffic is demanded.

SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397-5770
Fascimile: (416) 397-5777

Intersection:	**Queen's Quay & Bay Street**			**PX:**	**4007**
Date (YY/MM/DD):	**09/02/26**	**Our Ref.:**	**09022**	**Staff:**	**NS / MQ**
System:	**A.M.S.S.**	**M.O.C.:**	**FXT**	**Design Walk Speed:**	**1.0 m/s**
Issue To:	**ARUP (Marc-Paul Gauthier)**			**Controller Type:**	**Econolite ASC2**

	Phase 1	Phase 2	Phase 3
	EB / EBLA	EW	NS
Minimum Green	6	27	29
Maximum Green	12	27	29
Amber	3	4	4
All Red	2	3	3
Walk	-	15	14
Flashing Don't Walk	-	12	15

Comments: Phase 1 is callable.
Phase 2 & 3 are fixed.

SIGNAL TIMING INFORMATION
CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: 416-397-5770
Fascimile:416-397-5777

Intersection: QUEEN'S QUAY & YONGE ST. **PX:** 1588
Date (YY/MM/DD): 09/02/26 **Our Ref:** 09022 **Staff:** NS / MQ
System: MTSS **MOC:** FXT
Issued to: ARUP (Marc-Paul Gauthier)

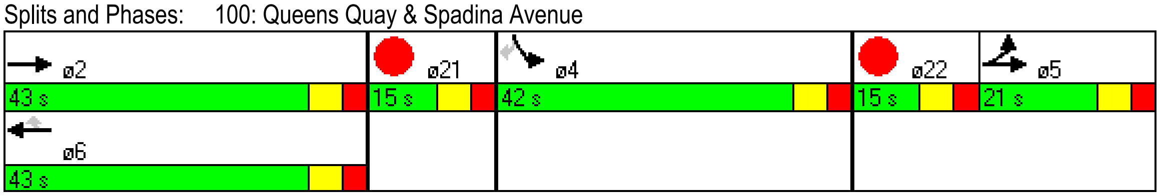
PLAN	AM PEAK	OFF PEAK	PM PEAK
TIME PERIOD	0645 - 0930 Mon - Fri	All Other Times	1545 - 1830 Mon - Fri
E-W PHASE			
EWG/EWWK	31	25	31
EWG/EWFD	10	10	10
EWY/EWDW	4	4	4
ALLR	2	2	2
N-S PHASE			
SBG/NSWK	16	12	16
SBG/NSFD	11	11	11
SBY/NSDW	3	3	3
ALLR	3	3	3
CYCLE LENGTH	80	70	80
OFFSETS(E-W)	44	41	60

F2 Do Nothing

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2	ø21	ø22
Lane Configurations									
Volume (vph)	70	580	355	90	120	60			
Turn Type	Prot			Perm		Perm			
Protected Phases	5	2 5	6		4		2	21	22
Permitted Phases				6		4			
Detector Phase	5	2 5	6	6	4	4			
Switch Phase									
Minimum Initial (s)	8.0		10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	15.0		43.0	43.0	42.0	42.0	43.0	14.0	14.0
Total Split (s)	21.0	64.0	43.0	43.0	42.0	42.0	43.0	15.0	15.0
Total Split (%)	15.4%	47.1%	31.6%	31.6%	30.9%	30.9%	32%	11%	11%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0			
Lead/Lag	Lag								Lead
Lead-Lag Optimize?									
Recall Mode	None		Max	Max	Max	Max	Max	None	None

Intersection Summary
Cycle Length: 136
Actuated Cycle Length: 117.2
Natural Cycle: 130
Control Type: Semi Act-Uncoord

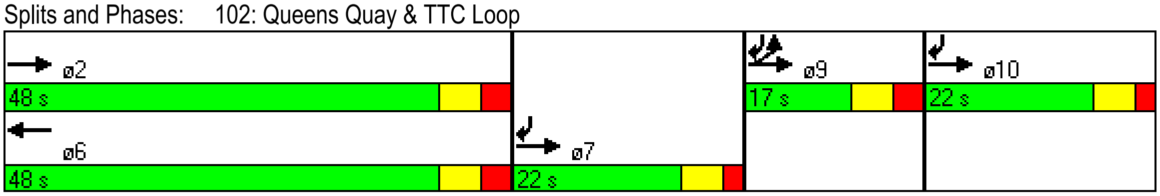
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	EBL	EBT	WBT	SBR	ø2	ø7	ø10
Lane Configurations							
Volume (vph)	25	675	375	70			
Turn Type	Prot			custom			
Protected Phases	9	2 7 9 10	6	7 9 10	2	7	10
Permitted Phases							
Detector Phase	9	2 7 9 10	6	7 9 10			
Switch Phase							
Minimum Initial (s)	7.0		10.0		10.0	7.0	7.0
Minimum Split (s)	14.0		37.0		37.0	13.0	13.0
Total Split (s)	17.0	109.0	48.0	61.0	48.0	22.0	22.0
Total Split (%)	15.6%	100.0%	44.0%	56.0%	44%	20%	20%
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	3.0		3.0		3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	6.0			
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None		Max		Max	None	None

Intersection Summary
Cycle Length: 109
Actuated Cycle Length: 107.6
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 102: Queens Quay & TTC Loop

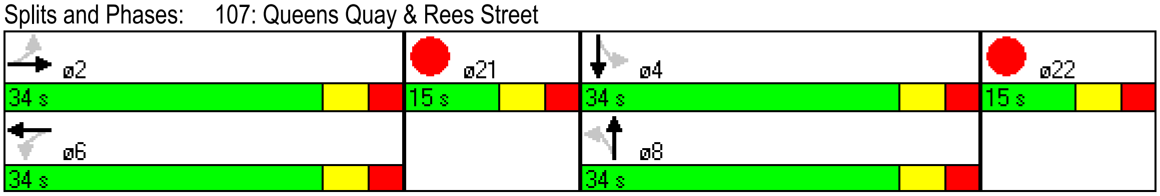


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations										
Volume (vph)	85	580	20	330	10	15	45	10		
Turn Type	Perm		Perm		Perm		Perm			
Protected Phases		2		6		8		4	21	22
Permitted Phases	2		6		8		4			
Detector Phase	2	2	6	6	8	8	4	4		
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	24.0	34.0	34.0	34.0	34.0	14.0	14.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	15.0	15.0
Total Split (%)	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	15%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	None	None	None	None	None	None

Intersection Summary

Cycle Length: 98
Actuated Cycle Length: 68.9
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Description: Queen's Quay / Rees / Radisson West

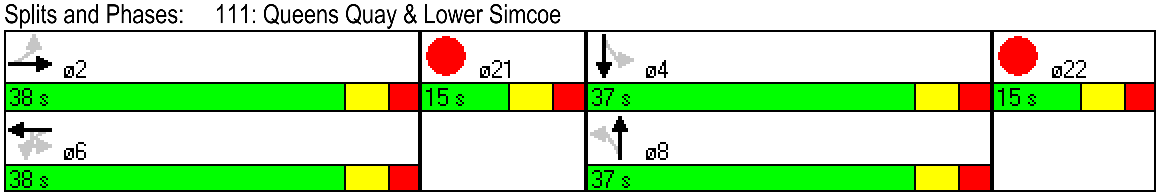
Splits and Phases: 107: Queens Quay & Rees Street



Lane Group	EBL	EBT	WBU	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations											
Volume (vph)	40	590	30	55	390	5	0	55	35		
Turn Type	Perm		Perm	Perm		Perm		Perm			
Protected Phases		2			6		8		4	21	22
Permitted Phases	2		6	6		8		4			
Detector Phase	2	2	6	6	6	8	8	4	4		
Switch Phase											
Minimum Initial (s)	31.0	31.0	31.0	31.0	31.0	4.0	4.0	29.0	29.0	7.0	7.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	36.0	36.0	36.0	36.0	14.0	14.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0	37.0	37.0	37.0	37.0	15.0	15.0
Total Split (%)	36.2%	36.2%	36.2%	36.2%	36.2%	35.2%	35.2%	35.2%	35.2%	14%	14%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None	None

Intersection Summary
Cycle Length: 105
Actuated Cycle Length: 81.4
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Description: Queen's Quay / Lower Simcoe / Harbourfront East

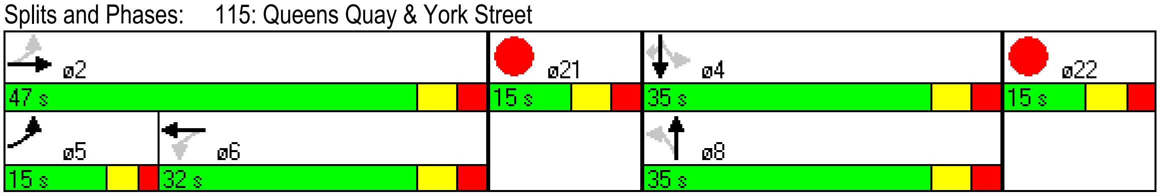
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	ø21	ø22
Lane Configurations											
Volume (vph)	110	545	15	450	20	40	100	10	110		
Turn Type	pm+pt		Perm		Perm		Perm		Perm		
Protected Phases	5	2		6		8		4		21	22
Permitted Phases	2		6		8		4		4		
Detector Phase	5	2	6	6	8	8	4	4	4		
Switch Phase											
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	11.0	32.0	32.0	32.0	35.0	35.0	35.0	35.0	35.0	14.0	14.0
Total Split (s)	15.0	47.0	32.0	32.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0
Total Split (%)	13.4%	42.0%	28.6%	28.6%	31.3%	31.3%	31.3%	31.3%	31.3%	13%	13%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes		Yes	Yes							
Recall Mode	None	Max	Max	Max	Max	Max	Max	Max	Max	None	None

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 93.2
Natural Cycle: 110
Control Type: Semi Act-Uncoord

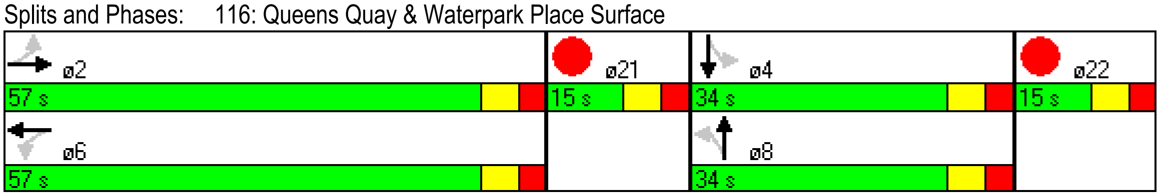
Splits and Phases: 115: Queens Quay & York Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations										
Volume (vph)	45	605	15	560	45	0	20	0		
Turn Type	Perm		Perm		Perm		Perm			
Protected Phases		2		6		8		4	21	22
Permitted Phases	2		6		8		4			
Detector Phase	2	2	6	6	8	8	4	4		
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	43.0	43.0	43.0	43.0	34.0	34.0	34.0	34.0	14.0	14.0
Total Split (s)	57.0	57.0	57.0	57.0	34.0	34.0	34.0	34.0	15.0	15.0
Total Split (%)	47.1%	47.1%	47.1%	47.1%	28.1%	28.1%	28.1%	28.1%	12%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	None	None	None	None	Ped	Ped

Intersection Summary
Cycle Length: 121
Actuated Cycle Length: 100.3
Natural Cycle: 105
Control Type: Semi Act-Uncoord

Splits and Phases: 116: Queens Quay & Waterpark Place Surface



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	115	520	50	675	5	65	80	10	340
Turn Type	pm+pt		Perm		Perm		Perm		Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	17.0	51.0	34.0	34.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	19.5%	58.6%	39.1%	39.1%	41.4%	41.4%	41.4%	41.4%	41.4%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	Max	Max	Max	None	None	None	None	None

Intersection Summary

Cycle Length: 87

Actuated Cycle Length: 79.4

Natural Cycle: 85

Control Type: Semi Act-Uncoord

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	200	400	735	95	240
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (%)	58.8%	58.8%	58.8%	41.3%	41.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max

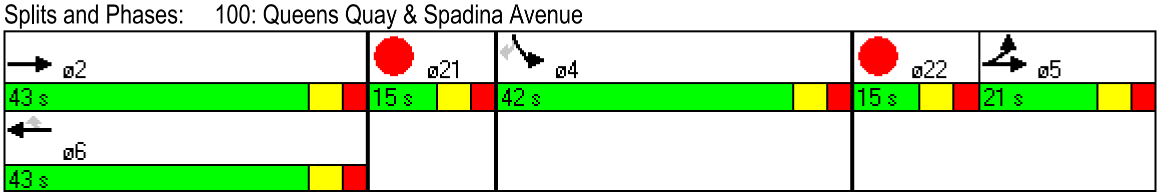
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Pretimed

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2	ø21	ø22
Lane Configurations									
Volume (vph)	70	645	580	155	95	95			
Turn Type	Prot			Perm		Perm			
Protected Phases	5	2 5	6		4		2	21	22
Permitted Phases				6		4			
Detector Phase	5	2 5	6	6	4	4			
Switch Phase									
Minimum Initial (s)	7.0		36.0	36.0	35.0	35.0	36.0	7.0	7.0
Minimum Split (s)	14.0		43.0	43.0	42.0	42.0	43.0	14.0	14.0
Total Split (s)	21.0	64.0	43.0	43.0	42.0	42.0	43.0	15.0	15.0
Total Split (%)	15.4%	47.1%	31.6%	31.6%	30.9%	30.9%	32%	11%	11%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0			
Lead/Lag	Lag								Lead
Lead-Lag Optimize?									
Recall Mode	None		Max	Max	Max	Max	Max	None	None

Intersection Summary
Cycle Length: 136
Actuated Cycle Length: 117.2
Natural Cycle: 130
Control Type: Semi Act-Uncoord

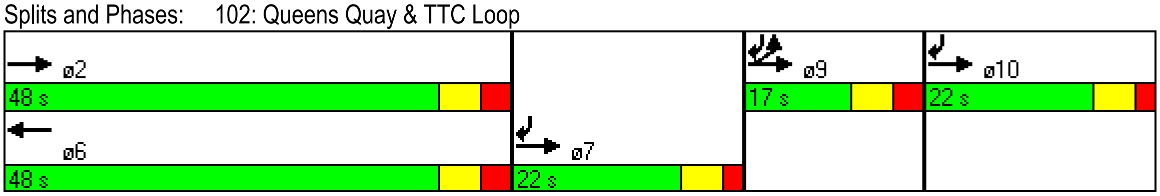
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	EBL	EBT	WBT	SBR	ø2	ø7	ø10
Lane Configurations							
Volume (vph)	45	695	685	50			
Turn Type	Prot			custom			
Protected Phases	9	2 7 9 10	6	7 9 10	2	7	10
Permitted Phases							
Detector Phase	9	2 7 9 10	6	7 9 10			
Switch Phase							
Minimum Initial (s)	7.0		10.0		10.0	7.0	7.0
Minimum Split (s)	14.0		37.0		37.0	13.0	13.0
Total Split (s)	17.0	109.0	48.0	61.0	48.0	22.0	22.0
Total Split (%)	15.6%	100.0%	44.0%	56.0%	44%	20%	20%
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0
All-Red Time (s)	3.0		3.0		3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	6.0			
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	None		Max		Max	None	None

Intersection Summary
Cycle Length: 109
Actuated Cycle Length: 106.8
Natural Cycle: 80
Control Type: Semi Act-Uncoord

Splits and Phases: 102: Queens Quay & TTC Loop

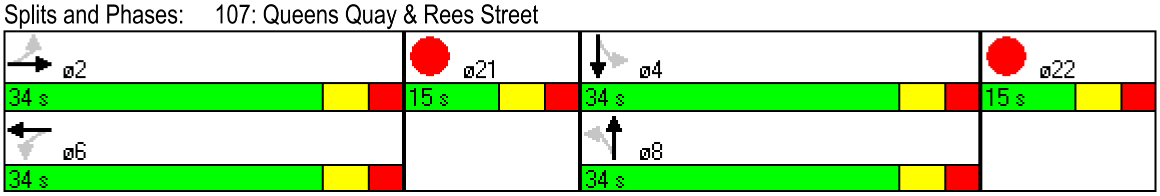


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations										
Volume (vph)	110	570	30	610	15	25	50	15		
Turn Type	Perm		Perm		Perm		Perm			
Protected Phases		2		6		8		4	21	22
Permitted Phases	2		6		8		4			
Detector Phase	2	2	6	6	8	8	4	4		
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	24.0	24.0	24.0	24.0	34.0	34.0	34.0	34.0	14.0	14.0
Total Split (s)	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0	15.0	15.0
Total Split (%)	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	34.7%	15%	15%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	None	None	None	None	None	None

Intersection Summary

Cycle Length: 98
Actuated Cycle Length: 66.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Description: Queen's Quay / Rees / Radisson West

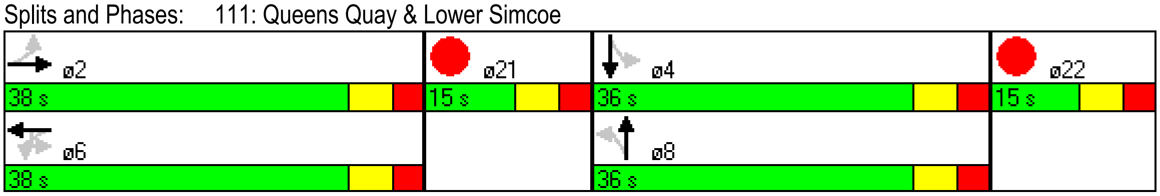
Splits and Phases: 107: Queens Quay & Rees Street



