REPORT PREPARED FOR
CITY OF SASKATOON

KINSMEN PARK
PARKING STRATEGY & TRANSPORTATION STUDY

December 2019 | 18M-01852-00
Final Report

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Quality Management

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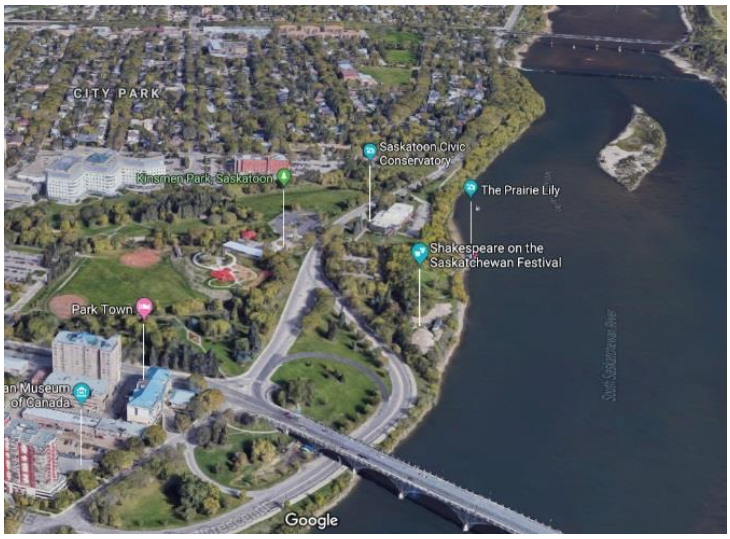
1 INTRODUCTION

Kinsmen Park is Saskatoon's oldest city park and is a source of civic pride for the city. The 46-acre park was first established in 1903 and was the initial home of the Saskatoon Fair and horse track. The park evolved through the decades with new amenities to the park such as adding a paddling pool in 1928, a sports field during the 1950's, and replacing the carousel in 1973. The park has continued to evolve and currently hosts a variety of activities for all ages, including boat tours, a theatre, the South Saskatchewan River, the Meewasin Trail, a large children's playground, a conservatory and a children's museum.



WSP Canada Group Limited (WSP) was retained by the City of Saskatoon (City) to complete a comprehensive parking, motor traffic and active transportation review in order to identify the parking and transportation needs of Kinsmen Park Area over the next 15 years.

The Kinsmen Park Parking Strategy and Transportation Plan has been developed utilizing the following three strategic steps to identify the needs / issues for the Park uses and ultimately establish solutions to address the issues that are tailor-made for the Park:

1. **Existing Conditions |** Conducted a comprehensive data collection program as well as public engagement including key stakeholders to establish the baseline conditions.
2. **Existing and Future Condition Reviews |** Conducted assessments and identified deficiencies for the existing and future conditions.
3. **Solution Development |** Brainstormed all potential solutions to address the needs as well as recommended appropriate remedial measures to accommodate the demand for all road users.

The Kinsmen Park Parking Strategy and Transportation Plan study area is presented in **Figure 1-1.**

In addition to the park space, the Kinsmen Park Area (Park) was assumed to include the YWCA, Nutrien Playland, Nutrien Wonderhub, Civic Conservatory, Shakespeare on the Saskatchewan (SOTS), and Prairie Lily Cruise.

LEGEND:

- Study Intersections
- Parking Data Collection Zones
- Study Boundary

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Issue Date - 2019-05-28
Scale: NTS
Aerial Imagery: Google Imagery

FIGURE 1-1 |
STUDY AREA AND INTERSECTIONS

Kinsmen Park Parking Strategy and Transportation Study

NOTE: These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design
DRAWING: Kinsmen Park Transportation Study.cdr DATE: 2019-05-28 DRAWNBY: thaia

1.1 EXISTING ROAD NETWORK

The Park is accessible via 25th Street, Kinsmen Avenue, Spadina Crescent, and Queen Street. **Table 1-1** summarizes the characteristics of the roads and segments within the study area.

Table 1-1 | Study Segments Characteristics

Corridors	Classification	Physical Characteristics	Modes	On-Street Parking
25th St East: University Bridge - Kinsmen Ave	Arterial	Posted Speed: 50 km/h # of Lanes: 4 Truck Route: No	Sidewalks: Both sides Cycling: Shared Transit: Frequent at peak hours (Routes 04, 06, 43, 44, 45, 60, 61, 62, 63, 65)	None
Spadina Cres: 25th St East - Spadina Cres Ramp	Arterial	Posted Speed: 50 km/h # of Lanes: 2 Truck Route: No	Sidewalks: Both sides Cycling: Both sides Transit: None (No stops)	None
Spadina Cres: Spadina Cres Ramp - Queen St	Arterial	Posted Speed: 50 km/h # of Lanes: 2 Truck Route: No	Sidewalks: West side (continuous), east side (University Bridge - Spadina Ramp intersection) Cycling: Shared Transit: (Hospital Shuttles)	None
Queen St: Spadina Cres - 9th Ave North	Collector	Posted Speed: 50 km/h # of Lanes: 2 Truck Route: No	Sidewalks: North side Cycling: Shared Transit: West of study area (Routes 11 & 12) and Hospital Shuttle	North side 2 Hours (08:00 - 17:00) Mon - Fri
Kinsmen Ave: North of 25th St East	Local	Posted Speed: 50 km/h # of Lanes: 2 Truck Route: No	Sidewalks: West side Cycling: Shared Transit: None	None
Spadina Cres Ramp: University Bridge - Spadina Cres	Ramp	Posted Speed: 50 km/h # of Lanes: 1 Truck Route: No	Sidewalks: on the northbound side Cycling: Shared Transit: None (No stops)	None
Spadina Westbound to Southbound Loop	Loop	Posted Speed: 50 km/h # of Lanes: 1 Truck Route: No	Sidewalks: None Cycling: Shared Transit: None (No stops)	None

1.2 DATA COLLECTION PROGRAM

To successfully complete the project, data collection was essential to serve as a baseline input to evaluate the existing conditions and estimate future demand. This includes field investigation of the current transportation infrastructure and document existing deficiencies, if any. Parking surveys and traffic volume data were collected to establish the baseline conditions for the usage of the Park. Conflict

observation and active transportation surveys were completed to document a deeper insight into any safety issues (i.e. near misses or sight obstructions), and driver and pedestrian behaviors beyond what an analysis of the collision statistics alone can indicate.

The Park consists of multiple developments including Nutrien Playland, Conservatory, Nutrien Wonderhub, Prairie Lily Cruise and Shakespeare on the Saskatchewan. The public utilizes the Spadina Crescent and Kinsmen Avenue corridors as well as parking spaces adjacent to the Park areas to access these businesses. The following highlights the hours of operations for the businesses.

- Nutrien Playland
  - Opens from: May 12 – September 2, 2019
  - Weekday Hours of Operation: 2:30 p.m. – 8:00 p.m.
  - Weekend Hours of Operation: 10:00 a.m. – 8:00 p.m.
- Civic Conservatory and Nutrien Wonderhub
  - Wonderhub Opening Day: June 28, 2019
  - Hours of Operation: 9:00 a.m. – 5:00 p.m. daily

  The Civic Conservatory was still under renovation during the data collection program.
- Prairie Lily Cruise
  - Sightseeing Cruise Operations: May 10 – October 12, 2019
  - Sightseeing Cruise Hours: 1:30 p.m. – 8:00 p.m. (90mins)
  - Friday Sunset Cruise Operations: May 17 – August 23, 2019
  - Friday Sunset Cruise Hours: 8:45 p.m. (boarding)
  - Dinner Cruise Operations: May 11 – October 12, 2019
  - Dinner Cruise Hours: 6:00 p.m. (boarding)
  - Sunday Brunch Cruise Operations: May 11 – October 13, 2019
  - Sunday Brunch Cruise Hours: 11:15 a.m. (boarding)
- Shakespeare on the Saskatchewan (SOTS)
  - Shows Start: July 3 – August 18, 2019
  - Hours of Operation: 7:30 p.m.
  - Sunday's Operations: 1:00 p.m., 5:30 p.m., 7:30 p.m.

1.2.1 PARKING SURVEY

The data collection was scheduled to coincide with regular hours of operations for the Park's activities / businesses, including:

- Parking Survey:
  - Collect at 1-hour intervals for 12 hours
  - Collect between 9:00 a.m. and 9:00 p.m.
  - Weekday Parking Survey was collected on Thursday July 11, 2019
  - Weekend Parking Survey was collected on Sunday July 14, 2019

1.2.2 INTERSECTION VOLUME COUNTS

- Typical Weekday Morning Peak: between 7:00 a.m. and 9:00 a.m.
- Typical Weekday Afternoon Peak: between 4:00 p.m. and 6:00 p.m.

- Weekday Late Evening Peak: between 6:00 p.m. and 8:00 p.m. (determined by the peak hour from Parking Survey)
- Weekend Peak: between 1:00 p.m. and 3:00 p.m. (determined by the peak hour from Parking Survey)
- Weekday volumes was collected on Thursday July 11, 2019
- Weekend volumes was collected on Sunday July 14, 2019

1.2.3 ACTIVE TRANSPORTATION AND CONFLICT OBSERVATION SURVEY

- Conflict Observation Survey – identify conflict points and near misses, if any, between vehicles, pedestrians, and cyclists at street intersections, internal intersections, and at driveways.
- Active Transportation Review
- Review sidewalks and paved/unpaved pathways
- Review informal pathways (worn pathways on grass)
- Document existing entrance / connection points to the existing infrastructure
- Identify missing connections

2 BACKGROUND INFORMATION

WSP reviewed background resources to ensure that the final recommendations developed would align with the City's visions. These documents also serve as a guide during the solution development stage so that the final improvement plans within the Park is consistent with the network throughout Saskatoon.

2.1 KINSMEN PARK MASTER PLAN

The City of Saskatoon Kinsmen Park Master Plan (Master Plan) was developed in November 2011 and set forth a 25-year improvement process for the rejuvenation and redesign of the Park to ensure that the Park can continue to be enjoyed by future generations.

"The primary vision of the Master Plan is to create a place-specific, memorable environment that is enjoyable for all ages, with a special focus on Children's activities."

The transportation initiatives identified within the Master Plan includes modifications on the road network, parking zones, and active transportation facilities. The Master Plan places specific emphasis on improving pedestrian and cycling infrastructure along Spadina Crescent to encourage the use of active modes. Recommendations to this street include:

- Improve the public realm through the park by continuing or partially continuing the 'promenade' characteristics that are currently found south of the Park on Spadina Crescent (i.e. widened sidewalk, green infrastructure, sidewalk lamps, textured sidewalk surface treatments);
- Implement dedicated cycling infrastructure, where possible, with the long-term objective of implementing a cycling facility that is physically separated from motor vehicle travel lanes; and
- Improve the conspicuity and safety of pedestrian crossings.

2.2 COMPLETE STREET DESIGN AND POLICY GUIDE

The Complete Streets Design and Policy Guide provides guidance to planners, engineers, the community and developers to design the public right-of-way in a consistent manner, ensure land uses are integrated, and contributes to a people-orientated street environment. The Complete Streets Design and Policy Guide defines the context of the corridor which includes both existing and future road, transit, bicycle, and pedestrian networks, and a toolkit that highlights some of the most important treatments that will be critical to Saskatoon's success.

2.3 ACTIVE TRANSPORTATION PLAN

The Active Transportation Plan (ATP) sets a vision for the city as a leader in active transportation by the year 2045. The ATP identifies a desire within the city to make active transportation a safe and comfortable modal choice for people of all ages and abilities. Furthermore, active transportation should be a safe and comfortable modal choice throughout the year. The ATP has noted that improving linkages and connections to destinations in Saskatoon for cyclists and pedestrians is an important component of

achieving the City's vision. Improving cycling and pedestrian infrastructure to Kinsmen Park Area is in line with this vision as the park is a destination for leisure and a connection to downtown.

The ATP has identified opportunities to improve active transportation in the form of six themes, three of which focuses on pedestrians and cyclists facilities:

1. Connectivity;
2. Safety and Security;
3. Convenience;

Theme 1, Connectivity, aims to create a network of sidewalks, paths, and cycling facilities that is connected and convenient for all active transportation users. This includes building upon and improving the existing sidewalk and bicycle network within the city, as well as addressing existing physical barriers. Improvements to the cycling network should be done to ensure that cycling facilities are designed for All Ages and Abilities (AAA). This will include the implementation of separated on-street cycling infrastructure and off-street multi-use paths where possible. Implementing cycling infrastructure that is designed for all ages and abilities is of specific importance in downtown, as noted by the ATP. Improving existing multi-use pathways has also been noted as an action item within this theme. The Meewasin Trail, a pathway that connects through the park, has been specifically identified within this action item as a facility that may require infrastructure improvements.

Key components for AAA cycling network identified in the study include:

- **Safety |** Be safe because cyclists are vulnerable road users;
- **Comfort |** Be comfortable in order to attract new cyclists; and,
- **Connectivity |** Connect not only to other facilities but also to key destinations in order to be practical.

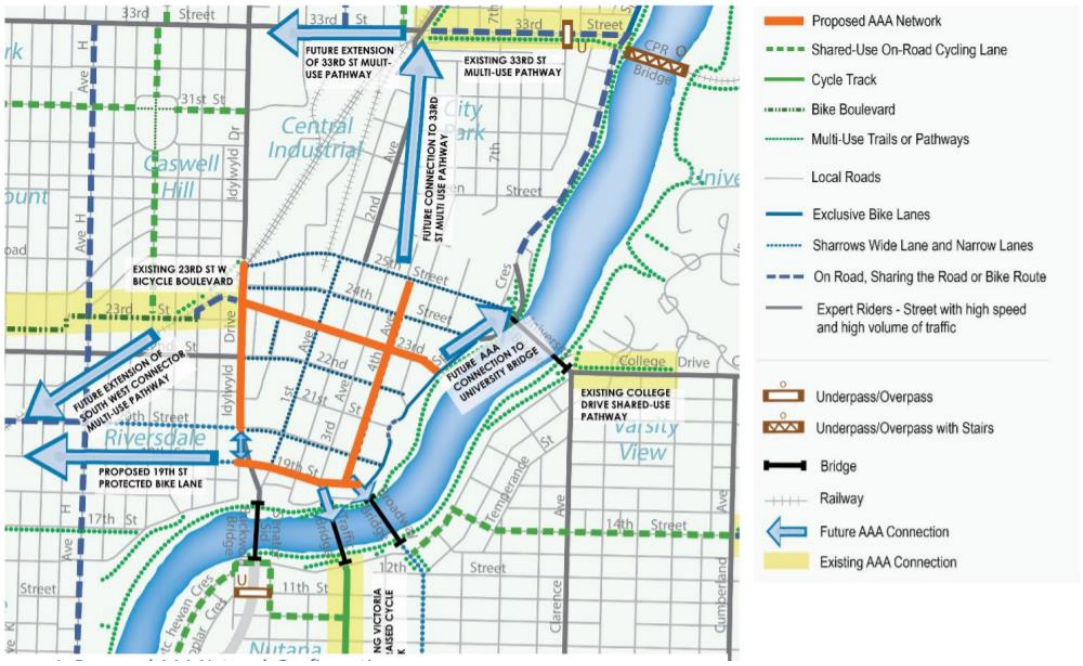
Theme 2, Safety and Security, includes a desire to reduce conflicts on multi-use pathways between different modes. This includes managing conflicting movements between pathway users and mitigating the speed differential of different modes, such as walking and cycling. Infrastructure improvements to the active transportation network should ensure that the design of shared facilities considers these conflicts.

Theme 3, Convenience, aims to provide public amenities that make active transportation a convenient and practical modal choice. This includes the provision of bicycle parking and end-of-trip facilities. Bicycle parking may take the form of short-term parking, bicycle racks situated in the public right-of-way, and long-term parking, secure storage facilities (e.g. lockers, cages, stations) that are intended for longer periods. The ATP notes that the City should act as a leader to private property owners by providing bicycle parking on public-owned land. It is further recommended that cycling amenities, such as bicycle repair and maintenance stations, be installed at key destinations throughout the city.

2.4 DOWNTOWN ALL AGES AND ABILITIES CYCLING NETWORK STUDY

The Downtown All Ages and Abilities Cycling Network study further identified the appropriate corridors and connections for the AAA network within the downtown area, as illustrated in **Figure 2-1**. The major principles in identifying the downtown network include connection with Saskatoon's wider cycling network, integration with other downtown projects, as well as the impacts on all road users.

Figure 2-1 | Proposed AAA Network



2.5 MEEWASIN TRAIL STUDY

The 2014 Meewasin Trail Study, prepared for the Meewasin Valley Authority, included a review of the existing Meewasin Trail to identify opportunities for infrastructure, maintenance, and accessibility improvements. The study notes that the Meewasin Trail is a popular corridor for all active transportation users. One of the largest complaints among users of the trail is the presence of cyclists and their higher travel speeds compared to other trail users. The section of trail near the Mendel Building, a location within the Park, has been noted as the busiest section of the trail and it is expected to have over 450 users per hour by 2043. The study indicates that this section does not meet the current 3.0m standard for the Meewasin Trail and that best practices suggest that an even wider facility (> 4.0m) may be warranted given the anticipated future volume of users. The following infrastructure improvements were identified:

- Widen the trail to accommodate anticipated future use;
- Reconstruct the pedestrian boardwalk path;
- Prune overhead and adjacent vegetation; and
- Improve accessibility.

2.6 COMPREHENSIVE DOWNTOWN PARKING STRATEGY

The Comprehensive Downtown Parking Strategy reviewed the existing and future parking conditions in the Downtown, Kinsmen, Riverdale and Broadway study areas, as well as identified a parking Management Plan and Transportation Demand Management initiatives to potentially reduce the future parking demands.

The Kinsmen study area was generally bounded by 25th Street to the south, Spadina Crescent to the east, Queen Street to the North and Idylwyld Drive to the west.

The following findings are applicable to this study:

- A total of 3,685 parking stalls are available in the Kinsmen area (including on-street, municipal off-street, commercial off-street, and private off-street).
- Approximately 70% of the parking supply is private off-street which is not available for public uses.
- Approximately 600 public stalls out of 1,514 total stalls were available during the study peak period at 2 p.m.

The following recommendations are applicable to this study:

- Actively identify locations to increase the supply of on-street parking.
- Conduct detailed feasibility studies regarding the provision of public parking in new garages on the former Police Station site and the surface lots adjacent to the YMCA.
- Review the feasibility of providing park and ride surface lots at the outer portion of the future BRT lines in order to reduce the amount of parking required Downtown.
- Implement a comprehensive TDM program to reduce the amount of costly parking garage(s) required in the future. This program would include local transit improvements, the provision of auto share services, a ride matching services, preferential parking for carpool vehicles, enhanced bicycle parking, a guaranteed ride home service and the continued use of parking rates for employee parking that are significantly higher than the cost of a transit pass.

3 PUBLIC ENGAGEMENT

Engaging stakeholders and the public was an important component of this project and for its successful completion. An effective engagement program targeting stakeholders and the public was necessary to communicate information about the project, identify issues and concerns, collect valuable feedback and background information. As part of this project, WSP met with several stakeholders identified by the City as well as two public open house events.

3.1 STAKEHOLDER CONSULTATIONS

During the kick-off meeting, the City provided a complete list of stakeholders as part of the engagement including a 'direct' group and an 'informed' group.

The direct group stakeholders are those that are directly impacted by the future of the Park. These stakeholders include:

- Meewasin Valley Authority (Meewasin)
- Nutrien Playland
- Nutrien Wonderhub
- Shakespeare on the Saskatchewan (SOTS)
- Prairie Lily Cruise
- YWCA
- Saskatoon Housing Authority
- Civic Conservatory
- City of Saskatoon – Special Event
- City of Saskatoon – Facility Division
- City of Saskatoon – Roadways and Operations
- City of Saskatoon – Park Division (Maintenance)
- City of Saskatoon – Park Division (Irrigation)
- City of Saskatoon – Park Division (Design)
- City of Saskatoon – Transit

WSP hosted individual meeting(s) with the identified stakeholders to discuss any safety and/or operational issues and concerns within the study area. The consultation also identified the existing operations of the Park uses and the anticipated future growth of each use / business. A detailed summary of the stakeholder consultations is attached in **Appendix A**.

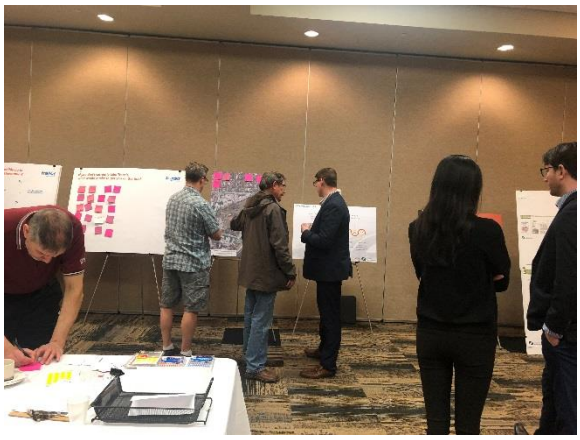
In addition to the direct group, the City also identified a list of 'informed' group stakeholders who, although may not be directly impacted by the Kinsmen Park area, has a vast interest in the modifications and improvements of the area. These inform groups include:

- City Park Community
- Saskatoon Housing Authority
- Saskatoon Health Region – City Hospital
- Saskatoon Health Region – Nurse's Residence
- Saskatoon Health Region – Royal University Hospital
- Nutrien
- Canpotex
- Discover Park Condo
- Nordic Ski Club

3.2 PUBLIC OPEN HOUSES

3.2.1 PUBLIC OPEN HOUSE #1

WSP attended a public open house event on April 16, 2019 hosted by the Meewasin, SOTS, and Civic Conservatory. The intent of this open house event was to inform the public of the project, and gather public input and concerns. Some of the most common feedback gathered from the event include:



- Improve pedestrian safety, especially for children, at the Nutrien Playland and Conservatory crossing
- Congestion at the Nutrien Playland and Conservatory intersection
- Provide bicycle lane and parking spaces. Protected bike lanes and parking (with chariots) should be considered for family
- Provide shuttle and transit services
- Improve public information / knowledge regarding the available parking spaces in the Park (i.e. indicative system of available parking spots)

Additional comments are summarized in **Appendix A**.

3.2.2 PUBLIC OPEN HOUSE #2

The second public open house, held on November 18, 2019, presented the findings and recommendations of the project. The public and key stakeholders were invited to attend to provide comments and feedback on the recommendations. Some of the comments gathered are summarized below:

- Agreed with the recommendations particularly on pedestrian improvements and parking facility expansion
- Prefers the use of multi-use pathway instead of on-street bike lanes on Spadina Crescent
- Agree that some form of transit services should be provided for the Park area to help reduce the strains of parking demand
- Provide pedestrian crossing improvement between Zone 3 and Zone 4 since there will likely be more children with the Wonderhub
- The timeframe for the parking improvements should be moved up

Additional comments are summarized in **Appendix A**.

4 COLLISION ANALYSIS

The most recent available collision information was provided by the Saskatchewan Government Insurance (SGI). A collision analysis was completed within the study area based on a 5-year (2013 – 2017) timeframe for 25th Street, Spadina Crescent, and Queen Street. The following collision analysis summary excludes impaired-related collisions.

Figure 4-1 illustrates the number of collisions by severity (ranging from property damaged to fatal collisions) within the study area. A detailed summary of the analysis is provided in **Appendix B**.

4.1.1 25TH STREET: SPADINA CRESCENT – KINSMEN AVENUE

The collision analysis indicates that there is a total of 111 collisions recorded on 25th Street between Spadina Crescent and Kinsmen Avenue with 92 Property Damaged Only (PDO), 19 injuries and 0 fatality.

A total of 82 collisions occurred at an intersection, 63 of which were at the 25th Street and Spadina Crescent intersection. The most common collision configurations were rear-ended at 73 collisions and side-swipe same direction at 8 collisions.

There was a collision involving a pedestrian recorded in 2013 at the 25th Street and Kinsmen Avenue intersection that resulted in personal injury. The major contributing factor was failure to yield to the right-of-way while the pedestrian was crossing the intersection.

4.1.2 SPADINA CRESCENT: 25TH AVENUE – QUEEN STREET

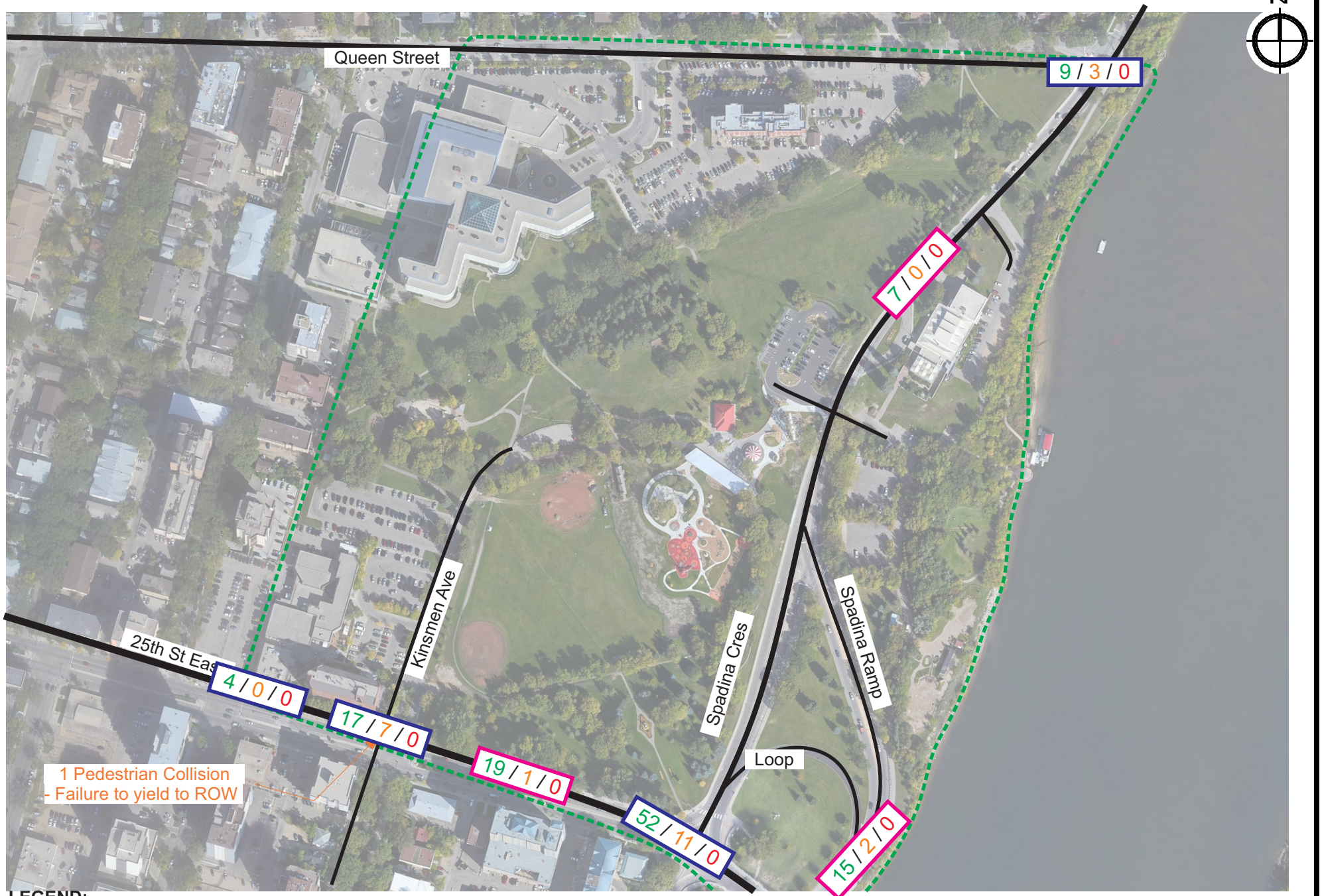
There was a total of 27 collisions recorded between 2013 and 2017 along Spadina Crescent between 25th Street and Queen Street, 22 of which were PDO, 2 injuries and no fatal collisions. The majority of the accidents were non-intersection collisions. Similarly, the most common collision configurations were rear-ended at 15 collisions recorded and followed by lost control right ditch at 3 collisions.

There were no collisions involving pedestrians or cyclists identified.

4.1.3 QUEEN STREET AND SPADINA CRESCENT INTERSECTION

There was a total of 12 collisions recorded between 2013 and 2017 at the Queen Street and Spadina Crescent intersection, 9 of which were PDO, 3 injuries, and no fatal collisions. There was a total of 11 rear-ended collisions and one lost control right-ditch collision.

There were no collisions involving pedestrians or cyclists recorded.



LEGEND:

PDO / Injury / Fatality Collision Severity

Intersection Collisions

Segment Collisions

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FIGURE 4-1 | COLLISION ANALYSIS BY SEVERITY - 5 YEAR ANALYSIS (2013-2017)

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5 EXISTING PARKING CAPACITY AND USAGE

In order to determine the current usage and demand for parking within the Park, the current parking inventory and hourly utilization were recorded. The data collected during the study period was analyzed for the following key parking performance indicators:

- Occupancy / Utilization
- Parking Turnover
- Duration of Stay

With the Civic Conservatory still under renovation during the data collection program, parking demand anticipated to generate from this use was estimated and added to the parking usage. Detail calculations are attached in **Appendix C**.

Detailed summary of the parking survey is provided in **Appendix D**.

5.1 EXISTING PARKING CAPACITY

Parking supply for the developments in the Park was divided into 6 surface parking zones for both staff and public uses, as outlined in **Table 5-1** below. Zone 6 is available for the SOTS patrons in the evening. **Figure 5-1** illustrates the parking zones and available capacity.

Table 5-1 | Total Parking Supply for Kinsmen Park Area Uses

Parking Zones	Capacity (Stalls)	
	Day	Evening
Zone 1 – Kinsmen Avenue	85	85
Zone 2 – Staff Parking	14	14
Zone 3 – Spadina West	52	52
Zone 4 – Spadina East	84	84
Zone 5 – Mendel Building	28	28
Total Kinsmen Park Area Parking Supply:	263	263
Zone 6 – City Hospital	-	366
Total Parking Supply:	***263***	***629***

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FIGURE 5-1 | AVAILABLE PARKING SUPPLY FOR KINSMEN PARK AREA USES

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5.2 EXISTING PARKING UTILIZATION

The parking survey at each zone was conducted over a 12-hour period (between 9:00 a.m. and 9:00 p.m.) on Thursday, July 11, 2019 and Sunday, July 14, 2019. **Table 5-2** presents the peak parking demand for the Park for both weekday and weekend operations.

Table 5-2 | Kinsmen Park Area Peak Parking Utilization

Parking Zones	Utilization	Weekday	Weekend
Zone 1 – Kinsmen Ave	*Average (%)*	63%	47%
	Peak	95%	84%
	**Peak (Time)*	11:00 AM	1:00 PM - 3:00 PM
	***No. of Hrs ≥ 90%*	1	0
Zone 2 – Staff Parking	*Average (%)*	57%	43%
	Peak	93%	64%
	**Peak (Time)*	2:00 PM	12:00 Noon - 3:00 PM
	***No. of Hrs ≥ 90%*	1	0
Zone 3 – Spadina West	*Average (%)*	90%	85%
	Peak	100%	100%
	**Peak (Time)*	11:00 AM-4:00 PM, 6:00 PM - 8:00 PM	2:00 PM - 4:00 PM, 5:00 PM, 7:00 PM
	***No. of Hrs ≥ 90%*	8	9
Zone 4 – Spadina East	*Average (%)*	86%	94%
	Peak	103%	110%
	**Peak (Time)*	1:00 PM - 3:00 PM	12:00 Noon - 4:00 PM, 5:00 PM - 8:00 PM
	***No. of Hrs ≥ 90%*	8	8
Zone 5 – Meewasin Trail	*Average (%)*	63%	57%
	Peak	89%	82%
	**Peak (Time)*	2:00 PM	2:00 PM
	***No. of Hrs ≥ 90%*	0	0
Total Kinsmen Park Area Parking Zones (excl. Zone 6)	*Average (%)*	76%	70%
	Peak	93%	94%
	**Peak (Time)*	2:00 PM	2:00 PM
	***No. of Hrs ≥ 90%*	1	2

* %Peak higher than 100% capacity of the supply due to illegal parking (i.e. double parked, use of parking circulation aisle.

** Note: Maximum number of hours ≥ 90% = 12 hours (90% is considered full)

Table 5-3 summarizes the peak parking demand for Zone 6 City Hospital.

Table 5-3 | Kinsmen Park Area Peak Parking Utilization

PARKING ZONES	UTILIZATION	WEEKDAY	WEEKEND
Zone 6 – City Hospital	*Average (%)*	41%	7%
	Peak	67%	14%
	**Peak (Time)*	1:00 PM	1:00 PM - 3:00 PM
	***No. of Hrs ≥ 90%*	0	0

* %Peak higher than 100% capacity of the supply due to illegal parking (i.e. double parked, use of parking circulation aisle.

** Note: Maximum number of hours ≥ 90% = 12 hours (90% is considered full)

The parking survey findings include:

- Peak parking utilization for the Park occurred between 2 p.m. and 3 p.m. for both weekday and weekend counts.
- Evening peak parking demand for the Park occurred between 7 p.m. and 8 p.m. for both weekday and weekend counts.
- Zone 1 appeared to be under-utilized, particularly during the evening period.
- Zone 2 (designated as staff only parking area) was being utilized by both the Park staff and visitors.
- Zone 3 is at capacity during peak demand (> 90% utilization).
- Zone 4 is overcapacity due to illegal parking in the circulating lane.
- Zone 5 (designated as staff only parking area) was being utilized by both the Wonderhub staff and public.
- Zone 6 was utilized in the evening by the SOTS patrons.

While the demand for parking in Zones 3 and 4 adjacent to Spadina Crescent was over 90% during the peak periods, it was identified that there was additional capacity available in other zones, particularly Zone 1 for the evening demand. The parking survey also indicates that parking supply in Zones 2 and 5 are essential to accommodate the demand for the Park.

There was use of adjacent on-street parking west and north of the Park by visitors as evident through the conflict observation survey and the parking study data collection.

Figures 5-2 and 5-3 illustrate the weekday and weekend peak utilization for each zone.

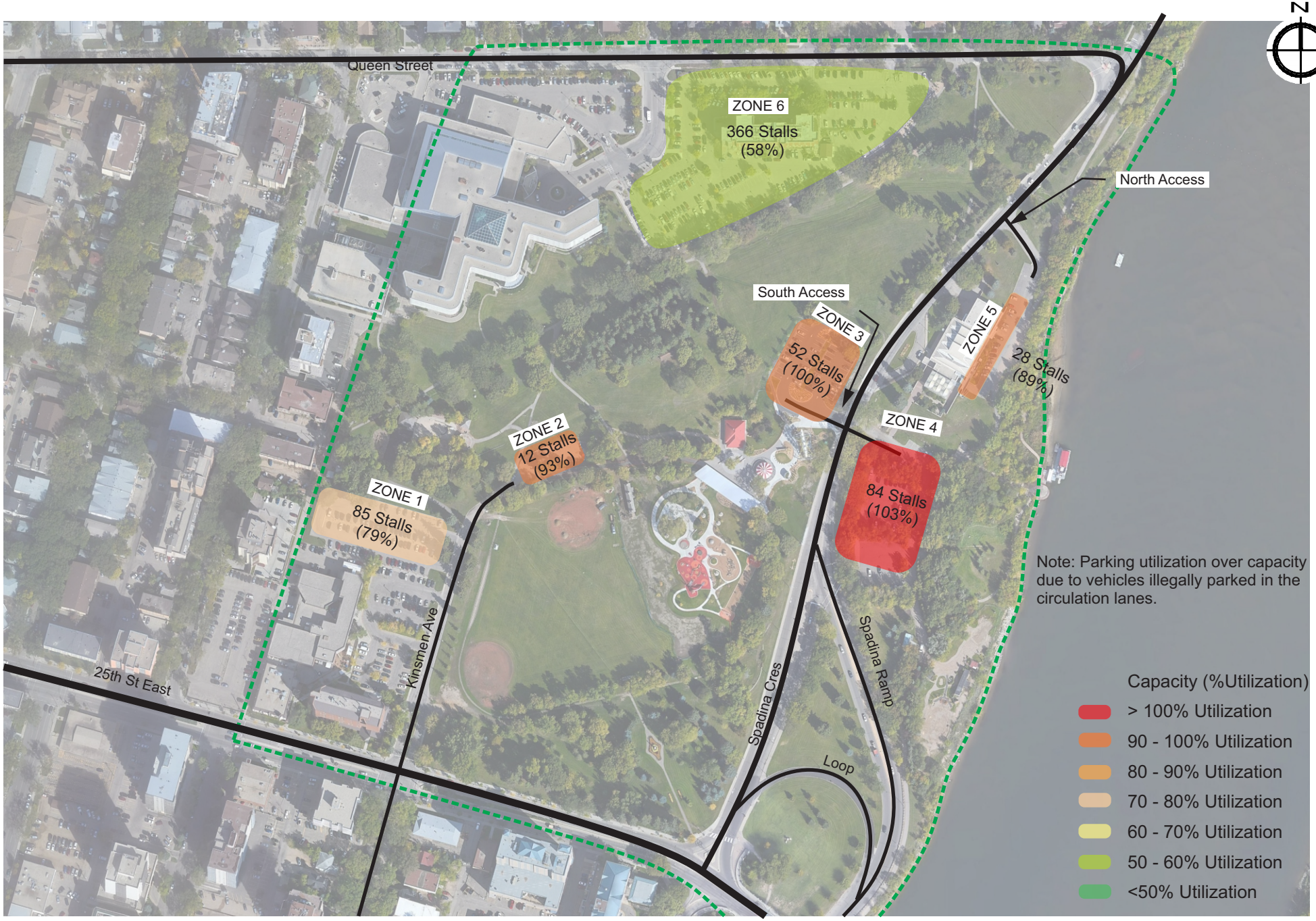

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FIGURE 5-2 |
WEEKDAY PEAK UTILIZATION

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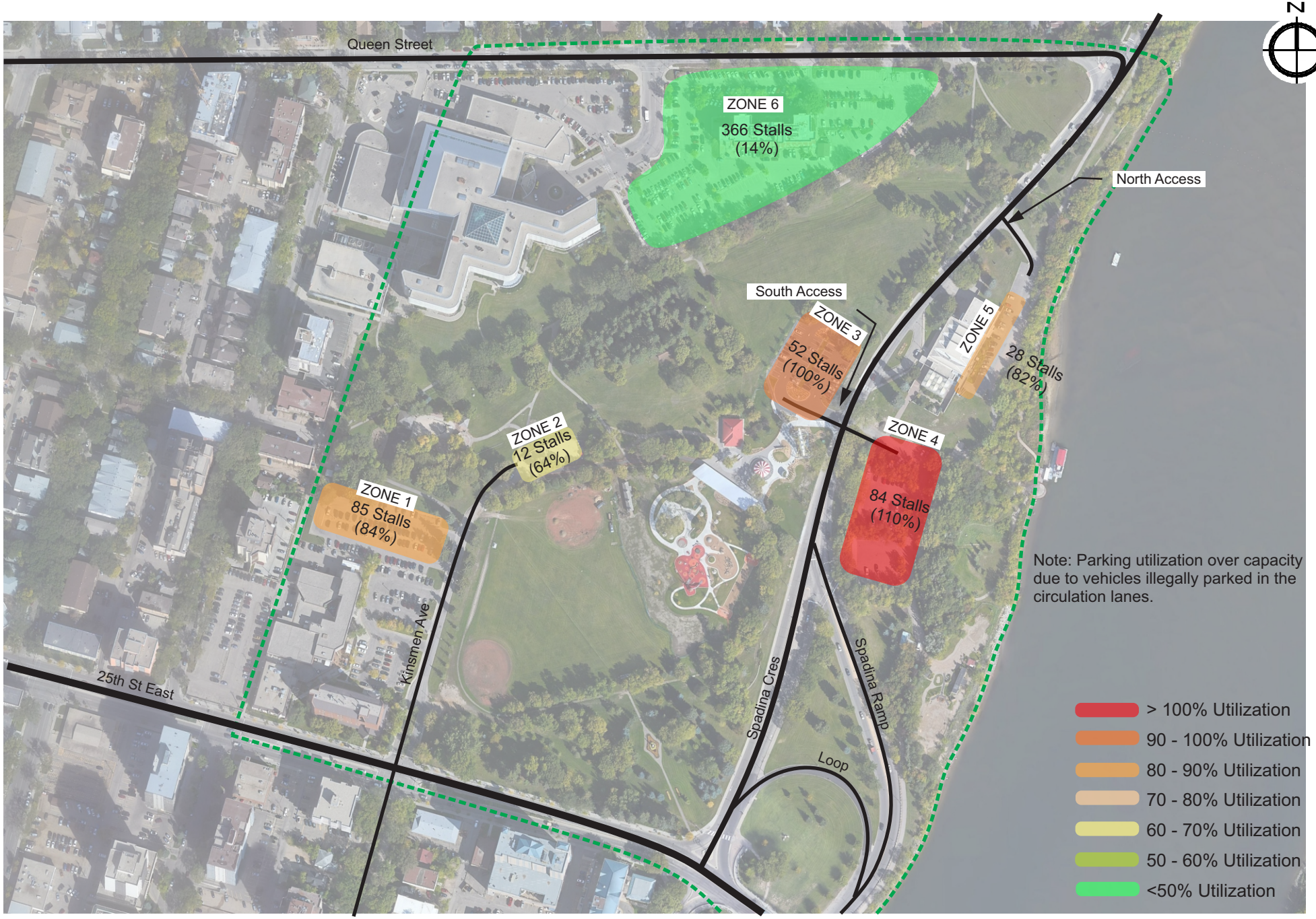

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FIGURE 5-3 |
WEEKEND PEAK UTILIZATION

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5.3 PARKING TURNOVER

Parking turnover estimates the number of vehicles parked in a space over the study period. Parking turnover was determined by the total vehicles counted during the study period over the capacity for each zone. **Table 5-3** summarizes the average parking turnover for the Park for both weekday and weekend usage during the daytime (9:00 a.m. to 5:00 p.m.) and evening (5:00 p.m. to 9:00 p.m.) operations.

Table 5-4 | Average Parking Turnover

Parking Zones	Capacity	Daytime Turnover (9:00a.m. - 5:00p.m.)		Evening Turnover (5:00p.m. - 9:00p.m.)		Overall Turnover (9:00a.m. - 9:00p.m.)	
		Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
Zone 1	85	5.86	4.40	1.75	1.24	7.61	5.64
Zone 2	14	5.64	4.07	1.21	1.14	6.86	5.21
Zone 3	52	7.44	6.79	3.37	3.37	10.81	10.15
Zone 4	84	7.22	7.13	3.11	4.11	10.33	11.24
Zone 5	28	5.01	4.46	2.60	2.39	7.61	6.86
Avg Parking Turnover:	***263***	***6.50***	***5.73***	***2.57***	***2.69***	***9.07***	***8.43***
Zone 6	366	4.40	0.68	0.51	0.13	4.91	0.81
Avg Parking Turnover:	***629***	***5.28***	***2.79***	***1.37***	***1.20***	***6.65***	***3.99***

All areas measured showed a slightly lower turnover for the weekend except for Zone 4 during the weekend evening period. It was identified that the variations in parking turnover in Zone 3 and Zone 4 were minimal.

5.4 DURATION OF STAY

Since there is no restriction on parking duration, a license plate survey was conducted on Sunday to identify the true duration of stay for the Park. The license plate survey was conducted at a one-hour interval for Zones 1 to 5. As such, the data is presented as a range rather than precise time of stay, as summarized in **Table 5-4.** The majority of the Park visitors stayed between 1 and 2 hours while approximately 30% stayed longer than 2 hours. The duration of stay for Zones 2 and 5 may also be an indication that the zones were utilized by visitors since staff would have parked for longer than 2 hours.

Table 5-5 | Duration of Stay (Weekend)

Zones	Duration of Stay			
	≤ 2 Hours	3 Hours	4 Hours	> 4 Hours
Zone 1	73%	15%	5%	7%
Zone 3	74%	15%	6%	4%
Zone 4	65%	17%	12%	7%
Visitor Parking Zones:	***70%***	***16%***	***9%***	***6%***
Zone 2	36%	14%	0%	50%
Zone 5	60%	8%	5%	27%
Total Parking Zones:	***69%***	***15%***	***8%***	***8%***

6 EXISTING TRAFFIC VOLUMES

Turning movement counts were collected at the study intersections for a typical weekday and weekend to determine the traffic demand along Spadina Crescent adjacent to the Park. Traffic volumes on the weekday were collected during the typical morning (7:00 a.m. – 9:00 a.m.) and afternoon (4:00 p.m. – 6 p.m.) peak periods, corresponding to commuter traffic.

In addition to the typical weekday peak hour, traffic volumes were collected during the peak operations of the Park, based on the maximum parking demand, on a weekday and weekend in order to determine how traffic would operate at these periods. As such, the weekday evening peak period was collected between 6:00 p.m. and 8:00 p.m. while the weekend peak period was collected between 1:00 p.m. and 3:00 p.m.

