Children's Hospital of Eastern Ontario (CHEO) 1Door4Care Phase 1A - Parking Garage Traffic Impact Assessment

B+H Architects

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401 Smyth Road – CHEO Parking Garage Phase 1A Traffic Impact Assessment – Analysis Submission

Prepared By:
EXP Services Inc.
2650 Queensview Drive, Suite 100
Ottawa, ON K2B 8H6

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Prepared By:	Dan Kang, **P. Eng.**		
Reviewed By:	Greg Kent, **P.Eng.**		

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Introduction

EXP was retained by B+H Architects on behalf of Children's Hospital of Eastern Ontario (CHEO) to prepare a Traffic Impact Assessment (TIA) for the parking garage being constructed as a part of the Phase 1 1Door4Care (1D4C) hospital expansion located at 401 Smyth Road. The proposed parking garage is to be located on the northeast corner of the Ring Road (E-W) and Emergency Access Road Intersection as shown in ***Figure 1***. The new parking garage is anticipated to house 1,083 parking spaces. Throughout this report the parking garage is considered to be the proposed development. The 1D4C building will have a separate and subsequent TIA completed and it will address the trip generation and travel impacts associated with it.

Figure 1: Site Location

1. Screening

A TIA screening form for the proposed development was completed to identify the needs of the TIA. A copy of the completed screening form is attached to this report as ***Appendix A*** and the findings are as follows:

TRIP GENERATION	The proposed parking garage is anticipated to include 1,083 parking spaces. On its opening, the parking garage will replace existing surface parking lots currently used to service existing hospital trips. These surface parking lots will be displaced by the parking garage and the 1D4C building construction. However, given a pent-up demand for CHEO staff parking passes and room within the new garage to accommodate them before the occupation of the 1D4C building, some new vehicle trips will be generated. As a result, building the new parking garage will create more than 60 new vehicle trips; thus, it triggers the trip generation component of the TIA.
LOCATION	The parking garage is not in a design priority area or transit-oriented development zone and does not propose a new driveway to a boundary street; thus, the location triggers are not satisfied.
SAFETY	The proposed development does not trigger any of the safety triggers.

Upon review of the City's screening assessment, EXP has confirmed the need to complete a TIA for the proposed development.

2. Scoping

2.1 Existing and Planned Conditions

2.1.1 Proposed Development

CHEO is planning to expand hospital facilities within the existing CHEO campus. This includes a proposed treatment center for children called 1Door4Care. As shown in ***Figure 1***, the building is anticipated to displace an existing surface parking lot currently in that location. It is anticipated that the 1D4C building will be occupied by 2027. As part of this expansion, a new 33,500 m^2 parking garage will also be constructed within the CHEO campus and it represents the "proposed development" in this TIA.

The parking garage will be constructed in 2024, prior to the 1D4C expansion that is expected to be complete by 2027. **Table 1** shows the breakdown of existing visitor/parking spaces in Lot B, Lot E and the new parking garage building.

Table 1: Parking Space Breakdown

Parking Facility	Staff Parking Spaces	Visitor Parking Spaces
Lot B	286	-
Lot E	-	270
New parking Garage	769	314

It should be noted that the current number of visitor parking spaces provided in Lot E is less than the amount that will be provided on the first two levels of the new parking garage. In addition, if the demand for visitor parking exceeds the available spaces, additional visitor parking will be permitted on the remaining upper levels of the new parking garage.

The parking garage will be in the northwest quadrant of the intersection of General Hospital Access Road and Ring Road (E-W). The parking garage is expected to be a 7-storey structure that houses 1,083 parking spaces, including and open-air roof level. The first two floors of the proposed structure will service visitor parking demand and the 5 floors above will service staff parking demand. It is anticipated that this parking garage will be constructed and open for use by 2024.

On it's opening, the parking garage will replace Lot E, an existing 270 stall gravel visitor parking lot, and Lot B, an existing 286 stall staff parking lot, which will be displaced by the 1D4C building. ***Figure 2*** illustrates the parking lot impact due to the parking garage and the future 1D4C building construction.

Figure 2: Parking Facilities

The site is currently zoned as Major Institutional (I2) Zone. The purpose of the Zone I2 is to:

- Ensure that major institutional uses such as hospitals, colleges, and universities are located at appropriate locations within areas designated as General Urban Area, Central Area, and Mixed-Use Centre in the Official Plan;
- Ensure that these large-scale high traffic generating institutions locate only on large parcels of land, with direct access to an arterial road and near rapid transit stations and/or service;
- Impose regulations that ensure that the size and intensity of these uses are compatible with adjacent uses; and
- Permit minor institutional uses and provide for a range of ancillary service uses.

Table 2 outlines the proposed land uses that will be referenced for this analysis as identified and obtained from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual 11th Edition*. Please note that the parking garage is not anticipated to generate any new trips on its own but will facilitate the need for a pent-up demand that will generate new auto trips to the campus. There are up to 360 staff on an existing parking waitlist. It is assumed spare spaces in the parking garage will be filled by this waitlist. Information provided by the Trip Generation Manual with assist in identifying the share of the 360 staff parking volumes occurring at the peak travel times and the splits in and out of the garage.

Table 2: Proposed Land Use

Land Use Code	Size	Land Use
610	33,500 m^2	Hospital

Due to the 24/7 nature of hospital operations, staff will arrive during different periods of time throughout the day. While there will be an opportunity to accommodate more than 360 staff on an existing staff parking waitlist, the proposed parking garage is intended only to replace existing surface parking lots that will be removed and meet the minimum zoning by-law requirement for the proposed 1D4C development. There will be no oversupply of parking and we do not anticipate that the proposed parking structure will compromise long-term transportation demand management and sustainable mode share goals for the hospital campus. Such objectives can continue to be met by staff parking policy and pricing that continues to favour the use of public transit and alternative modes of travel.

Vehicle access to the parking garage is anticipated to be provided from Ring Road (E-W) via a full movement access.

2.1.2 Existing Conditions

Roads and Traffic Control

The characteristics of the roads and intersections in the vicinity of the subject site are described below. Although an analysis of all intersections identified below has been undertaken, the focus of the TIA is to address the operation of those intersections that fall under the jurisdiction of the City of Ottawa and not those on the hospital road network.

- Smyth Road
    - Smyth Road is a four-lane east-west running arterial road which features a posted speed limit of 50 km/h. The road features an urban cross-section with sidewalks on both sides of the road. Two signalized intersections serve the overall hospital and medical campus (CHEO/Ottawa General Hospital): Smyth Road / Ring Road (N-S) / South Haven Place (more focused to serve CHEO) and Smyth Road / General Hospital Access Road. Smyth Road / Ring Road (N-S) / South Haven Place features no turn lanes on Smyth Road. Smyth Road / General Hospital Access Road (more focused on serving OGH) features an eastbound left-turn lane and a westbound right-turn lane. Smyth Road is classified as a Spine Cycling Route and Truck Route by the City of Ottawa.
- Ring Road
    - Ring Road is a two-lane road with a posted speed of 50 km/h that circles the CHEO and the General Hospital Campus. Portions of Ring Road have sidewalk; however, it is not a continuous network. The northern portion of Ring Road features a multi-use path on its north side. The intersection of Ring Road (N-S) / Ring Road (E-W) in the southwest area of the campus is stop-controlled in the E-W direction. The Smyth Road / Ring Road (N-S) / South Haven Place intersection is signalized with southbound left and right turn lanes. North and southbound thru movements are not permitted at this intersection.
- General Hospital Access Road
    - General Hospital Access Road is a north-south running local road that connects Ring Road to Smyth Road and provides access to the Ottawa Hospital General Campus. The road features sidewalks on both sides of the road. The intersection of Smyth Road / General Hospital Access Road features two southbound left turn lanes and one right turn lane. The intersection with Ring Road (E-W) is stop-controlled in the southbound, eastbound, and westbound directions, and is free-flowing in the northbound direction.
- Hospital Link Road
    - Hospital Link Road is an east-west running two-lane local road with a posted speed of 50 km/h. The road connects Ring Road to Alta Vista Road. There is no sidewalk along Hospital Link Road; however, there is a bi-directional multiuse path on its south side.

The existing lane configuration and traffic controls for the study area road network are presented in ***Figure*** 3.

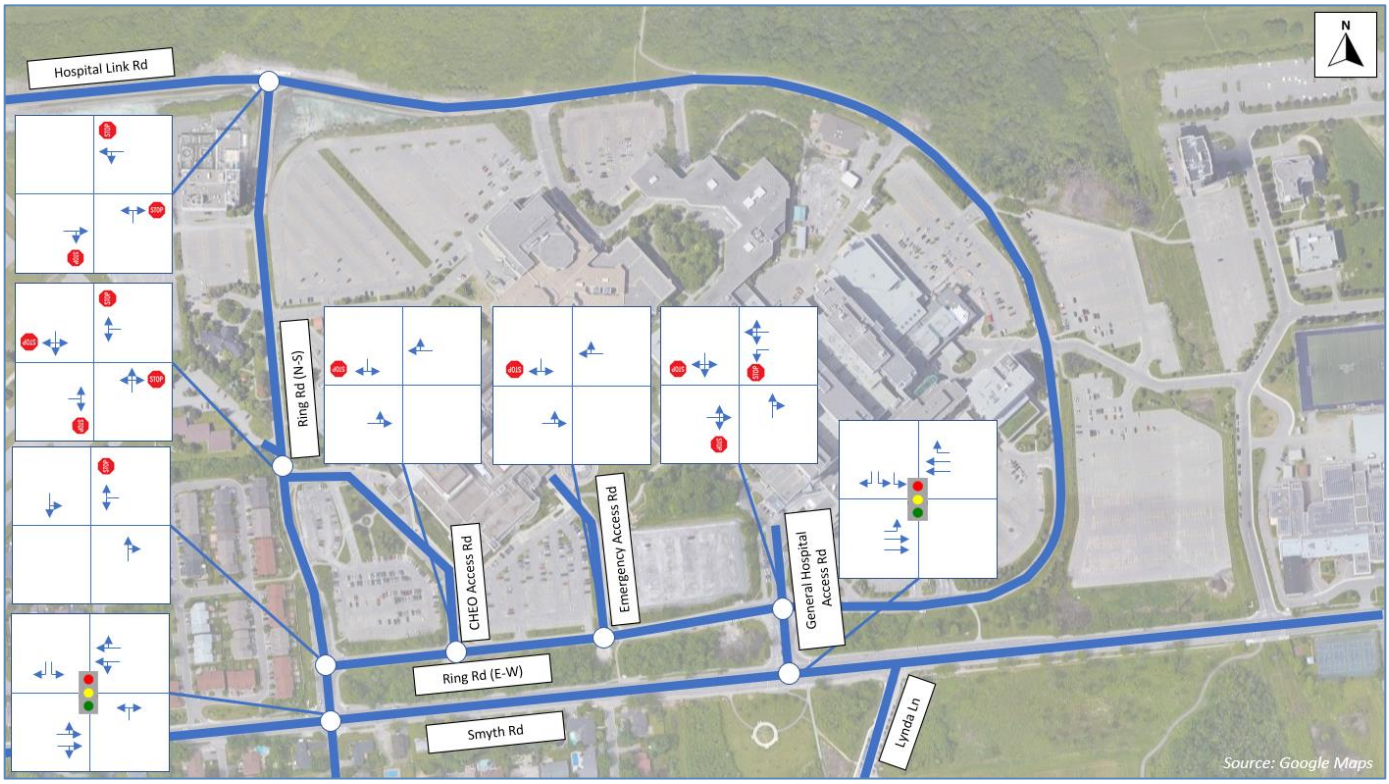

Figure 3: Existing Lane Configuration and Traffic Controls

Walking and Cycling

Walking and cycling facilities are somewhat limited within and around the CHEO campus. Existing facilities are as follows:

- Smyth Road features sidewalk on both sides of the road.
- The northern portion of Ring Road has a bi-directional multi-use path on its north side.
- Sidewalks are present intermittently along portions of Ring Road.

Existing Transit Operations

The following transit routes pass by or enter the CHEO Campus:

- Route 45: Hospital to Hurdman & N Rideau
    - Route 45 is a route that runs between CHEO Campus and Hurdman Station. It runs 7 days a week with 15-minute weekday headways and 30-minute weekend headways. In the vicinity of the CHEO Campus, bus stops are located in the eastbound and northbound direction of Ring Road.
- Route 55: Elmvale to Westgate
    - Route 55 is a route that runs between Elmvale and Westgate, stopping at the CHEO front door as part of its route. It runs 7 days a week with 15-minute weekday headways and 30-minute weekend headways. In the vicinity of the CHEO Campus, a few bus stops are located along Ring Road and Smyth Road.
- Route 609: De La Salle to Elmvale
    - Route 609 is a route that runs between De La Salle and Elmvale, stopping along Smyth Road as part of its route. It runs a limited service on weekdays only. In the vicinity of the CHEO Campus, a few bus stops are located along Smyth Road.

- Route 645: Hurdman
    - The first stop of the Route 645 is Smyth / Franco-Cité and the last stop is Hurdman Station stop A. Route 645 is operational during Wednesday, Thursday, and Friday, serving 10 stops and the total trip duration for this route is approximately 20 minute.

Snippets of the four route maps associated with these routes are shown in ***Figure 4***.

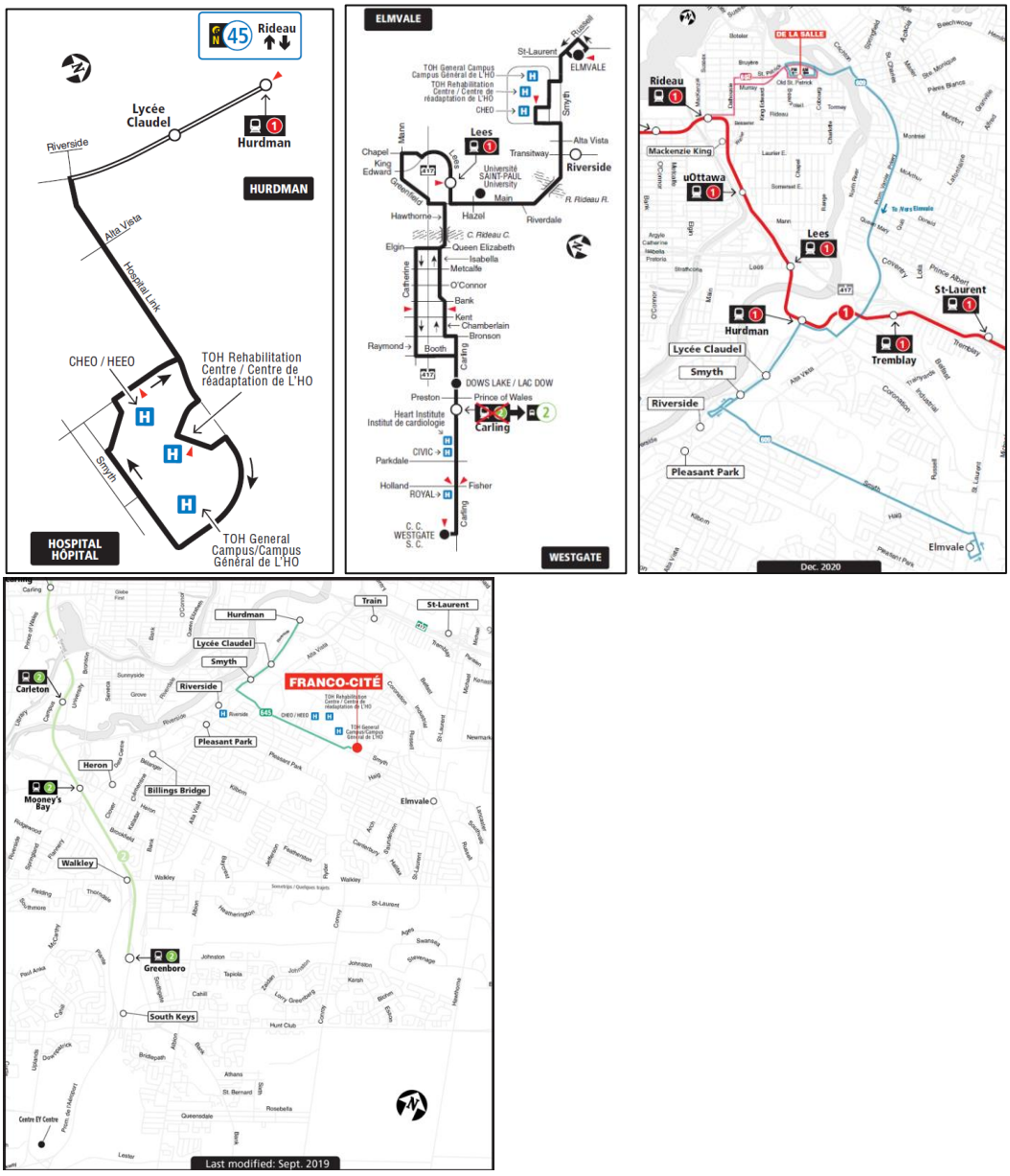

Figure 4: OC Transpo Transit Route Maps 45, 55, 609 and 645

Existing Traffic Management Measures

There are no existing traffic management measures currently provided near the site.

Traffic Volumes

Traffic volumes at the study intersections were provided by the City of Ottawa's Public Works Department or taken from a CHEO expansion traffic study completed by Stantec in September 2022. The Stantec report includes the City of Ottawa's traffic counts data are attached as ***Appendix B***. Turning movement counts were collected during weekday AM and PM peak periods. ***Table 3*** shows the month and year that traffic counts were collected.

Table 3: Collected Turning Movement Counts

Location	Month / Year	Source*
Ring Road (N-S) / Hospital Link Road	February / 2020	Stantec Traffic Study
Ring Road (N-S) / CHEO Access Road	February / 2020	Stantec Traffic Study
Ring Road (N-S) / Ring Road (E-W)	February / 2020	Stantec Traffic Study
Ring Road (N-S) / Smyth Road	October / 2022	City of Ottawa Traffic Count
CHEO Access Road / Ring Road (E-W)	February / 2020	Stantec Traffic Study
Emergency Access Road / Ring Road (E-W)	February / 2020	Stantec Traffic Study
General Hospital Access Road / Ring Road (E-W)	February / 2020	Stantec Traffic Study
General Hospital Access Road / Smyth Road	December / 2019	City of Ottawa Traffic Count

**Stantec Traffic Study is the 1Door4Care: Children's Hospital of Eastern Ontario (CHEO) 1Door4Care Project – Transportation Study (September 2022) prepared by Stantec.*

To develop 2022 traffic volumes, a 1.0 % annual growth rate was applied to the traffic counts collected prior to 2022. To develop the 1.0 % growth rate, the City of Ottawa's long-range model (Exhibit 2.11 of the 2013 TMP) was used to provide the growth rate to/from the inner suburbs between 2011 and 2031.

It should be noted that the growth rate was only applied to traffic along Smyth Road as traffic growth on the CHEO campus is largely based on the expansion of on-site services and facilities. ***Figure 5*** illustrates the existing 2022 traffic volumes at the study area intersections.

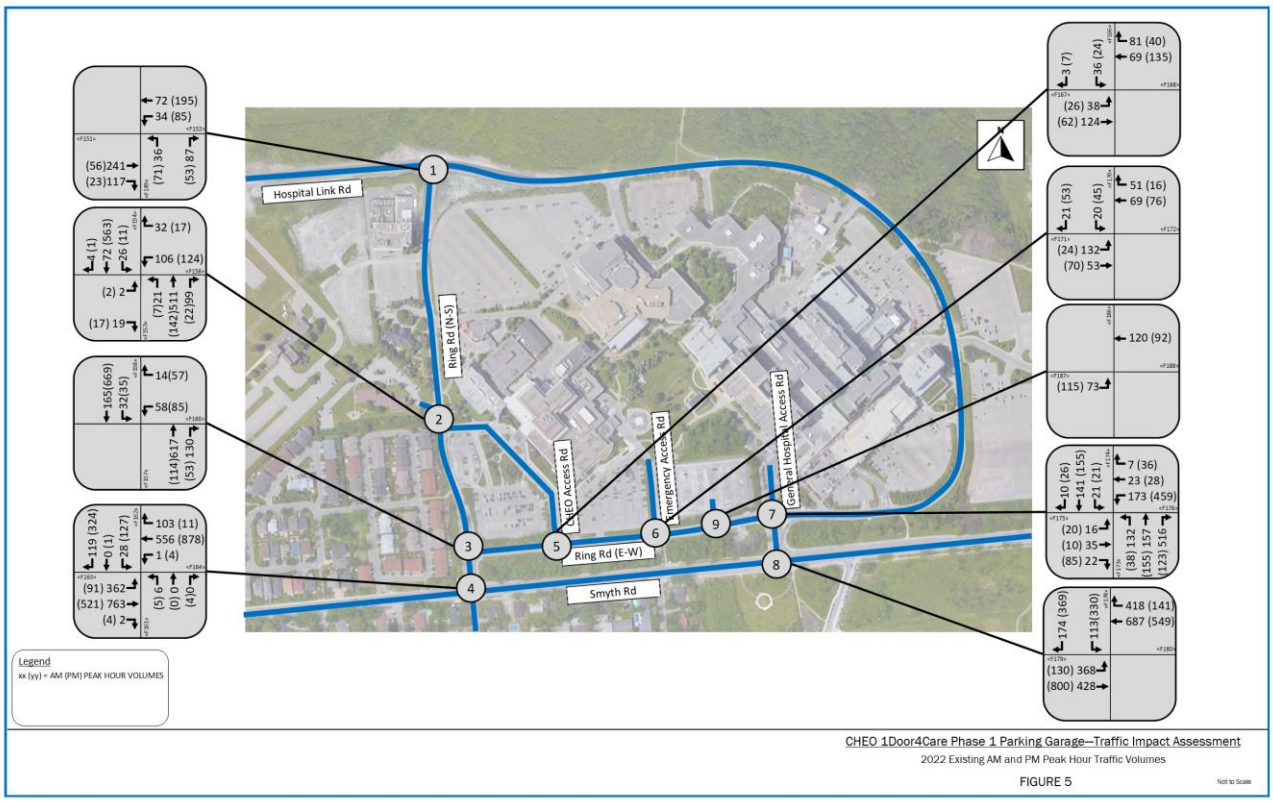

Figure 5: Existing 2022 AM and PM Peak Hour Volumes

Collision History

Collision data was provided by the City of Ottawa for the period of 2016 to 2020 along Smyth Road. Collision data was not available within the hospital campus as these are private roads. The collision data was reviewed to determine if there are any collision patterns during the five (5) year period. ***Table 4*** provides a summary of the collision data. The raw collision data can be found in ***Appendix C***.

Table 4: Collision Data Summary

	Collision Type	Ring Road (N-S) / Smyth Road	General Hospital Access / Smyth Road	Smyth Road between Ring Road (N-S) and General Hospital Access
Total	All	17	18	5
Classification	Non-Fatal Injury	4	1	2
	Property Damage Only	13	16	3
	Non-Reportable	-	1	-
Collision Type	Rear End	8	8	2
	Sideswipe	3	5	2
	Turning Movement	5	4	1
	Angle	1	-	-
	SMV Other	-	1	-
Driver Action	Following Too Close	6	4	1
	Failed to yield right-of-way	6	1	-
	Improper Lane Change	2	1	-
	Speed too fast for condition	1	-	-
	Lost Control	-	3	-
	Disobeyed Traffic Control	-	1	-
	Improper Turn	-	2	-
	Driving Properly	-	1	-
	Unknown	2	5	2
	Other	-	-	2
Environment	Clear	12	14	4
	Rain	3	2	1
	Snow	2	2	-
Light	Dawn	1	2	-
	Daylight	12	10	2
	Dusk	1	2	1
	Dark	3	4	2

The collision data presented in ***Table 4*** found that approximately 1 in 5 collisions that occurred along this section of Smyth Road resulted in a non-fatal injury, suggesting the majority of vehicles are travelling at low enough speeds so as not to cause bodily harm.

There were no identifiable collision patterns in the provided data which suggests there is not any specific area of concern. The main type of collision was rear-end (45%) followed by sideswipe (25%) and turning movement (25%). The most common type of driver action was following too close (28%) or failing to yield the right-of-way (18%). The majority of collisions occurred in clear weather (75%) during the daytime (60%).

2.1.3 Planned Conditions

Planned Projects

Based on the City of Ottawa's 2013 Transportation Master Plan, the following transportation projects nearby the proposed development are scheduled to occur. Please note these projects are listed under the Road Network Concept plans and therefore are not anticipated to be finalized by the study's ultimate horizon year.

- Alta Vista Transportation Corridor
  - Bus / High Occupancy vehicle lanes and transit signal priority between Riverside Drive and Ottawa Health Sciences Centre.
  - New four-lane road between Nicholas Street / Highway 417 interchange and Riverside Drive.
  - New four-lane road (including two peak-period bus lanes) between the Ottawa Health Sciences Centre and Walkley Road.
- Smyth Road
  - Transit signal priority and queue jump lanes between Alta Vista Transportation Corridor and St. Laurent Boulevard.

Planned Developments

Table 5 lists development applications that were identified on the City of Ottawa's *Development Application Search Tool*.

Table 5: Development Application Summary

Location	Type	Year
700 Coronation	4-storey, 35-unit residential building with 47 parking spaces.	Unknown
355 Everest	8-storey mid-rise apartment building with 101 units and 3 levels of underground parking with 108 spaces.	2020
1967 Riverside	Infill of the existing hospital campus with a continuum of care seniors community consisting of a Long-Term Care Home (256 beds) in Phase 1, and a 15-storey registered retirement home (270 beds) and shared amenity space in the second phase.	Unknown
200 Steamline 230 Steamline 260 Steamline	A seven-building high-rise development to be constructed in three phases. The first phase of the proposal consists of two buildings, 15 and 22 storeys high, with a total of 414 units. When phase 3 is completed, a total of 1,890 units will be constructed.	Phase 1: 2021 Phase 2: 2027 Phase 3: 2031
1971 St-Laurent	Three 17-storey residential use buildings with at-grade residential and amenity space and public park space all fronting on St. Laurent Blvd. Parking is provided at-grade and within a proposed new multi-level above-ground parking garage.	Unknown

2.2 Study Area and Time Periods

2.2.1 Study Area

The proposed study area for this proposed development is shown in ***Figure 6*** and includes the following nine (9) intersections:

- Ring Road (N-S) / Hospital Link Road (City jurisdiction)
- Ring Road (N-S) / CHEO Access Road
- Ring Road (N-S) / Ring Road (E-W)
- Ring Road (N-S) / Smyth Road (City jurisdiction)
- CHEO Access Road / Ring Road (E-W)
- Emergency Access Road / Ring Road (E-W)
- Parking Garage Entrance / Ring Road (E-W)
- General Hospital Access Road / Ring Road (E-W)
- General Hospital Access Road / Smyth Road (City jurisdiction)

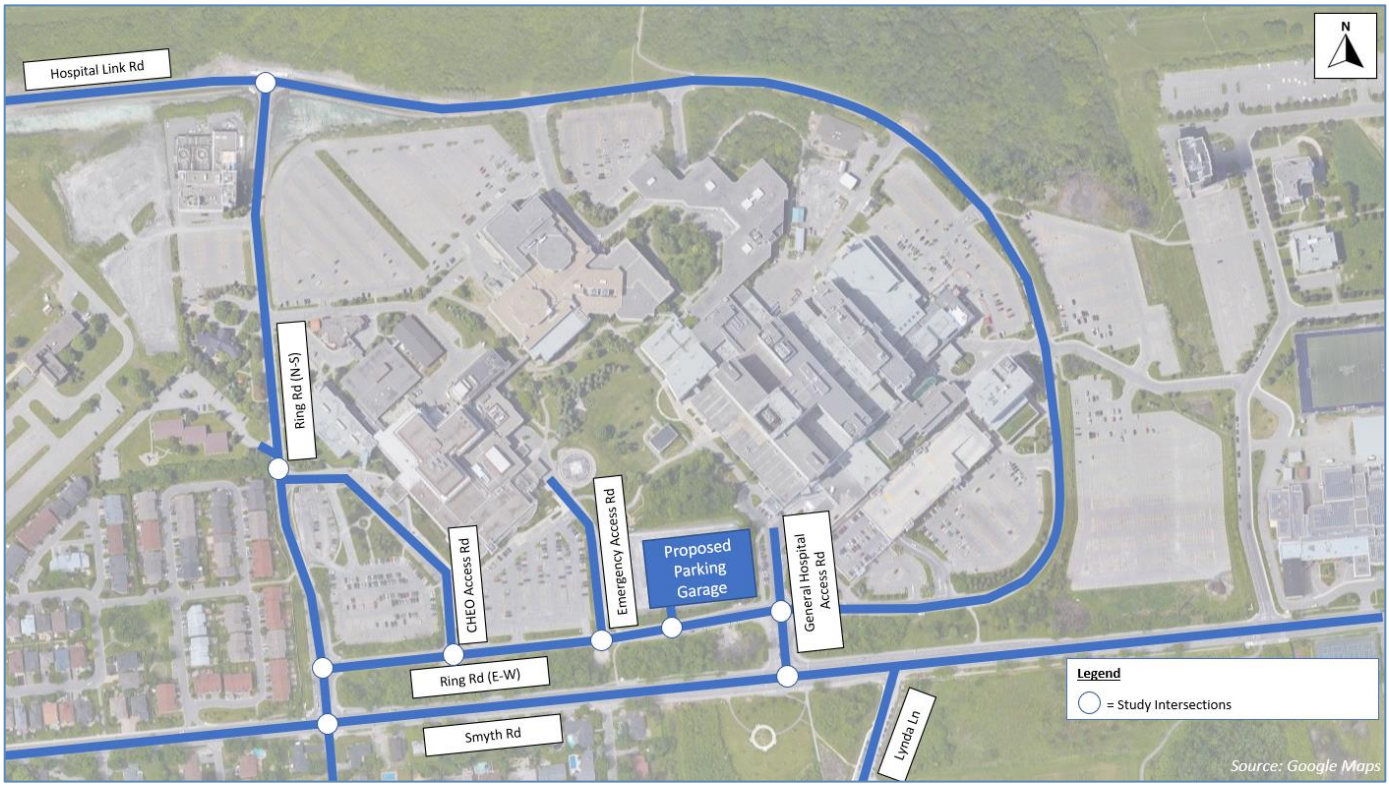

Figure 6: Study Area Intersections

2.2.2 Time Periods

The proposed scope of the transportation assessment includes the following analysis time periods:

- Weekday AM peak hour of roadway
- Weekday PM peak hour of roadway

2.2.3 Horizon Years

The scope of the transportation assessment proposes the following horizon years:

- 2022 existing conditions
- 2024 future background conditions
- 2024 future total conditions (parking garage build-out)

A future separate TIA that evaluates the 1D4C building impacts will be completed at a subsequent date. As the 1D4C building will be built within three years of the parking garage opening the 5-year future horizon period is not being analyzed as part of this TIA. That time period will be reflected on and addressed in the 1D4C building TIA.

2.3 Exemption Review

The Exemptions Review table from the City of Ottawa Transportation Impact Assessment Guidelines is summarized below in ***Table 6***. Many elements are exempt as this TIA is only reviewing the parking garage. Another TIA will need to be completed when assessing the 1D4C building.

Table 6: Exemptions Review

Module	Element	Exemption Considerations	Exempt? (Yes/No)
Design Review Component			
4.1. Development Design	4.1.2. Circulation and Access	Only required for site plans	No
	4.1.3. New Street Networks	Only required for plans of subdivisions	Yes
4.2. Parking	4.2.1. Parking Supply	Only required for site plans	No
	4.2.2. Spillover Parking	Only required for site plans where parking is 15% below unconstrained demand	No
Network Impact Component			
4.5. Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Yes
4.6. Neighbourhood Traffic Management	4.6.1. Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
4.8. Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by establishing zoning	Yes

3. Forecasting

3.1 Development Generated Travel Demand

3.1.1. Trip Generation and Mode Shares

Trip Generation Rates

Trip generation for this TIA is unique in that the number of staff parking passes available through CHEO will dictate the number of new trips being generated with the introduction of the parking garage. The remaining trips destined to the parking garage will include those form the displaced parking lots due to construction. These trips already exist and will form part of the background volumes. The share of staff verses visitors parking has been kept constant and transfer to the new garage so there will be no new visitor parking either. Despite knowing the number of parking passes available, further information is still required to determine the distribution of those trips through out the day and within the peaks needs to be determined as does the split of trips into and out of the garage.