Lane Group	EBL	EBT	WBU	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations											
Volume (vph)	65	585	50	20	650	15	45	65	5		
Turn Type	Perm		Perm	Perm		Perm		Perm			
Protected Phases		2			6		8		4	21	22
Permitted Phases	2		6	6		8		4			
Detector Phase	2	2	6	6	6	8	8	4	4		
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	36.0	36.0	36.0	36.0	14.0	14.0
Total Split (s)	38.0	38.0	38.0	38.0	38.0	36.0	36.0	36.0	36.0	15.0	15.0
Total Split (%)	36.5%	36.5%	36.5%	36.5%	36.5%	34.6%	34.6%	34.6%	34.6%	14%	14%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	Max	Max	Max	Max	Max	None	None	None	None	None	None

Intersection Summary
Cycle Length: 104
Actuated Cycle Length: 62.1
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Description: Queen's Quay / Lower Simcoe / Harbourfront East

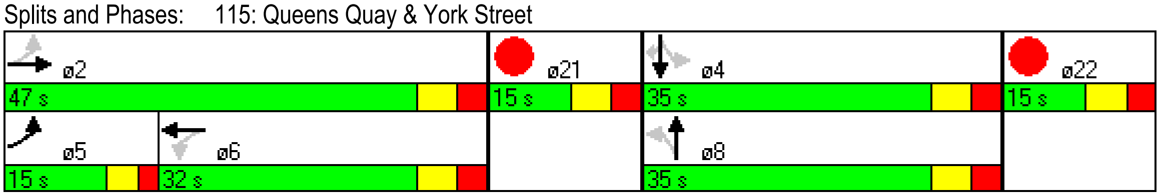
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	ø21	ø22
Lane Configurations											
Volume (vph)	90	625	5	705	10	15	55	20	115		
Turn Type	pm+pt		Perm		Perm		Perm		Perm		
Protected Phases	5	2		6		8		4		21	22
Permitted Phases	2		6		8		4		4		
Detector Phase	5	2	6	6	8	8	4	4	4		
Switch Phase											
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	11.0	32.0	32.0	32.0	35.0	35.0	35.0	35.0	35.0	14.0	14.0
Total Split (s)	15.0	47.0	32.0	32.0	35.0	35.0	35.0	35.0	35.0	15.0	15.0
Total Split (%)	13.4%	42.0%	28.6%	28.6%	31.3%	31.3%	31.3%	31.3%	31.3%	13%	13%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag	Lead		Lag	Lag							
Lead-Lag Optimize?	Yes		Yes	Yes							
Recall Mode	None	Max	Max	Max	Max	Max	Max	Max	Max	None	None

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 93.2
Natural Cycle: 110
Control Type: Semi Act-Uncoord

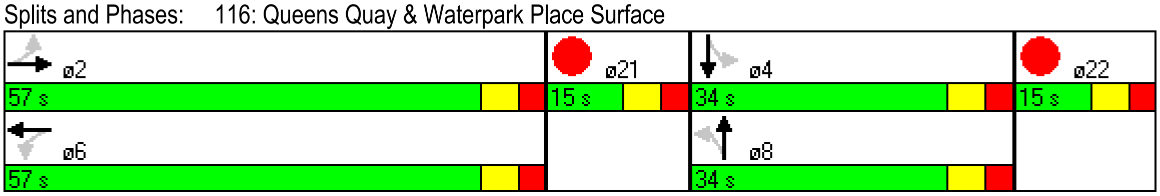
Splits and Phases: 115: Queens Quay & York Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø21	ø22
Lane Configurations										
Volume (vph)	15	660	20	810	10	0	175	0		
Turn Type	Perm		Perm		Perm		Perm			
Protected Phases		2		6		8		4	21	22
Permitted Phases	2		6		8		4			
Detector Phase	2	2	6	6	8	8	4	4		
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	43.0	43.0	43.0	43.0	34.0	34.0	34.0	34.0	14.0	14.0
Total Split (s)	57.0	57.0	57.0	57.0	34.0	34.0	34.0	34.0	15.0	15.0
Total Split (%)	47.1%	47.1%	47.1%	47.1%	28.1%	28.1%	28.1%	28.1%	12%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	Max	Max	Max	Max	None	None	None	None	None	None

Intersection Summary
Cycle Length: 121
Actuated Cycle Length: 102.2
Natural Cycle: 105
Control Type: Semi Act-Uncoord

Splits and Phases: 116: Queens Quay & Waterpark Place Surface



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Volume (vph)	185	720	50	675	5	20	95	30	120
Turn Type	pm+pt		Perm		Perm		Perm		Perm
Protected Phases	5	2		6		8		4	
Permitted Phases	2		6		8		4		4
Detector Phase	5	2	6	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0	36.0
Total Split (s)	17.0	51.0	34.0	34.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	19.5%	58.6%	39.1%	39.1%	41.4%	41.4%	41.4%	41.4%	41.4%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead		Lag	Lag					
Lead-Lag Optimize?	Yes		Yes	Yes					
Recall Mode	None	Max	Max	Max	Max	Max	Max	Max	Max

Intersection Summary
Cycle Length: 87
Actuated Cycle Length: 87
Natural Cycle: 85
Control Type: Semi Act-Uncoord

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	185	625	645	155	355
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	41.0	41.0	41.0	27.0	27.0
Minimum Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (%)	58.8%	58.8%	58.8%	41.3%	41.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Max	Max	Max	Max	Max

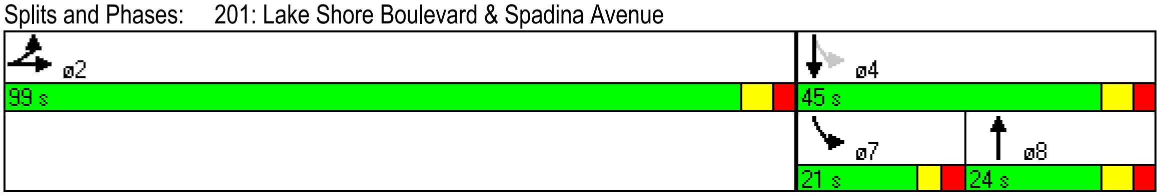
Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 4:SBL and 8:, Start of Green
Natural Cycle: 80
Control Type: Pretimed

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	1520	2530	70	165	115
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	96.0	96.0	24.0	16.0	24.0
Total Split (s)	99.0	99.0	24.0	21.0	45.0
Total Split (%)	68.8%	68.8%	16.7%	14.6%	31.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 144
Actuated Cycle Length: 144
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

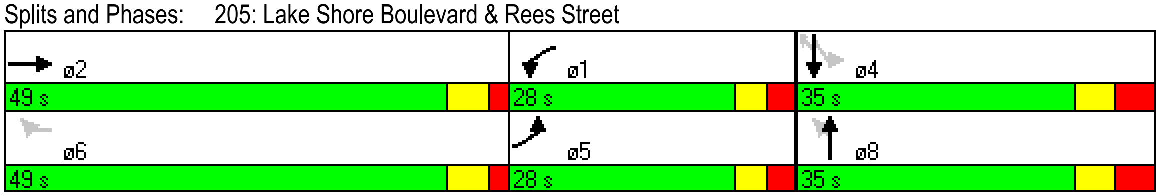
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	470	2275	10	940	10	65	190	55	10
Turn Type	Prot		Prot	custom	Perm		Perm		Perm
Protected Phases	5	2	1			8		4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	22.0	10.0	22.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	25.0%	43.8%	25.0%	43.8%	31.3%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 44 (39%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1130	25	30	95	25	1010
Turn Type	Prot		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases			8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	Max

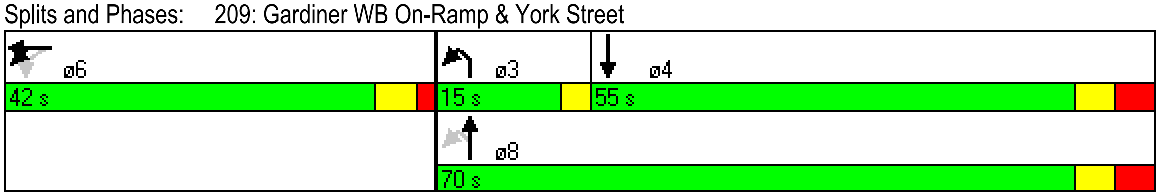
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 99 (88%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1090	595	100	895	250
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	12.0	10.0	10.0
Minimum Split (s)	42.0	42.0	15.0	55.0	55.0
Total Split (s)	42.0	42.0	15.0	70.0	55.0
Total Split (%)	37.5%	37.5%	13.4%	62.5%	49.1%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 2 (2%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

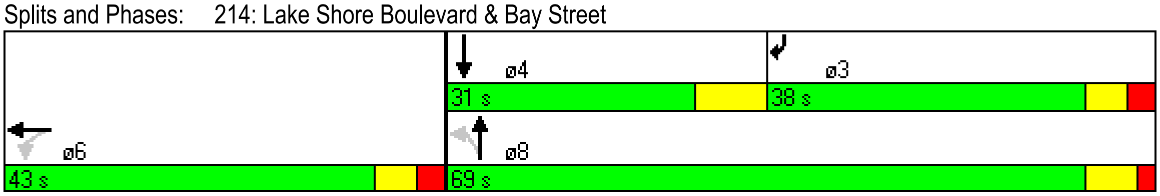
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2005	145	675	245	265
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	43.0	38.0	38.0	31.0	38.0
Total Split (s)	43.0	69.0	69.0	31.0	38.0
Total Split (%)	38.4%	61.6%	61.6%	27.7%	33.9%
Yellow Time (s)	4.0	5.0	5.0	7.0	4.0
All-Red Time (s)	3.0	2.0	2.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 92 (82%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

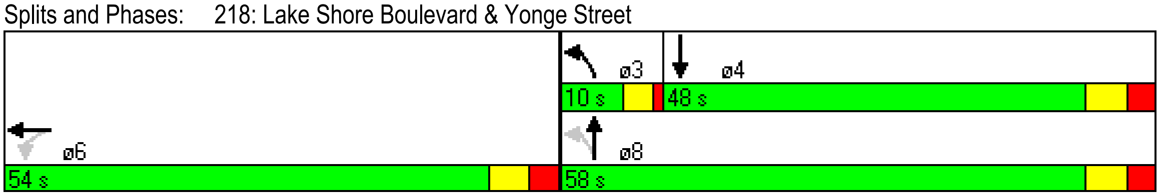
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	2060	110	1170	135
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	54.0	10.0	48.0	48.0
Total Split (s)	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 66 (59%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

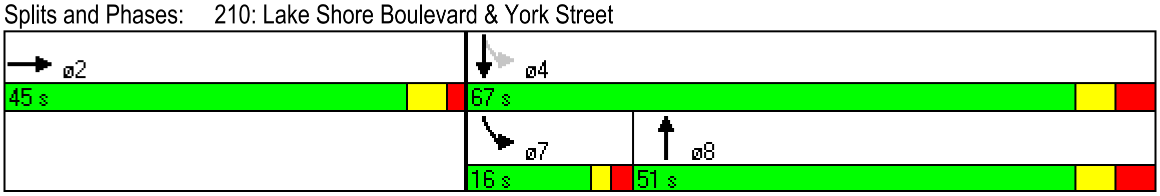
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1215	1015	155	190
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	45.0	51.0	16.0	51.0
Total Split (s)	45.0	51.0	16.0	67.0
Total Split (%)	40.2%	45.5%	14.3%	59.8%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 8 (7%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 210: Lake Shore Boulevard & York Street

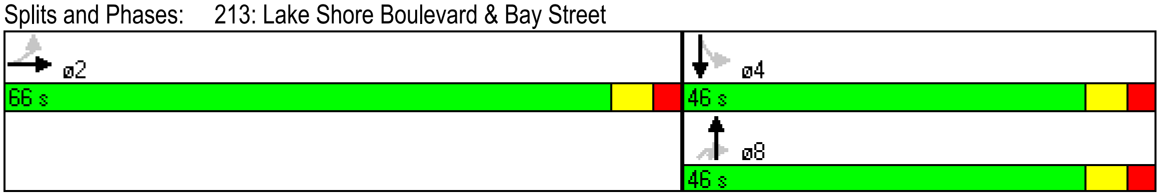


Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	820	1075	340	175	275	605	180
Turn Type	Perm			Perm		custom	custom
Protected Phases		2	8!		4!		
Permitted Phases	2			4		8!	8
Detector Phase	2	2	8	4	4	8	8
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	66.0	66.0	46.0	46.0	46.0	46.0	46.0
Total Split (s)	66.0	66.0	46.0	46.0	46.0	46.0	46.0
Total Split (%)	58.9%	58.9%	41.1%	41.1%	41.1%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 3 (3%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

! Phase conflict between lane groups.

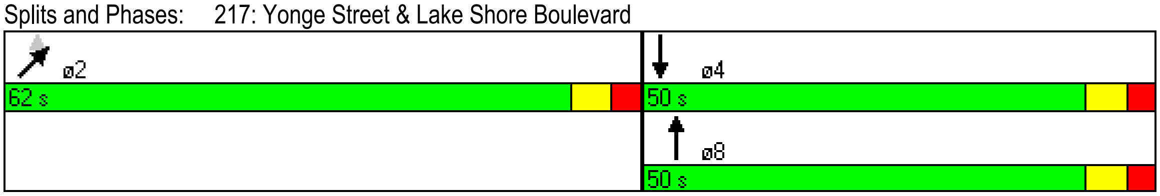
Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	170	240	1100	705
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	50.0	50.0	62.0	62.0
Total Split (s)	50.0	50.0	62.0	62.0
Total Split (%)	44.6%	44.6%	55.4%	55.4%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 109 (97%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

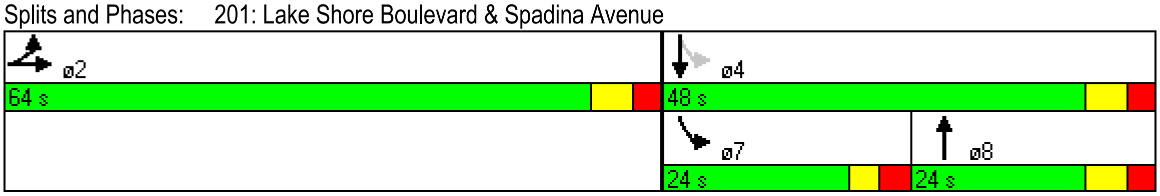
Splits and Phases: 217: Yonge Street & Lake Shore Boulevard



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	825	2095	200	280	40
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	51.0	51.0	24.0	12.0	24.0
Total Split (s)	64.0	64.0	24.0	24.0	48.0
Total Split (%)	57.1%	57.1%	21.4%	21.4%	42.9%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 105 (94%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

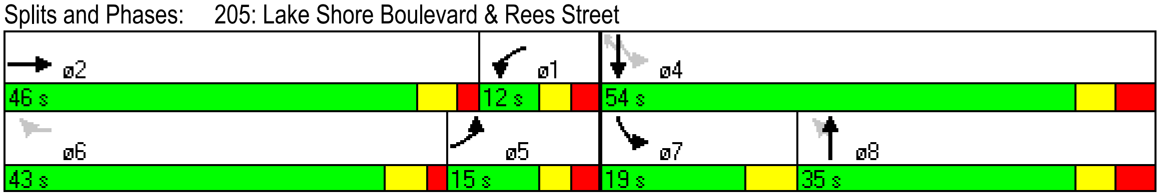
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	260	2110	25	1815	25	65	460	115	30
Turn Type	Prot		Prot	custom	Perm		pm+pt		Perm
Protected Phases	5	2	1			8	7	4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	7	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	14.0	10.0	10.0
Minimum Split (s)	12.0	34.0	12.0	34.0	35.0	35.0	19.0	35.0	35.0
Total Split (s)	15.0	46.0	12.0	43.0	35.0	35.0	19.0	54.0	54.0
Total Split (%)	13.4%	41.1%	10.7%	38.4%	31.3%	31.3%	17.0%	48.2%	48.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	5.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	5.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 42 (38%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1065	80	80	140	60	1820
Turn Type	Prot		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases			8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	Max

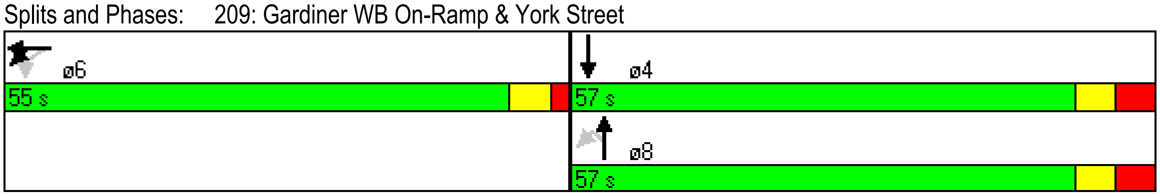
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 100 (89%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1870	655	160	620	585
Turn Type	Split		Perm		
Protected Phases	6	6		8	4
Permitted Phases			8		
Detector Phase	6	6	8	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	55.0	55.0	55.0
Total Split (s)	55.0	55.0	57.0	57.0	57.0
Total Split (%)	49.1%	49.1%	50.9%	50.9%	50.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	8.0	8.0	8.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 106 (95%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