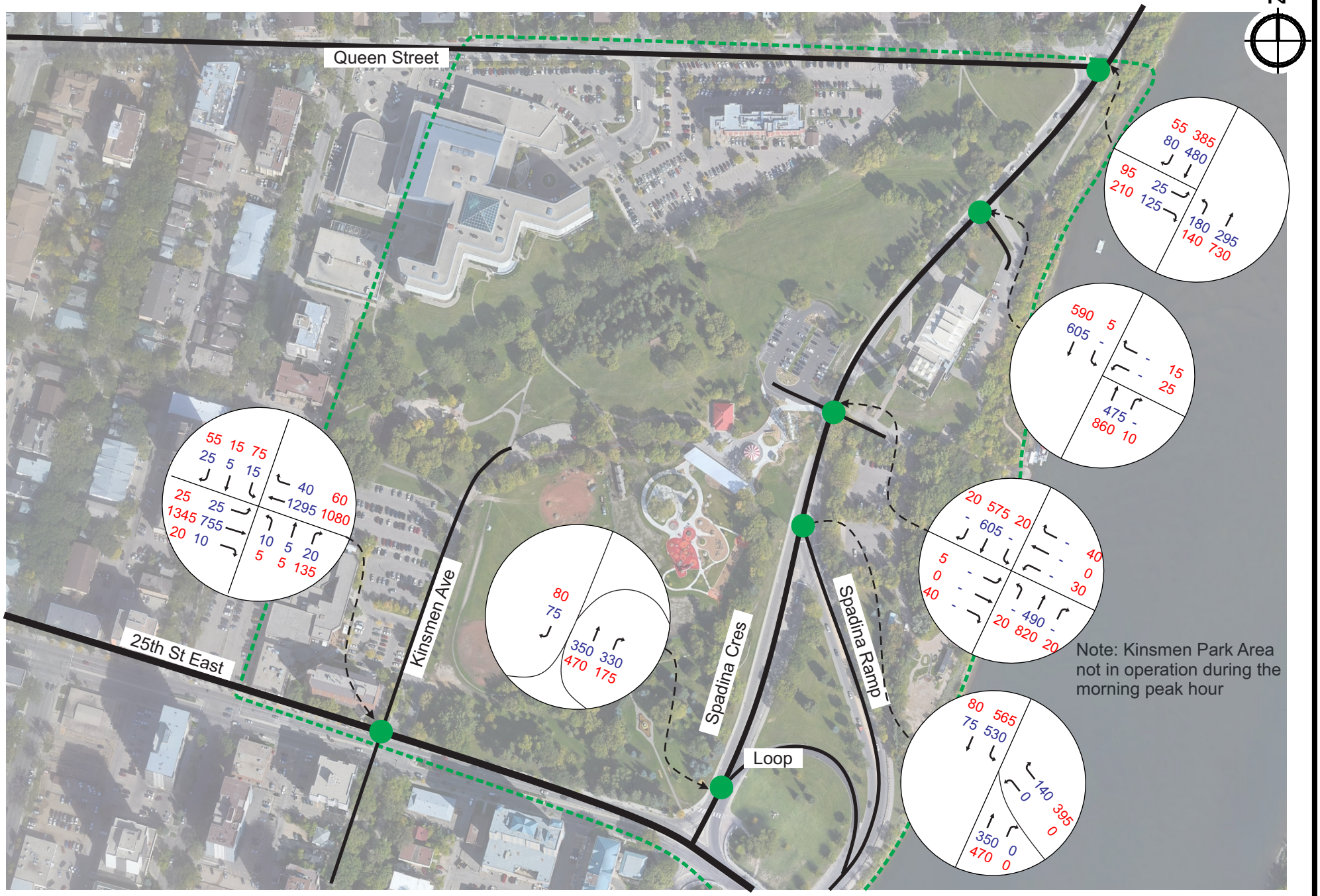
The traffic volumes collected in 2019 during peak operation of the Park were compared to 2018 traffic volumes, provided by the City. The 2018 traffic volumes were collected in April or November which represents typical commuter traffic. The purpose of the comparison is to determine the changes between typical commuter traffic volumes and summer traffic volumes to ensure that the recommended intersection improvement(s) would be able to accommodate traffic all year round. **Table 6-1** summarizes the morning and afternoon peak hour entering volumes at the study intersections for the 2018 and 2019 data.

Table 6-1 | Comparison of 2018 Commuter and 2019 Park Operations Traffic Volumes

Intersections	AM Peak Entering Volumes			PM Peak Entering Volumes		
	2018 (Apr/Nov)	2019 (Summer)	%Change	2018 (Apr/Nov)	2019 (Summer)	%Change
25th St & Kinsmen Ave	2,450	2,200	**-10%**	2,750	2,850	**4%**
Spadina Cres & Loop	850	750	**-12%**	750	700	**-7%**
Spadina Cres & Ramp	1,250	1,100	**-12%**	1,550	1,500	**-3%**
Spadina Cres & Playland Access	1,250	1,100	**-12%**	1,550	1,600	**3%**
Spadina Cres & Access	1,300	1,100	**-15%**	1,550	1,500	**-3%**
Spadina Cres & Queen St	1,350	1,200	**-11%**	1,550	1,600	**3%**

It was identified that the variation in traffic volumes was minimal with a maximum of 15% change which is considered acceptable since fluctuation of up to 25% can occur from day-to-day operations. The maximum difference was approximately 4 to 5 vehicles per minute between the two timeframes.

With the Civic Conservatory still under renovation during the data collection program, traffic volumes anticipated to generate from this use were estimated and added to the current traffic volumes. Detail calculations are attached in **Appendix C**. Adjusted traffic volumes are illustrated in **Figure 6-1** for the typical weekday commuter morning and afternoon peak hours and **Figure 6-2** illustrates the weekday evening and weekend peak hours.



LEGEND:

Existing Morning / Afternoon Peak Hour Volumes (rounded to nearest 5)

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FIGURE 6-1 | TYPICAL WEEKDAY COMMUTER PEAK HOUR VOLUMES

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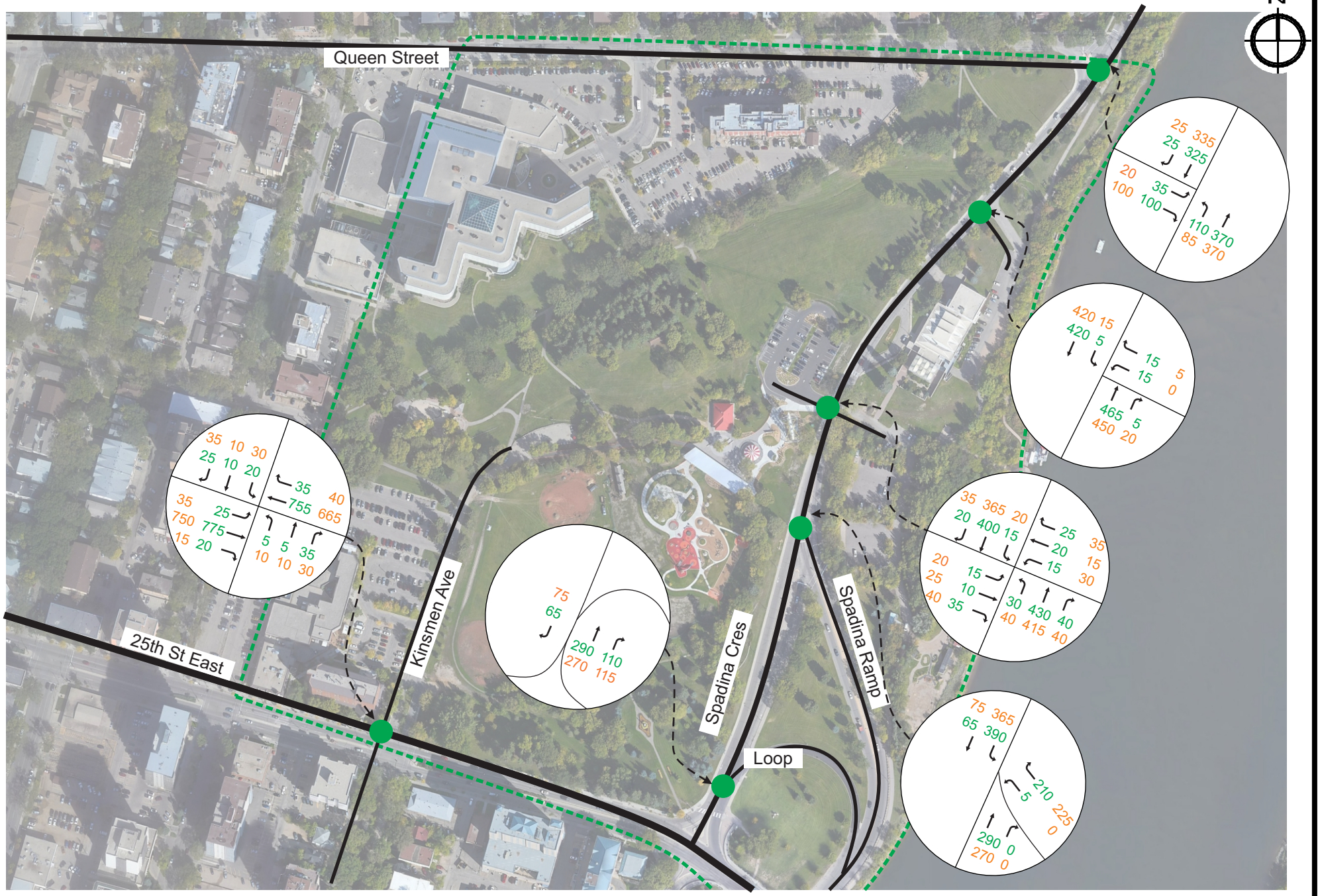

LEGEND:

Existing Weekday Evening / Weekend Peak Hour Volumes (rounded to nearest 5)

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FIGURE 6-2 | WEEKDAY EVENING & WEEKEND PARK PEAK HOUR VOLUMES

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7 ACTIVE TRANSPORTATION AND CONFLICT OBSERVATION SURVEY

7.1 EXISTING ACTIVE TRANSPORTATION CORRIDORS

The Park features two prominent North-South corridors for active transportation: the Meewasin Trail and Spadina Crescent.

- The Meewasin Trail is a multi-use trail that is shared by pedestrian and cyclists. It runs adjacent to the South Saskatchewan river and provides direct access to activity centres within the Park.
- Spadina Crescent is a roadway that dissects the centre of the Park. It provides direct access to the Playland, the Mendel Building, and several parking zones within the Park. It is a shared roadway between motorists and cyclists. Bike lanes are present on the roadway between the University Bridge and Spadina Ramp. Sidewalks are present along the full extent of Spadina Crescent on the west side of the road. Sidewalks are present on the east side of the road south of the Playland. The roadway is bi-directional with two general travel lanes, one in each direction, with a speed limit of 50 km/h. East-west pedestrian crossings on this roadway are limited to two locations: one at the southern portion of Spadina Crescent adjacent to the University Bridge and a second between Zones 3 and 4. The Master Plan proposes a long-term plan to improve the cycling and pedestrian environments of this roadway.

East-west movement within the Park is facilitated through multi-use pathways adjacent to the Playland to the north. These pathways connect the YWCA and Saskatoon City Hospital to the west of the park. The Master Plan identified that east-west pathways within the park are unclear, as shown in **Figure 7-1**. Since the Master Plan was completed in 2011, redevelopment of the Playland has resulted in a new pedestrian path between Spadina Crescent and Kinsmen Avenue. East-west movement within the park is also segmented by a lack of crossings on Spadina Crescent.

Figure 7-1: Existing, discontinuous pathways within the Park (Kinsmen Park Master Plan, 2011)

7.2 EXISTING PEDESTRIAN AND CYCLIST DESIRE LINES

Desire lines are informal pathways created by the repeated movement of pedestrians and cyclists. They indicate a desired path for active transportation that is currently unserved by dedicated facilities, such as multi-use trails or sidewalks. Desire lines may be used to understand the flow of pedestrians and cyclists and identify opportunities to build infrastructure that services an existing demand. The Park features several desire lines which should be considered for paving to facilitate improved circulation within and through the Park, as illustrated in **Figure 7-2**. The following locations feature desire lines that are opportunities for new active transportation facilities:

1. East-west desire line between Zone 3 and Zone 6 parking;
2. East-west desire line underneath the Spadina Crescent bridge;
3. East-west desire line between the Zones 4 / 5 parking and Spadina Crescent;
4. East-west desire line between the Meewasin Trail and Zone 4 parking;
5. East-west desire line between Kinsmen Avenue and the existing Playland path;
6. Northwest-southeast desire line within the field enclosed by the Canpotex train tracks;
7. East-west desire line south of the Canpotex train tracks; and
8. East-west desire line between Kinsmen Avenue and the northwest intersection corner of Spadina Crescent and 25 Street.
9. East-west desire line along Queen Street between Zone 6 parking and Spadina Crescent.

7.3 POTENTIAL CONFLICT POINTS

Conflict points are locations where motor vehicles, pedestrians, and cyclists have conflicting movements. These locations may be problematic since vulnerable road users (pedestrians and cyclists) must interact with motor vehicles in the same space. They are of concern where motor vehicle speeds and volumes are high, such as Spadina Crescent. Consideration should be made to improve the safety and comfort for vulnerable road users at these locations, as illustrated in **Figure 7-2**. The following locations within the Park could be viewed as conflicts points because they pose potential safety concerns:

10. The pedestrian crossing on Spadina Crescent that connects Zones 3 and 4 parking presents a potential safety concern between motorists and pedestrians. This pedestrian crossing facilitates movement across Spadina Crescent for visitors parked on the parking lots and attractions on either side of the road. At present, this is the only east-west crossing for pedestrians in the middle of the Park. This pedestrian crossing features pushbutton activated flashing lights that are located directly above the crossing to warn approaching motorists of pedestrians. If traffic volumes and speeds are high, techniques to improve the conspicuity of the crossing should be considered. The addition of supplementary pedestrian crossings along the corridor may be warranted. Consideration could also be made to installing a crossbike to facilitate bicycle crossing at this location.
11. The motor vehicle exit ramp located approximately 50m on Spadina Crescent north of the University Bridge presents a potential safety concern between motorists, pedestrians, and cyclists. The pedestrian crossing is marked by signage and pavement markings, whereas the bicycle lane is not marked through the conflict areas. Furthermore, the pavement markings for the bike lane leading up to the conflict area have faded. Consideration should be made to mark the cycling facility at this location

with a green surface treatment and ‘Turning Vehicles Yield to Cyclists’ signage to alert turning motorists to the presence of cyclists.

12. The pedestrian crossing on Spadina Crescent immediately north of the University Bridge presents a potential safety concern between motorists and pedestrians. The crossing is situated in a location that is partially obstructed from view of westbound motorists that are turning north onto Spadina Crescent from the University Bridge. Motorists that are turning onto Spadina Crescent do so from an unsignalized right-turn channel. The pedestrian crossing is located at the end of this turn channel, partially hidden from view due to guard rails on the University Bridge and vegetation in the boulevard. Existing pushbutton activated flashing lights are located directly above the crossing as well as advance pedestrian crossing warning sign. Due to limited visibility, supplementary flashing lights in advance of the crossing may be considered. Techniques to improve the conspicuity of the crossing should be considered, particularly in advance of the right turn channel to alert motorists to the presence of crossing pedestrians.

LEGEND:

- Existing Desired Lines
- Potential Conflict Points
- Study Boundary

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FIGURE 7-2 | EXISTING DESIRE LINES AND POTENTIAL CONFLICT POINTS

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7.4 OTHER SITE OBSERVATIONS

A site visit was conducted to review the existing transportation infrastructure and complete a conflict observation survey to identify potential safety issues between vehicles and other mode of uses within the study area.

Figure 7-3 illustrates the existing transportation infrastructure and highlights deficiencies. The following summarizes key issues identified during the site visit:

- Tripping hazards presented within median of the pedestrian crossings on Spadina Crescent at the intersection with the Spadina Ramp intersection.
- Pedestrian ramps are not aligned at the Spadina Loop.
- Pavement markings for bike lanes are not provided along Spadina Crescent between 25 Street East and Spadina Ramp.
- Uneven pathway adjacent to Spadina Ramp at Spadina Crescent may result in tripping hazards.
- Tripping hazards on the sidewalks on Queen Street.
- Sidewalk discontinued on the east of Kinsmen Avenue.
- Missing trails / pathways and connections.
- Drainage issues (flooded when rain) on multi-use pathway just north of Zone 1 parking.

Other site observations noted are summarized in **Appendix E.** Some of these including:

- Vehicle illegally parked on the grass in Zone 1 parking area.
- Several of the parking concrete blocks in Zone 1 parking area have rebar sticking out, which present hazards to users.
- There were vehicles circulating the parking zones multiple times looking for a parking spot.
- One-way, Entry-Only, and Exit-Only signs were blocked by vegetation or were too small.
- Some visitors to the Park were not aware of Zone 1 parking supply.
- Parking stall pavement markings need repainting and directional arrows for circulation patterns should be provided at the Park public parking zones on both sides of Spadina Crescent.

Potential conflicts observed include:

- Sight obstructions presented at the bend of the Meewasin Trail behind the Mendel Building.
- Safety issues at pedestrian crossing on Spadina Crescent (between Zones 3 and 4) with vehicles entry and exiting the zones, particularly when there are minimal gaps due to high traffic volumes on Spadina Crescent.
- Sight obstructions at the loop in front of the Mendel Building from the information / advertising signs.
- Sightline limitation due to vegetation at the corner of Zone 4 parking and the access point.
- Cyclist slipped and fell from bike on multi-use trail behind the Mendel building due to sharp curve.
- Young pedestrians ignoring the crossing device and crossing Spadina Crescent when it was unsafe to do so.

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13
- Missing sidewalks on the south side of Queen St

Queen Street

12
- Pedestrian ramps and crosswalks provided

Spadina Cres & Queen St Int.

11
- Missing pathway

Trail

10
- Missing trail / pathway connections

Trail

14
- Tripping hazards on sidewalks

Queen St

9
- Parking stall marking & directional arrows need repainting

Nutrien West Parking Lot

15
- Pedestrian ramps and crosswalks provided

Queen St & 9 Ave North Int.

8
- Ped ramps, markings, traffic control provided

Spadina Cres Crossing

16
- Pathway disconnection

Queen St & 9 Ave North Int.

7
- Worn Ped Crossing Pavement Marking

Wonderhub Crossing

17
- Worn pathway from under the bridge on Spadina

Informal Pathway

6
- Parking stall markings need repainting

Wonderhub Parking

18
- discontinued pathway informal pathway

Discontinuous Pathway

5
- Parking stall marking & directional arrows need repainting

Nutrien Public Lot - East

19
- Drainage issues (flooded when rain)

Multi-Use Pathway

20
- Parking lot needs upgrade and maintenance

Kinsmen Ave Parking Lot

2
- Pedestrian ramps do not aligned

Spadina Loop Crossing

3
- Bike lane pavement marking not provided on both sides

Spadina Cres Bike Lane

4
- Tripping hazards - Median protrudes into crosswalk

Spadina Ramp Crossing

21
- Sidewalk discontinued on the east side

Kinsmen Ave - East Sidewalk

22
- Pedestrian ramps and crosswalk markings provided

25 St East & Kinsmen Ave Int.

1
- Crosswalk and Overhead Flashing Beacon provided

University Bridge Crossing

wsp
203 Wellman Crescent
Saskatoon, SK
S7T 0J1
tel: 306.665.6223
fax: 306.665.8589

Issue Date -
Scale: NTS
Aerial Imagery: COS Image
Note: All Dimensions shown in Metres unless otherwise

FIGURE 7-3 | EXISTING TRANSPORTATION INFRASTRUCTURE & DEFICIENCIES

Kinsmen Park Parking Strategy and Transportation Study

DRAWING: Kinsmen Park Transportation Study.cdr DATE: 2019-05-28 DRAWNBY: thaia

8 ESTIMATED FUTURE DEMAND

8.1 TRAFFIC VOLUME PROJECTION

8.1.1 FUTURE CONDITIONS AND BACKGROUND GROWTH

The future horizon for the project was assumed to be a 15-year timeframe. The future demand projection was conducted using a combination of the following:

- Background growth was applied to traffic on the road network only and not those streets / accesses associated with Park's activities. Background growth is associated with organic growth of the city's population. The City Transportation Branch suggested that an annual 2% growth should be applied to the study area.
- Development specific growth is generated by the Park. Growth may occur in the form of increased attendance with no changes to existing capacity or in the form of physical expansion.

8.1.2 DEVELOPMENT SPECIFIC GROWTH

Information regarding potential future growth for the developments within the Park was derived from the stakeholder consultation. The following summarizes the potential growth identified:

- **Nutrien Playland |** No additional rides. Potential increase in overall attendance by 10% over short-term period. Potential new rental options could increase uses during the day and increase use after hours (8:00 p.m. – 10:30 p.m.). For the purpose of this study, a 20% increase was assumed for the Playland visitors for long-term growth.
- **Nutrien Wonderhub |** Current building is at capacity. Industry data suggests that for the first 5-10 years of operation for a children's museum, there is an expected 5% increase in attendance each year. A 20% increase was assumed for the Wonderhub visitors for long-term growth, assuming there is no physical expansion.
- **Civic Conservatory |** No plan to increase the number of visitors.
- **Shakespeare on the Saskatchewan |** No change in capacity (300 patrons) but potential increase in attendance by 10-30%. The future growth was assumed at 300 patrons where applicable.
- **Prairie Lily Cruise |** No change in capacity (400 patrons / day) but potential increase in attendance by 7-20%.
- **YWCA |** Assumed 0% growth since future plan is unknown at this time.

In addition to the above activities, an additional 20% of the Playland visitors was added to the daily visitors to account for other activities including picnics, exercise classes, Meewasin trail, etc. Based on the information provided and consideration for each venue's capacity, it was identified that the overall growth the Park would ultimately experience is approximately 13% during the weekday and 17% during the weekend uses. As such, the number of visitors to the Park is expected to increase by approximately 400 visitors to 3,600 visitors for the weekday and 600 visitors to 4,000 visitors per day for the weekend operations.

Table 8-1 summarizes the anticipated total new trips generated by the development growth for both entering and exiting the site at each study peak period.

Table 8-1 | Kinsmen Park Area Existing and Future Uses

Uses	Weekday Uses		Weekend Uses		Comments
	Existing	Future	Existing	Future	
Nutrien Playland[1]	1189	1426	1257	1508	Assumed 20% future growth
Nutrien Wonderhub	738	886	731	877	Assumed 20% future growth
Civic Conservatory[2]	222	222	222	222	No plan to increase the number of visitors
SOTS – Show	310	310	260	300	Assumed future growth to maximum capacity of 300 patrons
SOTS - Matinee	0	0	240	300	
Prairie Lily Cruise	174	209	336	400	Assumed 20% future growth or 400 capacity (Potential 7-20% increase in attendance)
YWCA	246	246	57	57	Assumed 0% future growth
Kinsmen Park (i.e. picnic, etc.)	297	297	297	297	Assumed 20% of the Playland visitors
Total Daily Attendance:	*3176*	*3596*	*3400*	*3962*	
%Future Growth to Existing:	**-**	***13%***	**-**	***17%***	
1. 2377 tickets scanned for weekday and 2514 for weekend operations. WSP assumed an average of 2 tickets used per visitor.					
2. The calculation for the Conservatory visitors is shown in Appendix C.					

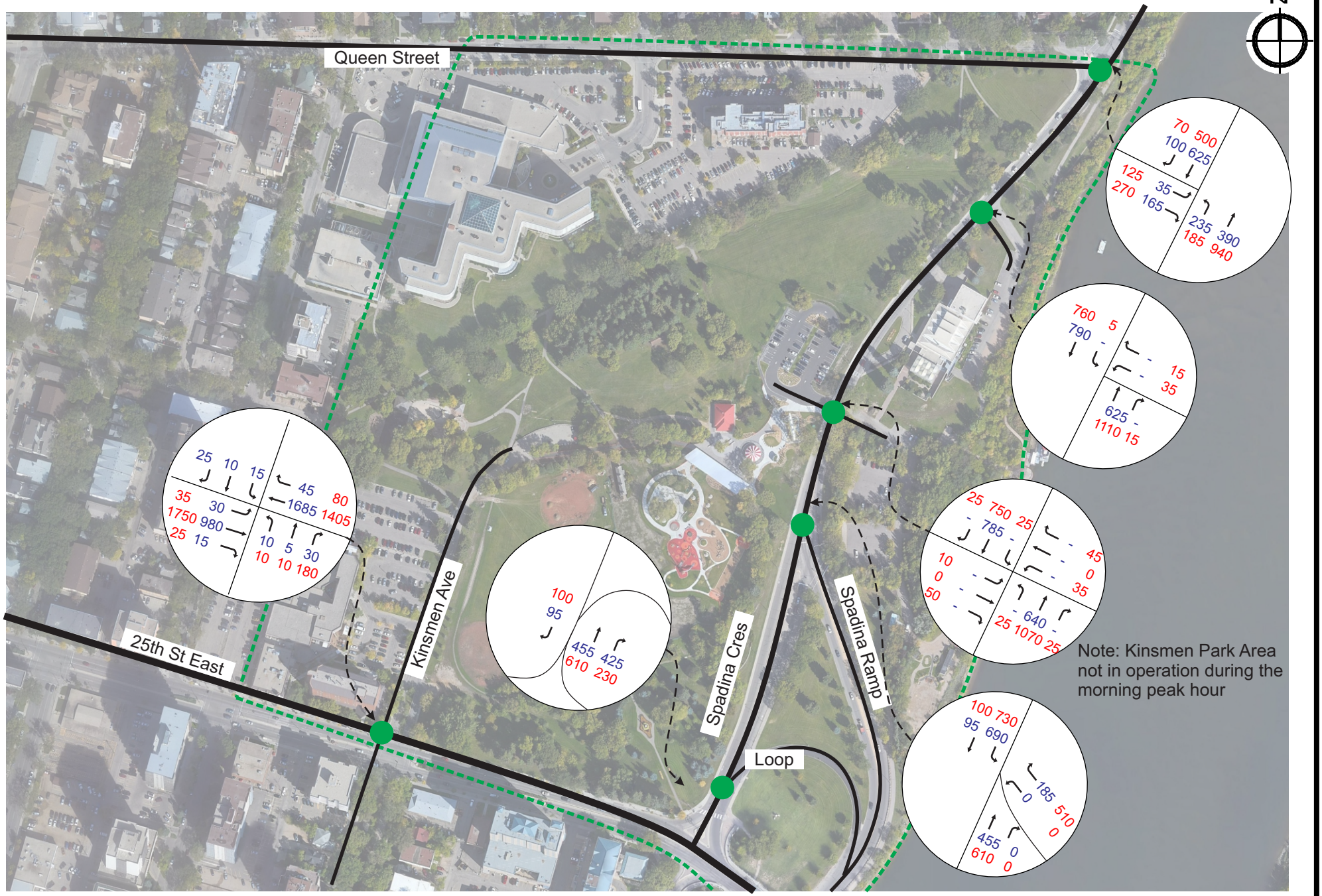
Future growth traffic patterns were assumed to be the same as the existing. As such, the percent growth was then applied to the egress and ingress movements at the visitors parking zones (Zones 1, 3, and 4) to determine the growth in traffic volumes at the site accesses for the respective peak hours. The additional development trips generated by the Park's businesses / activities are presented in **Table 8-2**. The morning p3030eak hour trips were not shown since it is outside of operating hours of the Park. Zone 6 occupancies were not included in the calculation since the number of visitors to the Park and to the Hospital cannot be determined.

Table 8-2 | Additional Kinsmen Park Area Businesses / Activities Generation Trips

Peak Hour	Existing Volumes (vph)			Growth Rates	Additional Future Growth (vph)		
	Enter	Exit	Total		Enter	Exit	Total
AM Peak	-	-	-	0%	-	-	-
PM Peak	185	300	485	13%	24	39	63
Evening	180	175	355	13%	24	23	47
Weekend	255	205	460	17%	42	35	77

8.1.3 KINSMEN PARK AREA FUTURE FORECAST VOLUMES

The future forecast traffic volumes in the Park can be determined by combining the background growth traffic volumes, generated by the city's organic growth, and the development specific growth in the Park. **Figure 8-1** illustrates the weekday commuter peak hour traffic volumes and **Figure 8-2** illustrates the weekday evening and weekend peak hour traffic volumes for the Park Future Forecast 15-year planning horizon.



LEGEND:

Morning / Afternoon Peak Hour Volumes
(rounded to nearest 5)

203 Wellman Crescent
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Issue Date - 2019-05-28
Scale: NTS
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FIGURE 8-1 | TYPICAL WEEKDAY AM & PM PEAK - 15 YR PLANNING HORIZON

Kinsmen Park Parking Strategy and Transportation Study

NOTE: These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design

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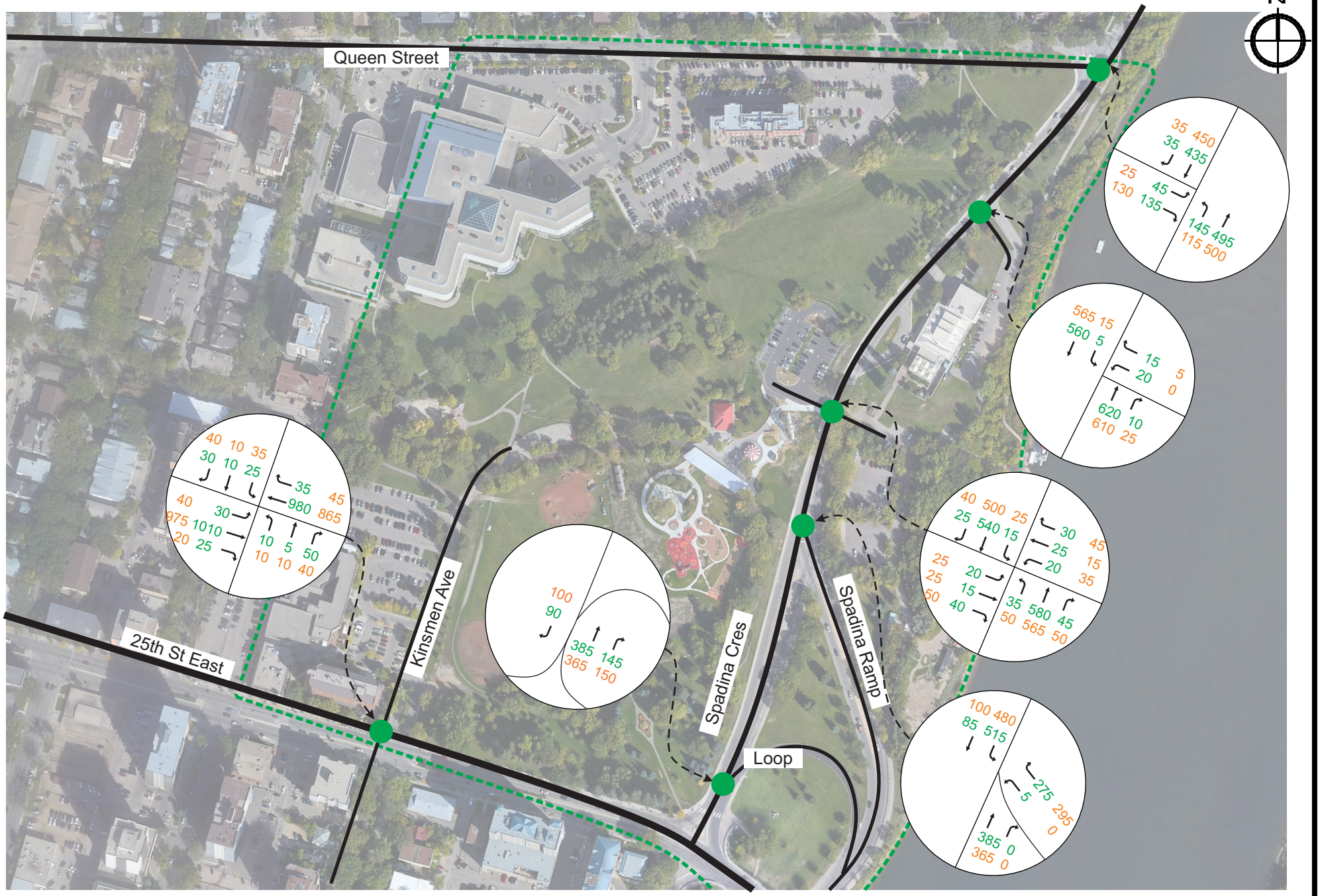

LEGEND:

Weekday Evening / Weekend Peak Hour Volumes
(rounded to nearest 5)

wsp
203 Wellman Crescent
Saskatoon, SK
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tel: 306.665.6223
fax: 306.665.8589

Issue Date - 2019-05-28
Scale: NTS
Aerial Imagery: Google Imagery

FIGURE 8-2 | WEEKDAY EVENING & WEEKEND PEAK - 15 YR HORIZON

Kinsmen Park Parking Strategy and Transportation Study

NOTE: These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design

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8.2 ESTIMATED ACTUAL PARKING DEMAND

The actual parking demand for the Park may exceed those captured in the occupancy data as part of the parking survey. The parking zones may reach capacity without reaching saturated (100%) utilization due to accessible stalls. As such, occupancy rates of 90% or higher was assumed to be at capacity. The actual parking demand may include those circling the parking zones looking for a spot as well as those that left due to unavailable parking spots. From the utilization data, it was identified that the parking demand in Zones 3 and 4 exceeds the supply. The total parking shortfall was determine using the license plate survey completed during the weekend operations to estimate the actual number of occupied spots along with the number of vehicles entering / exiting the parking zones. Although the weekend data was utilized in the calculations, it is anticipated that the shortfall is applicable to both weekday and weekend operations as the parking demand, identified in Section 5, is relatively similar (<10%). **Table 8-3** presents the estimated parking demand for Zones 3 and 4.

Table 8-3 | Estimated Existing Zones 3 and 4 Parking Demand – Weekday and Weekend Operations

		9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM
Zone 3	Occupied	18	61	84	80	107	94	75	73	69	64	60
	Capacity	52										
	Surplus / Deficiency	34	-9	-32	-28	-55	-42	-23	-21	-17	-12	-8
Zone 4	Occupied	12	52	88	99	126	100	76	90	84	77	67
	Capacity	84										
	Surplus / Deficiency	72	32	-4	-15	-42	-16	8	-6	0	7	17
Overall Surplus / Deficiency		***106***	***23***	***-36***	***-43***	***-97***	***-58***	***-15***	***-27***	***-17***	***-5***	***9***

The data above includes the parking deficiency (vehicles circling the parking zones looking for parking spots or left due to unavailable capacity) as well as pick-up and drop-off. For the purpose of this study, the demand between 1:00 p.m. and 3:00 p.m. was used to determine the range of additional parking supply needed to meet the Park's demand.

The parking demand for the Park was estimated by combining the demand and supply for all visitor parking zones, as presented in **Table 8-4**. It was identified that additional 52 to 89 parking stalls would be required to meet the current Park's parking demand.

Additional future parking demand was estimated based on the anticipated development generated trips, identified in **Table 8-2**. For conservative estimates, only the entering vehicles were taken into consideration. With the future development growth, it is anticipated that additional 76 to 132 stalls would be required to accommodate the demand.

Table 8-4 | Estimated Visitors Parking Demand

Parking Zones	Existing Capacity	Occupancy (Stalls)		Estimated Deficiency (Stalls)		Existing Surplus / Deficiency (stalls)	Additional Future Demand (stalls)	Future Surplus / Deficiency (stalls)
		1:00 PM	2:00 PM	1:00 PM	2:00 PM			
Zone 1	**85**	71	71	0	0	14	-9 to -13	0 to 5
Zone 3	**52**	51	52	-55	-42	-42 to -54	-7 to -15	-49 to -69
Zone 4	**84**	91	92	-42	-16	-24 to -49	-8 to -14	-32 to -63
Overall Parking Surplus / Deficiency (stalls):						***-52 to -89***	***-24 to -42***	***-76 to -132***

9 INTERSECTION CAPACITY ANALYSIS

Existing and future forecast scenarios have been assessed using Synchro Suite 10.0 (industry-standard traffic analysis software). The study intersections were assessed using the current conditions during the morning and afternoon peak hour with no additional turning lanes or changes applied.

Level of service (LOS) analysis assesses the effectiveness of a transportation system alphabetically from A to F, with LOS A equating to the best operating conditions and LOS F representing the failure of a movement or intersection. LOS E is typically considered the limit of acceptable operation for minor streets in order to provide additional capacity or maintain free-flow movement on the major street.

The volume-to-capacity (v/c) ratio is representative of congestion and available capacity, and may be used to identify a movement's ability to accommodate fluctuations in traffic flow. V/C values of 0.90 or greater typically indicate a system that has reached its limit of operational effectiveness. The 95th percentile queue length represents the maximum length of a queue a movement may experience with 95th percentile traffic volumes.

9.1 25TH STREET AND KINSMEN AVENUE

Table 9-1 and **Table 9-2** summarize the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the existing and future forecast traffic conditions.

Table 9-1 | LOS Summary for Existing Traffic Conditions – 25th Street and Kinsmen Avenue

Peak Hours	Overall Intersection	Performance	25th St W-Leg			25th St E-Leg			Kinsmen Ave S-Leg			Kinsmen Ave N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak		V/C Ratios	0.11	0.35			0.66		0.09	0.12		0.13	0.11	
	Cycle Length: 95s	Delay (s)	5	6		-	14		32	4		33	3	
	Intersection Delay: 18.6s	LOS	A	A			B		C	A		C	A	
	Intersection LOS: B	95th Queue (m)	13	48			92		10	12		14	13	
Weekday Afternoon Peak		V/C Ratios	0.09	0.63			0.6		0.07	0.6		0.52	0.23	
	Cycle Length: 100s	Delay (s)	6	10		-	14		32	29		45	8	
	Intersection Delay: 21.1s	LOS	A	A			B		C	C		D	A	
	Intersection LOS: C	95th Queue (m)	26	73			71		19	23		28	26	
Weekday Evening Peak		V/C Ratios	0.08	0.41			0.37		0.04	0.13		0.11	0.08	
	Cycle Length: 60s	Delay (s)	10	9		-	8		14	5		15	4	
	Intersection Delay: 10.1s	LOS	A	A			A		B	A		B	A	
	Intersection LOS: B	95th Queue (m)	14	49			42		8	12		15	12	
Weekend Park Peak		V/C Ratios	0.09	0.35			0.33		0.07	0.12		0.15	0.11	
	Cycle Length: 60s	Delay (s)	9	8		-	8		15	5		16	5	
	Intersection Delay: 10s	LOS	A	A			A		B	A		B	A	
	Intersection LOS: B	95th Queue (m)	21	49			36		10	12		15	13	

Table 9-2 | LOS Summary for Future Forecast Traffic Conditions – 25th Street and Kinsmen Avenue

Peak Hours	Overall Intersection	Performance	25th St W-Leg			25th St E-Leg			Kinsmen Ave S-Leg			Kinsmen Ave N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak		V/C Ratios	0.16	0.45			0.9		0.11		0.15	0.15		0.12
	Cycle Length: 95s	Delay (s)	7	7		-	26		32		2	33		1
	Intersection Delay: 18.6s	LOS	A	A			C		C		A	C		A
	Intersection LOS: B	95th Queue (m)	16	59			128		12		12	15		16
Weekday Afternoon Peak		V/C Ratios	0.14	0.83			0.82		0.08		0.76	0.56		0.25
	Cycle Length: 100s	Delay (s)	7	16		-	23		31		40	46		9
	Intersection Delay: 21.1s	LOS	A	B			C		C		D	D		A
	Intersection LOS: C	95th Queue (m)	26	102			69		40		28	29		28
Weekday Evening Peak		V/C Ratios	0.13	0.54			0.48		0.05		0.16	0.12		0.09
	Cycle Length: 60s	Delay (s)	11	11		-	9		14		8	16		5
	Intersection Delay: 10.1s	LOS	B	B			A		B		A	B		0
	Intersection LOS: B	95th Queue (m)	17	61			58		9		14	15		12
Weekend Park Peak		V/C Ratios	0.16	0.51			0.47		0.09		0.16	0.18		0.13
	Cycle Length: 60s	Delay (s)	11	10		-	10		15		8	17		5
	Intersection Delay: 10s	LOS	B	B			A		B		A	B		0
	Intersection LOS: B	95th Queue (m)	21	58			57		11		14	17		14

The 25th Street and Kinsmen Avenue intersection currently operates at acceptable conditions during all study peak hour and is expected to continue to operate acceptably for the future forecast traffic volumes. The east leg of 25th Street (heading into downtown) is expected to approach its capacity during the morning peak hour in the future forecast traffic volumes. Optimization of the signal timing plan would improve the v/c ratios.

9.2 SPADINA CRESCENT AND SPADINA RAMP

Table 9-3 summarizes the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the existing traffic conditions. The north leg of the Spadina Crescent fails (LOS E/F) during the morning and afternoon peak hour. Although the south leg operates acceptably (LOS C) during the afternoon peak hour, the 95th percentile queue lengths indicates that the queues may spill back to the University Bridge. The weekday evening and weekend park peak hours operate at acceptable conditions at LOS C or better.

Table 9-4 summarizes the traffic operations during the morning and afternoon peak hour for the existing conditions with signal timing modifications. By optimizing the current signal timing plans, the north leg of the Spadina Crescent is expected to improve to LOS C or better during both peaks. However, the queuing patterns on the south leg may still spill over to the University Bridge.

Table 9-3 | LOS Summary for Existing Traffic Conditions – Spadina Crescent and Spadina Ramp

Peak Hours	Overall Intersection	Performance	Spadina Cres S-Leg			Spadina Ramp E-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 80s	V/C Ratios	0.58	-	0.58	0	0.1	-	-	0.88	0.06
	Intersection Delay: 47.3s	Delay (s)	20		20	0	0			88	0
	Intersection LOS: D	LOS	B		B	0	A			F	A
		95th Queue (m)	52		52	0	32			78	51
Weekday Afternoon Peak	Cycle Length: 80s	V/C Ratios	0.66	-	0.66	0.01	0.24	-	-	0.76	0.05
	Intersection Delay: 36.8s	Delay (s)	23		23	13	0			80	0
	Intersection LOS: D	LOS	C		C	B	A			E	A
		95th Queue (m)	180		180	5	168			88	6
Weekday Evening	Cycle Length: 65s	V/C Ratios	0.41	-	0.41	0.02	0.12	-		0.7	0.05
	Intersection Delay: 13.9s	Delay (s)	13		13	12	0			24	0
	Intersection LOS: B	LOS	B		B	B	A			C	A
		95th Queue (m)	46		46	8	37			63	30
Weekend Park Peak	Cycle Length: 65	V/C Ratios	0.39	-	0.39	0	0.14	-		0.64	0.05
	Intersection Delay: 11.6	Delay (s)	12		12	0	0			21	0
	Intersection LOS: B	LOS	B		B	0	A			C	A
		95th Queue (m)	77		77	0	57			63	32

Table 9-4 | LOS Summary for Existing Traffic Conditions w/ Signal Timing Modifications – Spadina Crescent and Spadina Ramp

Peak Hours	Overall Intersection	Performance	Spadina Cres S-Leg			Spadina Ramp E-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 60s	V/C Ratios	0.69	-	0.69	0	0.1	-	-	0.83	0.06
	Intersection Delay: 23.6s	Delay (s)	22		22	0	0			35	0
	Intersection LOS: C	LOS	C		C	0	A			C	A
		95th Queue (m)	48		48	0	27			70	33
Weekday Afternoon Peak	Cycle Length: 65s	V/C Ratios	0.83	-	0.83	0	0.24	-	-	0.67	0.05
	Intersection Delay: 30.4s	Control Delay (s)	34		34	9	0			54	0
	Intersection LOS: C	LOS	C		C	A	A			D	A
		95th Queue (m)	170		170	0	150			83	6

Table 9-5 summarizes the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the future forecast traffic conditions. With the current configurations, traffic operations are expected to continue to decline particularly during the morning and afternoon peak hours.

Potential improvements for the Spadina Crescent and Spadina Ramp intersection is discussed in **Section 10.4**.

Table 9-5 | LOS Summary for Future Forecast Traffic Conditions – Spadina Crescent and Spadina Ramp

Peak Hours	Overall Intersection	Performance	Spadina Cres S-Leg			Spadina Ramp E-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 80s	V/C Ratios	0.81	-	0.81	0	0.13	-	-	1.04	0.07
	Intersection Delay: 53.1s	Delay (s)	30		30	0	0			93	0
	Intersection LOS: D	LOS	C		C	0	A			F	A
		95th Queue (m)	71		71	0	38			79	60
Weekday Afternoon Peak	Cycle Length: 80s	V/C Ratios	0.86	-	0.86	0.01	0.31	-	-	0.99	0.07
	Intersection Delay: 45.3s	Delay (s)	34		34	14	0			93	0
	Intersection LOS: D	LOS	C		C	B	A			F	A
		95th Queue (m)	149		149	11	159			88	0
Weekday Evening Peak	Cycle Length: 65s	V/C Ratios	0.6	-	0.6	0.04	0.16	-	-	0.81	0.06
	Intersection Delay: 18.9s	Delay (s)	18		18	12	0			32	0.1
	Intersection LOS: B	LOS	B		B	B	A			C	A
		95th Queue (m)	107		107	13	68			80	49
Weekend Park Peak	Cycle Length: 65s	V/C Ratios	0.53	-	0.53	0	0.19	-	-	0.76	0.07
	Intersection Delay: 14.9s	Delay (s)	16		16	0	0			27	0.1
	Intersection LOS: B	LOS	B		B	0	A			C	A
		95th Queue (m)	175		175	0	153			78	48

9.3 SPADINA CRESCENT AND SOUTH ACCESS

Table 9-6 and **Table 9-7** summarize the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the existing and future forecast traffic conditions. Note that although Spadina Crescent is a free-flow roadway, there is an Overhead Flashing (OF) beacon system at this location which may interrupt traffic flow on Spadina Crescent when actuated. As such, the intersection was modeled with a pedestrian-activated crosswalk where Spadina Crescent is controlled by the pedestrian volumes and frequency crossing between Zones 3 and 4, collected during the data collection program.