Table 7 outlines the proposed rates that will be applied to the new parking pass staff. Rates were obtained from the Institute of Transportation Engineer's (ITE) *Trip Generation Manual 11th Edition*. It was assumed Code 610 – Hospital would be the most appropriate proposed land use.

As previously stated, the parking garage is not anticipated to generate any new person trips. However, new trips will come from the 360 staff on an existing parking waitlist. These staff currently use an alternative mode (transit, vehicle passenger, cycle, or walk) or park their vehicles outside the hospital campus in the adjacent neighborhoods. With the construction of the parking garage, it is anticipated there will be a modal shift from transit / vehicle passenger /cycling / walking to driving as parking spaces in the parking garage will be filled by this waitlist.

Furthermore, the Ottawa General Hospital and CHEO have separate parking facilities with on-site signage that directs drivers to their own facilities. Visitors will follow the signs, so it is anticipated that no further trips will be generated. For staff parking, each of the two hospitals manage their own parking structure and they cater exclusively to their own staff. Given this, we do not see those attending OGH to use the CHEO parking structure and vice versa.

Table 7: Trip Generation Rates

Land Use Code	Employees	Peak Hour	Vehicle Trip Rate Per Employee	Entering	Exiting
Hospital (610)	360	AM Peak Hour of Generator	0.28	72%	28%
Hospital (610)	360	PM Peak Hour of Generator	0.28	30%	70%

Future Mode Share Targets

The CHEO parking garage is located in the Inner Area as defined by the City of Ottawa's 2013 Transportation Master Plan. Based on information in the Transportation Master Plan, in 2011 the Inner Area had a transit mode share of 42% and 20% for trips going to and coming from the Inner Area. By 2031 this is expected to minorly increase (approx. 2%).

The City of Ottawa typically requires TIAs to develop mode share targets for proposed developments. However, mode share targets have not been developed for this TIA as a parking garage is only going to service vehicle trips. When a TIA is completed for the CHEO facility, mode share targets can be further explored.

Vehicle Trip Generation

Using the rates noted in ***Table 7*** *above*, EXP estimated the number of site-generated auto-trips. The estimated site-generated auto trips are shown in ***Table 8***. Also, the City of Ottawa's typical method of calculating person-trips was not completed as the proposed development is a parking garage and will only serve auto trips.

Table 8: Site-Generated Trips

Land Use Code	Trip Type	Weekday AM Peak Hour			Weekday PM Peak Hour		
		Total	In	Out	Total	In	Out
Hospital (610)	Auto Trips	101	73	28	101	30	71

While 360 staff are on the parking waitlist, the ITE auto trip rate was still applied to the number of employees as all vehicle trips are not anticipated to occur during the peak hours and are expected to be spread throughout the day. It should be noted that the 360 staff on the waitlist for future parking use were assumed to be spread out throughout the day due to the nature of shift work schedules. The first two floors of the new parking garage provide spaces for visitors this will accommodate the existing visitor parking spaces being eliminated in the future. A total of 770 of staff parking spaces will be provided.

3.1.2. Trip Distribution

The distribution of site-generated traffic entering/exiting the site was developed using traffic data from the intersections of Smyth Road / Ring Road (N-S), Smyth Road / General Hospital Access Road, and Hospital Link Road / Ring Road (N-S). Key movements from these traffic counts were used to develop the proportion of traffic entering/exiting the site from each direction. The trip distribution percentages for site-generated traffic are presented in ***Table 9***.

Table 9: Trip Distribution Percentages

	Intersection	Movement	AM Peak Hour %	PM Peak Hour %
Entering	Smyth Road / South Haven Place	Eastbound left	30	36
	Smyth Road / General Hospital Access Road	Eastbound left	10	55
	Smyth Road / General Hospital Access Road	Westbound right	47	55
	Hospital Link Road / Ring Road (N-S)	Eastbound right	13	9
Exiting	Smyth Road / South Haven Place	Southbound right	16	44
	Smyth Road / General Hospital Access Road	Southbound left	64	46
	Hospital Link Road / Ring Road (N-S)	Northbound left	20	10

The AM and PM peak hour site-generated traffic distribution are presented by cardinal direction in **Figure 7**.

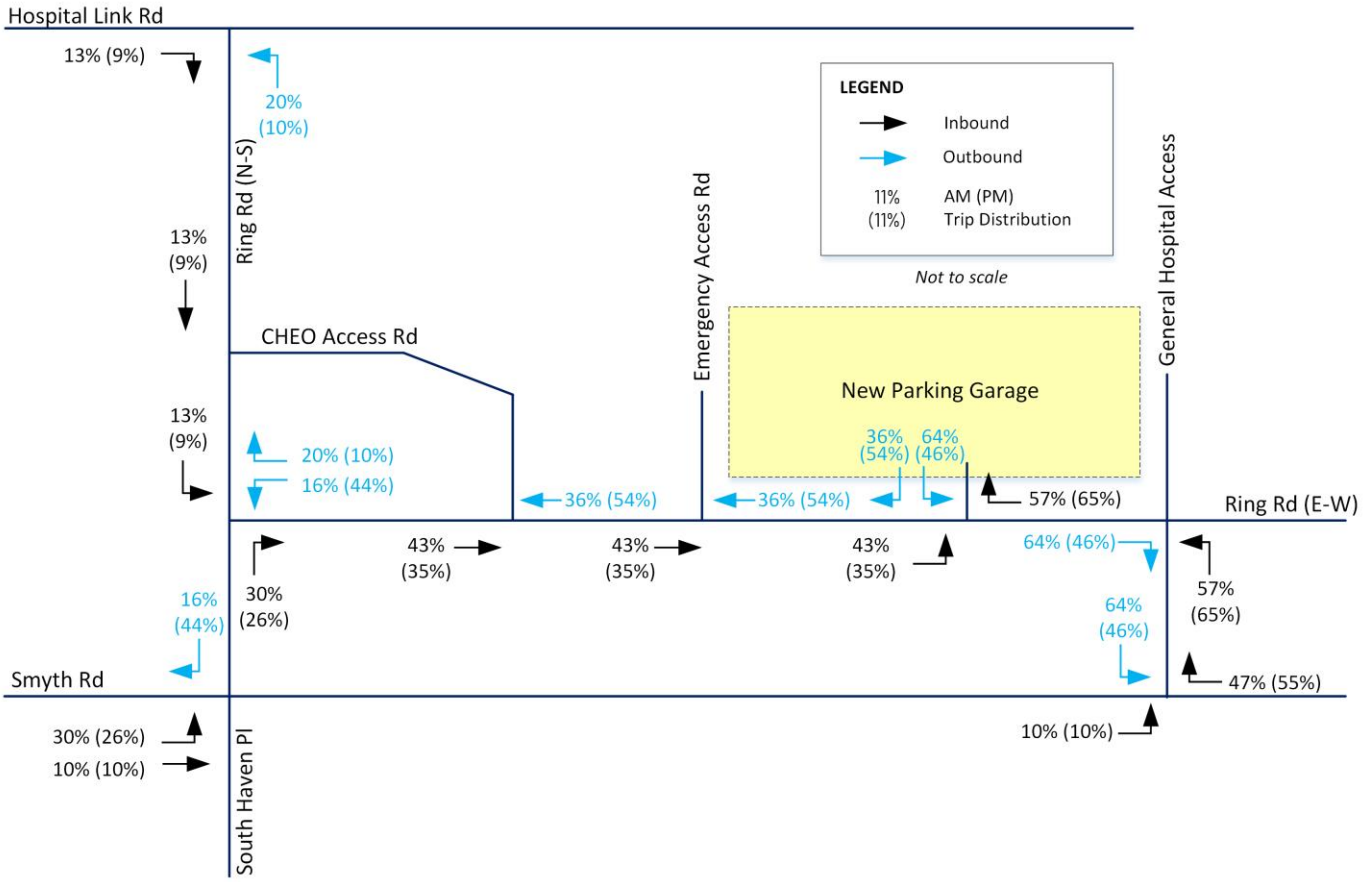

Figure 7: AM and PM Peak Hour Site Generated Trips Distribution

3.1.3. Trip Assignment

Site-generated trips were then assigned to the road network based on the proportions developed in ***Section 3.1.2***. The AM and PM peak hour site-generated traffic volumes are presented in ***Figure 8***.

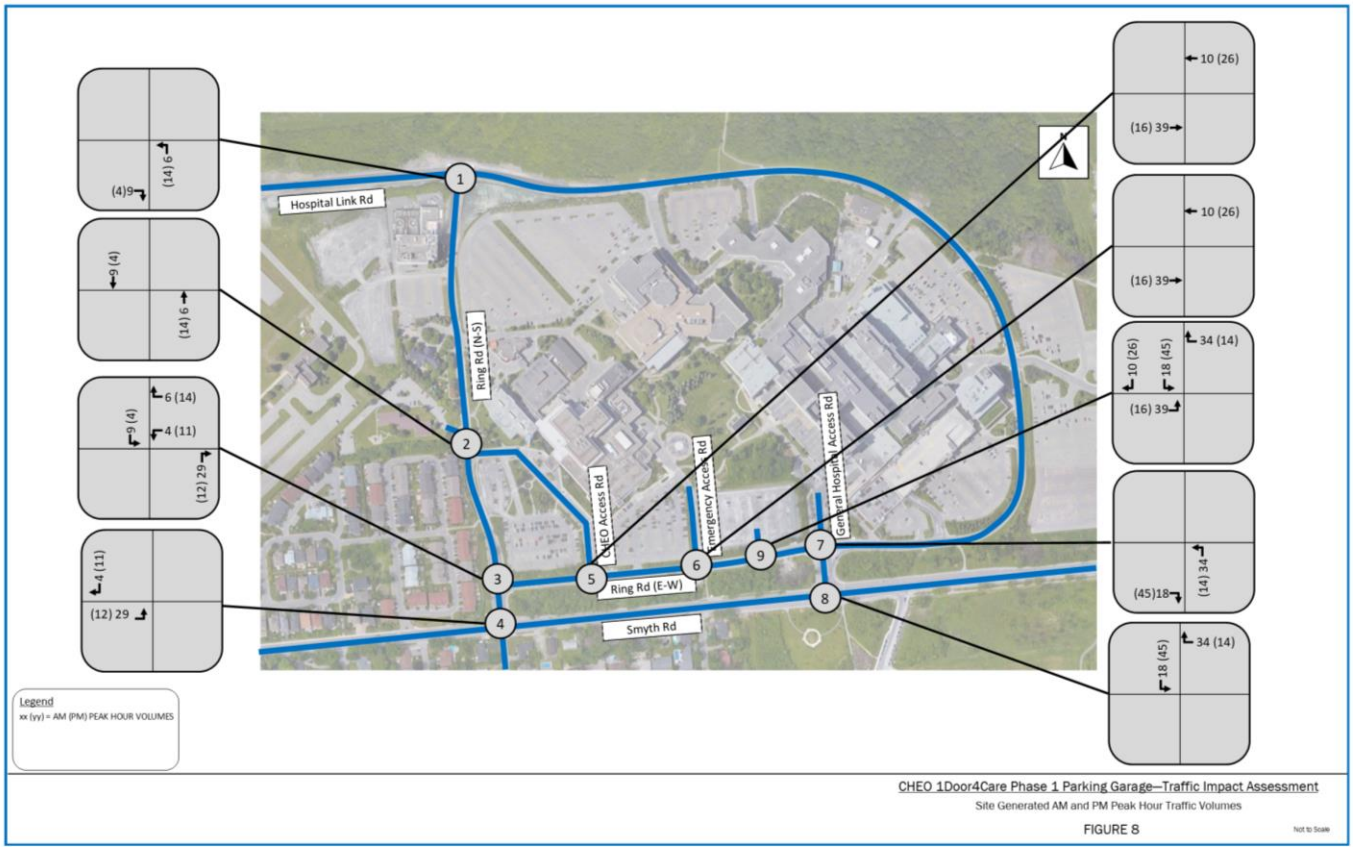

Figure 8: AM and PM Peak Hour Site Generated Trips

3.2 Background Network Travel Demands

3.2.1 Transportation Network Plans

Transportation network improvements are planned to occur near the development. However, as described in ***Section 2.1.3***, these improvements are not anticipated to occur until well after the opening of the proposed parking garage. As such, adjustments to traffic volumes and the road network to account for these improvements have not been made within the TIA.

3.2.2 Background Growth

To develop the 2024 background traffic volumes, a 1.0 % annual growth rate was applied to the 2022 traffic volumes.

To develop the 1.0 % growth rate, the City of Ottawa's long-range model (Exhibit 2.11 of the 2013 TMP) was used to estimate the growth rate to/from the inner suburbs between 2011 and 2031.

It should be noted that the growth rate was only applied to through traffic along Smyth Road as traffic growth on the CHEO campus is largely based on the expansion of on-site services and facilities. ***Figure 9*** illustrates the Background 2024 AM and PM peak hour traffic volumes at the study area intersections. ***Figure 10*** illustrates the Total (Background + Site Generated) 2024 AM and PM peak hour traffic volumes.

3.2.3 Other Developments

Developments that are currently under construction or in the development approval process are listed in ***Table 5***. Due to their locations and after reviewing available TIAs conducted for the developments, the developments are not anticipated to have a significant impact on the study area identified in this TIA. As such, trips generated by these developments have not applied and have been considered as part of the background growth (i.e., the 1.0 % annual growth rate applied).

3.2.4 Redistribution of Displaced Parking Trips

With the parking garage and 1D4C displacing existing surface parking lots (Lot B and E), those lot trips were reassigned on the internal road network to the parking garage.

3.3 Demand Rationalization

Demand rationalization is carried out when estimated future peak hour demand on the transportation network exceeds future capacity. Given the relatively small number of trips being added onto the road network in this TIA, it is not anticipated to be required. Demand rationalization has not been applied at this time but will be considered if appropriate as TDM measures could be effective on the behaviour of CHEO staff. It should be noted that the Ottawa Hospital is currently in the early stages of developing a TDM program for its various campuses. Partnering with The Ottawa Hospital for shared TDM measures such as a joint TDM program coordinator should be considered.

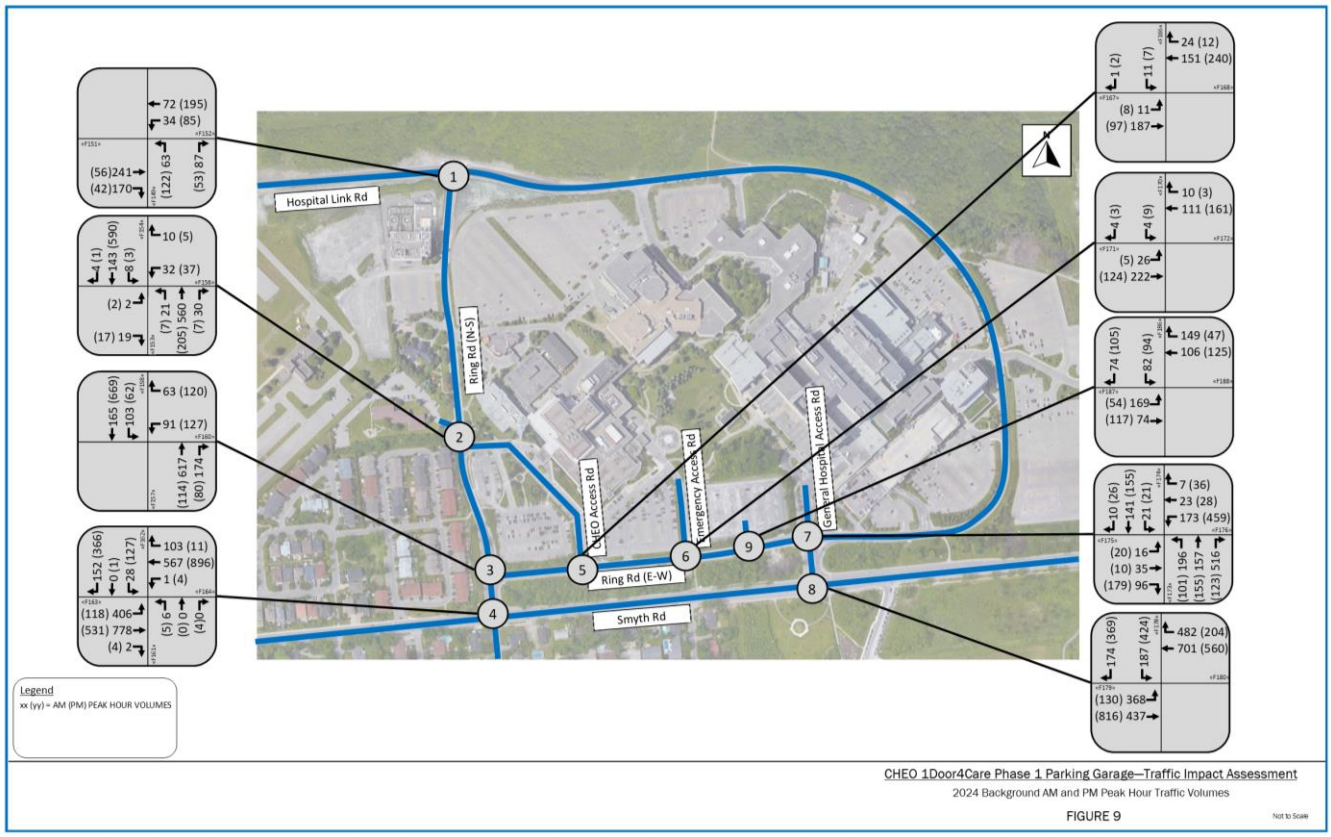

Figure 9: 2024 Background AM and PM Peak Hour Traffic Volumes

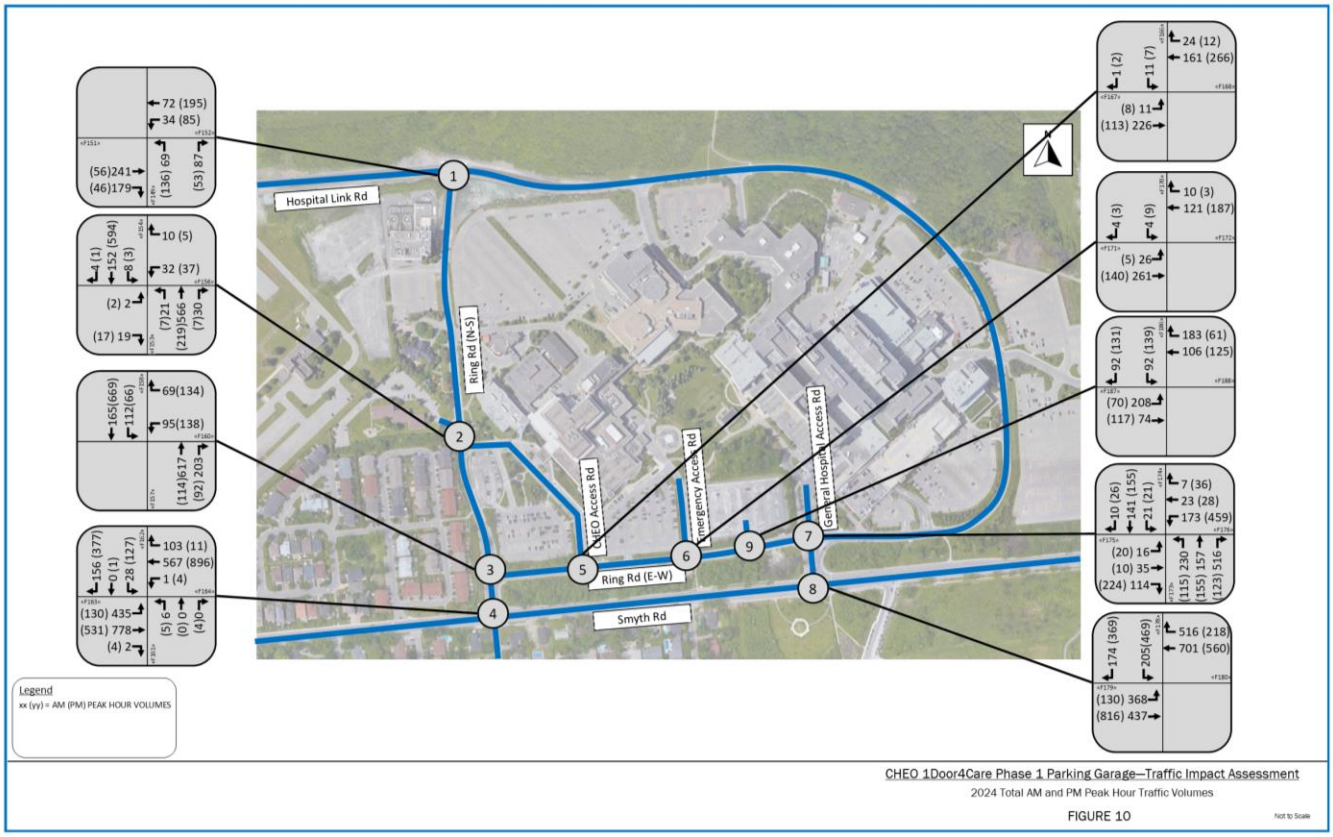

Figure 10: 2024 Total AM and PM Peak Hour Traffic Volumes

4. Analysis

4.1 Development Design

The proposed development and its transportation network elements were reviewed in order to ensure that a safe and efficient design has been proposed that will encourage walking, cycling, and transit use.

Pedestrian facilities will be provided between the proposed parking garage building entrance and the CHEO hospital facilities. A connection to the sidewalk along Ring Road (E-W) will be provided, as shown on the site plan. Sidewalks will be depressed and continuous across the study area road network, in accordance with City standards.

Bicycle parking will also be facilitated at the parking garage. It will be located adjacent to the northwest corner of the garage and will be in accordance wit the minimum requirement of the City's Zoning By-Law. A copy of the proposed site plan is included in ***Appendix E***.

OC Transpo's service will not have its riders destined to the parking garage so the associated design features for transit do not come into play. However, if one feels they should be in play, the guidelines for peak period service to provide service within a five minute (400m) walk of the proposed development should be confirmed. Stops #1806, #1808, $7044, #7072 and #7234 are all located within 400m actual walking distance (measured using legal crosswalks) of the proposed development. As stated previously, the nearest bus stops to the subject site are described in ***Section 2.1.2*** and shown in ***Figure 4***.

A review of the Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure Checklist has been conducted. A copy of the TDM checklist is included in ***Appendix F***. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

4.1.1. Circulation and Access

For the purposed the proposed development will only consist of a parking garage building, loading or short-stay delivery service facilities are not expected to accommodate on the adjacent public street. The development Site Plans show the design of the developments access road which allows for large fire trucks to enter from Ring Road (E-W) without encroaching any curb line while turning. Municipal services such as waste disposal are expected to have no significant impact.

The turning movements of a fire truck, City transit bus, and a passenger vehicle around the boundary street are shown in ***Appendix G.***

4.2 Parking

The parking garage itself does not generate a need for parking. It is the medical related buildings on campus that generate the parking needs. However, if one was to apply the by-law rates to identify parking requirements the following would come into play. The subject site is located in Area C on Schedule 1 and 1A of the City of Ottawa's Zoning By-Law. Minimum vehicular and bicycle parking rates for the proposed uses are identified and are summarized in the following ***Table 10***.

Table 10: Parking Requirement Per Zoning By-Law

Land Use	Rate	Units/GFA	Required
Minimum Vehicle Parking			
Hospital	0.7 per 100 m^2 of gross floor area	33,500 m^2	234.5
		Proposed Vehicle Parking	**1,050 Total**
Minimum Bicycle Parking			
Hospital	1 per 1,000 m^2 of gross floor area	33,500 m^2	33.5
		Proposed Bicycle Parking	**40 Total**

The proposed development will include 1,083 parking spaces in a parking garage accessible via Ring Road (E-W), meeting the minimum Zoning By-law 2008-250 Consolidation parking requirements. As the proposed supply of on-site parking meets or exceeds the By-law requirement, no further review of vehicular parking is required.

As was the case for vehicle parking, bicycle parking would not apply for a parking garage. However, if bicycle parking was calculated for the garage the proposed development will include a total of 40 bicycle parking spaces, meeting the minimum Zoning By-law 2008-250 Consolidation parking requirements for all land uses in the Site Plan.

The TIA guidelines identify the need to review spillover parking when the parking supply is 15% below demand. As the 1,083 proposed parking spaces exceeded the required demand, a review of spillover parking is not required for the TIA.

4.3 Boundary Street Design

This section provides a review of the boundary streets using complete streets principles. The Multi-Modal Level of Service (MMLOS) guidelines produced by IBI Group in October 2015 were used to evaluate the levels of service for the boundary roadways for each mode of transportation. Schedule B of the City of Ottawa's Official Plan identifies entire study area road networks as being within the General Urban Area.

Targets for Pedestrians, Bicyclists, Transit, and Truck LOS for the boundary roadways adhere to those outlined in Exhibit 22 of the MMLOS guidelines. The boundary streets review evaluates the MMLOS for all boundary roadways based on existing conditions. ***Table 11*** summarizes the findings of the Segment MMLOS for Existing (2022) conditions.

Table 11: Segment MMLOS – Existing (2022) Conditions

	LEVEL OF SERVICE BY MODES			
Segments	**Pedestrian (PLOS)**	**Bicyclist (BLOS)**	**Transit (TLOS)**	**Truck (TkLOS)**
Emergency Access Road	C	C	D	C
General Hospital Access Road	C	C	D	C
Ring Road (E-W)	C	B	E	C
Target	**C**	**D**	**D**	**E**

Given the development is an urban general area, the target level of service for pedestrians and bicyclist is high (PLOS 'C' and BLOS 'B'). As shown in ***Table 11***, the target levels of service for pedestrians and transit are not met for Ring Road (E-W), however this is only a temporary condition and is expected to be significantly improved prior to the horizon year of this study with the development of the 1D4C building construction with surrounding road and landscape updates.

According to the City of Ottawa's Cycling Network Plan, Ring Road is not in the included in any regional cycling facilities. Ring Road is a private roadway which is part of the hospital campus and is intended to serve the local needs. Nonetheless, a MUP is proposed on one side of the Ring Road and will be part of the future hospital campus sustainable transportation network. It should be noted that the detailed design of the proposed turning lanes along Ring Road (E-W) will be finalized as part of the detail design process.

Detailed Segment MMLOS calculations can be found in ***Appendix H***.

4.4 Access Intersections Design

The proposed parking garage building will be served by one entry/exit (allowing for two lane egress / two lane ingress) along Ring Road (E-W).

Section 25 (c) of the City of Ottawa's Private Approach By-Law identifies a requirement for two-way accesses driveway to have a width no greater than 9 m, as measured at the street line. Section 107 (1)(a) of the Zoning By-Law identifies a minimum width requirement of 6.7 m for a two-way driveway to a parking lot. The proposed access on Ring Road is approximately 15 m in width, measured at the property line, thereby meeting the requirements.

Section 25 (o) of the Private Approach By-Law identifies a requirement to provide a minimum spacing of 3 m between the nearest edge of the private approach and the property line, as measured at the street line. Due to the proximity of the site to the intersection of the Ring Road and Emergency Access Road it was suggested that the access to the subject property be as far east of the Ring Road and Emergency Access Road intersection as possible.

Section 25 (i) and (j) of the City of Ottawa's Private Approach By-law also identifies a requirement to provide a median between two private approaches intended for one-way operation, such median shall have a minimum width of 2 metres. And the length of the median on private property shall be determined by the General Manager.

The private approach to/from Emergency Access Road is to provide access to facilitate maintenance activities in the area. There is one exit lane connecting to the parking garage which will help to improve traffic flow at the main exit lanes of the parking structure. On the south side of this private approach street, there is a snow storage area and generator building for

maintenance purposes. During winter maintenance activities, maintenance vehicles may access the site via the private road. As this proposed private access is a dead end, traffic on this roadway is anticipated to be minimal. Side street stop control is recommended on the proposed approach. A minimum 12 m throat length is provided in each of the two exit lanes at the parking garage main entrance, however there is additional storage available on the north, south, east, and west driveway aisles to accommodate peak operating conditions.

Intersection sight distance (ISD) at the proposed access has been determined using the TAC Geometric Design Guide for Canadian Roads. The ISD for the access, for a design speed of 50 km/h (10 km/h above the posted speed limit), is as follows:

- Left Turn from Ring Road (E-W): 70 m
- Right Turn from Ring Road (E-W): 80 m

The required ISD for a passenger vehicle to turn left of right from the proposed access is shown in ***Figure 11.***

Figure 11: Ring Road (E-W) Access Intersection Sight Distance

The stopping sight distance (SSD) requirement for a design speed of 50 km/h is 65 m for vehicles turning left or right at the access. There is slight horizontal curvature along Ring Road (E-W) east of the proposed building entrance, however, as demonstrated in ***Figure 11***, the ISD is not impacted. As such, it can be found that the required ISD and SSD at the access are adequate. Available sightlines are within recommended guidelines to allow safe all directional access to the development.

Synchro was utilized to evaluate the storage length of the proposed new turning lanes for eastbound left turn at Emergency Access Road / Ring Road, the eastbound left-turn at Access/Ring Road and the new westbound right-turn lane at Access / Ring Road. To illustrate this, the queue lengths for above three turn movement have been reviewed using SimTraffic (the simulation software that accompanies the Synchro traffic modeling software). The 95th percentile queue length refers to the queue length that accommodates 95% of the observed queues.

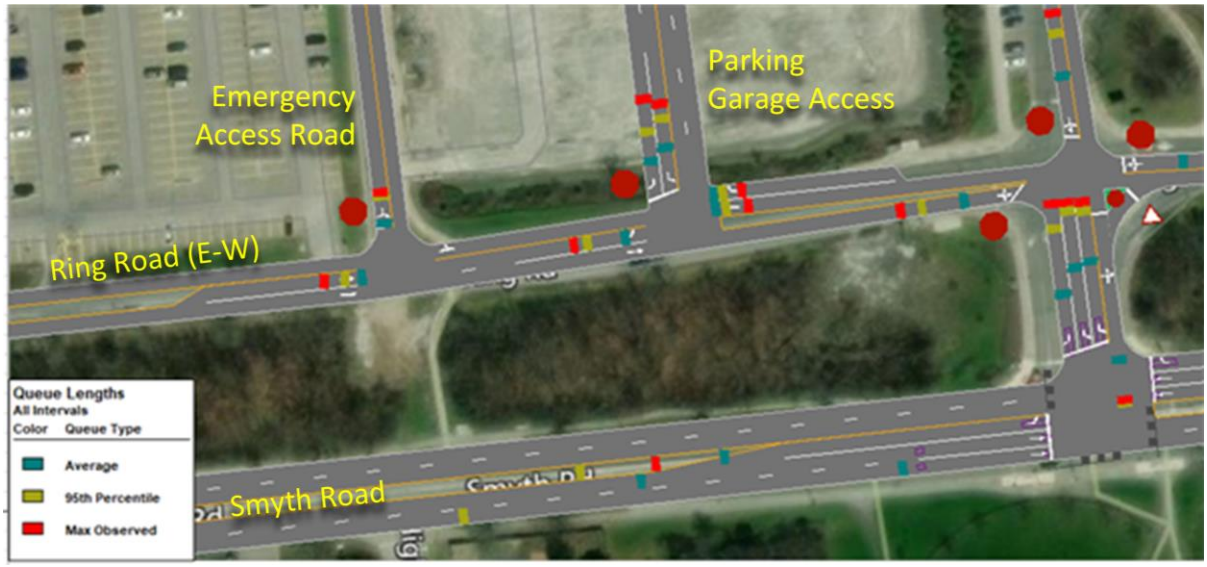

Figure 12: SimTraffic Queue Length Results

Based on the SimTraffic queuing assessment shown in ***Figure 12***, the 95th percentile queue lengths of very few car length which is reflective of the low volumes travelling within the site during the peak hour. This also shows that turning movement at three locations will rarely experience a delayed condition. In considering the above, the storage lengths shown on the site plan are sufficient to accommodate turning traffic along Ring Road (E-W) during both peak hour periods.