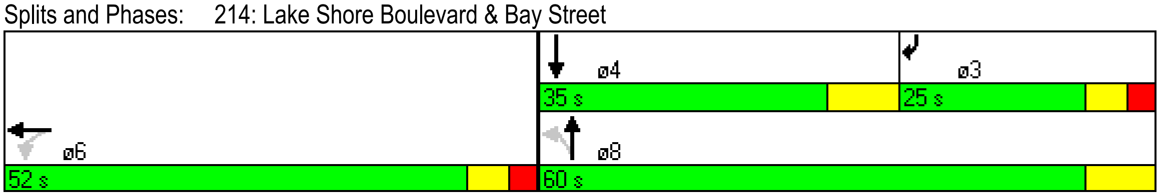
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2220	115	525	335	455
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0
Minimum Split (s)	28.0	31.0	31.0	31.0	25.0
Total Split (s)	52.0	60.0	60.0	35.0	25.0
Total Split (%)	46.4%	53.6%	53.6%	31.3%	22.3%
Yellow Time (s)	4.0	7.0	7.0	7.0	4.0
All-Red Time (s)	3.0	0.0	0.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 88 (79%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

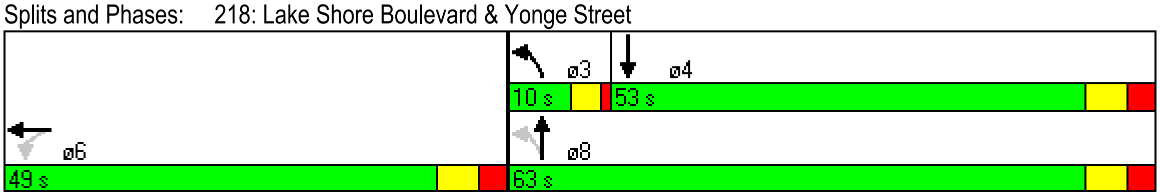
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	1925	170	705	200
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	29.0	10.0	31.0	31.0
Total Split (s)	49.0	10.0	63.0	53.0
Total Split (%)	43.8%	8.9%	56.3%	47.3%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 76 (68%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

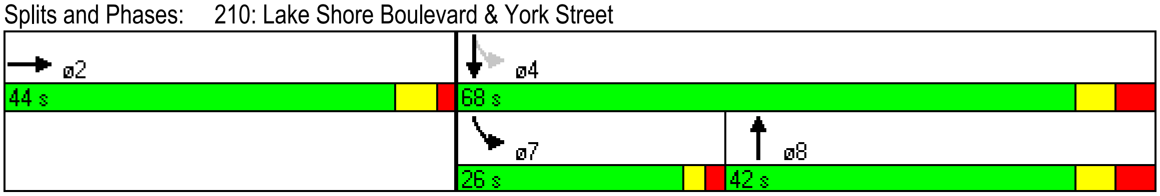
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1265	795	470	165
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	44.0	42.0	16.0	42.0
Total Split (s)	44.0	42.0	26.0	68.0
Total Split (%)	39.3%	37.5%	23.2%	60.7%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

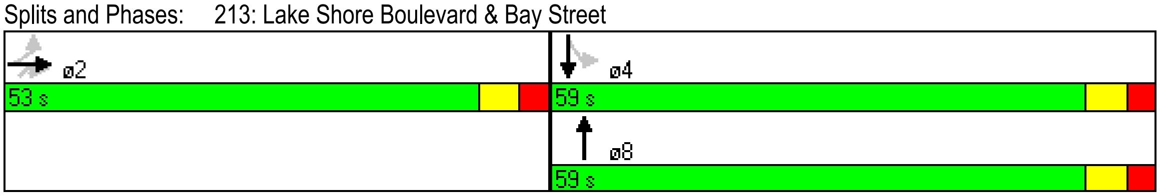
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	870	1215	400	275	140	695	75
Turn Type	Perm			Perm		custom	custom
Protected Phases		2	8		4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	4	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	59.0	59.0	59.0	25.0	25.0
Total Split (s)	53.0	53.0	59.0	59.0	59.0	53.0	53.0
Total Split (%)	47.3%	47.3%	52.7%	52.7%	52.7%	47.3%	47.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Ped	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 10 (9%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

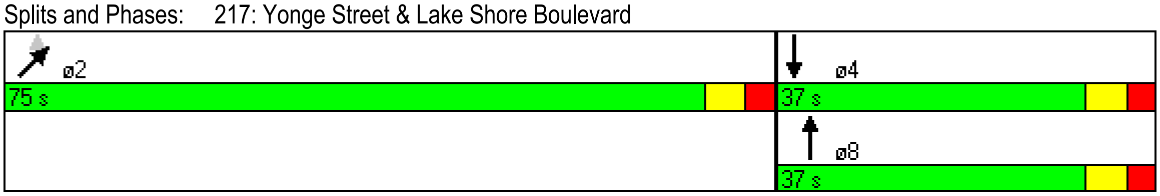
Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	110	300	750	1390
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	33.0	33.0	44.0	44.0
Total Split (s)	37.0	37.0	75.0	75.0
Total Split (%)	33.0%	33.0%	67.0%	67.0%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 21 (19%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 217: Yonge Street & Lake Shore Boulevard

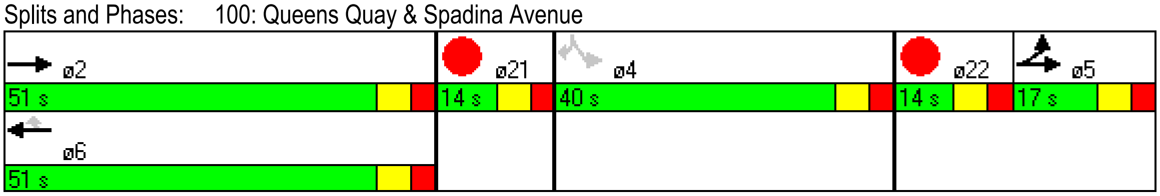


F3 Centre Transit

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø2	ø21	ø22
Lane Configurations									
Volume (vph)	70	580	355	90	120	60			
Turn Type	Prot			Perm		custom			
Protected Phases	5	2 5	6				2	21	22
Permitted Phases				6	4	4			
Detector Phase	5				4	4			
Switch Phase									
Minimum Initial (s)	1.0		36.0	36.0	33.0	33.0	30.0	7.0	7.0
Minimum Split (s)	8.0		44.0	44.0	40.0	40.0	44.0	14.0	14.0
Total Split (s)	17.0	68.0	51.0	51.0	40.0	40.0	51.0	14.0	14.0
Total Split (%)	12.5%	50.0%	37.5%	37.5%	29.4%	29.4%	38%	10%	10%
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0			
Lead/Lag	Lag								Lead
Lead-Lag Optimize?									
Recall Mode	None		C-Max	C-Max	Ped	Ped	C-Max	None	None

Intersection Summary
Cycle Length: 136
Actuated Cycle Length: 136
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated

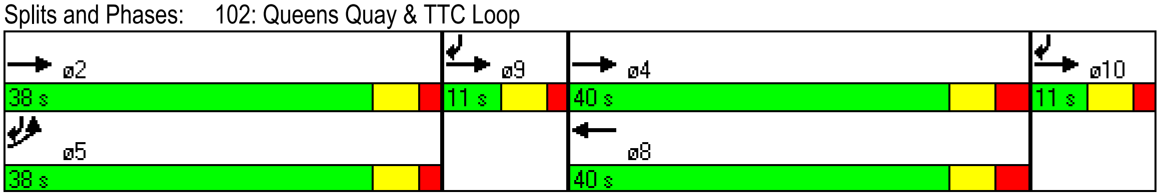
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	EBL	EBT	WBT	SBR	ø2	ø4	ø9	ø10
Lane Configurations								
Volume (vph)	25	675	375	70				
Turn Type	Prot			custom				
Protected Phases	5	2 4 9 10	8	5 9 10	2	4	9	10
Permitted Phases								
Detector Phase	5		8	5 9 10				
Switch Phase								
Minimum Initial (s)	5.0		26.0		5.0	26.0	5.0	5.0
Minimum Split (s)	17.0		33.0		17.0	33.0	11.0	11.0
Total Split (s)	38.0	100.0	40.0	60.0	38.0	40.0	11.0	11.0
Total Split (%)	38.0%	100.0%	40.0%	60.0%	38%	40%	11%	11%
Yellow Time (s)	4.0		4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	2.0		3.0		2.0	3.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0				
Total Lost Time (s)	6.0	6.0	7.0	6.0				
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None		C-Max		None	C-Max	None	None

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 26 (26%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 102: Queens Quay & TTC Loop



Lane Group	EBT	WBT	SBL	SBT	ø1	ø5	ø8
Lane Configurations							
Volume (vph)	670	370	10	0			
Turn Type			Perm				
Protected Phases	2	6		4	1	5	8
Permitted Phases			4				
Detector Phase	2	6	4	4			
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	7.0	10.0
Minimum Split (s)	51.0	51.0	35.0	35.0	14.0	14.0	35.0
Total Split (s)	51.0	51.0	35.0	35.0	14.0	14.0	35.0
Total Split (%)	51.0%	51.0%	35.0%	35.0%	14%	14%	35%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	6.0	6.0	7.0	7.0			
Lead/Lag	Lag	Lag			Lead	Lead	
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	None	None	None	None	None

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 14 (14%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 105: Queens Quay & Beer Store

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	85	580	20	330	10	15	45	10
Turn Type	Prot		Prot		Perm		Perm	
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	17.0	7.0	17.0	27.0	27.0	27.0	27.0
Minimum Split (s)	14.0	49.0	14.0	49.0	37.0	37.0	37.0	37.0
Total Split (s)	14.0	49.0	14.0	49.0	37.0	37.0	37.0	37.0
Total Split (%)	14.0%	49.0%	14.0%	49.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	6.0	7.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	Max	None	Max	Max	Max	Max	Max

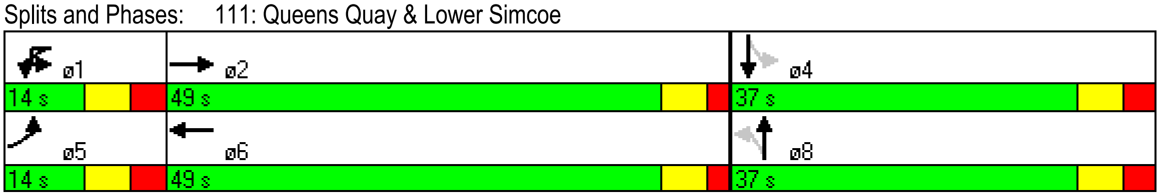
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 72 (72%), Referenced to phase 3:, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Description: Queen's Quay / Rees / Radisson West

Splits and Phases: 107: Queens Quay & Rees Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	40	590	55	390	5	0	55	35
Turn Type	Prot		Prot		Perm		Perm	
Protected Phases	5	2	1	6		8		4
Permitted Phases					8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	31.0	7.0	31.0	4.0	4.0	29.0	29.0
Minimum Split (s)	14.0	49.0	14.0	49.0	37.0	37.0	37.0	37.0
Total Split (s)	14.0	49.0	14.0	49.0	37.0	37.0	37.0	37.0
Total Split (%)	14.0%	49.0%	14.0%	49.0%	37.0%	37.0%	37.0%	37.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	6.0	7.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	Max	Max

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 78 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Description: Queen's Quay / Lower Simcoe / Harbourfront East

Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	110	545	15	450	150	20	40	100	10	110
Turn Type	Prot		Prot		Perm	Perm		Perm		Perm
Protected Phases	5	2	1	6			8		4	
Permitted Phases					6	8		4		4
Detector Phase	5	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	30.0	14.0	30.0	30.0	39.0	39.0	39.0	39.0	39.0
Total Split (s)	18.0	47.0	14.0	43.0	43.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	18.0%	47.0%	14.0%	43.0%	43.0%	39.0%	39.0%	39.0%	39.0%	39.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	6.0	7.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag					
Lead-Lag Optimize?										
Recall Mode	None	C-Max	None	C-Max	C-Max	Max	Max	Max	Max	Max

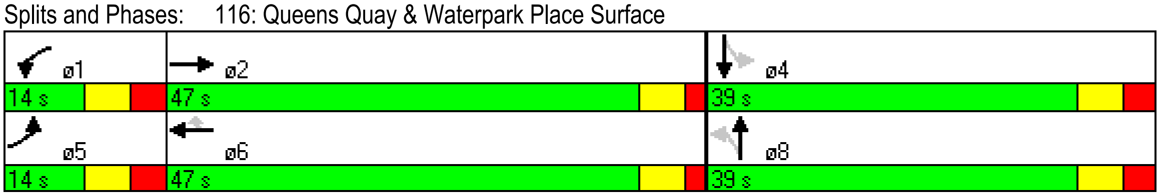
Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 18 (18%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 115: Queens Quay & York Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	45	605	15	560	320	45	0	20	0
Turn Type	Prot		Prot		Perm	Perm		Perm	
Protected Phases	5	2	1	6			8		4
Permitted Phases					6	8		4	
Detector Phase	5	2	1	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	7.0	10.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	23.0	14.0	23.0	23.0	39.0	39.0	39.0	39.0
Total Split (s)	14.0	47.0	14.0	47.0	47.0	39.0	39.0	39.0	39.0
Total Split (%)	14.0%	47.0%	14.0%	47.0%	47.0%	39.0%	39.0%	39.0%	39.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	6.0	7.0	6.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None	None	None

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 16 (16%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 116: Queens Quay & Waterpark Place Surface



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	115	520	50	675	210	5	65	80	10
Turn Type	pm+pt		Perm		Perm	Perm		Perm	
Protected Phases	5	2		6			8		4
Permitted Phases	2		6		6	8		4	
Detector Phase	5	2	6	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.0	34.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0
Total Split (s)	10.0	54.0	44.0	44.0	44.0	36.0	36.0	36.0	36.0
Total Split (%)	11.1%	60.0%	48.9%	48.9%	48.9%	40.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	200	400	735	95	240
Turn Type	pm+pt				Perm
Protected Phases	5	2	6	4	
Permitted Phases	2				4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	4.0	41.0	41.0	27.0	27.0
Minimum Split (s)	10.0	47.0	47.0	33.0	33.0
Total Split (s)	10.0	57.0	47.0	33.0	33.0
Total Split (%)	11.1%	63.3%	52.2%	36.7%	36.7%
Yellow Time (s)	3.0	4.0	4.0	3.0	3.0
All-Red Time (s)	1.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	None	None

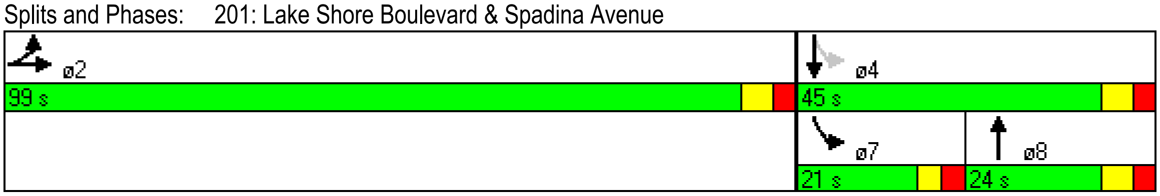
Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	1520	2530	70	165	115
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	96.0	96.0	24.0	16.0	24.0
Total Split (s)	99.0	99.0	24.0	21.0	45.0
Total Split (%)	68.8%	68.8%	16.7%	14.6%	31.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 144
Actuated Cycle Length: 144
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

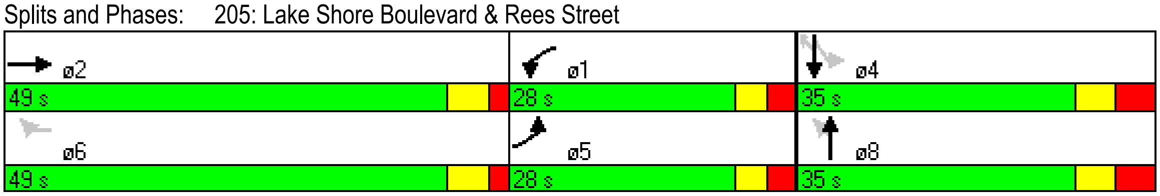
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	470	2275	10	940	10	65	190	55	10
Turn Type	Prot		Prot	custom	Perm		Perm		Perm
Protected Phases	5	2	1			8		4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	22.0	10.0	22.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	25.0%	43.8%	25.0%	43.8%	31.3%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 51 (46%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1130	25	30	95	25	1010
Turn Type	pm+pt		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases	2		8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	C-Max

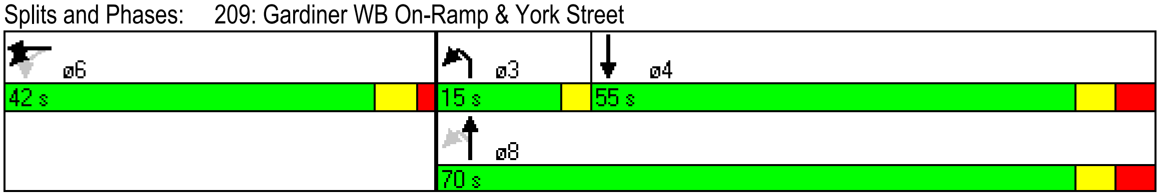
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 4 (4%), Referenced to phase 2:EBTL and 6:SWR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1090	595	100	895	250
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	12.0	10.0	10.0
Minimum Split (s)	42.0	42.0	15.0	55.0	55.0
Total Split (s)	42.0	42.0	15.0	70.0	55.0
Total Split (%)	37.5%	37.5%	13.4%	62.5%	49.1%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 8 (7%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