Table 9-6 | LOS Summary for Existing Traffic Conditions – Spadina Crescent and South Accesses

Peak Hours	Performance	Zone 3 Access W-Leg			Zone 4 Access E-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
		LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak		Park Not In Operation											
Weekday Afternoon Peak	V/C Ratios	0.13			0.2			0.87			0.61		
	Delay (s)	3			5			28			14		
	LOS	A			A			C			B		
	95th Queue (m)	15			18			70			192		
Weekday Evening	V/C Ratios	0.15			0.17			0.51			0.43		
	Delay (s)	4			4			9			6		
	LOS	A			A			A			A		
	95th Queue (m)	17			14			56			60		
Weekend Park Peak	V/C Ratios	0.19			0.22			0.54			0.47		
	Delay (s)	4			4			10			7		
	LOS	A			A			A			A		
	95th Queue (m)	17			16			72			108		

Table 9-7 | LOS Summary for Future Forecast Traffic Conditions – Spadina Crescent and South Accesses

Peak Hours	Performance	Zone 3 Access W-Leg			Zone 4 Access E-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
		LT	T	RT	LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak		Park Not In Operation											
Weekday Afternoon Peak	V/C Ratios	0.14			0.2			1.14			0.81		
	Delay (s)	3			6			96			23		
	LOS	A			A			F			C		
	95th Queue (m)	17			20			67			169		
Weekday Evening Peak	V/C Ratios	0.17			0.18			0.68			0.58		
	Delay (s)	4			4			16			11		
	LOS	A			A			B			B		
	95th Queue (m)	18			18			77			171		
Weekend Park Peak	V/C Ratios	0.23			0.24			0.68			0.59		
	Delay (s)	4			4			15			11		
	LOS	A			A			B			B		
	95th Queue (m)	18			17			77			200		

Since the existing intersection operates as a pedestrian actuated overhead flashing beacon system, traffic operations at this location would vary depending on the frequencies of the push buttons. With the current traffic volumes and active mode users, the intersection operates acceptably. Spadina Crescent is expected to operate overcapacity at the future forecast horizon.

Traffic signal warrant was completed using the Transportation Association of Canada (TAC) Signal Warrant for the future forecast traffic volumes. Traffic signals are not warranted at this location. The TAC Pedestrian Crossing Control Guide was also reviewed to determine whether pedestrian signals would be warranted. A Rectangular Rapid Flashing Beacon (RRFB) System is warranted. The existing OF treatment is a higher order than the RRFB treatment. TAC warrant analysis is presented in **Appendix F**.

9.4 SPADINA CRESCENT AND QUEEN STREET

Table 9-8 summarizes the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the existing traffic conditions. The intersection operates at LOS D or better during all peak hours for the existing traffic volumes. During the morning peak hour, Spadina Crescent operates near capacity (v/c ~ 1.0). Optimization of the signal timing plan is expected to improve the capacity of the segment, as presented in **Table 9-9**.

Table 9-8 | LOS Summary for Existing Traffic Conditions – Spadina Crescent and Queen Street

Peak Hours	Overall Intersection	Performance	Queen St W-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 75s Intersection Delay: 29.0s Intersection LOS: C	V/C Ratios	0.4	-	0.4	0.61	0.35	-	-	0.96	
		Delay (s)	9		9	19	9			51	
		LOS	A		A	B	A			D	
		95th Queue (m)	17		17	36	41			97	
Weekday Afternoon Peak	Cycle Length: 75s Intersection Delay: 18.7s Intersection LOS: B	V/C Ratios	0.72	-	0.72	0.33	0.7	-	-	0.66	
		Delay (s)	25		25	9	15			23	
		LOS	C		C	A	B			C	
		95th Queue (m)	303		303	56	106			184	
Weekday Evening	Cycle Length: 75s Intersection Delay: 12.9s Intersection LOS: B	V/C Ratios	0.29	-	0.29	0.22	0.37	-	-	0.51	
		Delay (s)	9		9	7	9			20	
		LOS	A		A	A	A			B	
		95th Queue (m)	15		15	23	47			56	
Weekend Park Peak	Cycle Length: 75s Intersection Delay: 13.1s Intersection LOS: B	V/C Ratios	0.28	-	0.28	0.19	0.38	-	-	0.54	
		Delay (s)	8		8	7	9			20	
		LOS	A		A	A	A			C	
		95th Queue (m)	11		11	22	46			60	

Table 9-9 | LOS Summary for Existing Traffic Conditions w/ Signal Timing Modifications – Spadina Crescent and Queen Street

Peak Hours	Overall Intersection	Performance	Queen St W-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 70s	V/C Ratios	0.47	-	0.47	0.65	0.33	-	-	0.82	
	Intersection Delay: 17.5s	Delay (s)	10		10	16	6			27	
	Intersection LOS: B	LOS	B		B	B	A			C	
		95th Queue (m)	14		14	32	33			79	
Weekday Afternoon Peak	Cycle Length: 85s	V/C Ratios	0.67	-	0.67	0.38	0.72	-	-	0.71	
	Intersection Delay: 21.0s	Delay (s)	23		23	11	18			27	
	Intersection LOS: C	LOS	C		C	B	B			C	
		95th Queue (m)	232		232	48	104			176	

Table 9-10 summarizes the capacity analysis results during the weekday morning, afternoon, evening and weekend park peak hour for the future forecast traffic conditions. Traffic operations during the morning and afternoon peak hours are expected to continue to deteriorate. Overall intersection is expected to fail (LOS E) during the morning peak hour with Spadina Crescent operating overcapacity (v/c > 1.0). During the afternoon peak hour, Queen Street is expected to experience significant delays and queuing. The north leg is also expected to approach its capacity.

Table 9-10 | LOS Summary for Future Traffic Conditions – Spadina Crescent and Queen Street

Peak Hours	Overall Intersection	Performance	Queen St W-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 75s	V/C Ratios	0.49	-	0.49	0.76	0.45	-	-	1.26	
	Intersection Delay: 76.5s	Delay (s)	9		9	29	10			156	
	Intersection LOS: E	LOS	A		A	C	A			F	
		95th Queue (m)	24		24	50	55			167	
Weekday Afternoon Peak	Cycle Length: 75s	V/C Ratios	0.97	-	0.97	0.56	0.88	-	-	0.92	
	Intersection Delay: 35.7s	Delay (s)	55		55	17	24			43	
	Intersection LOS: D	LOS	E		E	B	C			D	
		95th Queue (m)	670		670	57	106			161	
Weekday Evening Peak	Cycle Length: 75s	V/C Ratios	0.38	-	0.38	0.35	0.48	-	-	0.73	
	Intersection Delay: 16.1s	Delay (s)	10		10	9	10			27	
	Intersection LOS: B	LOS	A		A	A	B			C	
		95th Queue (m)	25		25	29	60			97	
Weekend Park Peak	Cycle Length: 75s	V/C Ratios	0.35	-	0.35	0.29	0.51	-	-	0.7	
	Intersection Delay: 15.5s	Delay (s)	8		8	8	11			25	
	Intersection LOS: B	LOS	A		A	A	B			C	
		95th Queue (m)	58		58	32	70			155	

Optimization of the signal timing plans is expected to slightly improve traffic operations to LOS D or better. However, Queen Street is still expected to experience long queues. **Table 9-11** summarizes the future traffic conditions with optimized signal timing plans. Due to the constraint right-of-way, there are limited opportunities to implement geometric improvements to increase intersection capacity. To minimize impacts on the green space, traffic operations should be continuously monitored and modified signal timing plans to accommodate traffic demand. No additional improvements were recommended.

Table 9-11 | LOS Summary for Future Traffic Conditions w/ Signal Timing Modifications – Spadina Crescent and Queen Street

Peak Hours	Overall Intersection	Performance	Queen St W-Leg			Spadina Cres S-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Morning Peak	Cycle Length: 100s	V/C Ratios	0.66	-	0.66	0.88	0.39	-	-	0.93	
	Intersection Delay: 28.2s	Delay (s)	20		20	50	6			37	
	Intersection LOS: C	LOS	C		C	D	A			D	
		95th Queue (m)	32		32	52	42			116	
Weekday Afternoon Peak	Cycle Length: 90s	V/C Ratios	0.9	-	0.9	0.61	0.91	-	-	0.93	
	Intersection Delay: 37.3s	Delay (s)	44		44	22	30			48	
	Intersection LOS: D	LOS	D		D	C	C			D	
		95th Queue (m)	513		513	58	115			174	

10 DEVELOPMENT OF SOLUTIONS

Potential options were developed and reviewed with the Steering Committee prior to further comments. Options developed include combinations of parking, traffic operations, and active modes of transportation. Some of the potential options may be implemented year-round or during the summer season only when the Park is in operation. In addition, some of the proposed options may be implemented in conjunction with others to achieve higher effectiveness. Some of the identified strategies would have impacts on multiple transportation modes.

10.1 PARKING STRATEGIES

10.1.1 IMPROVE PARKING ENFORCEMENT

During the data collection program, it was identified that there was minimal parking enforcement within the parking zones. This was also confirmed during the stakeholder consultation. Some observations made during the parking survey include parking on the grass, parking exceeding duration limits, and vehicles parked in the circulating lanes blocking the parking area circulation. Improved parking enforcement would encourage parking turnover and reduce the need for additional parking spaces.

- **Impacts on Active Modes of Transportation |** No.
- **Impacts on Parking |** Yes, increase turnover and compliance.
- **Impacts on Traffic Operations |** Yes, improved parking circulation within the parking area.
- **Recommendation: Yes**

10.1.2 IMPLEMENT TIME LIMIT ON WEEKEND PARKING DURATION

Since the Park is a destination location for summer activities, the City may consider implementing a similar time limit for parking during the weekend as well during the summer when the Park is in operation. Similar to the weekday operations, the implementation of a time limit on the weekend would increase turnover rates. There may be increased demand for the on-street parking from the Park's visitors within the City Park residential area which has no restrictions during the weekend. If implemented, parking enforcement would be required during the weekend as well. City Park should be informed prior to implementing this change.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** No.
- **Impacts on Parking |** Yes, increased turnover rates. Potential for higher use of on-street parking. adjacent to the Park
- **Impacts on Traffic Operations |** No.
- **Recommendation: Yes**

10.1.3 IMPROVE USER INFORMATION, MARKETING AND WAY-FINDING

As noted, it was identified that some visitors were not aware that Zone 1 is reserved for the Park visitors, resulting in underutilization of this zone. Way-finding signage relating to Zone 1 is provided in Zone 3

only, while SOTS provides signage showing alternate parking in Zone 6 for patrons in Zone 4. Parking utilization may be increased by improving user information and way-finding through maps, signs, brochures and / or social media (i.e. City of Saskatoon / Kinsmen Park Area / Meewasin Trail websites).

- **Impacts on Active Modes of Transportation |** Yes, potentially improve safety by reducing vehicles on the road and circling the parking zones.
- **Impacts on Parking |** Yes, increase utilization / reallocation of demand for Zones 3 and 4.
- **Impacts on Traffic Operations |** Yes, reduce queuing and spillback onto city roadways.
- **Recommendation: Yes**

10.1.4 PARKING CAPACITY DISPLAY

During the site observation and data collection program, it was noted that there were vehicles circling as well as crossing between Zones 3 and 4 searching for available spots. In addition, some visitors were also not aware of Zone 1 parking supply.

A "Digital Parking Display" may be considered at each parking zone identifying whether there are available spots in the zone as well as other zones. An example of a digital parking display is provided in **Figure 10-1**. Real-time information on available parking capacity may also be provided on the City's or the Park's website to help visitors plan their trips; thus, improve visitors' experience. Signage and awareness of parking zones will be critical to these devices working to reduce demand in Zones 3 and 4.

Figure 10-1 | Example of Digital Parking Display

- **Impacts on Active Modes of Transportation |** Yes, potentially improve pedestrian safety by eliminating vehicles circulating on the roadways as well as parking zones.
- **Impacts on Parking |** Yes, improve utilization in other zones and reallocation of demand in Zones 3 and 4.
- **Impacts on Traffic Operations |** Yes, potentially improve traffic operations by eliminating traffic volumes on the roadways, particularly at Zone 3 and 4 access points.
- **Recommendation: Yes**

10.1.5 IMPLEMENT PAID PARKING PROGRAM

A paid parking program should be considered in the visitor parking zones within the Park. Different combinations of a paid parking program may be implemented including free parking for a defined period (i.e. 30 minutes), paid parking in premium locations (i.e. Zones 3 and 4) to improve utilization in other zones, combination of free and pay parking for non-peak hours or seasons. A paid parking program would encourage turnover, use of alternate modes of transportation, and reduce violations. Escalated parking fees may be considered to encourage high turnover rates. City Park should be informed prior to implementing this change.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** Yes, potentially improves safety by reducing traffic on the roadways and encourages alternate modes of transportation.
- **Impacts on Parking |** Yes, increase turnover.
- **Impacts on Traffic Operations |** Yes, potentially reduce congestion by encouraging alternate modes of transportation.
- **Recommendation: Yes**

10.1.6 REMOTE PARKING AND SHUTTLE SERVICES

It was identified from the City of Saskatoon Downtown Parking Strategy Report that there is additional available parking supply in the downtown and Kinsmen area. The report also identified other potential parking garages to accommodate future demand. Opportunities to utilize the available spaces (i.e. Midtown Plaza and other off-street parkades) should be considered as satellite parking for the Park. Free shuttle services should be considered and would likely encourage visitors to utilize these parking areas. A similar off-site parking model is being implemented at the Saskatoon airport.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** Yes, potentially improves safety by reducing traffic on the roadways and encourages alternate modes of transportation.
- **Impacts on Parking |** Yes, increase supply with no impact on green space.
- **Impacts on Traffic Operations |** Yes, potentially improve traffic operations by reducing traffic volumes on the roadways in the Kinsmen Park Area.
- **Recommendation: Yes**

10.1.7 ADDITIONAL PARKING SUPPLY IN ZONE 1

There are approximately 27 stalls currently reserved for the YWCA staff in Zone 1, which would increase the current supply from 85 stalls to 112 stalls. These additional stalls may be used to accommodate the Park needs during the summer months without additional cost or impact on the existing green space.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** No or minimal.
- **Impacts on Parking |** Yes, increase supply without impacting green space.
- **Impacts on Traffic Operations |** No or minimal.
- **Recommendation: Yes, with consultation with the YWCA**

10.1.8 POTENTIAL PARKING FACILITY EXPANSION

Zone 1 parking facility may be redesigned to a 45-degree angle parking which would provide additional parking spaces. The total number of stalls may vary slightly in the final design due to corner curbs and / or the number of accessible stalls.

An optional reconfiguration of the parking facility that was examined at a high level would increase the total parking supply from 112 stalls to 125 stalls. The dimensions are 2.7m by 6.0m for each typical stall or 6.3m by 6.0m for two accessible stalls side by side, meeting the City's standards. There are some impacts on the existing green space due to reconfiguration of the access points as well as expansion to the

north (approximately 3.9m to the north). The final number of stalls will be determined by a cost benefit analysis. A conceptual redesign of Zone 1 facility is presented in **Appendix G**.

Other potential expansion to consider is Zone 3 parking area. The parking capacity of Zone 3 was previously at 100 stalls. It was identified in the Master Plan that the capacity was reduced during the public consultation process as the general consensus was that there was adequate parking supply. The parking strategy explored the opportunities of restoring the original capacity of this zone. Potential expansion may be constructed to the north. However, the expansion would result in the loss green space usable for recreational activities. Although the increase in traffic volumes at the access point from further Zone 3 expansion may not be significant, there would be additional conflicts and potential safety concerns between vehicles and vulnerable road users at the driveway access. This location was already identified as an existing conflict point during the field review and AT review. Note that this option is not a preferred option as there is potential to increase parking inventory at other locations with less impact on usable green space.

- **Impacts on Active Modes of Transportation |** May increase potential conflicts between pedestrian and vehicles at the access points. Zone 1 expansion may require realignment of the existing pathway on the north.
- **Impacts on Parking |** Yes, increase parking supply for visitors.
- **Impacts on Traffic Operations |** Yes, increase traffic volumes at access point.
- **Recommendation: Yes. Note that expansion of Zone 3 is not a preferred option as there are other location with less impact on usable green space.**

10.1.9 INCREASE PARKING SUPPLY ON KINSMEN AVENUE

As part of the Master Plan, additional parking supply is identified along Kinsmen Avenue. Depending on the final recommendations on the adjacent parking zones, this area may be considered for the near- or long-term horizon. The Master Plan proposed that 40 stalls would be provided along Kinsmen Avenue. Depending on the configuration, the parking area may impact traffic on Kinsmen Avenue (nose-in parking) or may impact the existing green space through the provision of a layby to avoid interrupting traffic flow.

- **Impacts on Active Modes of Transportation |** No or minimal.
- **Impacts on Parking |** Yes, increase supply with minor impact on green space.
- **Impacts on Traffic Operations |** No or minimal.
- **Recommendation: Yes, consider for medium- or long-term depending on the final recommendations.**

10.1.10 ON-STREET PARKING ALONG SPADINA CRESCENT

Similar to the northern portion of Spadina Crescent north of the Queen Street intersection, on-street parking may be considered particularly on the southern portion between the University Bridge and Spadina Ramp. On-street parking may serve as a traffic calming measure by reducing roadway width and increase side friction. However, the provision of on-street parking along Spadina Crescent would likely impede on bike lanes as well as blocking through traffic flow during parking maneuvers.

- **Impacts on Active Modes of Transportation |** Yes, may impact the existing bike lanes.
- **Impacts on Parking |** Yes, increase supply without major impact on green space.
- **Impacts on Traffic Operations |** Yes, likely interrupt through traffic flow during parking maneuvers and reduce travel speeds.
- **Recommendation: No, unless major reconstruction of Spadina Crescent is desired for other reasons.**

10.1.11 MAINTAIN ZONE 2 STAFF PARKING SUPPLY

While Zone 2 is proposed to be removed in the Master Plan, the parking survey indicates that there is a shortage in parking supply in the Park. As such it is recommended that this zone be maintained as is for staff parking. It was noted during the parking survey that this zone is not 100% utilized during both weekday and weekend operations and was being utilized by some visitors as well. Regular enforcement would discourage any illegal parking. To increase better utilization and open up additional parking capacity for the visitors, allowing all the Park staff / business owners to utilize this zone should be considered including the Wonderhub, SOTS, and Prairie Lily's staff with designated stalls. Not all staff parking demand from the Park's businesses could be accommodated in this zone. If desired, designated staff parking stalls may be provided in other zones if required.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** No.
- **Impacts on Parking |** Yes, increase parking supply for visitors.
- **Impacts on Traffic Operations |** No.
- **Recommendation: Yes**

10.1.12 POTENTIAL ZONE 4 UPGRADES

The Meewasin Valley Authority provided a preliminary design of Zone 4 parking reconfiguration as part of the trail upgrade. With the planned redesign and additional space gained due to the Spadina Crescent and Spadina Ramp intersection upgrades (Option 10.4.3), opportunities to expand and redesign the parking arrangement should be considered. Similar to Zone 3 expansion, any expansion would increase additional conflicts with pedestrians at the crossings. Care should be taken as part of the redesign with the following key considerations:

- Pick-up / drop-off bay should be provided. A pull-out or pick-up / drop-off loop should be considered to avoid blocking circulation routes.
- Depending on the final configuration of the parking zone as well as pedestrian pathways in the adjacent areas, raised or textured surface treatment for the pedestrian crossings should be considered.
- If one-way parking circulation is selected, angled parking arrangements should be considered to emphasize the one-way traffic flow.
- Consider providing additional right-in and / or right-out access to reduce traffic at the existing access which in turn would reduce potential conflicts with pedestrians at the crossing.

- **Impacts on Active Modes of Transportation |** May increase potential conflicts between pedestrian and vehicles at the access point.
- **Impacts on Parking |** Yes, increase parking supply.

- **Impacts on Traffic Operations |** Yes, increase traffic volumes on road network and site access.
- **Recommendation: Yes**

10.1.13 MAINTAIN AND UPGRADE ZONE 5 PARKING FACILITY

It was identified in the Master Plan that the Zone 5 parking area would be removed over time. Zone 5 is located in a busy portion of the park for pedestrians, cyclists, etc. There are no physical curbs or barriers present to separate the vehicular traffic from the pathway in the southern portion behind the Wonderhub, which poses safety concerns for vulnerable road users. The parking survey indicates that there is a significant parking shortage in the Park even with the current supply in Zone 5. As such it is recommended that this parking area be maintained to accommodate the demand.

Potential mitigation measures include providing curb separation between the parking area and the pathway or consider converting Zone 5 into a back-in parking area. By doing so, vulnerable road users on the pathway would always be in the field of vision of the drivers and avoid potential conflicts of vehicles backing into vulnerable road users. With the planned Meewasin Trail upgrade within the area, opportunities to modify and convert the parking orientation to an angle (45-degree) back-in parking configuration should be considered. Proper signage (**Figure 10-2**) would need to be provided. The benefits of converting to a 45-degree compared to a 90-degree is that it would provide extra spacing between vehicles and vulnerable road users.

Figure 10-2 | Example of Angle Back-in Parking Signage

Another potential improvement option includes converting this portion to a shared street which is discussed in Section 10.3.6.

- **Impacts on Active Modes of Transportation |** Yes, improve vulnerable road users' safety compared to existing conditions.
- **Impacts on Parking |** Potential reduction to current parking supply.
- **Impacts on Traffic Operations |** No or minimal.
- **Recommendation: Yes, with curbing.**

10.1.14 SHARE PARKING WITH SASKATOON HEALTH REGION (ZONE 6)

The data collection program identified that less than 70% of Zone 6 supply was utilized during the weekday and less than 15% during the weekend. The City may consider entering into a share parking agreement with the Saskatoon Health Region (SHR) where some of Zone 6 parking area would be supplied for the Park uses during the summer months while the City may provide the city parking zones when the Park is not in operation.

- **Impacts on Active Modes of Transportation |** No.
- **Impacts on Parking |** Yes, increase supply
- **Impacts on Traffic Operations |** No.
- **Recommendation: Yes**

10.1.15 PICK-UP / DROP-OFF AREAS

Pick-up / Drop-off (PUDO) areas should be provided for passenger vehicles as well as buses, particularly in Zones 3 and 4. There is a 5-minute loading zone provided in Zone 3 in the southwest corner which could potentially block the circulation if a school bus occupies the area. As such, the loading area in Zone 3 should be restricted for passenger vehicles only to avoid blocking circulation while school bus loading may be accommodated in front of the Mendel Building. In addition, the planned improvement of Zone 4 parking area provides opportunities to include a PUDO area for both passenger vehicles and buses. Additional PUDO area may be provided in Zone 1 as part of the redesign recommended in Option 10.1.8. Pavement marking and different curbing may be considered to emphasize the areas.

- **Impacts on Active Modes of Transportation |** No.
- **Impacts on Parking |** Yes, potentially reduce on-site parking demand.
- **Impacts on Traffic Operations |** Yes, improve circulation within parking area.
- **Recommendation: Yes.**

10.2 TRANSPORTATION DEMAND MANAGEMENT

10.2.1 DEVELOP SPECIAL EVENT TRAFFIC AND PARKING MANAGEMENT PLAN

An overflow parking plan to address special events (i.e. Children's Festival) should be developed to accommodate the demand for the Park during the event. In addition to traffic demand management, parking demand management is also required during festivals. Activity hosts / organizers should coordinate with the City to develop plans to address traffic and parking demand during the event. Some of the strategies may include, but not limited to, the following:

- Coordinate event scheduling with the adjacent parks (i.e. River Landing) to ensure manageable parking and traffic demand in the downtown area
- Provide remote parking and shuttle services to the event to reduce the parking and traffic demand coming to the event
- Consider opportunities for shared parking with the adjacent off-street parking facilities during the event
- Depending on the size and time of the event, Spadina Crescent and / or Queen Street adjacent to the Park may be closed to commuter traffic during the event to ease congestion to facilitate transit / shuttle services as well as charter buses
- Spadina Crescent may be converted to one-way only traffic during the event to improve traffic flow through the Park. Additional traffic management plan details will be required to identify the circulation routes
- Consider providing a concierge service for bike parking during the events
- Provide a communication plan to the public on the alternate modes of transportation to arrive at the event area

- **Impacts on Active Modes |** Yes, encourage the use of alternate modes of transportation.
- **Impacts on Parking |** Yes, reduce vehicular parking demand.
- **Impacts on Traffic Operations |** Yes, reduce traffic volumes on roadways.
- **Recommendation: Yes**

10.2.2 BIKE SHARE

Currently, the Downtown Saskatoon (DTNYXE), the city's central Business Improvement District, has launched a free bike rental service collaborating with eight hotels in the downtown area. This provides the City opportunities to explore and further expand this service to the Park, the downtown area and ultimately all throughout the city. Bike share, a similar but larger framework program, is being implemented in other Canadian cities. Bike share programs offer many benefits including improved mobility and accessibility, positive impacts for the environmental and public health, and reduced automobile dependency. Additional assessments on feasibility, ridership, and stations should be considered. Other e-mobility options such as electric scooters have been introduced as an alterative mode.

- **Impacts on Active Modes of Transportation |** Yes, encourage alternate modes of transportation.
- **Impacts on Parking |** Yes, reduce demand for parking.
- **Impacts on Traffic Operations |** Yes, reduce the traffic demand on the roadway.
- **Recommendation: Yes**

10.2.3 TRANSIT SERVICES

Opportunities to provide transit service within the Park may be explored. Depending on the final design of the Spadina Crescent and Kinsmen Avenue, bus stops may be provided on one- or both sides of the street on Spadina Crescent or Kinsmen Avenue. Pull-outs are not generally desired, but may be necessary if the City determines that the bus should not impact traffic flow on Spadina Crescent.

This strategy may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** Yes, encourage alternate modes of transportation.
- **Impacts on Parking |** Yes, reduce the demand for parking spaces.
- **Impacts on Traffic Operations |** Yes, reduce the traffic demand on the roadway. Depending on the location of the bus stop(s), the bus could temporarily block traffic flow.
- **Recommendation: Yes**

10.2.4 SHUTTLE SERVICES / PROGRAM

In addition to the remote parking and shuttle services, a shuttle program between key tourist destinations in Saskatoon may be considered. These attraction points may include the Remai Modern Museum, Wanuskewin Heritage Park, Western Development Museum, and Saskatoon Forestry Farm Park and Zoo, etc. The provision of a shuttle service between attraction points would enrich visitors' experience while reducing the demand for parking spaces.

- **Impacts on Active Modes of Transportation |** Yes, encourage alternate modes of transportation.
- **Impacts on Parking |** Yes, reduce the demand for parking spaces.
- **Impacts on Traffic Operations |** Yes, reduce the traffic demand on the roadway.
- **Recommendation: Consider exploring future possibility as part of city-wide or Saskatoon tourism program.**

10.2.5 EMPLOYEE TRIP REDUCTION

Employee trip reduction programs offer resources and incentives to reduce automobile trips and switch to non-motorized modes of transportation. Some of the strategies may be appropriate for the Park, including the following:

- Financial incentives are developed to encourage use of more efficient commuter modes, which may include one or more of the incentives including employee parking pricing, travel allowances, reduced or subsidized cost of public transit and rideshare benefits.
- Guaranteed ride home program provides subsidized rides for employees who use alternate modes in the event of an emergency or the need to work later than expected.
- Cycling and transit programs encourage employees to use non-motorized modes through promotional campaigns, educational programs, secure bike storage and end-of-trip facilities, and subsidize fares.
- Alternative scheduling should be considered when applicable, particularly between the City of Saskatoon staff. The purpose of alternative scheduling is to reduce the number of employees at the site at one time and reduce the demand for employees parking supply.

Similar to other measures, these strategies may be implemented during the summer season when the Park is in operation.

- **Impacts on Active Modes of Transportation |** Yes, encourage the use of non-motorized modes.
- **Impacts on Parking |** Yes, increase visitors supply.
- **Impacts on Traffic Operations |** No or minimal.
- **Recommendation: Yes**

10.3 ACTIVE TRANSPORTATION IMPROVEMENTS

10.3.1 MODIFICATIONS ALONG SPADINA CRESCENT

As noted during the public consultation stage, there is a desire to reduce the speed of vehicles traveling along Spadina Crescent within the Park. Depending on the provision of other improvement options, traffic calming measures along this segment of Spadina Crescent may be considered. Since Spadina Crescent is classified as an arterial roadway, reducing the posted speed limit on the segment adjacent to the Park may not be appropriate, particularly with the Park currently only in operation during the summer months. As such, implementing permanent or seasonal speed reduction may not be effective and could result in violations or driver confusion. However, this measure may be revisited if there are additional winter activities as part of the Winter City program.

Although an arterial roadway, Spadina Crescent runs through the Park. As such, this segment was examined to determined if the Playground Zone may be warranted. As per TAC Speed Management Guide – Playground Speed Zone Warrant, the warrant scores resulted between 67 (Playground Area) or 82 (Playground Zone) points. The variations in the warrant scores were a result of how the following components are defined, including:

1. Fencing | the Playland may be considered as fully or partially traversable. The traversability is determined by "*extent of fencing between the roadway and the playground, the effectiveness of the*

playground's internal pathway system in guiding children to a safe opening in the fence, and the height and type of fencing".

2. Property Line Separation | "*A roadway that is separated from the playground by only a sidewalk or fence is said to abut the roadway*." Considering the playground and equipment, the property line of the Playland may be considered to abut the roadway or be situated within 50m of the roadway.

It was identified that the City is reviewing transportation policies regarding playground zones and playground areas in Saskatoon including the Kinsmen Park Area. Although generally not implemented along arterial roadways, a playground zone or area should be considered along this segment of the Park since this roadway runs through the Park with high volumes of vulnerable road user.

- **Impacts on Active Modes of Transportation |** Yes, improve pedestrians and cyclists' safety.
- **Impacts on Parking |** No.
- **Impacts on Traffic Operations |** Yes, reduce travel speed and safer operations at site access points.
- **Recommendation: Potentially, depend on the implementation of other proposed options that would work in conjunction or remove the need for additional traffic calming measures. City of Saskatoon reviewing playground zone and playground area policy.**

10.3.2 CROSSWALK ON SPADINA CRESCENT BETWEEN ZONES 3 & 4

The public and stakeholder consultation as well as the AT review identified that the Spadina Crescent crosswalk between Zones 3 and 4 is a potential conflict area. Connecting the east and west side of the Park, this crosswalk experiences high pedestrian volumes.

Since the majority of the Park is in operation during the summer months only, permanent vertical deflection may not be appropriate. Other improvement measures to consider may include colored or textured surface treatment to emphasize active modes activities within the area. An example of textured crossing is currently installed in Saskatoon along Stonebridge Boulevard, as shown in **Figure 10-3**. Although typically paired with raised crosswalk, shark teeth pavement marking may be used to increase the conspicuity at a non-raised crossing.

Figure 10-3 | Textured Pedestrian Crosswalk on Stonebridge Boulevard (Google Map)

The maximum protection provided for pedestrians is to implement traffic signal controls at the intersection where vehicles are stopped. Traffic signals and pedestrian signals are not warranted at this location with the future forecast traffic volumes, as presented in **Section 9.3**. A RRFB system is warranted at this location. An OF treatment is provided in the existing conditions. As such, no additional improvements are required at this time. It is recommended that this crossing be monitored continuously as pedestrian volumes would likely increase throughout the year since the Wonderhub opened.

- **Impacts on Active Modes of Transportation |** Yes, improve active mode users' safety.
- **Impacts on Parking |** No.
- **Impacts on Traffic Operations |** No.
- **Recommendation: Monitor continuously to identify appropriate improvements, if required.**

10.3.3 IMPROVE CROSSWALK AT UNIVERSITY BRIDGE

The field review and public consultation also identified safety concerns at the crosswalk on Spadina Crescent immediately north of the University Bridge. There is currently an OF treatment provided at the crosswalk. The crosswalk is positioned on a channelized right-turn where vehicles may be travelling downstream at a high speed.

Some additional measures to consider for short-term improvements include:

- Enhance the existing (ladder) crosswalk with shark teeth pavement markings to improve the conspicuity of the crossing and to reinforce yielding behavior for motorists
- Colored or texture surface treatment to provide visual and audible cues about the traffic-calmed area while increasing pedestrian and cyclist visibility
- Upgrade the existing "Pedestrian Crossing Ahead" sign to "Pedestrian and Bicycle Crossing Ahead"

Figure 10-4 | Example of Textured Pedestrian Crossing with Shark Teeth Markings

An example of textured surface treatment for pedestrian crosswalk with shark teeth marking is provided in **Figure 10-4**.

Long-term measures to consider include:

- Consider corner radius treatment to reduce vehicle turning speeds
- Consider implementing horizontal deflections (i.e. choker / curb extensions)
- Consider vertical deflections (i.e. rumble strips, raised crosswalks, speed humps)
- Additional assessment will be required prior to implementing any of the long-term measures to ensure the improvement to pedestrian and cyclist safety would not result in other potential traffic conflicts.

- **Impacts on Active Modes of Transportation |** Yes, improve active mode users' safety.
- **Impacts on Parking |** No.
- **Impacts on Traffic Operations |** Depend on the improvement measures implemented.

  Recommendation: Additional assessment required particularly for long-term improvements.

10.3.4 UPGRADING SPADINA CRESCENT TO AAA NETWORK

Currently, there are bike lanes provided on both sides of Spadina Crescent between Spadina Ramp and the University Bridge. With the available right-of-way, this segment may be upgraded to an AAA network without major impacts to the existing green space. Opportunities to extend the bike lanes to the north should be explored with consideration to the right-of-way restriction at the Spadina Crescent bridge.

The intent of a protected bike lane facility is to allow cyclists of all ages and abilities to feel comfortable and safe when using the facility. The implementation of the bicycle facility should take into consideration the potential improvements at the Spadina Crescent and Spadina Ramp intersection. The following bicycle network may be considered:

- **Option A: Multi-Use Trail with Connection to Meewasin Trail |** This option proposes the bicycle facility be provided as bidirectional in-boulevard multi-use pathways. While providing buffer between vehicles and vulnerable road users, multi-use pathways require less right-of-way than a separate protected bike lane and sidewalk. With the planned Meewasin Trail upgrades, it is recommended that the proposed multi-use trail on the east side be connected to the Meewasin Trail to increase cyclists' comfort by providing additional buffer between bicycle and traffic.
- **Option B: Protected Bike Lanes |** The bicycle facility may also be provided in the form of protected on-street bike lane.

Figure 10-5 illustrates the potential improvements for a bicycle facility along Spadina Crescent.

- **Impacts on Active Modes of Transportation |** Yes, encourage alternate modes of transportation.
- **Impacts on Parking |** Yes, increase available parking supply with the accessibility to other park facilities and potentially reduce parking demand.
- **Impacts on Traffic Operations |** Yes, reduce the traffic demand on the roadway.
- **Recommendation: Option A**

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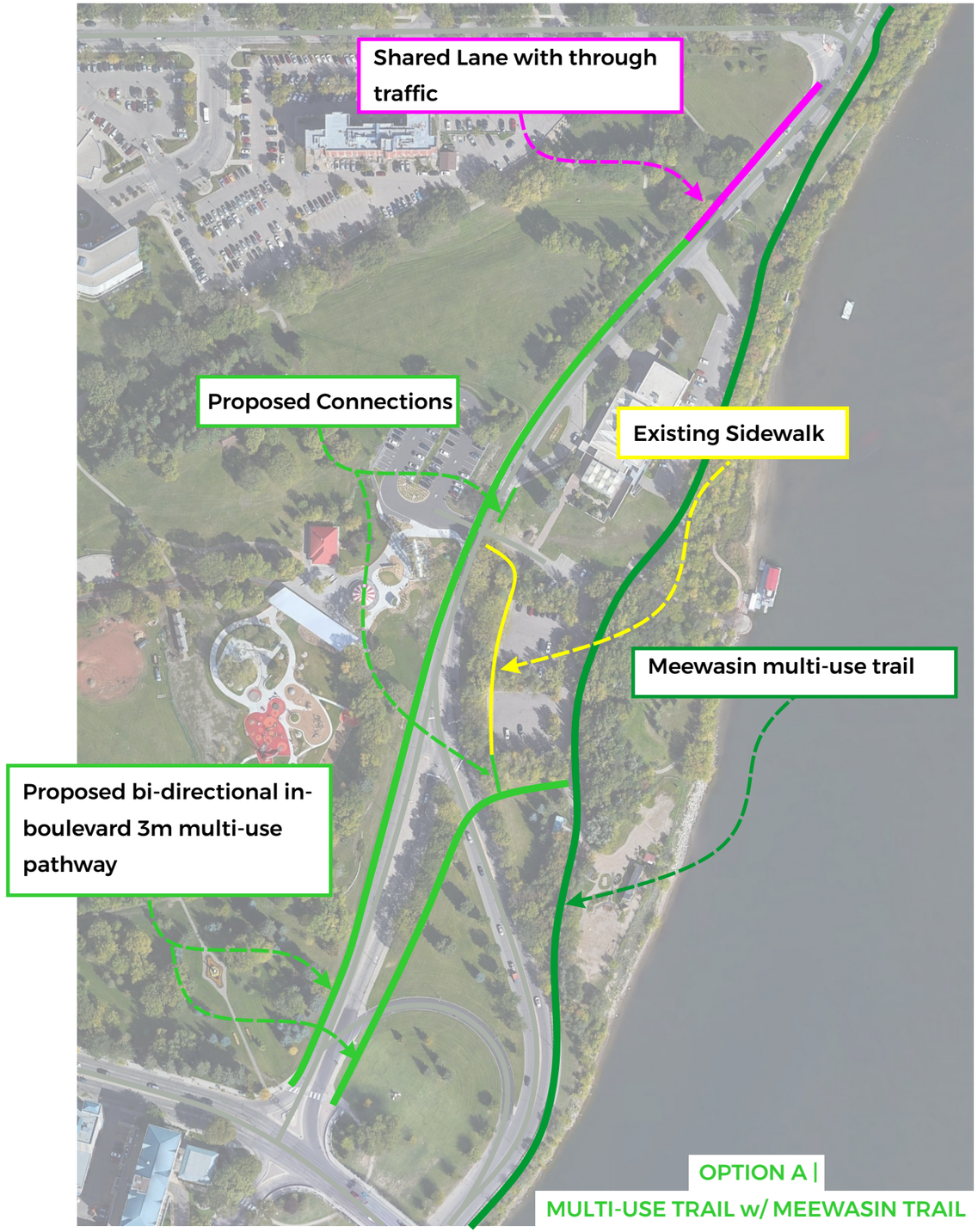

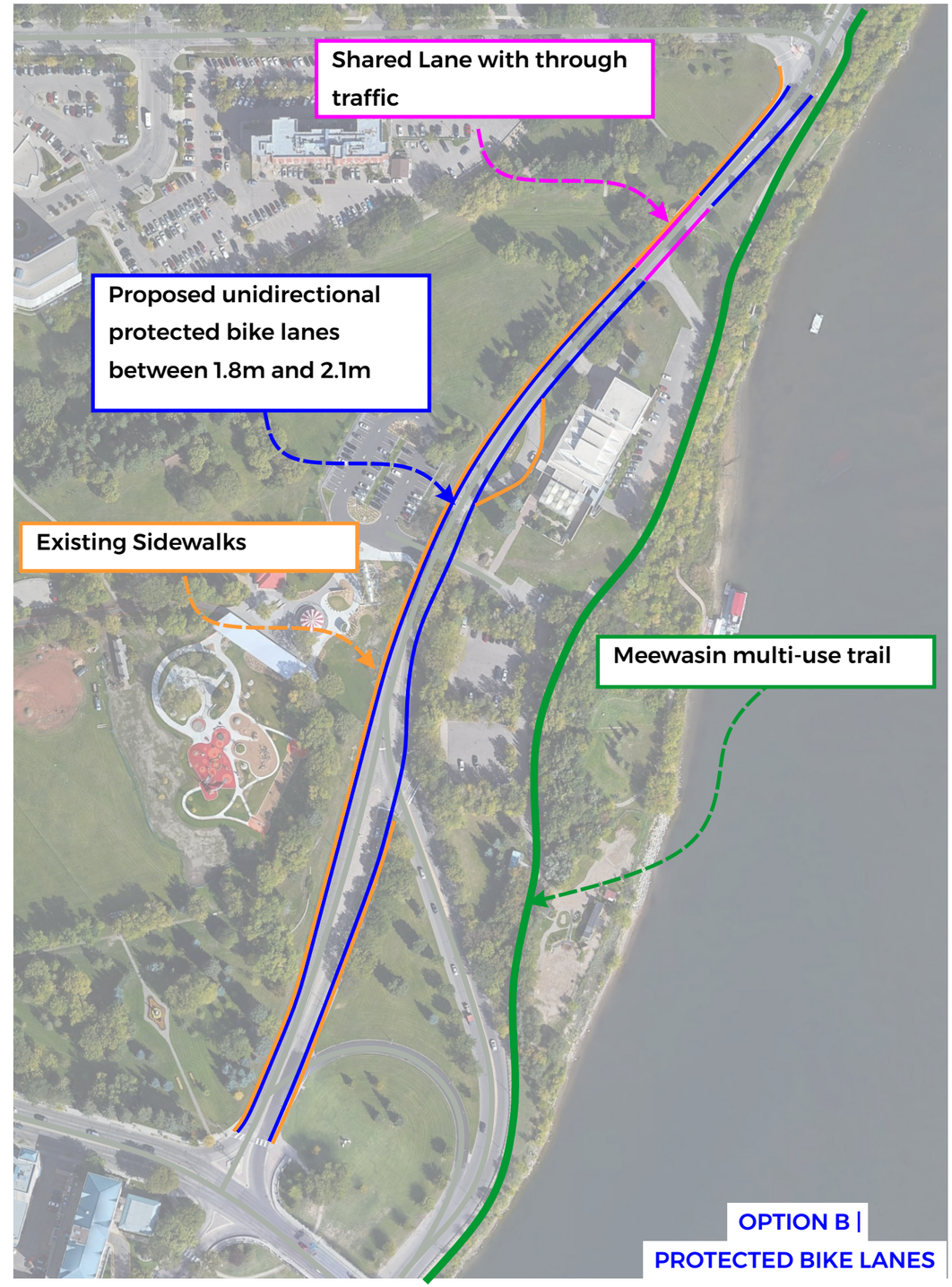

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FIGURE 10-5 | POTENTIAL BIKE FACILITY IMPROVEMENT OPTIONS

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10.3.5 SHARED STREET – SPADINA CRESCENT

A shared street or shared space shifts the priority from vehicles toward pedestrians and cyclists where pedestrians and cyclists can cross anywhere. Curbs, barriers and traffic control devices are often removed to improve the recognition of shared space. Street furniture (i.e. bollards, benches, planters, and bicycle parking), trees, textured pavements are typically used to help define a shared street, subtly delineating the traveled way from pedestrian-only space. Shared streets are typically implemented on urban commercial streets with active commercial frontages and low to moderate traffic volumes. However, there are cases where shared streets have been implemented on streets with higher traffic volumes and high pedestrian demand.

A shared street may be considered for Spadina Crescent between Queen Street and Spadina Ramp as a much more aggressive approach on Spadina Crescent to emphasize the active transportation uses. Since the Kinsmen Park Area is mostly only heavily utilized by active mode users during the summer months, this option may not be appropriate as a short-term improvement. In addition, Saskatoon drivers may not be familiar with the concept yet which could potentially introduce more conflicts with the traffic demand along this segment.

This modification may be reserved for a longer term improvement when there are more winter activities in the Kinsmen Park Area that would increase the demand for active modes throughout the year. Additional assessments and planning would be required to ensure that all road users' needs are met. Prior to implementation, an education campaign should be conducted so all road users are aware of how to utilize a shared space. Stakeholders and public consultation should also be incorporated into the plan.

Figure 10-6 | Example of Shared Street (www.halifax.ca)

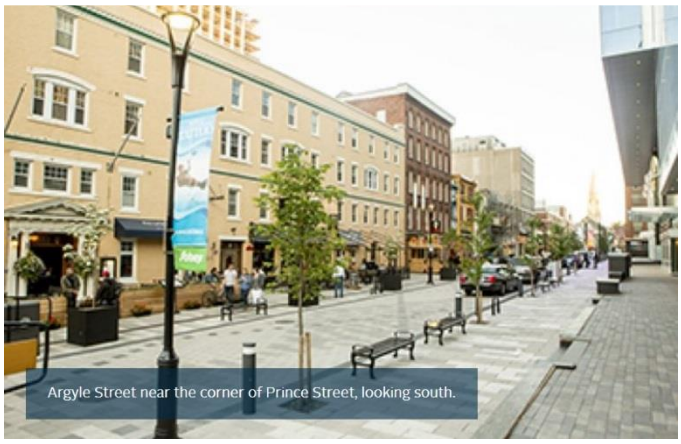

Figure 10-6 shows an existing shared street in Halifax.

- **Impacts on Active Modes of Transportation |** Yes, improve pedestrian and cyclist safety as well as encourage more activities.
- **Impacts on Parking |** No changes to parking supply.
- **Impacts on Traffic Operations |** Yes, impacts on travel time and delays and would remove Spadina Crescent as a key link in the city road network.
- **Recommendation: Not at this time but should be monitored by the City. Additional assessment and planning would be required.**

10.3.6 SHARED STREET – ZONE 5 AREA

The demand for additional parking spaces, currently accommodated in Zone 5, and the high pedestrian and cyclist activities along the Meewasin Trail call for an opportunity to explore a share street design. Modifications to the trail to the south and Zone 4 parking may be required to improve circulation east of

Spadina Crescent. Although noted in the above section that a shared street may be a more appropriate solution for the longer term option on Spadina Crescent due to the traffic volumes, this portion of north-south movements may present a more suitable environment due to lower traffic demand and travel speeds. In addition, shared street within this portion would improve 'eyes on the street', safety, lighting, etc. Similarly, additional assessments should be conducted to identify the feasibility and circulation. Stakeholders and public consultation should also be conducted as part of the assessment.

- **Impacts on Active Modes of Transportation |** Yes, improve vulnerable road users' safety as well as encourage more activities.
- **Impacts on Parking |** No changes to current parking supply.
- **Impacts on Traffic Operations |** Yes, reinforce interaction of drivers and active mode users.
- **Recommendation**: **Possible solution for longer term with modifications to layout and design of the area. Additional assessment and planning should be conducted**

10.4 TRAFFIC OPERATIONS

10.4.1 RIGHT-IN / RIGHT-OUT ACCESS AT ZONES 3 AND 4

During the data collection and site observation, it was noted that vehicles were crossing Spadina Crescent back and forth between Zone 3 and Zone 4 parking areas searching for available stalls, which could pose as safety issues for all road users as well as additional delays at the access points. Converting the access points to right-in / right-out configurations would eliminate these issues at the access but could move the issues to another location unless alternative parking zones are known or drivers understand how to get to their destination without the left-turn movements.