4.5 Transit

The transit trips are not anticipated to be generated by the subject parking garage building specifically. As described in ***Section 2.1.2***, OC Transpo routes #45 and #55 travel on 15-minute headways during the weekdays, 30-minute headways during the weekend. The existing transit services in the study area are anticipated to be sufficient to accommodate the demand from the proposed development.

4.6 Intersection Design

4.6.1. Existing Intersection MMLOS Analysis

This section provides a review of the signalized study area intersections using complete streets principles. The MMLOS guidelines produced by IBI Group in October 2015 were used to evaluate the LOS of the signalized study area intersections for each mode of transportation. The policy related area types for the study area intersections are described as follows:

- Smyth Road/Ring Road (N-S): General Urban Area;
- Smyth Road/General Hospital Access Road: General Urban Area.

The following ***Table 12*** summarizes the findings of the MMLOS intersection analysis. Detailed intersection MMLOS calculations are included in ***Appendix I***.

Table 12: Intersection MMLOS Summary

	LEVEL OF SERVICE BY MODES			
Intersection	**Pedestrian (PLOS)**	**Bicyclist (BLOS)**	**Transit (TLOS)**	**Truck (TkLOS)**
Smyth Road/Ring Road (N-S)	D	F	F	F
Target	**C**	C	**D**	**D**
Smyth Road/General Hospital Access Road	D	F	F	A
Target	**C**	**C**	**D**	**D**

Smyth Road/Ring Road (N-S)

There are limited opportunities to improve the current PLOS of each approach without reducing the number of travel lanes or restricting turning movements. The level of comfort can be increased by implementing zebra-striped crosswalks at each approach. There is also limited opportunity in improving the delay score for pedestrians without incurring major delays for vehicles.

The BLOS is dependent on the number of travel lanes and operating speed. All approaches do not meet the target BLOS of C. Implementation of MUP on both north and south side on Smyth Road will enhance the cyclist user's convenience and this can be improved to the target of BLOS C.

The north approach does not meet the target TLOS of D. The TLOS is based on the average signal delay experienced by transit vehicles at each approach. The poor TLOS is a result of the average delay which includes travel time from end of queue to entering the intersection, and this will exceed more than 50 seconds at north approach. Reduction of traffic demands at the intersection would improve this level of service as would implementation of some form of transit signal priority such as a queue jump lane. The implementation of continuous bus lanes on Smyth Road would also improve the TLOS beyond the target TLOS of D.

The TkLOS is dependent on the number of lanes in each direction and the curb lane width. TkLOS could be improved to the target of D if the wider turning radii is provided at the south approach.

Smyth Road/General Hospital Access Road

There is limited opportunity in improving the delay score without incurring major delays for vehicles. The east approach has a divided cross-section with median. Regardless of the median on the east approach, there are limited opportunities to improve the current PLOS without reducing the number of travel lanes or restricting turning movements. The level of comfort can be increased by implementing zebra-striped crosswalks on each approach.

As this intersection is a T-intersection, there is no space available to implement a two-stage left-turn bike box for cyclists coming from the west approach. Two-stage left turn bike boxes can be implemented at the north and east approaches. A jug handle and crossride for cyclists coming from the west approach could be implemented along with the installation of a bicycle traffic signal. The implementation of a higher order cycling facility (e.g. cycle track) would improve the BLOS of this intersection based on right turn characteristics.

The north approach does not meet the target TLOS of D. The TLOS is based on the average signal delay experienced by transit vehicles on each approach. The poor TLOS is a result of the average delay which includes travel time from end of queue to entering the intersection, and this will exceed more than 40 seconds on the north approach. Reduction of traffic demands at the intersection would improve this level of service as would the implementation of some form of transit signal priority such as a queue jump lane. The implementation of continuous bus lanes on Smyth Road would also improve the TLOS beyond the target TLOS of D.

Smyth Road and General Hospital Access Road intersection will meet the City's target, operating with TkLOS of A.

4.6.2. Background Intersection Operations

Intersection capacity analysis has been completed for the 2024 background traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (Saturation Flow rate: 1800 vphpl[1], Peak Hour Factor: 1.0 for future conditions). ***Table 13*** summarizes the results of the Synchro analysis for the 2024 background traffic conditions. Detailed Synchro reports are included in ***Appendix J***.

Table 13: 2024 Background Intersection Operations

Intersection	AM Peak Hour					PM Peak Hour				
	Critical Movement	Max v/c	LOS	Delay (s)	95th Queue (m)	Critical Movement	Max v/c	LOS	Delay (s)	95th Queue (m)
Hospital Link Road/Ring Road (N-S)	**Eastbound through-right**	**0.54**	**B**	**12**	**-**	**Westbound left-through**	**0.40**	**B**	**11**	**-**
CHEO Access Road/Ring Road (N-S)	Northbound left-through-right	0.72	C	18	-	Southbound left-through-right	0.81	C	24	-
Ring Road (E-W)/Ring Road (N-S)	Westbound left-right	0.57	D	35	25	Westbound left-right	0.75	E	39	44
Smyth Road/Ring Road (N-S)	**Eastbound left-through-right**	**0.74**	**B**	**11**	**127**	**Southbound left**	**0.58**	**D**	**50**	**45**
CHEO Access Road/Ring Road (E-W)	Westbound through-right	0.10	A	0	0	Westbound through-right	0.16	A	0	0
Emergency Access Road/Ring Road (E-W)	Westbound through-right	0.07	A	0	0	Westbound through-right	0.11	A	0	0
General Hospital Access Road/Ring Road (E-W)	Westbound left-through-right	0.38	B	14	-	Westbound left-through-right	1.16	F[2]	119	-
Smyth Road/General Hospital Access Road	**Southbound left**	**0.40**	**D**	**45**	**24**	**Southbound left**	**0.69**	**D**	**46**	**56**
Parking Garage Access/Ring Road (E-W)	Southbound left	0.16	C	15	5	Southbound left	0.18	B	13	5

The three intersections under the City's jurisdiction are the focus of this assessment and are highlighted in bold print in ***Table 13***. All have been found to operate at an acceptable level and within City standards. Although some of movements show higher delay and queuing associate with them, these negative impacts do not affect the operations of the traffic signal on Smyth Road. All other intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours.

It is noted that some existing trips at both Parking Lot B and Lot E have re-routed to the Parking Garage Access. Assumptions follow below:

[1] Vehicles per hour per lane
[2] Due to the limited storage at this intersection, Northbound traffic is currently uncontrolled to provide a priority to inbound movements towards the emergency department. However, there is no way to force Synchro to provide the results for an unusual level of intersection control, three-way stops control cannot be coded for a four-way intersection. As such, all-way (four-way) stops control was assumed/modelled in Synchro to provide results, which may not be an accurate result.

- 80% of traffic to/from Ring Road (E-W) would be re-routed to Parking Garage Access, with the remaining 20% of traffic proceeding to/from Emergency Access Road.
- 70% of traffic to/from CHEO Access Road would be re-routed to Parking Garage Access, with the remaining 30% of traffic proceeding to/from the main hospital building (CHEO).

This is a relatively small number of vehicles that appear during both peak hours, it would have minimal impacts on the existing traffic and does not have significant impacts to the study area intersections.

4.9.3 Total Intersection Operations

Intersection capacity analysis has been completed for the 2024 total traffic conditions. The intersection parameters used in the analysis are consistent with the TIA guidelines (Saturation Flow rate: 1800 vphpl, Peak Hour Factor: 1.0 for future conditions). ***Table 14*** summarizes the results of the Synchro analysis for the 2024 total traffic conditions. Detailed Synchro reports are included in ***Appendix J***.

Table 14: 2024 Total Intersection Operations

Intersection	AM Peak Hour					PM Peak Hour				
	Critical Movement	Max v/c	LOS	Delay (s)	95th Queue (m)	Critical Movement	Max v/c	LOS	Delay (s)	95th Queue (m)
Hospital Link Road/Ring Road (N-S)	**Eastbound through-right**	**0.49**	**B**	**12**	**-**	**Westbound left-through**	**0.41**	**B**	**11**	**-**
CHEO Access Road/Ring Road (N-S)	Northbound left-through-right	0.73	C	18	-	Southbound left-through-right	0.82	C	25	-
Ring Road (E-W)/Ring Road (N-S)	Westbound left-right	0.64	E	41	30	Westbound left-right	0.83	E	49	57
Smyth Road/Ring Road (N-S)	**Eastbound left-through-right**	**0.76**	**B**	**12**	**138**	**Southbound left**	**0.56**	**D**	**49**	**45**
CHEO Access Road/Ring Road (E-W)	Westbound through-right	0.08	A	0	0	Westbound through-right	0.18	A	0	0
Emergency Access Road/Ring Road (E-W)	Westbound through-right	0.09	A	0	0	Westbound through-right	0.12	A	0	0
General Hospital Access Road/Ring Road (E-W)	Westbound left-through-right	0.38	B	14	-	Westbound left-through-right	1.23	F[3]	147	-
Smyth Road/General Hospital Access Road	**Southbound left**	**0.42**	**D**	**45**	**26**	**Southbound left**	**0.71**	**D**	**46**	**62**
Parking Garage Access/Ring Road (E-W)	Southbound left	0.28	B	14	9	Southbound left	0.28	B	14	9

[3] As noted above in section 4.6.2, Synchro does not provide the results for an unusual level of intersection control. As such, all-way (four-way) stops control was assumed/modelled in Synchro to provide results, which may not be an accurate result.

As with the 2024 Background Conditions the three main City intersections operate at and acceptable levels of service when the parking trip are included in the traffic mix. All other intersections are anticipated to operate with a LOS E or better during the weekday AM and PM peak hours under 2024 total traffic conditions. The site trips added to the road network will not have a significant impact on the traffic operations. Additionally, all unsignalized intersection movements are expected to operate within capacity and with acceptable delays.

5. Conclusion and Recommendations

Based on the foregoing, the conclusions and recommendation of this TIA can be summarized as follows:

Development Design and Parking

- Pedestrian facilities will be provided between the parking garage building entrance and existing CHEO facilities. A connection to the sidewalk along Ring Road (E-W) will be provided, as shown on the site plan. Sidewalks will be continuous and depressed across the study area.
- OC Transpo stops #1806, #1808, $7044, #7072 and #7234 are located within a 400 m walking distance of the proposed parking garage entrance.
- With the 1083 proposed vehicular parking spaces, 40 proposed bicycle parking spaces will meet the requirement of the City of Ottawa's Zoning By-Law.

Boundary Street MMLOS

- All boundary streets within the study area meet the target segment level of service, with the exception of Ring Road (E-W). However, given the proposed site plan with its implementation of new sidewalks across the study area, this is only a temporary condition and will be significantly improved in the near future with the construction of the 1D4C building and surrounding landscape.

Access Design

- The proposed parking garage building will be served by one all-movement access along Ring Road (E-W). This access will be approximately 15 m in width and will meet all requirements of the City's Private Approach By-Law.
- Available sightlines are within recommended guidelines to allow safe all directional access to the proposed development.
- Based on the SimTraffic queuing assessment, ingress movements to the parking garage and the eastbound left movement at Emergency Access Road will not experience delays during both peak hour periods.

Transit

- The existing transit services in the study area are anticipated to be sufficient to accommodate the demand from the proposed development.

Intersection MMLOS

- The Smyth Road/Ring Road (N-S) intersection does not meet the target PLOS, BLOS, TLOS, or TkLOS.
- The Smyth Road/General Hospital Access Road intersection achieves the target TkLOS, however does not meet the target PLOS, BLOS, or TLOS.

Background Traffic Conditions

- A 1.0 % growth rate was applied to the study area road network.
- Under 2024 background traffic conditions, all intersections are anticipated to operate with a LOS E or better.

Total Traffic Conditions

- A 1.0 % growth rate was applied to the study area road network.
- Under 2024 total traffic conditions, all intersections are anticipated to operate with a LOS E or better. It is noted that traffic volumes on the westbound approach to the General Hospital Access Road/Ring Road (E-W) intersection are not related to the proposed development and represent existing background traffic conditions and anticipated traffic growth on the overall hospital campus.

In summary, no changes to the existing intersections within the study area are required to serve the proposed development of a 1083 space parking garage. Traffic growth expected from servicing the induced vehicular demand is anticipated to be modest and accommodated through the existing transportation infrastructure.

Appendix A

TIA Screening Form

Certification Form for TIA Study PM

TIA Plan Reports

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associated documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below.

CERTIFICATION

- ☑ I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
- ☑ I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- ☑ I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
- ☑ I am either a licensed[1] or registered[2] professional in good standing, whose field of expertise
  - ☑ is either transportation engineering
  - ☐ or transportation planning .

[1,2] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

City Of Ottawa
Infrastructure Services and Community Sustainability
Planning and Growth Management
110 Laurier Avenue West, 4th fl.
Ottawa, ON K1P 1J1
Tel. : 613-580-2424
Fax: 613-560-6006

Dated at Ottawa (City) this 9 day of Sept, 20 22.

Name : Greg Kent

Professional title: Manager Traffic Engineering

Signature of individual certifier that s/he meets the above criteria

Office Contact Information (Please Print)	
Address:	
City / Postal Code:	
Telephone / Extension:	
E-Mail Address:	

Stamp

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	401 Smyth Road
Description of Location	NW corner of the Ring Road/General Hospital Access Intersection.
Land Use Classification	Parking Garage
Development Size (units)	N/A
Development Size (m^2)	1,050 space Parking Garage; 33,519 m2
Number of Accesses and Locations	1 Access on Ring Road
Phase of Development	Phase 1 of 2 (there will be additional related to 1Door4Care).
Buildout Year	Parking Garage built and occupied by 2024.

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

Parking Garage with 1,050 parking spaces. The proposed development will generate more than 60 new person trips due to an existing latent parking demand consisting of 360 staff. The garage will house displaced surface parking spaces onthe hospital campus due to new building development as well as facilitate the latent demand.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		X
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		X

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		X
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?		X

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?		X

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

Appendix B

1Door4Care: Children's Hospital of Eastern Ontario (CHEO) 1Door4Care Project – Transportation Study (September 2022) prepared by Stantec

1Door4Care: CHEO Integrated Treatment Centre (1Door4Care and Parking Garage) Internal project reference - Not issued for City Review

Transportation Study

October 4, 2022

Prepared for:

Fotenn / Infrastructure Ontario

Prepared by:

Stantec Consulting Ltd.
Stantec Consulting Ltd.

Certification

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;

2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;

3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and

4. I am either a licensed[1] or registered[1] professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

Signature of individual certifier that s/he meets the above four criteria.

Zheng Luo Ph.D., P. Eng.
Transportation Engineer
400 - 10220 103 Avenue NW
Edmonton AB T5J 0K4

Phone: (780) 969-2040
zheng.luo@stantec.com

Stephen Oliver,
Senior Planner

100 - 300 Hagey Boulevard
Waterloo ON N2L 0A4

Phone: (519) 574-4002
stephen.oliver@stantec.com

[1] License of registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works

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1.0 SCREENING

1.1 SUMMARY OF DEVELOPMENT

Municipal Address	401 Smyth Road
Description of Location	**1Door4Care**: North-east quadrant of the Smyth Road at South Haven Place intersection. **Parking Structure:** northwest quadrant of the Ring Road and General Hospital Access intersection.
Land Use Classification	Hospital
Development Size (units)	N/A
Development Size (ft^2)	231,443 ft^2 GFA (including 195,931.04 ft^2 programmed areas and 35,511.96ft^2 non-programmed areas) Hospital Building + 1,050-space 8-level parking garage
Number of Accesses and Locations	1 one-way access to the hospital building from Ring Road (N-S) and 1 full movements access to the proposed parking garage from Ring Road (E-W)
Phase of Development	1 Phase
Buildout Year	Assumed build-out and occupancy by 2025[2]

1.2 TRIP GENERATION TRIGGER

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size	Triggered
Single-family homes	40 units	✘
Townhomes or apartments	90 units	✘
Office	3,500 m^2	✘
Industrial	5,000 m^2	✘
Fast-food restaurant or coffee shop	100 m^2	✘
Destination retail	1,000 m^2	✘
Gas station or convenience market	75 m^2	✘
Development will generate more than 60 person trips		✓

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

[2] This assumed building buildout year was based on evolving work. Currently, the estimated timeline for full development is approximately 2027, which may impact traffic operation and performances at the study intersections compared to what was presented in this study due to the additional 2-year traffic growth. It may be necessary to evaluate that impact traffic operation in the study area once more development detailed designs are available..

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

1.3 LOCATION TRIGGERS

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		✘
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone? *		✘

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

1.4 SAFETY TRIGGERS

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		✘
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✘
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e., within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		✘
Is the proposed driveway within auxiliary lanes of an intersection?		✘
Does the proposed driveway make use of an existing median break that serves an existing site?		✘
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✘
Does the development include a drive-thru facility?		✘

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

1.5 SUMMARY

	Yes	No
Does the development satisfy the Trip Generation Trigger?	✓	
Does the development satisfy the Location Trigger?		✘
Does the development satisfy the Safety Trigger?		✘

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

2.0 SCOPING

2.1 EXISTING AND PLANNED CONDITIONS

2.1.1 Proposed Development

The Children's Hospital of Eastern Ontario (CHEO) is proposing to construct a new building within the existing CHEO campus, referred to as the '1Door4Care or 1D4C' facility, with a GFA of approximately 231,443 ft^2 (including 195,931.04 ft^2 programmed areas and 35,511.96ft^2 non-programmed areas) based on the proposed Site Plan (see **Appendix A**). The 1Door4Care facility is planned to accommodate a Children's Treatment Centre and is envisioned to consolidate services into a central location and address the aging infrastructure and poor physical condition of the main existing children's treatment center. In this study, it was assumed that the 1Door4Care building in the southwest portion of the CHEO campus is planned to be fully built out by the year 2025 in place of the existing surface parking Lot B. This assumed building buildout year was based on evolving work. Currently, the estimated timeline for full development is approximately 2027, which may impact traffic operation and performances at the study intersections compared to what was presented in this study due to the additional 2-year traffic growth. It may be necessary to evaluate that impact traffic operation in the study area once more development detailed designs are available.

Based on the Site Plan and Parking Garage Plan (see **Appendix B**), CHEO is also proposing to construct a new 8-storey parking garage (i.e., Phase 1), which will be constructed concurrently with the 1D4C building. This parking garage is planned to have a capacity of 1,050 spaces and it is planned to be located in the northwest quadrant of the intersection of General Hospital Access and Ring Road (to be constructed in place of the existing surface parking Lot E) to accommodate projected future parking demand for staff and patients / visitors. As shown in the Site Plan, it was identified the need to expand this planned parking garage to the west (to be constructed in place of the east portion of the existing Surface Parking Lot A) with a total of 2,700 spaces for the whole parking garage structure to accommodate future conditions of the CHEO campus. Concept layouts were developed to illustrate the required footprint. To maintain acceptable on-site parking operations and vehicular circulation, the proposed Phase 1 parking garage is envisioned to be constructed concurrently with the 1Door4Care facility, and it was anticipated to be built out in 2024. It is noted that the CHEO campus has an ultimate future campus upgrades plan; however, the timeline for such campus upgrades was determined to be beyond the study's ultimate horizon year, 2030.

This transportation and parking study assesses the general off-site transportation requirements to support the 1Door4Care building. The study investigates intersection operations as well as parking requirements for the future conditions of the CHEO campus. This study will utilize available policy and best practice guidelines supported by the City of Ottawa ('the City') to assess the current transportation network's performance and future network needs to support the 1Door4Care project.

The subject site where the proposed 1Door4Care building as well as the proposed parking structure are envisioned to be is currently bound by internal access roadways on all sides, i.e., Ring Road and internal parking access roadways.

Figure 1 illustrates the location of the proposed 1Door4Care building and parking structure.

Figure 2 illustrates the study area intersections (i.e., orange 'x' in this figure) and parking lot designations within the vicinity of the CHEO campus.

The subject site is currently zoned as Major Institutional (I2) Zone; the purpose of the I2 Zone, according to the City of Ottawa Official Plan, is to:

- *"ensure that major institutional uses such as hospitals, colleges and universities are located at appropriate locations within areas designated as* ***General Urban Area, Central Area, and Mixed-Use Centre*** *in the Official Plan;*
- *Ensure that these large scale, high traffic generating institutions locate only on large parcels of land, with direct access to an arterial road and near rapid transit stations;*
- *Impose regulations which ensure that the size and intensity of these uses is compatible with adjacent land uses; and*
- *Permit minor institutional uses and provide for a range of ancillary service use.*

Table 1 outlines the proposed land uses assumed for the analysis which were obtained from the *Institute of Transportation (ITE) Trip Generation Manual 10th Edition*.

Figure 1 – Envisioned CHEO Campus – 1Door4Care Buildout (2025)

Figure 2 - Study Area Intersections and Parking Lots

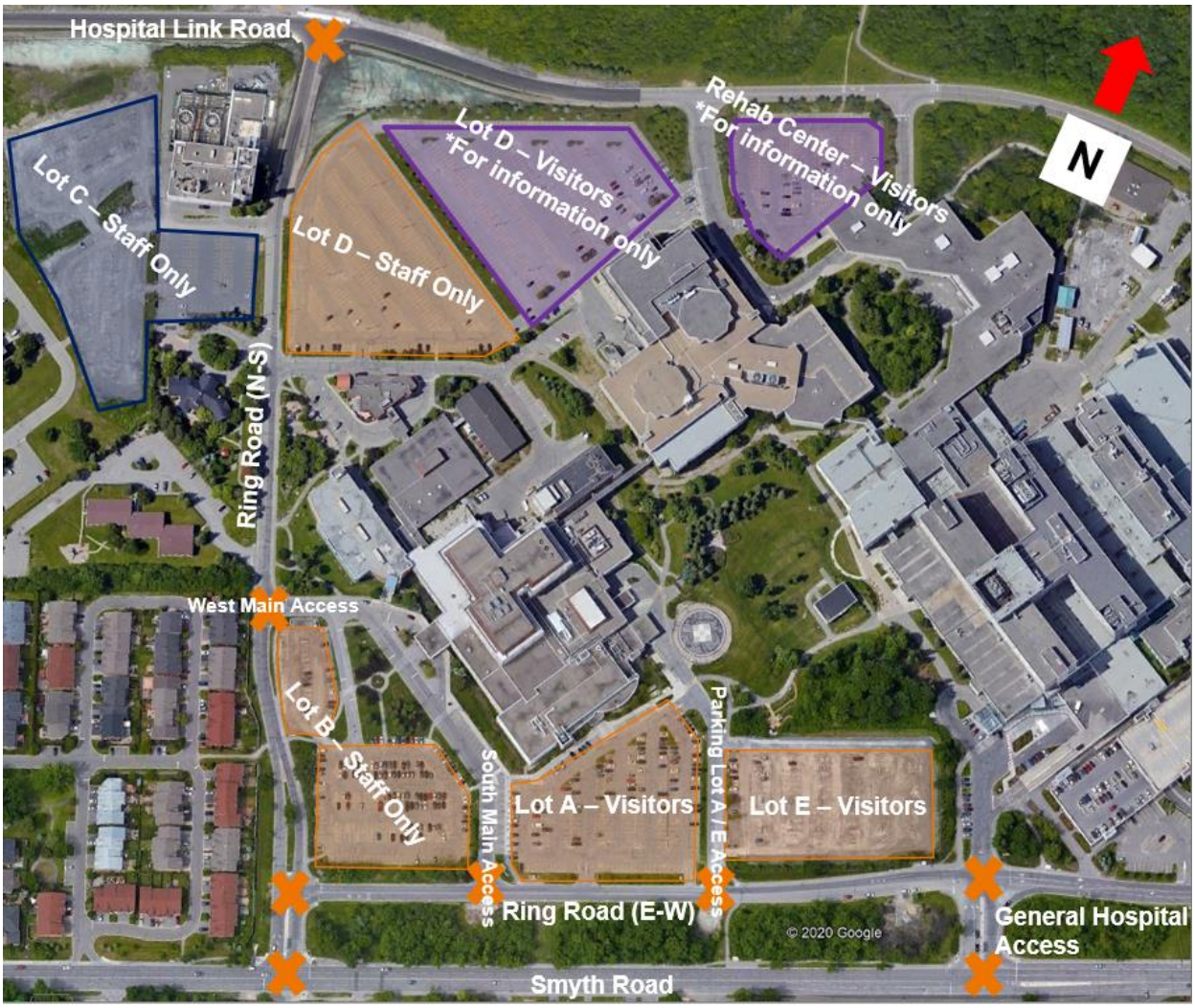


Table 1 - Proposed Land Uses / Land Use Codes

Land Use Code (LUC)	Size	Land Use
LUC 610	231,443 ft^2 (including 195,931.04 ft^2 programmed areas and 35,511.96ft^2 non-programmed areas)	Hospital

2.1.2 Existing Conditions

2.1.2.1 Roads and Traffic Control

The characteristics of the roads and intersections in the vicinity of the subject site are described below. The roadway classifications were taken from the City of Ottawa's Official Plan, Schedule E.

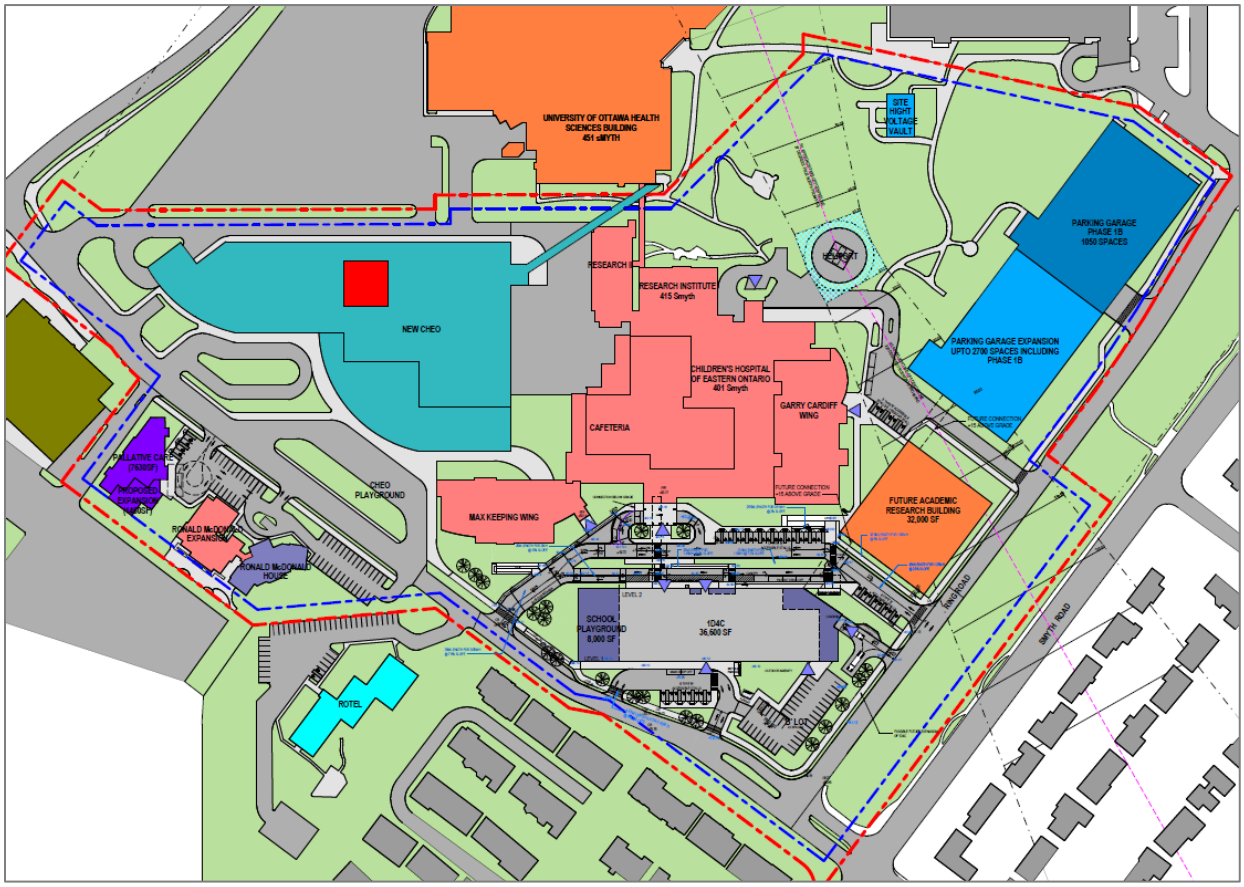
Smyth Road	Smyth Road is an east-west four-lane arterial roadway with an urban cross-section that abuts the south side of the CHEO Campus. In the vicinity of the subject site, there are sidewalks along both sides of the roadway and the posted speed limit is 50 km/h. The intersection with South Haven Place is signalized. The intersection with General Hospital Access is signalized with eastbound left and westbound right auxiliary turn lanes. Smyth Road is designated as a Spine Cycling Route in the City of Ottawa's Ultimate Cycling Plan. Smyth Road is designated as a full truck route.
Ring Road	Ring Road is a two-lane local roadway with an urban cross-section that circles around the CHEO and the General Hospital Campus. Portions of Ring Road have sidewalks (i.e., on the south, west, and north sides of the hospital campus), however, it is a discontinuous network. On the north edge of the campus, the northern portion of Ring Road was recently upgraded to include a multi-use pathway. The posted speed limit is 40 km/h and parking is prohibited along the roadway. The intersection with of Ring Road (N-S) with Ring Road (E-W) on the southwest side of the campus is minor stop controlled along the E-W direction. The intersection with South Haven Place/Smyth Road is signalized with left and right turn lanes.
Hospital Link Road	Hospital Link Road connects the Ring Road to Alta Vista Drive. Hospital Link Road is a two-lane east-west local roadway with an urban cross-section and a bi-directional multi-use pathway on the south side of the roadway west of the intersection with Ring Road (N-S). The posted speed limit is 50 km/h. The intersection with Ring Road (N-S and E-W) is all-way stop controlled.
General Hospital Access Road	General Hospital Access Road is a local roadway that connects Ring Road to Smyth Road at the southeast access of the campus. There are sidewalks on both sides of the roadway. The intersection with Smyth Road is signalized with dual left turn lanes and a right turn lane. The intersection with Ring Road is stop controlled in the southbound, eastbound, and westbound directions, and free in the northbound direction.

The existing and the proposed 1D4C building access lane configurations and intersection traffic control within the study area are illustrated in **Figure 3** below. All intersections identified in the figure will be analyzed under the base year (2021) conditions.

Figure 3 – Existing and Proposed 1D4C Access Lane Configuration and Traffic Control

Figure 4 illustrates the ultimate concept plan for the CHEO Campus. It is noted that several existing surface parking lots (e.g., the existing Parking Lot A, B and E) are ultimately planned to be removed and replaced with new buildings/facilities. It is noted that under the ultimate configuration, several on-site intersections (with Ring Road N-S and Ring Road E-W) to the surrounding areas of the 1Door4Care building are envisioned to be re-aligned to accommodate the ultimate layout including emergency services, pedestrian pathways, and internal driveways. The ultimate site plan also envisions the parking structure to be horizontally expanded to displace the east portion of the existing central surface parking Lot A, and a new future academic research building will take the west portion of the existing central surface parking Lot A. The ultimate site plan is envisioned to be realized beyond the ultimate (2030) horizon of this study. For analysis, only phase 1 of the parking structure and the 1Door4Care facility have been considered.

Figure 4 – CHEO Campus Ultimate Site Plan Concept



2.1.2.2 Walking and Cycling

Currently, there are limited pedestrian and cycling facilities within the hospital campus. Sidewalks are provided on both sides of Smyth Road and at various locations along the Ring Road. A multi-use pathway is provided along the north side of the northern portion of the Ring Road.

2.1.2.3 Transit

OC Transpo currently provides transit service in the vicinity of the CHEO / General Campus via routes 45 and 55.

Route 45 — Route 45 is a Rapid Route that runs between the General Hospital / CHEO Campus and Hurdman Station all day, 7 days a week. From Monday to Friday, it runs with 15-mintue headways during the AM and PM peak periods. On weekends, it runs with 30-minute headways.

Route 55 — Route 55 is a Local Route that runs between Elmvale and Bayshore Station 7 days a week. From Monday to Friday, it runs with 15-minute headways during the AM and PM Peak

periods. On weekends, it runs with 30-minute headways and on Sundays, it runs only between Elmvale Mall and the General Hospital.