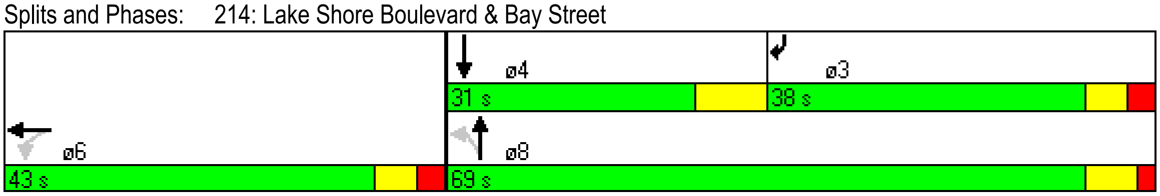
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2005	145	675	245	265
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	43.0	38.0	38.0	31.0	38.0
Total Split (s)	43.0	69.0	69.0	31.0	38.0
Total Split (%)	38.4%	61.6%	61.6%	27.7%	33.9%
Yellow Time (s)	4.0	5.0	5.0	7.0	4.0
All-Red Time (s)	3.0	2.0	2.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 98 (88%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

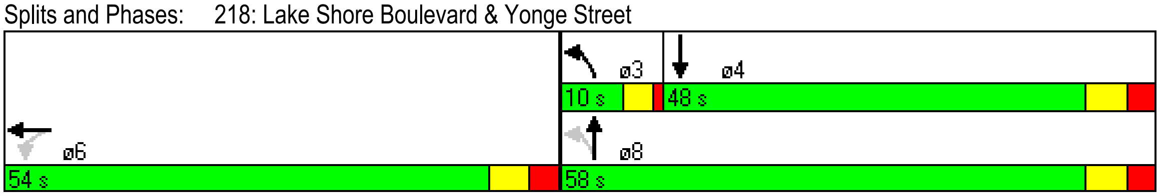
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	2060	110	1170	135
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	54.0	10.0	48.0	48.0
Total Split (s)	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 72 (64%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

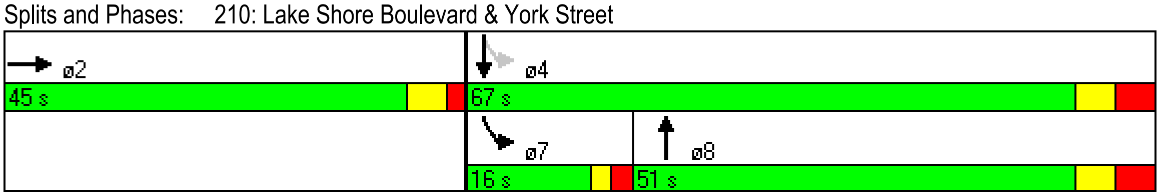
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1215	1015	155	190
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	45.0	51.0	16.0	51.0
Total Split (s)	45.0	51.0	16.0	67.0
Total Split (%)	40.2%	45.5%	14.3%	59.8%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 14 (13%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

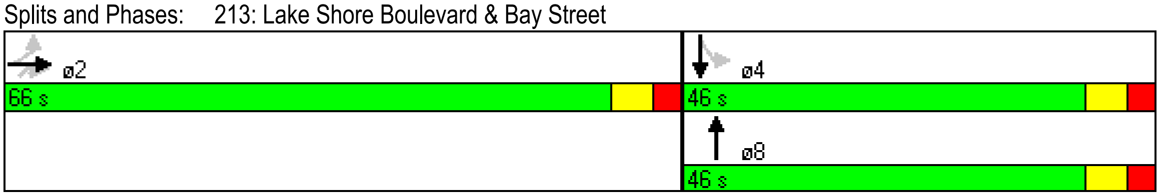
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	820	1075	340	175	275	605	180
Turn Type	Perm			Perm		custom	custom
Protected Phases		2	8		4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	4	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	41.1%	41.1%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Ped	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 6 (5%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

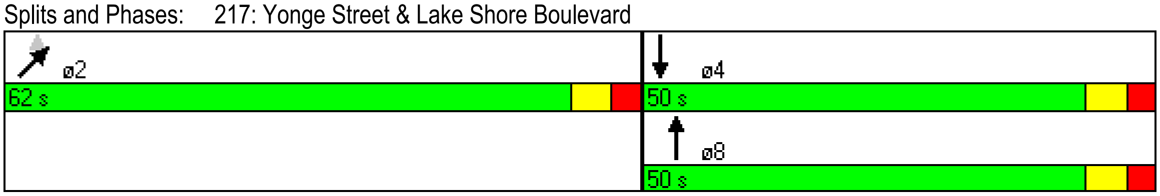
Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	170	240	1100	705
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	50.0	50.0	62.0	62.0
Total Split (s)	50.0	50.0	62.0	62.0
Total Split (%)	44.6%	44.6%	55.4%	55.4%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 17 (15%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

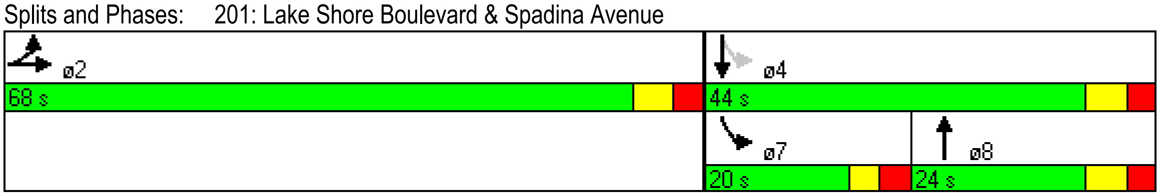
Splits and Phases: 217: Yonge Street & Lake Shore Boulevard



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	825	2095	200	280	40
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	51.0	51.0	24.0	12.0	24.0
Total Split (s)	68.0	68.0	24.0	20.0	44.0
Total Split (%)	60.7%	60.7%	21.4%	17.9%	39.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 97 (87%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

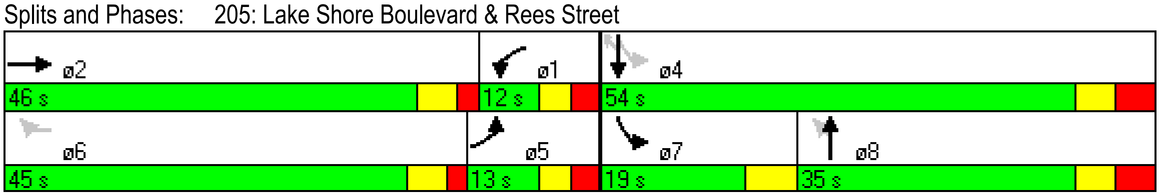
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	260	2110	25	1815	25	65	460	115	30
Turn Type	Prot		Prot	custom	Perm		pm+pt		Perm
Protected Phases	5	2	1			8	7	4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	7	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	14.0	10.0	10.0
Minimum Split (s)	12.0	34.0	12.0	34.0	35.0	35.0	19.0	35.0	35.0
Total Split (s)	13.0	46.0	12.0	45.0	35.0	35.0	19.0	54.0	54.0
Total Split (%)	11.6%	41.1%	10.7%	40.2%	31.3%	31.3%	17.0%	48.2%	48.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	5.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	5.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 38 (34%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1065	80	80	140	60	1820
Turn Type	Prot		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases			8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	Max

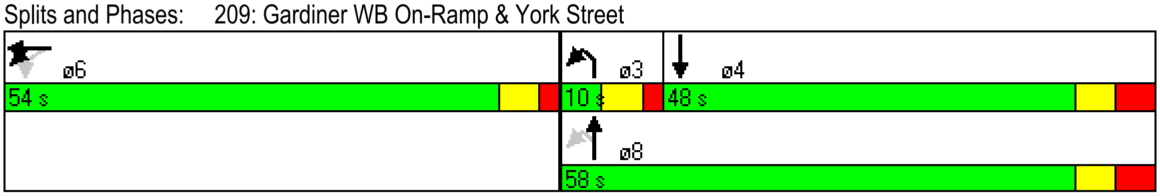
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 98 (88%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1870	655	160	620	585
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)	28.0	28.0	10.0	45.0	45.0
Total Split (s)	54.0	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 102 (91%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

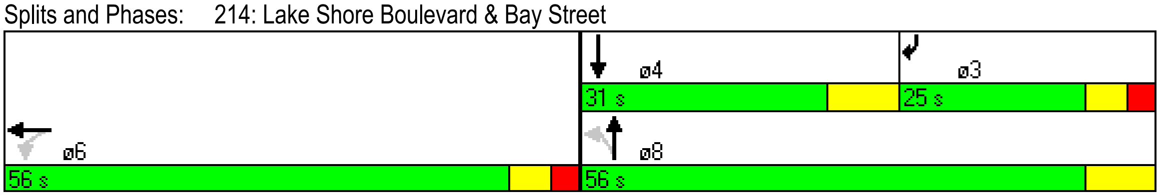
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2220	115	525	335	455
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0
Minimum Split (s)	28.0	31.0	31.0	31.0	25.0
Total Split (s)	56.0	56.0	56.0	31.0	25.0
Total Split (%)	50.0%	50.0%	50.0%	27.7%	22.3%
Yellow Time (s)	4.0	7.0	7.0	7.0	4.0
All-Red Time (s)	3.0	0.0	0.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 79 (71%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

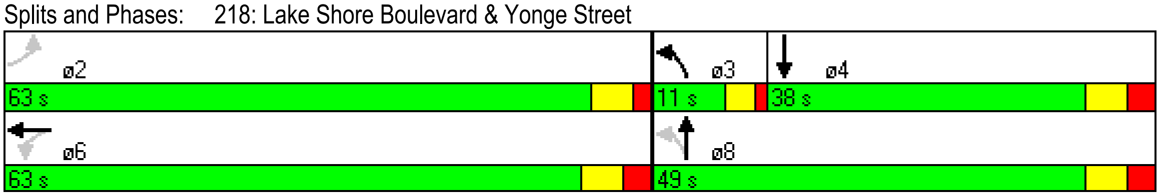
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT	ø2
Lane Configurations					
Volume (vph)	1925	170	705	200	
Turn Type		pm+pt			
Protected Phases	6	3	8	4	2
Permitted Phases		8			
Detector Phase	6	3	8	4	
Switch Phase					
Minimum Initial (s)	10.0	6.0	10.0	10.0	4.0
Minimum Split (s)	29.0	10.0	31.0	31.0	24.0
Total Split (s)	63.0	11.0	49.0	38.0	63.0
Total Split (%)	56.3%	9.8%	43.8%	33.9%	56%
Yellow Time (s)	4.0	3.0	4.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	4.0	7.0	7.0	
Lead/Lag		Lead		Lag	
Lead-Lag Optimize?		Yes		Yes	
Recall Mode	C-Max	None	Ped	Ped	None

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 64 (57%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

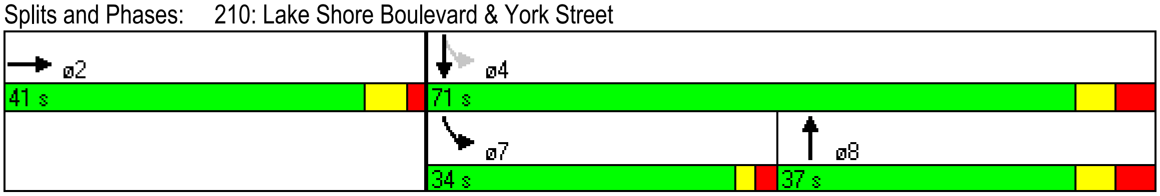
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1265	795	470	165
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	27.0	27.0	16.0	27.0
Total Split (s)	41.0	37.0	34.0	71.0
Total Split (%)	36.6%	33.0%	30.4%	63.4%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 111 (99%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

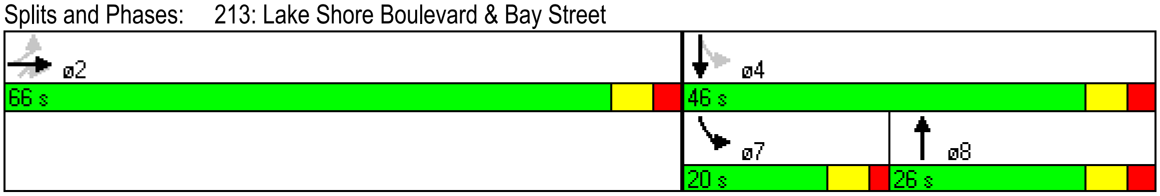
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	870	1215	400	275	140	695	75
Turn Type	Perm			pm+pt		custom	custom
Protected Phases		2	8	7	4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	7	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	26.0	10.0	26.0	25.0	25.0
Total Split (s)	66.0	66.0	26.0	20.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	23.2%	17.9%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0	7.0	7.0
Lead/Lag			Lag	Lead			
Lead-Lag Optimize?			Yes	Yes			
Recall Mode	C-Max	C-Max	Ped	None	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

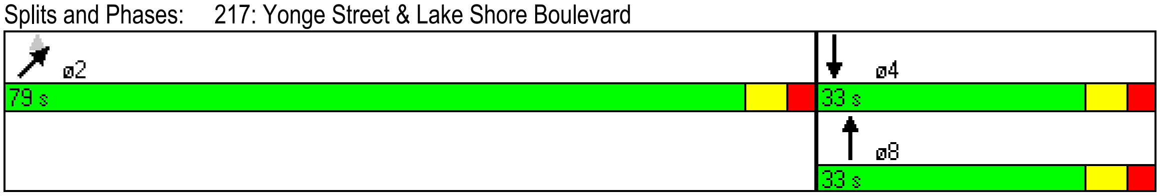
Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	110	300	750	1390
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	33.0	33.0	44.0	44.0
Total Split (s)	33.0	33.0	79.0	79.0
Total Split (%)	29.5%	29.5%	70.5%	70.5%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 4 (4%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 217: Yonge Street & Lake Shore Boulevard

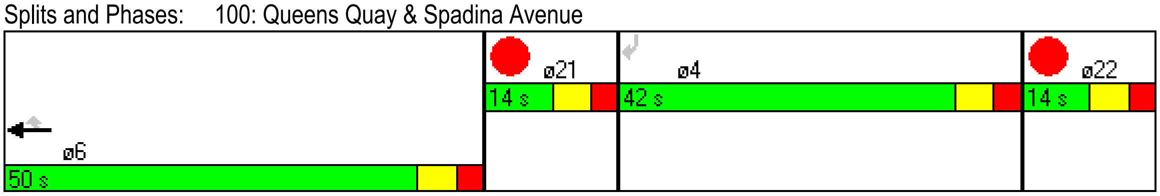


F4 South Side One-Way

Lane Group	WBT	WBR	SBR	ø21	ø22
Lane Configurations					
Volume (vph)	355	100	60		
Turn Type		Perm	custom		
Protected Phases	6			21	22
Permitted Phases		6	4		
Detector Phase	6	6	4		
Switch Phase					
Minimum Initial (s)	36.0	36.0	35.0	7.0	7.0
Minimum Split (s)	43.0	43.0	42.0	14.0	14.0
Total Split (s)	50.0	50.0	42.0	14.0	14.0
Total Split (%)	41.7%	41.7%	35.0%	12%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0		
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Ped	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 37 (31%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

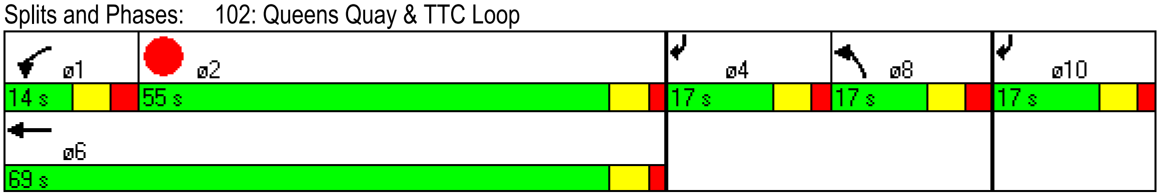
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	WBL	WBT	NBL	SBR	ø2	ø4	ø10
Lane Configurations							
Volume (vph)	5	385	5	70			
Turn Type	Prot		Prot	custom			
Protected Phases	1	6	8	4 10	2	4	10
Permitted Phases							
Detector Phase	1	6	8	4 10			
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	17.0		24.0	17.0	17.0
Total Split (s)	14.0	69.0	17.0	34.0	55.0	17.0	17.0
Total Split (%)	11.7%	57.5%	14.2%	28.3%	46%	14%	14%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	6.0	7.0	6.0			
Lead/Lag	Lead				Lag		
Lead-Lag Optimize?	Yes				Yes		
Recall Mode	None	C-Max	None		C-Max	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 42 (35%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 102: Queens Quay & TTC Loop



Lane Group	WBT	SBT	ø1	ø2	ø8
Lane Configurations					
Volume (vph)	400	0			
Turn Type					
Protected Phases	6	4	1	2	8
Permitted Phases					
Detector Phase	6	4			
Switch Phase					
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	24.0	25.0	14.0	24.0	25.0
Total Split (s)	85.0	35.0	14.0	71.0	35.0
Total Split (%)	70.8%	29.2%	12%	59%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			
Total Lost Time (s)	6.0	7.0			
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	Ped	None	C-Max	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 105: Queens Quay & Beer Store

Lane Group	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations						
Volume (vph)	20	330	10	40	45	
Turn Type	Prot		Perm			
Protected Phases	1	6		8	4	2
Permitted Phases			8			
Detector Phase	1	6	8	8	4	
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	34.0	34.0	34.0	24.0
Total Split (s)	14.0	86.0	34.0	34.0	34.0	72.0
Total Split (%)	11.7%	71.7%	28.3%	28.3%	28.3%	60%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	7.0	7.0	
Lead/Lag	Lead					Lag
Lead-Lag Optimize?	Yes					Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	C-Max