If implemented, displacements of the left-turn and through movements are expected. The maximum left-turn and through traffic volumes exiting the site for the future forecast traffic volumes are anticipated to be 50 vehicles from Zone 3 and 50 from Zone 4 during the weekend peak hour. The maximum left-turn movements entering from Spadina Crescent are 50 vehicles for Zone 3 and 25 for Zone 4 during the weekend peak hour. The capacity analysis indicates that the increased right-turn movements would be adequately accommodated.

- **Impacts on Active Modes of Transportation |** Yes, improve active mode users' safety by reducing conflicting movements.
- **Impacts on Parking |** Yes, impact access to Zones 3 and 4 parking.
- **Impacts on Traffic Operations |** Yes, improve intersection operations and reduce queuing, increase inconvenience.
- **Recommendation: Yes**

10.4.2 INTERSECTION IMPROVEMENTS AT SPADINA RAMP INTERSECTION – DUAL LEFT-TURN LANES

For interim improvements, a southbound dual left-turn from Spadina Crescent onto the Spadina Ramp was considered to improve the operations along Spadina Crescent and avoid spillback onto the University Bridge. The provision of the dual left-turn lane may be accommodated by converting the existing outside southbound through lane to a shared left-turn / through lane. It should be noted that this modification will

no longer permit free-flowing southbound through traffic, which is considered acceptable since the through movement volumes are relatively low (approximately 100vph in the afternoon peak hour for the 15-year future forecast condition). An update of the signal timing plan will be required.

A conceptual sketch is illustrated in **Figure 10-7**. It should be noted that the purpose of this interim option is to improve traffic operations with minimal modifications to the current infrastructure. The conceptual design proposes that the northbound right-turn loop remain as is with a yield control approaching the Spadina Ramp. Other alternatives to this option include:

— Lane drop on the outside receiving lane on Spadina Ramp to a one-lane segment prior to the loop. This would allow the loop to continue to operate at free-flow conditions and Spadina Ramp operate as is; or

— Adjust the northbound right-turn movement from the loop to the Spadina Crescent and Spadina Ramp intersection. This would likely require a channelization for the right-turn movements or realignment of the intersection. A similar lane change would be required for southbound traffic to continue south at the on-ramp loop to the University Bridge.

Capacity analysis was completed using Synchro 7.0 for the future forecast traffic volumes during the weekday afternoon peak hour for the worst-case scenario, as summarized in **Table 10-1**. The interim option modifies the existing lane arrangement on the north leg (Spadina Crescent). Although overall intersection operation is expected to improve to acceptable conditions, the dual receiving lanes on Spadina Ramp may result in more conflicts and weaving movements with the loop south of this intersection. As such, it is not recommended unless the right-turn movement at the loop is relocated to avoid weaving conflicts with Spadina Ramp and that the skewed angle be addressed.

Table 10-1 | LOS Summary for Interim

Peak Hours	Overall Intersection	Performance	Spadina Cres S-Leg			Spadina Ramp E-Leg			Spadina Cres N-Leg		
			LT	T	RT	LT	T	RT	LT	T	RT
Weekday Afternoon Peak	Cycle Length: 80s Intersection Delay: 19.2s Intersection LOS: B	V/C Ratios	0.76	-	0.76	0.01	0.3	-	-	0.8	
		Delay (s)	23		23	31	0			28	
		LOS	C		C	C	A			C	
		95th Queue (m)	97		97	5	99			79	

- **Impacts on Active Modes of Transportation |** Yes. Depending on the final option, potential conflicts for active mode users may be reduced by consolidating the right-turn movements at the loop with the intersection.
- **Impacts on Parking |** No.
- **Impacts on Traffic Operations |** Yes, improve intersection operations though weaving or merge conflicts will increase.
- **Recommendation: No, unless the intersection will be realigned as part of the staging improvements for the long-term solution. Relocation of the right-turn movements at the loop would be required to reduce potential conflicts and weaving segment south of the intersection.**

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FIGURE 10-7 | SPADINA INTERSECTION IMPROVEMENT - DUAL LEFT TURN LANE

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10.4.3 INTERSECTION IMPROVEMENTS AT SPADINA RAMP – ROUNDABOUT

For long-term improvements, a multi-lane roundabout may be considered at the Spadina Crescent and Spadina Ramp intersection, as illustrated in **Figure 10-8**. The provision of the roundabout would improve traffic operations and reduce queuing. Although pedestrian / AT crossings become more spread out, roundabout intersections also typically have traffic calming effects by reducing vehicle speeds and in-turn improves safety for active mode users. In addition, the roundabout intersection provides opportunities to realign the current intersection geometry from a skewed angle and reduce potential conflicts (i.e. for left-turn movements from the east leg onto the south leg). The multi-lane is for one movement (Spadina Crescent toward Spadina Ramp) which will simplify the roundabout operations compared to a fully multi-lane roundabout.

As part of the Active Transportation improvement options, it is recommended that Spadina Crescent be upgraded to an AAA cycling network. Cyclists may have difficulty negotiating through a multi-lane roundabout. If implemented, it is recommended that the bicycle facility on the east side be constructed as an in-boulevard multi-use pathway to improve cyclists' safety and comfort. Opportunities to implement a cross-ride should be considered. The bike facility on the west side of Spadina Crescent may be implemented as a protected bike lane separated from the sidewalks or as multi-use pathways since active mode users would be travelling parallel to the traffic and both options provide buffers.

Capacity analysis at the Spadina Crescent and Spadina ramp multi-lane roundabout intersection was conducted using Sidra 7 (industry simulation software for roundabouts) for the total future forecast volumes during the afternoon peak hour for the worst-case scenario, summarized in **Table 10-2.**

Table 10-2 | Capacity Analysis for Spadina Crescent and Spadina Ramp Roundabout Intersection

INTERSECTION	Overall Intersection	Performance	Spadina Ramp (East Leg)			Spadina Cres (North Leg)			Spadina Cres (South Leg)		
			LT	T	RT	LT	T	RT	LT	T	RT
Spadina Cres & Spadina Ramp	*Roundabout Intersection*	V/C Ratios	0.97	-	0.97	0.27	0.27	-	-	0.72	0.4
		Delay (s)	38.4		33.9	7.3	3			9	8.5
	Intersection Delay: 14.3	LOS	D		C	A	A			A	A
	Intersection LOS: B	95th Queue (m)	139		139	16	16			40	12.3

Overall, the intersection is expected to operate acceptably for the future forecast traffic volumes during the afternoon peak hour. The implementation of the multi-lane roundabout is anticipated to accommodate traffic demand during other peak hours acceptably since there is less traffic demand than during the afternoon peak hour. Although the Spadina Ramp is anticipated to approach its capacity (v/c ~ 1.0) with the proposed single-lane approach, traffic is expected to operate with acceptable delays (LOS D). Since the majority of the traffic are right-turn movements and minimal left-turns (< 5 vehicles), the Spadina Ramp approach was designed as a single-lane approach to minimize the required right-of-way and ultimately the loss of green space. If a bypass lane is implemented to accommodate the right-turn movement from Spadina Ramp onto Spadina Crescent, the Spadina Ramp is expected to operate at optimal conditions (LOS A and 0.3 v/c ratio). Detailed summary of the analyses are presented in **Appendix H**.

- **Impacts on Active Modes of Transportation |** Yes, improve active mode users' safety by reducing vehicle speeds. Multi-lane roundabout may be difficult to navigate on bikes and crossings become more spread out.
- **Impacts on Parking |** No.
- **Impacts on Traffic Operations |** Yes, improve intersection operations and reduce queuing.
- **Recommendation: Yes**

Table 10-3 summarizes all the proposed improvement options.

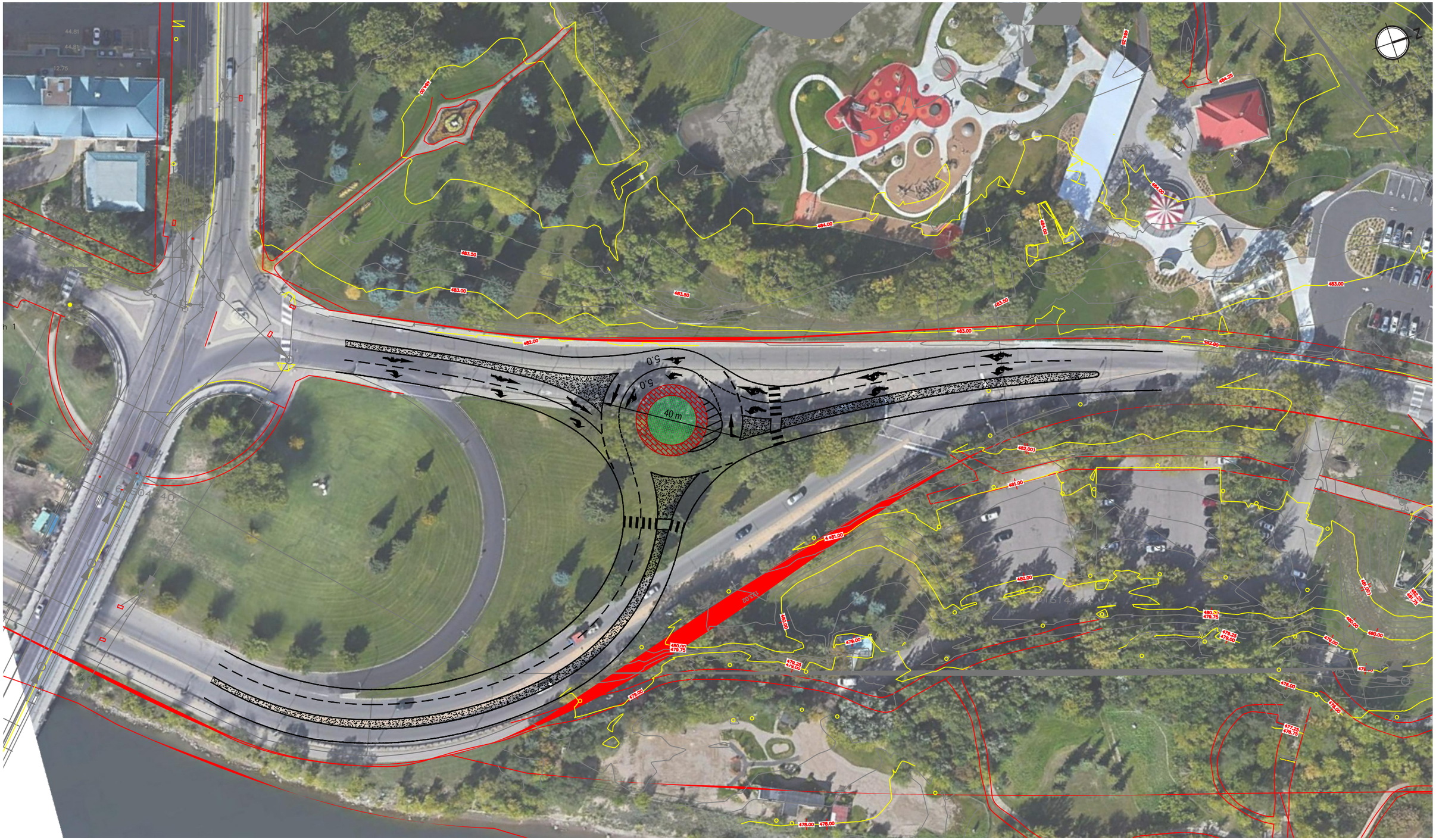

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FIGURE 10-8 | SPADINA RAMP INTERSECTION - LONG-TERM IMPROVEMENTS

Kinsmen Park Parking Strategy and Transportation Study

Table 10-3 | Proposed Improvement Options

Options			Impacts on AT	Impacts on Parking	Impacts on Traffic Ops	**Recommended**
Parking Demand Management	1	Improve Parking Enforcement	No	Yes	Yes	**Yes**
	2	Implement Time Limit on Weekend Parking	No	Yes	No	**Yes**
	3	Improve User Information, Marketing and Way-Finding	Yes	Yes	Yes	**Yes**
	4	Parking Capacity Display	Yes	Yes	Yes	**Yes**
	5	Implement Paid Parking Program	Yes	Yes	Yes	**Yes**
	6	Remote Parking and Shuttle Services	Yes	Yes	Yes	**Yes**
	7	Additional Parking Supply in Zone 1	No	Yes	No	**Yes**
	8	Potential Parking Facility Expansion	Yes	Yes	Yes	**Yes**
	9	Increase Parking Supply on Kinsmen Ave	No	Yes	No	**Yes**
	10	On-Street Parking along Spadina Cres	Yes	Yes	Yes	**No**
	11	Maintain Zone 2 Parking Supply	No	Yes	No	**Yes**
	12	Potential Zone 4 Upgrades	Yes	Yes	Yes	**Yes**
	13	Maintain and Upgrade Zone 5 Parking Facility	Yes	Yes	No	**Yes**
	14	Shared Parking with SHR (Zone 6)	No	Yes	No	**Yes**
	15	Pick-up / Drop-off Areas	No	Yes	Yes	**Yes**
Traffic Demand Management	16	Develop Special Event Traffic and Parking Management Plan	Yes	Yes	Yes	**Yes**
	17	Bike Share	Yes	Yes	Yes	**Yes**
	18	Transit Services	Yes	Yes	Yes	**Yes**
	19	Shuttle Services / Program	Yes	Yes	Yes	**Yes**
	20	Employee Trip Reduction	Yes	Yes	No	**Yes**
Active Transportation Improvements	21	Modifications along Spadina Cres	Yes	No	Yes	**See Report**
	22	Improve Crosswalk on Spadina Cres b/w Zones 3 and 4	Yes	No	No	**See Report**
	23	Improve Crosswalk at the University Bridge	Yes	No	Yes	**See Report**
	24	Upgrade Spadina Cres to AAA Network	Yes	Yes	Yes	**Yes**
	25	Shared Street - Spadina Crescent	Yes	No	Yes	**No**
	26	Shared Street - Zone 5	Yes	No	Yes	**No**
Traffic Operations	27	Right-in / Right-out Access at Zones 3 and 4	Yes	Yes	Yes	**Yes**
	28	Intersection Improvements at Spadina Ramp - Dual LT Lanes	Yes	No	Yes	**No**
	29	Intersection Improvements at Spadina Ramp - Roundabout	Yes	No	Yes	**Yes**

* See Report for comments on assessments or for future consideration.

11 RECOMMENDED INFRASTRUCTURE NETWORK

Stakeholders, steering committee, and public consultation inputs have been combined with the results of the network assessment and capacity analyses to develop an improved strategy to address existing issues and anticipated deficiencies as traffic volumes continue to grow. All identified mitigation measures have been evaluated to develop recommendations that will provide a comprehensive plan to address the operations and parking needs within the Park. The following sections identified the recommended plan for the Park based on modifications to infrastructure, parking, active transportation and traffic operations.

11.1 EXISTING TRANSPORTATION INFRASTRUCTURE

The field review identified deficiencies in existing infrastructure, as illustrated in **Figure 7-3**. **Table 11-1** summarizes the recommendations addressing those issues that may be implemented in immediate-term.

Table 11-1 | Recommended Modifications for Existing Infrastructure Deficiencies – Immediate-term

Locations		Modifications	Immediate-term (< 1 year)
1	25 St & Spadina Cres	Trim median curb back within crosswalk to avoid tripping hazards	♦
2	Spadina Cres & Spadina Loop	Align the southern pedestrian ramp to the north	♦
3	Spadina Cres: 25 St - Ramp	Provide pavement marking for bike lanes	♦
4	Spadina Cres & Spadina Ramp	Trim median curb back within crosswalk to avoid tripping hazards	♦
5	Zone 4 Parking	Repaint parking stall markings and directional arrows where applicable	♦
6	Zone 4 Parking	Provide wayfinding signage for all Kinsmen Park Area parking	♦
7	Zone 4 Parking	Repaint pedestrian crosswalk	♦
8	Spadina Cres Crosswalk	See Section 11.3	N/A
9	Zone 3 Parking	Repaint parking stall markings and directional arrows where applicable. One-way signage blocked by shrub	♦
10	Trail	See Section 11.3	♦
11	Trail	See Section 11.3	♦
12	Spadina Cres & Queen St	No improvement required	N/A
13	Queen St	Assumed will be rectified when construction activities adjacent to Queen St are completed	N/A
14	Queen St	No improvement required	♦
15	Trail on Queen St	Connect pathway	♦
16	Informal Pathway	See Section 11.3	N/A
17	Informal Pathway	See Section 11.3	N/A
18	Trail (Zone 1)	Drainage improvements required to avoid flooding during rain	♦
19	Zone 1	Parking stall markings, directional arrows, wayfinding signage, and parking curbs needed	♦
20	Kinsmen Ave	No improvement required	N/A
21	25th St & Kinsmen Ave	No improvement required	N/A

11.2 PARKING AND TRAFFIC DEMAND MANAGEMENT STRATEGIES

Section 10.1 identified various strategies to increase parking supply without major impact to the green space as well as to reduce parking demand by encouraging the use of other modes. Using the Victoria Transport Policy Institute Parking Management Strategies[1], the typical percent reduction on parking demand is summarized in **Table 11-2**. Some strategies also help reduce vehicle traffic volumes, which is noted as an additional advantage of the strategy.

Table 11-2 | Typical Parking Reduction

	PARKING DEMAND MANAGEMENT STRATEGIES	TYPICAL PARKING REDUCTION	TRAFFIC REDUCTION
1	Shared Parking (with Zone 6)	10 – 30%	-
2	Remote Parking	10 – 30%	Yes
3	Walking and Cycling Improvements	5 – 15%	Yes
4	Parking Pricing	10 – 30%	Yes
5	Bicycle Facilities (i.e. secure storage)	5 – 15%	Yes
6	Improve Users Information and Marketing	5 – 15%	Yes

Other parking and transportation demand management strategies proposed within this study also have varying rates of reduction including improve parking enforcement, bike share program, transit services, and shuttle program. Although each strategy has a typical range of percent reduction, applying multiple strategies at the same time does not indicate cumulative reduction. For a conservative estimate, a 10% to 30% reduction was set as the total potential parking demand reduction for the Park.

The estimated parking demand including future growth, identified in **Section 8.2**, indicates that approximately 76 to 132 additional parking stalls would be required. Assuming 10 – 30% parking reduction from the parking demand management strategies, the revised forecast increase in parking demand is expected to be:

- 10%-Reduction = 68 to 119 additional stalls required; or
- 30%-Reduction = 53 to 93 additional stalls required.

As such, approximately 55 to 120 additional stalls would be required to meet future demand in the Park if the parking demand management strategies are to be implemented.

Based on the proposed reconfiguration of Zone 4, identified in the planned Meewasin upgrades, additional 12 stalls would be provided to increase the capacity from 84 to 96 stalls.

As such, it is anticipated that approximately 45 to 110 additional stalls would be required to meet future demand in the Park.

[1] Parking Management Strategies for More Efficient Use of Parking Resources – Updated November 28, 2018 (https://www.vtpi.org/tdm/tdm28.htm#_Toc128220479)

To minimize the impacts on green space, the following potential improvement options (identified in **Section 10.1)** are recommended to meet the parking demand:

1. Expanding and redesigning Zone 1 facility would potentially increase parking supply up to 35 stalls.
2. Expanding and redesigning Zone 4 facility would potentially increase parking supply up to 40 stalls. Note that this improvement is further expansion of the planned Meewasin upgrades identified above (additional 12 stalls) which may be implemented due to the additional right-of-way obtained from the roundabout improvement at the Spadina Crescent and Spadina Ramp intersection.
3. Providing the parking area along Kinsmen Avenue proposed in the Master Plan would potentially increase parking supply up to 40 stalls.

It is recommended that the parking demand be monitored continuously along with the growth of the Park uses prior to implementing additional expansions. The final parking improvements may be completed with a combination of the abovementioned improvements and should be implemented as needed.

11.3 ACTIVE TRANSPORTATION NETWORK

Active transportation needs including desire lines, potential conflicts and safety concerns, as well as existing infrastructure deficiencies are outlined in **Section 7**, providing insights to the current and anticipated future demand. Special consideration should be made to road safety recommendations on Spadina Crescent to improve the safety and comfort of vulnerable road users. This roadway dissects the Park and currently acts as a barrier to east-west movement for active transportation. Opportunities to implement intersection improvements, traffic calming strategies, and physically separated cycling facilities should be explored. The Master Plan, completed in 2011, identified opportunities to improve pedestrian connections between activity centres and parking zones. As such, the following sections are intended to confirm the improvements identified in the Master Plan with existing demand and identify potential modifications of those improvements to address the current and future uses, which have been illustrated in **Figure 11-1**.

11.3.1 EAST-WEST MOVEMENT

The east-west circulation within the park is fragmented and Spadina Crescent acts as a barrier to pedestrian and cycling movement. Opportunities to implement new pedestrian paths within the park and intersection improvements should be considered to facilitate greater ease of movement across Spadina Crescent. The following list includes opportunities from the Master Plan and modifications to the Master Plan that are suggested to improve east-west movement within the Park:

1. Implement a path from the Meewasin Trail to 26th Street, as proposed by the Master Plan. Modify the proposed facility to a multi-use trail, so that it may be shared between pedestrians and cyclists, and include yellow skip centrelines to delineate space for east and west movement. The pedestrian crossing on Spadina Crescent that connects the two portions of this path should be upgraded as part of this proposed trail improvement. The proposed improvements to this pedestrian crossing are described by *Improvement 8*.
2. Implement a path between Zone 3 and Zone 6 parking areas, as proposed by the Master Plan. This path will provide a connection between the Park's path network and the Hospital's parking (Zone 6) area, which currently serves as overflow parking to the Park parking. Demand for this connection is

demonstrated by an existing desire line connecting these two locations. The Master Plan currently proposes a 1.5m to 2.0m path, however, a wider (3 – 4 m) path may be warranted given the current demand for this connection and the capacity of the hospital's parking supply.

3. Implement a northwest-southeast path within the field enclosed by the Canpotex train tracks, as shown by desire lines. Ensure that this proposed path connects to the proposed east-west multi-use path to the north and the existing park entrance to the south. Provide mitigating measures where the path crosses the train tracks, such as 'Look Both Way for Trains' signage. Opportunities to improve the pathway to be aligned with the crosswalk on Spadina Crescent immediately north of the University Bridge should be considered.
4. Provide sidewalk connection on the south side along Queen Street between the hospital main access to Spadina Crescent.

11.3.2 NORTH-SOUTH MOVEMENT

The Master Plan identifies opportunities to improve north-south movement within the Park, particularly through improvement to existing facilities on Spadina Crescent and the Meewasin Trail. The Master Plan notes that Spadina Crescent is a key corridor for motorists that connects to several parking zones and activity centres within the Park. Although there are existing facilities for pedestrians and cyclists on or adjacent to the roadway, opportunities exist to improve these facilities to attract users of all ages and abilities. The following list includes opportunities from the Master Plan and modifications to the Master Plan that are recommended to improve north-south movement within the Park:

5. Widen the Meewasin Multi-Use Trail to 4m or greater to accommodate higher cycling volumes, as proposed by the Master Plan and the Meewasin Trail Study. Include yellow skip centrelines within the redesign of this facility to delineate space for north and south movement. Provide wayfinding signage to key destinations at crossings and entrances of the trail.
6. With the widening of the multi-use pathway on the east side adjacent to Spadina Crescent (*Improvement 5*), opportunities to expand the pedestrian and AAA facilities should be explored. Implement separated cycling and pedestrian multi-use pathway on the south and connect it to the Meewasin Multi-Use Trail. Note that the position of the final connection between the Spadina multi-use pathway and the Meewasin trail will depend on final configuration of Zone 4 parking area. The connection should be extended to connect to the existing walkway on the west side of Zone 4 as well as the sidewalk in front of the Mendel Building.
7. Repaint the existing bike lane on Spadina Crescent. Where possible, the bike lane should be extended to connect with other cycling facilities, such as the proposed east-west multi-use path near Playland and the Mendel Building. A long-term objective should be to implement separated cycling facilities along the full extent of the Park on Spadina Crescent, as noted by the Master Plan. The Downtown All Ages and Abilities Cycling Network Study has identified the south portion of this roadway as future AAA connection to the University Bridge. Extending the AAA facilities on Spadina Crescent north of the University Bridge will allow connections to additional activities and parking supply in the downtown area and ultimately encourage alternate modes. Providing physical separation between motorists and cyclists may upgrade the facility to an all ages and abilities design. Implementing cycle tracks or physically separated bike lanes would require widening the road right-of-way.

11.3.3 IMPROVED CROSSINGS

The intersection crossings on Spadina Crescent are conflict points between motorists, cyclists, and pedestrians. Opportunities to improve the safety of vulnerable road users by managing conflicts at these locations should be explored. The Master Plan identifies several locations for intersection improvements that have the potential to mitigate these conflicts. The following list includes opportunities from the Master Plan and modifications that are suggested to improve crossings on Spadina Crescent:

8. Implement a path underneath the Spadina Crescent bridge, as proposed by the Master Plan and existing desire lines. Connect this path to the existing path to the west of the bridge, which connects to the intersection of Queen St and 9th Ave. Widen both the existing and proposed paths to 4m to facilitate comfortable two-way movement. If the height of the bridge accommodates bicycle clearance, ensure that signage indicates that path is multi-use (i.e. shared between cyclists and pedestrians) and include yellow skip centrelines to delineate space for east and west movement. If implemented, this facility would serve as a cycling connection between the existing Meewasin Trail and the proposed AAA cycling facility on 9th Avenue.
9. Enhance the existing pedestrian crossing between Zones 3 and 4 by adding shark teeth pavement markings to the existing ladder crossing markings to improve the conspicuity of the crossing and to reinforce yielding behaviour for motorists. The existing ‘Pedestrian Crossing Ahead’ warning signs in advance of the crossing should also be replaced with ‘Pedestrian and Bicycle Crossing Ahead’ warning signs. Explore the opportunity of implementing a raised crossing at this location.
10. Consider the implementation of a roundabout to replace the existing entrance and exit to Spadina Crescent, as noted by the Master Plan. The proposed roundabout has the potential to have a traffic calming effect on Spadina Crescent and would provide an additional mid-park pedestrian crossing. The existing entrance and exit ramps are unsignalized and provide limited instruction to motorists to yield to pedestrians or cyclists. Replacement of the Spadina Crescent and Spadina Ramp intersection with a roundabout would require significant reconstruction of the road. If this is not possible in the short-term, a temporary solution to mitigate conflicts would be to implement new pavement markings and signage at these locations. Ladder pavement markings are recommended to add to the conspicuity of the pedestrian crossings. A green surface treatment and ‘Turning Vehicles Yield to Cyclists’ signage are recommended to add to the conspicuity of the bicycle lane through the conflict zone.
11. Enhance the existing pedestrian crossing at 25th Street to alert turning motorists to the presence of pedestrians on the roadway. This crossing is partially obstructed by guard rails on the University Bridge and vegetation in the boulevard. This crossing connects the Park’s path system to the multi-use path on the University Bridge. It should be expected that cyclists will use this crossing to travel between these facilities.

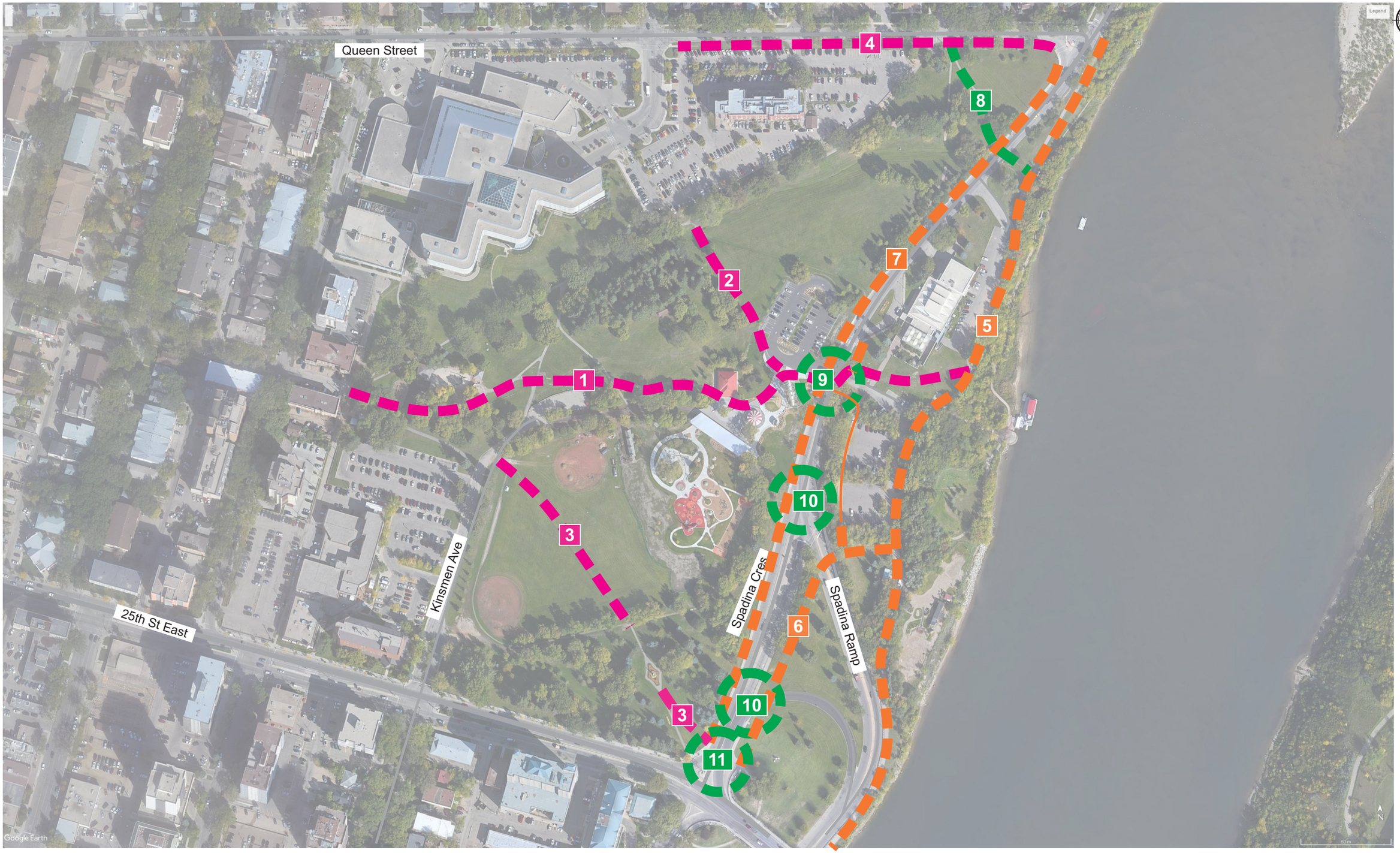

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FIGURE 11-1 | RECOMMENDED ACTIVE TRANSPORTATION IMPROVEMENTS

Kinsmen Park Parking Strategy and Transportation Study

11.3.4 BICYCLE NETWORK FACILITY

Section 10.3.4 identified two potential options for the AAA bicycle network along Spadina Crescent. It is recommended that Option A be considered since there is less impact on the existing green space. Due to the constrained right-of-way along Spadina Crescent particularly at the bridge, there would be gaps on the AAA cycling network where the bike facility would have to share the roadway with traffic. If desired, the City may expand the existing bridge or provide separate infrastructure for active transportation users to ensure continuous AAA network within the Park.

Figure 11-2 illustrates the proposed bicycle facility along Spadina Crescent. The cross-section drawings for Spadina Crescent with the recommended bi-directional in-boulevard multi-use pathway are presented in **Figure 11-3.**

11.3.5 BICYCLE PARKING

The Park currently features several locations for short-term bicycle parking, including the Zones 3 and 4 as well as the SOTS site. Consideration should be made to adding additional short-term bicycle parking at key destinations as cycling to the park becomes more desirable following infrastructure improvements.

11.4 TRAFFIC OPERATIONS

It is recommended that traffic operations at all study intersections be monitored continuously and traffic signal timing plans be optimized, when required, to accommodate the traffic demand.

Although the Spadina Crescent and Queen Street intersection is expected to approach its capacity in the 15-year future forecast traffic volumes. The intersection is expected to operate at LOS D or better and no further improvements are required.

The Spadina Crescent and Spadina Ramp intersection is expected to fail in 5 to 10 years, depending on Saskatoon background growth rates. Although one of the improvement options identified an interim modification, it is not recommended due to the skewed angle of the existing intersection. It is recommended that the intersection be monitored continuously, and when required, the proposed multi-lane roundabout be implemented.

Figure 11-2 illustrates the proposed modifications along Spadina Crescent. **Figures 11-3** illustrates the cross-section design of the recommended roundabout at the Spadina Crescent and Spadina Ramp intersection.

Table 11-3 summarizes the proposed improvement options, identified in Section 10, as well as the improvement horizons.

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Figure 11-2 | Proposed Long-term Modification Along Spadina Crescent

Kinsmen Park Parking Strategy and Transportation Study

DRAWING: Cross Sections - Kinsmen.dwg DATE: 2019-10-11 DRAWN BY: epps

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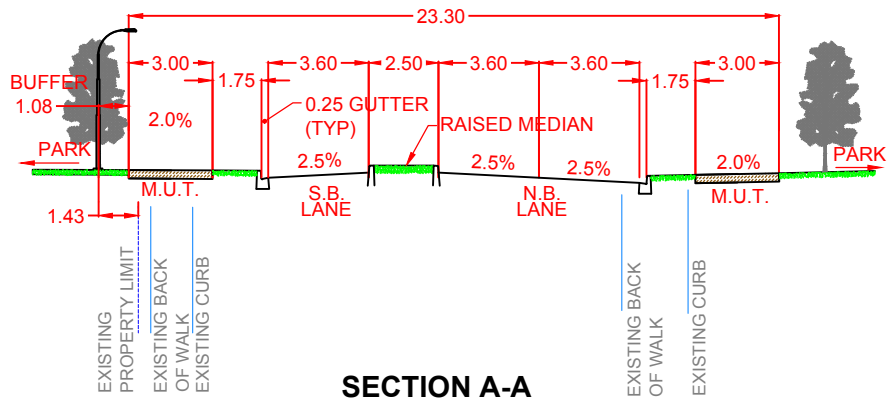
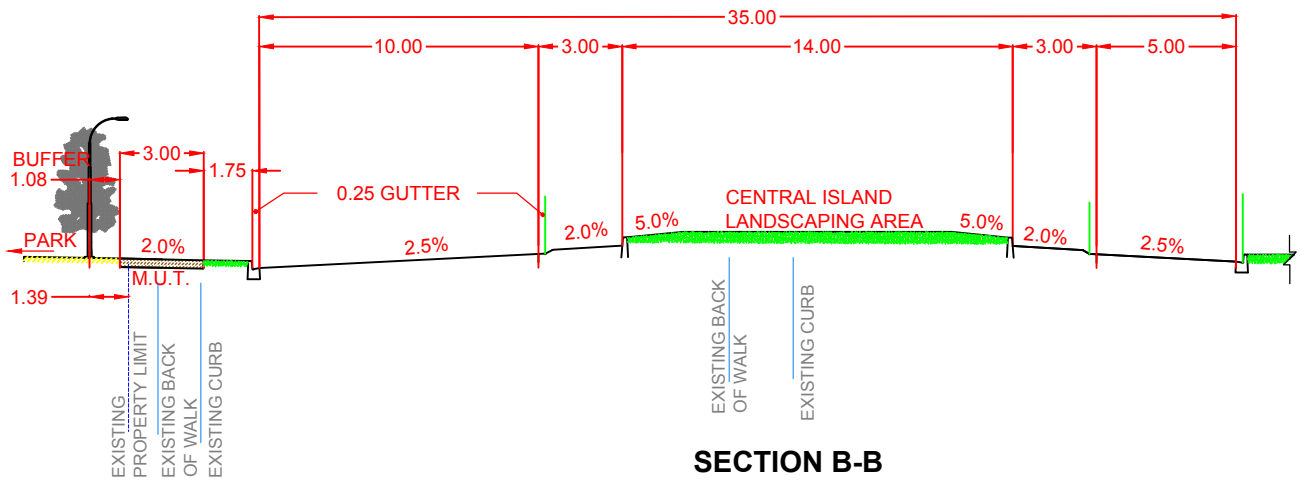
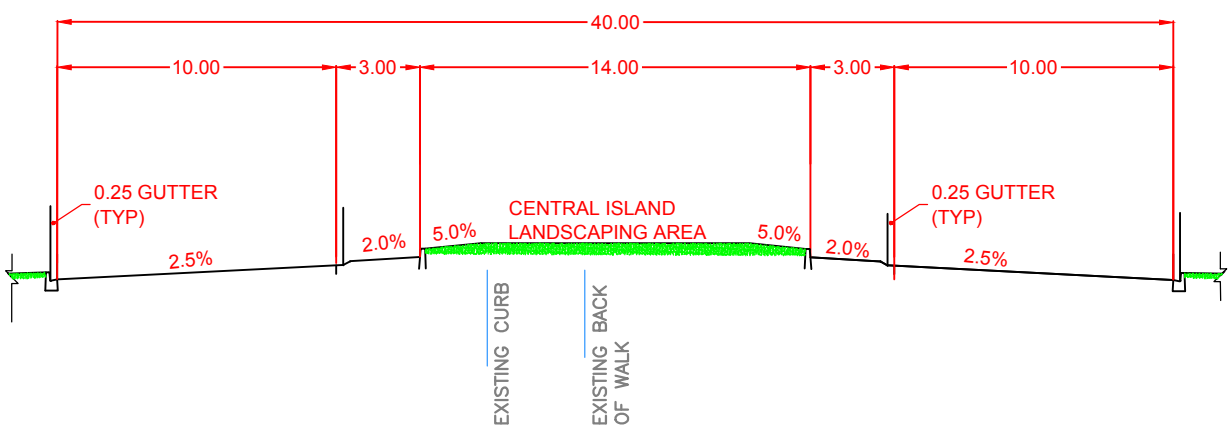


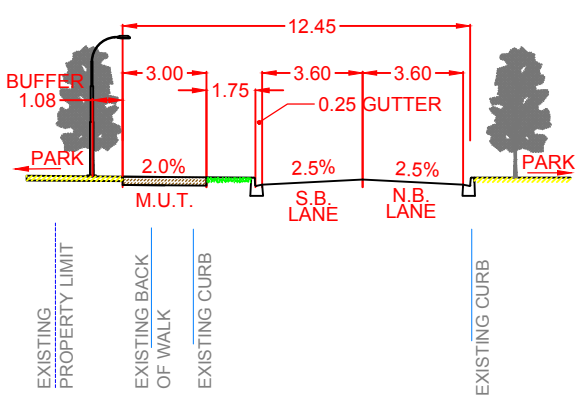
SECTION A-A



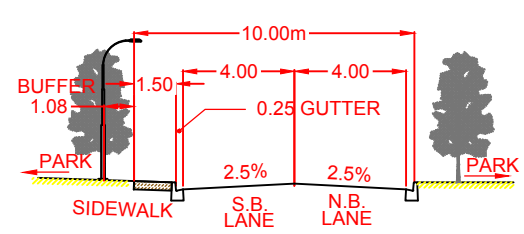
SECTION B-B



SECTION C-C



SECTION D-D



PROPOSED MATCHES ALL EXISTING WIDTHS

SECTION E-E

LEGEND

- PROPOSED PROPERTY LIMIT
- ROAD LINES
- MUILTI–LINE PATH
- BOULEVARD
- DEMOLITION AREA
- EXISTING PROPERTY LIMIT
- EXISTING INFRASTRUCTURE

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Figure 11-3 | Cross-Section Drawings for Proposed Long-term Modification Along Spadina Crescent

Kinsmen Park Parking Strategy and Transportation Study

Table 11-3 | Kinsmen Park Area Recommendations with Horizons

Options			Recommended	Improvement Horizons		
				Short (< 5 Yrs)	Medium (5 - 10 Yrs)	Long (> 10 Yrs)
Parking Demand Management	1	Improve Parking Enforcement	Yes	♦		
	2	Implement Time Limit on Weekend Parking	Yes	♦		
	3	Improve User Information, Marketing and Way-Finding	Yes	♦		
	4	Parking Capacity Display	Yes	♦		
	5	Implement Paid Parking Program	Yes	♦		
	6	Remote Parking and Shuttle Services	Yes			♦
	7	Additional Parking Supply in Zone 1	Yes			♦
	8	Potential Parking Facility Expansion	Yes	(as needed)		
	9	Increase Parking Supply on Kinsmen Ave	Yes		♦	
	10	On-Street Parking along Spadina Cres	No	N/A		
	11	Maintain Zone 2 Parking Supply	Yes	♦		
	12	Potential Zone 4 Upgrades	Yes		♦ (> 5 years)	
	13	Maintain and Upgrade Zone 5 Parking Facility	Yes	♦		
	14	Shared Parking with SHR (Zone 6)	Yes		♦	
	15	Pick-up / Drop-off Areas	Yes	(as available)		
Traffic Demand Management	16	Develop Special Event Traffic and Parking Management Plan	Yes	♦		
	17	Bike Share	Yes		♦	
	18	Transit Services	Yes		♦	
	19	Shuttle Services / Program	Yes			♦
	20	Employee Trip Reduction	Yes	♦		
Active Transportation Improvements	21	Modifications along Spadina Cres	**See Report**	(City reviewing policies)		
	22	Improve Crosswalk on Spadina Cres between Zones 3 and 4	**See Report**	N/A		
	23	Improve Crosswalk at the University Bridge	**See Report**	(additional assessments needed)		
	24	Upgrade Spadina Cres to AAA Network	Yes			♦
	25	Shared Street - Spadina Crescent	No	N/A		
	26	Shared Street - Zone 5	No	N/A		
Traffic Operations	27	Right-in / Right-out Access at Zones 3 and 4	Yes		♦	
	28	Intersection Improvements at Spadina Ramp - Dual LT Lanes	No	N/A		
	29	Intersection Improvements at Spadina Ramp - Roundabout	Yes			♦

The recommended improvements of the Kinsmen Park Area are presented in **Figure 11-4**.

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FIGURE 11-4 | KINSMEN PARK AREA RECOMMENDED IMPROVEMENTS

Kinsmen Park Parking Strategy and Transportation Study

DRAWING: Kinsmen Park Transportation Study.cdr DATE: 2019-11-23 DRAWNBY: thaia

12 CLOSING

The Kinsmen Park Area is Saskatoon's oldest city park and is a source of civic pride for the city. The Park welcomes thousands of visitors throughout the year. With various activities, festivals, and the Meewasin Trail, the Park experiences one of the highest pedestrians and other active modes in the city.

WSP was retained by the City of Saskatoon to complete a Parking Strategy and Transportation Study to address the Park's needs including parking demand, traffic operations and safety, and active transportation. Comprehensive data collection program and conflict observation survey were conducted to establish the baseline conditions. Solutions were developed to address the Park's needs to accommodate all road users while preserving the valuable green space of the Park. The Parking Strategy and Transportation study identified potential remedial measures as well as short-, medium-, and long-term recommendations to address the parking, active transportation, and traffic operations in the study area. Implementations of these recommendations may be completed as part of investment into the Park or in conjunction with other City initiatives. Future demand of parking and transportation infrastructure depends on the rate of development of the Park's uses which ultimately dictate the need for improvements. It is recommended that the City continuously monitors the operations at the Park prior to implementing the changes, particularly the medium- and long-term improvements.

APPENDIX A

OPEN HOUSE EVENTS SUMMARY

A

APPENDIX A – OPEN HOUSE #1 SUMMARY

The following summarizes feedback received from the comment sheets:

- Corner of Spadina Crescent and Queen Street intersection is bad traffic, unsafe for kids, speeding, loud motorcycles.
- Traffic on Spadina Crescent between Queen Street and 25 Street is too fast, very unsafe for children, and needs more speed enforcement.
- Unsafe for bikes on Spadina Crescent between Queen Street and 25 Street → need dedicated bike lane on Spadina Cres. Had a near miss incident and nearly been hit by cars.
- Clustering destinations together and providing transit access makes it more likely that more people will use the location and use transit to get there. SOTS should be located closer to the Conservatory and Prairie Lily dock. Families may come together but go to different facilities at the same time.
- Providing a transit discount or bundling it with entry tickets will encourage people to use transit rather than drive. Likewise, cyclists and walkers could get a credit – carpool too.
- As a long time resident of City Park, I appreciate the vision for a more vibrant family / kids area – and robust programming for Kinsmen Park and Area. As a year-round cycling and member of the Saskatoon Cycles, I strongly suggest that bike parking be considered for the area as a way to encourage cycling and reduce congestion / GHG. Family with bike chariots and children on kid bikes need to be accommodated in transportation planning. I also support transit / shuttles / walking options.
- The 25 Year Master Plan for Kinsmen Park and Area needs to be taken into consideration
- The proposed expansion of the Conservatory comes with a significant additional operating and cost when there is not sufficient funds to maintain the existing.
- There appears to be a disconnect between what the Meewasin Valley Authority's plans are and Shakespeare on the Saskatchewan and the parking and transportation needs. Meewan's paths don't connect up with what STOS needs are / or should be. Neither SOTS or the Meewasin are addressing pedestrian flows across the site from Spadina to the river's edge. There appears to be no consideration for tour buses at any of the site.
- Why not extend the Meewasin trail along the river edge below the SOTS site and provide docking facilities for boats, canoes, kayaks and maybe even houseboats. And provide access at the Prairie Lily at the SOTS site to the site from the lower Meewasin trail / boat dock.
- The washrooms need to be located on the SOTS side so that they are accessible without leaving the SOTS site, placed on property line open to both Meewasin trail and SOTS site.
- There needs to be pedestrian links to Kinsmen Park rides. Parking at City Hospital, CDM and SOTS parking areas. These should be grade separation under Spadina Crescent using the existing little bridge and a new one south of the Museum.
- SOTS needs to work on the relationship to the river. The proposed design is moving in the direction but is lacking the focus of "on the Saskatchewan".
- SOTS's design has no indication of addressing solar energy or other environmental challenges.
- One of the key things that appears year after year on SOTS surveys is the desire of patrons to have dinner and attend the show. The medival feasts are big attractions. SOTS should give serious

consideration to providing a restaurant on site. Four seasons would help make the site attractive all year round.