The existing transit routes are illustrated in **Figure 5**.

Figure 5 - Study Area Transit Routes and Stops

Source: https://www.octranspo.com/images/files/maps/systemmap.pdf (accessed April 14, 2021)

2.1.2.4 Traffic Management Measures

No traffic management measures are currently provided near the subject site.

2.1.2.5 Traffic Volumes

Traffic volumes at the study area intersections were provided by the City of Ottawa's Transportation Services department. The turning movement counts on Smyth Road at the intersections with South Haven Place and General Hospital access were collected in April 2017 and December 2019, respectively. The turning movement counts along Ring Road and Hospital Link Road were collected in February 2020. The City of Ottawa long range model (Exhibit 2.11 of the 2013 TMP) was utilized to calculate the forecast growth rate to/from the inner suburbs between 2011 and 2031, and the annual growth rate was found to be 1%. Although this annual growth rate is applicable for the Alta Vista zone where the CHEO Hospital Campus is situated, it is not entirely representative of the hospital operations, as the CHEO campus traffic growth is thought to be dependent on factors unique to the hospital campus including the expansion of services and facilities. As such, the annual growth rate of 1% was applied only to the through traffic along Smyth Road.

Figure 6 and **Figure 7** illustrate the balanced 2021 traffic volumes at the study area intersections.

Appendix C contains the traffic data and is provided for reference.

Figure 6 - 2021 Base Traffic Volumes – AM Peak Hour

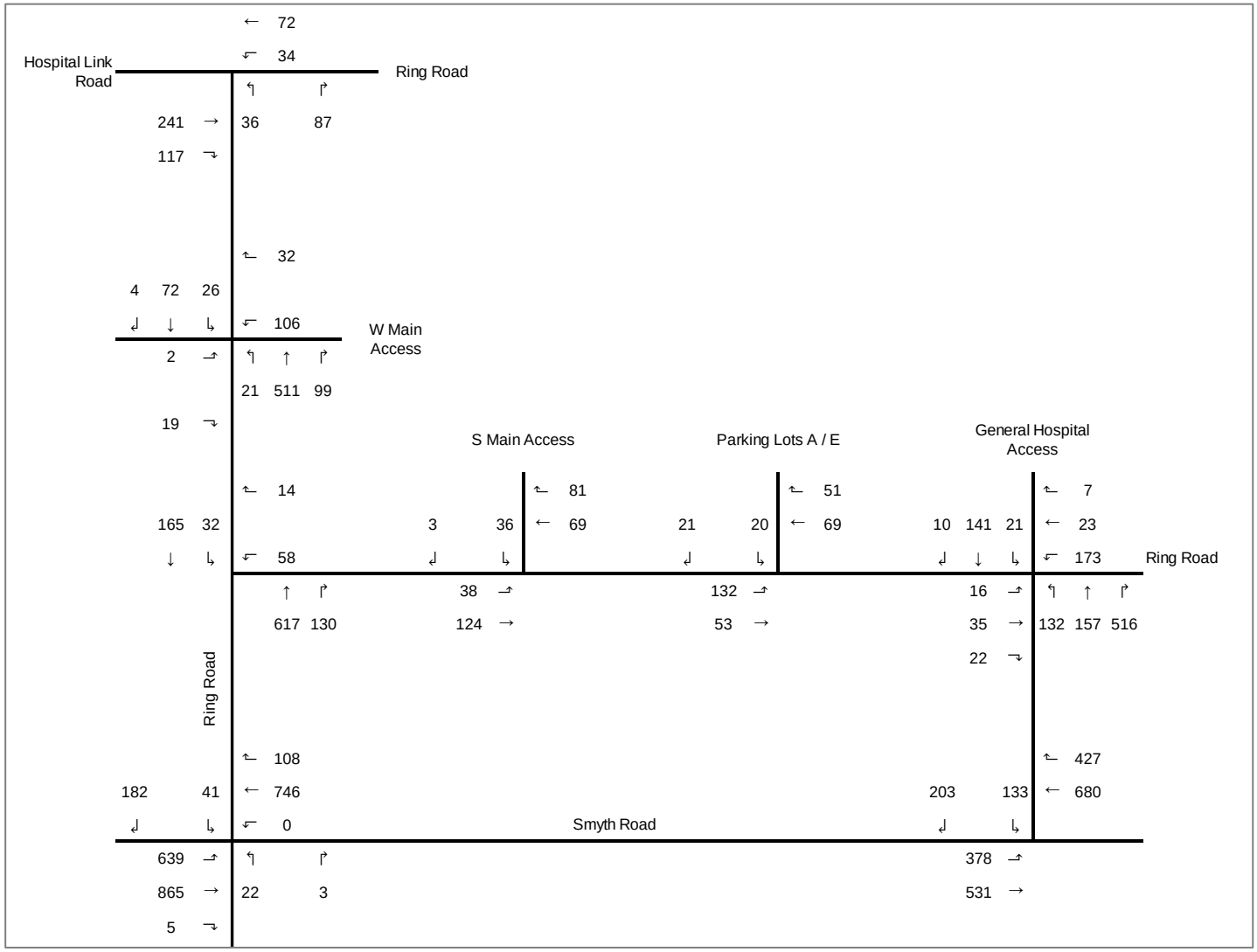
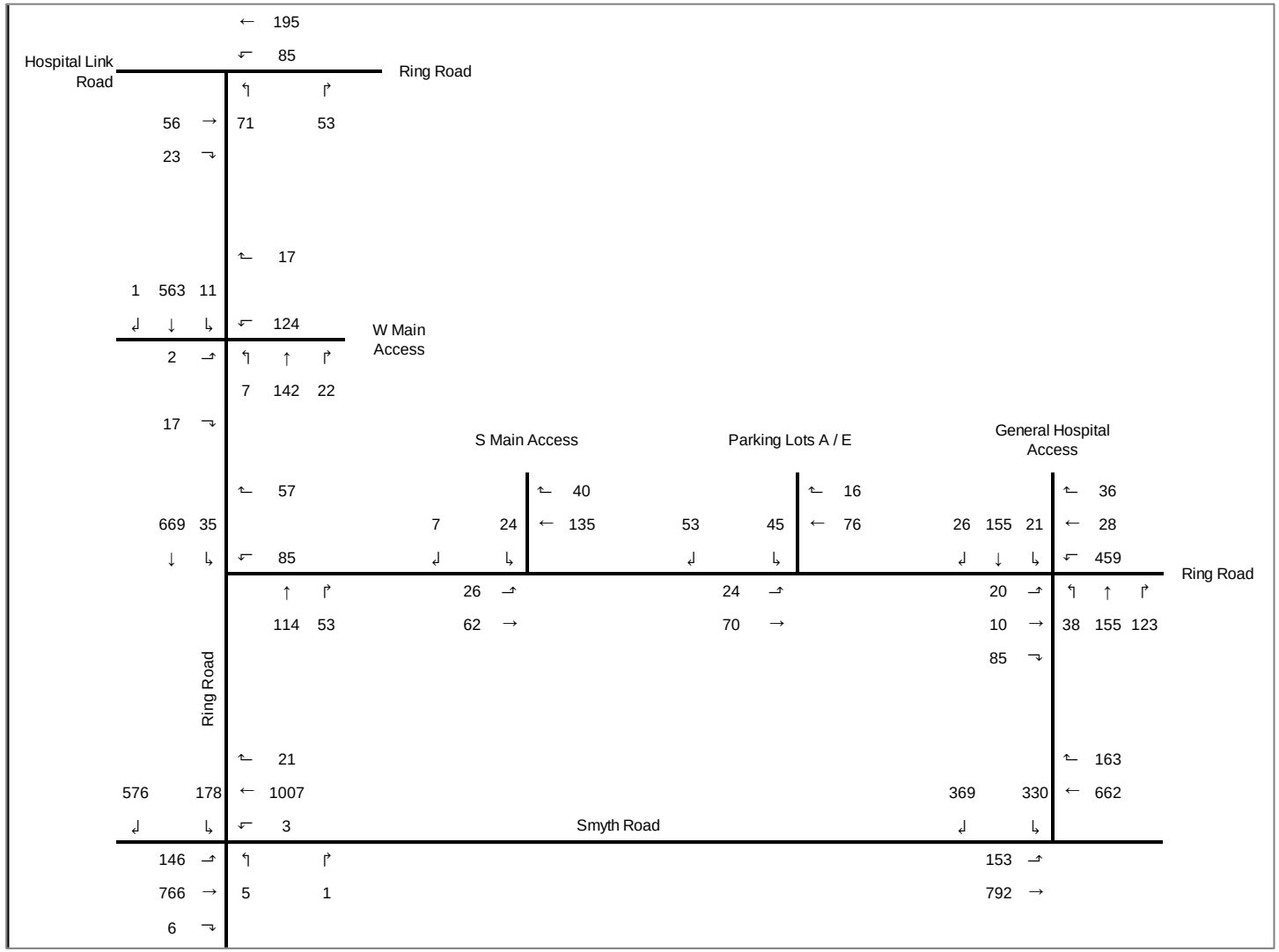


Figure 7 - 2021 Base Traffic Volumes – PM Peak Hour



2.1.2.6 Collision History

Collision data was provided by the City of Ottawa for the period January 1st, 2014, to December 31st, 2018 in the vicinity of the subject site. As the hospital campus is private property, the City of Ottawa only has collision data along Smyth Road. The data was reviewed to determine if any intersections or road segments exhibited an identifiable collision pattern during the five (5) year period.

Table 2 includes the collision summary for each road segment and intersection.

Table 2 - Collision Summary

		Smyth Road at South Haven Place	Smyth Road at General Hospital Access	Smyth Road between South Haven Place and General Hospital Access
Classification	Property Damage Only	14	11	3
	Non-Fatal Injury	3	1	3
	Non-Reportable	--	1	--
Collision Type	Rear End	7	6	2
	Angle / Turning	7	4	1
	Sideswipe	3	2	2
	Single Motor Vehicle	0	1	1
Driver Action	Tailgating / Speeding	7	3	1
	Improper Turn / Lane Change	3	2	1
	Disobeying Traffic Control	1	2	--
	Failing to Yield Right of Way	6	1	--
	Driving Properly	--	1	1
	Lost Control / Unknown	--	4	3

Based on the collision data summarized in **Table 2** above, it was found that most of the collisions on Smyth Road (78%) were classified as property damage only, which suggests vehicles were traveling at low enough speeds as to not cause bodily harm. There were no identifiable collisions patterns in the provided data which suggests there is not any specific area for concern. Based on the collision types and driver action, it was found that 41% of the collisions at the intersection of Smyth Road and South Haven Place were attributed to speeding / following too close, while 59% were attributed to driver errors such as failing to yield the right of way, disobeying traffic control signs, or improper turning/lane changing. It was found that 81% of the collisions in the vicinity of the study area occurred under clear environmental conditions.

2.1.3 Planned Conditions

2.1.3.1 Road Network Modifications

One transit improvement is scheduled to occur within the vicinity of the subject development, as outlined in the City of Ottawa's Transportation Master Plan and is summarized in **Table 3** below. It is noted that the identified projects are listed under the Road Network Concept plans, and, as such, are not anticipated to be finalized by the study's ultimate horizon year.

Table 3 - City of Ottawa Transportation Master Plan Projects

Project	Description	TMP Phase
Alta Vista Transportation Corridor	New four-lane road between Nicholas Street / Highway 417 interchange and Riverside Drive	Network Concept (i.e., beyond 2031)
	New four-lane road (including two peak-period bus lanes) between the Ottawa Health Sciences Centre and Walkley Road	Network Concept (i.e., beyond 2031)
	New four-lane road between Nicholas Street / Highway 417 interchange and Riverside Drive	Network Concept (i.e., beyond 2031)
Smyth Road	Transit signal priority and queue jump lanes between Alta Vista Transportation Corridor and St. Laurent Boulevard	Network Concept (i.e., beyond 2031)

2.1.3.2 Future Background Developments

Based on the City of Ottawa's development applications website, five development applications were identified in the vicinity (i.e., approximately between 1.35km and 2km) of the proposed development. Where applicable, the site generated traffic from the identified background developments was added to the network.

Table 4 - Background Developments

Project	Description	Completion year
355 – 374 Everest	101 Mid-Rise Apartment Units with 108 parking spaces	2020
700 Coronation	4-storey, 35-unit residential building with a 47-parking space garage	Unknown
1967 Riverside	Phase 1: 256 beds of long-term care Phase 2: 15-story (270 beds) registered retirement home	Unknown
200, 230, 260 Steamline	Phase 1: 15- and 22-storey buildings, with a total of 414 apartment units	Phase 1: 2021 Phase 2: 2027 Phase 3: 2031
1740-1760 St. Laurent	Two mixed-use towers at 15-storeys and two residential towers at 12-storeys	2024

2.2 STUDY AREA AND TIME PERIODS

2.2.1 Study Area

The proposed study area is limited to the following intersections, which are visually depictured in **Figure 2**:

1. Smyth Road at Ring Road;
2. Smyth Road at Ottawa General Hospital General Campus Access;
3. Ring Road at Ottawa General Hospital General Campus Access;
4. Ring Road at Parking Lots A / E Access;
5. Ring Road at South Main Access;
6. Ring Road (N-S) at Ring Road (E-W);
7. Ring Road at West Main Access; and
8. Ring Road at Hospital Link Road.

2.2.2 Time Periods

The proposed scope of the transportation assessment includes the following analysis time periods:

- Weekday AM peak hour of roadway; and
- Weekday PM peak hour of roadway.

2.2.3 Horizon Years

The scope of the transportation assessment proposes the following horizon years:

- 2021 base conditions;
- 2025 future background conditions;
- 2025 total future conditions (site build-out); and
- 2030 total future conditions (5 years beyond build-out).

2.3 EXEMPTIONS REVIEW

Table 5 summarizes the Exemptions Review table from the City of Ottawa's *2017 Transportation Impact Assessment Guidelines*.

Table 5 - Exemptions Review

Module	Element	Exemption Considerations	Exempted?
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	No
	4.1.3 New Street Networks	Only required for plans of subdivision	Yes
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	No
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Yes
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	No
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Yes
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Yes
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met.	No

3.0 FORECASTING

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1 Trip Generation and Mode Shares

The *Institute of Transportation (ITE) Trip Generation Manual* (10th edition) was used to forecast auto trip generation for the proposed 1Door4Care building. Land use code 610 - Hospital was thought to be the most representative of the proposed land use. **Table 6** outlines the assumed land use and the trip generation rates.

Table 6 - Land Uses and Trip Generation Rates

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
610 - Hospital	195,931.04 GFA[3]	68%	32%	1.38	32%	68%	1.35

The auto trip generation rates were converted to person trips using a conversion factor of 1.28. **Table 7** outlines development-generated person trips.

As discussed in greater details in **Section 4**, the recommended improvements target addressing background conditions.

Table 7 - Person Trips Generated by Land Use

Land Use	Trip Conversion	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Hospital	Auto Trips	184	87	271	85	180	265
	Conversion Factor	1.28	1.28	1.28	1.28	1.28	1.28
	Person Trips	236	111	347	109	230	339

To reflect local travel characteristics, the person trips were assigned to the four primary modal shares (i.e., auto, passenger, transit, and active moves) using the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the Alta Vista district as a basis.

[3] As mentioned before, the size of 195,931.04 GFA, which was obtained from the latest building gross up plans, are 1Door4Care building's programmed areas, and they were used for trip generation in this study since they represent the main function of the building with activities to generate vehicle trips. The 35,511.96ft^2 non-programmed areas, which should not generate vehicle trips were not included for trip generation calculation.

Table 8 outlines the anticipated trip generation potential of the proposed development by travel mode based on assumed mode share targets.

Table 8 - Trips Generated by Travel Mode

Land Use	Mode Share		Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Hospital	Auto	65%	153	72	227	71	150	220
	Passenger	20%	47	22	70	22	46	68
	Walk	10%	24	11	35	11	23	35
	Bike	2%	5	2	7	2	5	7
	Transit	3%	7	3	10	3	7	10

3.1.2 Trip Distribution

The distribution of traffic to / from the proposed development was determined through the available turning movement counts at the major CHEO Campus accesses including:

- Smyth Road and South Haven Place
- Smyth Road and General Hospital Access; and
- Hospital Link Road and Ring Road.

3.1.3 Trip Assignment

Site generated trips were assigned to the study area road network based on the trip distribution assumptions derived from the accesses turning movement counts.

Figure 8 and **Figure 9** illustrates the trip distribution during the AM and PM peak hours.

Figure 10 and **Figure 11** illustrates the trip assignment during the AM and PM peak hours.

Figure 8 - Site Traffic Assignment – AM Peak Hour

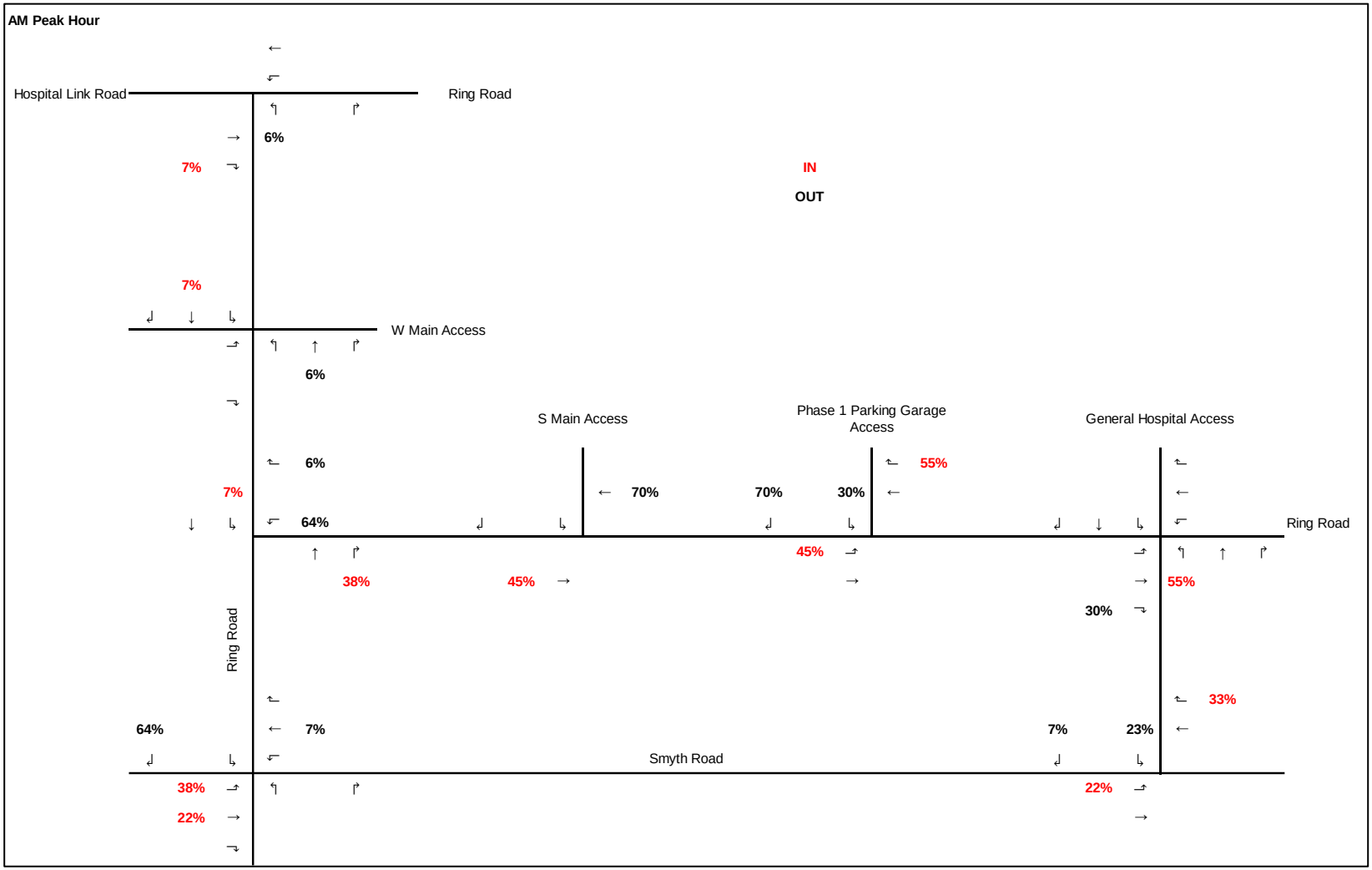


Figure 9- Site Traffic Assignment – PM Peak Hour

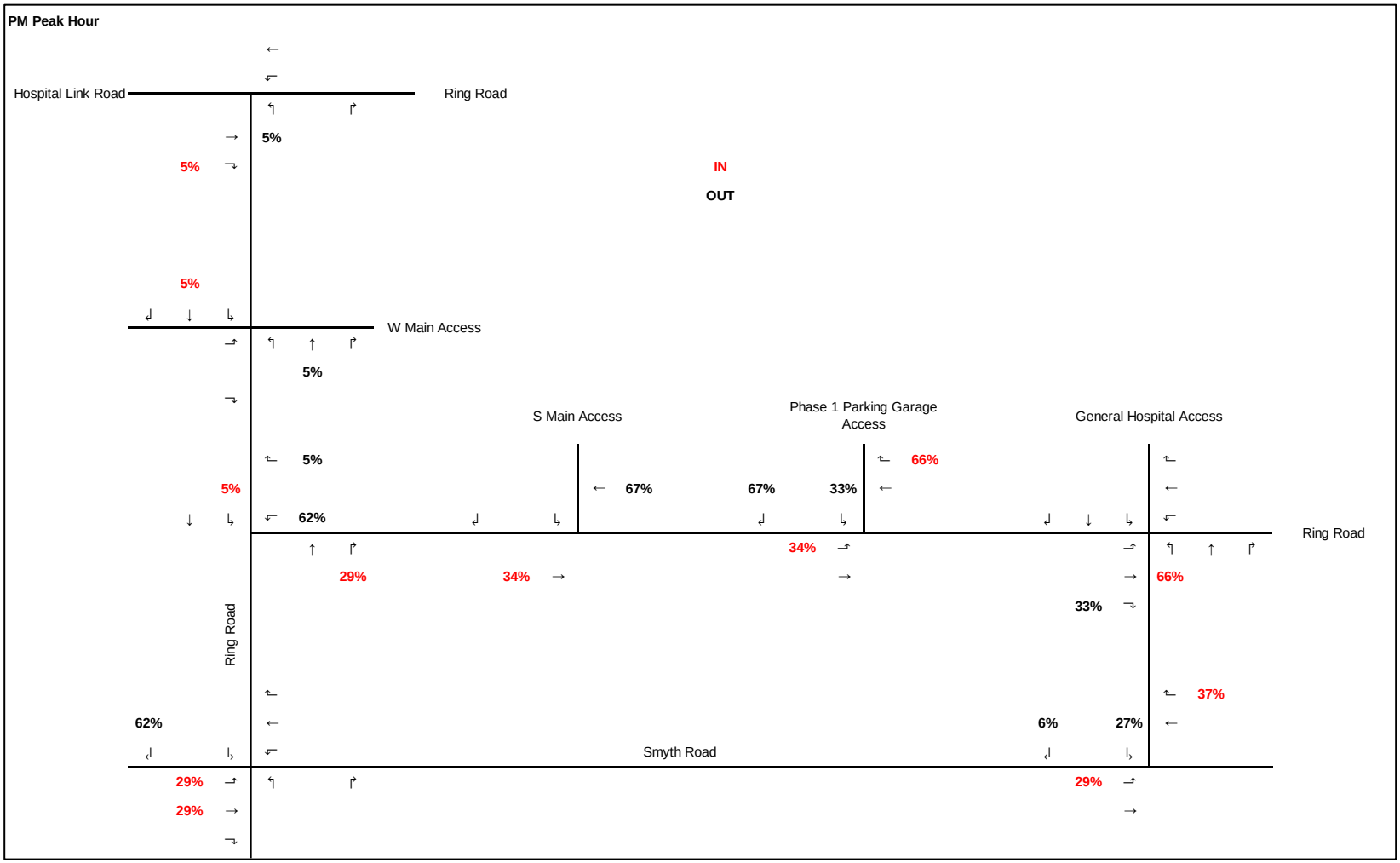


Figure 10 - Site Generated Traffic Volumes - AM Peak Hour

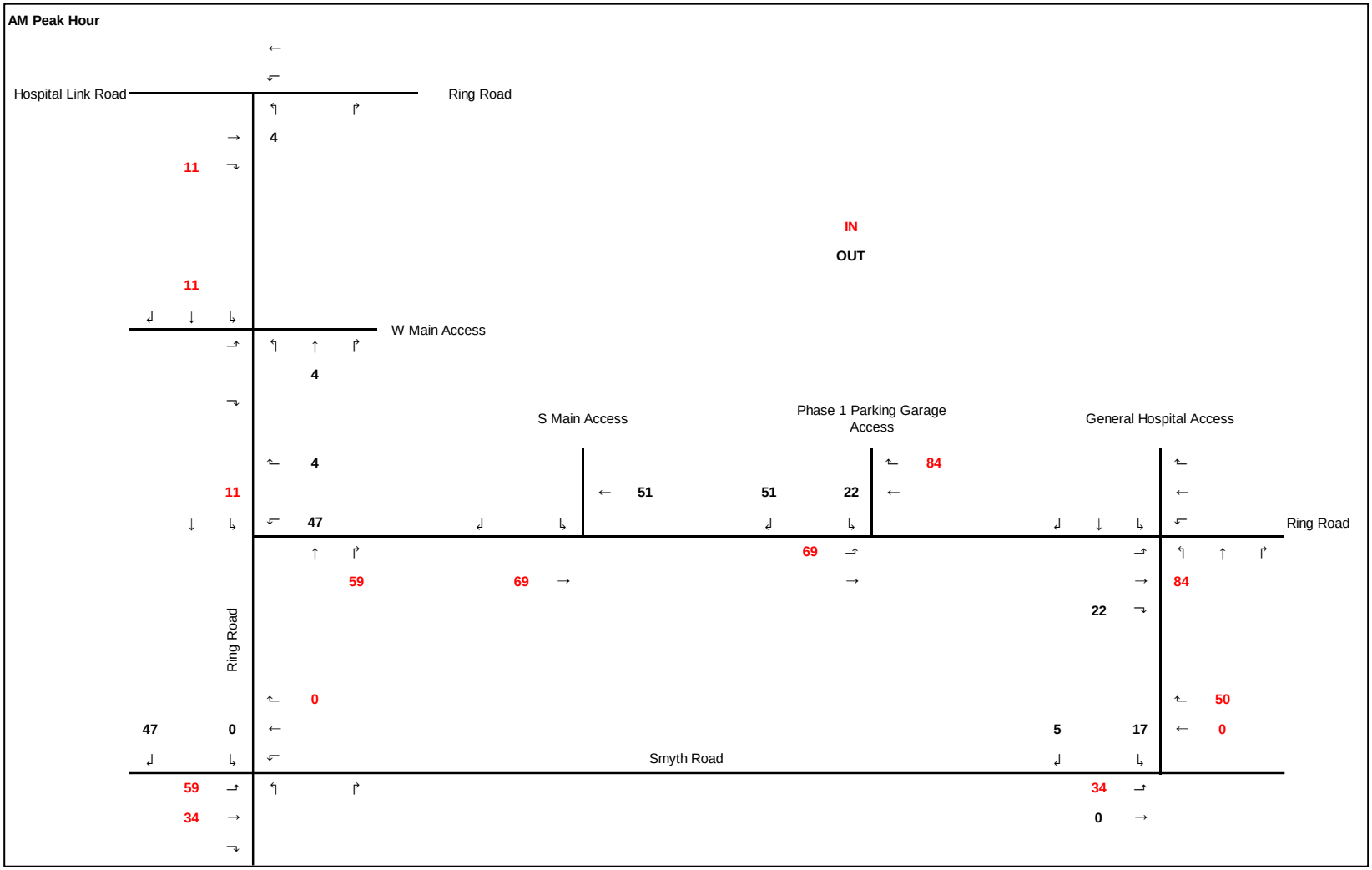
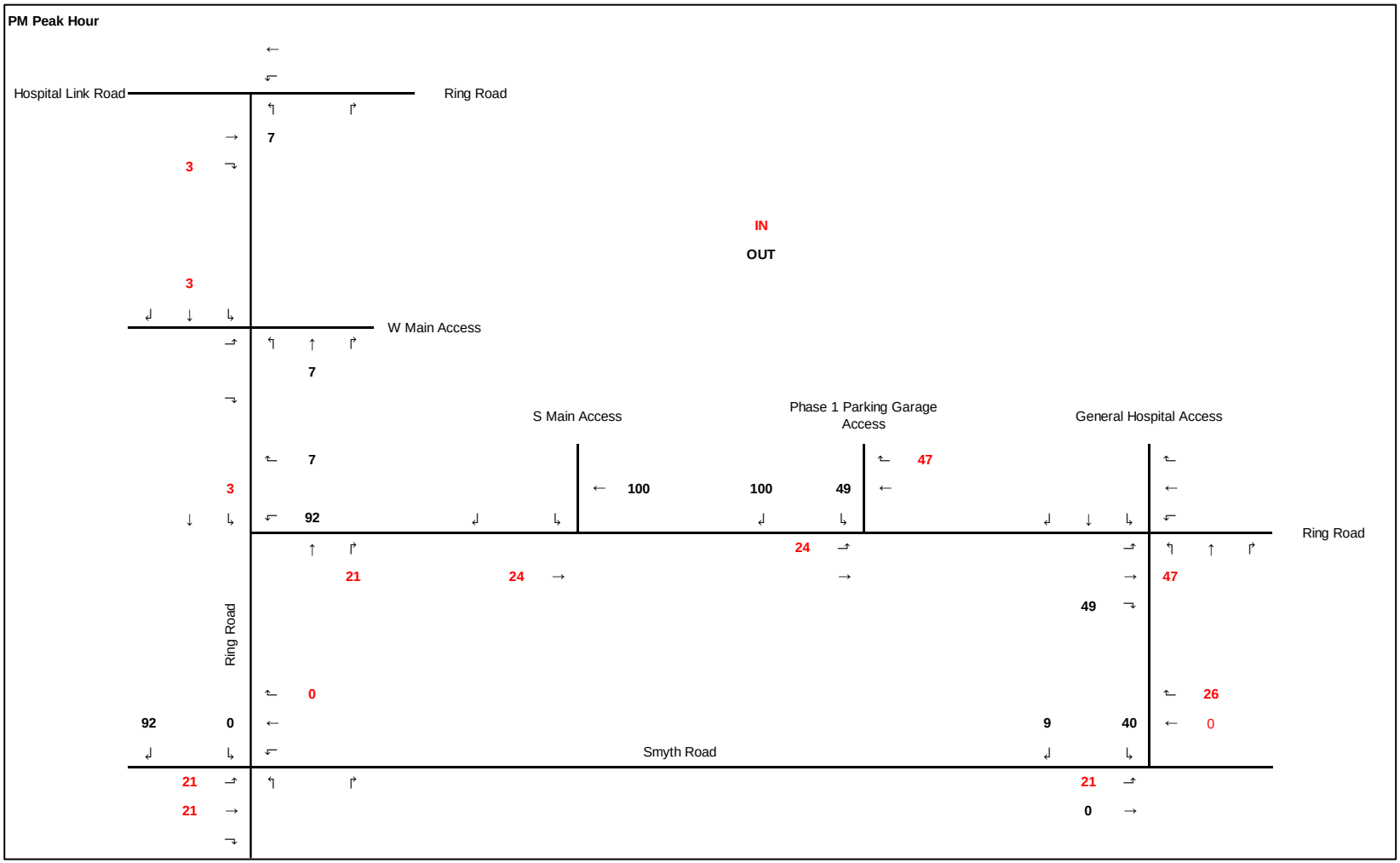


Figure 11 - Site Generated Traffic Volumes - PM Peak Hour



3.2 BACKGROUND NETWORK TRAVEL DEMAND

3.2.1 Transportation Network Plans

As outlined in **Table 3** in **Section 2.1.3.1**, the Alta Vista Transportation Corridor and the Smyth Road Transit Signal Priority improvement projects are anticipated to occur in the vicinity of the study area. However, as per the timelines in the TMP, the listed improvement projects are not part of the 'Affordable Network' and will therefore be implemented post 2031 under the "Concept Network". As such, in the absence of any definitive timelines, it is assumed that the improvements will not be in place by the ultimate horizon year 2030 and are therefore excluded from the analysis.