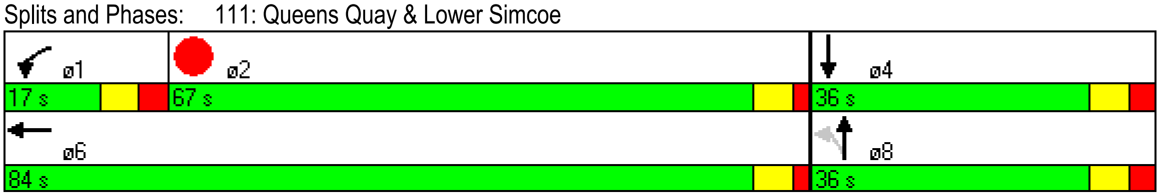
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Description: Queen's Quay / Rees / Radisson West

Splits and Phases: 107: Queens Quay & Rees Street

Lane Group	WBL	WBT	NBT	SBT	ø2
Lane Configurations					
Volume (vph)	55	395	5	35	
Turn Type	Prot				
Protected Phases	1	6	8	4	2
Permitted Phases					
Detector Phase	1	6	8	4	
Switch Phase					
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	38.0	36.0	36.0	24.0
Total Split (s)	17.0	84.0	36.0	36.0	67.0
Total Split (%)	14.2%	70.0%	30.0%	30.0%	56%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	7.0	
Lead/Lag	Lead				Lag
Lead-Lag Optimize?	Yes				Yes
Recall Mode	None	C-Max	Ped	Ped	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Description: Queen's Quay / Lower Simcoe / Harbourfront East

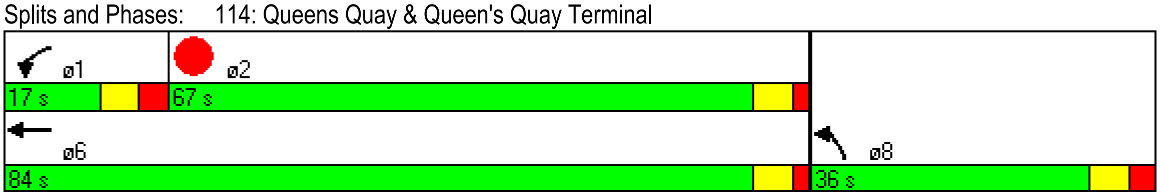
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	WBL	WBT	NBL	ø2
Lane Configurations				
Volume (vph)	20	530	20	
Turn Type	Prot			
Protected Phases	1	6	8	2
Permitted Phases				
Detector Phase	1	6	8	
Switch Phase				
Minimum Initial (s)	7.0	10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	25.0	24.0
Total Split (s)	17.0	84.0	36.0	67.0
Total Split (%)	14.2%	70.0%	30.0%	56%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	
Lead/Lag	Lead			Lag
Lead-Lag Optimize?	Yes			Yes
Recall Mode	None	C-Max	Ped	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 114: Queens Quay & Queen's Quay Terminal



Lane Group	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	30	425	45	60	540	30	100
Turn Type	Perm		Perm		pm+pt		Perm
Protected Phases		6		8	7	4	
Permitted Phases	6		8		4		4
Detector Phase	6	6	8	8	7	4	4
Switch Phase							
Minimum Initial (s)	25.0	25.0	28.0	28.0	4.0	28.0	28.0
Minimum Split (s)	32.0	32.0	35.0	35.0	10.0	35.0	35.0
Total Split (s)	41.0	41.0	35.0	35.0	44.0	79.0	79.0
Total Split (%)	34.2%	34.2%	29.2%	29.2%	36.7%	65.8%	65.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	6.0	7.0	7.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	Ped	Ped	None	Ped	Ped

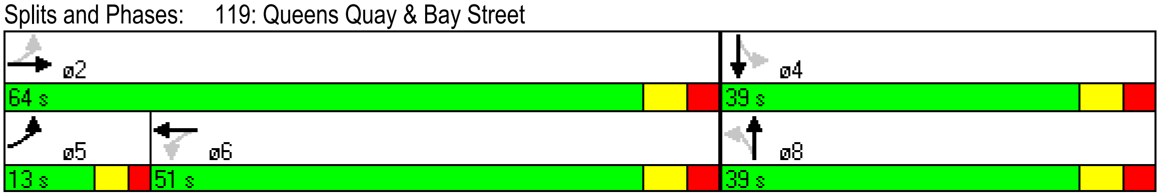
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 115: Queens Quay & York Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	105	450	50	675	5	65	80	10
Turn Type	pm+pt		Perm		Perm		Perm	
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	6.0	27.0	27.0	27.0	29.0	29.0	29.0	29.0
Minimum Split (s)	11.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0
Total Split (s)	13.0	64.0	51.0	51.0	39.0	39.0	39.0	39.0
Total Split (%)	12.6%	62.1%	49.5%	49.5%	37.9%	37.9%	37.9%	37.9%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max

Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 51 (50%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 119: Queens Quay & Bay Street



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	95	435	735	155	240
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	41.0	41.0	41.0	27.0	27.0
Minimum Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (s)	68.0	68.0	68.0	35.0	35.0
Total Split (%)	66.0%	66.0%	66.0%	34.0%	34.0%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None

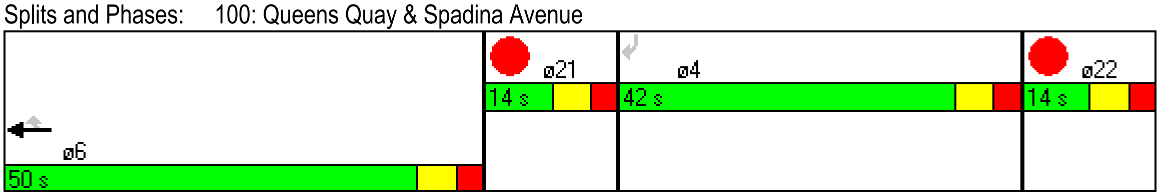
Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 48 (47%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	WBT	WBR	SBR	ø21	ø22
Lane Configurations					
Volume (vph)	580	165	95		
Turn Type		Perm	custom		
Protected Phases	6			21	22
Permitted Phases		6	4		
Detector Phase	6	6	4		
Switch Phase					
Minimum Initial (s)	36.0	36.0	35.0	7.0	7.0
Minimum Split (s)	43.0	43.0	42.0	14.0	14.0
Total Split (s)	50.0	50.0	42.0	14.0	14.0
Total Split (%)	41.7%	41.7%	35.0%	12%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0		
Total Lost Time (s)	7.0	7.0	7.0		
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	Ped	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 6:WBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

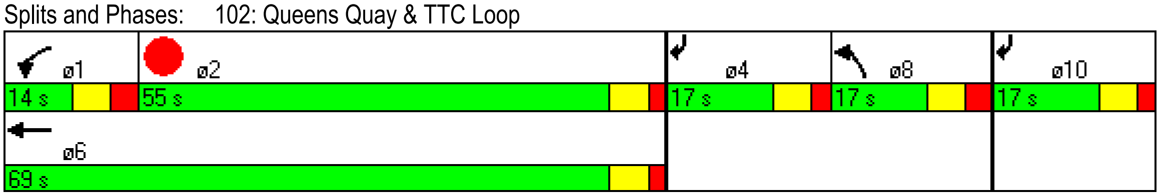
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	WBL	WBT	NBL	SBR	ø2	ø4	ø10
Lane Configurations							
Volume (vph)	10	695	5	50			
Turn Type	Prot		Prot	custom			
Protected Phases	1	6	8	4 10	2	4	10
Permitted Phases							
Detector Phase	1	6	8	4 10			
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	17.0		24.0	17.0	17.0
Total Split (s)	14.0	69.0	17.0	34.0	55.0	17.0	17.0
Total Split (%)	11.7%	57.5%	14.2%	28.3%	46%	14%	14%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0			
Total Lost Time (s)	7.0	6.0	7.0	6.0			
Lead/Lag	Lead				Lag		
Lead-Lag Optimize?	Yes				Yes		
Recall Mode	None	C-Max	None		C-Max	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 102: Queens Quay & TTC Loop



Lane Group	WBT	SBT	ø1	ø2	ø8
Lane Configurations					
Volume (vph)	755	0			
Turn Type					
Protected Phases	6	4	1	2	8
Permitted Phases					
Detector Phase	6	4			
Switch Phase					
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	24.0	25.0	14.0	24.0	25.0
Total Split (s)	85.0	35.0	14.0	71.0	35.0
Total Split (%)	70.8%	29.2%	12%	59%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0			
Total Lost Time (s)	6.0	7.0			
Lead/Lag			Lead	Lag	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	Ped	None	C-Max	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 105: Queens Quay & Beer Store

Lane Group	WBL	WBT	NBL	NBT	SBT	SBR	ø2
Lane Configurations							
Volume (vph)	30	610	15	70	40	165	
Turn Type	Prot		Perm			Perm	
Protected Phases	1	6		8	4		2
Permitted Phases			8			4	
Detector Phase	1	6	8	8	4	4	
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	34.0	34.0	34.0	34.0	24.0
Total Split (s)	14.0	86.0	34.0	34.0	34.0	34.0	72.0
Total Split (%)	11.7%	71.7%	28.3%	28.3%	28.3%	28.3%	60%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	7.0	7.0	7.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	C-Max

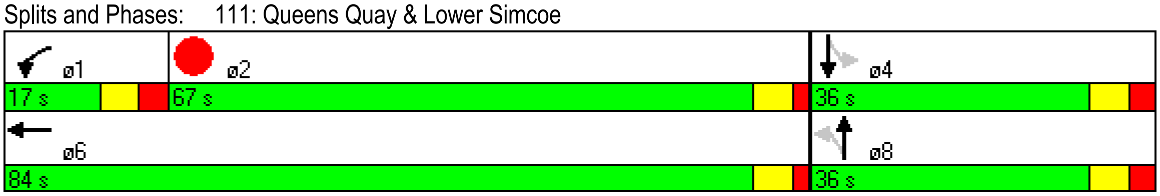
Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Description: Queen's Quay / Rees / Radisson West

Splits and Phases: 107: Queens Quay & Rees Street

Lane Group	WBL	WBT	NBL	NBT	SBT	ø2
Lane Configurations						
Volume (vph)	25	645	20	80	5	
Turn Type	Prot		Perm			
Protected Phases	1	6		8	4	2
Permitted Phases			8			
Detector Phase	1	6	8	8	4	
Switch Phase						
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	38.0	36.0	36.0	36.0	24.0
Total Split (s)	17.0	84.0	36.0	36.0	36.0	67.0
Total Split (%)	14.2%	70.0%	30.0%	30.0%	30.0%	56%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	7.0	7.0	
Lead/Lag	Lead					Lag
Lead-Lag Optimize?	Yes					Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Description: Queen's Quay / Lower Simcoe / Harbourfront East

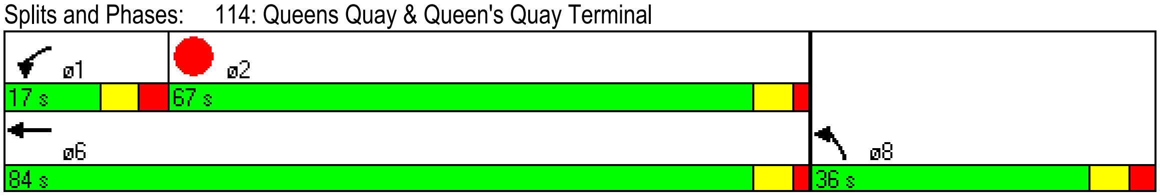
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	WBL	WBT	NBL	ø2
Lane Configurations				
Volume (vph)	20	785	15	
Turn Type	Prot			
Protected Phases	1	6	8	2
Permitted Phases				
Detector Phase	1	6	8	
Switch Phase				
Minimum Initial (s)	7.0	10.0	10.0	10.0
Minimum Split (s)	14.0	24.0	25.0	24.0
Total Split (s)	17.0	84.0	36.0	67.0
Total Split (%)	14.2%	70.0%	30.0%	56%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	7.0	6.0	7.0	
Lead/Lag	Lead			Lag
Lead-Lag Optimize?	Yes			Yes
Recall Mode	None	C-Max	Ped	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 14 (12%), Referenced to phase 2:Hold and 6:WBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

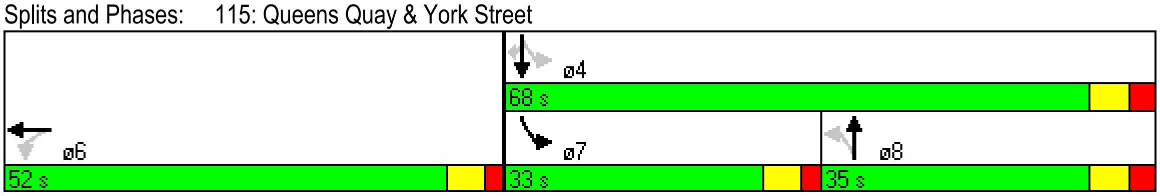
Splits and Phases: 114: Queens Quay & Queen's Quay Terminal



Lane Group	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations							
Volume (vph)	25	700	15	20	480	35	90
Turn Type	Perm		Perm		pm+pt		Perm
Protected Phases		6		8	7	4	
Permitted Phases	6		8		4		4
Detector Phase	6	6	8	8	7	4	4
Switch Phase							
Minimum Initial (s)	25.0	25.0	28.0	28.0	4.0	28.0	28.0
Minimum Split (s)	32.0	32.0	35.0	35.0	10.0	35.0	35.0
Total Split (s)	52.0	52.0	35.0	35.0	33.0	68.0	68.0
Total Split (%)	43.3%	43.3%	29.2%	29.2%	27.5%	56.7%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	6.0	7.0	7.0
Lead/Lag			Lag	Lag	Lead		
Lead-Lag Optimize?			Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	Ped	Ped	None	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 2 (2%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 115: Queens Quay & York Street



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	95	450	50	675	5	20	95	30
Turn Type	pm+pt		Perm		Perm		Perm	
Protected Phases	5	2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	6.0	27.0	27.0	27.0	29.0	29.0	29.0	29.0
Minimum Split (s)	11.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0
Total Split (s)	16.0	67.0	51.0	51.0	36.0	36.0	36.0	36.0
Total Split (%)	15.5%	65.0%	49.5%	49.5%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead		Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max	Max	Max

Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	120	420	640	390	355
Turn Type	Perm				Perm
Protected Phases		2	6	4	
Permitted Phases	2				4
Detector Phase	2	2	6	4	4
Switch Phase					
Minimum Initial (s)	41.0	41.0	41.0	27.0	27.0
Minimum Split (s)	47.0	47.0	47.0	33.0	33.0
Total Split (s)	59.0	59.0	59.0	44.0	44.0
Total Split (%)	57.3%	57.3%	57.3%	42.7%	42.7%
Yellow Time (s)	4.0	4.0	4.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	None	None

Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 51 (50%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

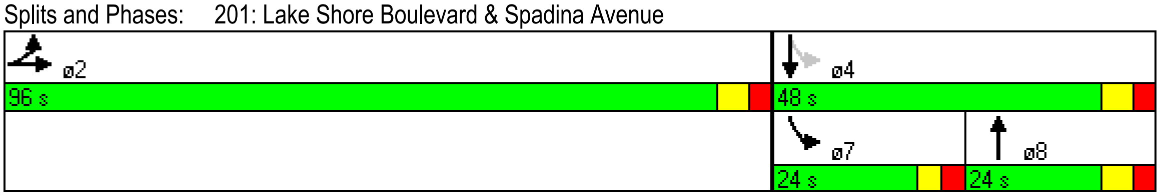
Splits and Phases: 123: Queens Quay & Yonge Street

201: Lake Shore Boulevard & Spadina Avenue

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	1510	3150	0	245	35
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	96.0	96.0	24.0	24.0	24.0
Total Split (s)	96.0	96.0	24.0	24.0	48.0
Total Split (%)	66.7%	66.7%	16.7%	16.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 144
Actuated Cycle Length: 144
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 145
Control Type: Actuated-Coordinated

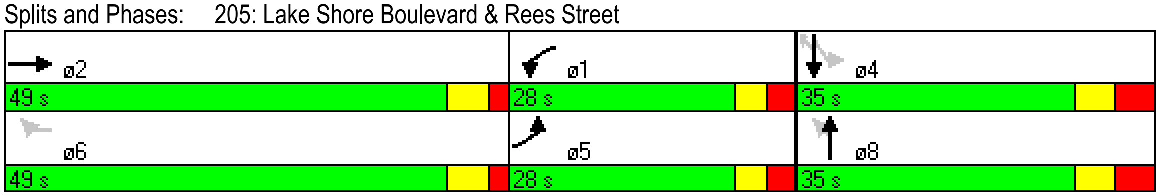
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	525	2910	10	940	10	65	190	55	10
Turn Type	Prot		Prot	custom	Perm		Perm		Perm
Protected Phases	5	2	1			8		4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	22.0	10.0	22.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	25.0%	43.8%	25.0%	43.8%	31.3%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 58 (52%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	170	1665	25	0	105	10	1010
Turn Type	pm+pt		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases	2		8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	C-Max