In addition to the comments on the comment sheets, residents provided feedbacks and discussed their concerns with WSP's and City's representatives. The following summarizes the comments received verbally during the Open House event:

- Reduce posted speed along Spadina Crescent adjacent to the Kinsmen Park Area to 30km/h, similar to park / school zones
- Provide bus loop for pick up / drop-off area
- Provide pathway from Spadina Crescent to Queen Street at the east corner of the parking (9th Avenue North intersection), include potentially the bridge under Spadina Crescent
- Pathway stops from 9th Avenue North intersection across the creek to match the other side
- Improve pedestrian crossing along 25th Street (north side of the bridge / near loop)
- Provide bike parking for bicycle with trailers for kids
- Prohibit left-turn in and out of the Kinsmen Park Area parking
- Provide additional controls / modifications to help children cross Spadina Crescent
- Provide on-street parking along Spadina Crescent
- No more uses/development in the park (use other parks city)
- Will not use transit to the park
- Speed and noise issues along Spadina Crescent for residents north of Queen Street (signed petitions provided to the City)
- Provide additional parking spaces
- Support the idea of transit / shuttle services to downtown and river landing parking areas
- Provide pedestrian overpass along Spadina Crescent
- Preserve green space / trees
- Pedestrian / bike access from pathway along river to get across Spadina Crescent is dangerous
- Parking zone adjacent to the Nutrien Playland is always full
- Left-turn out of the Kinsmen Park area parking zone is difficult and a safety issue due to pedestrians and limited gaps in traffic along Spadina Crescent
- Left-turn movements from Spadina Crescent onto the Kinsmen Park Area parking lot result in severe backups on Spadina Crescent due to limited lanes
- Visitors parking in City Park residential areas to go to the park
- Kinsmen Drive is a very busy road
- Some visitors do not know that the lot adjacent to the YWCA is a public parking zone
- Remove parking area in the middle of Kinsmen Park
- Pedestrian / cyclist conflicts can be dangerous and cause injuries
- Provide more bathrooms to accommodate people using the park and potentially shuttle to riverlanding
- Consider roundabout as a potential solution at the Queen Street and Spadina Crescent intersection to reduce noise

- Pedestrian desire line diagonally from entrance way in the SE corner to the NW area
- Most of the time there is adequate parking
- Crossing on Spadina Crescent adjacent to the University Bridge is dangerous. Provide advance notification to drivers on the bridge
- Crossing northbound from the loop onto Spadina Crescent ramp is difficult
- One access point at the Nutrien Playland parking zone makes it difficult to access
- Provide shuttle services between different attractions (i.e. Zoo, Kinsmen Park Area, Remai, Wanuskewin Park, etc.)
- Jaywalking all along Spadina Crescent
- Provide drop-off by SOTS area
- Provide more parking stalls in the Nutrien Playland parking zone. Reduction of this parking supply resulted in inadequate parking
- Provide indicative system of available parking spots in each zone. Long delays at the site accesses make it difficult to drive around both parking zones to look for free spots.
- Provide more bicycle parking
- Provide protected / sheltered bike parking
- Provide bike lanes suitable for children when biking in the area as a family

COMMENT SHEET

Open House: Kinsmen Park Parking Strategy & Transportation Study

Date: November 18, 2019

Time: 3:30 p.m. – 7:30 p.m.

Location: Frances Morrison Public Library (Meeting Room)

Name: Amanda McReynolds Doran

Address: 111 Anglin Cres

Postal Code: Saskatoon S7J5E8

COMMENTS

Please provide land location for specific points of concern or comment:

hooray for pedestrian improvements, new bus route, and resurfacing lots!

Can we please move up the timeline for expanding the playland lot? Businesses are losing customers and I really dont want to lose Prairie Lily.
Also, I'm apprehensive about the right in/right out in front of Wonderhub/Kinsmen/playland. Where would you want people to turn around if they aren't able to turn left when they need? City park doesn't need more traffic, especially not school buses, etc.

Please drop your comment sheet in the collection box, or send to:

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E Amy.Thai@wsp.com
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COMMENT SHEET

Open House: Kinsmen Park Parking Strategy & Transportation Study

Date: November 18, 2019

Time: 3:30 p.m. – 7:30 p.m.

Location: Frances Morrison Public Library (Meeting Room)

Name: Sherry Gore

Address: 1168 Spadina Cres E

Postal Code: S7K 3H8

COMMENTS

Please provide land location for specific points of concern or comment:

- approved bus routing blue line seems to service City Park residents nicely

- pedestrian light @ Nutrien Playland to Kinsmen Park creates unsafe conditions because 1. button for pedestrian on west side does not align well with parking lot (too far south) so is often not used 2. evenings, during rush hour to mid evening, pedestrian traffic is near constant causing slowed to stopped traffic up to and sometimes onto the 25th st bridge creating traffic stress

- pedestrian cross light at 25th & Spadina is poorly used ~~despite~~ by pedestrians causing very unsafe crossing as vehicles do not have the warning to stop and / along with visibility being very poor

- proposal to not allow traffic to turn left into Kinsmen Park or Nutrien Playland is a very good idea

- guard rails to guide pedestrians to proper walkway when crossing Spadina to Kinsmen Park ~~the~~ and Nutrien Playland is important to keep children safe

Please drop your comment sheet in the collection box, or send to:

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COMMENT SHEET

Open House: Kinsmen Park Parking Strategy & Transportation Study

Date: November 18, 2019

Time: 3:30 p.m. – 7:30 p.m.

Location: Frances Morrison Public Library (Meeting Room)

Name: D. Cook

Address: 719 9TH

Postal Code: S7K 2Y8

COMMENTS

Please provide land location for specific points of concern or comment:

① #11 LOT NEEDS TO GO AWAY!!!

② LEASE SPACE IN BAYDO'S PARKADE FOR EVENT PARKING.

③ "TOURIST" TROLLEY SERVICE TYING ANCHORS (RL TO WONDERFUL).
(RATHER THAN THE BUS LOOP)
– THIS COULD BE A CONTRACTED SERVICE RATHER THAN A TRANSIT RUN SERVICE.

Please drop your comment sheet in the collection box, or send to:

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E Amy.Thai@wsp.com
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④ I LIKE THE AT & TRAFFIC STUFF!!!

COMMENT SHEET

Open House: Kinsmen Park Parking Strategy & Transportation Study

Date: November 18, 2019

Time: 6:30 p.m. – 7:30 p.m.

Location: Saskatoon Public Library (Meeting Room)

Name:

Address:

Postal Code

COMMENTS

Please provide any comments of concern or comment:

#10 and #12 Best Potential expansion

overbridge for walking and cycling

Please drop your comment sheet in the collection box, or send to:

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APPENDIX B

COLLISION ANALYSIS

B

25th Street

Table B - 1 | 25th Street Collision Summary – by Severity

Severity	# of Collisions
PDO	92
Personal Injury	19
TOTAL:	***111***

Table B - 2 | 25th Street Collision Summary – by Year

Year	# of Collisions
2013	23
2014	27
2015	18
2016	24
2017	19
TOTAL:	***111***

Table B - 3 | 25th Street Collision Summary – by Locations

Locations	# of Collisions
6TH AVE & 25TH ST	24
25TH ST & 5TH - 6TH	4
25TH ST & 6TH - SPADINA	20
25TH ST & SPADINA CR	63
TOTAL:	***111***

Table B - 4 | 25th Street Collision Summary – by Configuration

Collision Configurations	# of Collisions
Fixed/movable object on road	7
Left-turn straight same direction	1
Lost control left ditch	2

Lost control left to right ditch	2
Lost control right ditch	7
Other	7
Rear end	73
Right angle	3
Right-turn passing	1
Side swipe same direction	8
TOTAL:	***111***

Spadina Crescent

Table B - 5 | Spadina Crescent Collision Summary – by Severity

Severity	# of Collisions
PDO	22
Personal Injury	2
TOTAL:	***24***

Table B - 6 | Spadina Crescent Collision Summary – by Year

Year	# of Collisions
2013	3
2014	7
2015	5
2016	4
2017	5
TOTAL:	***24***

Table B - 7 | Spadina Crescent Collision Summary – by Location

Locations	# of Collisions
SPADINA CR & UNDER UNIVERSITY BRIDGE	17
SPADINA CR & QUEEN - SPADINA CR	7
TOTAL:	***24***

Table B - 8 | Spadina Crescent Collision Summary – by Configuration

Collision Configurations	# of Collisions
Lost control right ditch	3
Other	2
Rear end	15
Side swipe same direction	2
Fixed/movable object on road	1
Left-turn straight opposite direction	1
TOTAL:	***24***

Spadina Crescent and Queen Street Intersection

Table B - 9 | Spadina Crescent and Queen Street Intersection Collision Summary – by Severity

Severity	# of Collisions
PDO	9
Personal Injury	3
TOTAL:	***12***

Table B - 10 | Spadina Crescent and Queen Street Intersection Collision Summary – by Year

Year	# of Collisions
2013	3
2014	3
2015	3
2016	2
2017	1
TOTAL:	***12***

Table B - 11 | Spadina Crescent and Queen Street Intersection Collision Summary – by Configuration

Collision Configurations	# of Collisions
Lost control right ditch	1
Rear end	11
TOTAL:	12

APPENDIX C

CIVIC CONSERVATORY TRIPS ESTIMATES

C

APPENDIX C – CIVIC CONSERVATORY TRIPS ESTIMATES

With the Civic Conservatory closed for renovation during the data collection program, traffic generated by this use was estimated and applied to the data collected. Since the Civic Conservatory is a unique use with no pre-defined trip generation, the trip rates and directional distribution were estimated using historical statistics as well as the Park site usage. The statistics for number of visitors was provided. It should be noted that the data for 2015 and 2016 were not taken into consideration due to Mendel Art Gallery and Conservatory closure.

The annual average number of visitors between 2010 and 2014 were approximately 80,000 visitors while the third quarter (between July and September) were approximately 17,500 visitors for the Conservatory. The trips for the Conservatory were estimated using the following assumptions:

- Assumed 6 days in operations per week or 79 days in the quarter
- Assumed previous hours of operations between 9:00 a.m. and 5:00 p.m.
- Assumed occupancy rates of 2.10 people per vehicle for recreational / social trip purposes[3]
- Assumed a 25% synergy with other Park activities for the worst-case scenario
- Weekday park peak hour of 11% based on parking survey data
- Weekday commuter hours peak hour of 14% based on parking survey data
- Weekend peak hour of 16% based on parking survey data

As such, the daily visitors for the Conservatory was estimated to be 222 visitors on average or 106 trips. With 25% synergy, the new trips were estimated to be approximately 79 trips on average per day. As such, the new trips generated by the Conservatory during the peak hour are:

- Weekday morning peak hour = 0 trips (closed)
- Weekday park peak = 11 trips
- Weekday afternoon peak hour = 8 trips
- Weekday evening peak hour = 0 trips (closed)
- Weekend peak hour = 13 trips

Without synergy with the other Park activities, the new trips would likely exit the next consecutive hour. The additional demand generated by the Civic Conservatory uses was added to the parking usage and traffic volumes on the road network.

[3] *Source: Federal Highway Administration, 2017 National Household Travel Survey (NHTS)*
Tabulation created on the NHTS website at https://nhts.ornl.gov/tables09/ae/work/Job81862.html

APPENDIX D

PARKING SURVEY DATA SUMMARY

D

APPENDIX D – PARKING SURVEY DATA SUMMARY

Table D - 1 | Weekday Parking Count

WEEKDAY PARKING COUNT												
Parking Zones	**Capacity**	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Zone 1	**85**	63	81	69	55	67	64	55	37	35	38	39
Zone 2	**14**	10	11	10	11	13	12	5	4	4	5	4
Zone 3	**52**	51	52	52	52	52	52	43	35	52	52	36
Zone 4	**84**	75	70	76	85	87	81	55	52	83	80	47
Zone 5	**28**	11	12	18	23	25	16	22	20	23	21	10
Total Kinsmen Park Area Parking Demand:	**263**	**210**	**226**	**225**	**226**	**244**	**226**	**180**	**147**	**197**	**196**	**136**
Zone 6	**366**	232	224	240	244	211	150	72	44	40	51	52
Total Parking Demand:	***629***	***442***	***450***	***465***	***470***	***455***	***376***	***252***	***191***	***237***	***247***	***188***

Table D - 2 | Weekday Parking %Utilization

WEEKDAY PARKING UTILIZATION												
Weekday Parking	**%Avg**	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Zone 1	*63%*	74%	95%	81%	65%	79%	75%	65%	44%	41%	45%	46%
Zone 2	*57%*	71%	79%	71%	79%	93%	86%	36%	29%	29%	36%	29%
Zone 3	*90%*	98%	100%	100%	100%	100%	100%	83%	67%	100%	100%	69%
Zone 4	*86%*	89%	83%	91%	101%	103%	97%	65%	61%	99%	95%	56%
Zone 5	*63%*	39%	43%	66%	81%	89%	58%	78%	70%	81%	74%	35%
Total Kinsmen Park Area Parking Utilization:	***76%***	**80%**	**86%**	**86%**	**86%**	**93%**	**86%**	**68%**	**56%**	**75%**	**74%**	**52%**
Zone 6	*41%*	63%	61%	66%	67%	58%	41%	20%	12%	11%	14%	14%
Average Weekday Parking Utilization:	*55%*	70%	71%	74%	75%	72%	60%	40%	30%	38%	39%	30%

Figure D - 1 | Weekday Parking Count

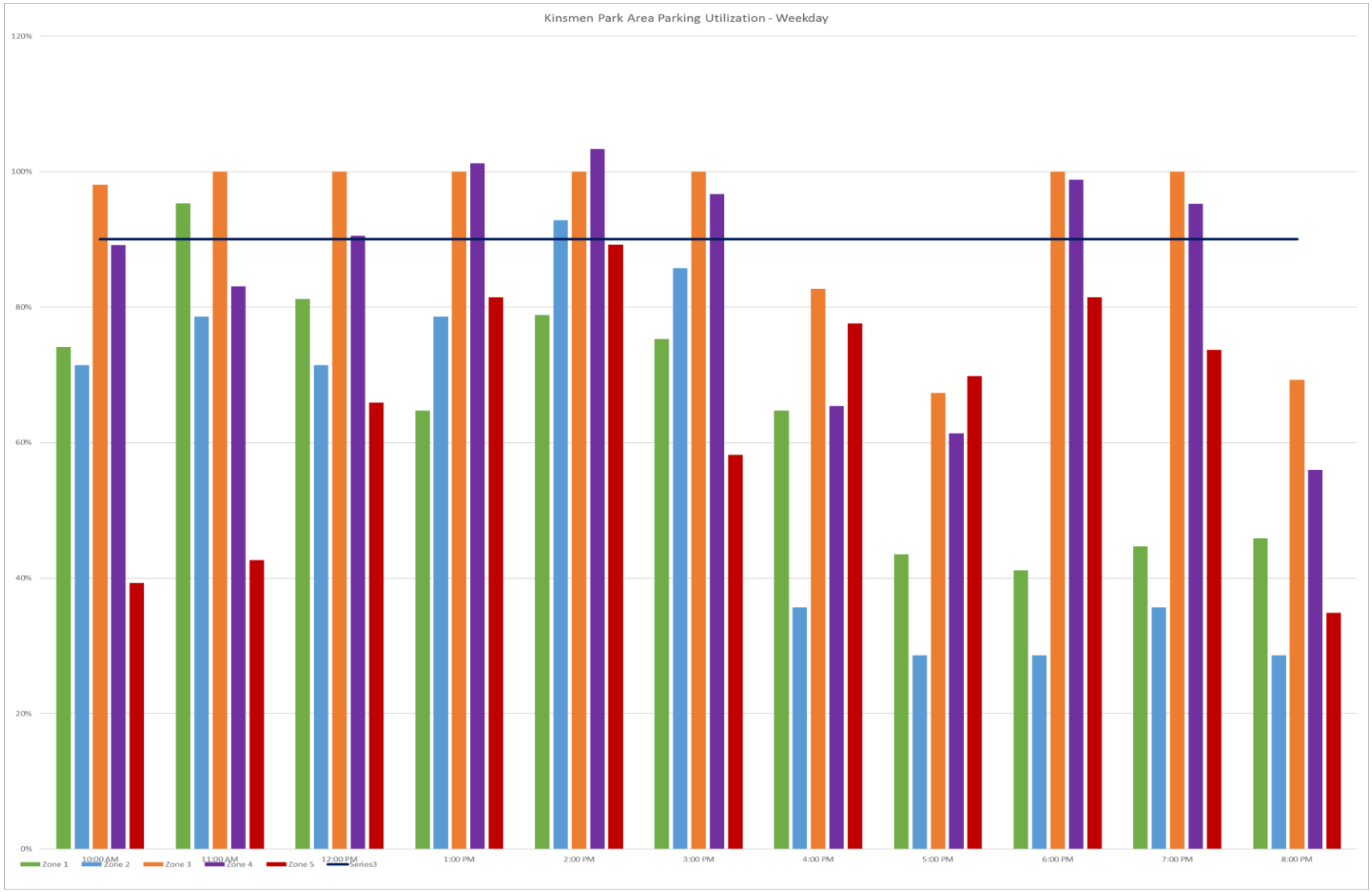


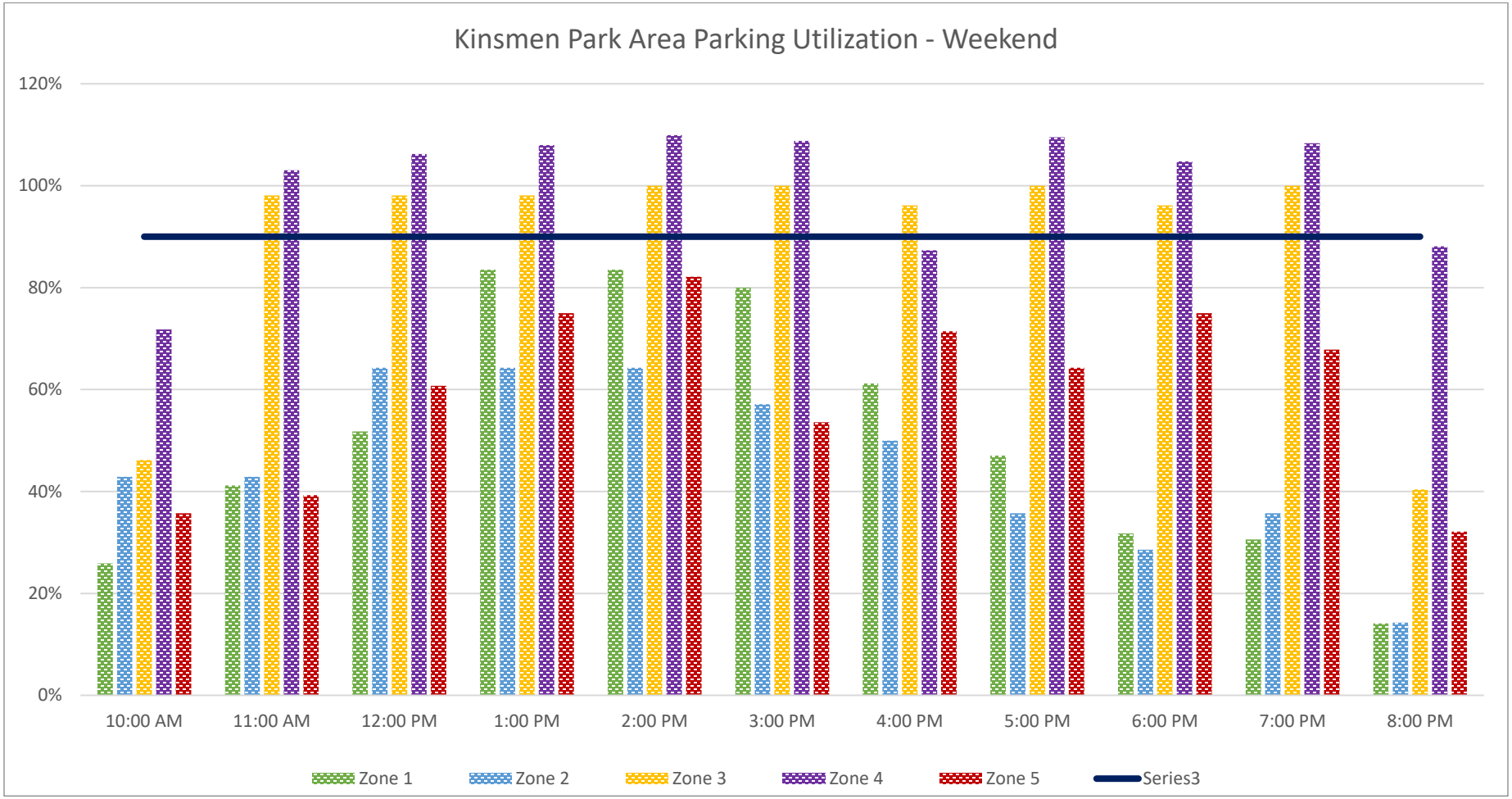
Table D - 3 | Weekend Parking Count

WEEKEND PARKING COUNT												
Parking Zones	**Capacity**	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Zone 1	**85**	22	35	44	71	71	68	52	40	27	26	12
Zone 2	**14**	6	6	9	9	9	8	7	5	4	5	2
Zone 3	**52**	24	51	51	51	52	52	50	52	50	52	21
Zone 4	**84**	60	87	89	91	92	91	73	92	88	91	74
Zone 5	**28**	10	11	17	21	23	15	20	18	21	19	9
Total Kinsmen Park Area Parking Demand:	***263***	***122***	***190***	***210***	***243***	***247***	***234***	***202***	***207***	***190***	***193***	***118***
Zone 6	**366**	18	22	42	52	50	27	18	19	17	9	4
Total Parking Supply:	***629***	***140***	***212***	***252***	***295***	***297***	***261***	***220***	***226***	***207***	***202***	***122***

Table D - 4 | Weekend Parking %Utilization

WEEKEND PARKING UTILIZATION												
Parking Supply	**%Avg**	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Zone 1	*47%*	26%	41%	52%	84%	84%	80%	61%	47%	32%	31%	14%
Zone 2	*43%*	43%	43%	64%	64%	64%	57%	50%	36%	29%	36%	14%
Zone 3	*85%*	46%	98%	98%	98%	100%	100%	96%	100%	96%	100%	40%
Zone 4	*94%*	72%	103%	106%	108%	110%	109%	87%	110%	105%	108%	88%
Zone 5	*57%*	36%	39%	61%	75%	82%	54%	71%	64%	75%	68%	32%
Total Kinsmen Park Area Parking Utilization:	***70%***	**47%**	**72%**	**80%**	**92%**	**94%**	**89%**	**77%**	**79%**	**72%**	**73%**	**45%**
Zone 6	*7%*	5%	6%	11%	14%	14%	7%	5%	5%	5%	2%	1%
AVG Weekend Parking Utilization (w SHR Lot):	*33%*	22%	34%	40%	47%	47%	42%	35%	36%	33%	32%	19%

Figure D - 2 | Weekend Parking Count



APPENDIX E

SITE VISIT

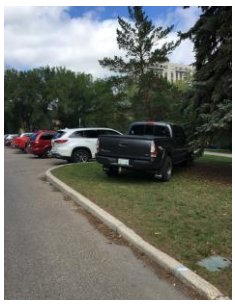
E

SITE VISIT NOTES

JOB TITLE	Kinsmen Park Transportation Study		
PROJECT NUMBER	18M-01852-00	**DATE**	11-14 July 2019
TIME	9 AM – 9PM	**VENUE**	Kinsmen Park
SUBJECT	Site Visits (Data Collection Program)		
CLIENT	City of Saskatoon		

ATTENDEES			
Name	**Company**	**Phone**	**Email**
Nathan Gray	WSP		
Amy Thai	WSP		

FIELD OBSERVATION

– Location: Kinsmen Park Public Lot #1 – Observations: illegal parking on the grass		– Location: Spadina Ave underpass – Observations: unpaved pathway, flooded during rain	
– Location: Kinsmen Park Staff Parking Lot #2 – Observations: some vehicles parked with no permit		– Location: Kinsmen Park Public Lot #3 – Observations: vehicles parked in the 5 minutes loading zone for long duration	

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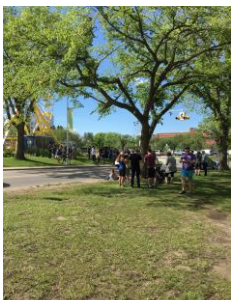
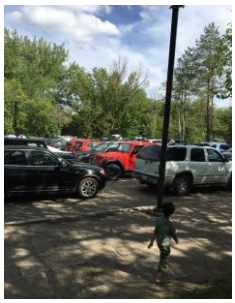
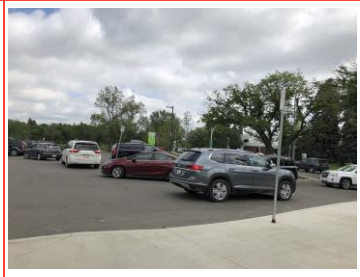
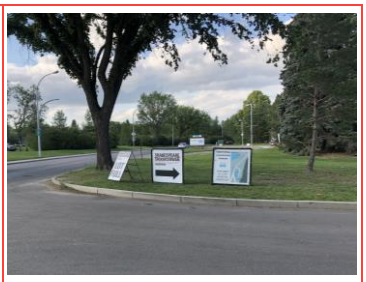
SITE VISIT NOTES

— Location: Kinsmen Park Public Lot #4 — Observations: vehicles parked in the circulation lane		— Location: Spadina Crescent and Kinsmen Park Access intersection — Observations: additional activities around the Kinsmen Park Area (PokemonGo)	
— Location: Kinsmen Park Public Lot #4 — Observations: vehicles blocked in the circulation lane		— Location: Kinsmen Park Public Lot #3 — Observations: delivery outside of 5 minutes loading zone	
— Location: Kinsmen Park Public Lot #4 — Observations: motorcycle parked in circulation lane		— Location: Kinsmen Park Public Lot #3 — Observations: vehicle waiting in the parking lot to get into a free spot, resulted in vehicle spillback all the way to Spadina Crescemt	
— Location: Kinsmen Park Trail (by Hospital) — Observations: missing connection		— Location: Kinsmen Park Public Lot #3 — Observations: bus parked in circulation lane for pick up	
— Location: Kinsmen Park Public Lot #3 — Observations: one-way sign too small, arrow pavement marking needs repainting		— Location: Kinsmen Park Public Lot #3 — Observations: vehicle drove in the wrong direction	
— Location: Spadina Crescent at Spadina Ramp Intersection — Observations: bus and vehicle parked in bike lane		— Location: Kinsmen Park Public Lot #4 — Observations: vehicle parked in circulation lane resulted in blockage for a one-way circulation loop	

SITE VISIT NOTES

– Location: Trail adjacent to Spadina Ramp at Spadina Ramp Crescent – Observations: tripping hazards		– Location: Kinsmen Park Public Lot #4 – Observations: Lot Full sign and additional parking area sign provide. Signs may be blocked by oncoming traffic if there is vehicle queues in the driveway	
– Location: Kinsmen Park trail by the YWCA – Observations: drainage issue, pathway flooded after rain		– Location: Spadina Crescent at Spadina Ramp Intersection – Observations: median sign fallen off, should remove for hazard	
– Location: Kinsmen Park Public Lot #1 – Observations: several of the concrete block has rebar sticking out (hazards)		– Location: Kinsmen Park Public Lot #4 – Observations: queues out of the drive way	
– Location: Kinsmen Park trail behind the Mendel building – Observations: limited sightlines due to shrub		– Location: Nutrien Playland train track – Observations: parking sign by the train track where parking is lot allowed	
–		–	

APPENDIX F

TAC WARRANT

F

City of Saskatoon - Traffic Signal Warrant Analysis

Main Street (name)	Spadina Cres	Direction (EW or NS)	NS	Road Authority:	City of Saskatoon
Side Street (name)	Zones 3 and 4 Parking	Direction (EW or NS)	EW	City:	Saskatoon
Quadrant / Int #		Comments	The remaining volumes for the AM are 78% of the AM peak and 91% of the PM peak. The midday was assumed to be 80% of PM peak	Analysis Date:	2019 Sep 17, Tue
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	15-Year Future Forecast
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Spadina Cres	NB				1			100	1
Spadina Cres	SB				1			300	1
Zones 3 and 4 Parking	WB				1				
Zones 3 and 4 Parking	EB				1				

Are the Zones 3 and 4 Parking WB right turns significantly impeded by through movements?	(y/n)	n
Are the Zones 3 and 4 Parking EB right turns significantly impeded by through movements?	(y/n)	y

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	y
Pathway to School	(y/n)	n
Metro Area Population	(#)	250,000
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Spadina Cres	NS	50	1.0%	n	0.0
Zones 3 and 4 Parking	EW	30	2.2%	n	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	11	615	11	6	772	6	6	0	5	8	0	6	0	0	0	6
8:00 - 9:00	9	506	9	5	635	5	5	0	4	7	0	5	0	1	0	18
11:30 - 12:30	16	857	19	17	611	16	6	0	34	25	1	30	24	6	3	184
12:30 - 13:30	16	857	19	17	611	16	6	0	34	25	1	30	8	1	1	148
16:00 - 17:00	20	1082	24	22	771	20	8	0	43	32	1	37	26	10	2	153
17:00 - 18:00	18	980	22	19	699	18	7	0	39	29	1	34	21	22	0	96
Total (6-hour peak)	91	4,897	104	85	4,098	81	38	0	159	126	4	142	79	40	6	605
Average (6-hour peak)	15	816	17	14	683	14	6	0	26	21	1	24	13	7	1	101

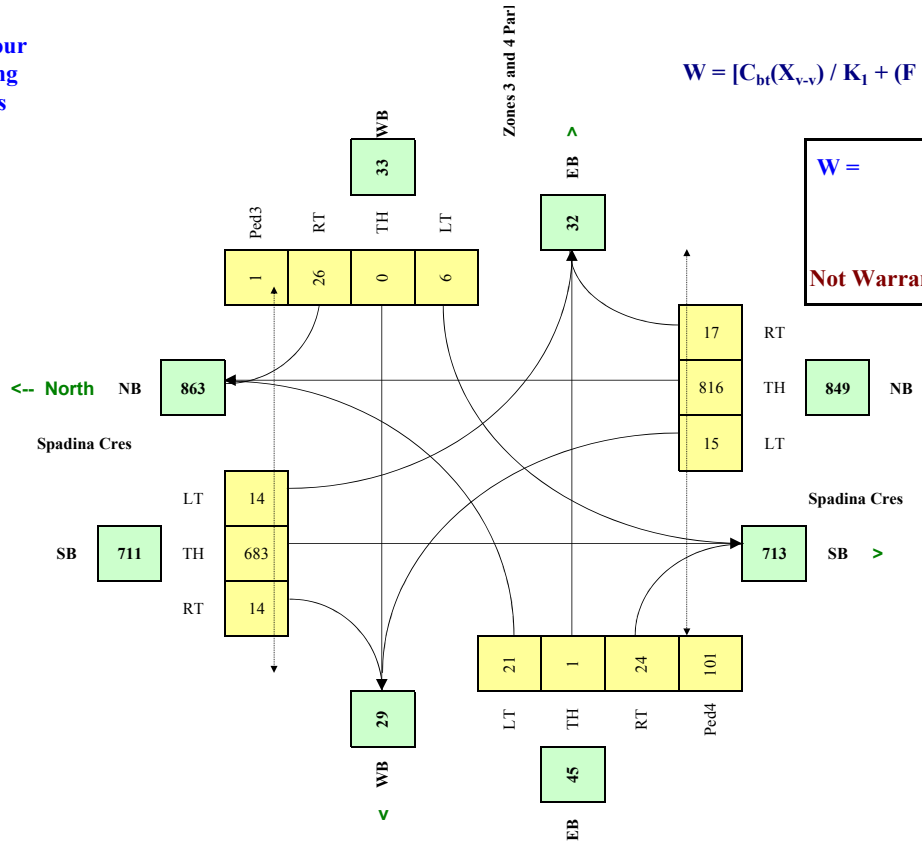
Average 6-hour Peak Turning Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p}) L) / K_2] \times C_i$$

W =	204	49	155
		Veh	*Ped*

Not Warranted - Vs<75

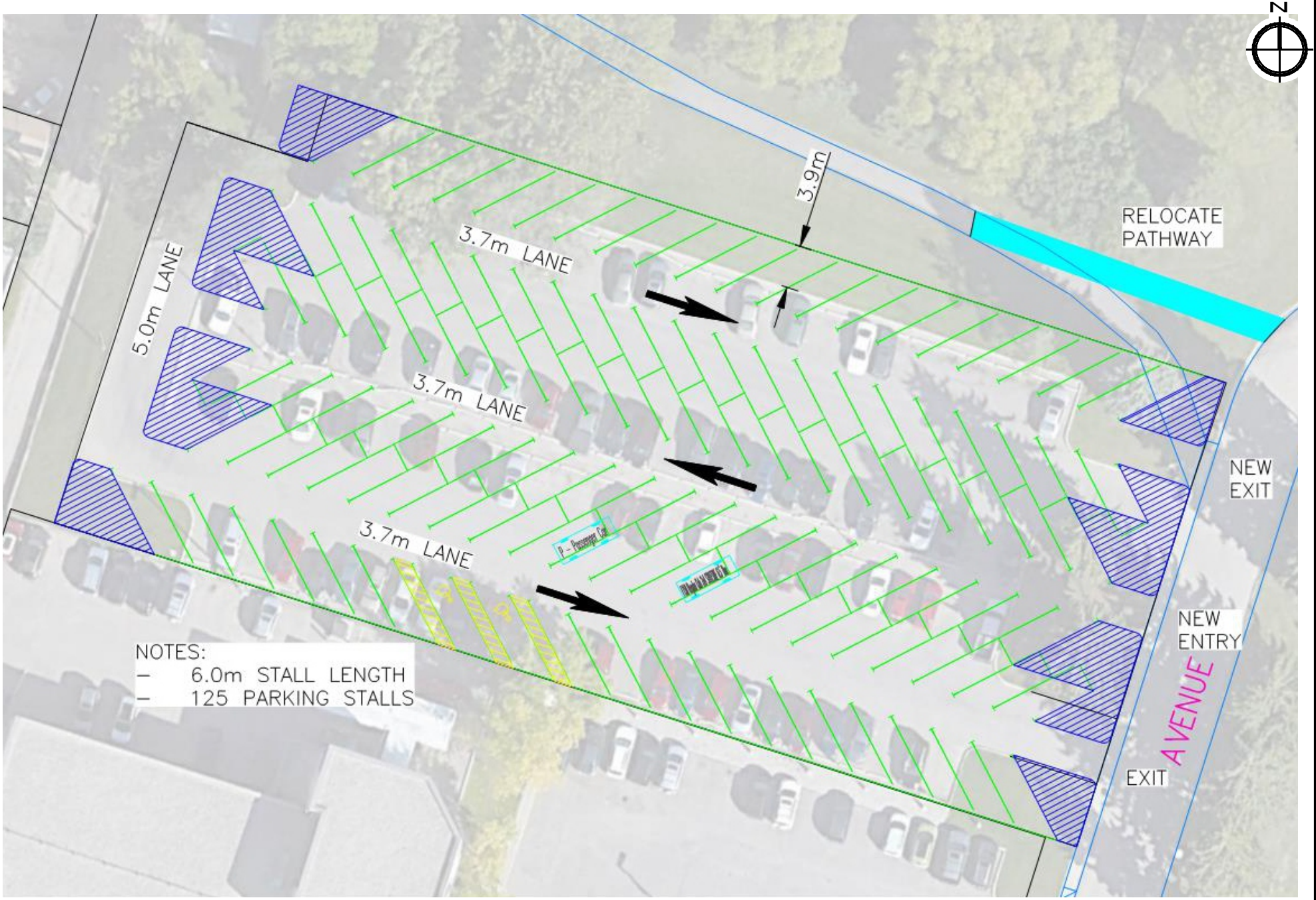
RESET SHEET



APPENDIX G

POTENTIAL ZONE 1 REDESIGN

G



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S7T 0J1
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fax: 306.665.8589

Issue Date - 2019-05-28
Scale: NTS
Aerial Imagery: Google Imagery

APPENDIX G | POTENTIAL ZONE 1 FACILITY REDESIGN

Kinsmen Park Parking Strategy and Transportation Study

NOTE: These design documents are prepared solely for the use by the party with whom the design professional has entered into a contract and there are no representations of any kind made by the design professional to any party with whom the design

DRAWING: Kinsmen Park Transportation Study.cdr DATE: 2019-05-28 DRAWNBY: thaia

APPENDIX H

SYNCHRO REPORTS

H

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

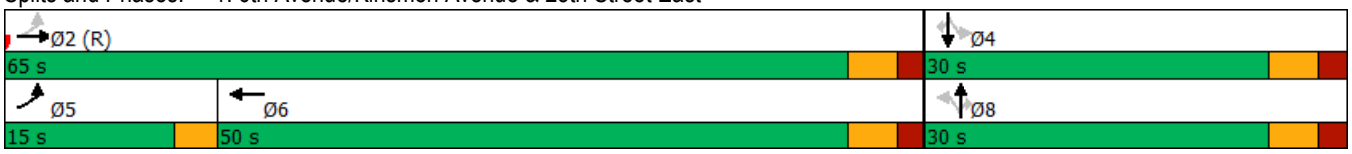
09/18/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	753	11	0	1297	38	8	5	22	15	7	24
Future Volume (vph)	26	753	11	0	1297	38	8	5	22	15	7	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.98	0.97		0.99	0.96
Frt		0.998			0.996				0.850			0.850
Flt Protected	0.950							0.969			0.968	
Satd. Flow (prot)	1444	3087	0	0	3166	0	0	1657	1454	0	1623	1425
Flt Permitted	0.118							0.837			0.817	
Satd. Flow (perm)	179	3087	0	0	3166	0	0	1405	1403	0	1356	1366
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4				62			62
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	22		3	3		22	23		12	12		23
Confl. Bikes (#/hr)						3			9			
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Adj. Flow (vph)	28	818	12	0	1457	43	12	7	33	18	9	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	830	0	0	1500	0	0	19	33	0	27	29
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	5	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	9.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	12.0	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	15.0	65.0			50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	15.8%	68.4%			52.6%		31.6%	31.6%	31.6%	31.6%	31.6%	31.6%
Maximum Green (s)	12.0	59.6			44.6		24.3	24.3	24.3	24.3	24.3	24.3
Yellow Time (s)	3.0	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.0	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	3.0	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max			Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)		3			22		12	12	12	23	23	23
Act Effct Green (s)	74.6	73.3			68.5			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.79	0.77			0.72			0.16	0.16		0.16	0.16
v/c Ratio	0.11	0.35			0.66			0.09	0.12		0.13	0.11
Control Delay	5.2	5.6			14.0			31.8	3.5		32.9	2.5
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	5.2	5.6			14.0			31.8	3.5		32.9	2.5
LOS	A	A			B			C	A		C	A
Approach Delay		5.6			14.0			13.9			17.1	
Approach LOS		A			B			B			B	

Intersection Summary	
Area Type: CBD	
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 80.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

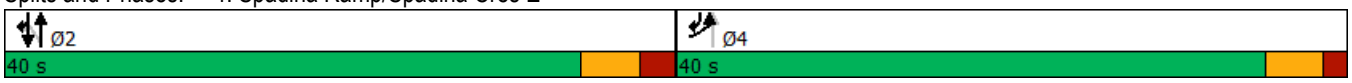


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	349	0	0	139	529	73
Future Volume (vph)	349	0	0	139	529	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	1827	1827	1881	1599
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	1827	1827	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		4				
Confl. Bikes (#/hr)		9				
Peak Hour Factor	0.72	0.72	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	1%	4%	4%	1%	1%
Adj. Flow (vph)	485	0	0	176	645	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	485	0	0	176	645	89
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	40.0		40.0	40.0	40.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Maximum Green (s)	35.0		34.3	34.3	34.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	13					
Act Effct Green (s)	35.2			75.5	29.6	75.5
Actuated g/C Ratio	0.47			1.00	0.39	1.00
v/c Ratio	0.58			0.10	0.88	0.06
Control Delay	19.5			0.1	35.7	0.1
Queue Delay	0.0			0.0	51.9	0.0
Total Delay	19.5			0.1	87.6	0.1
LOS	B			A	F	A
Approach Delay	19.5			0.1	77.0	
Approach LOS	B			A	E	

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 75.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 47.3	Intersection LOS: D
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Ramp/Spadina Cres E

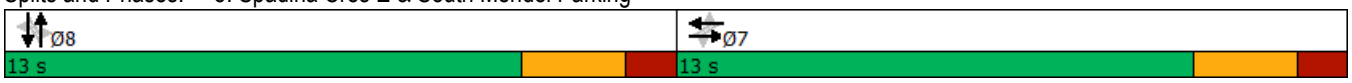


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	4	7	0	5	10	468	10	5	591	5
Future Volume (vph)	5	0	4	7	0	5	10	468	10	5	591	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.940			0.948			0.997			0.999	
Flt Protected		0.973			0.970			0.999				
Satd. Flow (prot)	0	1704	0	0	1713	0	0	1874	0	0	1879	0
Flt Permitted								0.988			0.997	
Satd. Flow (perm)	0	1751	0	0	1766	0	0	1853	0	0	1874	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			5			5			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			175.7	
Travel Time (s)		4.0			5.5			6.0			12.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.72	0.72	0.72	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	0	4	8	0	5	14	650	14	6	721	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	9	0	0	13	0	0	678	0	0	733	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	20	20		20	20							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		6.4			6.4			27.3			27.3	
Actuated g/C Ratio		0.21			0.21			0.91			0.91	
v/c Ratio		0.02			0.03			0.40			0.43	
Control Delay		8.4			8.4			2.9			3.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		8.4			8.4			2.9			3.1	
LOS		A			A			A			A	
Approach Delay		8.4			8.4			2.9			3.1	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	Other
Cycle Length: 26	
Actuated Cycle Length: 29.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 3.1	Intersection LOS: A
Intersection Capacity Utilization 43.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	127	182	296	479	78
Future Volume (vph)	25	127	182	296	479	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.887				0.981	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1592	0	1787	1881	1839	0
Flt Permitted	0.992		0.115			
Satd. Flow (perm)	1584	0	216	1881	1839	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	181				12	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	12		1			1
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.70	0.70	0.74	0.74	0.82	0.82
Heavy Vehicles (%)	5%	5%	1%	1%	1%	1%
Adj. Flow (vph)	36	181	246	400	584	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	217	0	246	400	679	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	12				1	
Act Effct Green (s)	20.0		48.9	48.2	30.0	
Actuated g/C Ratio	0.25		0.62	0.61	0.38	
v/c Ratio	0.40		0.61	0.35	0.96	
Control Delay	8.8		19.2	8.5	51.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	8.8		19.2	8.5	51.1	
LOS	A		B	A	D	
Approach Delay	8.8			12.6	51.1	
Approach LOS	A			B	D	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 78.7	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 62.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3661	3772	3622	3668	3619	3677	3735
Vehs Exited	3633	3759	3622	3674	3639	3679	3727
Starting Vehs	61	73	83	85	99	80	83
Ending Vehs	89	86	83	79	79	78	91
Travel Distance (km)	2386	2415	2325	2384	2324	2369	2393
Travel Time (hr)	75.7	77.7	73.6	75.6	74.0	73.7	76.8
Total Delay (hr)	24.5	25.8	23.6	24.4	24.3	22.8	25.3
Total Stops	2376	2448	2275	2395	2296	2197	2477
Fuel Used (l)	216.5	220.9	211.4	217.6	212.8	216.3	220.4

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3710	3791	3653	3690
Vehs Exited	3689	3792	3669	3690
Starting Vehs	77	86	90	81
Ending Vehs	98	85	74	83
Travel Distance (km)	2399	2430	2359	2379
Travel Time (hr)	77.2	80.6	74.1	75.9
Total Delay (hr)	25.9	28.4	23.4	24.8
Total Stops	2439	2741	2178	2379
Fuel Used (l)	220.5	225.3	215.0	217.7

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	3661	3772	3622	3668	3619	3677	3735
Vehs Exited	3633	3759	3622	3674	3639	3679	3727
Starting Vehs	61	73	83	85	99	80	83
Ending Vehs	89	86	83	79	79	78	91
Travel Distance (km)	2386	2415	2325	2384	2324	2369	2393
Travel Time (hr)	75.7	77.7	73.6	75.6	74.0	73.7	76.8
Total Delay (hr)	24.5	25.8	23.6	24.4	24.3	22.8	25.3
Total Stops	2376	2448	2275	2395	2296	2197	2477
Fuel Used (l)	216.5	220.9	211.4	217.6	212.8	216.3	220.4

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	3710	3791	3653	3690
Vehs Exited	3689	3792	3669	3690
Starting Vehs	77	86	90	81
Ending Vehs	98	85	74	83
Travel Distance (km)	2399	2430	2359	2379
Travel Time (hr)	77.2	80.6	74.1	75.9
Total Delay (hr)	25.9	28.4	23.4	24.8
Total Stops	2439	2741	2178	2379
Fuel Used (l)	220.5	225.3	215.0	217.7

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent & North Interchange Loop Performance by movement

4: Spadina Ramp/Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	17.8	55.6	45.8	78.2	146.4	14.3	11.6	15.9	16.2
Average Queue (m)	5.2	25.8	14.9	39.6	41.9	2.9	4.1	4.7	5.1
95th Queue (m)	13.4	48.4	35.6	69.5	91.5	10.4	11.5	13.5	13.4
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					0				
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	7				0	0	0	0
Queuing Penalty (veh)	0	2				0	0	0	0