3.2.2 Background Growth

As per the long-range growth model in the City of Ottawa 2013 Transportation Master Plan, a background traffic growth rate of 1% was applied to the through movements on Smyth Street. It is assumed the internal CHEO traffic growth is predicated on unique external factors including an expansion of land uses. As such, the internal traffic on the campus roads was not subject to a background growth rate.

3.2.3 Other Developments

As outlined in **Section 2.1.3.2**, there are five development applications in the vicinity of the subject site that have been explicitly accounted for within background traffic, where applicable.

3.3 DEMAND RATIONALIZATION

Traffic operations analysis found that Smyth Road is projected to operate close to its theoretical capacity under the existing 2021 conditions. During the AM peak hour, the eastbound left/through movement at the intersection of Smyth Road and South Haven Place was found to operate with a v/c ratio of 0.92 and a delay exceeding 5 minutes. During the PM peak hour, the southbound right movement was found to operate with a v/c ratio of 1.21 and a delay of 17s. Overall, it was found that the movements resulting in deteriorated operations are the turning movements to/from the CHEO campus due to the heavy eastbound left turn demand in the AM peak period opposed to through movements on Smyth Road. The analysis of future horizons also found that internal intersections in the campus are projected to experience long queues and deteriorated operations after the construction of the proposed parking garage as a result of traffic including visitors and staff being diverted to one parking structure. Given the sensitive hospital land use, it was not assumed that CHEO internal traffic is subject to demand rationalization. Visitors are likely to continue to rely on automobiles as the primary mode of transportation, and TDM measures are likely to be most effective to the CHEO staff's traffic and parking demand. Furthermore, the volume-to-capacity ratio for through traffic does not exceed 1 under ultimate conditions.

As such, demand rationalization was not applied to the study area traffic volumes under the base and future horizons for the internal CHEO intersections. Detailed analyses are presented in **Section 4.9**, showcasing a combination of signal timing and geometric improvements to meter the diversion of traffic to the proposed garage as well as accommodate the traffic generated by the proposed 1D4C facility.

The traffic volumes for the future horizons are shown in the figures below. It is noted that by the year 2025, the new parking garage is envisioned to have been constructed, which will see a portion of the northbound and southbound

traffic along Ring Road (N-S) divert to Ring Road (E-W). The diverted traffic is traffic originally bound to use parking Lot C, located west of the Ring Road, facing Lot D. It was assumed that this Lot will not be available for future use by CHEO and therefore, the anticipated traffic using Lot-C was diverted to use the proposed parking structure in the vicinity of Lot E.

Figure 12 and

Figure 13 summarize the 2025 background traffic conditions, which represent a 1,050-space parking structure in the vicinity of Lot E, prior to the full buildout of the 1D4C building.

Figure 14 and **Figure 15** summarize the total future conditions traffic volumes at the 1D4C build-out year, 2025.

Figure 16 and **Figure 17** summarize the ultimate traffic demands five years beyond the full buildout of the 1D4C building, i.e., the year 2030.

Figure 12 - 2025 Future Background Volumes – AM Peak Hour

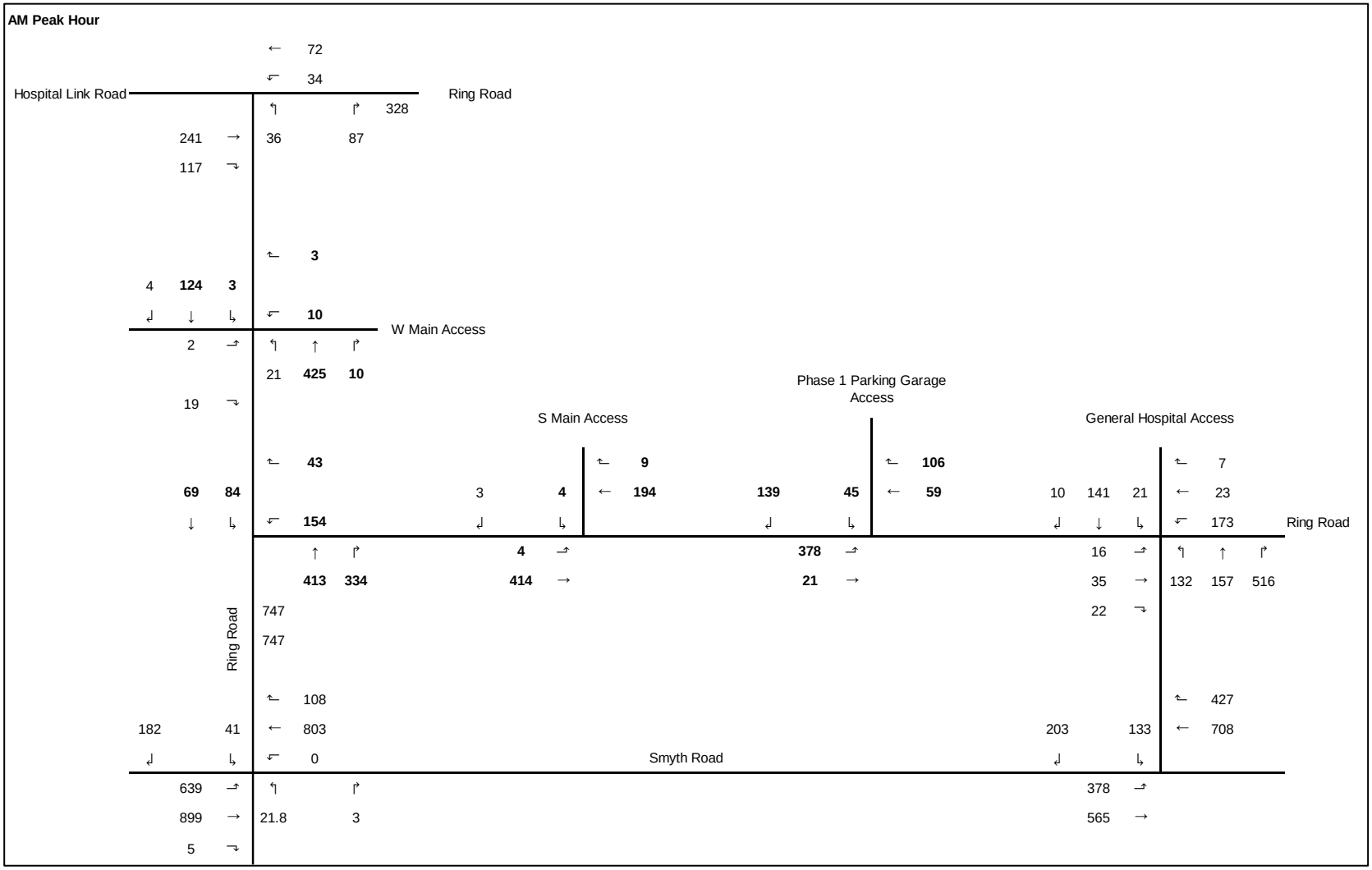


Figure 13- 2025 Future Background Volumes – PM Peak Hour

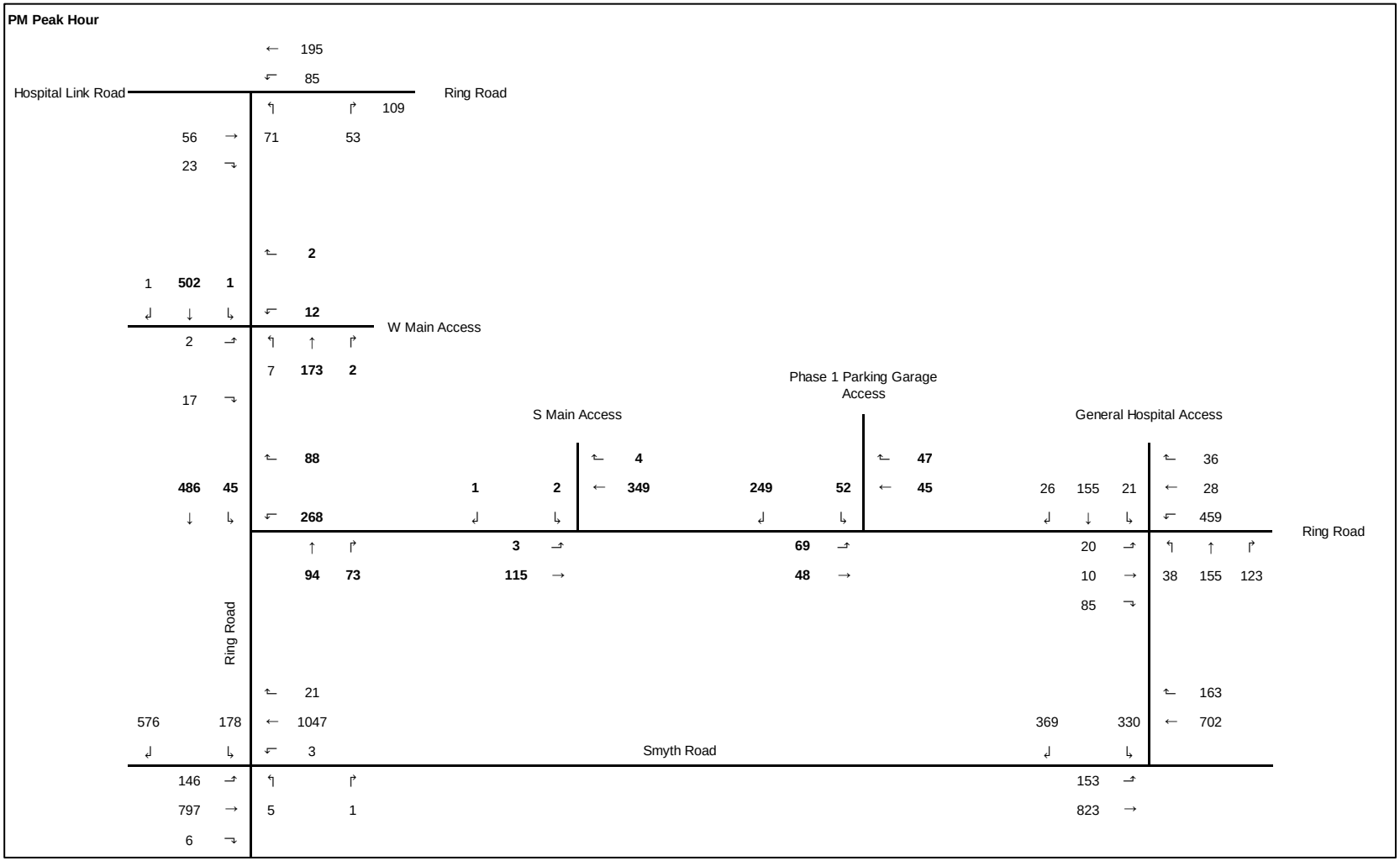


Figure 14 - 2025 Total Future Volumes - AM Peak Hour

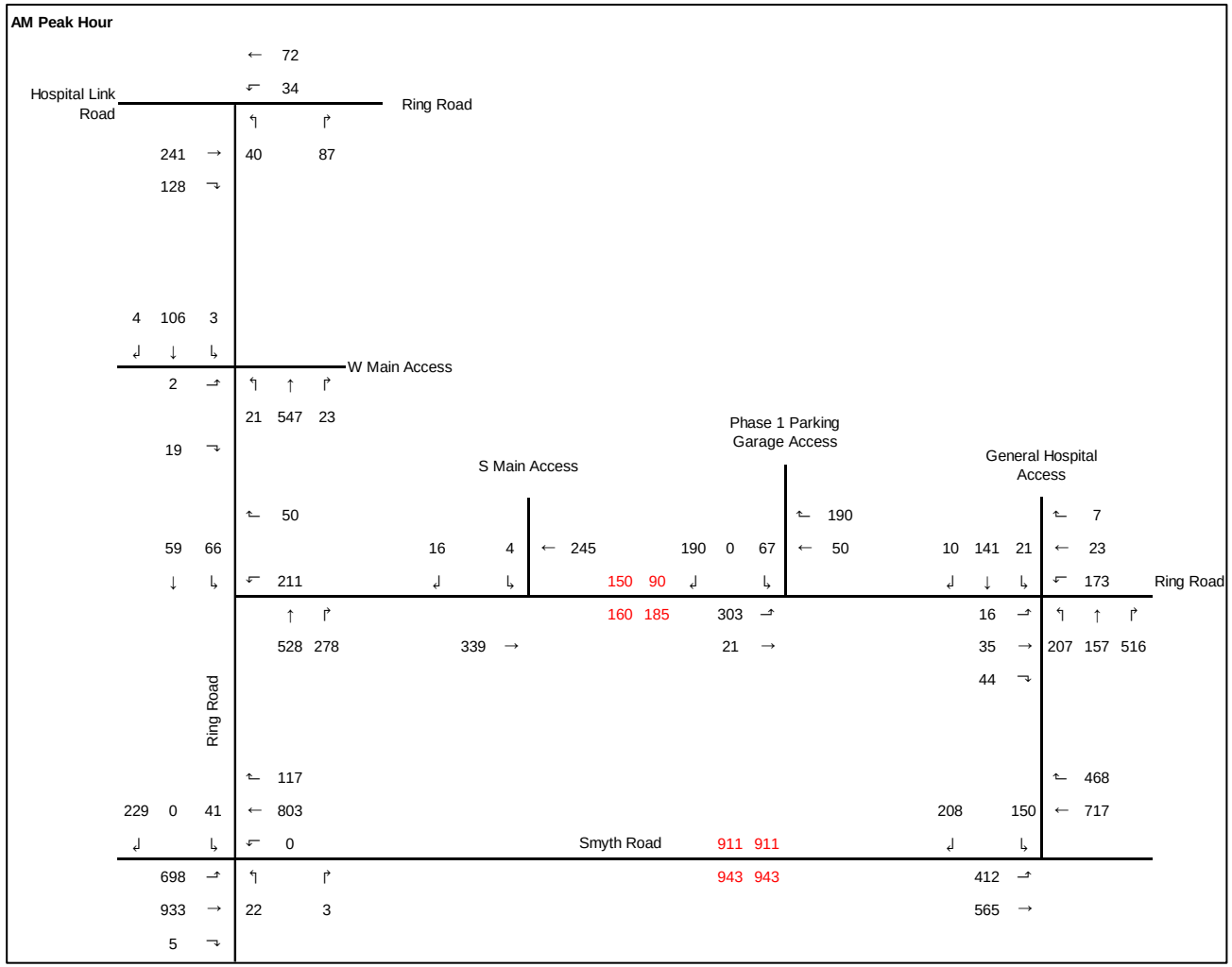


Figure 15 - 2025 Total Future Volumes - PM Peak Hour

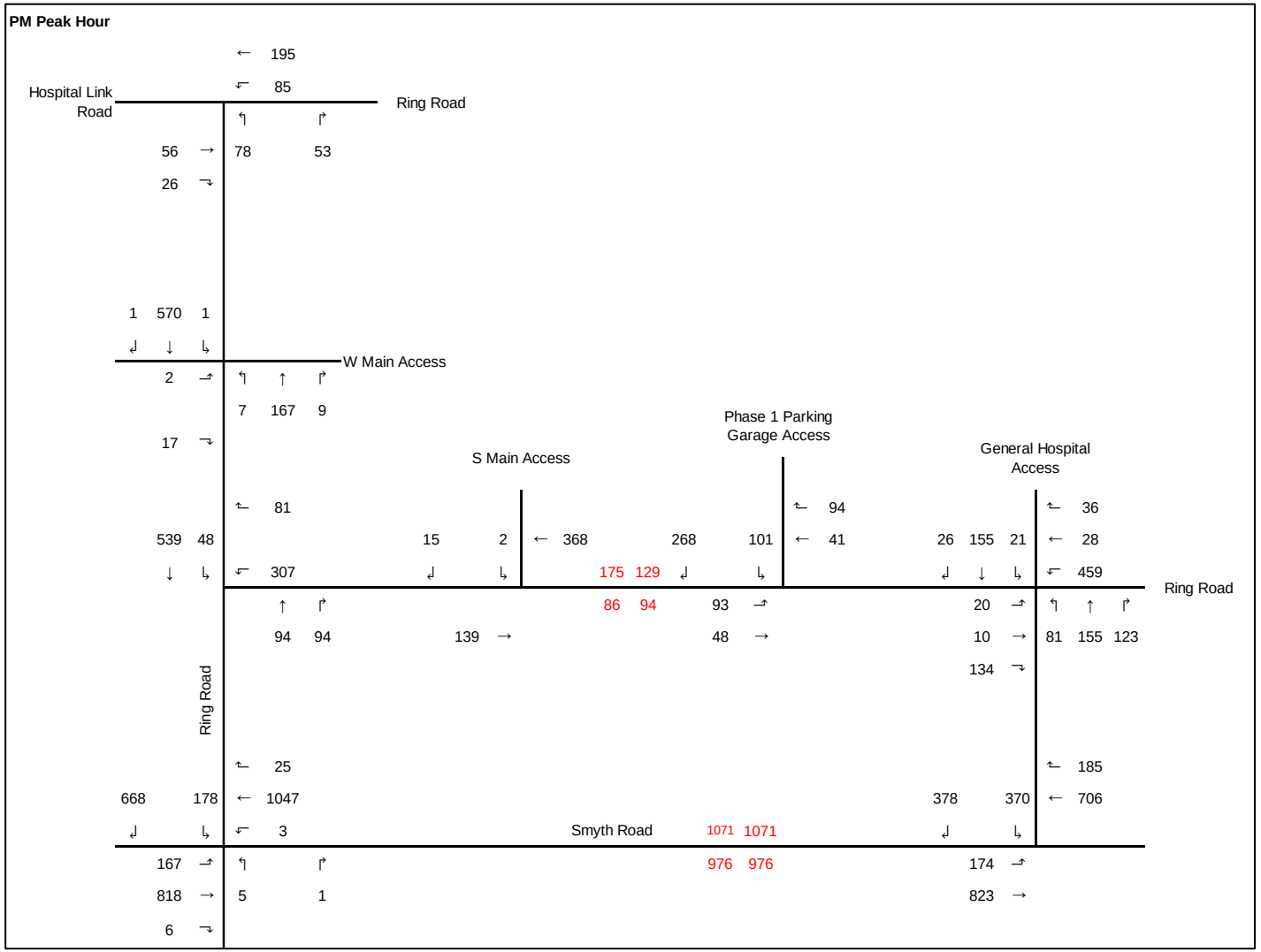


Figure 16 - 2030 Ultimate Future Volumes - AM Peak Hour

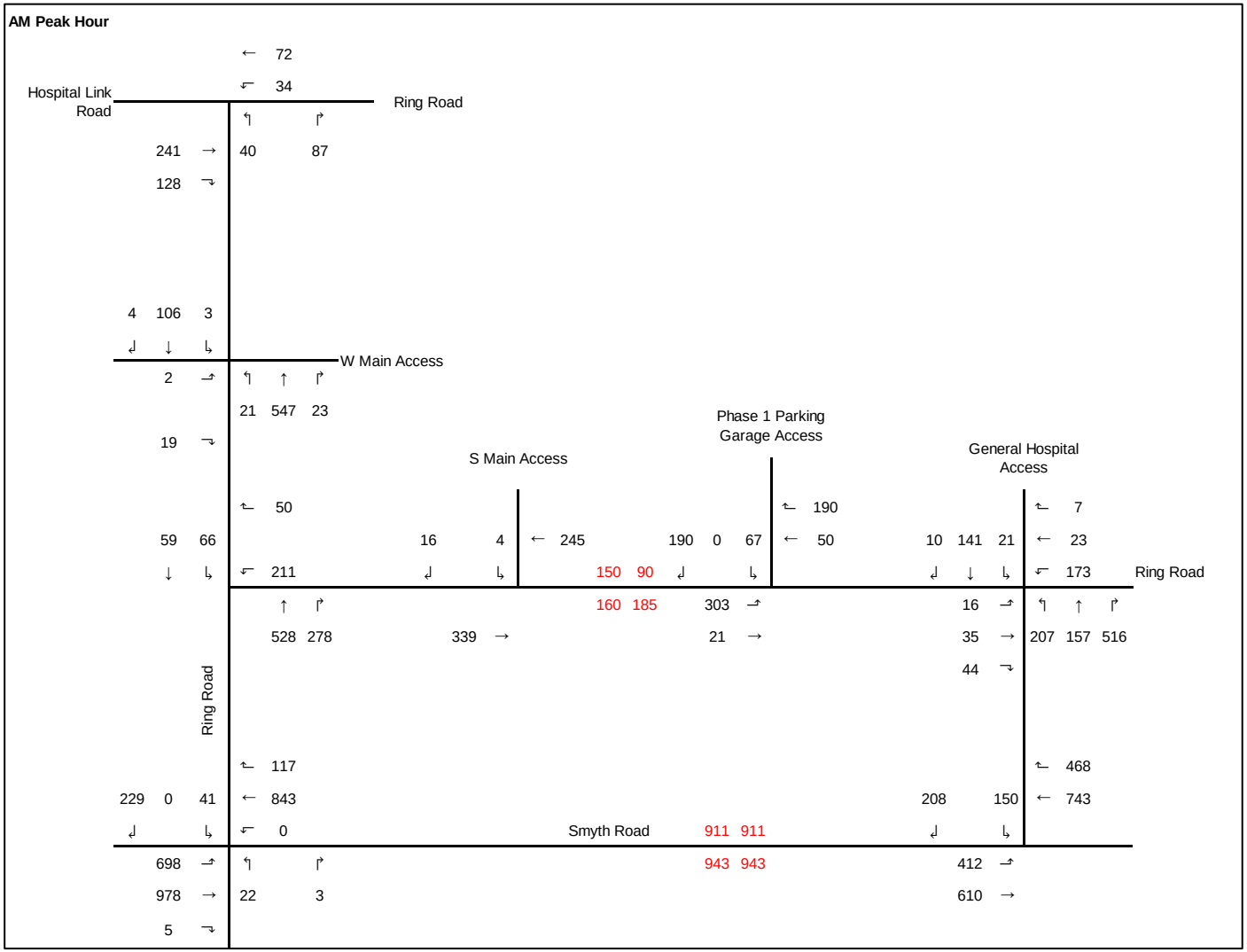
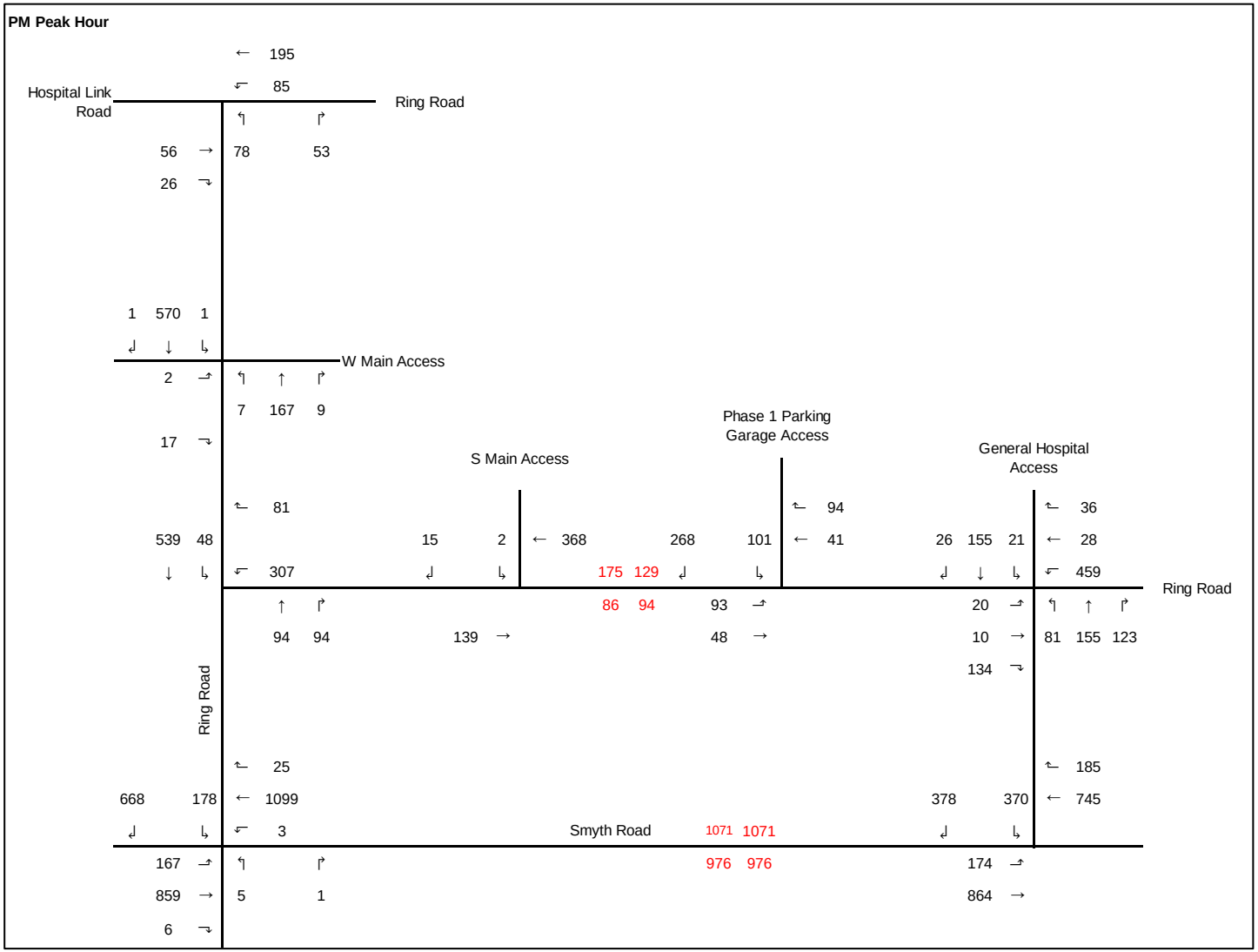


Figure 17 - 2030 Ultimate Future Volumes - PM Peak Hour



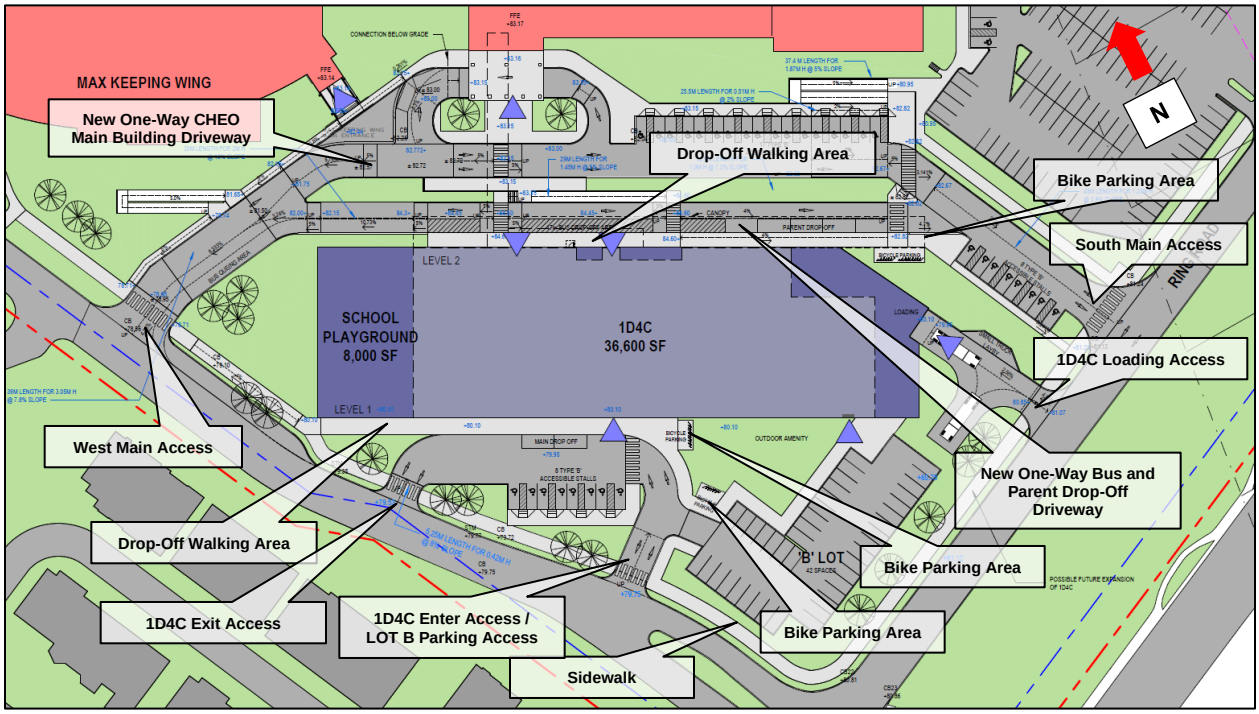
4.0 STRATEGY

4.1 DEVELOPMENT DESIGN

4.1.1 Design for Sustainable Modes

The proposed 1D4C facility is envisioned to displace the existing surface Lot B in the southwest portion of the CHEO campus. The design of pedestrian routes and facilities, the location of bicycle parking areas, and the location of transit amenities are proposed and shown in the latest Site Plan (see **Appendix A** and **Figure 18**).

Figure 18 – Proposed Active and Transit Design and Accesses



Specifically:

- The proposed bike parking areas with bike parking racks are located in the 1D4C main pick-up/drop-off area (west of the building) as well as the parent pick-up/drop-off area (east of the building)

- New sidewalks were proposed to be located on the east side of Ring Road (N-S) and on the north side of Ring Road (E-W), as well as pick-up/drop-off walking areas on both sides of this building, which connect to these sidewalks, the surface parking lot (i.e., Lot B shown in **Figure 18**) southwest of the 1D4C building and Type B accessible parking stalls surrounding this building. Several crosswalks were proposed to accommodate pedestrian facility connection. All these new pedestrian facilities will connect this new 1D4C building to the adjacent roadway network.

- A new one-way two-lane driveway was proposed on the east side of the 1D4C building, being parallel to the existing CHEO Main Building's Access that will be converted to one-way driveway as well with the same vehicle operation direction as the new driveway, to accommodate future bus routes and parent pick-up/drop-off operations. The existing West Main Access and South Main Access will be shared by both these two driveways. Buses and other passenger vehicles will enter the site via West Main Access on Ring Road (N-S) and exit the site via the South Main Access on Ring Road (E-W). Future bus route will only utilize one of the two lanes of the new driveway. The transit amenities along the bus route include a bus queuing area and a bus stop pick-up/drop-off area with canopy, which is adjacent to the 1D4C building.

Auto parking is planned to be located at the proposed parking garage at the location of the existing surface Parking Lot E, as well as the new surface Parking Lot B southwest of the new 1D4C building.

4.1.2 Circulation and Access

Based on the detailed Site Plan and the ultimate high level concept plan illustrated in **Figure 4** and **Appendix A,** as well as **Figure 18**, a new one-way two-lane driveway is proposed on the west side of the 1D4C building to accommodate the main pick-up/drop-off operations and surface parking in Parking Lot B. In addition, another new one-way two-lane driveway is proposed on the east side of the 1D4C building, which is parallel to the existing CHEO main building's pick-up/drop-off driveway. Both these two new driveways connect to the existing east-west Ring Road and north-south Ring Road. The new driveway east of the 1D4C building will share West Main Access and South Main Access with the existing CHEO main building's pick-up/drop-off driveway, which will be converted to a one-way two-lane driveway as well. All buses and vehicles for 1D4C's parent pick-up/drop-off will circulate on-site by entering via West Main Access and exiting via South Main Access. All vehicles for 1D4C's main pick-up/drop-off operation will circulate on-site by entering via the south access and exiting via the north access on the north-south Ring Road. All vehicles to park in Lot B will use the south access on the north-south Ring Road for both entering and exiting.

The only loading access for the 1D4C building is proposed on the south site of this building. Base on the swept path analysis included in the Site Plan, the design vehicles for loading should be accommodated. Also, it is expected that there will be no conflicts between loading vehicles and other vehicles for the 1D4C due to the proposed on-site vehicle circulation plan.

4.1.3 New Street Networks

Not applicable; exempted during screening and scoping.