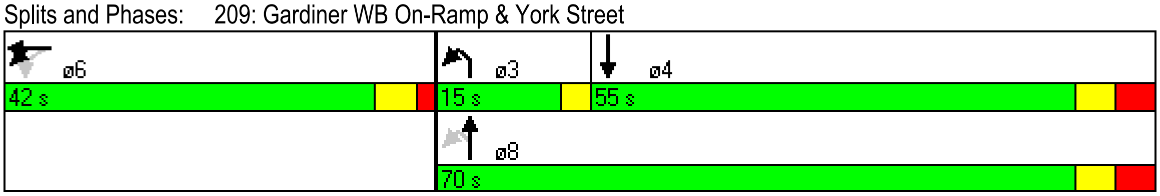
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 4 (4%), Referenced to phase 2:EBTL and 6:SWR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1090	595	100	785	250
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	12.0	10.0	10.0
Minimum Split (s)	42.0	42.0	15.0	55.0	55.0
Total Split (s)	42.0	42.0	15.0	70.0	55.0
Total Split (%)	37.5%	37.5%	13.4%	62.5%	49.1%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 6 (5%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

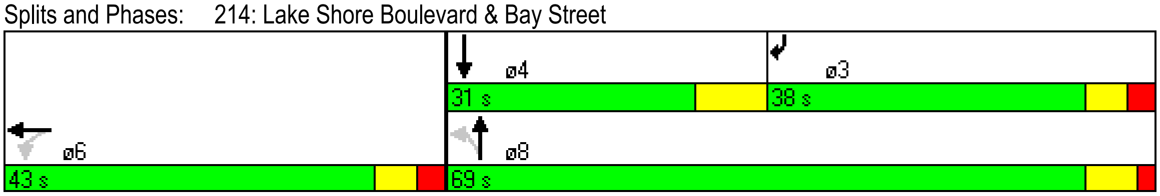
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2005	145	675	245	260
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	43.0	38.0	38.0	31.0	38.0
Total Split (s)	43.0	69.0	69.0	31.0	38.0
Total Split (%)	38.4%	61.6%	61.6%	27.7%	33.9%
Yellow Time (s)	4.0	5.0	5.0	7.0	4.0
All-Red Time (s)	3.0	2.0	2.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 96 (86%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

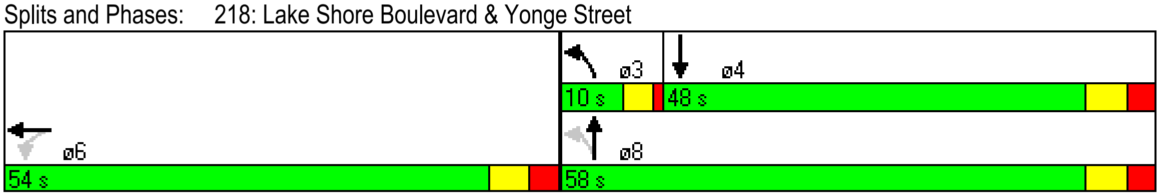
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	2060	110	1170	125
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	54.0	10.0	48.0	48.0
Total Split (s)	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 70 (63%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

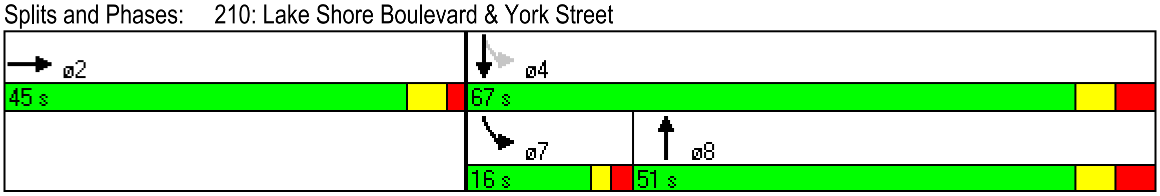
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1320	905	165	195
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	45.0	51.0	16.0	51.0
Total Split (s)	45.0	51.0	16.0	67.0
Total Split (%)	40.2%	45.5%	14.3%	59.8%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 12 (11%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

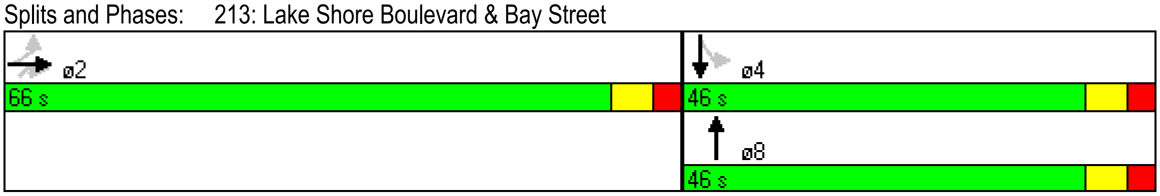
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	830	1120	340	180	275	635	180
Turn Type	Perm			Perm		custom	custom
Protected Phases		2	8		4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	4	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	41.1%	41.1%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Ped	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 4 (4%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

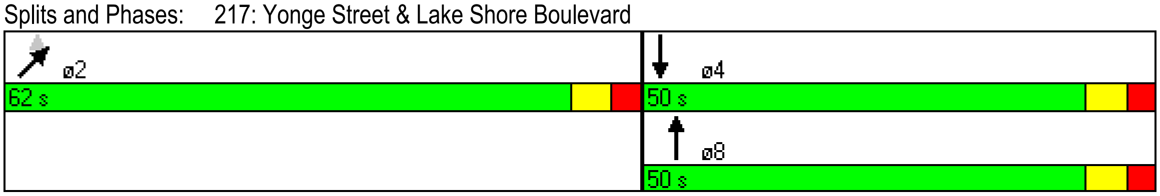
Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	165	230	1100	700
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	50.0	50.0	62.0	62.0
Total Split (s)	50.0	50.0	62.0	62.0
Total Split (%)	44.6%	44.6%	55.4%	55.4%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 13 (12%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

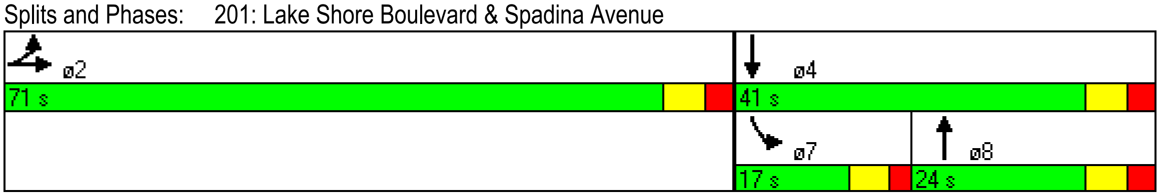
Splits and Phases: 217: Yonge Street & Lake Shore Boulevard



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	895	2735	130	380	5
Turn Type	Split			Prot	
Protected Phases	2	2	8	7	4
Permitted Phases					
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	4.0	10.0
Minimum Split (s)	51.0	51.0	24.0	10.0	24.0
Total Split (s)	71.0	71.0	24.0	17.0	41.0
Total Split (%)	63.4%	63.4%	21.4%	15.2%	36.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	2.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 111 (99%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

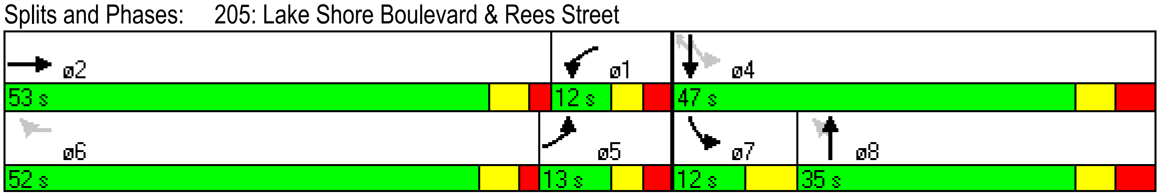
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	300	2785	25	1815	25	65	460	115	30
Turn Type	Prot		Prot	custom	Perm		pm+pt		Perm
Protected Phases	5	2	1			8	7	4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	7	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	7.0	10.0	10.0
Minimum Split (s)	12.0	34.0	12.0	34.0	35.0	35.0	12.0	35.0	35.0
Total Split (s)	13.0	53.0	12.0	52.0	35.0	35.0	12.0	47.0	47.0
Total Split (%)	11.6%	47.3%	10.7%	46.4%	31.3%	31.3%	10.7%	42.0%	42.0%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	5.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	5.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	175	1620	80	30	170	30	1820
Turn Type	Prot		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases			8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	Max

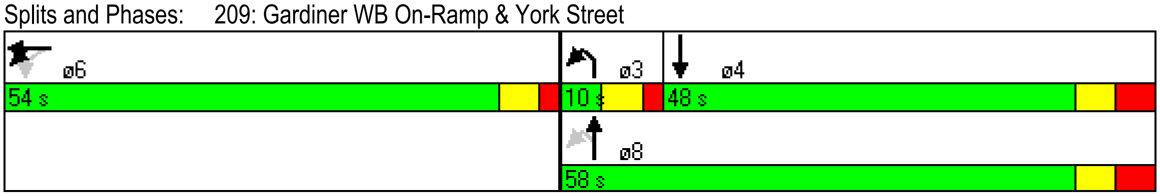
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 98 (88%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1870	655	160	545	585
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)	28.0	28.0	10.0	45.0	45.0
Total Split (s)	54.0	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

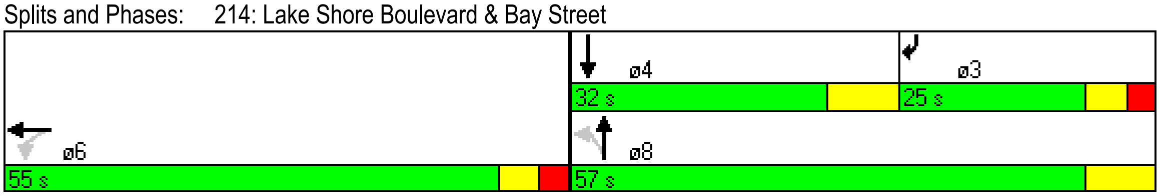
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2220	115	525	345	455
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0
Minimum Split (s)	28.0	31.0	31.0	31.0	25.0
Total Split (s)	55.0	57.0	57.0	32.0	25.0
Total Split (%)	49.1%	50.9%	50.9%	28.6%	22.3%
Yellow Time (s)	4.0	7.0	7.0	7.0	4.0
All-Red Time (s)	3.0	0.0	0.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 89 (79%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

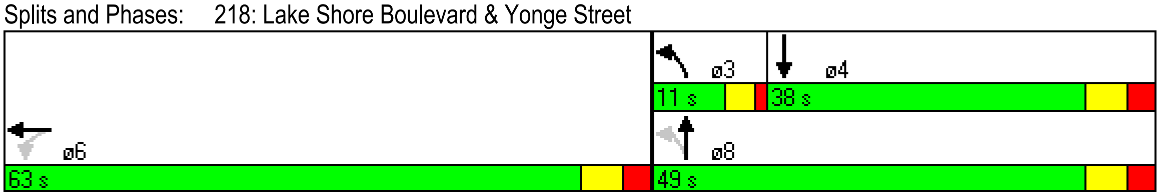
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	1925	170	705	175
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	29.0	10.0	31.0	31.0
Total Split (s)	63.0	11.0	49.0	38.0
Total Split (%)	56.3%	9.8%	43.8%	33.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 68 (61%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

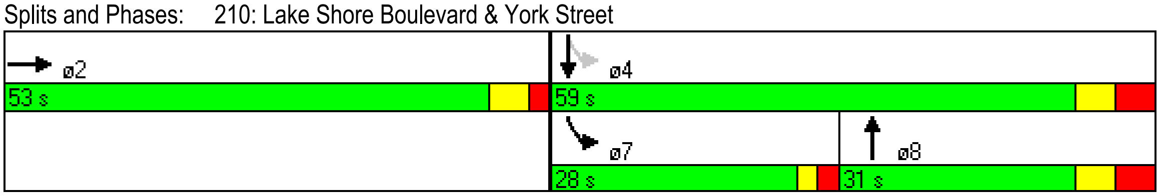
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1465	720	470	165
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	27.0	27.0	16.0	27.0
Total Split (s)	53.0	31.0	28.0	59.0
Total Split (%)	47.3%	27.7%	25.0%	52.7%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

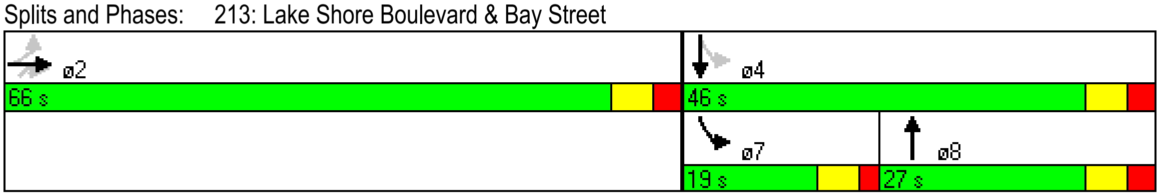
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	960	1420	310	295	140	760	75
Turn Type	Perm			pm+pt		custom	custom
Protected Phases		2	8	7	4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	7	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	26.0	10.0	26.0	25.0	25.0
Total Split (s)	66.0	66.0	27.0	19.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	24.1%	17.0%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0	7.0	7.0
Lead/Lag			Lag	Lead			
Lead-Lag Optimize?			Yes	Yes			
Recall Mode	C-Max	C-Max	Ped	None	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 213: Lake Shore Boulevard & Bay Street

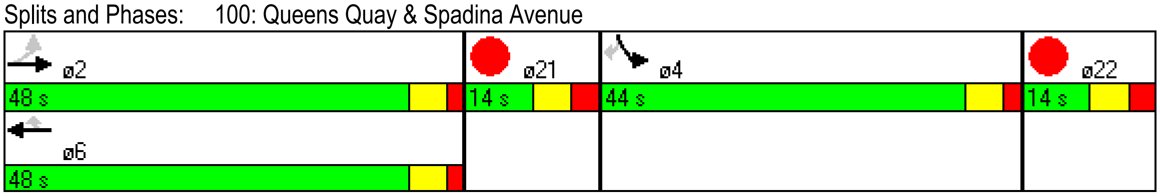


F5 South Side Two-Way

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø21	ø22
Lane Configurations	↰	↑	↑	↱	↰	↱		
Volume (vph)	70	555	355	90	120	60		
Turn Type	Perm			Perm		Perm		
Protected Phases		2	6		4		21	22
Permitted Phases	2			6		4		
Detector Phase	2	2	6	6	4	4		
Switch Phase								
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	24.0	24.0	31.0	31.0	44.0	44.0	14.0	14.0
Total Split (s)	48.0	48.0	48.0	48.0	44.0	44.0	14.0	14.0
Total Split (%)	40.0%	40.0%	40.0%	40.0%	36.7%	36.7%	12%	12%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 25 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

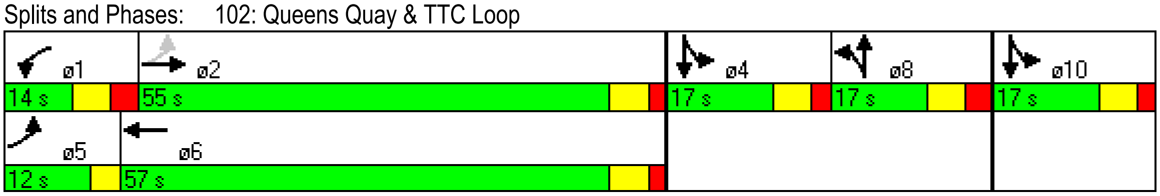
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT	ø4	ø10
Lane Configurations								
Volume (vph)	25	650	5	375	0	0		
Turn Type	pm+pt		Prot					
Protected Phases	5	2	1	6	8	4 10	4	10
Permitted Phases	2							
Detector Phase	5	2	1	6	8	4 10		
Switch Phase								
Minimum Initial (s)	6.0	10.0	7.0	10.0	10.0		10.0	10.0
Minimum Split (s)	12.0	24.0	14.0	24.0	17.0		17.0	17.0
Total Split (s)	12.0	55.0	14.0	57.0	17.0	34.0	17.0	17.0
Total Split (%)	10.0%	45.8%	11.7%	47.5%	14.2%	28.3%	14%	14%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	2.0	3.0	2.0	3.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	3.0	6.0	7.0	6.0	7.0	6.0		
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None		None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 30 (25%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 102: Queens Quay & TTC Loop



Lane Group	EBT	WBT	SBL	SBT	ø1	ø8
Lane Configurations						
Volume (vph)	650	375	10	0		
Turn Type			Perm			
Protected Phases	2	6		4	1	8
Permitted Phases			4			
Detector Phase	2	6	4	4		
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	24.0	24.0	30.0	30.0	14.0	30.0
Total Split (s)	76.0	90.0	30.0	30.0	14.0	30.0
Total Split (%)	63.3%	75.0%	25.0%	25.0%	12%	25%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	7.0	7.0		
Lead/Lag	Lag				Lead	
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	Ped	Ped	None	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 105: Queens Quay & Beer Store

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	45	580	35	330	10	15	45	30
Turn Type	Perm		custom		Perm		Perm	
Protected Phases		2	5	6		8		4
Permitted Phases	2				8		4	
Detector Phase	2	2	5	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	31.0	31.0	14.0	31.0	30.0	30.0	30.0	30.0
Total Split (s)	90.0	90.0	15.0	75.0	30.0	30.0	30.0	30.0
Total Split (%)	75.0%	75.0%	12.5%	62.5%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag			Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	C-Max	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 62 (52%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Description: Queen's Quay / Rees / Radisson West