Intersection: 2: 25th Street East

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (m)	68.1	111.2	4.0
Average Queue (m)	13.3	13.1	0.1
95th Queue (m)	42.9	61.5	3.9
Link Distance (m)	195.4	195.4	38.5
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Spadina Crescent & North Interchange Loop

Movement	NB
Directions Served	TR
Maximum Queue (m)	8.8
Average Queue (m)	0.3
95th Queue (m)	4.9
Link Distance (m)	38.5
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (m)	61.0	40.4	67.5	50.0
Average Queue (m)	31.7	16.1	52.0	14.0
95th Queue (m)	51.7	32.1	77.6	50.7
Link Distance (m)	143.6	139.0	61.0	
Upstream Blk Time (%)			9	
Queuing Penalty (veh)			51	
Storage Bay Dist (m)				20.0
Storage Blk Time (%)		5	35	
Queuing Penalty (veh)		0	26	

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	16.5	18.5	51.8	63.5
Average Queue (m)	4.5	3.5	10.2	18.3
95th Queue (m)	14.0	12.3	33.2	50.5
Link Distance (m)	47.7	63.6	61.0	156.3
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.4	47.9
Average Queue (m)	1.1	2.7
95th Queue (m)	5.7	28.7
Link Distance (m)	34.2	121.0
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	24.7	43.7	50.7	111.0
Average Queue (m)	5.1	22.0	20.5	60.0
95th Queue (m)	16.9	36.4	40.8	97.0
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)		0	0	
Queuing Penalty (veh)		0	0	

Network Summary

Network wide Queuing Penalty: 80

Lanes, Volumes, Timings
4: Spadina Ramp/Spadina Cres E

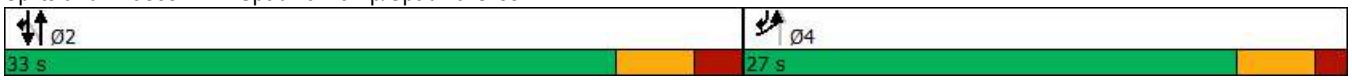
10/07/2019

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	349	0	0	139	529	73
Future Volume (vph)	349	0	0	139	529	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	1827	1827	1881	1599
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	1827	1827	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		4				
Confl. Bikes (#/hr)		9				
Peak Hour Factor	0.72	0.72	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	1%	4%	4%	1%	1%
Adj. Flow (vph)	485	0	0	176	645	89
Shared Lane Traffic (%)						
Lane Group Flow (vph)	485	0	0	176	645	89
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	27.0		33.0	33.0	33.0	
Total Split (%)	45.0%		55.0%	55.0%	55.0%	
Maximum Green (s)	22.0		27.3	27.3	27.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	13					
Act Effct Green (s)	22.2			56.0	23.0	56.0
Actuated g/C Ratio	0.40			1.00	0.41	1.00
v/c Ratio	0.69			0.10	0.83	0.06
Control Delay	21.9			0.1	25.7	0.1
Queue Delay	0.0			0.0	8.8	0.0
Total Delay	21.9			0.1	34.5	0.1
LOS	C			A	C	A
Approach Delay	21.9			0.1	30.3	
Approach LOS	C			A	C	
Queue Length 50th (m)	44.5			0.0	58.3	0.0
Queue Length 95th (m)	56.9			0.0	81.7	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)						20.0
Base Capacity (vph)	707			1804	924	1578
Starvation Cap Reductn	0			0	244	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.69			0.10	0.95	0.06

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 56	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 56.1%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Ramp/Spadina Cres E



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	127	182	296	479	78
Future Volume (vph)	25	127	182	296	479	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00		1.00	
Frt	0.887				0.981	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1592	0	1787	1881	1840	0
Flt Permitted	0.992		0.148			
Satd. Flow (perm)	1584	0	278	1881	1840	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	181				15	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	12		1			1
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.70	0.70	0.74	0.74	0.82	0.82
Heavy Vehicles (%)	5%	5%	1%	1%	1%	1%
Adj. Flow (vph)	36	181	246	400	584	95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	217	0	246	400	679	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	19.0		14.0	51.0	37.0	
Total Split (%)	27.1%		20.0%	72.9%	52.9%	
Maximum Green (s)	14.0		9.2	45.5	31.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	12				1	
Act Effct Green (s)	14.0		45.5	44.8	30.8	
Actuated g/C Ratio	0.20		0.66	0.65	0.44	
v/c Ratio	0.47		0.65	0.33	0.82	
Control Delay	10.1		16.2	6.4	26.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	10.1		16.2	6.4	26.8	
LOS	B		B	A	C	
Approach Delay	10.1			10.1	26.8	
Approach LOS	B			B	C	
Queue Length 50th (m)	4.1		11.3	20.9	75.8	
Queue Length 95th (m)	11.0		19.5	25.8	102.0	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	466		382	1235	844	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.47		0.64	0.32	0.80	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 69.3
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 17.5 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	2	3	4	5	6	7
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3600	3685	3692	3680	3624	3643	3722
Vehs Exited	3601	3649	3722	3697	3616	3641	3715
Starting Vehs	86	46	88	90	67	78	75
Ending Vehs	85	82	58	73	75	80	82
Travel Distance (km)	2340	2371	2380	2380	2330	2351	2378
Travel Time (hr)	70.5	72.2	72.7	71.4	71.9	70.8	73.3
Total Delay (hr)	20.4	21.2	21.6	20.4	21.8	20.3	22.1
Total Stops	2092	2083	2226	2180	2242	2156	2314
Fuel Used (l)	209.1	213.1	215.3	212.7	211.5	211.5	214.9

Summary of All Intervals

Run Number	8	9	Avg
Start Time	6:50	6:50	6:50
End Time	8:00	8:00	8:00
Total Time (min)	70	70	70
Time Recorded (min)	60	60	60
# of Intervals	2	2	2
# of Recorded Intervals	1	1	1
Vehs Entered	3742	3635	3671
Vehs Exited	3758	3628	3672
Starting Vehs	101	63	74
Ending Vehs	85	70	74
Travel Distance (km)	2431	2331	2366
Travel Time (hr)	74.1	71.2	72.0
Total Delay (hr)	21.9	20.9	21.2
Total Stops	2138	2188	2179
Fuel Used (l)	217.8	209.6	212.8

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	6	7
Vehs Entered	3600	3685	3692	3680	3624	3643	3722
Vehs Exited	3601	3649	3722	3697	3616	3641	3715
Starting Vehs	86	46	88	90	67	78	75
Ending Vehs	85	82	58	73	75	80	82
Travel Distance (km)	2340	2371	2380	2380	2330	2351	2378
Travel Time (hr)	70.5	72.2	72.7	71.4	71.9	70.8	73.3
Total Delay (hr)	20.4	21.2	21.6	20.4	21.8	20.3	22.1
Total Stops	2092	2083	2226	2180	2242	2156	2314
Fuel Used (l)	209.1	213.1	215.3	212.7	211.5	211.5	214.9

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	8	9	Avg
Vehs Entered	3742	3635	3671
Vehs Exited	3758	3628	3672
Starting Vehs	101	63	74
Ending Vehs	85	70	74
Travel Distance (km)	2431	2331	2366
Travel Time (hr)	74.1	71.2	72.0
Total Delay (hr)	21.9	20.9	21.2
Total Stops	2138	2188	2179
Fuel Used (l)	217.8	209.6	212.8

4: Spadina Ramp/Spadina Cres E Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Zone Performance

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (m)	55.2	34.0	67.2	49.9
Average Queue (m)	30.0	13.3	43.0	6.3
95th Queue (m)	47.6	26.7	70.2	33.4
Link Distance (m)	143.6	139.0	61.0	
Upstream Blk Time (%)			2	
Queuing Penalty (veh)			14	
Storage Bay Dist (m)				20.0
Storage Blk Time (%)		2	22	
Queuing Penalty (veh)		0	16	

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	19.5	40.1	39.0	91.2
Average Queue (m)	5.0	18.9	16.9	48.5
95th Queue (m)	14.3	31.8	32.8	79.0
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Zone Summary

Zone wide Queuing Penalty: 30

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

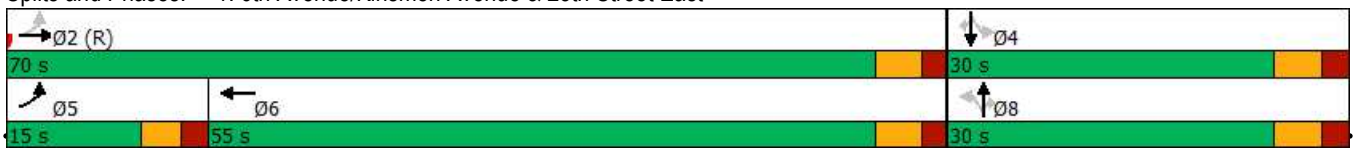
09/18/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	1347	21	0	1080	61	6	7	137	74	14	55
Future Volume (vph)	26	1347	21	0	1080	61	6	7	137	74	14	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.98	0.94		0.97	0.95
Frt		0.998			0.992				0.850			0.850
Flt Protected	0.950							0.977			0.960	
Satd. Flow (prot)	1486	3177	0	0	3112	0	0	1671	1454	0	1625	1439
Flt Permitted	0.159							0.875			0.748	
Satd. Flow (perm)	249	3177	0	0	3112	0	0	1472	1371	0	1223	1360
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			8				81			81
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	32		11	11		32	30		31	31		30
Confl. Bikes (#/hr)			2			5			4			3
Peak Hour Factor	0.96	0.96	0.96	0.93	0.93	0.93	0.74	0.74	0.74	0.79	0.79	0.79
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	27	1403	22	0	1161	66	8	9	185	94	18	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	1425	0	0	1227	0	0	17	185	0	112	70
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2			2		1	2	1	1	2	1
Detector Template	Left	Thru			Thru		Left		Right	Left		Right
Leading Detector (m)	2.0	10.0			10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6			0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	8.0	0.0	0.0	8.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	5	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	9.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	15.0	70.0			55.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	15.0%	70.0%			55.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	10.0	64.6			49.6		24.3	24.3	24.3	24.3	24.3	24.3
Yellow Time (s)	3.0	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.4			5.4			5.7	5.7		5.7	5.7
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max			Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)		11			32		31	31	31	30	30	30
Act Effct Green (s)	71.7	71.3			65.7			17.6	17.6		17.6	17.6
Actuated g/C Ratio	0.72	0.71			0.66			0.18	0.18		0.18	0.18
v/c Ratio	0.09	0.63			0.60			0.07	0.60		0.52	0.23
Control Delay	6.0	9.8			13.7			32.0	28.5		45.0	7.9
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	6.0	9.8			13.7			32.0	28.5		45.0	7.9
LOS	A	A			B			C	C		D	A
Approach Delay		9.8			13.7			28.8			30.7	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type: CBD	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 86 (86%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 86.9%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

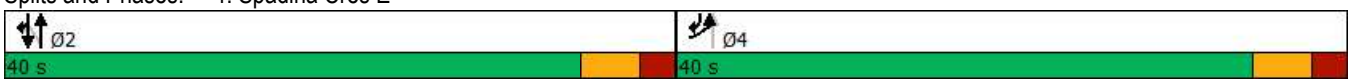


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	471	0	1	395	567	79
Future Volume (vph)	471	0	1	395	567	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	0	1787	1881	1881	1599
Flt Permitted	0.950		0.210			
Satd. Flow (perm)	1770	0	395	1881	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		14				
Confl. Bikes (#/hr)		12				
Peak Hour Factor	0.94	0.94	0.89	0.89	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	501	0	1	444	610	85
Shared Lane Traffic (%)						
Lane Group Flow (vph)	501	0	1	444	610	85
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	2.0		2.0	10.0	10.0	2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		2.0	0.6	0.6	2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	15.0		15.0	15.0	15.0	
Minimum Split (s)	27.7		23.7	23.7	23.7	
Total Split (s)	40.0		40.0	40.0	40.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Maximum Green (s)	34.3		34.3	34.3	34.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	2.2		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.7		5.7	5.7	5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		Max	Max	Max	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	26					
Act Effct Green (s)	34.3		34.3	80.0	34.3	80.0
Actuated g/C Ratio	0.43		0.43	1.00	0.43	1.00
v/c Ratio	0.66		0.01	0.24	0.76	0.05
Control Delay	23.4		13.0	0.3	26.8	0.1
Queue Delay	0.0		0.0	0.0	52.8	0.0
Total Delay	23.4		13.0	0.3	79.6	0.1
LOS	C		B	A	E	A
Approach Delay	23.4			0.3	69.9	
Approach LOS	C			A	E	

Intersection Summary	
Area Type: Other	
Cycle Length: 80	
Actuated Cycle Length: 80	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 36.8	Intersection LOS: D
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Cres E

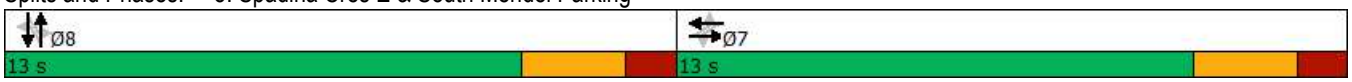


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	0	38	32	1	39	18	822	26	22	576	18
Future Volume (vph)	7	0	38	32	1	39	18	822	26	22	576	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.90			0.95			1.00			1.00	
Frt		0.886			0.926			0.996			0.996	
Flt Protected		0.992			0.978			0.999			0.998	
Satd. Flow (prot)	0	1481	0	0	1698	0	0	1869	0	0	1887	0
Flt Permitted		0.958			0.872			0.986			0.964	
Satd. Flow (perm)	0	1429	0	0	1452	0	0	1845	0	0	1823	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48			42			7			7	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			176.0	
Travel Time (s)		4.0			5.5			6.0			12.7	
Confl. Peds. (#/hr)	3		129	129		3	3		19	19		3
Confl. Bikes (#/hr)			6									2
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.92	0.92	0.92	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	0%	0%	0%
Adj. Flow (vph)	9	0	48	39	1	48	20	893	28	23	606	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	88	0	0	941	0	0	648	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	0		1	0		1	0		1	0	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	0.0		2.0	0.0		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	138	138		138	138							
Act Effct Green (s)		8.5			8.5			17.1			17.1	
Actuated g/C Ratio		0.29			0.29			0.58			0.58	
v/c Ratio		0.13			0.20			0.87			0.61	
Control Delay		3.2			4.6			27.5			13.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.2			4.6			27.5			13.7	
LOS		A			A			C			B	
Approach Delay		3.2			4.6			27.5			13.7	
Approach LOS		A			A			C			B	

Intersection Summary	
Area Type:	Other
Cycle Length: 26	
Actuated Cycle Length: 29.3	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 20.4	Intersection LOS: C
Intersection Capacity Utilization 68.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	96	208	142	729	386	53
Future Volume (vph)	96	208	142	729	386	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt	0.908				0.984	
Flt Protected	0.984		0.950			
Satd. Flow (prot)	1664	0	1787	1881	1841	0
Flt Permitted	0.984		0.253			
Satd. Flow (perm)	1639	0	472	1881	1841	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	142				10	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		18			18
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	128	277	148	759	449	62
Shared Lane Traffic (%)						
Lane Group Flow (vph)	405	0	148	759	511	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	2		2	2	2	
Detector Template				Thru	Thru	
Leading Detector (m)	10.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	2.0		2.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	0.0		0.0	9.4	9.4	
Detector 2 Size(m)	10.0		2.0	0.6	0.6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	20				18	
Act Effct Green (s)	20.2		42.2	41.5	30.2	
Actuated g/C Ratio	0.28		0.58	0.57	0.42	
v/c Ratio	0.72		0.33	0.70	0.66	
Control Delay	24.5		8.6	15.0	22.7	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	24.5		8.6	15.0	22.7	
LOS	C		A	B	C	
Approach Delay	24.5			14.0	22.7	
Approach LOS	C			B	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 72.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.72	
Intersection Signal Delay: 18.7	Intersection LOS: B
Intersection Capacity Utilization 65.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	3:50	3:50	3:50	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	4394	4333	4328	4343	4598	4651	4233
Vehs Exited	4365	4182	4272	4200	4485	4647	4154
Starting Vehs	166	136	163	87	158	167	131
Ending Vehs	195	287	219	230	271	171	210
Travel Distance (km)	2563	2476	2554	2500	2672	2759	2471
Travel Time (hr)	309.1	415.8	483.1	315.2	247.0	167.8	376.6
Total Delay (hr)	254.4	362.9	428.2	261.8	189.8	108.6	323.5
Total Stops	5879	5439	5819	5140	6517	4706	5168
Fuel Used (l)	437.2	519.0	585.0	436.0	393.8	322.2	485.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4743	4524	4620	4478
Vehs Exited	4645	4421	4505	4388
Starting Vehs	106	127	120	136
Ending Vehs	204	230	235	221
Travel Distance (km)	2782	2632	2730	2614
Travel Time (hr)	219.2	191.1	230.8	295.6
Total Delay (hr)	159.4	134.6	172.2	239.5
Total Stops	6275	4942	5626	5553
Fuel Used (l)	373.7	333.3	374.9	426.0

Interval #0 Information Seeding

Start Time	3:50
End Time	4:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	4394	4333	4328	4343	4598	4651	4233
Vehs Exited	4365	4182	4272	4200	4485	4647	4154
Starting Vehs	166	136	163	87	158	167	131
Ending Vehs	195	287	219	230	271	171	210
Travel Distance (km)	2563	2476	2554	2500	2672	2759	2471
Travel Time (hr)	309.1	415.8	483.1	315.2	247.0	167.8	376.6
Total Delay (hr)	254.4	362.9	428.2	261.8	189.8	108.6	323.5
Total Stops	5879	5439	5819	5140	6517	4706	5168
Fuel Used (l)	437.2	519.0	585.0	436.0	393.8	322.2	485.1

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	4743	4524	4620	4478
Vehs Exited	4645	4421	4505	4388
Starting Vehs	106	127	120	136
Ending Vehs	204	230	235	221
Travel Distance (km)	2782	2632	2730	2614
Travel Time (hr)	219.2	191.1	230.8	295.6
Total Delay (hr)	159.4	134.6	172.2	239.5
Total Stops	6275	4942	5626	5553
Fuel Used (l)	373.7	333.3	374.9	426.0

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

4: Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Zone Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	35.4	80.7	72.6	78.1	89.1	32.9	25.2	27.0	37.7
Average Queue (m)	6.3	47.4	37.7	36.7	35.1	4.8	14.1	15.5	10.5
95th Queue (m)	21.6	73.1	66.0	67.0	70.8	19.2	23.3	27.7	25.7
Link Distance (m)		240.2	240.2	194.2	194.2	168.1			173.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)		17				0	5	10	0
Queuing Penalty (veh)		4				0	1	5	0

Intersection: 4: Spadina Cres E

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (m)	148.5	4.9	141.5	68.2	6.0
Average Queue (m)	129.5	0.2	92.5	51.5	0.2
95th Queue (m)	180.4	4.9	167.8	88.0	5.9
Link Distance (m)	143.6		139.0	61.2	61.2
Upstream Blk Time (%)	34		31	12	
Queuing Penalty (veh)	160		0	38	
Storage Bay Dist (m)		20.0			
Storage Blk Time (%)			65		
Queuing Penalty (veh)			1		

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	17.7	24.6	66.5	161.8
Average Queue (m)	6.3	8.3	61.6	151.9
95th Queue (m)	14.5	18.3	69.6	191.6
Link Distance (m)	43.9	63.6	61.2	157.3
Upstream Blk Time (%)			16	44
Queuing Penalty (veh)			138	271
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	329.2	78.9	119.5	147.0
Average Queue (m)	126.4	20.8	59.1	110.4
95th Queue (m)	303.2	55.8	105.6	184.0
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)			3	64
Queuing Penalty (veh)			25	0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)		0	9	
Queuing Penalty (veh)		0	13	

Zone Summary

Zone wide Queuing Penalty: 656

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	471	0	1	395	567	79
Future Volume (vph)	471	0	1	395	567	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	0	1787	1881	1881	1599
Flt Permitted	0.950		0.273			
Satd. Flow (perm)	1770	0	514	1881	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		14				
Confl. Bikes (#/hr)		12				
Peak Hour Factor	0.94	0.94	0.89	0.89	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	501	0	1	444	610	85
Shared Lane Traffic (%)						
Lane Group Flow (vph)	501	0	1	444	610	85
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	15.0		15.0	15.0	15.0	
Minimum Split (s)	27.7		23.7	23.7	23.7	
Total Split (s)	28.0		37.0	37.0	37.0	
Total Split (%)	43.1%		56.9%	56.9%	56.9%	
Maximum Green (s)	22.3		31.3	31.3	31.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	2.2		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.7		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		Max	Max	Max	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	26					
Act Effct Green (s)	22.3		31.3	65.0	31.3	65.0
Actuated g/C Ratio	0.34		0.48	1.00	0.48	1.00
v/c Ratio	0.83		0.00	0.24	0.67	0.05
Control Delay	33.7		9.0	0.3	17.6	0.1
Queue Delay	0.0		0.0	0.0	36.4	0.0
Total Delay	33.7		9.0	0.3	53.9	0.1
LOS	C		A	A	D	A
Approach Delay	33.7			0.3	47.3	
Approach LOS	C			A	D	
Queue Length 50th (m)	57.1		0.1	0.0	55.7	0.0
Queue Length 95th (m)	#107.0		0.8	0.0	89.9	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)			20.0			
Base Capacity (vph)	607		247	1881	905	1599
Starvation Cap Reductn	0		0	0	328	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.83		0.00	0.24	1.06	0.05

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 65
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 30.4 Intersection LOS: C
Intersection Capacity Utilization 65.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Spadina Cres E

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	96	208	142	729	386	53
Future Volume (vph)	96	208	142	729	386	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		0.99		0.99	
Frt	0.908				0.984	
Flt Protected	0.984		0.950			
Satd. Flow (prot)	1664	0	1787	1881	1841	0
Flt Permitted	0.984		0.225			
Satd. Flow (perm)	1636	0	420	1881	1841	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	130				10	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		18			18
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	128	277	148	759	449	62
Shared Lane Traffic (%)						
Lane Group Flow (vph)	405	0	148	759	511	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	30.0		13.9	55.0	41.1	
Total Split (%)	35.3%		16.4%	64.7%	48.4%	
Maximum Green (s)	25.0		9.1	49.5	35.6	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	20				18	
Act Effct Green (s)	25.0		45.7	45.0	31.1	
Actuated g/C Ratio	0.31		0.57	0.56	0.39	
v/c Ratio	0.67		0.38	0.72	0.71	
Control Delay	22.7		11.1	18.0	27.0	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	22.7		11.1	18.0	27.0	
LOS	C		B	B	C	
Approach Delay	22.7			16.9	27.0	
Approach LOS	C			B	C	
Queue Length 50th (m)	36.8		10.4	83.6	66.8	
Queue Length 95th (m)	53.4		18.6	125.6	94.9	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	606		392	1157	820	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.67		0.38	0.66	0.62	

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 80.5
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 21.0 Intersection LOS: C
Intersection Capacity Utilization 65.2% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	3:50	3:50	3:50	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	4101	4432	4315	4416	4592	4339	4423
Vehs Exited	3961	4330	4270	4366	4563	4253	4288
Starting Vehs	95	118	175	145	136	110	92
Ending Vehs	235	220	220	195	165	196	227
Travel Distance (km)	2324	2556	2546	2567	2747	2548	2585
Travel Time (hr)	465.1	237.2	454.9	263.0	251.7	299.6	228.2
Total Delay (hr)	415.4	182.5	400.5	208.1	193.0	244.9	172.7
Total Stops	5061	5355	6131	5626	6681	5805	5132
Fuel Used (l)	552.5	374.0	563.7	400.3	400.8	427.1	365.8

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4484	4318	4278	4369
Vehs Exited	4439	4235	4262	4297
Starting Vehs	137	119	177	125
Ending Vehs	182	202	193	200
Travel Distance (km)	2624	2491	2477	2547
Travel Time (hr)	231.3	322.7	457.9	321.2
Total Delay (hr)	174.9	269.4	405.0	266.7
Total Stops	5871	5538	5781	5697
Fuel Used (l)	375.1	441.6	560.8	446.2

Interval #0 Information Seeding

Start Time	3:50
End Time	4:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	4101	4432	4315	4416	4592	4339	4423
Vehs Exited	3961	4330	4270	4366	4563	4253	4288
Starting Vehs	95	118	175	145	136	110	92
Ending Vehs	235	220	220	195	165	196	227
Travel Distance (km)	2324	2556	2546	2567	2747	2548	2585
Travel Time (hr)	465.1	237.2	454.9	263.0	251.7	299.6	228.2
Total Delay (hr)	415.4	182.5	400.5	208.1	193.0	244.9	172.7
Total Stops	5061	5355	6131	5626	6681	5805	5132
Fuel Used (l)	552.5	374.0	563.7	400.3	400.8	427.1	365.8

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	4484	4318	4278	4369
Vehs Exited	4439	4235	4262	4297
Starting Vehs	137	119	177	125
Ending Vehs	182	202	193	200
Travel Distance (km)	2624	2491	2477	2547
Travel Time (hr)	231.3	322.7	457.9	321.2
Total Delay (hr)	174.9	269.4	405.0	266.7
Total Stops	5871	5538	5781	5697
Fuel Used (l)	375.1	441.6	560.8	446.2

4: Spadina Cres E Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Zone Performance

Intersection: 4: Spadina Cres E

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (m)	149.5	15.8	133.5	69.1	6.2
Average Queue (m)	141.5	0.5	74.7	47.3	0.2
95th Queue (m)	169.6	8.8	149.6	82.9	6.1
Link Distance (m)	143.6		139.0	61.2	61.2
Upstream Blk Time (%)	50		18	5	0
Queuing Penalty (veh)	235		0	17	0
Storage Bay Dist (m)		20.0			
Storage Blk Time (%)			52		
Queuing Penalty (veh)			1		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	226.8	71.2	118.2	143.3
Average Queue (m)	86.4	18.8	60.0	100.4
95th Queue (m)	232.1	48.0	104.4	175.7
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)			1	48
Queuing Penalty (veh)			10	0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)		0	8	
Queuing Penalty (veh)		0	11	

Zone Summary

Zone wide Queuing Penalty: 273

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

10/07/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	777	20	0	755	33	6	6	37	20	10	26
Future Volume (vph)	25	777	20	0	755	33	6	6	37	20	10	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.99	0.97		0.99	0.97
Frt		0.996			0.994				0.850			0.850
Flt Protected	0.950							0.976			0.968	
Satd. Flow (prot)	1486	3168	0	0	3159	0	0	1669	1454	0	1655	1454
Flt Permitted	0.321							0.869			0.809	
Satd. Flow (perm)	498	3168	0	0	3159	0	0	1472	1409	0	1368	1405
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			9				48			44
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	20		22	22		20	24		21	21		24
Confl. Bikes (#/hr)			4			5			3			4
Peak Hour Factor	0.86	0.86	0.86	0.94	0.94	0.94	0.77	0.77	0.77	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	29	903	23	0	803	35	8	8	48	24	12	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	29	926	0	0	838	0	0	16	48	0	36	32
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	2			2		1	2	1	1	2	1
Detector Template	Left	Thru			Thru		Left		Right	Left		Right
Leading Detector (m)	2.0	10.0			10.0		2.0	10.0	2.0	2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6			0.6		2.0	0.6	2.0	2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	8.0	0.0	0.0	8.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	

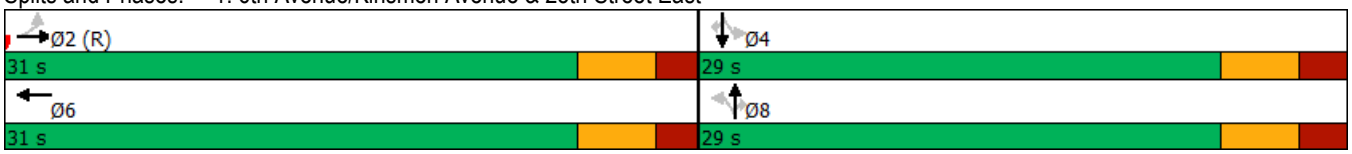
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	2	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.4	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	31.0	31.0			31.0		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%			51.7%		48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
Maximum Green (s)	25.6	25.6			25.6		23.3	23.3	23.3	23.3	23.3	23.3
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.9	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.4	5.4			5.4			5.7	5.7		5.7	5.7
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max			Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	13.0	13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	22	22			20		21	21	21	24	24	24
Act Effct Green (s)	42.5	42.5			42.5			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.71	0.71			0.71			0.25	0.25		0.25	0.25
v/c Ratio	0.08	0.41			0.37			0.04	0.13		0.11	0.08
Control Delay	9.5	8.6			8.2			14.0	5.3		15.4	4.1
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	9.5	8.6			8.2			14.0	5.3		15.4	4.1
LOS	A	A			A			B	A		B	A
Approach Delay		8.6			8.2			7.5			10.1	
Approach LOS		A			A			A			B	
Queue Length 50th (m)	1.0	23.0			19.9			1.6	0.0		3.6	0.0
Queue Length 95th (m)	6.1	55.3			51.9			3.9	4.2		7.0	3.0
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	353	2247			2242			571	576		531	572
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.08	0.41			0.37			0.03	0.08		0.07	0.06

Intersection Summary	
Area Type:	CBD
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 29 (48%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.41	

Intersection Signal Delay: 8.4	Intersection LOS: A
Intersection Capacity Utilization 65.8%	ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East



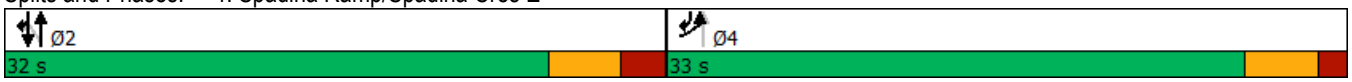
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	292	0	4	208	391	63
Future Volume (vph)	292	0	4	208	391	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1787	0	1787	1881	1881	1599
Flt Permitted	0.950		0.324			
Satd. Flow (perm)	1787	0	610	1881	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		25				
Confl. Bikes (#/hr)		8				
Peak Hour Factor	0.82	0.82	0.90	0.90	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	356	0	4	231	444	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	356	0	4	231	444	72
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1		1	2	2	1
Detector Template	Left		Left	Thru	Thru	Right
Leading Detector (m)	2.0		2.0	10.0	10.0	2.0
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0
Detector 1 Size(m)	2.0		2.0	0.6	0.6	2.0
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	33.0		32.0	32.0	32.0	
Total Split (%)	50.8%		49.2%	49.2%	49.2%	
Maximum Green (s)	28.0		26.3	26.3	26.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	33					
Act Effct Green (s)	28.1		19.6	58.5	19.6	58.5
Actuated g/C Ratio	0.48		0.34	1.00	0.34	1.00
v/c Ratio	0.41		0.02	0.12	0.70	0.05
Control Delay	12.8		12.2	0.1	23.5	0.0
Queue Delay	0.0		0.0	0.0	0.8	0.0
Total Delay	12.8		12.2	0.1	24.3	0.0
LOS	B		B	A	C	A
Approach Delay	12.8			0.3	20.9	
Approach LOS	B			A	C	
Queue Length 50th (m)	23.6		0.3	0.0	42.3	0.0
Queue Length 95th (m)	45.4		1.9	0.0	67.0	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)			20.0			20.0
Base Capacity (vph)	859		275	1864	850	1584
Starvation Cap Reductn	0		0	0	177	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.41		0.01	0.12	0.66	0.05

Intersection Summary	
Area Type:	Other
Cycle Length: 65	
Actuated Cycle Length: 58.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 47.8%	ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 4: Spadina Ramp/Spadina Cres E



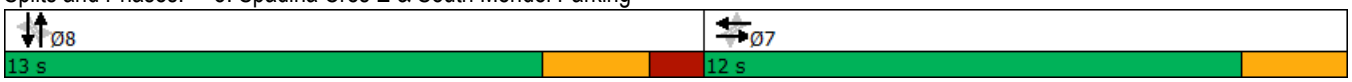
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	12	35	17	20	26	31	430	39	13	402	22
Future Volume (vph)	16	12	35	17	20	26	31	430	39	13	402	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.89			0.95			1.00			1.00	
Frt		0.925			0.944			0.990			0.993	
Flt Protected		0.988			0.987			0.997			0.999	
Satd. Flow (prot)	0	1551	0	0	1754	0	0	1872	0	0	1858	0
Flt Permitted		0.944			0.939			0.965			0.985	
Satd. Flow (perm)	0	1481	0	0	1598	0	0	1809	0	0	1832	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			35			20			13	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			175.7	
Travel Time (s)		4.0			5.5			6.0			12.7	
Confl. Peds. (#/hr)	2		139	139		2	52					52
Confl. Bikes (#/hr)			3						3			
Peak Hour Factor	0.88	0.88	0.88	0.75	0.75	0.75	0.90	0.90	0.90	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	18	14	40	23	27	35	34	478	43	14	432	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	72	0	0	85	0	0	555	0	0	470	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Number of Detectors	1	0		1	0		1	0		1	0	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	2.0	0.0		2.0	0.0		2.0	0.0		2.0	0.0	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6		2.0	0.6		2.0	0.6		2.0	0.6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		52.0%	52.0%		52.0%	52.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		2.0			2.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	142	142		142	142							
Act Effct Green (s)		8.5			8.5			17.0			17.0	
Actuated g/C Ratio		0.30			0.30			0.60			0.60	
v/c Ratio		0.15			0.17			0.51			0.43	
Control Delay		3.8			4.3			9.0			6.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.8			4.3			9.0			6.4	
LOS		A			A			A			A	
Approach Delay		3.8			4.3			9.0			6.4	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		1.0			1.5			15.3			12.3	
Queue Length 95th (m)		3.1			3.0			#43.5			23.4	
Internal Link Dist (m)		31.9			51.8			59.0			151.7	
Turn Bay Length (m)												
Base Capacity (vph)		554			593			1087			1098	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.13			0.14			0.51			0.43	

Intersection Summary

Area Type: Other
Cycle Length: 25
Actuated Cycle Length: 28.5
Natural Cycle: 40
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 7.3 Intersection LOS: A
Intersection Capacity Utilization 54.3% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	101	109	371	325	26
Future Volume (vph)	33	101	109	371	325	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.898				0.990	
Flt Protected	0.988		0.950			
Satd. Flow (prot)	1637	0	1787	1881	1858	0
Flt Permitted	0.988		0.351			
Satd. Flow (perm)	1617	0	657	1881	1858	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	120				6	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		9			9
Confl. Bikes (#/hr)						3
Peak Hour Factor	0.84	0.84	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%
Adj. Flow (vph)	39	120	118	403	369	30
Shared Lane Traffic (%)						
Lane Group Flow (vph)	159	0	118	403	399	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	2		2	2	2	
Detector Template				Thru	Thru	
Leading Detector (m)	10.0		10.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	2.0		2.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	0.0		0.0	9.4	9.4	
Detector 2 Size(m)	10.0		10.0	0.6	0.6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	25.0		20.0	30.0	30.0	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	18				9	
Act Effct Green (s)	20.2		42.8	42.0	30.2	
Actuated g/C Ratio	0.28		0.59	0.58	0.41	
v/c Ratio	0.29		0.22	0.37	0.51	
Control Delay	9.4		7.3	9.2	19.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	9.4		7.3	9.2	19.8	
LOS	A		A	A	B	
Approach Delay	9.4			8.7	19.8	
Approach LOS	A			A	B	
Queue Length 50th (m)	4.4		6.7	28.0	43.2	
Queue Length 95th (m)	16.6		12.9	43.9	71.6	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	540		623	1180	775	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.29		0.19	0.34	0.51	

Intersection Summary	
Area Type:	Other
Cycle Length: 75	
Actuated Cycle Length: 72.8	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 53.6%	ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	5:50	5:50	5:50	5:50	5:50	5:50	5:50
End Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	2890	2904	2941	2888	2949	2830	2998
Vehs Exited	2867	2920	2932	2894	2947	2814	2993
Starting Vehs	60	74	65	71	63	55	68
Ending Vehs	83	58	74	65	65	71	73
Travel Distance (km)	1975	1993	2047	1996	2038	1945	2038
Travel Time (hr)	59.2	59.0	61.8	60.9	61.6	58.8	60.7
Total Delay (hr)	17.0	16.6	18.2	18.4	18.1	17.3	17.4
Total Stops	2311	2267	2447	2509	2517	2372	2459
Fuel Used (l)	178.1	176.6	184.1	179.7	184.5	174.8	181.5

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	5:50	5:50	5:50	5:50
End Time	7:00	7:00	7:00	7:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	2951	2969	2954	2926
Vehs Exited	2923	2979	2966	2922
Starting Vehs	64	72	65	61
Ending Vehs	92	62	53	65
Travel Distance (km)	2014	2041	2039	2012
Travel Time (hr)	66.3	60.1	60.5	60.9
Total Delay (hr)	23.4	16.5	17.0	18.0
Total Stops	2529	2264	2342	2403
Fuel Used (l)	185.8	181.7	182.5	180.9

Interval #0 Information Seeding

Start Time	5:50
End Time	6:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	6:00
End Time	7:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	2890	2904	2941	2888	2949	2830	2998
Vehs Exited	2867	2920	2932	2894	2947	2814	2993
Starting Vehs	60	74	65	71	63	55	68
Ending Vehs	83	58	74	65	65	71	73
Travel Distance (km)	1975	1993	2047	1996	2038	1945	2038
Travel Time (hr)	59.2	59.0	61.8	60.9	61.6	58.8	60.7
Total Delay (hr)	17.0	16.6	18.2	18.4	18.1	17.3	17.4
Total Stops	2311	2267	2447	2509	2517	2372	2459
Fuel Used (l)	178.1	176.6	184.1	179.7	184.5	174.8	181.5

Interval #1 Information Recording

Start Time	6:00
End Time	7:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	2951	2969	2954	2926
Vehs Exited	2923	2979	2966	2922
Starting Vehs	64	72	65	61
Ending Vehs	92	62	53	65
Travel Distance (km)	2014	2041	2039	2012
Travel Time (hr)	66.3	60.1	60.5	60.9
Total Delay (hr)	23.4	16.5	17.0	18.0
Total Stops	2529	2264	2342	2403
Fuel Used (l)	185.8	181.7	182.5	180.9

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent & North Interchange Loop Performance by movement

4: Spadina Ramp/Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	18.7	56.4	50.5	48.1	47.6	9.3	12.3	18.3	14.2
Average Queue (m)	4.4	29.7	17.9	24.3	20.9	2.3	5.2	6.4	4.2
95th Queue (m)	13.5	48.9	36.9	41.8	39.2	8.2	12.3	15.1	12.0
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	9				0	0	0	0
Queuing Penalty (veh)	0	2				0	0	0	0

Intersection: 2: 25th Street East

Movement	EB	EB	WB	WB
Directions Served	T	TR	T	TR
Maximum Queue (m)	23.1	28.3	48.2	41.7
Average Queue (m)	4.5	4.5	7.3	4.0
95th Queue (m)	15.6	17.3	37.2	33.1
Link Distance (m)	194.9	194.9	195.4	195.4
Upstream Blk Time (%)			0	1
Queuing Penalty (veh)			0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Spadina Crescent & North Interchange Loop

Movement
Directions Served
Maximum Queue (m)
Average Queue (m)
95th Queue (m)
Link Distance (m)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (m)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (m)	58.1	12.4	47.7	65.7	49.9
Average Queue (m)	24.7	1.1	20.8	39.6	5.3
95th Queue (m)	45.8	7.5	37.3	62.7	30.4
Link Distance (m)	143.6		139.0	61.0	
Upstream Blk Time (%)				1	
Queuing Penalty (veh)				5	
Storage Bay Dist (m)		20.0			20.0
Storage Blk Time (%)			8	25	
Queuing Penalty (veh)			0	16	

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	20.1	17.8	62.9	71.6
Average Queue (m)	8.0	6.2	30.8	30.7
95th Queue (m)	17.2	14.1	56.2	59.6
Link Distance (m)	47.7	63.6	61.0	156.3
Upstream Blk Time (%)			1	
Queuing Penalty (veh)			5	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	12.6	38.0
Average Queue (m)	5.7	2.0
95th Queue (m)	12.9	23.0
Link Distance (m)	34.2	121.0
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	21.2	29.3	56.7	65.8
Average Queue (m)	5.4	12.7	27.0	31.9
95th Queue (m)	15.3	23.1	47.4	55.8
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Network Summary

Network wide Queuing Penalty: 28

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

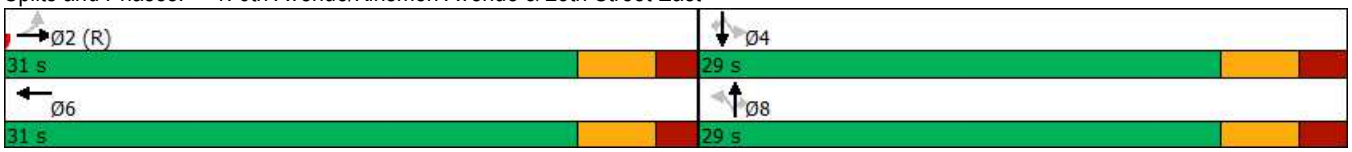
10/07/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	751	15	0	666	39	8	10	32	31	9	36
Future Volume (vph)	35	751	15	0	666	39	8	10	32	31	9	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.99	0.96		0.98	0.96
Frt		0.997			0.992				0.850			0.850
Flt Protected	0.950							0.977			0.963	
Satd. Flow (prot)	1501	3204	0	0	3183	0	0	1671	1454	0	1630	1439
Flt Permitted	0.367							0.864			0.759	
Satd. Flow (perm)	576	3204	0	0	3183	0	0	1462	1401	0	1262	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			12				46			44
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	14		18	18		14	29		29	29		29
Confl. Bikes (#/hr)						4			2			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.69	0.69	0.69	0.83	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	36	782	16	0	694	41	12	14	46	37	11	43
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	798	0	0	735	0	0	26	46	0	48	43
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	2	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.4	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	31.0	31.0			31.0		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%			51.7%		48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
Maximum Green (s)	25.6	25.6			25.6		23.3	23.3	23.3	23.3	23.3	23.3
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.9	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.4	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max			Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	13.0	13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	18	18			14		29	29	29	29	29	29
Act Effct Green (s)	42.5	42.5			42.5			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.71	0.71			0.71			0.25	0.25		0.25	0.25
v/c Ratio	0.09	0.35			0.33			0.07	0.12		0.15	0.11
Control Delay	9.3	8.0			7.7			14.7	5.4		16.3	5.4
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	9.3	8.0			7.7			14.7	5.4		16.3	5.4
LOS	A	A			A			B	A		B	A
Approach Delay		8.1			7.7			8.8			11.1	
Approach LOS		A			A			A			B	
Queue Length 50th (m)	1.3	18.6			16.5			2.6	0.0		4.9	0.0
Queue Length 95th (m)	7.4	48.6			43.6			4.7	3.3		8.8	4.5
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	408	2272			2260			567	572		490	565
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.09	0.35			0.33			0.05	0.08		0.10	0.08

Intersection Summary	
Area Type:	CBD
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 8.1	Intersection LOS: A
Intersection Capacity Utilization 66.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

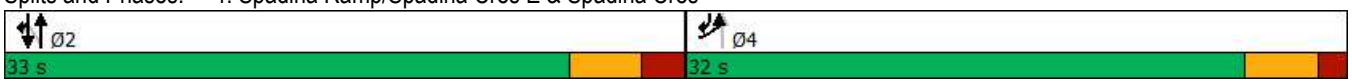


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	274	0	0	227	366	77
Future Volume (vph)	274	0	0	227	366	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	1900	1900	1900	1615
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	1900	1900	1900	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		19	2			
Confl. Bikes (#/hr)		14				
Peak Hour Factor	0.82	0.82	0.83	0.83	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	0%	0%
Adj. Flow (vph)	334	0	0	273	402	85
Shared Lane Traffic (%)						
Lane Group Flow (vph)	334	0	0	273	402	85
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	32.0		33.0	33.0	33.0	
Total Split (%)	49.2%		50.8%	50.8%	50.8%	
Maximum Green (s)	27.0		27.3	27.3	27.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	33					
Act Effct Green (s)	27.2			56.7	18.8	56.7
Actuated g/C Ratio	0.48			1.00	0.33	1.00
v/c Ratio	0.39			0.14	0.64	0.05
Control Delay	12.3			0.2	21.0	0.1
Queue Delay	0.0			0.0	0.3	0.0
Total Delay	12.3			0.2	21.4	0.1
LOS	B			A	C	A
Approach Delay	12.3			0.2	17.6	
Approach LOS	B			A	B	
Queue Length 50th (m)	20.0			0.0	36.0	0.0
Queue Length 95th (m)	43.0			0.0	59.5	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)						20.0
Base Capacity (vph)	856			1870	920	1589
Starvation Cap Reductn	0			0	161	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.39			0.15	0.53	0.05

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 56.7	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 46.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Ramp/Spadina Cres E & Spadina Cres



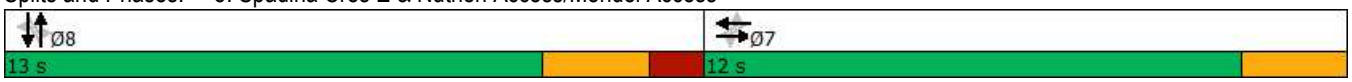
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	23	42	34	14	43	41	414	46	28	367	33
Future Volume (vph)	20	23	42	34	14	43	41	414	46	28	367	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.89			0.93			1.00			1.00	
Frt		0.933			0.936			0.988			0.990	
Flt Protected		0.988			0.982			0.996			0.997	
Satd. Flow (prot)	0	1538	0	0	1746	0	0	1851	0	0	1851	0
Flt Permitted		0.942			0.900			0.950			0.959	
Satd. Flow (perm)	0	1466	0	0	1493	0	0	1764	0	0	1780	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		51			57			24			20	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			240.1			83.0			175.7	
Travel Time (s)		10.2			17.3			6.0			12.7	
Confl. Peds. (#/hr)			169	169			17					17
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.82	0.82	0.82	0.75	0.75	0.75	0.95	0.95	0.95	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	24	28	51	45	19	57	43	436	48	30	395	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	103	0	0	121	0	0	527	0	0	460	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		52.0%	52.0%		52.0%	52.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		2.0			2.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	171	171		171	171							
Act Effct Green (s)		9.3			9.3			15.0			15.0	
Actuated g/C Ratio		0.34			0.34			0.55			0.55	
v/c Ratio		0.19			0.22			0.54			0.47	
Control Delay		3.9			4.2			9.5			7.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.9			4.2			9.5			7.2	
LOS		A			A			A			A	
Approach Delay		3.9			4.2			9.5			7.2	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		1.1			1.4			14.1			11.8	
Queue Length 95th (m)		3.7			3.7			#40.8			23.0	
Internal Link Dist (m)		117.0			216.1			59.0			151.7	
Turn Bay Length (m)												
Base Capacity (vph)		576			590			981			988	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.21			0.54			0.47	