4.2 PARKING

4.2.1 Parking Supply By-law Requirements without the Proposed Parking Structure

As per the City of Ottawa By-law 2016-249, for a hospital land use located in Area B, a minimum number of 1.4 vehicle parking spaces per 100 m^2 of gross floor area is required, while a minimum number of 1 bicycle parking spaces per 1000 m^2 of gross floor area is required.

For the proposed 1D4C building, the By-law requirement indicates that a minimum of 255 vehicle parking spaces and a minimum of 19 bicycle spaces are required. The by-law informs developments on the City's requirements based on the City's land use policies for the general City of Ottawa zones and targets. Using a total gross floor area for the hospital land use of 60,983 m^2 and an added 18,203 m^2 by the 1Door4Care development, the total required parking spaces, per the by-law requirements is 1,109 vehicle parking spaces.

Currently, 1,316 parking spaces were provided for the whole site. Based on the site plan, as the 1D4C is envisioned to displace all of Lot B which currently includes 286 vehicle parking spaces, with offering 42 surface parking spaces and 8 type 'B' Accessible parking stalls, the total number of existing parking spaces would be 1,080 spaces, which is below the by-law requirement by 29 spaces. Such deviations from the by-law requirements may be accepted through the committee of adjustment. However, it is critical to note that from a demand perspective, parking demand could be significantly higher as compared to the by-law requirements and the site was observed to operate at its parking capacity. In addition, there is staff demand that currently is on a waiting list, indicating a shortage of parking supply.

4.2.2 Observed Parking Demand

Parking data at the lots marked in **Figure 2** were collected via field survey conducted by Stantec staff on February 12th, 2020, between 7:00 am and 5:00 pm. It is noted that generally, parking demand may fluctuate depending on the time of year and could potentially exceed the demand observed during the site visit.

The surveyed staff parking lots include Lot B and a portion of the overall Lot D, while visitor lots include Lot A and Lot E. It is acknowledged that parking Lot C (located just north and northwest of the Ronald McDonald House) is currently utilized by CHEO staff under an agreement with the Federal Government of Canada. CHEO's continued use of this parking lot into the future is uncertain as there are presently no long-term agreements in place. Based on correspondence with CHEO, it is noted that for all staff usage at all staff designated parking lots, there are currently 360 staff members on the waiting list waiting to be enrolled to use the hospital's parking.

Staff Parking Lots

Preliminary analysis of the data found that the staff parking portion of Lot D was heavily utilized (> 85%) between 8:00 am and 3:00 pm, with the heaviest utilization (97%) occurring between 1:00 pm and 2:00 pm. The parking utilization was found to gradually decrease to 40% by 5:00 pm. The utilization rate was 95% or greater between 11:00 am and 2:00 pm.

The staff parking Lot B was found to be heavily utilized (>85%) between 10:00 am and 3:00 pm, with the heaviest utilization (96%) between 1:00 pm and 2:00 pm. After 3:00 pm, the utilization was found to gradually decrease to 65% by 5:00 pm. The utilization rate was 95% or greater between 11:00 am and 2:00 pm.

It should be noted that for the purpose of quantifying parking demand, utilization rates between 85% and 95% are considered to reflect parking lots operating close to capacity and should be monitored. This range provides practically almost full utilization with a relatively user-friendly circulation experience to finds parking spots. Utilization rates of 95% or greater reflect lots operating at capacity, as at these rates, circulation to find spaces becomes challenging from a user perspective. With respect to staff parking, which does not follow a pre-assigned spaces system, all staff lots are operating at capacity. Furthermore, there are 360 staff members currently on a waiting list for parking and are considered to be existing latent parking demand.

Visitor Parking Lots

Preliminary analysis of the collected parking data found that the visitor parking Lot A was heavily utilized (> 85%) between 9:00 am and 2:00 pm, with the heaviest utilization (94%) occurring between 11:00 am and 12:00 pm and between 1:00 pm and 2:00 pm. After 2:00 pm, the utilization was found to gradually decrease to 55% by 5:00 pm.

It is important to note that the surveys represent a snapshot (few minutes) within the hour of the surveyed lots. Within that time, a few vehicles may have entered or left the lots (i.e., after or before the surveying team scanned through the lots). These vehicles, which may not have been captured or missed, have typically a low impact on utilization. Within the context of Lot A, the added number of vehicles that would represent 95% utilization translates into 2 additional vehicles compared to the captured numbers in the survey and can be attributed to the prescribed movement of vehicles in and out of spaces during the time of the survey. Therefore, for the purposes of the analysis, Lot A is considered to have reached its capacity. During the time of the survey, the Stantec team was also approached a few times by Lot A users, who expressed that finding parking is challenging in Lot A.

The visitor parking Lot E was found to be the least utilized lot in the study area with the highest utilization rate being 76% which occurred between 11:00 am and 12:00 pm. After 2:00 pm, the utilization was found to decrease to 42% by 5:00 pm. This can be attributed to its proximity, being further away from the hospital's main entrance and translates into 51 free spaces to reach a utilization rate of 95%.

Although excluded from the utilization analyses, the visitor portion of parking Lot D was found to be heavily utilized (> 85%) between 10:00 am and 2:00 pm, with the heaviest utilization (95%) occurring between 11:00 am and 12:00 pm. After 2:00 pm, the utilization was found to gradually decrease to 55% by 5:00 pm. Similarly, the Rehabilitation Center lot was observed to be heavily utilized (>85%) between 9:00 am and 3:00 pm at a rate exceeding the theoretical capacity (i.e., vehicles parked outside the designated parking lines or over the lot's curbs). After 3:00 pm, the utilization rate was found to decrease to 65% by 5:00 pm. The calculated utilization rates for the aforementioned Pay and Display lots (Lot D visitors and Rehabilitation Center visitors) are included for information only indicating that these areas are not likely to be part of future mitigation measures for parking shortages due to the 1Door4Care development.

Overall Parking Utilization (Lot D Staff + Lot B Staff + Lot A Visitors + Lot E Visitors)

Generally, both visitor and staff uses should not be combined due to the nature of uses (short to medium term for visitors, while predominantly long-term use for staff) and due to the spatial constrains (lots separated by barriers, gates, and curbs). However, for the planning purposes of the 1Door4Care facility, and in cases that re-arrangements of parking numbers can be applied, the overall statistics have been summarized to show case the aggregated parking conditions.

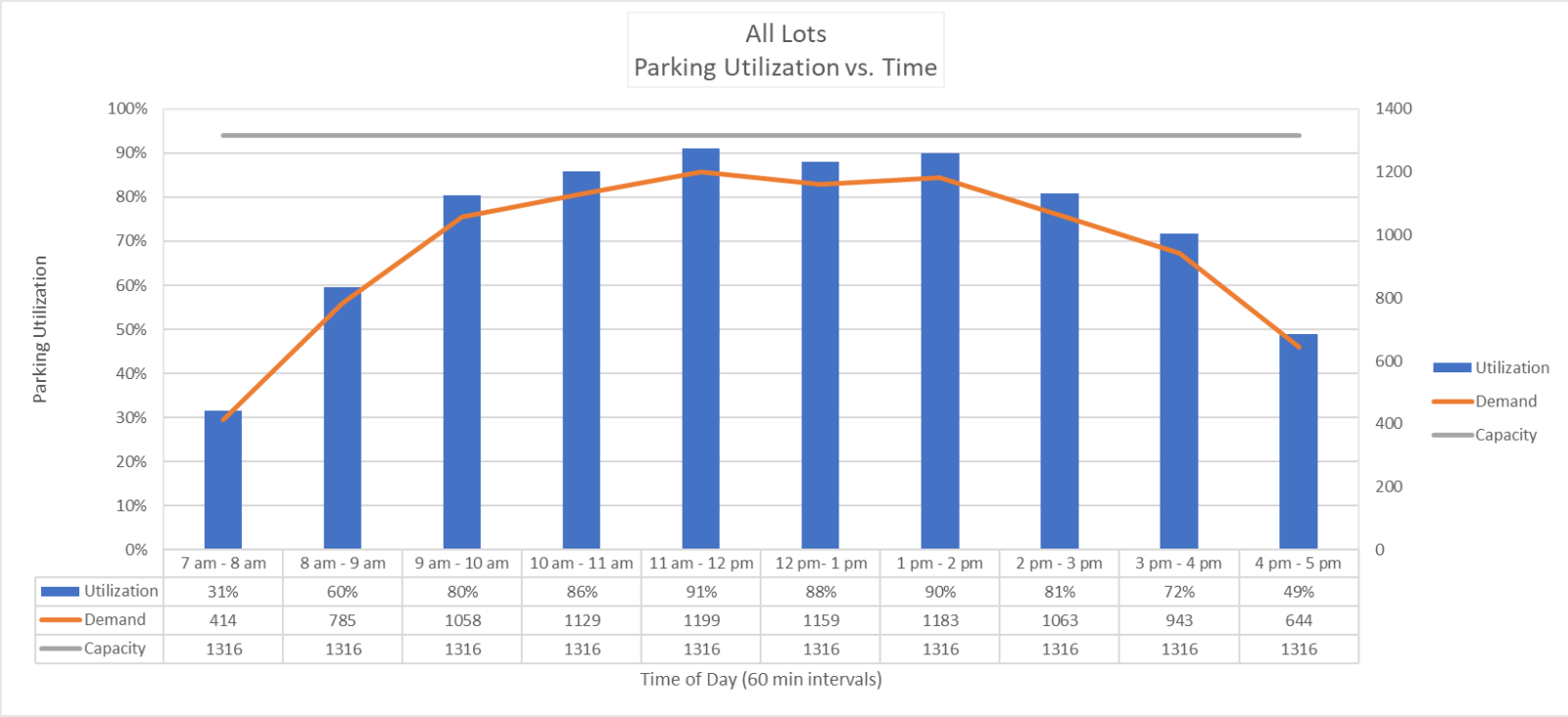
Overall, Lot D Staff, Lot B Staff, Lot A Visitors, and Lot E Visitors have been cumulatively found to have the highest utilization between 11:00 am and 12:00 pm at a utilization rate of 91%. Similar levels of utilization continue at 90% between 1:00 pm and 2:00 pm. The slight reduction in parking utilization between 12:00 pm and 1:00 pm is likely due to visitors / staff departing the CHEO campus for lunch or mid-day breaks.

The findings of the aggregated statistics indicate that the overall parking utilization is high and is approaching capacity. The overall parking demand for all-surveyed lots is shown in **Figure 19**.

Utilization graphs for each surveyed parking lot can be found in **Appendix D**.

It was noted that COVID pandemic caused traffic volume reduction in the roadway network and parking reduction as well. However, it was assumed that the parking demand increase should be observed with the pandemic restriction was lifted in 2022 and it will go back to the normal level of pre-COVID time for long-term expectations.

Figure 19 – Hourly Parking Utilization | All Surveyed Lots



	7 am - 8 am	8 am - 9 am	9 am - 10 am	10 am - 11 am	11 am - 12 pm	12 pm- 1 pm	1 pm - 2 pm	2 pm - 3 pm	3 pm - 4 pm	4 pm - 5 pm
Utilization	31%	60%	80%	86%	91%	88%	90%	81%	72%	49%
Demand	414	785	1058	1129	1199	1159	1183	1063	943	644
Capacity	1316	1316	1316	1316	1316	1316	1316	1316	1316	1316

4.2.3 Parking Demand Requirements Assessment

4.2.3.1 PARKING DEMAND ASSESSMENT

Parking data collected on February 12th, 2020, between 7:00 AM and 5:00 PM indicated that the overall available parking supply is being utilized at capacity. In effort to develop a parking demand rate reflective of CHEO, all captured demand data in addition to Lot C demand and demand that is currently on a waiting list for a parking space were considered. This includes:

- A peak parking demand of 1199 spaces.
- A peak demand that consists of 95% of Lot C capacity (350 spaces), which is indicated as fully utilized. This reflects a peak demand of 333 spaces.
- A peak demand that consists of 95% of the demand currently on a waiting list for a parking stall (360 staff). This reflects a peak demand of 342 spaces and is referred to as “latent parking demand”.

In total, the anticipated unconstrained parking demand totals 1,874 spaces. As the existing gross floor area of CHEO is 60,983 m^2, the parking generation rate for CHEO is estimated at 3.07 spaces per 100 m^2.

In comparison to the City of Ottawa parking requirements, 3.07 spaces per 100 m^2. is more than twice the requirement of 1.4 spaces per 100 m^2.

In comparison to the Institute of Transportation Engineers (ITE) parking generation rates, 3.07 spaces per 100 m^2 is 23.25% lower than the rate of 4 spaces per 100 m^2.

The aforementioned comparison indicates that relying on the by-law parking requirements is anticipated to underestimate parking needs by 120%. Using ITE rates would overestimate the needed parking spaces which would reflect added construction costs. Overall, the developed parking rate for CHEO would be the most appropriate rate for application to the proposed 1D4C building resulting in a need for 559 spaces (based on a 1D4C gross floor area of 195,931.04 0 [4]ft^2) to serve the 1D4C building parking demand.

The proposed buildings, 1D4C and proposed parking structure, are anticipated to displace the following parking lots:

1. **Lot B** (staff parking): which consists of 286 spaces.
2. **Lot E** (gravel visitors parking): which consists of 270 spaces.

With the provision of the 1,050 space Phase 1 parking garage, as well as 50 surface parking spaces which are adjacent to the 1D4C building, it will roughly satisfy the 1D4C building parking demands (559 spaces for the 1D4C building plus 286 spaces displaced from Lot B plus 270 spaces displaced from Lot E for a total of 1,115 spaces; i.e., with an shortage of 15 spaces).

As included in Appendix D for the previous TIS report, several parking structure options with different parking spaces were analyzed. It was recommended that the proposed 8-level parking garage may need to increase the parking spaces

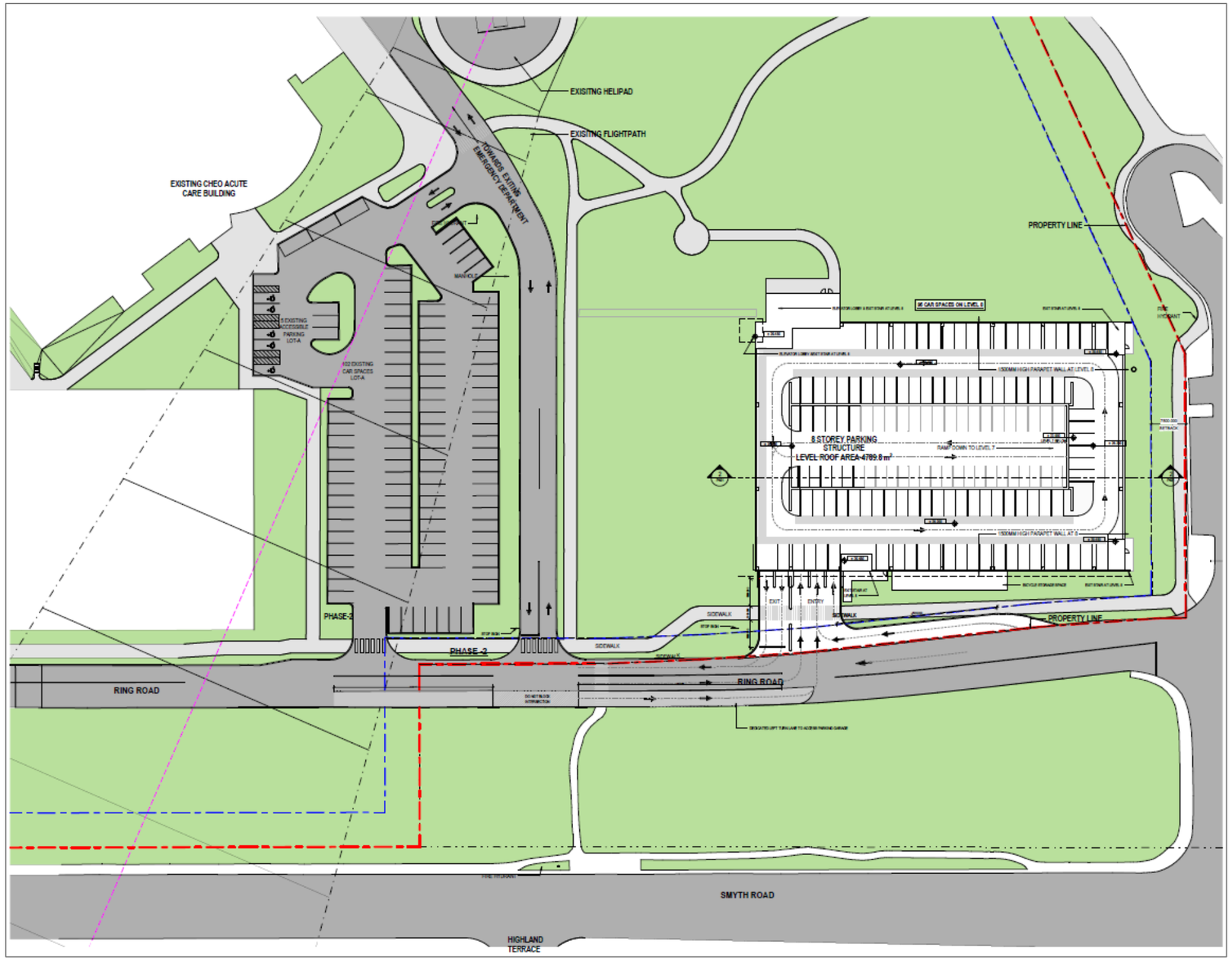
[4] Like trip generation, this GFA, which does not include non-programmed areas, should be used for parking demand calculation.

to accommodate the calculated 1,115 spaces of parking demand. **Figure 20** shows the site plan of the Phase 1 parking garage with a total of 1,050 spaces. The details of the plan are included in **Appendix B**.

4.2.3.2 PARKING STRUCTURE ENTRY/EXIT

Based on the proposed parking garage plan illustrated in **Appendix B**, for the structure of 1,050 spaces, three entry lanes and two exit lanes were proposed.

Figure 20 – Proposed Phase 1 Parking Garage Site Plan



4.2.4 Parking Demand Management During Construction

As the parking structure is recommended to be constructed on the entirety of the unpaved parking Lot E without the need to infringe on the emergency access, accessibility impacts are anticipated to be minimal. Construction vehicles and equipment would require using the existing emergency access providing accessibility to both visitor parking Lot A and Lot E. Construction vehicles and equipment may need to temporarily block portions of the access leading to the hospital's emergency department. Coordination would be required to ensure that such roadway blockages, if needed, will only partially block the access during off-peak hospital operations.

During construction, Lot E would not be usable for visitors and therefore, would require an alternative site to serve parking demand. It is recommended that CHEO constructs the parking structure first prior to constructing the 1D4C building. The existing Lot B, to be replaced by the 1D4C building, can be used as temporary visitor parking supply until the construction of the parking structure is completed. In the interim, a remote parking site may be investigated by CHEO to provide temporary staff parking to serve the staff parking demand of Lot B.

Once the parking structure is constructed and ready for in-service revenue, it would be able to sufficiently accommodate the 1D4C building demand as well as the displaced staff's Lot B demand, Lot C parking demand, as well as the visitors parking demand.

4.3 BOUNDARY STREET DESIGN

4.3.1 Design Concept

As outlined in the City of Ottawa's *Official Plan* Schedule B, both Smyth Road and Ring Road fall within the 'General Urban Area' designation. In addition, the following information was found:

- Smyth Road is classified as an arterial road and Ring Road is classified as a local road;
- Smyth Road is classified as a Cycling Spine Route; and
- Smyth Road is classified as a truck route.

Based on the aforementioned information, the Pedestrian Level of Service (PLOS) target for Smyth Road and Ring Road (and other internal roadways) is C. The Bicycle Level of Service (BLOS) target is C for Smyth Road and D for Ring Road. The Transit Level of Service (TLOS) target for both Smyth Road and Ring Road is D. The Truck Level of Service (TkLOS) target is D for Smyth Road. As Ring Road is a local road, the truck level of service does not apply.

Appendix E contains the detailed MMLOS analysis and is provided for reference.

Ring Road (N-S) to West Main CHEO Access

The PLOS target of C along this segment is currently being met due to the 2m width of the existing sidewalk, the operating speed, and the average daily curb lane traffic volume being under 3,000 vehicles. The BLOS target of D along this segment is currently being met due to the low number of travel lanes and the posted speed limit. The TLOS target of D along this segment is currently being met due to the limited parking / driveway friction along the corridor. As Ring Road is not designated as a truck route, the TkLOS does not apply to this roadway segment.

Ring Road (E-W) to South Main CHEO Access

The PLOS target of C along this segment is not currently being met due to the lack of sidewalks and boulevards as well as the operating speed. To improve the PLOS and meet the target of C, a 1.8m wide sidewalk could be implemented along the segment, or a 1.5m sidewalk with a 2m boulevard. The BLOS target of D along this segment is currently being met due to the low number of travel lanes and the posted speed limit. The TLOS target of D along this segment is currently being met due to the limited parking / driveway friction along the corridor. As Ring Road is not designated as a truck route, the TkLOS does not apply to this roadway segment.

Ring Road (E-W) across Lot E frontage

The PLOS target of C is being met due to the 1.8m sidewalk, posted speed limit, and curb lane volumes as the segment operates with PLOS B. The segment operates at BLOS B, meeting the target of D due to the low number of lanes and posted speed. The TLOS target of D along Ring Road, between Ring Road and S Main Access, is currently being met due to the limited parking / driveway friction along the corridor.

Lot A/E Access (N-S) across Lot E frontage

The PLOS target of C is being met due to the 1.8m sidewalk, operating speed, and curb lane volumes. The segment operates at BLOS B, meeting the target of D. The TLOS target of D along Ring Road, between Ring Road and S Main Access, is currently being met due to the limited parking / driveway friction along the corridor.

4.4 ACCESS INTERSECTIONS DESIGN

4.4.1 Location and Design of Access

The parking garage access with a total of 3 entry lanes and 2 exit lanes is proposed to be located on the south side of the structure on the Ring Road (E-W). The type of operation is to be gated.

The proposed 1D4C is proposed to have its primary access served by a one-way two-lane driveway on the west side of the building to connect to Ring Road (N-S).

4.4.2 Intersection Control

1) Smyth Road and South Haven Place – Signalized
2) Smyth Road and General Hospital Access – Signalized
3) Ring Road (E-W) and Ring Road (N-S) – Minor Stop Controlled
4) Ring Road (E-W) at General Hospital Access – 3-Way Stop Controlled
5) Ring Road (E-W) at Existing Parking Lot A/E Access– Minor Stop Controlled
6) Ring Road (E-W) at Future Phase 1 Parking Garage Access – Minor Stop Controlled
7) Ring Road (N-S) at CHEO Entry Access – No Control

8) Ring Road (N-S) at CHEO Exit Access – Minor Stop Controlled

9) Ring Road (N-S) at West Main Access - 3-Way Stop Controlled

10) Ring Road at South Main Access - Major Stop Controlled

4.4.3 Intersection Design

Section 4.9.2 contains the detailed intersection and MMLOS analyses under all horizons.

4.5 TRANSPORTATION DEMAND MANAGEMENT

4.5.1 Context for TDM

Transportation Demand Management (TDM) for hospitals tends to be linked to the parking performance. The nature of hospital trips is anticipated to be primarily using personal passenger vehicles, especially for hospital visitors. On the other hand, staff trips can be influenced more directly as compared to visitors to enhance the use of other modes such as transit, walking, and cycling and better manage parking demand.

Below are basic TDM measures envisioned for the 1D4C building and proposed parking structure:

- Display local area maps with walking/cycling access routes and key destinations at major entrances.
- Display relevant transit schedules and route maps at entrances.
- Provide a dedicated ride-matching portal at OttawaRideMatch.com. This measure is anticipated to reduce the latent parking demand, currently consisting of 360 staff on a waiting list for a parking space. The program is currently on hold due to the pandemic but is anticipated to resume in the future.
- Provide walking and cycling improvements to reduce and manage parking demand effectively. This may include studying improvements to ensure the connectivity of sidewalks and multi-use pathways around the overall hospital camps (inclusive of the University of Ottawa and General Hospital campus). This measure is anticipated to encourage staff living within proximity to using walking and or cycling as a mode of transportation.
- Complementary monetary parking incentives especially for staff could assist with converting the parking demand into transit, walking, and cycling trips. This may include subsidized transit passes for regular staff or safe and secure bicycle parking areas.
- Hospital's parking policies related to the hospital's staff permit issuance management and practices could be reviewed to avoid issuing permits to staff living within proximity to the hospital area or major transit stops. Alternatively, permit rates for general staff (excludes on-call staff) could be increased based on the geographic areas.

The TDM checklists are contained in **Appendix F.**

4.6 NEIGHBOURHOOD TRAFFIC MANAGEMENT

Not applicable; exempted during screening and scoping.

4.7 TRANSIT

4.7.1 Route Capacity

The proposed 1D4C facility is projected to add 35 additional two-way transit trips during the AM and PM peak hours, respectively. Given a low anticipated transit modal share of 10% due to the sensitive land use, the existing OC Transpo bus service is anticipated to accommodate the additional 35 two-way trips during the AM and PM peak hours without the need for more frequent service.

4.8 REVIEW OF NETWORK CONCEPT

Not applicable; exempted during screening and scoping.

4.9 INTERSECTION DESIGN

4.9.1 Intersection Control

The existing intersection control was maintained as the default control for all study area intersections for the 2021 base conditions assessments. The existing lane control is shown in **Figure 3**. Any intersection improvements triggered through the intersection level of service analysis are highlighted and adopted to the following horizon years accordingly. The existing signal timing plan for the intersections of Smyth Road with Ring Road and the General Hospital Access were obtained from the City of Ottawa.

4.9.2 Intersection Design

An assessment of the study area intersections was undertaken to determine the operational characteristics of the study area intersections under the horizons identified in the Screening and Scoping report. Intersection operational analysis was facilitated by Synchro 10.0™ and SimTraffic software packages and the MMLOS analysis was completed for the signalized intersection for all modes and compared against the City of Ottawa's MMLOS targets. The Highway Capacity Manual (HCM) 2000 edition analysis method in Synchro was used to assess the study intersection movements' volume-to-capacity ratios. However, due to the minimized intersection spacing and substandard intersection controls, the movement delays and queues were extracted from SimTraffic reports.

4.9.2.1 2021 Base Conditions

Figure 6 and Figure 7 illustrate the 2021 base AM and PM peak hour traffic volumes at the study area intersections.

Intersection Capacity Analysis

Table 9 summarizes the results of the Synchro analysis under 2021 existing conditions[5]. It is noted that **Table 9** reflects improved signal timing plans to 130s at the intersection of Smyth Road at South Haven Place under the AM peak hour**.**

Table 10 summarizes the results of the Synchro analysis under 2021 existing conditions at the intersection of Smyth Road at South Haven Place if existing signal timing plan is to be retained during the AM peak hour.

The analysis found that the eastbound left/through and the eastbound through/right movements at the intersection of Smyth Road and South Haven Place operate with a v/c ratio of 0.92 and a delay exceeding 5 minutes, resulting in LOS F during the AM peak hour. This is attributed to the heavy eastbound left turning traffic volumes (639 vph) utilizing a shared traffic lane as well as the high volume of conflicting southbound through vehicles (746 vph). Overall, this results in a stop-and-go queue at the eastbound approach, with the 95th percentile queue approximately at 790m. During the PM peak hour, the southbound right movement was found to operate above capacity with a v/c ratio of 1.21 but a short delay of 17s, resulting in LOS B.

Under an optimized signal timing plan of 130s during the AM peak hour, the operations were found to improve as the delays in the eastbound direction were reduced to between 2 and 5 minutes. The optimization was also applied to the intersection of Smyth Road and General Hospital Access to coordinate the offsets and meter vehicular arrivals. Signal timing optimization was also applied during the PM peak hour for both intersections with 120s timing plans and recalculated phase lengths. The optimized timing plans can be found in **Appendix G**.

During the PM peak hour, the analysis found that the minor stop controlled westbound left/right movement at the intersection of Ring Road (N-S) and Ring Road (E-W) operates with a delay exceeding 5 minutes, resulting in LOS F and a 95th percentile queue of approximately 155m, spilling back and affecting the operations on Ring Road (E-W) and the CHEO South Main Access and the Parking Lot A/E access. This is attributed to the westbound left/right vehicles yielding to cross traffic which includes 669 southbound through vehicles and 114 northbound through vehicles under free conditions. At the intersection of Ring Road and Parking Lot A/E Access, the queue along Ring Road was found to impact operations, and departing southbound vehicles experience a delay between 2 and 5 minutes, leading to LOS F. Similarly, at the intersection of Ring Road and CHEO South Entrance, departing southbound vehicles experience a delay exceeding 5 minutes, also leading to LOS F.

During the PM peak hour, the westbound left movement at the intersection of General Hospital Access and Ring Road was found to operate at LOS F, with a delay of 62s and a forecasted 95th percentile queue length exceeding 240m. This is attributed to the high volume of westbound left turning vehicles (exceeding 450 vph).

The analysis found that during the PM peak hour, southbound 95th percentile queues on Ring Road (N-S) are expected to spill back from Smyth Road and extend beyond the Lot C / D access (approximately 120m south of the intersection with Hospital Link Road).

Appendix G contains detailed intersection performance worksheets.

[5] LOS results are based on movement delays due to the utilization of SimTraffic simulation.

Table 9 – Base Year (2021) Intersection Operations

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	v/c	95th Q	LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	2min < Del. < 5mins	0.75	890	C	20	0.83	80
	EBT/R	F	2min < Del. < 5mins	0.75	890	B	17	0.83	75
	WBL/T	D	49	1.02	155	B	18	0.74	65
	WBT/R	D	50	1.02	165	B	18	0.74	70
	NBL	D	54	0.12	15	D	45	0.01	5
	NBR	A	8	0	5	A	8	0	5
	SBL	D	48	0.27	20	D	36	0.43	35
	SBR	B	11	0.14	30	B	17	1.21	35
	Overall Int.	F	***164***			B	***20***		
Smyth Road at General Hospital Access *(Signalized)*	EBL	D	53	0.83	95	C	31	0.53	40
	EBT	B	17	0.28	90	C	21	0.5	70
	WBT	D	35	0.59	90	C	31	0.57	80
	WBR	B	15	0.32	65	A	7	0.12	25
	SBL	D	54	0.52	35	D	43	0.71	50
	SBR	A	9	0.3	30	B	10	0.59	50
	Overall Int.	C	***29***			C	***25***		
Ring Road at Ring Road *(Unsignalized)*	WBL/R	B	15	0.29	20	F	> 5mins	0.37	155
	NBT/R	A	1	0.49	5	A	1	0.11	0
	SBL/T	A	4	0.04	20	F	73	0.01	190
	Overall Int.	A	***2***			F	***116***		
Ring Road at General Hospital Access *(Unsignalized)*	EBL/T/R	B	11	--	20	B	11	--	20
	WBL	B	10	--	15	F	61	--	>245m
	WBL/T/R	B	11	--	25	F	62	--	>245m
	NBL/T/R	A	4	--	50	A	6	--	25
	SBL/T/R	A	9	--	25	C	20	--	45
	Overall Int.	A	***6***			D	***35***		
Ring Road at Parking Lot A/E Access *(Unsignalized)*	EBL/T	A	2	0.11	15	A	1	0.02	5
	WBT/R	A	1	0.11	5	F	2min < Del. < 5mins	0.06	140
	SBL/R	A	4	0.07	15	F	2min < Del. < 5mins	0.13	70
	Overall Int.	A	2			F	166		
Ring Road at South Main Access *(Unsignalized)*	EBL/T	A	1	0.03	5	A	1	0.02	5
	WBT/R	A	0	0.1	0	F	> 5mins	0.11	145
	SBL/R	A	5	0.07	15	F	> 5mins	0.05	40
	Overall Int.	A	1			F	218		
Ring Road at West Main Access *(Unsignalized)*	WBL/R	A	5	0.25	20	B	12	0.26	30
	NBT/R	B	10	0.84	60	A	6	0.26	19
	SBL/T	A	3	0.16	15	F	72	0.83	215
	Overall Int.	A	8			F	53		
Ring Road at Hospital Link Road *(Unsignalized)*	EBT/R	A	7	0.47	25	A	5	0.11	15
	WBL/T	A	5	0.16	15	A	6	0.38	25
	NBL/R	A	5	0.18	15	A	5	0.18	15
	Overall Int.	A	5			A	5		

Delays and queues are based on SimTraffic simulation; v/c is based on HCM.
Delays are rounded to the nearest second; queues are rounded to the nearest 5m.