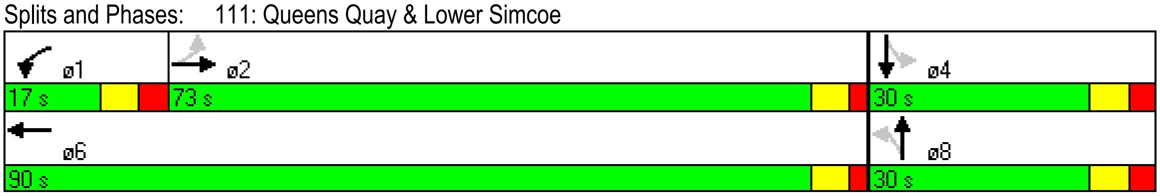
Splits and Phases: 107: Queens Quay & Rees Street

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Configurations							
Volume (vph)	80	570	55	375	0	75	35
Turn Type	Perm		Prot			Perm	
Protected Phases		2	1	6	8		4
Permitted Phases	2					4	
Detector Phase	2	2	1	6	8	4	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	29.0	29.0	14.0	29.0	30.0	30.0	30.0
Total Split (s)	73.0	73.0	17.0	90.0	30.0	30.0	30.0
Total Split (%)	60.8%	60.8%	14.2%	75.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead				
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	None	C-Max	Ped	Ped	Ped

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 80 (67%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Description: Queen's Quay / Lower Simcoe / Harbourfront East

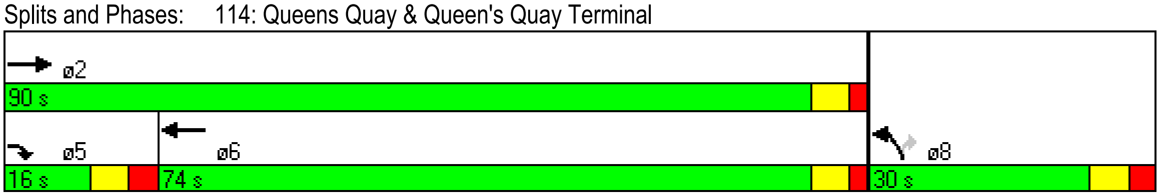
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Configurations					
Volume (vph)	630	20	510	5	15
Turn Type		custom			Perm
Protected Phases	2	5	6	8	
Permitted Phases					8
Detector Phase	2	5	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	29.0	14.0	29.0	30.0	30.0
Total Split (s)	90.0	16.0	74.0	30.0	30.0
Total Split (%)	75.0%	13.3%	61.7%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	6.0	7.0	7.0
Lead/Lag		Lead	Lag		
Lead-Lag Optimize?					
Recall Mode	C-Max	None	C-Max	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 114: Queens Quay & Queen's Quay Terminal



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	110	535	30	385	130	45	60	110	30	100
Turn Type	Perm		Prot		Perm	Perm		Perm		Perm
Protected Phases		2	1	6			8		4	
Permitted Phases	2				6	8		4		4
Detector Phase	2	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	35.0	35.0	14.0	35.0	35.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	66.0	66.0	14.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	55.0%	55.0%	11.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	None	C-Max	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 115: Queens Quay & York Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	115	520	50	675	210	5	65	80	10
Turn Type	pm+pt		Perm		Perm	Perm		Perm	
Protected Phases	5	2		6			8		4
Permitted Phases	2		6		6	8		4	
Detector Phase	5	2	6	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	34.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0
Total Split (s)	13.0	67.0	54.0	54.0	54.0	36.0	36.0	36.0	36.0
Total Split (%)	12.6%	65.0%	52.4%	52.4%	52.4%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	100	500	735	115	90	240
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	47.0	47.0	47.0	47.0	33.0	33.0
Total Split (s)	70.0	70.0	70.0	70.0	33.0	33.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped

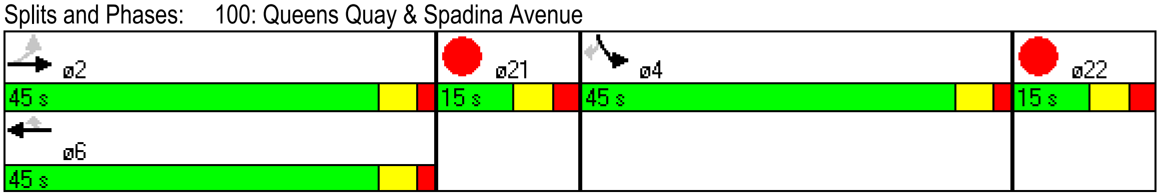
Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 20 (19%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	ø21	ø22
Lane Configurations								
Volume (vph)	70	620	580	155	95	95		
Turn Type	Perm			Perm		Perm		
Protected Phases		2	6		4		21	22
Permitted Phases	2			6		4		
Detector Phase	2	2	6	6	4	4		
Switch Phase								
Minimum Initial (s)	4.0	4.0	10.0	10.0	10.0	10.0	7.0	7.0
Minimum Split (s)	24.0	24.0	31.0	31.0	44.0	44.0	14.0	14.0
Total Split (s)	45.0	45.0	45.0	45.0	45.0	45.0	15.0	15.0
Total Split (%)	37.5%	37.5%	37.5%	37.5%	37.5%	37.5%	13%	13%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 25 (21%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 105
Control Type: Actuated-Coordinated

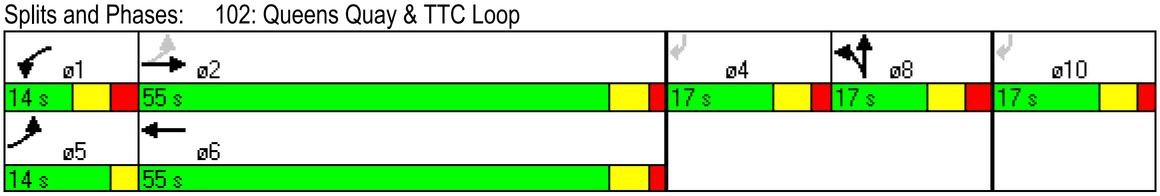
Splits and Phases: 100: Queens Quay & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBT	NBT	SBR	ø4	ø10
Lane Configurations								
Volume (vph)	45	670	10	685	0	50		
Turn Type	pm+pt		Prot			custom		
Protected Phases	5	2	1	6	8		4	10
Permitted Phases	2					4 10		
Detector Phase	5	2	1	6	8	4 10		
Switch Phase								
Minimum Initial (s)	6.0	10.0	7.0	10.0	10.0		10.0	10.0
Minimum Split (s)	14.0	25.0	14.0	25.0	17.0		17.0	17.0
Total Split (s)	14.0	55.0	14.0	55.0	17.0	34.0	17.0	17.0
Total Split (%)	11.7%	45.8%	11.7%	45.8%	14.2%	28.3%	14%	14%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	0.0	2.0	3.0	2.0	3.0		2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	3.0	6.0	7.0	6.0	7.0	6.0		
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None		None	None

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 30 (25%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 102: Queens Quay & TTC Loop



Lane Group	EBL	EBT	WBT	SBL	SBT	ø1	ø8
Lane Configurations							
Volume (vph)	5	665	710	10	0		
Turn Type	Perm			Perm			
Protected Phases		2	6		4	1	8
Permitted Phases	2			4			
Detector Phase	2	2	6	4	4		
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	30.0	30.0	30.0	29.0	29.0	14.0	30.0
Total Split (s)	76.0	76.0	90.0	30.0	30.0	14.0	30.0
Total Split (%)	63.3%	63.3%	75.0%	25.0%	25.0%	12%	25%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		
Lead/Lag	Lag	Lag				Lead	
Lead-Lag Optimize?	Yes	Yes					
Recall Mode	C-Max	C-Max	C-Max	Ped	Ped	None	Ped

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 105: Queens Quay & Beer Store

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	55	595	25	610	15	25	50	45
Turn Type	Perm		custom		Perm		Perm	
Protected Phases		2	5	6		8		4
Permitted Phases	2				8		4	
Detector Phase	2	2	5	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	23.0	23.0	7.0	23.0	23.0	23.0	23.0	23.0
Minimum Split (s)	31.0	31.0	14.0	31.0	30.0	30.0	30.0	30.0
Total Split (s)	90.0	90.0	14.0	76.0	30.0	30.0	30.0	30.0
Total Split (%)	75.0%	75.0%	11.7%	63.3%	25.0%	25.0%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag			Lead	Lag				
Lead-Lag Optimize?				Yes				
Recall Mode	Ped	Ped	None	Ped	C-Max	C-Max	C-Max	C-Max

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 62 (52%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Description: Queen's Quay / Rees / Radisson West

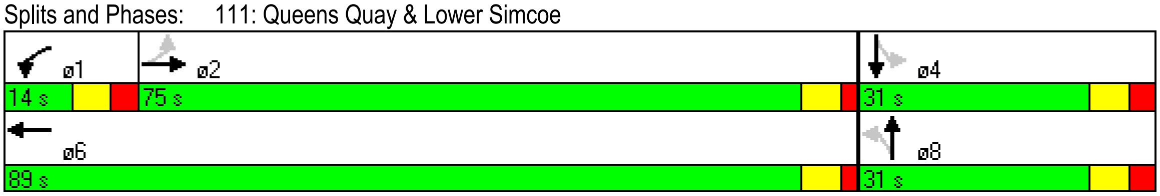
Splits and Phases: 107: Queens Quay & Rees Street

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	120	570	20	620	15	45	90	5
Turn Type	Perm		Prot		Perm		Perm	
Protected Phases		2	1	6		8		4
Permitted Phases	2				8		4	
Detector Phase	2	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.0	30.0	14.0	30.0	30.0	30.0	30.0	30.0
Total Split (s)	75.0	75.0	14.0	89.0	31.0	31.0	31.0	31.0
Total Split (%)	62.5%	62.5%	11.7%	74.2%	25.8%	25.8%	25.8%	25.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	None	C-Max	Ped	Ped	Ped	Ped

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 80 (67%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Description: Queen's Quay / Lower Simcoe / Harbourfront East

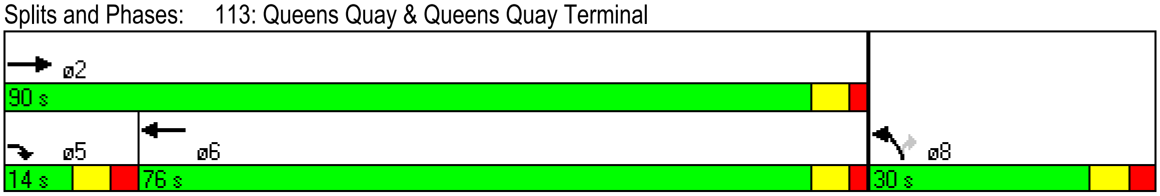
Splits and Phases: 111: Queens Quay & Lower Simcoe



Lane Group	EBT	EBR	WBT	NBL	NBR
Lane Configurations					
Volume (vph)	670	25	750	10	10
Turn Type		custom			Perm
Protected Phases	2	5	6	8	
Permitted Phases					8
Detector Phase	2	5	6	8	8
Switch Phase					
Minimum Initial (s)	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	30.0	14.0	30.0	30.0	30.0
Total Split (s)	90.0	14.0	76.0	30.0	30.0
Total Split (%)	75.0%	11.7%	63.3%	25.0%	25.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	3.0	2.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	7.0	6.0	7.0	7.0
Lead/Lag		Lead	Lag		
Lead-Lag Optimize?					
Recall Mode	C-Min	None	C-Max	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 113: Queens Quay & Queens Quay Terminal



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Volume (vph)	80	600	25	645	260	15	20	80	35	90
Turn Type	Perm		Prot		Perm	Perm		Perm		Perm
Protected Phases		2	1	6			8		4	
Permitted Phases	2				6	8		4		4
Detector Phase	2	2	1	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	10.0	10.0	7.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	32.0	32.0	14.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Split (s)	74.0	74.0	14.0	88.0	88.0	32.0	32.0	32.0	32.0	32.0
Total Split (%)	61.7%	61.7%	11.7%	73.3%	73.3%	26.7%	26.7%	26.7%	26.7%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	6.0	6.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes								
Recall Mode	C-Max	C-Max	None	C-Max	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Description: Queens Quay / York Street

Splits and Phases: 115: Queens Quay & York Street

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	185	720	50	675	235	5	20	95	30
Turn Type	pm+pt		Perm		Perm	Perm		Perm	
Protected Phases	5	2		6			8		4
Permitted Phases	2		6		6	8		4	
Detector Phase	5	2	6	6	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	6.0	23.0	23.0	23.0	23.0	23.0	23.0	27.0	27.0
Minimum Split (s)	12.0	29.0	29.0	29.0	29.0	33.0	33.0	34.0	34.0
Total Split (s)	13.0	69.0	56.0	56.0	56.0	34.0	34.0	34.0	34.0
Total Split (%)	12.6%	67.0%	54.4%	54.4%	54.4%	33.0%	33.0%	33.0%	33.0%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead		Lag	Lag	Lag				
Lead-Lag Optimize?	Yes		Yes	Yes	Yes				
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 119: Queens Quay & Bay Street

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	135	675	640	195	135	355
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	47.0	47.0	33.0	33.0	33.0	33.0
Total Split (s)	70.0	70.0	70.0	70.0	33.0	33.0
Total Split (%)	68.0%	68.0%	68.0%	68.0%	32.0%	32.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped

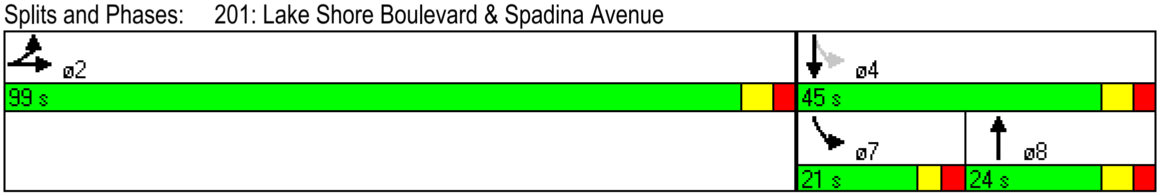
Intersection Summary
Cycle Length: 103
Actuated Cycle Length: 103
Offset: 20 (19%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 123: Queens Quay & Yonge Street

Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	1540	2575	70	165	115
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	7.0	10.0
Minimum Split (s)	96.0	96.0	24.0	16.0	24.0
Total Split (s)	99.0	99.0	24.0	21.0	45.0
Total Split (%)	68.8%	68.8%	16.7%	14.6%	31.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 144
Actuated Cycle Length: 144
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 140
Control Type: Actuated-Coordinated

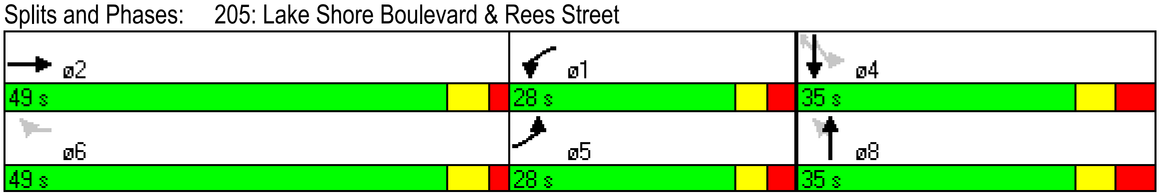
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	470	2315	10	940	10	25	190	75	10
Turn Type	Prot		Prot	custom	Perm		Perm		Perm
Protected Phases	5	2	1			8		4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	4	4	4
Switch Phase									
Minimum Initial (s)	22.0	10.0	22.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (s)	28.0	49.0	28.0	49.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	25.0%	43.8%	25.0%	43.8%	31.3%	31.3%	31.3%	31.3%	31.3%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	4.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	8.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes	Yes					
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	Ped	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 47 (42%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1150	25	70	95	25	1010
Turn Type	pm+pt		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases	2		8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	C-Max

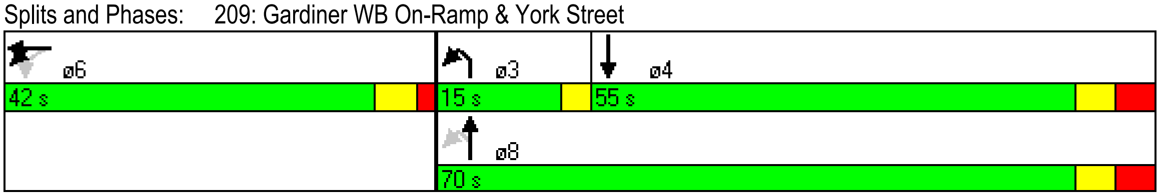
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:SWR, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1090	595	100	895	250
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	12.0	10.0	10.0
Minimum Split (s)	42.0	42.0	15.0	55.0	55.0
Total Split (s)	42.0	42.0	15.0	70.0	55.0
Total Split (%)	37.5%	37.5%	13.4%	62.5%	49.1%
Yellow Time (s)	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	2.0	2.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	3.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 8 (7%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

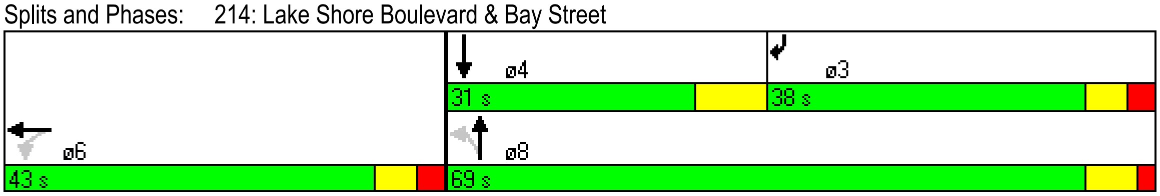
Splits and Phases: 209: Gardiner WB On-Ramp & York Street



Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2005	145	675	245	265
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	43.0	38.0	38.0	31.0	38.0
Total Split (s)	43.0	69.0	69.0	31.0	38.0
Total Split (%)	38.4%	61.6%	61.6%	27.7%	33.9%
Yellow Time (s)	4.0	5.0	5.0	7.0	4.0
All-Red Time (s)	3.0	2.0	2.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 98 (88%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

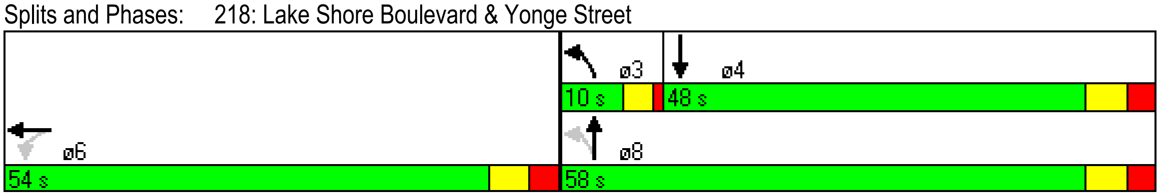
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	2060	110	1170	125
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	54.0	10.0	48.0	48.0
Total Split (s)	54.0	10.0	58.0	48.0
Total Split (%)	48.2%	8.9%	51.8%	42.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 72 (64%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

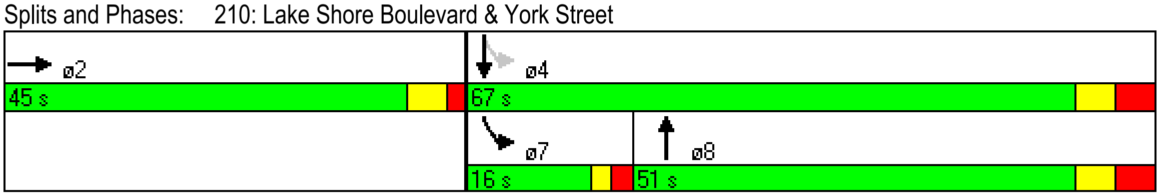
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1215	1015	165	190
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	45.0	51.0	16.0	51.0
Total Split (s)	45.0	51.0	16.0	67.0
Total Split (%)	40.2%	45.5%	14.3%	59.8%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 14 (13%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

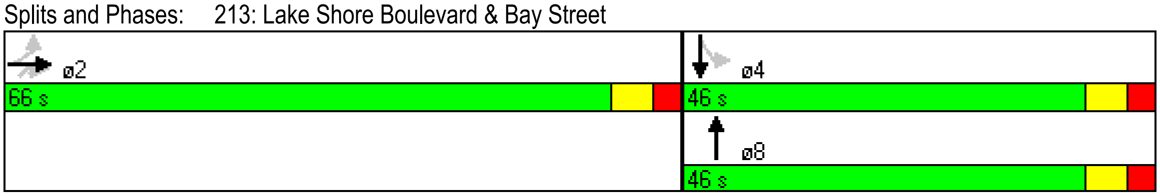
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	820	1085	340	180	275	615	140
Turn Type	Perm			Perm		custom	custom
Protected Phases		2	8		4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	4	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (s)	66.0	66.0	46.0	46.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	41.1%	41.1%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	C-Max	C-Max	Ped	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 5 (4%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 213: Lake Shore Boulevard & Bay Street

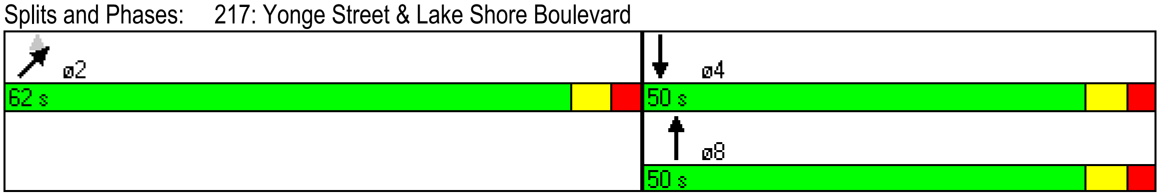


217: Yonge Street & Lake Shore Boulevard

Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	170	230	1100	710
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	50.0	50.0	62.0	62.0
Total Split (s)	50.0	50.0	62.0	62.0
Total Split (%)	44.6%	44.6%	55.4%	55.4%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 15 (13%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

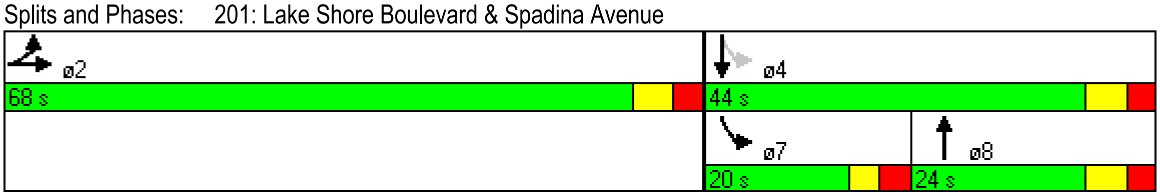
Splits and Phases: 217: Yonge Street & Lake Shore Boulevard



Lane Group	EBL	EBT	NBT	SBL	SBT
Lane Configurations					
Volume (vph)	855	2145	200	280	40
Turn Type	Split			pm+pt	
Protected Phases	2	2	8	7	4
Permitted Phases				4	
Detector Phase	2	2	8	7	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	6.0	10.0
Minimum Split (s)	51.0	51.0	24.0	12.0	24.0
Total Split (s)	68.0	68.0	24.0	20.0	44.0
Total Split (%)	60.7%	60.7%	21.4%	17.9%	39.3%
Yellow Time (s)	4.0	4.0	4.0	3.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0
Lead/Lag			Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	
Recall Mode	C-Max	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 95 (85%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

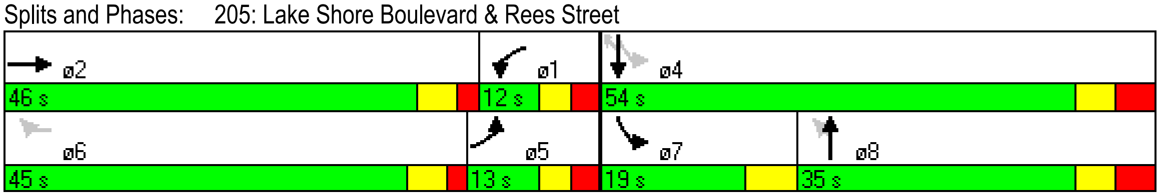
Splits and Phases: 201: Lake Shore Boulevard & Spadina Avenue



Lane Group	EBL	EBT	WBL	WBR	NBL	NBT	SBL	SBT	SBR2
Lane Configurations									
Volume (vph)	260	2150	25	1815	25	10	460	145	30
Turn Type	Prot		Prot	custom	Perm		pm+pt		Perm
Protected Phases	5	2	1			8	7	4	
Permitted Phases				6	8		4		4
Detector Phase	5	2	1	6	8	8	7	4	4
Switch Phase									
Minimum Initial (s)	6.0	10.0	6.0	10.0	10.0	10.0	14.0	10.0	10.0
Minimum Split (s)	12.0	34.0	12.0	34.0	35.0	35.0	19.0	35.0	35.0
Total Split (s)	13.0	46.0	12.0	45.0	35.0	35.0	19.0	54.0	54.0
Total Split (%)	11.6%	41.1%	10.7%	40.2%	31.3%	31.3%	17.0%	48.2%	48.2%
Yellow Time (s)	3.0	4.0	3.0	4.0	4.0	4.0	5.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	2.0	4.0	4.0	0.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	8.0	8.0	5.0	8.0	8.0
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	None	C-Max	None	C-Max	Ped	Ped	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 36 (32%), Referenced to phase 2:EBT and 6:WBR, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated

Splits and Phases: 205: Lake Shore Boulevard & Rees Street



Lane Group	EBL2	EBT	NBL	NBT	SBL	SBT	SWR
Lane Configurations							
Volume (vph)	85	1080	80	135	140	60	1820
Turn Type	Prot		Perm		Perm		custom
Protected Phases	5	2		8		4	
Permitted Phases			8		4		6
Detector Phase	5	2	8	8	4	4	6
Switch Phase							
Minimum Initial (s)	7.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	13.0	60.0	39.0	39.0	39.0	39.0	60.0
Total Split (s)	13.0	73.0	39.0	39.0	39.0	39.0	60.0
Total Split (%)	11.6%	65.2%	34.8%	34.8%	34.8%	34.8%	53.6%
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	7.0	7.0	7.0	7.0	6.0
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	None	C-Max	Ped	Ped	Ped	Ped	Max

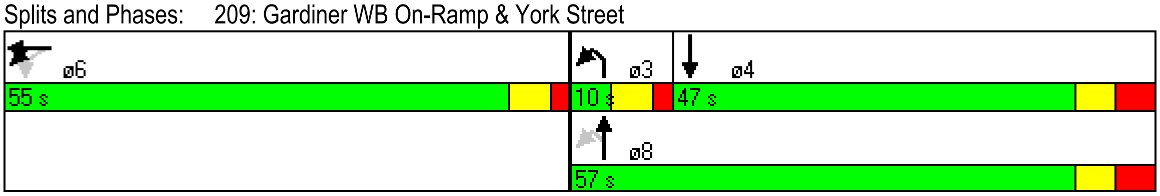
Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 96 (86%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 115
Control Type: Actuated-Coordinated

Splits and Phases: 208: Lake Shore Boulevard & Lower Simcoe

Lane Group	WBL	WBT	NBL2	NBT	SBT
Lane Configurations					
Volume (vph)	1870	655	160	620	585
Turn Type	Split		pm+pt		
Protected Phases	6	6	3	8	4
Permitted Phases			8		
Detector Phase	6	6	3	8	4
Switch Phase					
Minimum Initial (s)	10.0	10.0	4.0	10.0	10.0
Minimum Split (s)	28.0	28.0	10.0	45.0	45.0
Total Split (s)	55.0	55.0	10.0	57.0	47.0
Total Split (%)	49.1%	49.1%	8.9%	50.9%	42.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	4.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	8.0	8.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	C-Max	C-Max	None	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 102 (91%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

Splits and Phases: 209: Gardiner WB On-Ramp & York Street

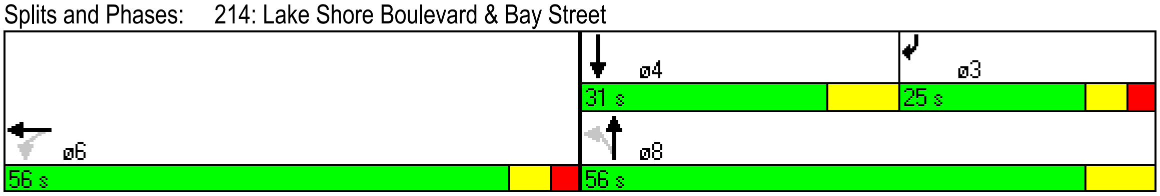


214: Lake Shore Boulevard & Bay Street

Lane Group	WBT	NBL	NBT	SBT	SBR
Lane Configurations					
Volume (vph)	2220	115	525	345	455
Turn Type		Perm			custom
Protected Phases	6		8	4	3
Permitted Phases		8			
Detector Phase	6	8	8	4	3
Switch Phase					
Minimum Initial (s)	10.0	10.0	10.0	10.0	7.0
Minimum Split (s)	28.0	31.0	31.0	31.0	25.0
Total Split (s)	56.0	56.0	56.0	31.0	25.0
Total Split (%)	50.0%	50.0%	50.0%	27.7%	22.3%
Yellow Time (s)	4.0	7.0	7.0	7.0	4.0
All-Red Time (s)	3.0	0.0	0.0	0.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0
Lead/Lag				Lead	Lag
Lead-Lag Optimize?				Yes	Yes
Recall Mode	C-Max	Ped	Ped	Ped	Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 80 (71%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated

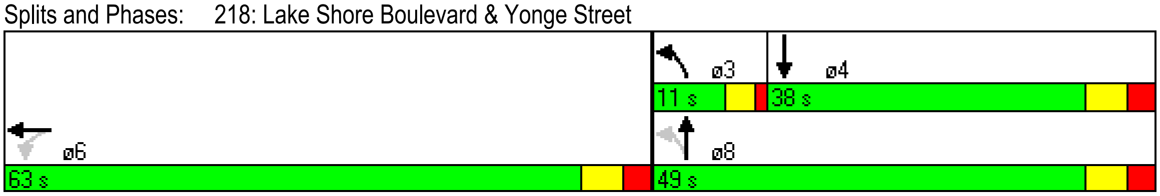
Splits and Phases: 214: Lake Shore Boulevard & Bay Street



Lane Group	WBT	NBL	NBT	SBT
Lane Configurations				
Volume (vph)	1925	170	705	175
Turn Type		pm+pt		
Protected Phases	6	3	8	4
Permitted Phases		8		
Detector Phase	6	3	8	4
Switch Phase				
Minimum Initial (s)	10.0	6.0	10.0	10.0
Minimum Split (s)	29.0	10.0	31.0	31.0
Total Split (s)	63.0	11.0	49.0	38.0
Total Split (%)	56.3%	9.8%	43.8%	33.9%
Yellow Time (s)	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	1.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	4.0	7.0	7.0
Lead/Lag		Lead		Lag
Lead-Lag Optimize?		Yes		Yes
Recall Mode	C-Max	None	Ped	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 65 (58%), Referenced to phase 6:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

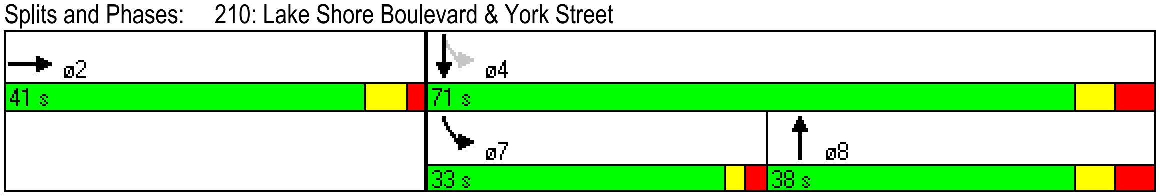
Splits and Phases: 218: Lake Shore Boulevard & Yonge Street



Lane Group	EBT	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	1265	795	470	165
Turn Type			pm+pt	
Protected Phases	2	8	7	4
Permitted Phases			4	
Detector Phase	2	8	7	4
Switch Phase				
Minimum Initial (s)	10.0	10.0	12.0	10.0
Minimum Split (s)	27.0	27.0	16.0	27.0
Total Split (s)	41.0	38.0	33.0	71.0
Total Split (%)	36.6%	33.9%	29.5%	63.4%
Yellow Time (s)	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	4.0	2.0	4.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	8.0	4.0	8.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	C-Max	Ped	None	Ped

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 0 (0%), Referenced to phase 2:EBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

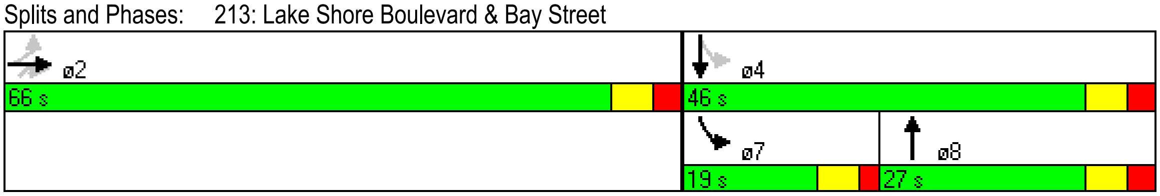
Splits and Phases: 210: Lake Shore Boulevard & York Street



Lane Group	EBL	EBT	NBT	SBL	SBT	NER	NER2
Lane Configurations							
Volume (vph)	870	1215	400	295	140	660	20
Turn Type	Perm			pm+pt		custom	custom
Protected Phases		2	8	7	4		
Permitted Phases	2			4		2	2
Detector Phase	2	2	8	7	4	2	2
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	4.0	10.0	10.0	10.0
Minimum Split (s)	25.0	25.0	26.0	10.0	26.0	25.0	25.0
Total Split (s)	66.0	66.0	27.0	19.0	46.0	66.0	66.0
Total Split (%)	58.9%	58.9%	24.1%	17.0%	41.1%	58.9%	58.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	6.0	7.0	7.0	7.0
Lead/Lag			Lag	Lead			
Lead-Lag Optimize?			Yes	Yes			
Recall Mode	C-Max	C-Max	Ped	None	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 1 (1%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 213: Lake Shore Boulevard & Bay Street



Lane Group	NBT	SBT	NEL	NET
Lane Configurations				
Volume (vph)	110	275	750	1415
Turn Type			Perm	
Protected Phases	8	4		2
Permitted Phases			2	
Detector Phase	8	4	2	2
Switch Phase				
Minimum Initial (s)	10.0	10.0	10.0	10.0
Minimum Split (s)	33.0	33.0	44.0	44.0
Total Split (s)	33.0	33.0	79.0	79.0
Total Split (%)	29.5%	29.5%	70.5%	70.5%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Ped	Ped	C-Max	C-Max

Intersection Summary
Cycle Length: 112
Actuated Cycle Length: 112
Offset: 5 (4%), Referenced to phase 2:NETL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 217: Yonge Street & Lake Shore Boulevard