Intersection Summary	
Area Type: Other	
Cycle Length: 25	
Actuated Cycle Length: 27.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 52.8%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 5: Spadina Cres E & Nutrien Access/Mendel Access

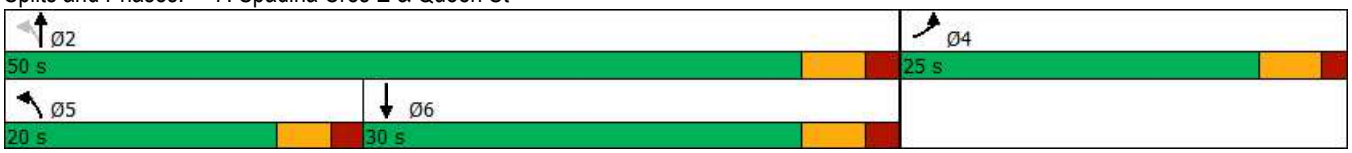


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	20	99	88	374	342	27
Future Volume (vph)	20	99	88	374	342	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.888				0.990	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1625	0	1805	1900	1858	0
Flt Permitted	0.992		0.329			
Satd. Flow (perm)	1604	0	622	1900	1858	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	127				6	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	29		9			9
Peak Hour Factor	0.78	0.78	0.90	0.90	0.87	0.87
Heavy Vehicles (%)	3%	3%	0%	0%	1%	1%
Adj. Flow (vph)	26	127	98	416	393	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	153	0	98	416	424	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	25.0		20.0	30.0	30.0	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Vehicle Extension (s)	3.0		3.0	0.2	0.2	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	36				9	
Act Effct Green (s)	20.1		42.3	41.6	30.2	
Actuated g/C Ratio	0.28		0.59	0.58	0.42	
v/c Ratio	0.28		0.19	0.38	0.54	
Control Delay	8.2		7.1	9.3	20.1	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	8.2		7.1	9.3	20.1	
LOS	A		A	A	C	
Approach Delay	8.2			8.9	20.1	
Approach LOS	A			A	C	
Queue Length 50th (m)	2.8		5.5	29.0	46.1	
Queue Length 95th (m)	12.3		11.1	45.7	74.4	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	544		614	1190	779	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.28		0.16	0.35	0.54	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 72.3	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 13.1	Intersection LOS: B
Intersection Capacity Utilization 53.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	12:50	12:50	12:50	12:50	12:50	12:50	12:50
End Time	2:00	2:00	2:00	2:00	2:00	2:00	2:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	2939	2910	2854	2848	2861	2904	2884
Vehs Exited	2940	2915	2844	2854	2853	2927	2879
Starting Vehs	59	65	59	66	56	77	53
Ending Vehs	58	60	69	60	64	54	58
Travel Distance (km)	2032	2016	1957	1944	1961	2002	1991
Travel Time (hr)	63.0	64.1	62.3	60.2	62.0	64.6	62.8
Total Delay (hr)	18.9	20.5	20.0	18.0	19.6	21.0	19.8
Total Stops	2626	2770	2660	2563	2669	2710	2729
Fuel Used (l)	185.5	184.6	180.8	177.8	180.1	185.3	182.6

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	12:50	12:50	12:50	12:50
End Time	2:00	2:00	2:00	2:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	2862	2865	2827	2874
Vehs Exited	2869	2865	2824	2877
Starting Vehs	80	53	51	58
Ending Vehs	73	53	54	56
Travel Distance (km)	1985	1972	1930	1979
Travel Time (hr)	62.3	63.8	61.7	62.7
Total Delay (hr)	19.3	20.9	19.7	19.8
Total Stops	2706	2784	2724	2693
Fuel Used (l)	182.1	183.2	179.0	182.1

Interval #0 Information Seeding

Start Time	12:50
End Time	1:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	1:00
End Time	2:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	2939	2910	2854	2848	2861	2904	2884
Vehs Exited	2940	2915	2844	2854	2853	2927	2879
Starting Vehs	59	65	59	66	56	77	53
Ending Vehs	58	60	69	60	64	54	58
Travel Distance (km)	2032	2016	1957	1944	1961	2002	1991
Travel Time (hr)	63.0	64.1	62.3	60.2	62.0	64.6	62.8
Total Delay (hr)	18.9	20.5	20.0	18.0	19.6	21.0	19.8
Total Stops	2626	2770	2660	2563	2669	2710	2729
Fuel Used (l)	185.5	184.6	180.8	177.8	180.1	185.3	182.6

Interval #1 Information Recording

Start Time	1:00
End Time	2:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	2862	2865	2827	2874
Vehs Exited	2869	2865	2824	2877
Starting Vehs	80	53	51	58
Ending Vehs	73	53	54	56
Travel Distance (km)	1985	1972	1930	1979
Travel Time (hr)	62.3	63.8	61.7	62.7
Total Delay (hr)	19.3	20.9	19.7	19.8
Total Stops	2706	2784	2724	2693
Fuel Used (l)	182.1	183.2	179.0	182.1

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent/Spadina Cres & North Interchange Loop Performance by movement

4: Spadina Cres/Spadina Cres E & Spadina Ramp Performance by movement

5: Spadina Cres E & Nutrien Access/Mendel Access Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	41.0	54.2	47.3	43.8	42.7	11.2	12.0	17.6	16.8
Average Queue (m)	7.1	31.5	20.6	25.2	21.8	2.3	4.7	6.0	5.6
95th Queue (m)	21.0	48.7	39.2	39.7	38.2	8.7	11.8	15.5	13.8
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	10				0	0	0	0
Queuing Penalty (veh)	0	3				0	0	0	0

Intersection: 2: 25th Street East

Movement	EB	EB	WB	WB
Directions Served	T	TR	T	TR
Maximum Queue (m)	23.7	30.7	22.5	16.7
Average Queue (m)	3.9	3.9	3.6	1.5
95th Queue (m)	14.8	17.0	14.4	8.9
Link Distance (m)	194.9	194.9	195.4	195.4
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Spadina Crescent/Spadina Cres & North Interchange Loop

Movement	NB
Directions Served	TR
Maximum Queue (m)	1.8
Average Queue (m)	0.1
95th Queue (m)	1.3
Link Distance (m)	38.5
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Spadina Cres/Spadina Cres E & Spadina Ramp

Movement	WB	NB	SB	SB
Directions Served	R	T	L	T
Maximum Queue (m)	53.3	74.7	40.3	58.3
Average Queue (m)	19.9	35.5	29.5	7.0
95th Queue (m)	38.9	61.0	44.2	37.1
Link Distance (m)	136.1	141.6		61.8
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (m)			33.0	
Storage Blk Time (%)	9		6	
Queuing Penalty (veh)	0		5	

Intersection: 5: Spadina Cres E & Nutrien Access/Mendel Access

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.3	18.3	65.4	82.4
Average Queue (m)	8.7	7.3	44.5	37.7
95th Queue (m)	16.7	15.4	66.7	68.7
Link Distance (m)	131.0	227.3	61.8	155.7
Upstream Blk Time (%)			2	
Queuing Penalty (veh)			8	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.4	33.2
Average Queue (m)	1.0	2.8
95th Queue (m)	5.6	18.6
Link Distance (m)	34.2	121.0
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	17.8	24.0	52.8	63.9
Average Queue (m)	3.0	10.8	26.9	32.9
95th Queue (m)	11.2	20.8	44.4	55.1
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Network Summary

Network wide Queuing Penalty: 17

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

10/07/2019

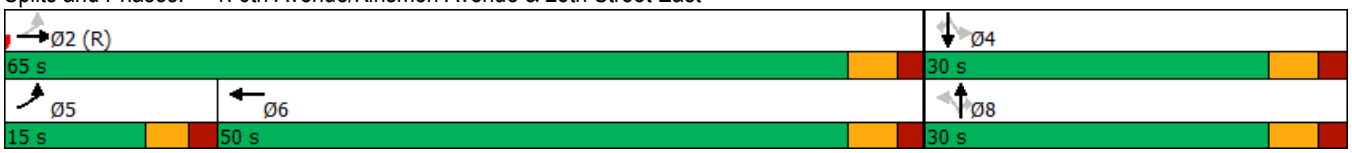
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	979	14	0	1686	43	10	6	29	17	8	27
Future Volume (vph)	29	979	14	0	1686	43	10	6	29	17	8	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.98	0.97		0.99	0.96
Frt		0.998			0.996				0.850			0.850
Flt Protected	0.950							0.970			0.967	
Satd. Flow (prot)	1444	3087	0	0	3167	0	0	1659	1454	0	1621	1425
Flt Permitted	0.061							0.828			0.806	
Satd. Flow (perm)	93	3087	0	0	3167	0	0	1391	1403	0	1337	1366
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			4				85			85
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	22		3	3		22	23		12	12		23
Confl. Bikes (#/hr)						3			9			
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.67	0.67	0.67	0.82	0.82	0.82
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Adj. Flow (vph)	32	1064	15	0	1894	48	15	9	43	21	10	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	1079	0	0	1942	0	0	24	43	0	31	33
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	5	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	9.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	15.0	65.0			50.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	15.8%	68.4%			52.6%		31.6%	31.6%	31.6%	31.6%	31.6%	31.6%
Maximum Green (s)	10.0	59.6			44.6		24.3	24.3	24.3	24.3	24.3	24.3
Yellow Time (s)	3.0	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max			Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)		3			22		12	12	12	23	23	23
Act Effct Green (s)	72.6	73.3			64.9			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.76	0.77			0.68			0.16	0.16		0.16	0.16
v/c Ratio	0.16	0.45			0.90			0.11	0.15		0.15	0.12
Control Delay	6.7	6.5			25.7			32.4	2.3		33.4	0.8
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	6.7	6.5			25.7			32.4	2.3		33.4	0.8
LOS	A	A			C			C	A		C	A
Approach Delay		6.5			25.7			13.1			16.6	
Approach LOS		A			C			B			B	
Queue Length 50th (m)	1.1	29.2			170.5			4.3	0.0		5.6	0.0
Queue Length 95th (m)	5.0	68.4			#284.5			7.7	0.0		11.2	0.0
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	213	2383			2165			355	422		341	412
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.15	0.45			0.90			0.07	0.10		0.09	0.08

Intersection Summary	
Area Type:	CBD
Cycle Length: 95	
Actuated Cycle Length: 95	
Offset: 84 (88%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 18.6	Intersection LOS: B
Intersection Capacity Utilization 92.7%	ICU Level of Service F
Analysis Period (min) 15	

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

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East



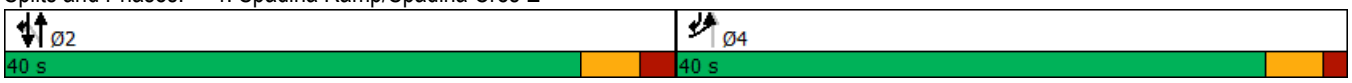
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	455	0	0	183	689	95
Future Volume (vph)	455	0	0	183	689	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	1827	1827	1881	1599
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	1827	1827	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		4				
Confl. Bikes (#/hr)		9				
Peak Hour Factor	0.72	0.72	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	1%	4%	4%	1%	1%
Adj. Flow (vph)	632	0	0	232	840	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	632	0	0	232	840	116
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	40.0		40.0	40.0	40.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Maximum Green (s)	35.0		34.3	34.3	34.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	13					
Act Effct Green (s)	35.0			80.0	34.3	80.0
Actuated g/C Ratio	0.44			1.00	0.43	1.00
v/c Ratio	0.81			0.13	1.04	0.07
Control Delay	29.7			0.1	68.2	0.1
Queue Delay	0.0			0.0	24.3	0.0
Total Delay	29.7			0.1	92.5	0.1
LOS	C			A	F	A
Approach Delay	29.7			0.1	81.3	
Approach LOS	C			A	F	
Queue Length 50th (m)	84.9			0.0	~147.6	0.0
Queue Length 95th (m)	89.5			0.0	#185.2	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)						20.0
Base Capacity (vph)	781			1827	806	1599
Starvation Cap Reductn	0			0	250	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.81			0.13	1.51	0.07

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 53.1 Intersection LOS: D
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Spadina Ramp/Spadina Cres E



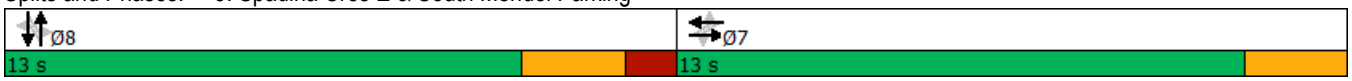
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	0	5	8	0	6	11	615	11	6	772	6
Future Volume (vph)	6	0	5	8	0	6	11	615	11	6	772	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.944			0.941			0.998			0.999	
Flt Protected		0.972			0.973			0.999				
Satd. Flow (prot)	0	1709	0	0	1706	0	0	1876	0	0	1879	0
Flt Permitted								0.986			0.996	
Satd. Flow (perm)	0	1758	0	0	1753	0	0	1851	0	0	1872	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			7			4			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			175.7	
Travel Time (s)		4.0			5.5			6.0			12.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.72	0.72	0.72	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	7	0	5	9	0	7	15	854	15	7	941	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	16	0	0	884	0	0	955	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	11.0	11.0		11.0	11.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		2.0			2.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	20	20		20	20							

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Act Effct Green (s)		6.4			6.4			26.6			26.6	
Actuated g/C Ratio		0.22			0.22			0.91			0.91	
v/c Ratio		0.03			0.04			0.52			0.56	
Control Delay		7.5			7.4			5.8			6.6	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.5			7.4			5.8			6.6	
LOS		A			A			A			A	
Approach Delay		7.5			7.4			5.8			6.6	
Approach LOS		A			A			A			A	
Queue Length 50th (m)		0.3			0.3			0.0			0.0	
Queue Length 95th (m)		2.2			2.6			40.8			#88.3	
Internal Link Dist (m)		31.9			51.8			59.0			151.7	
Turn Bay Length (m)												
Base Capacity (vph)		669			669			1687			1706	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.02			0.02			0.52			0.56	

Intersection Summary	
Area Type: Other	
Cycle Length: 26	
Actuated Cycle Length: 29.2	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 54.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	166	237	389	623	101
Future Volume (vph)	33	166	237	389	623	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.887				0.981	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1592	0	1787	1881	1839	0
Flt Permitted	0.992		0.115			
Satd. Flow (perm)	1584	0	216	1881	1839	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	237				12	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	12		1			1
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.70	0.70	0.74	0.74	0.82	0.82
Heavy Vehicles (%)	5%	5%	1%	1%	1%	1%
Adj. Flow (vph)	47	237	320	526	760	123
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	0	320	526	883	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	12				1	
Act Effct Green (s)	20.0		49.9	49.2	30.0	
Actuated g/C Ratio	0.25		0.63	0.62	0.38	
v/c Ratio	0.49		0.76	0.45	1.26	
Control Delay	9.2		29.1	9.6	155.5	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	9.2		29.1	9.6	155.5	
LOS	A		C	A	F	
Approach Delay	9.2			17.0	155.5	
Approach LOS	A			B	F	
Queue Length 50th (m)	5.9		30.6	39.8	~182.9	
Queue Length 95th (m)	11.7		42.6	45.3	#220.9	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	576		434	1161	699	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.49		0.74	0.45	1.26	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 79.7
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 76.7 Intersection LOS: E
Intersection Capacity Utilization 76.9% ICU Level of Service D
Analysis Period (min) 15

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

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

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	4827	4800	4694	4719	4717	4720	4757
Vehs Exited	4787	4809	4680	4676	4729	4730	4777
Starting Vehs	106	125	148	94	124	120	134
Ending Vehs	146	116	162	137	112	110	114
Travel Distance (km)	3075	3101	3029	3032	3012	3048	3057
Travel Time (hr)	167.1	190.7	143.5	164.8	135.6	195.8	160.2
Total Delay (hr)	101.0	124.3	78.7	99.9	71.1	130.4	94.5
Total Stops	4742	4832	4233	4399	4255	4598	4343
Fuel Used (l)	355.6	379.1	329.3	349.8	322.3	379.0	345.7

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4752	4709	4703	4742
Vehs Exited	4747	4679	4676	4732
Starting Vehs	107	104	110	113
Ending Vehs	112	134	137	123
Travel Distance (km)	3063	3045	3025	3049
Travel Time (hr)	133.7	176.5	155.0	162.3
Total Delay (hr)	67.9	111.1	90.0	96.9
Total Stops	3965	4761	4344	4447
Fuel Used (l)	320.8	360.4	340.7	348.3

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	4827	4800	4694	4719	4717	4720	4757
Vehs Exited	4787	4809	4680	4676	4729	4730	4777
Starting Vehs	106	125	148	94	124	120	134
Ending Vehs	146	116	162	137	112	110	114
Travel Distance (km)	3075	3101	3029	3032	3012	3048	3057
Travel Time (hr)	167.1	190.7	143.5	164.8	135.6	195.8	160.2
Total Delay (hr)	101.0	124.3	78.7	99.9	71.1	130.4	94.5
Total Stops	4742	4832	4233	4399	4255	4598	4343
Fuel Used (l)	355.6	379.1	329.3	349.8	322.3	379.0	345.7

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	4752	4709	4703	4742
Vehs Exited	4747	4679	4676	4732
Starting Vehs	107	104	110	113
Ending Vehs	112	134	137	123
Travel Distance (km)	3063	3045	3025	3049
Travel Time (hr)	133.7	176.5	155.0	162.3
Total Delay (hr)	67.9	111.1	90.0	96.9
Total Stops	3965	4761	4344	4447
Fuel Used (l)	320.8	360.4	340.7	348.3

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent & North Interchange Loop Performance by movement

4: Spadina Ramp/Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	26.9	66.8	56.8	127.3	171.3	13.8	12.9	17.9	18.8
Average Queue (m)	5.5	31.9	22.4	60.6	65.1	3.7	4.8	5.9	6.2
95th Queue (m)	16.1	58.6	47.8	109.1	127.8	11.8	12.3	15.0	15.6
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)				0	0				
Queuing Penalty (veh)				1	1				
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	9				0	0	0	0
Queuing Penalty (veh)	0	3				0	0	0	0

Intersection: 2: 25th Street East

Movement	WB	WB	SB
Directions Served	T	TR	R
Maximum Queue (m)	202.6	203.3	25.0
Average Queue (m)	94.8	111.2	1.8
95th Queue (m)	237.7	258.4	14.7
Link Distance (m)	195.4	195.4	38.5
Upstream Blk Time (%)	3	6	1
Queuing Penalty (veh)	0	0	1
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Spadina Crescent & North Interchange Loop

Movement	NB	SB
Directions Served	TR	T
Maximum Queue (m)	13.0	7.9
Average Queue (m)	0.5	0.7
95th Queue (m)	5.4	9.1
Link Distance (m)	38.5	143.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (m)	82.6	45.8	68.0	50.0
Average Queue (m)	45.8	20.4	60.9	19.6
95th Queue (m)	70.9	38.0	79.1	59.5
Link Distance (m)	143.6	139.0	61.0	
Upstream Blk Time (%)			19	
Queuing Penalty (veh)			145	
Storage Bay Dist (m)				20.0
Storage Blk Time (%)		9	43	
Queuing Penalty (veh)		0	41	

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.7	18.0	50.9	88.2
Average Queue (m)	4.2	4.2	11.6	33.8
95th Queue (m)	14.4	13.3	38.2	75.1
Link Distance (m)	47.7	63.6	61.0	156.3
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			1	
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	8.4	92.2
Average Queue (m)	1.2	7.1
95th Queue (m)	6.1	47.5
Link Distance (m)	34.2	121.0
Upstream Blk Time (%)		0
Queuing Penalty (veh)		2
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	37.6	62.4	66.0	147.2
Average Queue (m)	7.8	30.5	29.0	131.1
95th Queue (m)	24.1	50.2	55.1	166.7
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				59
Queuing Penalty (veh)				0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)		0	0	
Queuing Penalty (veh)		1	1	

Network Summary

Network wide Queuing Penalty: 197

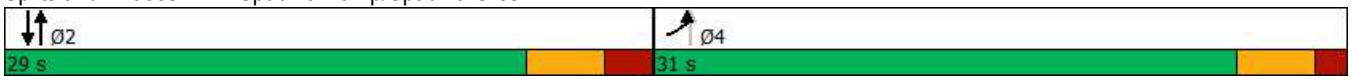
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	455	0	0	183	689	95
Future Volume (vph)	455	0	0	183	689	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	0			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor						
Frt					0.982	
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	0	1827	3510	0
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	0	1827	3510	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					29	
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		4				
Confl. Bikes (#/hr)		9				
Peak Hour Factor	0.72	0.72	0.79	0.79	0.82	0.82
Heavy Vehicles (%)	1%	1%	4%	4%	1%	1%
Adj. Flow (vph)	632	0	0	232	840	116
Shared Lane Traffic (%)						
Lane Group Flow (vph)	632	0	0	232	956	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot			NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4			2 4	2	
Detector Phase	4			2	2	
Switch Phase						
Minimum Initial (s)	10.0			15.0	15.0	
Minimum Split (s)	27.0			27.7	27.7	
Total Split (s)	31.0			29.0	29.0	
Total Split (%)	51.7%			48.3%	48.3%	
Maximum Green (s)	26.0			23.3	23.3	
Yellow Time (s)	3.5			3.5	3.5	
All-Red Time (s)	1.5			2.2	2.2	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.0			5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	Max			None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	13					
Act Effct Green (s)	26.1			57.4	20.6	
Actuated g/C Ratio	0.45			1.00	0.36	
v/c Ratio	0.78			0.13	0.75	
Control Delay	23.1			0.1	19.7	
Queue Delay	0.0			0.0	2.4	
Total Delay	23.1			0.1	22.2	
LOS	C			A	C	
Approach Delay	23.1			0.1	22.2	
Approach LOS	C			A	C	
Queue Length 50th (m)	59.6			0.0	45.5	
Queue Length 95th (m)	69.2			0.0	56.3	
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)						
Base Capacity (vph)	812			1785	1446	
Starvation Cap Reductn	0			0	349	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.78			0.13	0.87	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 57.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 19.7 Intersection LOS: B
Intersection Capacity Utilization 56.2% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Spadina Ramp/Spadina Cres E



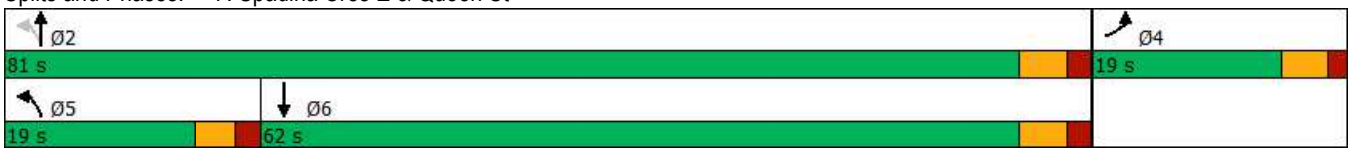
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	33	166	237	389	623	101
Future Volume (vph)	33	166	237	389	623	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				1.00	
Frt	0.887				0.981	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1592	0	1787	1881	1840	0
Flt Permitted	0.992		0.078			
Satd. Flow (perm)	1581	0	147	1881	1840	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	211				13	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	12		1			1
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.70	0.70	0.74	0.74	0.82	0.82
Heavy Vehicles (%)	5%	5%	1%	1%	1%	1%
Adj. Flow (vph)	47	237	320	526	760	123
Shared Lane Traffic (%)						
Lane Group Flow (vph)	284	0	320	526	883	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	19.0		19.0	81.0	62.0	
Total Split (%)	19.0%		19.0%	81.0%	62.0%	
Maximum Green (s)	14.0		14.2	75.5	56.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	12				1	
Act Effct Green (s)	14.2		66.0	65.3	46.3	
Actuated g/C Ratio	0.16		0.73	0.72	0.51	
v/c Ratio	0.66		0.88	0.39	0.93	
Control Delay	20.1		49.9	5.5	36.5	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	20.1		49.9	5.5	36.5	
LOS	C		D	A	D	
Approach Delay	20.1			22.3	36.5	
Approach LOS	C			C	D	
Queue Length 50th (m)	12.5		41.4	30.1	139.1	
Queue Length 95th (m)	19.8		#63.4	32.5	166.4	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	428		369	1582	1174	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.66		0.87	0.33	0.75	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 90.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 28.2 Intersection LOS: C
Intersection Capacity Utilization 76.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Spadina Cres E & Queen St



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	4719	4824	4808	4736	4795	4848	4911
Vehs Exited	4697	4799	4826	4756	4810	4818	4914
Starting Vehs	104	103	98	126	121	92	106
Ending Vehs	126	128	80	106	106	122	103
Travel Distance (km)	3030	3138	3129	3090	3118	3083	3165
Travel Time (hr)	130.7	128.2	121.8	155.1	125.1	132.0	130.3
Total Delay (hr)	65.7	60.8	54.4	88.6	58.2	65.6	62.5
Total Stops	4209	4054	3942	4217	3938	4051	4280
Fuel Used (l)	320.3	324.9	318.9	344.3	320.5	325.2	327.9

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	4800	4674	4759	4789
Vehs Exited	4794	4676	4740	4781
Starting Vehs	107	121	101	104
Ending Vehs	113	119	120	112
Travel Distance (km)	3070	3056	3056	3094
Travel Time (hr)	128.7	119.4	115.0	128.6
Total Delay (hr)	62.7	53.4	49.4	62.1
Total Stops	4296	4019	3812	4081
Fuel Used (l)	323.0	309.0	308.0	322.2

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	4719	4824	4808	4736	4795	4848	4911
Vehs Exited	4697	4799	4826	4756	4810	4818	4914
Starting Vehs	104	103	98	126	121	92	106
Ending Vehs	126	128	80	106	106	122	103
Travel Distance (km)	3030	3138	3129	3090	3118	3083	3165
Travel Time (hr)	130.7	128.2	121.8	155.1	125.1	132.0	130.3
Total Delay (hr)	65.7	60.8	54.4	88.6	58.2	65.6	62.5
Total Stops	4209	4054	3942	4217	3938	4051	4280
Fuel Used (l)	320.3	324.9	318.9	344.3	320.5	325.2	327.9

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	4800	4674	4759	4789
Vehs Exited	4794	4676	4740	4781
Starting Vehs	107	121	101	104
Ending Vehs	113	119	120	112
Travel Distance (km)	3070	3056	3056	3094
Travel Time (hr)	128.7	119.4	115.0	128.6
Total Delay (hr)	62.7	53.4	49.4	62.1
Total Stops	4296	4019	3812	4081
Fuel Used (l)	323.0	309.0	308.0	322.2

4: Spadina Ramp/Spadina Cres E Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Zone Performance

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	TR
Maximum Queue (m)	69.4	40.5	56.2	62.6
Average Queue (m)	37.3	19.1	33.6	36.9
95th Queue (m)	58.3	34.2	53.0	56.2
Link Distance (m)	137.6	134.1	62.4	62.4
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	1
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	45.3	63.1	50.4	130.9
Average Queue (m)	10.9	30.1	21.1	72.7
95th Queue (m)	31.6	52.1	41.6	116.3
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				1
Queuing Penalty (veh)				0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)		0	0	
Queuing Penalty (veh)		2	0	

Zone Summary

Zone wide Queuing Penalty: 3

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

10/07/2019

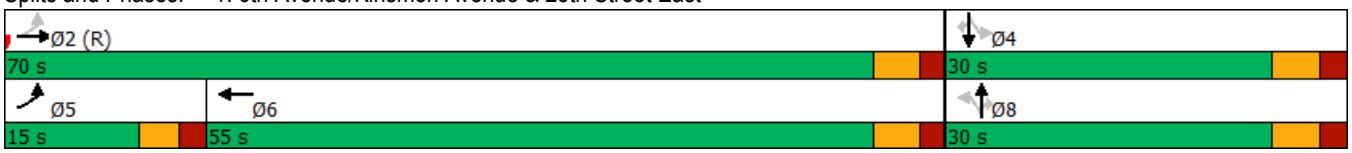
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	1751	27	0	1405	69	8	8	178	84	16	62
Future Volume (vph)	29	1751	27	0	1405	69	8	8	178	84	16	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			0.98	0.94		0.97	0.95
Frt		0.998			0.993				0.850			0.850
Flt Protected	0.950							0.976			0.960	
Satd. Flow (prot)	1486	3177	0	0	3117	0	0	1669	1454	0	1625	1439
Flt Permitted	0.076							0.857			0.744	
Satd. Flow (perm)	119	3177	0	0	3117	0	0	1440	1371	0	1216	1360
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			7				81			81
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	32		11	11		32	30		31	31		30
Confl. Bikes (#/hr)			2			5			4			3
Peak Hour Factor	0.96	0.96	0.96	0.93	0.93	0.93	0.74	0.74	0.74	0.79	0.79	0.79
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	30	1824	28	0	1511	74	11	11	241	106	20	78
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	1852	0	0	1585	0	0	22	241	0	126	78
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	5	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	9.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	14.0	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	15.0	70.0			55.0		30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	15.0%	70.0%			55.0%		30.0%	30.0%	30.0%	30.0%	30.0%	30.0%
Maximum Green (s)	10.0	64.6			49.6		24.3	24.3	24.3	24.3	24.3	24.3
Yellow Time (s)	3.0	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	2.0	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.0	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?	Yes				Yes							
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max			Max		None	None	None	None	None	None
Walk Time (s)		7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)		13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)		11			32		31	31	31	30	30	30
Act Effct Green (s)	70.9	70.5			62.1			18.4	18.4		18.4	18.4
Actuated g/C Ratio	0.71	0.70			0.62			0.18	0.18		0.18	0.18
v/c Ratio	0.14	0.83			0.82			0.08	0.76		0.56	0.25
Control Delay	7.2	16.1			22.7			31.4	39.9		45.7	8.9
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	7.2	16.1			22.7			31.4	39.9		45.7	8.9
LOS	A	B			C			C	D		D	A
Approach Delay		16.0			22.7			39.2			31.6	
Approach LOS		B			C			D			C	
Queue Length 50th (m)	1.8	140.5			154.3			3.6	29.8		22.5	0.0
Queue Length 95th (m)	5.2	198.4			#222.8			8.0	40.2		34.2	7.9
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	221	2239			1937			349	394		295	391
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.14	0.83			0.82			0.06	0.61		0.43	0.20

Intersection Summary

Area Type: CBD
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 86 (86%), Referenced to phase 2:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 21.1 Intersection LOS: C
Intersection Capacity Utilization 100.6% ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East



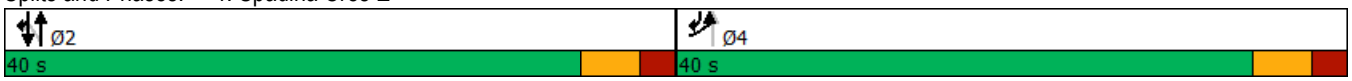
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	611	0	1	514	743	103
Future Volume (vph)	611	0	1	514	743	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			0.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	0	1787	1881	1881	1599
Flt Permitted	0.950		0.117			
Satd. Flow (perm)	1770	0	220	1881	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		14				
Confl. Bikes (#/hr)		12				
Peak Hour Factor	0.94	0.94	0.89	0.89	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	650	0	1	578	799	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	650	0	1	578	799	111
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	15.0		15.0	15.0	15.0	
Minimum Split (s)	27.7		23.7	23.7	23.7	
Total Split (s)	40.0		40.0	40.0	40.0	
Total Split (%)	50.0%		50.0%	50.0%	50.0%	
Maximum Green (s)	34.3		34.3	34.3	34.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	2.2		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.7		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		Max	Max	Max	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	26					
Act Effct Green (s)	34.3		34.3	80.0	34.3	80.0
Actuated g/C Ratio	0.43		0.43	1.00	0.43	1.00
v/c Ratio	0.86		0.01	0.31	0.99	0.07
Control Delay	34.2		14.0	0.4	54.6	0.1
Queue Delay	0.0		0.0	0.0	38.6	0.0
Total Delay	34.2		14.0	0.4	93.2	0.1
LOS	C		B	A	F	A
Approach Delay	34.2			0.4	81.8	
Approach LOS	C			A	F	
Queue Length 50th (m)	90.8		0.1	0.0	122.6	0.0
Queue Length 95th (m)	#155.0		1.0	0.0	#201.7	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)			20.0			
Base Capacity (vph)	758		94	1881	806	1599
Starvation Cap Reductn	0		0	0	261	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.86		0.01	0.31	1.47	0.07

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 45.3 Intersection LOS: D
Intersection Capacity Utilization 82.5% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Spadina Cres E



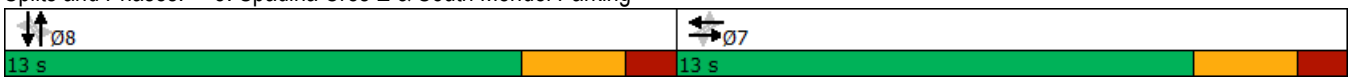
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	43	32	1	37	20	1082	24	22	771	20
Future Volume (vph)	8	0	43	32	1	37	20	1082	24	22	771	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.90			0.95			1.00			1.00	
Frt		0.886			0.929			0.997			0.997	
Flt Protected		0.992			0.978			0.999			0.999	
Satd. Flow (prot)	0	1480	0	0	1704	0	0	1872	0	0	1891	0
Flt Permitted		0.958			0.866			0.983			0.962	
Satd. Flow (perm)	0	1429	0	0	1446	0	0	1842	0	0	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		54			15			5			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			176.0	
Travel Time (s)		4.0			5.5			6.0			12.7	
Confl. Peds. (#/hr)	3		129	129		3	3		19	19		3
Confl. Bikes (#/hr)			6									2
Peak Hour Factor	0.80	0.80	0.80	0.82	0.82	0.82	0.92	0.92	0.92	0.95	0.95	0.95
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	1%	1%	1%	0%	0%	0%
Adj. Flow (vph)	10	0	54	39	1	45	22	1176	26	23	812	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	64	0	0	85	0	0	1224	0	0	856	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (s)	13.0	13.0		13.0	13.0		13.0	13.0		13.0	13.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		3.0			3.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	138	138		138	138							
Act Effct Green (s)		8.6			8.6			17.0			17.0	
Actuated g/C Ratio		0.29			0.29			0.58			0.58	
v/c Ratio		0.14			0.20			1.14			0.81	
Control Delay		3.2			6.4			95.5			22.8	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.2			6.4			95.5			22.8	
LOS		A			A			F			C	
Approach Delay		3.2			6.4			95.5			22.8	
Approach LOS		A			A			F			C	
Queue Length 50th (m)		0.3			2.2			~94.3			~37.7	
Queue Length 95th (m)		2.3			4.4			#128.8			#85.3	
Internal Link Dist (m)		31.9			51.8			59.0			152.0	
Turn Bay Length (m)												
Base Capacity (vph)		531			511			1072			1061	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.12			0.17			1.14			0.81	

Intersection Summary	
Area Type: Other	
Cycle Length: 26	
Actuated Cycle Length: 29.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 61.5	Intersection LOS: E
Intersection Capacity Utilization 83.8%	ICU Level of Service E
Analysis Period (min) 15	

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

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



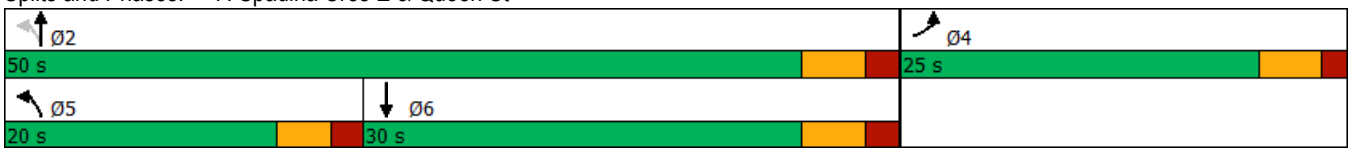
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	125	271	184	946	517	69
Future Volume (vph)	125	271	184	946	517	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98		1.00		0.99	
Frt	0.908				0.984	
Flt Protected	0.984		0.950			
Satd. Flow (prot)	1664	0	1787	1881	1841	0
Flt Permitted	0.984		0.114			
Satd. Flow (perm)	1639	0	213	1881	1841	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	141				9	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		18			18
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	167	361	192	985	601	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	528	0	192	985	681	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	20				18	
Act Effct Green (s)	20.0		45.9	45.2	30.2	
Actuated g/C Ratio	0.26		0.61	0.60	0.40	
v/c Ratio	0.97		0.56	0.88	0.92	
Control Delay	55.4		16.6	24.0	42.6	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	55.4		16.6	24.0	42.6	
LOS	E		B	C	D	
Approach Delay	55.4			22.8	42.6	
Approach LOS	E			C	D	
Queue Length 50th (m)	59.0		11.4	112.8	90.6	
Queue Length 95th (m)	#90.4		29.3	#207.9	#161.6	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	543		445	1129	738	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.97		0.43	0.87	0.92	

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 35.7 Intersection LOS: D
Intersection Capacity Utilization 82.1% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 7: Spadina Cres E & Queen St



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	3:50	3:50	3:50	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	5995	6072	6027	6033	5857	6273	6139
Vehs Exited	5908	6010	5957	5930	5784	6189	6098
Starting Vehs	206	268	281	243	278	247	249
Ending Vehs	293	330	351	346	351	331	290
Travel Distance (km)	3149	3193	3105	3107	2982	3316	3274
Travel Time (hr)	999.4	1119.3	1214.8	1172.5	1217.6	1034.2	959.4
Total Delay (hr)	931.8	1050.9	1148.1	1106.1	1153.7	963.1	889.0
Total Stops	6951	7376	7094	6501	6595	7686	7629
Fuel Used (l)	1072.5	1181.3	1259.2	1219.0	1250.1	1114.2	1048.6

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	5903	6026	6137	6046
Vehs Exited	5812	5943	6015	5965
Starting Vehs	267	263	235	249
Ending Vehs	358	346	357	337
Travel Distance (km)	3034	3141	3184	3148
Travel Time (hr)	1236.4	994.1	1131.5	1107.9
Total Delay (hr)	1171.2	926.8	1063.1	1040.4
Total Stops	6837	6992	7400	7105
Fuel Used (l)	1271.1	1067.8	1189.0	1167.3

Interval #0 Information Seeding

Start Time	3:50
End Time	4:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	5995	6072	6027	6033	5857	6273	6139
Vehs Exited	5908	6010	5957	5930	5784	6189	6098
Starting Vehs	206	268	281	243	278	247	249
Ending Vehs	293	330	351	346	351	331	290
Travel Distance (km)	3149	3193	3105	3107	2982	3316	3274
Travel Time (hr)	999.4	1119.3	1214.8	1172.5	1217.6	1034.2	959.4
Total Delay (hr)	931.8	1050.9	1148.1	1106.1	1153.7	963.1	889.0
Total Stops	6951	7376	7094	6501	6595	7686	7629
Fuel Used (l)	1072.5	1181.3	1259.2	1219.0	1250.1	1114.2	1048.6

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	5903	6026	6137	6046
Vehs Exited	5812	5943	6015	5965
Starting Vehs	267	263	235	249
Ending Vehs	358	346	357	337
Travel Distance (km)	3034	3141	3184	3148
Travel Time (hr)	1236.4	994.1	1131.5	1107.9
Total Delay (hr)	1171.2	926.8	1063.1	1040.4
Total Stops	6837	6992	7400	7105
Fuel Used (l)	1271.1	1067.8	1189.0	1167.3

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

4: Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Zone Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	44.7	111.5	107.2	79.3	81.6	51.3	25.5	27.1	40.3
Average Queue (m)	7.2	68.2	60.9	35.5	34.7	11.9	18.9	16.8	11.3
95th Queue (m)	26.0	101.8	98.2	67.6	69.0	39.6	27.8	28.7	28.1
Link Distance (m)		240.2	240.2	194.2	194.2	168.1			173.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	22				0	19	13	0
Queuing Penalty (veh)	0	6				0	3	8	0

Intersection: 4: Spadina Cres E

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	T
Maximum Queue (m)	148.9	19.9	151.7	69.1
Average Queue (m)	145.5	0.9	143.1	50.5
95th Queue (m)	149.0	11.4	158.7	88.2
Link Distance (m)	143.6		139.0	61.2
Upstream Blk Time (%)	50		90	12
Queuing Penalty (veh)	308		0	52
Storage Bay Dist (m)		20.0		
Storage Blk Time (%)			82	
Queuing Penalty (veh)			1	

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.8	27.4	67.3	161.6
Average Queue (m)	7.5	8.7	62.9	158.7
95th Queue (m)	16.5	19.8	66.8	168.7
Link Distance (m)	43.9	63.6	61.2	157.3
Upstream Blk Time (%)			16	50
Queuing Penalty (veh)			176	403
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	516.3	89.1	120.7	147.4
Average Queue (m)	351.3	21.4	62.1	134.5
95th Queue (m)	669.7	57.1	106.2	161.2
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)	30		1	88
Queuing Penalty (veh)	0		8	0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			8	
Queuing Penalty (veh)			15	

Zone Summary

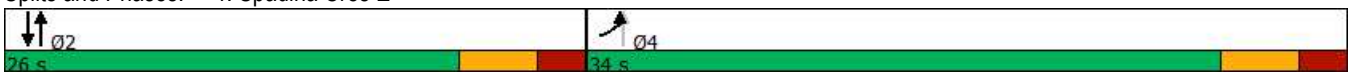
Zone wide Queuing Penalty: 981

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	611	0	0	514	743	103
Future Volume (vph)	611	0	0	514	743	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			0.0
Storage Lanes	1	0	0			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor						
Frt					0.982	
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1881	3510	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1881	3510	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					27	
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		14				
Confl. Bikes (#/hr)		12				
Peak Hour Factor	0.94	0.94	0.89	0.89	0.93	0.93
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	650	0	0	578	799	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	650	0	0	578	910	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	1			2	2	
Detector Template	Left			Thru	Thru	
Leading Detector (m)	2.0			10.0	10.0	
Trailing Detector (m)	0.0			0.0	0.0	
Detector 1 Position(m)	0.0			0.0	0.0	
Detector 1 Size(m)	2.0			0.6	0.6	
Detector 1 Type	Cl+Ex			Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0			0.0	0.0	
Detector 1 Queue (s)	0.0			0.0	0.0	
Detector 1 Delay (s)	0.0			0.0	0.0	
Detector 2 Position(m)				9.4	9.4	
Detector 2 Size(m)				0.6	0.6	
Detector 2 Type				Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)				0.0	0.0	
Turn Type	Prot			NA	NA	
Protected Phases	4			2	2	
Permitted Phases	4			2 4	2	
Detector Phase	4			2	2	
Switch Phase						
Minimum Initial (s)	15.0			15.0	15.0	
Minimum Split (s)	27.7			23.7	23.7	
Total Split (s)	34.0			26.0	26.0	
Total Split (%)	56.7%			43.3%	43.3%	
Maximum Green (s)	28.3			20.3	20.3	
Yellow Time (s)	3.5			3.5	3.5	
All-Red Time (s)	2.2			2.2	2.2	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	5.7			5.7	5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	
Recall Mode	Max			Max	Max	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	26					
Act Effct Green (s)	28.3			60.0	20.3	
Actuated g/C Ratio	0.47			1.00	0.34	
v/c Ratio	0.78			0.31	0.76	
Control Delay	21.8			0.4	21.9	
Queue Delay	0.0			0.0	6.4	
Total Delay	21.8			0.4	28.4	
LOS	C			A	C	
Approach Delay	21.8			0.4	28.4	
Approach LOS	C			A	C	

Intersection Summary	
Area Type: Other	
Cycle Length: 60	
Actuated Cycle Length: 60	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 70.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Cres E