Table 10 – Base Year (2021) Intersection Operations at Smyth Rd / South Haven Pl during the AM peak | Under Unimproved Signal Operations

Intersection	Movement	AM Peak Hour			
		LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	> 5mins	0.92dl	785
	EBT/R	F	> 5mins	0.92dl	790
	WBL/T	C	35	0.90	105
	WBT/R	D	35	0.90	115
	NBL	D	43	0.12	15
	NBR	B	16	0	5
	SBL	D	46	0.24	20
	SBR	A	9	0.14	30
	Overall Int.	F	***170***		

Delays and queues are based on SimTraffic simulation; v/c is based on HCM.
Delays are rounded to the nearest second; queues are rounded to the nearest 5m.

Multi-Modal Level of Service Analysis – Signalized Intersections

The MMLOS targets at intersections are determined by taking the most stringent of the MMLOS targets for each individual road segment. As such, based on **Section 4.3.1**, the PLOS target is currently C for Smyth Road and Ring Road, the BLOS target is currently C for Smyth Road and D for Ring Road, the TLOS target is currently D for Smyth Road and Ring Road, and the TkLOS target is currently D for Smyth Road. All other internal roadways/accesses have identical classifications and level of service targets as Ring Road. The Vehicle Level of Service target was not considered because the SimTraffic results are based on movement delays and not volume-to-capacity operations. The aforementioned targets apply to both study area signalized intersections.

Smyth Road and South Haven Place

The Pedestrian Level of Service (PLOS) at the intersection of Smyth Road and South Haven Place is currently operating at a PLOS E, which does not meet the desired target of C. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross at the intersection. Due to the nature of arterial roads, reducing the number of lanes at the intersection is not a feasible option. The existing cycle length and the short effective walking times also deteriorate the PLOS by increasing the average pedestrian delays. The PLOS operation can be improved by lowering the signal cycle length, but that would be to the detriment of vehicles on the roadway.

The Bicycle Level of Service (BLOS) is currently operating at a BLOS of D at the intersection of Smyth Road and South Haven Place which does not meet the desired target of C. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. The BLOS can be improved by introducing segregated cycling lanes on Smyth Road, which may not be feasible as it is predicated on the available right of way. The BLOS can also be improved by lowering the speed limit on Smyth Road, but this is not a feasible measure as it would be to the detriment of vehicles on the roadway.

The Transit Level of Service (TLOS) at the intersection of Smyth Road and South Haven Place is currently operating with a TLOS of F which does not meet the desired target of D. Based on the MMLOS guidelines, intersection TLOS is governed by the delay at the intersection. The analysis found that the delay experienced on the eastbound approach exceeds 2 minutes (with an optimized timing plan). As buses are currently utilizing shared lanes with vehicular traffic, they are highly impacted by traffic operations. It is not recommended to implement any improvements as an interim mitigation measure as the City of Ottawa's Network Concept Plan includes transit improvement projects on Smyth Road.

The Truck Level of Service (TkLOS) at the intersection of Smyth Road and South Haven Place is currently operating with a TkLOS of B, which meets the target of D.

It is noted that the improved timing plan during the AM and PM peak hour does not have an impact on the MMLOS operations.

Smyth Road and General Hospital Access

The Pedestrian Level of Service (PLOS) at the intersection of Smyth Road and General Hospital Access is currently operating at a PLOS E, which does not meet the desired target of C. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross at the intersection. Due to the nature of arterial roads, reducing the number of lanes at the intersection is not a feasible option. The existing cycle length and the short effective walking times also deteriorate the PLOS by increasing the average pedestrian delays. The PLOS operation can be improved by lowering the signal cycle length, but that would be to the detriment of vehicles on the roadway.

The Bicycle Level of Service (BLOS) is currently operating at a BLOS of F at the intersection of Smyth Road and General Hospital Access which does not meet the desired target of C. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds. The BLOS can be improved by introducing segregated cycling lanes on Smyth Road, which may not be feasible as it is predicated on the available right of way, and left turn treatments to eliminate conflicts between left turning cyclists and roadway vehicles. The BLOS can also be improved by lowering the speed limit on Smyth Road, but this is not a feasible measure as it would be to the detriment of vehicles on the roadway.

The Transit Level of Service (TLOS) at the intersection of Smyth Road and General Hospital Access is currently operating with a TLOS of D which meets the desired target of D. It is noted that the City of Ottawa's Network Concept Plan includes transit improvement projects on Smyth Road.

The Truck Level of Service (TkLOS) at the intersection of Smyth Road and General Hospital Access is currently operating with a TkLOS of B, which meets the target of D.

The improved timing plan during the AM and PM peak hour does not have an impact on the MMLOS operations.

Appendix E contains the detailed MMLOS analysis and is provided for reference.

4.9.2.2 2025 Future Background Conditions

Figure 12 and

Figure 13 illustrate the 2025 future background AM and PM peak hour traffic volumes at the study area intersections.

Intersection Capacity Analysis

Table 11 summarizes the results of the SimTraffic analysis for the 2025 future background horizon under various improvements (both geometric and timing plan related). The construction of the parking structure in place of the existing surface Lot E would alter the traffic circulation on the internal campus roadways. The envisioned displacement of Lot B (staff) and the removal of Lot C (staff) will see lower volumes on Ring Road (N-S). The volumes are envisioned to be diverted to Ring Road (E-W) to the intersection with the new Phase 1 Parking Garage Access. The intersection of Smyth Road and South Haven Place is projected to continue to see deteriorated eastbound operations as the 2021 existing conditions despite an optimized timing plan of 130s during the AM peak hour. During the AM peak hour, the eastbound and westbound approaches at the intersection are anticipated to experience delays exceeding 3 minutes, with 95th percentile queues extending 935m in the eastbound direction and 400m in the westbound direction, resulting in LOS F.

As shown in **Table 12**, further signal timing improvements (under a 130s timing plan) are anticipated not to improve operations at the intersection of Smyth Road and South Haven Place.

As shown in **Table 11**, the intersection of Ring Road (N-S) and Ring Road (E-W) is anticipated to see deteriorated operations during the PM peak hour due to a substantial increase in westbound left and right turning traffic as a result of relocating the CHEO parking to the proposed structure. The increase in the westbound

traffic results in a delay exceeding 4 minutes during the PM peak hour, resulting in LOS F, with a queue projected to spill back along Ring Road (E-W) and affect the southbound and westbound movements at the intersections with the CHEO South Entrance.

Considering the deteriorated operations on Ring Road (E-W), the intersection with Ring Road (N-S) was signalized and envisioned to operate in a cluster with Smyth Road and South Haven Place controller to ensure optimized vehicular arrivals via metering due to the short distance between the intersections. Due to the high number of westbound left turning vehicles during the PM peak hour, a 37.5m westbound right auxiliary turn lane was added for analysis. Signalization of the intersection is projected to substantially improve queueing operations on Ring Road (E-W) as it would naturally increase the priority of the E-W flow and minimize queue spill back. It is noted that the signalization of this intersection will likely increase queues in the southbound direction. To counteract the effect of queueing, a 37.5m auxiliary southbound lane was included in the analysis. Similarly, to prevent vehicular queues from spilling back to Smyth Road, a dedicated northbound right turn lane was also included in the analysis. A dedicated northbound right turn lane would independently provide storage for and channel the vehicles destined to the proposed parking structure. Under this configuration, the westbound left movement is projected to experience a delay of approximately 43s, resulting in LOS D, and a 95th percentile queue of 82m during the PM peak hour. The northbound through and northbound right lanes are anticipated to experience 95th percentile queues of no greater than 20m (during the AM peak hour), which does not spill back to Smyth Road. During the PM peak hour, the southbound queues along Ring Road are projected to extend from Smyth Road to 138m and the queue will not spill back to the CHEO West Access, which represents a significant improvement over the 2021 conditions. The introduction of a traffic signal at the intersection of Ring Road (E-W) and Ring Road (N-S) is therefore expected to dissipate the westbound queues forming as the result of increased volumes due to the parking structure, which would otherwise experience substantially increased delays and queues under a minor stop control method.

Figure 21 illustrates the envisioned lane configuration (geometric improvements) within the CHEO campus.

Appendix G contains detailed intersection performance worksheets.

Figure 21 - Envisioned Lane Configuration - Ring Road (E-W) and Ring Road (N-S)

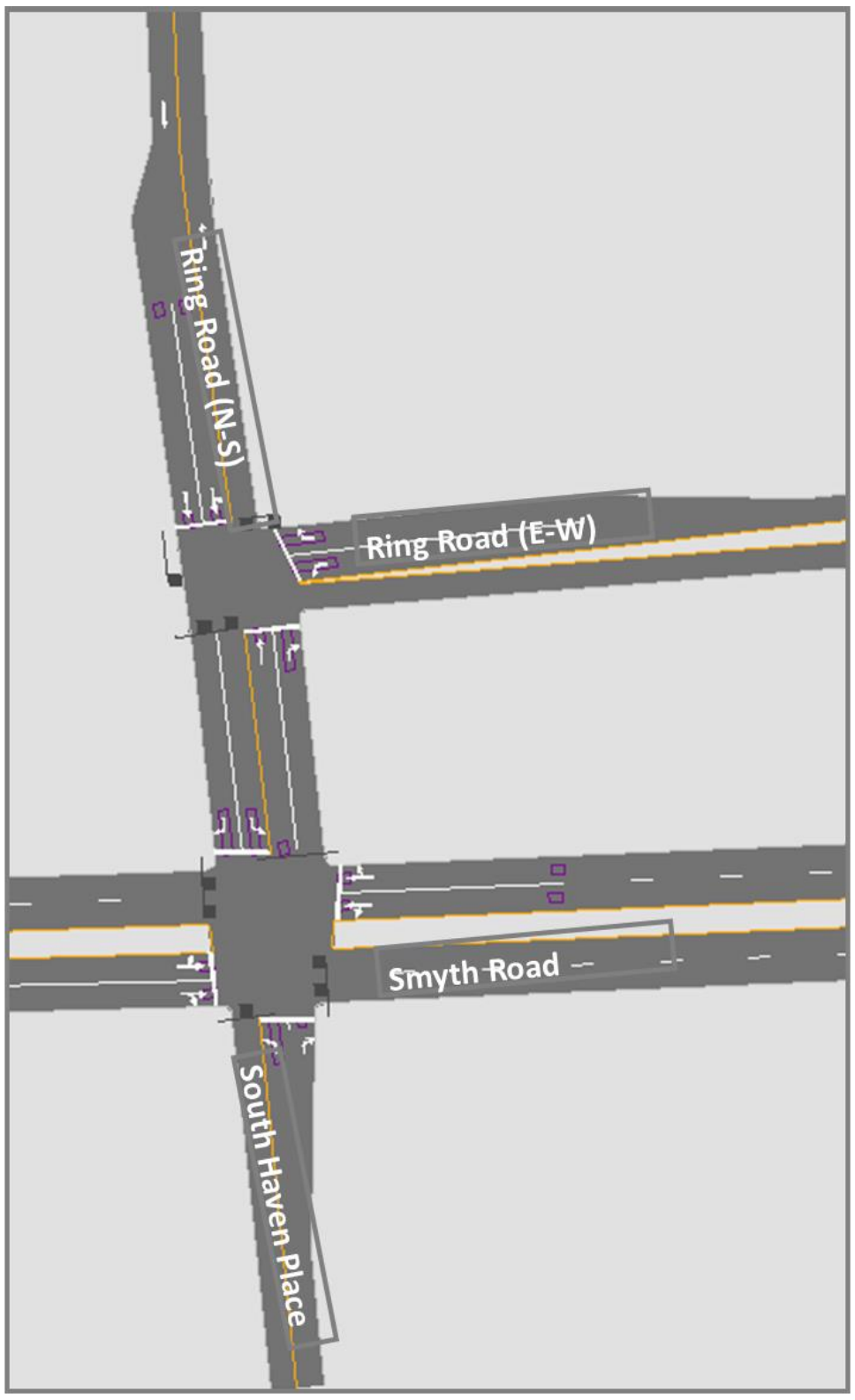


Table 11 - 2025 Future Background Conditions Intersection Operations – without Geometric Improvements

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	v/c	95th Q	LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	> 5mins	0.69	935	C	22	0.75	48
	EBT/R	F	241	0.69	935	B	17	0.75	77
	WBL/T	F	191	0.98	400	B	20	0.68	71
	WBT/R	F	193	0.98	404	B	19	0.68	74
	NBL	D	54	0.13	16	C	26	0.01	5
	NBR	B	12	0	5	B	12	0	4
	SBL	D	47	0.7	22	D	37	0.39	39
	SBR	B	11	0.4	34	B	18	1.02	36
	Overall Int.	F	***230***			C	***20***		
Smyth Road at General Hospital Access *(Signalized)*	EBL	D	46	0.75	85	C	34	0.45	24
	EBT	B	18	0.26	68	C	23	0.46	48
	WBT	D	37	0.5	93	C	31	0.53	54
	WBR	B	15	0.29	68	A	8	0.11	14
	SBL	D	53	0.5	31	D	47	0.68	32
	SBR	B	11	0.29	34	B	10	0.53	26
	Overall Int.	C	***29***			C	***26***		
Ring Road at Ring Road *(Unsignalized)*	WBL/R	C	19	0.58	42	F	258	0.78	109
	NBT/R	A	1	0.44	9	A	1	0.1	2
	SBL/T	A	8	0.1	25	C	21	0.03	109
	Overall Int.	A	***6***			F	***71***		
Ring Road at General Hospital Access *(Unsignalized)*	EBL/T/R	B	10	0.24	16	C	20	0.28	39
	WBL	B	11	0.69	15	E	38	1.49	85
	WBL/T/R	B	11	0.47	23	E	38	0.89	113
	NBL/T/R	A	3	0.1	39	A	3	0.07	16
	SBL/T/R	A	10	0.02	26	D	28	0.02	60
	Overall Int.	A	***6***			C	***24***		
Ring Road at Parking Lot A/E Access *(Unsignalized)*	EBL/T	A	3	0.27	26	A	1	0.05	9
	WBT/R	A	1	0.1	4	F	53	0.05	76
	SBL/R	A	5	0.39	24	F	65	0.33	31
	Overall Int.	A	***3***			E	***44***		
Ring Road at South Main Access *(Unsignalized)*	EBL/T	A	0	0	6	A	0	0	124
	WBT/R	A	0	0.12	0	F	285	0.21	0
	SBL/R	A	4	0.01	9	F	165	0.01	6
	Overall Int.	A	***0***			F	***179***		
Ring Road at West Main Access *(Unsignalized)*	WBL/R	A	4	0.02	11	A	4	0.02	10
	NBT/R	A	7	0.49	29	A	5	0.22	18
	SBL/T	A	5	0.15	16	A	8	0.58	41
	Overall Int.	A	***6***			A	***8***		
Ring Road at Hospital Link Road *(Unsignalized)*	EBT/R	A	7	0.41	27	A	5	0.1	14
	WBL/T	A	5	0.14	17	A	6	0.34	22
	NBL/R	A	5	0.16	15	A	5	0.16	13
	Overall Int.	A	***5***			A	***5***		

Delays and queues are based on SimTraffic simulation; v/c is based on HCM.
Delays are rounded to the nearest second; queues are rounded to the nearest 5m.

Table 12 - 2025 Future Background Conditions Intersection Operations – with Geometric Improvements

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	v/c	95th Q	LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	299	0.73	951	C	21	0.6	78
	EBT/R	F	224	0.73	954	B	16	0.6	75
	WBL/T	F	195	0.98	415	C	35	0.75	129
	WBT/R	F	197	0.98	416	C	35	0.75	133
	NBL	D	53	0.1	16	C	31	0.01	6
	NBR	A	5	0	6	A	8	0	3
	SBL	C	30	0.02	17	D	49	0.52	39
	SBR	A	4	0.03	24	B	15	0.88	38
	Overall Int.	F	***226***			C	***26***		
Smyth Road at General Hospital Access *(Signalized)*	EBL	D	45	0.75	84	C	27	0.45	40
	EBT	B	19	0.26	64	C	20	0.46	76
	WBT	D	39	0.5	100	C	31	0.53	84
	WBR	B	14	0.29	56	A	6	0.11	23
	SBL	E	56	0.5	33	D	46	0.68	40
	SBR	B	12	0.29	36	B	11	0.53	41
	Overall Int.	C	***29***			C	***25***		
Ring Road at Ring Road (Signalized)	WBL	D	51	0.67	55	D	43	0.77	82
	WBR	A	6	0.03	10	A	5	0.06	50
	NBT	A	2	0.3	19	A	6	0.08	14
	NBR	A	1	0.22	17	A	1	0.05	12
	SBL/T	A	7	0.09	22	E	58	0.24	138
	Overall Int.	A	***10***			D	***40***		
Ring Road at General Hospital Access *(Unsignalized)*	EBL/T/R	A	9	0.24	16	B	14	0.28	31
	WBL	A	9	0.69	15	D	26	1.49	57
	WBL/T/R	A	9	0.47	23	D	26	0.89	80
	NBL/T/R	A	3	0.1	43	A	2	0.07	16
	SBL/T/R	A	8	0.02	24	C	16	0.02	39
	Overall Int.	A	***5***			C	***16***		
Ring Road at Parking Lot A/E Access *(Unsignalized)*	EBL	A	2	0.25	19	A	2	0.04	5
	EBT	A	0	0.01	0	A	0	0.03	0
	WBT	A	1	0.03	0	A	1	0.03	0
	WBR	A	2	0.06	0	A	2	0.03	0
	SBL/R	A	5	0.36	24	A	4	0.32	22
	Overall Int.	A	***3***			A	***2***		
Ring Road at South Main Access *(Unsignalized)*	EBL/T	A	1	0	3	A	0	0	2
	WBT/R	A	0	0.12	0	A	1	0.21	0
	SBL/R	A	4	0.01	8	A	4	0.01	6
	Overall Int.	A	***1***			A	***0***		
Ring Road at West Main Access *(Unsignalized)*	WBL/R	A	4	0.02	11	A	9	0.02	10
	NBT/R	A	7	0.49	28	A	5	0.22	20
	SBL/T	A	5	0.15	16	F	82	0.58	210
	Overall Int.	A	***6***			F	***59***		
Ring Road at Hospital Link Road *(Unsignalized)*	EBT/R	A	7	0.41	27	A	5	0.1	15
	WBL/T	A	5	0.14	17	A	6	0.34	24
	NBL/R	A	5	0.16	13	A	5	0.16	15
	Overall Int.	A	***5***			A	***5***		

Delays and queues are based on SimTraffic simulation; v/c is based on HCM.
Delays are rounded to the nearest second; queues are rounded to the nearest 5m.

Multi-Modal Level of Service Analysis – Signalized Intersections

The intersection operating conditions remain similar to existing conditions; therefore, the intersection MMLOS discussion in **Section 4.9.2.1** applies to the 2025 future background analysis.

Smyth Road and General Hospital Access

It is noted that the TLOS at the intersection of Smyth Road and General Hospital Access is anticipated to deteriorate from TLOS D to TLOS E and not meet the target of D due to the additional delays on the roadway under the 2025 future background conditions. The operations are anticipated to change in the future due to the City of Ottawa's plans to implement transit improvement projects in the area, and as such, no interim corrective actions would be necessitated.

Ring Road (E-W) and Ring Road (N-S)

The intersection is anticipated to operate with PLOS E, and will not meet the target of C. This is attributed to the pedestrian delays observed under the 130s signal timing plan during the AM peak hour. The PLOS level can be improved by utilizing a shorter timing plan, but this is anticipated to significantly impact vehicular operations.

The intersection is anticipated to operate with BLOS D, thereby meeting the target.

The intersection is anticipated to operate with TLOS F, and will not meet the target of D. This is due to the delays in the westbound direction exceeding 40s.

Appendix E contains the detailed MMLOS analysis and is provided for reference.

4.9.2.3 2025 Total Future Conditions

Figure 14 and **Figure 15** illustrate 2025 total future AM and PM peak hour traffic volumes at the study area intersections.

Intersection Capacity Analysis

Table 13 summarizes the results of the Simtraffic analysis for the 2025 total future horizon.

The analysis found that the addition of site generated traffic is projected to slightly deteriorate operations at the intersection of Smyth Road and South Haven Place with similar results. Overall, the intersection is projected to operate with a delay of 224s during the AM peak hour with LOS F.

During the both peak hours, the intersection of Ring Road (E-W) and Ring Road (N-S) is also anticipated to see slightly deteriorated operations. Specifically, during the PM peak hour, the westbound delay is projected to be 54s (from 43s under the future background conditions), resulting in LOS D. The 95th percentile queue is projected to increase to 101m (from 82m under future background conditions), but the impact is minimal along Ring Road. Southbound delays are also anticipated to increase to 61s (from 58s under future background conditions), resulting in LOS E. The southbound queue (from Smyth Road) during the PM peak hour is projected to extend 171m beyond the CHEO West Main Access (up from 138m under future background conditions).

The introduction of the site traffic is also projected to slightly deteriorate traffic operations at the intersection or Ring Road and General Hospital Access, mainly during the PM peak hour. While the eastbound movement is forecasted to experience 31s of delay resulting in LOS C (compared to 27s under future background conditions – LOS C), the westbound movement is projected to experience a delay of 33s resulting in LOS C (compared to 31s under future background conditions – LOS C). Overall, the delay at the intersection is anticipated to be 27s (compared to 25s under future background conditions) with an acceptable traffic operational performance.

For the new Phase 1 parking garage access intersection, the overall LOS and Delay, as well as all LOSs and delays for individual movements during both AM and PM peak hours are acceptable in this horizon.

Appendix G contains detailed intersection performance worksheets.

Table 13 – 2025 Total Future Intersection Operations

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	v/c	95th Q	LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	> 5mins	0.93dl	897	C	23	0.63	84
	EBT/R	F	> 5mins	0.93dl	901	B	17	0.63	83
	WBL/T	D	46	0.91	133	C	29	0.87	90
	WBT/R	D	46	0.91	141	C	29	0.87	94
	NBL	D	49	0.08	14	D	38	0.01	7
	NBR	A	9	0	5	A	4	0	3
	SBL	C	29	0.16	13	D	48	0.48	39
	SBR	A	4	0.25	36	B	13	0.92	37
	Overall Int.	F	223			C	24		
Smyth Road at General Hospital Access *(Signalized)*	EBL	D	45	0.81	82	C	31	0.46	43
	EBT	B	18	0.27	64	B	18	0.44	65
	WBT	C	35	0.54	91	C	33	0.52	89
	WBR	B	14	0.32	62	A	6	0.12	27
	SBL	D	52	0.52	33	E	57	0.83	40
	SBR	A	9	0.28	28	B	11	0.55	43
	Overall Int.	C	***28***			C	***27***		
Ring Road at Ring Road (Signalized)	WBL	E	63	0.8	80	D	54	0.81	101
	WBR	A	7	0.03	34	A	9	0.08	63
	NBT	A	2	0.39	23	A	4	0.08	12
	NBR	A	1	0.18	16	A	2	0.06	15
	SBL/T	B	10	0.07	19	D	38	0.28	48
	SBT	A	4	0.07	10	E	61	0.28	171
	Overall Int.	B	***15***			D	***44***		
Ring Road at General Hospital Access *(Unsignalized)*	EBL/T/R	A	9	9.9	18	D	30	0.28	48
	WBL	B	10	46.2	18	F	83	1.46	143
	WBL/T/R	B	11	25.1	23	F	83	0.87	170
	NBL/T/R	A	3	3.9	42	A	2	0.06	12
	SBL/T/R	A	9	0.3	24	E	35	0.02	61
	Overall Int.	A	***6***			E	***45***		
Ring Road at Phase 1 Parking Garage Access *(Unsignalized)*	EBL	A	2	0.2	12	A	2	0.06	8
	EBT	A	0	0.01	0	A	0	0.03	0
	WBT	A	1	0.03	1	A	1	0.02	0
	WBR	A	3	0.11	0	A	2	0.06	0
	SBL/R	A	5	0.39	25	A	4	0.42	23
	Overall Int.	A	4			A	3		
Ring Road at South Main Access *(Unsignalized)*	EBT	A	1	0.2	0	A	0	0.08	0
	WBT	A	1	0.14	7	A	2	0.22	21
	SBL	A	7	0.01	6	A	3	0	2
	SBR	A	5	0.02	11	A	3	0.02	10
	Overall Int.	A	1			A	1		
Ring Road at West Main Access (Unsignalized)	NBT/R	A	8	0.64	37	A	5	0.22	19
	SBL/T	A	4	0.14	16	F	117	0.65	229
	Overall Int.	A	7			F	89		
Ring Road at Hospital Link Road *(Unsignalized)*	EBT/R	A	7	0.43	26	A	5	0.1	15
	WBL/T	A	5	0.14	17	A	6	0.34	25
	NBL/R	A	5	0.16	14	A	3	0.17	17
	Overall Int.	A	5			A	6		

Delays and queues are based on SimTraffic simulation; v/c is based on HCM.
Delays are rounded to the nearest second; queues are rounded to the nearest 5m.

Multi-Modal Level of Service Analysis – Signalized Intersections

The intersection operating conditions remain similar to future background conditions except the intersection of Smyth Road and General Hospital Access. Specifically, the TLOS at this intersection is anticipated to deteriorate from TLOS E to TLOS F and not meet the target of D due to the additional delays on the roadway under the 2025 total future conditions.

4.9.2.4 2030 Ultimate Conditions

Figure 16 and **Figure 17 i**llustrate the 2030 ultimate AM and PM peak hour traffic volumes at the study area intersections.

Intersection Capacity Analysis

Traffic operations analysis found that the internal CHEO campus intersections are anticipated to experience very similar traffic operations in comparison with the 2025 total future conditions as the internal volumes were not subjected to background growth.

At the intersection of Smyth Road and South Haven Place, traffic operation is projected to slightly deteriorate operations compared to 2025 future total conditions with overall LOS F during the AM peak hour. Traffic operations at other study intersections are similar to 2025 future total conditions with acceptable results.

Table 14 summarizes the results of the Simtraffic analysis for the 2030 ultimate horizon.

Appendix G contains detailed intersection performance worksheets.

Table 14 – 2030 Ultimate Intersection Operations

Intersection	Movement	AM Peak Hour				PM Peak Hour			
		LOS	Delay (s)	v/c	95th Q	LOS	Delay (s)	v/c	95th Q
Smyth Road at South Haven Place *(Signalized)*	EBL/T	F	> 5mins	0.93dl	853	C	23	0.63	84
	EBT/R	F	> 5mins	0.93dl	860	B	18	0.63	83
	WBL/T	C	26	0.95	302	C	31	0.87	90
	WBT/R	F	112	0.95	312	C	31	0.87	94
	NBL	D	50	0.08	18	D	39	0.01	7
	NBR	B	11	0	5	B	12	0	3
	SBL	C	30	0.16	15	D	47	0.48	39
	SBR	A	1	0.26	33	B	14	0.92	37
	Overall Int.	F	***246***			C	***25***		
Smyth Road at General Hospital Access *(Signalized)*	EBL	D	45	0.81	83	C	31	0.46	43
	EBT	B	19	0.29	74	B	19	0.44	65
	WBT	D	36	0.57	94	C	33	0.52	89
	WBR	B	14	0.32	61	A	6	0.12	27
	SBL	D	50	0.52	33	E	58	0.83	40
	SBR	A	10	0.28	33	B	12	0.55	43
	Overall Int.	C	***28***			C	***27***		
Ring Road at Ring Road (Signalized)	WBL	E	67	0.8	91	D	52	0.81	101
	WBR	A	9	0.03	41	A	9	0.08	63
	NBT	A	2	0.39	22	A	6	0.08	12
	NBR	A	1	0.18	16	A	1	0.6	15
	SBL/T	A	9	0.07	21	E	59	0.28	48
	SBT	A	4	0.07	12	E	61	0.28	171
	Overall Int.	B	***16***			D	***44***		
Ring Road at General Hospital Access *(Unsignalized)*	EBL/T/R	A	9	0.33	18	F	56	0.28	48
	WBL	B	10	1	16	F	58	1.46	143
	WBL/T/R	B	11	0.66	27	F	58	0.87	170
	NBL/T/R	A	4	0.16	46	A	2	0.06	12
	SBL/T/R	A	9	0.02	26	E	45	0.02	61
	Overall Int.	A	***6***			E	***39***		
Ring Road at Phase 1 Parking Garage Access *(Unsignalized)*	EBL	A	2	0.2	11	A	2	0.06	8
	EBT	A	0	0.01	1	A	0	0.03	0
	WBT	A	1	0.03	0	A	1	0.02	0
	WBR	A	3	0.11	0	A	2	0.06	0
	SBL/R	A	4	0.39	24	A	4	0.42	23
	Overall Int.	A	***3***			A	***3***		
Ring Road at South Main Access *(Unsignalized)*	EBT	A	1	0.2	0	A	0	0.08	0
	WBT	A	0	0.14	4	A	3	0.22	21
	SBL	A	5	0.01	6	A	7	0	2
	SBR	A	3	0.02	12	A	5	0.02	10
	Overall Int.	A	***1***			A	***3***		
Ring Road at West Main Access (Unsignalized)	NBT/R	A	8	0.64	37	A	6	0.22	19
	SBL/T	A	4	0.14	16	F	110	0.65	229
	Overall Int.	A	***7***			F	***83***		
Ring Road at Hospital Link Road *(Unsignalized)*	EBT/R	A	7	0.43	27	A	5	0.1	15
	WBL/T	A	5	0.14	18	A	6	0.34	25
	NBL/R	A	5	0.16	13	A	6	0.17	17
	Overall Int.	A	***5***			A	***5***		

Multi-Modal Level of Service Analysis – Signalized Intersections

The intersection operating conditions remain similar to the future total conditions.

Summary of Improvements

The proposed signal timing and geometric improvements are noted in the table below.

Table 15 - Summary of Improvements

Intersections	2021 Base Year	2025 FBG	2025 TF	2030 Ultimate
Smyth Road and South Haven Place	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)
	To improve traffic flows to /from the CHEO Campus and minimize queues in the eastbound direction.			
Smyth Road and General Hospital Access	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)	Optimize Timing Plan (130s AM peak & 120s PM peak)
	To improve traffic flows to /from the CHEO Campus and minimize queues in the eastbound direction.			
Ring Road (E-W) and Ring Road (N-S)	--	1) Install Traffic Signal clustered with Smyth @ South Haven controller 2) Add NBR storage lane 3) Add 37.5m SBT auxiliary lane 4) Add 37.5m WBR auxiliary lane	--	--
	Signalization to increase the priority of westbound traffic flows and meter traffic arrivals. Auxiliary lanes are operational improvements recommended to increase traffic throughput and reduce the potential of queueing reaching the General Hospital's Intersection with Ring Road.			

CONCLUSION

Infrastructure Ontario, on behalf of CHEO, is undertaking a traffic impact study of the proposed 1Door4Care building and parking structure. This Transportation Impact Assessment (TIA) and Parking Study has been developed to assess the off-site transportation requirements to support the proposed 1Door4Care building and supporting parking structure.

Parking Requirements

The proposed development includes a new 231,443 GFA (including 195,931.04 ft^2 programmed areas and 35,511.96ft^2 non-programmed areas) building within the existing CHEO campus, referred to as the '1Door4Care or 1D4C' facility as well as a parking structure to accommodate the anticipated parking demand. Based on the By-Law parking requirements, it was found that the existing surface parking (i.e. without the parking garage) supply within the CHEO campus is short of meeting the overall campus's parking requirements by 29 spaces. i.e., the total required spaces by the by-law are 1,109 spaces while the available supply would be 1,100 after displacing a net of 286 spaces through the development. Based on collected field data and the subsequently derived CHEO campus parking rate of 3.07 spaces per 100m^2 of GFA, it was found that the 1D4C facility would require 559 parking spaces to service the new building's demand, excluding the 286 displaced parking spaces attributable to its construction in Lot B. A 1,050-space parking structure and 50 surface parking spaces that are adjacent to the 1Door4Care building would address the new demand generated by the 1D4C building in addition to the 286 displaced spaces from Lot B and the 270 displaced spaces from Lot E (270 spaces) due to the construction of the parking structure. Excluding considerations for the latent demand of Lot C and the waiting list, this new parking garage, as well as the new LOT B south of the new 1D4C building, will provide accommodate parking supply with only 15-space shortage. It is important to note that site observations indicate that the current parking supply within the CHEO campus is operating at capacity.