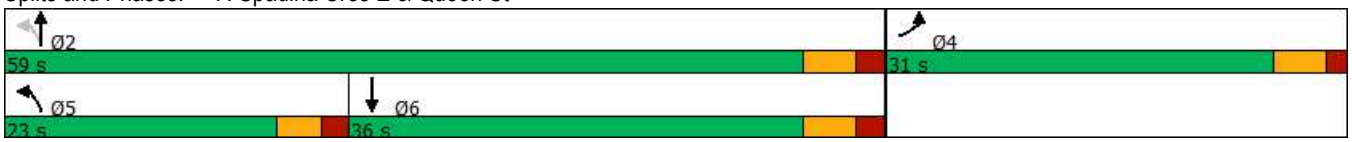


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	125	271	184	946	517	69
Future Volume (vph)	125	271	184	946	517	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98				0.99	
Frt	0.908				0.984	
Flt Protected	0.984		0.950			
Satd. Flow (prot)	1664	0	1787	1881	1841	0
Flt Permitted	0.984		0.103			
Satd. Flow (perm)	1634	0	194	1881	1841	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	122				8	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		18			18
Confl. Bikes (#/hr)						2
Peak Hour Factor	0.75	0.75	0.96	0.96	0.86	0.86
Heavy Vehicles (%)	2%	2%	1%	1%	1%	1%
Adj. Flow (vph)	167	361	192	985	601	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	528	0	192	985	681	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Number of Detectors	2		2	2	2	
Detector Template				Thru	Thru	
Leading Detector (m)	10.0		2.0	10.0	10.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	
Detector 1 Size(m)	2.0		2.0	0.6	0.6	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	
Detector 1 Queue (s)	2.0		2.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	
Detector 2 Position(m)	0.0		0.0	9.4	9.4	
Detector 2 Size(m)	10.0		2.0	0.6	0.6	
Detector 2 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	
Detector 2 Channel						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Detector 2 Extend (s)	0.0		0.0	0.0	0.0	
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	19.0		13.8	20.5	35.5	
Total Split (s)	31.0		23.0	59.0	36.0	
Total Split (%)	34.4%		25.6%	65.6%	40.0%	
Maximum Green (s)	26.0		18.2	53.5	30.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	20				18	
Act Effct Green (s)	26.1		50.4	49.7	34.0	
Actuated g/C Ratio	0.30		0.58	0.58	0.39	
v/c Ratio	0.90		0.61	0.91	0.93	
Control Delay	43.6		21.5	30.1	47.2	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	43.6		21.5	30.1	47.2	
LOS	D		C	C	D	
Approach Delay	43.6			28.7	47.2	
Approach LOS	D			C	D	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 86.3	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 37.3	Intersection LOS: D
Intersection Capacity Utilization 82.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	6:50	6:50	6:50	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	6810	6983	7022	6829	7238	6706	6774
Vehs Exited	6752	6919	6961	6737	7183	6623	6692
Starting Vehs	224	238	271	172	224	210	231
Ending Vehs	282	302	332	264	279	293	313
Travel Distance (km)	3423	3510	3556	3451	3710	3314	3386
Travel Time (hr)	1096.3	869.0	891.1	820.0	524.6	846.2	944.1
Total Delay (hr)	1022.9	793.5	814.7	745.8	444.8	775.1	871.3
Total Stops	7869	8199	8092	8033	8720	7519	8010
Fuel Used (l)	1180.8	990.8	1013.6	944.4	709.1	958.4	1048.7

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	6748	6720	7245	6903
Vehs Exited	6630	6690	7146	6831
Starting Vehs	218	219	181	213
Ending Vehs	336	249	280	292
Travel Distance (km)	3346	3381	3705	3478
Travel Time (hr)	1070.6	894.8	614.5	857.1
Total Delay (hr)	998.7	822.2	535.0	782.4
Total Stops	7329	7755	8360	7991
Fuel Used (l)	1150.8	1005.1	788.0	979.0

Interval #0 Information Seeding

Start Time	6:50
End Time	7:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	6810	6983	7022	6829	7238	6706	6774
Vehs Exited	6752	6919	6961	6737	7183	6623	6692
Starting Vehs	224	238	271	172	224	210	231
Ending Vehs	282	302	332	264	279	293	313
Travel Distance (km)	3423	3510	3556	3451	3710	3314	3386
Travel Time (hr)	1096.3	869.0	891.1	820.0	524.6	846.2	944.1
Total Delay (hr)	1022.9	793.5	814.7	745.8	444.8	775.1	871.3
Total Stops	7869	8199	8092	8033	8720	7519	8010
Fuel Used (l)	1180.8	990.8	1013.6	944.4	709.1	958.4	1048.7

Interval #1 Information Recording

Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	6748	6720	7245	6903
Vehs Exited	6630	6690	7146	6831
Starting Vehs	218	219	181	213
Ending Vehs	336	249	280	292
Travel Distance (km)	3346	3381	3705	3478
Travel Time (hr)	1070.6	894.8	614.5	857.1
Total Delay (hr)	998.7	822.2	535.0	782.4
Total Stops	7329	7755	8360	7991
Fuel Used (l)	1150.8	1005.1	788.0	979.0

Intersection: 4: Spadina Cres E

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	TR
Maximum Queue (m)	143.4	145.9	69.8	73.7
Average Queue (m)	139.5	138.6	36.6	39.5
95th Queue (m)	145.5	142.9	66.6	70.3
Link Distance (m)	137.6	134.1	62.4	62.4
Upstream Blk Time (%)	52	98	1	1
Queuing Penalty (veh)	316	0	3	5
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	458.9	89.4	120.0	143.8
Average Queue (m)	206.3	21.0	62.3	123.3
95th Queue (m)	513.4	57.6	114.8	173.7
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)	6		3	67
Queuing Penalty (veh)	0		29	0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			11	
Queuing Penalty (veh)			20	

Zone Summary

Zone wide Queuing Penalty: 373

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

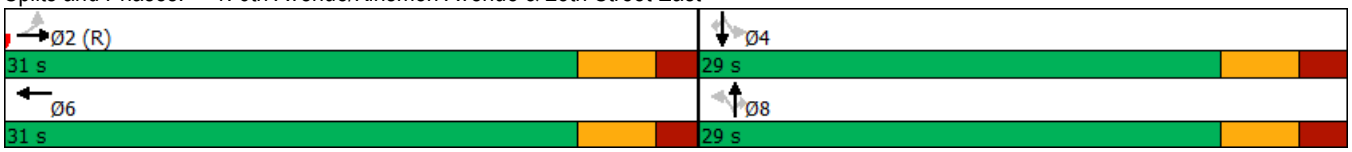
10/08/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1010	26	0	982	37	8	7	48	23	11	29
Future Volume (vph)	28	1010	26	0	982	37	8	7	48	23	11	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			0.99	0.97		0.99	0.97
Frt		0.996			0.995				0.850			0.850
Flt Protected	0.950							0.974			0.967	
Satd. Flow (prot)	1486	3168	0	0	3163	0	0	1666	1454	0	1654	1454
Flt Permitted	0.231							0.856			0.797	
Satd. Flow (perm)	360	3168	0	0	3163	0	0	1449	1409	0	1347	1405
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			8				44			44
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	20		22	22		20	24		21	21		24
Confl. Bikes (#/hr)			4			5			3			4
Peak Hour Factor	0.86	0.86	0.86	0.94	0.94	0.94	0.77	0.77	0.77	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	33	1174	30	0	1045	39	10	9	62	28	13	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	1204	0	0	1084	0	0	19	62	0	41	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	2	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.4	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	31.0	31.0			31.0		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%			51.7%		48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
Maximum Green (s)	25.6	25.6			25.6		23.3	23.3	23.3	23.3	23.3	23.3
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.9	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.4	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max			Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	13.0	13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	22	22			20		21	21	21	24	24	24
Act Effct Green (s)	42.5	42.5			42.5			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.71	0.71			0.71			0.25	0.25		0.25	0.25
v/c Ratio	0.13	0.54			0.48			0.05	0.16		0.12	0.09
Control Delay	10.8	10.8			9.4			14.2	7.8		15.7	4.5
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	10.8	10.8			9.4			14.2	7.8		15.7	4.5
LOS	B	B			A			B	A		B	A
Approach Delay		10.8			9.4			9.3			10.6	
Approach LOS		B			A			A			B	
Queue Length 50th (m)	1.2	34.1			28.8			1.9	1.8		4.1	0.0
Queue Length 95th (m)	7.3	80.8			74.6			4.3	6.1		7.8	3.4
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	255	2247			2245			562	574		523	572
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.13	0.54			0.48			0.03	0.11		0.08	0.06

Intersection Summary	
Area Type:	CBD
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 29 (48%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 10.1	Intersection LOS: B
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	384	0	5	275	516	83
Future Volume (vph)	384	0	5	275	516	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1787	0	1787	1881	1881	1599
Flt Permitted	0.950		0.211			
Satd. Flow (perm)	1787	0	397	1881	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		25				
Confl. Bikes (#/hr)		8				
Peak Hour Factor	0.82	0.82	0.90	0.90	0.88	0.88
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	468	0	6	306	586	94
Shared Lane Traffic (%)						
Lane Group Flow (vph)	468	0	6	306	586	94
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	31.0		34.0	34.0	34.0	
Total Split (%)	47.7%		52.3%	52.3%	52.3%	
Maximum Green (s)	26.0		28.3	28.3	28.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	33					
Act Effct Green (s)	26.2		23.1	60.1	23.1	60.1
Actuated g/C Ratio	0.44		0.38	1.00	0.38	1.00
v/c Ratio	0.60		0.04	0.16	0.81	0.06
Control Delay	18.3		11.6	0.2	26.2	0.1
Queue Delay	0.0		0.0	0.0	5.9	0.0
Total Delay	18.3		11.6	0.2	32.1	0.1
LOS	B		B	A	C	A
Approach Delay	18.3			0.4	27.7	
Approach LOS	B			A	C	
Queue Length 50th (m)	42.2		0.4	0.0	58.2	0.0
Queue Length 95th (m)	66.5		2.4	0.0	90.3	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)			20.0			20.0
Base Capacity (vph)	778		188	1865	891	1585
Starvation Cap Reductn	0		0	0	246	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.60		0.03	0.16	0.91	0.06

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 60.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 18.9 Intersection LOS: B
Intersection Capacity Utilization 57.3% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: Spadina Ramp/Spadina Cres E

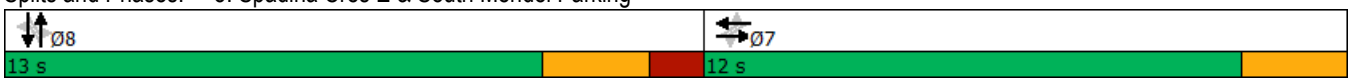
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	14	40	19	23	29	35	581	44	15	540	25
Future Volume (vph)	18	14	40	19	23	29	35	581	44	15	540	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.89			0.95			1.00			1.00	
Frt		0.925			0.945			0.991			0.994	
Flt Protected		0.988			0.987			0.997			0.999	
Satd. Flow (prot)	0	1551	0	0	1756	0	0	1874	0	0	1861	0
Flt Permitted		0.943			0.938			0.959			0.982	
Satd. Flow (perm)	0	1479	0	0	1600	0	0	1801	0	0	1830	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45			39			17			11	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		55.9			75.8			83.0			175.7	
Travel Time (s)		4.0			5.5			6.0			12.7	
Confl. Peds. (#/hr)	2		139	139		2	52					52
Confl. Bikes (#/hr)			3						3			
Peak Hour Factor	0.88	0.88	0.88	0.75	0.75	0.75	0.90	0.90	0.90	0.93	0.93	0.93
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	20	16	45	25	31	39	39	646	49	16	581	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	95	0	0	734	0	0	624	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		52.0%	52.0%		52.0%	52.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		2.0			2.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	142	142		142	142							
Act Effct Green (s)		8.6			8.6			16.6			16.6	
Actuated g/C Ratio		0.31			0.31			0.59			0.59	
v/c Ratio		0.17			0.18			0.69			0.58	
Control Delay		3.8			4.4			16.0			11.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		3.8			4.4			16.0			11.1	
LOS		A			A			B			B	
Approach Delay		3.8			4.4			16.0			11.1	
Approach LOS		A			A			B			B	
Queue Length 50th (m)		0.9			1.5			23.8			18.5	
Queue Length 95th (m)		3.3			3.2			#65.4			#52.0	
Internal Link Dist (m)		31.9			51.8			59.0			151.7	
Turn Bay Length (m)												
Base Capacity (vph)		563			603			1069			1083	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.14			0.16			0.69			0.58	

Intersection Summary	
Area Type: Other	
Cycle Length: 25	
Actuated Cycle Length: 28.1	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Spadina Cres E & South Mendel Parking



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	43	133	143	494	435	34
Future Volume (vph)	43	133	143	494	435	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.898				0.990	
Flt Protected	0.988		0.950			
Satd. Flow (prot)	1637	0	1787	1881	1858	0
Flt Permitted	0.988		0.215			
Satd. Flow (perm)	1617	0	403	1881	1858	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	158				6	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	18		9			9
Confl. Bikes (#/hr)						3
Peak Hour Factor	0.84	0.84	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	3%	3%	1%	1%	1%	1%
Adj. Flow (vph)	51	158	155	537	494	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	0	155	537	533	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	25.0		20.0	30.0	30.0	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?			Yes		Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	18				9	
Act Effct Green (s)	20.0		46.4	45.7	30.0	
Actuated g/C Ratio	0.26		0.61	0.60	0.39	
v/c Ratio	0.38		0.35	0.48	0.73	
Control Delay	9.6		8.6	10.2	26.8	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	9.6		8.6	10.2	26.8	
LOS	A		A	B	C	
Approach Delay	9.6			9.9	26.8	
Approach LOS	A			A	C	
Queue Length 50th (m)	5.9		9.0	40.9	65.5	
Queue Length 95th (m)	19.8		16.4	63.0	105.1	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	546		521	1134	735	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.38		0.30	0.47	0.73	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 76.2	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	5:50	5:50	5:50	5:50	5:50	5:50	5:50
End Time	7:00	7:00	7:00	7:00	7:00	7:00	7:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3781	3811	3764	3832	3758	3908	3872
Vehs Exited	3735	3819	3744	3824	3719	3892	3859
Starting Vehs	85	95	103	96	85	78	82
Ending Vehs	131	87	123	104	124	94	95
Travel Distance (km)	2606	2637	2623	2679	2594	2682	2704
Travel Time (hr)	103.2	88.5	93.6	95.3	87.3	90.5	101.9
Total Delay (hr)	47.7	32.5	37.9	38.3	32.0	33.4	44.2
Total Stops	4160	3654	3910	3964	3592	3796	4190
Fuel Used (l)	254.8	247.1	249.0	254.3	242.5	250.5	259.6

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	5:50	5:50	5:50	5:50
End Time	7:00	7:00	7:00	7:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3777	3797	3889	3818
Vehs Exited	3778	3812	3876	3807
Starting Vehs	90	103	93	84
Ending Vehs	89	88	106	99
Travel Distance (km)	2611	2651	2707	2649
Travel Time (hr)	84.9	111.1	115.5	97.2
Total Delay (hr)	29.4	54.7	57.6	40.8
Total Stops	3562	4541	4661	4006
Fuel Used (l)	241.8	268.1	273.2	254.1

Interval #0 Information Seeding

Start Time	5:50
End Time	6:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	6:00
End Time	7:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	3781	3811	3764	3832	3758	3908	3872
Vehs Exited	3735	3819	3744	3824	3719	3892	3859
Starting Vehs	85	95	103	96	85	78	82
Ending Vehs	131	87	123	104	124	94	95
Travel Distance (km)	2606	2637	2623	2679	2594	2682	2704
Travel Time (hr)	103.2	88.5	93.6	95.3	87.3	90.5	101.9
Total Delay (hr)	47.7	32.5	37.9	38.3	32.0	33.4	44.2
Total Stops	4160	3654	3910	3964	3592	3796	4190
Fuel Used (l)	254.8	247.1	249.0	254.3	242.5	250.5	259.6

Interval #1 Information Recording

Start Time	6:00
End Time	7:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	3777	3797	3889	3818
Vehs Exited	3778	3812	3876	3807
Starting Vehs	90	103	93	84
Ending Vehs	89	88	106	99
Travel Distance (km)	2611	2651	2707	2649
Travel Time (hr)	84.9	111.1	115.5	97.2
Total Delay (hr)	29.4	54.7	57.6	40.8
Total Stops	3562	4541	4661	4006
Fuel Used (l)	241.8	268.1	273.2	254.1

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent & North Interchange Loop Performance by movement

4: Spadina Ramp/Spadina Cres E Performance by movement

5: Spadina Cres E & South Mendel Parking Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	21.1	68.6	58.8	61.4	74.0	10.0	15.8	17.4	12.5
Average Queue (m)	5.8	38.8	28.9	31.9	30.7	2.8	6.2	5.9	4.6
95th Queue (m)	17.0	60.6	53.2	51.9	58.2	9.4	13.6	14.8	12.2
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					0				
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	0	16				0	0	0	0
Queuing Penalty (veh)	1	5				0	0	0	0

Intersection: 2: 25th Street East

Movement	EB	EB	WB	WB	SB
Directions Served	T	TR	T	TR	R
Maximum Queue (m)	28.8	36.9	59.6	60.3	3.0
Average Queue (m)	7.1	7.3	10.1	6.9	0.2
95th Queue (m)	21.0	25.2	37.9	40.0	4.0
Link Distance (m)	194.9	194.9	195.4	195.4	38.5
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Spadina Crescent & North Interchange Loop

Movement	NB
Directions Served	TR
Maximum Queue (m)	18.4
Average Queue (m)	2.3
95th Queue (m)	18.9
Link Distance (m)	38.5
Upstream Blk Time (%)	1
Queuing Penalty (veh)	7
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Spadina Ramp/Spadina Cres E

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (m)	113.4	22.0	90.7	68.8	50.0
Average Queue (m)	53.4	2.0	33.6	51.7	12.8
95th Queue (m)	107.2	12.6	68.2	79.6	48.5
Link Distance (m)	143.6		139.0	61.0	
Upstream Blk Time (%)	1			6	
Queuing Penalty (veh)	6			36	
Storage Bay Dist (m)		20.0			20.0
Storage Blk Time (%)		0	24	31	
Queuing Penalty (veh)		0	1	25	

Intersection: 5: Spadina Cres E & South Mendel Parking

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	21.4	24.1	66.2	155.9
Average Queue (m)	9.2	8.1	51.8	82.9
95th Queue (m)	18.1	17.7	76.6	170.7
Link Distance (m)	47.7	63.6	61.0	156.3
Upstream Blk Time (%)			9	7
Queuing Penalty (veh)			59	41
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	22.2	114.2
Average Queue (m)	8.2	25.8
95th Queue (m)	21.3	99.9
Link Distance (m)	34.2	121.0
Upstream Blk Time (%)	4	3
Queuing Penalty (veh)	0	18
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	34.9	36.0	67.2	107.0
Average Queue (m)	9.1	17.0	35.4	51.7
95th Queue (m)	25.1	29.0	60.2	97.4
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)				2
Queuing Penalty (veh)				0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			1	
Queuing Penalty (veh)			1	

Network Summary

Network wide Queuing Penalty: 199

Lanes, Volumes, Timings
1: 6th Avenue/Kinsmen Avenue & 25th Street East

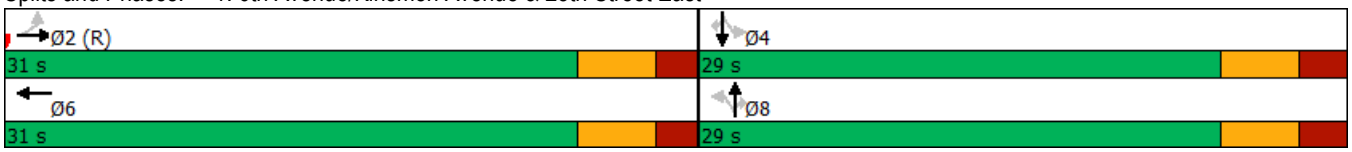
10/08/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	976	20	0	866	45	10	12	42	36	10	42
Future Volume (vph)	41	976	20	0	866	45	10	12	42	36	10	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Storage Length (m)	25.0		0.0	0.0		0.0	0.0		18.0	20.0		20.0
Storage Lanes	1		0	0		0	0		1	1		0
Taper Length (m)	20.0			7.5			7.5			7.5		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			0.99	0.96		0.98	0.96
Frt		0.997			0.993				0.850			0.850
Flt Protected	0.950							0.978			0.962	
Satd. Flow (prot)	1501	3204	0	0	3187	0	0	1672	1454	0	1629	1439
Flt Permitted	0.270							0.874			0.765	
Satd. Flow (perm)	425	3204	0	0	3187	0	0	1480	1401	0	1272	1388
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			11				44			51
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		253.8			214.2			182.9			188.1	
Travel Time (s)		18.3			15.4			13.2			13.5	
Confl. Peds. (#/hr)	14		18	18		14	29		29	29		29
Confl. Bikes (#/hr)						4			2			1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.69	0.69	0.69	0.83	0.83	0.83
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%
Adj. Flow (vph)	43	1017	21	0	902	47	14	17	61	43	12	51
Shared Lane Traffic (%)												
Lane Group Flow (vph)	43	1038	0	0	949	0	0	31	61	0	55	51
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		5.1			4.5			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.25	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA			NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2						8		8	4		4
Detector Phase	2	2			6		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.4	25.4			25.4		27.7	27.7	27.7	27.7	27.7	27.7
Total Split (s)	31.0	31.0			31.0		29.0	29.0	29.0	29.0	29.0	29.0
Total Split (%)	51.7%	51.7%			51.7%		48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
Maximum Green (s)	25.6	25.6			25.6		23.3	23.3	23.3	23.3	23.3	23.3
Yellow Time (s)	3.5	3.5			3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.9	1.9			1.9		2.2	2.2	2.2	2.2	2.2	2.2
Lost Time Adjust (s)	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Lost Time (s)	5.4	5.4			5.4			5.7	5.7		5.7	5.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max			Max		None	None	None	None	None	None
Walk Time (s)	7.0	7.0			7.0		7.0	7.0	7.0	7.0	7.0	7.0
Flash Dont Walk (s)	13.0	13.0			13.0		15.0	15.0	15.0	15.0	15.0	15.0
Pedestrian Calls (#/hr)	18	18			14		29	29	29	29	29	29
Act Effct Green (s)	38.3	38.3			38.3			14.8	14.8		14.8	14.8
Actuated g/C Ratio	0.64	0.64			0.64			0.25	0.25		0.25	0.25
v/c Ratio	0.16	0.51			0.47			0.09	0.16		0.18	0.13
Control Delay	11.0	10.2			9.7			15.0	7.7		16.7	5.3
Queue Delay	0.0	0.0			0.0			0.0	0.0		0.0	0.0
Total Delay	11.0	10.2			9.7			15.0	7.7		16.7	5.3
LOS	B	B			A			B	A		B	A
Approach Delay		10.3			9.7			10.2			11.2	
Approach LOS		B			A			B			B	
Queue Length 50th (m)	1.6	27.0			23.5			3.1	1.7		5.6	0.0
Queue Length 95th (m)	9.4	69.4			61.1			5.2	5.0		9.8	5.0
Internal Link Dist (m)		229.8			190.2			158.9			164.1	
Turn Bay Length (m)	25.0								18.0			20.0
Base Capacity (vph)	271	2047			2039			574	570		493	570
Starvation Cap Reductn	0	0			0			0	0		0	0
Spillback Cap Reductn	0	0			0			0	0		0	0
Storage Cap Reductn	0	0			0			0	0		0	0
Reduced v/c Ratio	0.16	0.51			0.47			0.05	0.11		0.11	0.09

Intersection Summary	
Area Type:	CBD
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 73.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

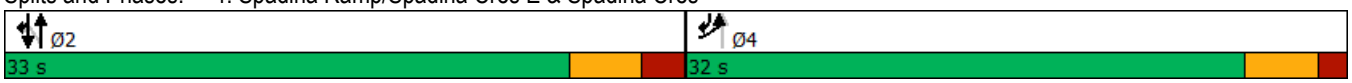


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	367	0	0	296	482	101
Future Volume (vph)	367	0	0	296	482	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			1
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected	0.950					
Satd. Flow (prot)	1787	0	1900	1900	1900	1615
Flt Permitted	0.950					
Satd. Flow (perm)	1787	0	1900	1900	1900	1615
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)						
Link Speed (k/h)	50			50	50	
Link Distance (m)	178.9			163.3	83.0	
Travel Time (s)	12.9			11.8	6.0	
Confl. Peds. (#/hr)		19	2			
Confl. Bikes (#/hr)		14				
Peak Hour Factor	0.82	0.82	0.83	0.83	0.91	0.91
Heavy Vehicles (%)	1%	1%	0%	0%	0%	0%
Adj. Flow (vph)	448	0	0	357	530	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	448	0	0	357	530	111
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	8.3			5.1	7.2	
Link Offset(m)	0.0			0.0	-4.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Perm	NA	NA	custom
Protected Phases	4			2	2	2 4
Permitted Phases	4		2	2 4	2	2 4
Detector Phase	4		2	2	2	2 4
Switch Phase						
Minimum Initial (s)	10.0		15.0	15.0	15.0	
Minimum Split (s)	27.0		27.7	27.7	27.7	
Total Split (s)	32.0		33.0	33.0	33.0	
Total Split (%)	49.2%		50.8%	50.8%	50.8%	
Maximum Green (s)	27.0		27.3	27.3	27.3	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	1.5		2.2	2.2	2.2	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		5.7	5.7	5.7	
Lead/Lag						

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	None	
Walk Time (s)	7.0					
Flash Dont Walk (s)	15.0					
Pedestrian Calls (#/hr)	33					
Act Effct Green (s)	27.2			59.9	22.0	59.9
Actuated g/C Ratio	0.45			1.00	0.37	1.00
v/c Ratio	0.55			0.19	0.76	0.07
Control Delay	16.4			0.2	24.4	0.1
Queue Delay	0.0			0.0	2.8	0.0
Total Delay	16.4			0.2	27.2	0.1
LOS	B			A	C	A
Approach Delay	16.4			0.2	22.5	
Approach LOS	B			A	C	
Queue Length 50th (m)	36.8			0.0	51.8	0.0
Queue Length 95th (m)	61.2			0.0	83.7	0.0
Internal Link Dist (m)	154.9			139.3	59.0	
Turn Bay Length (m)						20.0
Base Capacity (vph)	810			1891	871	1607
Starvation Cap Reductn	0			0	228	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.55			0.19	0.82	0.07

Intersection Summary	
Area Type: Other	
Cycle Length: 65	
Actuated Cycle Length: 59.9	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 54.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Spadina Ramp/Spadina Cres E & Spadina Cres



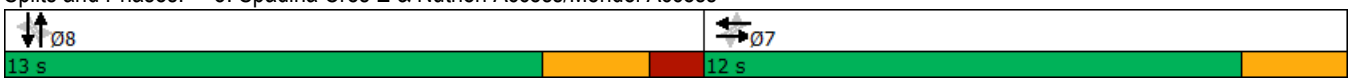
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	27	49	35	16	43	48	567	49	26	499	38
Future Volume (vph)	23	27	49	35	16	43	48	567	49	26	499	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.89			0.93			1.00			1.00	
Frt		0.933			0.938			0.990			0.991	
Flt Protected		0.989			0.982			0.996			0.998	
Satd. Flow (prot)	0	1539	0	0	1750	0	0	1855	0	0	1855	0
Flt Permitted		0.936			0.890			0.941			0.963	
Satd. Flow (perm)	0	1457	0	0	1482	0	0	1752	0	0	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60			57			19			17	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		141.0			240.1			83.0			175.7	
Travel Time (s)		10.2			17.3			6.0			12.7	
Confl. Peds. (#/hr)			169	169			17					17
Confl. Bikes (#/hr)			2									
Peak Hour Factor	0.82	0.82	0.82	0.75	0.75	0.75	0.95	0.95	0.95	0.93	0.93	0.93
Heavy Vehicles (%)	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	28	33	60	47	21	57	51	597	52	28	537	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	121	0	0	125	0	0	700	0	0	606	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		7			7			8			8	
Permitted Phases	7			7			8			8		
Detector Phase	7	7		7	7		8	8		8	8	
Switch Phase												
Minimum Initial (s)	1.0	1.0		1.0	1.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (s)	12.0	12.0		12.0	12.0		13.0	13.0		13.0	13.0	
Total Split (%)	48.0%	48.0%		48.0%	48.0%		52.0%	52.0%		52.0%	52.0%	
Maximum Green (s)	10.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Yellow Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
All-Red Time (s)	0.0	0.0		0.0	0.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		2.0			2.0			3.0			3.0	
Lead/Lag	Lag	Lag		Lag	Lag		Lead	Lead		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None		Max	Max		Max	Max	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Walk Time (s)	7.0	7.0		7.0	7.0							
Flash Dont Walk (s)	3.0	3.0		3.0	3.0							
Pedestrian Calls (#/hr)	171	171		171	171							
Act Effct Green (s)		8.3			8.3			14.5			14.5	
Actuated g/C Ratio		0.32			0.32			0.56			0.56	
v/c Ratio		0.24			0.24			0.71			0.60	
Control Delay		4.2			4.4			16.5			11.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		4.2			4.4			16.5			11.5	
LOS		A			A			B			B	
Approach Delay		4.2			4.4			16.5			11.5	
Approach LOS		A			A			B			B	
Queue Length 50th (m)		1.3			1.4			22.5			17.6	
Queue Length 95th (m)		4.2			3.8			#62.4			#50.3	
Internal Link Dist (m)		117.0			216.1			59.0			151.7	
Turn Bay Length (m)												
Base Capacity (vph)		601			609			988			1009	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.20			0.21			0.71			0.60	

Intersection Summary	
Area Type: Other	
Cycle Length: 25	
Actuated Cycle Length: 25.9	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 12.6	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 5: Spadina Cres E & Nutrien Access/Mendel Access



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	26	130	115	500	448	35
Future Volume (vph)	26	130	115	500	448	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	60.0			0.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99		1.00		1.00	
Frt	0.887				0.990	
Flt Protected	0.992		0.950			
Satd. Flow (prot)	1623	0	1805	1900	1858	0
Flt Permitted	0.992		0.213			
Satd. Flow (perm)	1602	0	403	1900	1858	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	167				6	
Link Speed (k/h)	50			50	50	
Link Distance (m)	582.7			137.7	141.7	
Travel Time (s)	42.0			9.9	10.2	
Confl. Peds. (#/hr)	29		9			9
Peak Hour Factor	0.78	0.78	0.90	0.90	0.87	0.87
Heavy Vehicles (%)	3%	3%	0%	0%	1%	1%
Adj. Flow (vph)	33	167	128	556	515	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	0	128	556	555	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases			2			
Detector Phase	4		5	2	6	
Switch Phase						
Minimum Initial (s)	10.0		9.0	15.0	15.0	
Minimum Split (s)	25.0		20.0	30.0	30.0	
Total Split (s)	25.0		20.0	50.0	30.0	
Total Split (%)	33.3%		26.7%	66.7%	40.0%	
Maximum Green (s)	20.0		15.2	44.5	24.5	
Yellow Time (s)	3.5		3.0	3.5	3.5	
All-Red Time (s)	1.5		1.8	2.0	2.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.0		4.8	5.5	5.5	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	None	Ped	
Walk Time (s)	7.0				23.0	
Flash Dont Walk (s)	7.0				7.0	
Pedestrian Calls (#/hr)	36				9	
Act Effct Green (s)	20.2		42.6	41.9	30.2	
Actuated g/C Ratio	0.28		0.59	0.58	0.42	
v/c Ratio	0.35		0.30	0.51	0.71	
Control Delay	8.1		8.2	10.9	25.3	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	8.1		8.2	10.9	25.3	
LOS	A		A	B	C	
Approach Delay	8.1			10.4	25.3	
Approach LOS	A			B	C	
Queue Length 50th (m)	3.7		7.3	42.9	67.7	
Queue Length 95th (m)	13.9		13.9	65.9	105.4	
Internal Link Dist (m)	558.7			113.7	117.7	
Turn Bay Length (m)			60.0			
Base Capacity (vph)	571		532	1190	777	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.35		0.24	0.47	0.71	

Intersection Summary	
Area Type: Other	
Cycle Length: 75	
Actuated Cycle Length: 72.6	
Natural Cycle: 75	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 55.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Spadina Cres E & Queen St

Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	1:50	1:50	1:50	1:50	1:50	1:50	1:50
End Time	3:00	3:00	3:00	3:00	3:00	3:00	3:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	3732	3629	3626	3611	3709	3657	3787
Vehs Exited	3689	3572	3537	3561	3625	3597	3732
Starting Vehs	98	85	81	90	81	90	62
Ending Vehs	141	142	170	140	165	150	117
Travel Distance (km)	2554	2478	2472	2479	2520	2492	2578
Travel Time (hr)	102.9	108.4	165.8	146.5	126.1	181.9	97.1
Total Delay (hr)	48.4	55.4	112.9	93.5	72.3	128.6	42.2
Total Stops	4095	4127	4498	4292	4235	4312	4079
Fuel Used (l)	253.5	253.0	301.3	286.0	268.7	315.9	250.1

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	1:50	1:50	1:50	1:50
End Time	3:00	3:00	3:00	3:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3678	3556	3588	3657
Vehs Exited	3643	3434	3470	3586
Starting Vehs	106	75	88	78
Ending Vehs	141	197	206	154
Travel Distance (km)	2508	2374	2410	2487
Travel Time (hr)	177.8	163.1	241.1	151.1
Total Delay (hr)	124.4	112.3	189.7	98.0
Total Stops	4998	4272	5094	4398
Fuel Used (l)	316.8	292.7	365.1	290.3

Interval #0 Information Seeding

Start Time	1:50
End Time	2:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	2:00
End Time	3:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	3732	3629	3626	3611	3709	3657	3787
Vehs Exited	3689	3572	3537	3561	3625	3597	3732
Starting Vehs	98	85	81	90	81	90	62
Ending Vehs	141	142	170	140	165	150	117
Travel Distance (km)	2554	2478	2472	2479	2520	2492	2578
Travel Time (hr)	102.9	108.4	165.8	146.5	126.1	181.9	97.1
Total Delay (hr)	48.4	55.4	112.9	93.5	72.3	128.6	42.2
Total Stops	4095	4127	4498	4292	4235	4312	4079
Fuel Used (l)	253.5	253.0	301.3	286.0	268.7	315.9	250.1

Interval #1 Information Recording

Start Time	2:00
End Time	3:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	3678	3556	3588	3657
Vehs Exited	3643	3434	3470	3586
Starting Vehs	106	75	88	78
Ending Vehs	141	197	206	154
Travel Distance (km)	2508	2374	2410	2487
Travel Time (hr)	177.8	163.1	241.1	151.1
Total Delay (hr)	124.4	112.3	189.7	98.0
Total Stops	4998	4272	5094	4398
Fuel Used (l)	316.8	292.7	365.1	290.3

1: 6th Avenue/Kinsmen Avenue & 25th Street East Performance by movement

2: 25th Street East Performance by movement

3: Spadina Crescent/Spadina Cres & North Interchange Loop Performance by movement

4: Spadina Ramp/Spadina Cres E & Spadina Cres Performance by movement

5: Spadina Cres E & Nutrien Access/Mendel Access Performance by movement

6: Spadina Cres E & Mendel North Parking Lot Performance by movement

7: Spadina Cres E & Queen St Performance by movement

Total Network Performance

Intersection: 1: 6th Avenue/Kinsmen Avenue & 25th Street East

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	T	TR	LT	R	LT	R
Maximum Queue (m)	27.1	62.8	57.7	56.8	72.7	15.6	16.1	19.5	16.3
Average Queue (m)	8.6	38.5	27.9	30.6	29.2	3.3	6.1	7.4	5.8
95th Queue (m)	20.9	57.8	49.7	50.6	56.9	10.9	13.7	17.3	14.0
Link Distance (m)		240.2	240.2	194.9	194.9	168.1			173.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0						18.0	20.0	
Storage Blk Time (%)	1	15				0	0	0	0
Queuing Penalty (veh)	3	7				0	0	0	0

Intersection: 2: 25th Street East

Movement	EB	EB	WB	WB	SB
Directions Served	T	TR	T	TR	R
Maximum Queue (m)	29.3	32.4	122.1	131.8	13.3
Average Queue (m)	6.3	6.2	45.2	49.5	0.7
95th Queue (m)	20.0	22.1	162.8	173.1	8.4
Link Distance (m)	194.9	194.9	195.4	195.4	38.5
Upstream Blk Time (%)			9	13	0
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: Spadina Crescent/Spadina Cres & North Interchange Loop

Movement	NB	SB
Directions Served	TR	T
Maximum Queue (m)	51.9	0.9
Average Queue (m)	18.6	0.1
95th Queue (m)	59.8	1.3
Link Distance (m)	38.5	143.6
Upstream Blk Time (%)	22	
Queuing Penalty (veh)	114	
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Spadina Ramp/Spadina Cres E & Spadina Cres

Movement	EB	NB	SB	SB
Directions Served	LR	T	T	R
Maximum Queue (m)	148.3	135.4	68.3	50.0
Average Queue (m)	96.2	74.6	44.7	12.5
95th Queue (m)	175.4	153.9	78.2	47.8
Link Distance (m)	143.6	139.0	61.8	
Upstream Blk Time (%)	20	17	3	
Queuing Penalty (veh)	70	0	18	
Storage Bay Dist (m)				20.0
Storage Blk Time (%)		59	24	
Queuing Penalty (veh)		0	24	

Intersection: 5: Spadina Cres E & Nutrien Access/Mendel Access

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	19.5	18.7	68.1	159.0
Average Queue (m)	9.6	8.6	61.3	115.3
95th Queue (m)	17.5	16.8	76.5	200.2
Link Distance (m)	132.8	228.9	61.8	155.8
Upstream Blk Time (%)			24	23
Queuing Penalty (veh)			158	125
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Spadina Cres E & Mendel North Parking Lot

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	8.4	17.4	123.8
Average Queue (m)	2.1	1.0	61.1
95th Queue (m)	8.0	19.1	161.8
Link Distance (m)	34.2	155.8	121.0
Upstream Blk Time (%)			22
Queuing Penalty (veh)			125
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Spadina Cres E & Queen St

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	72.3	46.7	81.2	115.3
Average Queue (m)	15.9	13.7	37.8	76.6
95th Queue (m)	57.7	31.8	70.4	154.5
Link Distance (m)	569.4		121.0	133.9
Upstream Blk Time (%)			0	31
Queuing Penalty (veh)			2	0
Storage Bay Dist (m)		60.0		
Storage Blk Time (%)			2	
Queuing Penalty (veh)			2	

Network Summary

Network wide Queuing Penalty: 648

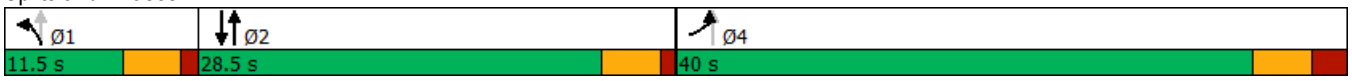
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	611	0	1	514	743	103
Future Volume (vph)	611	0	1	514	743	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	0.0	20.0			20.0
Storage Lanes	1	0	1			0
Taper Length (m)	7.5		30.0			
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95
Frt					0.982	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1770	0	1770	1863	3476	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1770	0	1770	1863	3476	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)					19	
Link Speed (k/h)	50			50	50	
Link Distance (m)	196.9			204.5	142.4	
Travel Time (s)	14.2			14.7	10.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	664	0	1	559	808	112
Shared Lane Traffic (%)						
Lane Group Flow (vph)	664	0	1	559	920	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Turn Type	Prot		Prot	NA	NA	
Protected Phases	4		1	2	2	
Permitted Phases				1 2 4		
Detector Phase	4		1	2	2	
Switch Phase						
Minimum Initial (s)	10.0		7.0	5.0	5.0	
Minimum Split (s)	27.7		11.5	22.5	22.5	
Total Split (s)	40.0		11.5	28.5	28.5	
Total Split (%)	50.0%		14.4%	35.6%	35.6%	
Maximum Green (s)	34.3		7.0	24.0	24.0	
Yellow Time (s)	3.5		3.5	3.5	3.5	
All-Red Time (s)	2.2		1.0	1.0	1.0	
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	
Total Lost Time (s)	5.7		4.5	4.5	4.5	
Lead/Lag			Lead	Lag	Lag	
Lead-Lag Optimize?			Yes	Yes	Yes	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	Max		None	Min	Min	
Walk Time (s)	7.0			7.0	7.0	

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Flash Dont Walk (s)	15.0			11.0	11.0	
Pedestrian Calls (#/hr)	30			0	0	
Act Effct Green (s)	34.5		7.0	69.7	22.9	
Actuated g/C Ratio	0.49		0.10	1.00	0.33	
v/c Ratio	0.76		0.01	0.30	0.80	
Control Delay	23.1		31.0	0.4	27.9	
Queue Delay	0.0		0.0	0.0	0.0	
Total Delay	23.1		31.0	0.4	27.9	
LOS	C		C	A	C	
Approach Delay	23.1			0.5	27.9	
Approach LOS	C			A	C	
Queue Length 50th (m)	66.6		0.1	0.0	55.0	
Queue Length 95th (m)	#160.1		1.7	0.0	#106.2	
Internal Link Dist (m)	172.9			180.5	118.4	
Turn Bay Length (m)			20.0			
Base Capacity (vph)	876		178	1841	1216	
Starvation Cap Reductn	0		0	0	0	
Spillback Cap Reductn	0		0	0	0	
Storage Cap Reductn	0		0	0	0	
Reduced v/c Ratio	0.76		0.01	0.30	0.76	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 69.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 19.2 Intersection LOS: B
Intersection Capacity Utilization 69.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 22:



Summary of All Intervals

Run Number	1	10	2	3	4	5	6
Start Time	3:50	3:50	3:50	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1	1
Vehs Entered	7165	6582	7100	6868	7130	6857	6744
Vehs Exited	7067	6606	6974	6754	7049	6742	6673
Starting Vehs	188	258	204	185	232	230	236
Ending Vehs	286	234	330	299	313	345	307
Travel Distance (km)	3647	3280	3556	3464	3650	3373	3329
Travel Time (hr)	611.7	875.5	798.8	839.6	728.2	1015.1	978.3
Total Delay (hr)	533.3	804.8	722.5	765.2	650.0	942.7	906.8
Total Stops	8260	7879	8347	7635	8531	8042	7589
Fuel Used (l)	779.9	980.8	936.6	960.5	879.9	1108.6	1069.6

Summary of All Intervals

Run Number	7	8	9	Avg
Start Time	3:50	3:50	3:50	3:50
End Time	5:00	5:00	5:00	5:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	7038	6986	7155	6965
Vehs Exited	6961	6924	7049	6879
Starting Vehs	256	230	210	220
Ending Vehs	333	292	316	303
Travel Distance (km)	3567	3586	3633	3508
Travel Time (hr)	745.3	762.5	750.6	810.6
Total Delay (hr)	668.5	685.4	672.6	735.2
Total Stops	8066	8382	8171	8091
Fuel Used (l)	888.1	905.2	898.8	940.8

Interval #0 Information Seeding

Start Time	3:50
End Time	4:00
Total Time (min)	10

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	10	2	3	4	5	6
Vehs Entered	7165	6582	7100	6868	7130	6857	6744
Vehs Exited	7067	6606	6974	6754	7049	6742	6673
Starting Vehs	188	258	204	185	232	230	236
Ending Vehs	286	234	330	299	313	345	307
Travel Distance (km)	3647	3280	3556	3464	3650	3373	3329
Travel Time (hr)	611.7	875.5	798.8	839.6	728.2	1015.1	978.3
Total Delay (hr)	533.3	804.8	722.5	765.2	650.0	942.7	906.8
Total Stops	8260	7879	8347	7635	8531	8042	7589
Fuel Used (l)	779.9	980.8	936.6	960.5	879.9	1108.6	1069.6

Interval #1 Information Recording

Start Time	4:00
End Time	5:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	7	8	9	Avg
Vehs Entered	7038	6986	7155	6965
Vehs Exited	6961	6924	7049	6879
Starting Vehs	256	230	210	220
Ending Vehs	333	292	316	303
Travel Distance (km)	3567	3586	3633	3508
Travel Time (hr)	745.3	762.5	750.6	810.6
Total Delay (hr)	668.5	685.4	672.6	735.2
Total Stops	8066	8382	8171	8091
Fuel Used (l)	888.1	905.2	898.8	940.8

22: Performance by movement

Intersection: 22:

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	TR
Maximum Queue (m)	110.7	7.7	112.9	84.8	73.4
Average Queue (m)	58.3	0.3	62.9	55.2	41.4
95th Queue (m)	96.7	5.4	99.4	78.9	68.9
Link Distance (m)	173.3		183.5	132.3	132.3
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (m)		20.0			
Storage Blk Time (%)			43		
Queuing Penalty (veh)			0		

MOVEMENT SUMMARY

Site: 102 [2Lane - Spadina Crescent and Spadina Ramp - Sidra]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Spadina Cres											
11	T1	630	1.0	0.716	9.3	LOS A	5.6	39.6	0.76	0.98	37.4
12	R2	237	1.0	0.397	8.5	LOS A	1.7	12.3	0.63	0.82	42.0
Approach		867	1.0	0.716	9.1	LOS A	5.6	39.6	0.73	0.94	39.3
East: Spadina Ramp											
1	L2	1	1.0	0.965	38.4	LOS D	19.7	139.1	1.00	1.64	27.9
3	R2	578	1.0	0.965	33.9	LOS C	19.7	139.1	1.00	1.64	29.5
Approach		579	1.0	0.965	33.9	LOS C	19.7	139.1	1.00	1.64	29.5
North: Spadina Cres											
4	L2	799	1.0	0.272	7.3	LOS A	2.3	16.1	0.03	0.58	45.9
5	T1	111	1.0	0.272	2.8	LOS A	2.3	16.1	0.03	0.56	41.8
Approach		910	1.0	0.272	6.8	LOS A	2.3	16.1	0.03	0.58	45.7
All Vehicles		2355	1.0	0.965	14.3	LOS B	19.7	139.1	0.52	0.97	38.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [2Lane+Bypass - Spadina Crescent and Spadina Ramp - Sidra]

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Spadina Cres											
11	T1	630	1.0	0.715	9.3	LOS A	5.6	39.5	0.76	0.98	37.4
12	R2	237	1.0	0.397	8.5	LOS A	1.7	12.3	0.63	0.82	42.0
Approach		867	1.0	0.715	9.1	LOS A	5.6	39.5	0.72	0.94	39.3
East: Spadina Ramp											
1	L2	1	1.0	0.002	9.9	LOS A	0.0	0.1	0.64	0.56	40.2
3	R2	578	1.0	0.302	2.5	LOS A	0.0	0.0	0.00	0.36	47.9
Approach		579	1.0	0.302	2.5	LOS A	0.0	0.1	0.00	0.36	47.9
North: Spadina Cres											
4	L2	799	1.0	0.272	7.3	LOS A	2.0	14.2	0.02	0.59	45.9
5	T1	111	1.0	0.272	2.8	LOS A	2.0	14.2	0.02	0.56	41.8
Approach		910	1.0	0.272	6.8	LOS A	2.0	14.2	0.02	0.58	45.7
All Vehicles		2355	1.0	0.715	6.6	LOS A	5.6	39.5	0.28	0.66	44.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.