Through communication with CHEO, it was found that the existing Lot C lands (encompassing 350 parking spaces) may become unavailable in the future, and that there are currently 360 staff members on a waiting list to secure parking spaces. As indicated, a 1,050-space parking structure and the new 50 surface parking spaces that are adjacent to the new 1D4C building would approximately address the 1D4C demand (559 spaces) and the displaced parking spaces from Lots B and E (556 spaces). The proposed 8-level 1,050-space parking structure will have three (3) entry gates/lanes and two (2) exit gates/lanes based on the parking garage plans. Through the parking demand assessment, it was identified that the parking demand rate reflective of the CHEO campus and the 1D4C building is significantly higher than the City Ottawa by-law requirements and therefore, the by-law requirement is anticipated to significantly underestimate parking demand by approximately 54%. On the other hand, using the Institute of Transportation Engineers parking rates for the hospital land use was found to overestimate parking requirements by approximately 30%.

As noted above, the proposed 1,050-space parking structure and the new 50 surface parking spaces that are adjacent to the new 1D4C building are envisioned to serve the 1D4C proposed building parking demand, the displaced users of Lot B and Lot E, as well as one of: Lot C demand or users on the waiting list fully. It is anticipated that parking demand measures would be required to manage the remaining latent parking demand, i.e., staff on the waiting list for a parking space.

During construction, Lot E would not be usable for visitors and therefore, would require an alternative site to serve parking demand. It is recommended that CHEO constructs the parking structure first prior to constructing the 1D4C

building. The existing Lot B, to be replaced by the 1D4C building, can be used as temporary visitor parking supply until the construction of the parking structure is completed. In the interim, a remote parking site may be investigated by CHEO to provide temporary staff parking to serve the staff parking demand of Lot B.

2021 Base Conditions

- The analyses found that the intersection Smyth Road and South Haven Place operate with a v/c ratio of 0.92 and a delay exceeding 5 minutes during the AM peak. This is indicative of stop and go operating conditions doe to the heavy eastbound left turn movement demand, approximately 640 vehicles/hr on a shared through/left lane. Under an optimized signal timing plan of 130s during the AM peak hour, the operations were found to improve as the delays in the eastbound direction were reduced to between 2 and 5 minutes. No geometric improvements are recommended at the intersection due to the limited Right-of-Way (ROW).

- During the PM peak hour, the analysis found that the minor stop controlled westbound left/right movement at the intersection of Ring Road (N-S) and Ring Road (E-W) operates with a delay exceeding 5 minutes, resulting in LOS F and a 95th percentile queue of approximately 155m, spilling back and affecting the operations on Ring Road (E-W) and the CHEO South Main Access and the Parking Lot A/E access. As existing operating conditions do not result in queues impacting the general hospital access, no recommended measures were introduced. Similarly, at the intersection of Ring Road and CHEO South Entrance, departing southbound vehicles experience a delay exceeding 5 minutes, also leading to LOS F. However, these results are anticipated to be an over estimation as in congested conditions, drivers tend to operate based on first come first served at the vicinity of unsignalized intersections. Generally, the analyses use the planned opening year as an opportunity to improve the internal roadway network.

- During the PM peak hour, the westbound left movement at the intersection of General Hospital Access and Ring Road was found to operate at LOS F, with a delay of 62s and a forecasted 95th percentile queue length exceeding 240m. This is attributed to the high volume of westbound left turning vehicles (exceeding 450 vph).

- During the PM peak hour, southbound 95th percentile queues on Ring Road (N-S) are expected to spill back from Smyth Road and extend beyond the Lot C / D access (approximately 120m south of the intersection with Hospital Link Road).

2025 Future Background Conditions

Under the 2025 Future Background conditions, it was assumed that the parking structure would have been built concurrently with the proposed 1D4C building with the full buildout time in 2024. Traffic has been reassigned so that Lot C users are rerouted to using the parking structure. Without introducing geometric improvements, the network is anticipated to operate poorly during both peaks, especially during the PM peak hour. Internal roadway delays along Ring Road between the general hospital access westerly are anticipated to exceed 4mins.

The following improvements are recommended to address the 2025 Future background conditions:

- Adding a right turn lane in the northbound direction of Ring Road, between Smyth Road and Ring Road (E-W).

- Adding an additional through lane in the southbound direction of Ring Road N-S at Ring Road E-W; the through lane is short with an approximate length of 55m to help double the southbound through traffic.
- Converting the intersection of Ring Road E-W at Ring Road N-S to a clustered signalized intersection that can be operated using the same controller as the signalized intersection of Smyth Road at South Haven Place.

With the above improvements the study area intersections are anticipated to operate satisfactorily with the exception of the westbound and eastbound approaches during the AM peak hour of the intersection of Smyth Road at South Haven Place, as well as southbound approach during the PM peak hour of the intersection of Ring Road at West Main Access.

2025 Total Future Conditions

Operations during both AM and PM peak hours are anticipated to be similar to the 2025 background conditions but at slightly higher delays and queues. Internal roadway operations are anticipated to be satisfactory with the worst operations reaching LOS F along Ring Road at West Main Access in the southbound direction of approximately 117s. the next worst movement is anticipated to operate at 83s of delay at the intersection of Ring Road E-W with General Hospital Access. Southbound queues at the signalized intersection of Ring Road E-W and Ring Road N-S are anticipated to block West Main Access but not Lots C and D and this delay is anticipated to be an improvement compared to the 2021 base options with greater than 5 mins of delay.

2030 Ultimate Conditions

Operations during both AM and PM peak hours are anticipated to be similar to the 2025 future total conditions.

Overall, the geometric improvements identified in this report are recommended to address background conditions and the shift in traffic patterns that will be introduced by building a parking structure in place of Lot E. Under no geometric improvements, the westbound future background traffic on Ring Road (E-W) is anticipated to experience delays exceeding 4 minutes at the intersection with the South Main Access. The analysis found that the delays and queues along Ring Road (E-W) are attributed to the intersection with Ring Road (N-S). Presently, the intersection is minor stop-controlled along Ring Road (E-W) and given the heavy conflicting southbound flows during the PM peak hour, the westbound direction is projected to experience significantly deteriorated operations under the increased traffic flows arising from the location of the proposed parking structure, with delays exceeding five minutes. This finding is under the assumption that the parking structure is built but the 1D4C building is still not buildout yet. Once the 1D4C is built-out, the operational challenges of background conditions would be expected to continue at increased deteriorated operating condition.

Based on the transportation evaluation presented in this transportation study, the proposed development, the 1D4C building and the proposed 1050 space-parking structure can be supported from a transportation perspective. Generally, the noted geometric improvements are recommended prior to the full in-service revenue of the proposed parking structure and 1D4C building, i.e., prior to the 2025 horizon year. Part of the recommendations includes signalizing the intersection of Ring Road (E-W) at Ring Road (N-S) under a cluster signal, pegged to the intersection of Smyth Road at Ring Road (N-S). This recommendation requires feedback and review by the City's Traffic Operations team, due to the close proximity of both intersections.

Appendix C

City of Ottawa Collision Data

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: HIGHLAND TER @ SMYTH RD

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Nov-09, Wed,15:11	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Pedestrian	1
2017-May-17, Wed,16:06	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Nov-20, Fri,18:08	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Pick-up truck	Other motor vehicle	0
					West	Overtaking	Police vehicle	Other motor vehicle	

Location: SMYTH RD @ GENERAL HOSPITAL E

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Sep-10, Sat,19:54	Clear	Turning movement	P.D. only	Dry	West	Making "U" turn	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Delivery van	Other motor vehicle	
2016-Oct-21, Fri,20:18	Rain	Sideswipe	P.D. only	Wet	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Dec-09, Fri,08:57	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-08, Fri,06:52	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jan-26, Fri,08:30	Clear	Rear end	P.D. only	Loose snow	East	Unknown	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-27, Wed,07:32	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: SMYTH RD @ GENERAL HOSPITAL E

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jul-06, Fri,07:29	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-17, Wed,11:10	Clear	Sideswipe	P.D. only	Dry	South	Unknown	Unknown	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-30, Fri,15:32	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jan-23, Wed,07:15	Snow	Sideswipe	Non-reportable	Packed snow	East	Changing lanes	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-05, Thu,07:57	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-10, Tue,09:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Truck - dump	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Unknown	Unknown	Other motor vehicle	
2019-Dec-14, Sat,22:42	Snow	SMV other	P.D. only	Packed snow	East	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2019-Dec-20, Fri,16:22	Clear	Sideswipe	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Jan-15, Wed,18:00	Clear	Rear end	P.D. only	Dry	South	Going ahead	Municipal transit bus	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-27, Mon,16:09	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Mar-03, Tue,11:30	Clear	Rear end	P.D. only	Loose snow	West	Going ahead	School van	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: SMYTH RD @ GENERAL HOSPITAL E

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Mar-10, Tue,09:10	Rain	Sideswipe	P.D. only	Wet	East	Going ahead	Unknown	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	

Location: SMYTH RD @ SOUTH HAVEN PL/GENERAL HOSPITAL ENTRANCE W

Traffic Control: Traffic signal **Total Collisions:** 17

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jun-10, Fri,09:15	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2016-Jul-07, Thu,11:24	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2016-Sep-17, Sat,15:43	Rain	Rear end	Non-fatal injury	Wet	West	Going ahead	Municipal transit bus	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Dec-07, Wed,14:34	Clear	Sideswipe	Non-fatal injury	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-09, Fri,07:11	Snow	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2017-Jan-27, Fri,09:43	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jun-27, Tue,12:44	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: SMYTH RD @ SOUTH HAVEN PL/GENERAL HOSPITAL ENTRANCE W

Traffic Control: Traffic signal **Total Collisions:** 17

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Jun-27, Tue,13:43	Rain	Turning movement	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2017-Aug-06, Sun,19:50	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Nov-03, Fri,19:44	Clear	Turning movement	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Bus (other)	Other motor vehicle	
2018-Nov-07, Wed,18:00	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jan-07, Mon,08:35	Clear	Turning movement	P.D. only	Ice	West	Turning left	Passenger van	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jan-22, Tue,10:40	Clear	Angle	P.D. only	Packed snow	East	Going ahead	Unknown	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2019-Aug-12, Mon,14:40	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-29, Fri,16:49	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-04, Wed,09:50	Snow	Rear end	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Sep-29, Tue,19:59	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: SMYTH RD btwn GENERAL HOSPITAL & HIGHLAND TER

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Nov-15, Wed,17:00	Rain	Sideswipe	P.D. only	Wet	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2018-Oct-03, Wed,23:50	Clear	Rear end	P.D. only	Dry	East	Pulling onto shoulder or toward curb	Automobile, station wagon	Other motor vehicle	0
					East	Overtaking	Police vehicle	Other motor vehicle	
2019-Apr-18, Thu,16:45	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Changing lanes	Automobile, station wagon	Other motor vehicle	

Location: SMYTH RD btwn HIGHLAND TER & SOUTH HAVEN PL

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Mar-09, Wed,19:13	Clear	Rear end	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2016-Jun-30, Thu,13:14	Clear	Turning movement	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	

Appendix D

2011 Origin-Destination Survey (Alta Vista)

Alta Vista

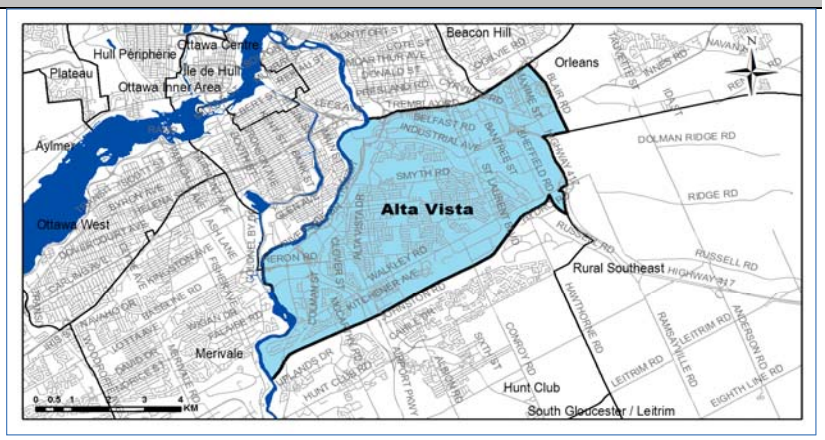
Demographic Characteristics

Population	74,770	Actively Travelled	59,190
Employed Population	32,910	Number of Vehicles	37,270
Households	32,590	Area (km^2)	38.5

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	15,840	12,940	28,780
Part Time Employed	1,660	2,470	4,130
Student	8,130	8,750	16,870
Retiree	6,200	8,840	15,030
Unemployed	1,200	950	2,150
Homemaker	50	2,150	2,200
Other	630	900	1,530
Total:	33,700	36,990	70,700

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	7,620	9,140	16,760
Licensed Drivers	25,060	24,810	49,870
Telecommuters	140	60	200
Trips made by residents	92,440	98,770	191,210

Selected Indicators	
Daily Trips per Person (age 5+)	2.70
Vehicles per Person	0.50
Number of Persons per Household	2.29
Daily Trips per Household	5.87
Vehicles per Household	1.14
Workers per Household	1.01
Population Density (Pop/km2)	1940

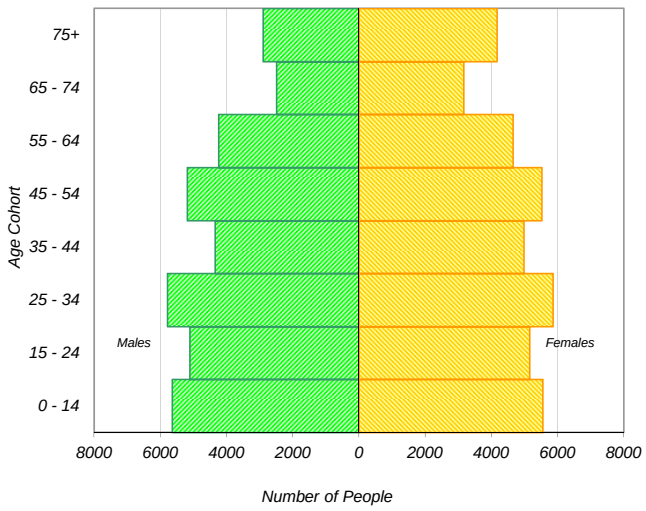


Household Size		
1 person	10,780	33%
2 persons	11,010	34%
3 persons	4,790	15%
4 persons	3,880	12%
5+ persons	2,130	7%
Total:	32,590	100%

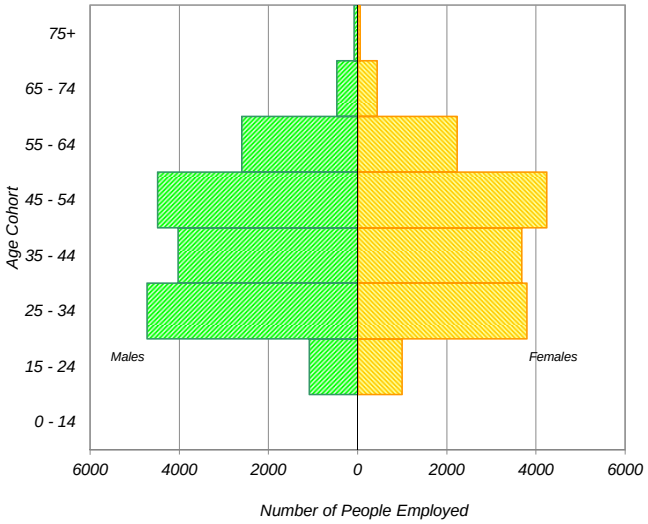
Households by Vehicle Availability		
0 vehicles	6,320	19%
1 vehicle	16,930	52%
2 vehicles	8,030	25%
3 vehicles	1,030	3%
4+ vehicles	290	1%
Total:	32,590	100%

Households by Dwelling Type		
Single-detached	12,320	38%
Semi-detached	1,790	5%
Townhouse	4,700	14%
Apartment/Condo	13,780	42%
Total:	32,590	100%

Population



Employed Population

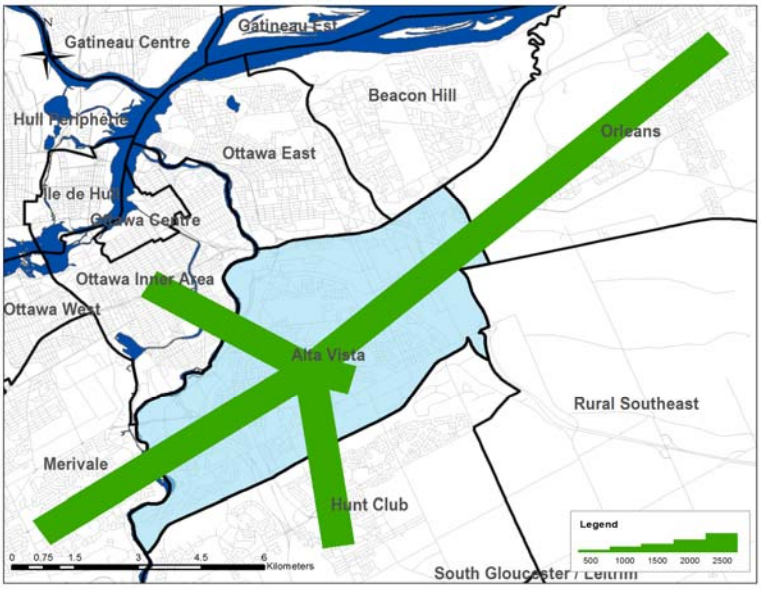


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Origins of Trips to Alta Vista

AM Peak Period



Summary of Trips to and from Alta Vista

AM Peak Period (6:30 - 8:59) Districts	Destinations of Trips From District	% Total	Origins of Trips To District	% Total
Ottawa Centre	4,180	10%	680	1%
Ottawa Inner Area	4,970	12%	4,270	7%
Ottawa East	1,940	5%	2,370	4%
Beacon Hill	2,690	7%	1,850	3%
Alta Vista	16,220	39%	16,220	27%
Hunt Club	1,980	5%	7,990	13%
Merivale	3,010	7%	3,690	6%
Ottawa West	1,160	3%	1,550	3%
Bayshore / Cedarview	830	2%	2,330	4%
Orléans	1,050	3%	5,890	10%
Rural East	110	0%	430	1%
Rural Southeast	140	0%	1,550	3%
South Gloucester / Leitrim	160	0%	1,970	3%
South Nepean	460	1%	2,360	4%
Rural Southwest	160	0%	690	1%
Kanata / Stittsvile	660	2%	1,810	3%
Rural West	20	0%	180	0%
Île de Hull	710	2%	190	0%
Hull Périphérie	360	1%	420	1%
Plateau	0	0%	680	1%
Aylmer	40	0%	480	1%
Rural Northwest	40	0%	300	1%
Pointe Gatineau	20	0%	740	1%
Gatineau Est	220	1%	270	0%
Rural Northeast	10	0%	320	1%
Buckingham / Masson-Angers	10	0%	70	0%
Ontario Sub-Total:	39,740	97%	55,830	94%
Québec Sub-Total:	1,410	3%	3,470	6%
Total:	41,150	100%	59,300	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	22,370	15%	46,540	31%	10,770	13%
School	8,550	6%	8,090	5%	6,440	8%
Shopping	16,500	11%	16,600	11%	14,550	17%
Leisure	11,940	8%	13,340	9%	7,720	9%
Medical	2,990	2%	7,860	5%	2,380	3%
Pick-up / drive passenger	9,390	6%	9,900	6%	6,990	8%
Return Home	75,570	50%	44,070	29%	33,060	39%
Other	4,870	3%	6,050	4%	3,240	4%
Total:	152,180	100%	152,450	100%	85,150	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	13,920	56%	28,300	66%	5,390	33%
School	5,340	21%	7,330	17%	5,600	35%
Shopping	510	2%	530	1%	320	2%
Leisure	570	2%	990	2%	480	3%
Medical	500	2%	1,760	4%	460	3%
Pick-up / drive passenger	1,790	7%	2,490	6%	2,110	13%
Return Home	1,380	6%	730	2%	910	6%
Other	910	4%	940	2%	930	6%
Total:	24,920	100%	43,070	100%	16,200	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	820	2%	1,340	5%	740	4%
School	550	1%	90	0%	70	0%
Shopping	3,920	9%	3,630	13%	2,830	14%
Leisure	2,550	6%	2,440	9%	1,580	8%
Medical	260	1%	670	2%	300	2%
Pick-up / drive passenger	3,310	7%	2,550	9%	2,390	12%
Return Home	31,900	72%	15,950	57%	11,310	58%
Other	1,270	3%	1,230	4%	440	2%
Total:	44,580	100%	27,900	100%	19,660	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	389,780		22%
AM Peak Period	84,190	22%	19%
PM Peak Period	92,140	24%	21%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	92,240	61%	92,670	61%	43,390	51%
Auto Passenger	24,030	16%	24,040	16%	13,430	16%
Transit	27,890	18%	27,220	18%	6,520	8%
Bicycle	2,180	1%	2,110	1%	1,390	2%
Walk	1,440	1%	1,510	1%	15,170	18%
Other	4,420	3%	4,890	3%	5,260	6%
Total:	152,200	100%	152,440	100%	85,160	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	12,430	50%	26,810	62%	6,330	39%
Auto Passenger	3,040	12%	5,100	12%	2,500	15%
Transit	7,540	30%	7,300	17%	1,700	10%
Bicycle	750	3%	750	2%	340	2%
Walk	280	1%	280	1%	3,210	20%
Other	880	4%	2,850	7%	2,140	13%
Total:	24,920	100%	43,090	100%	16,220	100%

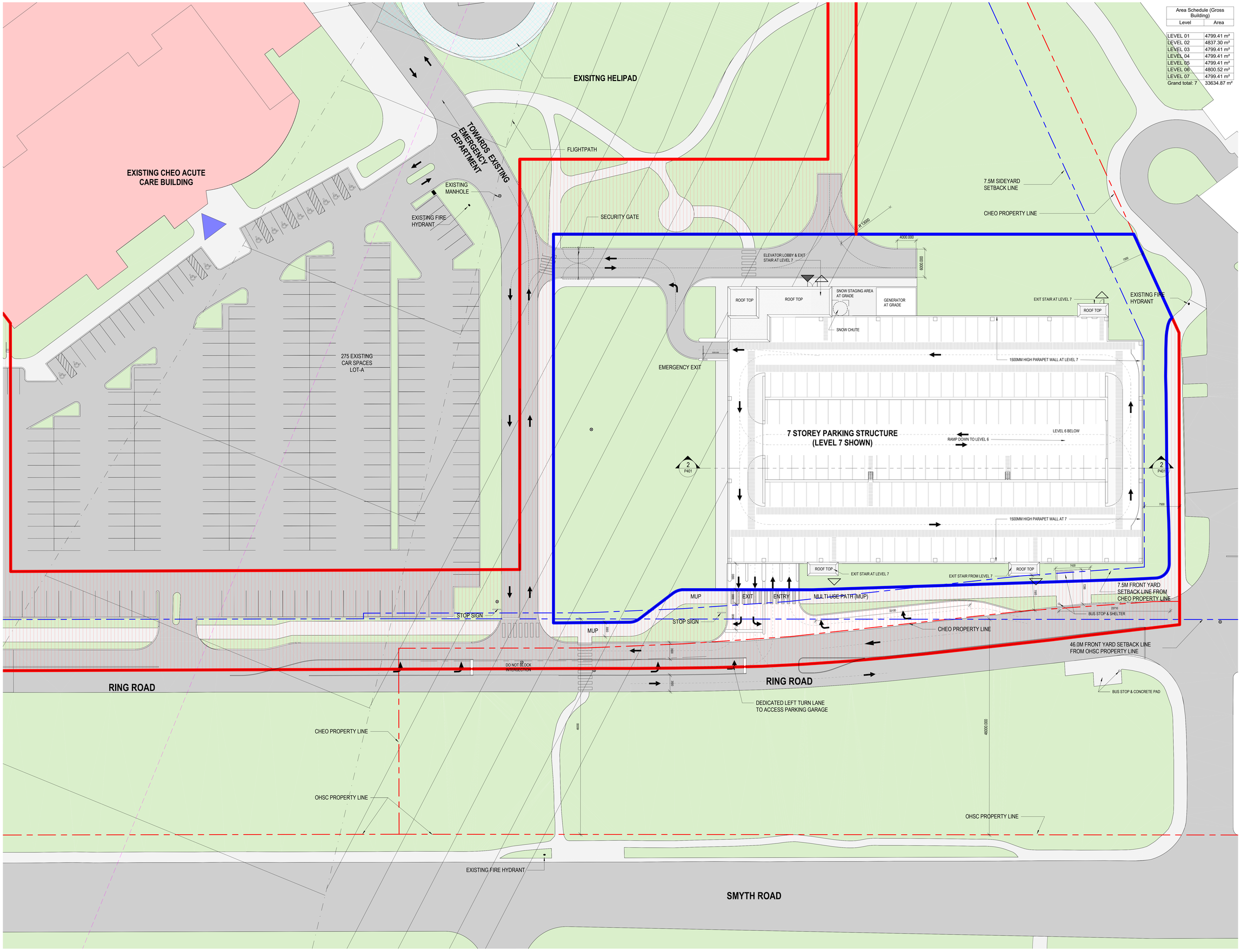
PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	28,570	64%	15,990	57%	9,640	49%
Auto Passenger	5,930	13%	4,230	15%	3,570	18%
Transit	7,460	17%	6,420	23%	1,500	8%
Bicycle	630	1%	610	2%	470	2%
Walk	340	1%	310	1%	3,280	17%
Other	1,660	4%	340	1%	1,210	6%
Total:	44,590	100%	27,900	100%	19,670	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.26	1.26	1.31
AM Peak Period	1.24	1.19	1.39
PM Peak Period	1.21	1.26	1.37

Transit Modal Split	From District	To District	Within District
24 Hours	19%	19%	10%
AM Peak Period	33%	19%	16%
PM Peak Period	18%	24%	10%

Appendix E

Proposed Site Plan



Area Schedule (Gross Building)	
Level	Area
LEVEL 01	4799.41 m²
LEVEL 02	4837.30 m²
LEVEL 03	4799.41 m²
LEVEL 04	4799.41 m²
LEVEL 05	4799.41 m²
LEVEL 06	4800.52 m²
LEVEL 07	4799.41 m²
Grand total: 7	33634.87 m²

PN TN

Keyplan:

NO.	ISSUED FOR	DATE
1	ISSUED FOR SPC	04/04/23

- Extent of Construction Site - Phase 1A
- Extent of Construction Site - Phase 1B
- Required Improvement Areas

PDC:

B+H

320 Bay Street, Suite 200
Toronto, ON, Canada, M5H 4A6
t. 416.596.2299 f. 416.596.0599

Client :

Infrastructure Ontario

1 Dundas St. West, Suite 2000
Toronto, ON M5G 1Z3
t. 416.327.3937

Client :

CHEO

401 Smyth Rd
Ottawa, ON K1H 8L1
t. 613.737.7600

Project:

1Door4Care

CHEO Integrated Treatment Centre

SITE PLAN - PHASE 1A

Solic.No: 2111095
Scale: As indicated
Date: 01/20/22

DWG No:

P003

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Appendix F

Supportive TDM Development Design Checklist

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

BASIC — The measure is generally feasible and effective, and in most cases would benefit the development and its users

BETTER — The measure could maximize support for users of sustainable modes, and optimize development performance

★ — The measure is one of the most dependably effective tools to encourage the use of sustainable modes

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1. TDM PROGRAM MANAGEMENT	
		1.1 Program coordinator	
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	☒
		1.2 Travel surveys	
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	☐
		2. WALKING AND CYCLING	
		2.1 Information on walking/cycling routes & destinations	
BASIC		2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances	☒
		2.2 Bicycle skills training	
		Commuter travel	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
		2.3 Valet bike parking	
		Visitor travel	
BETTER		2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

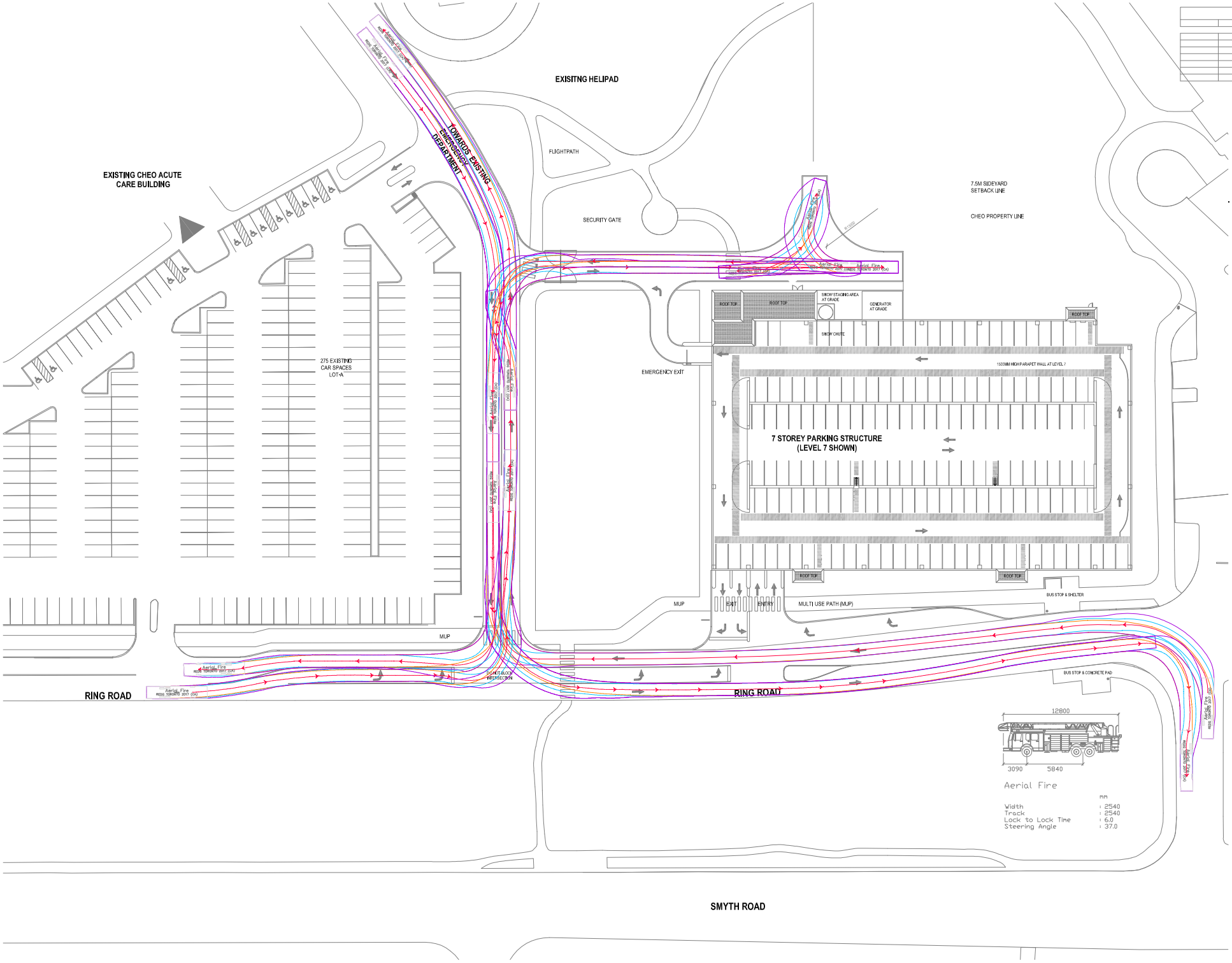
			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3.	**TRANSIT**	
		3.1	**Transit information**	
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances	☒
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☒
BETTER		3.1.3	Provide real-time arrival information display at entrances	☐
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☒
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☐
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☐
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☒
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☒

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	☒
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☐
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	☐
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☐
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	☐
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	☐
BETTER		8.2.2	Encourage compressed workweeks	☐
BETTER	★	8.2.3	Encourage telework	☐
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	☒

Appendix G

Turning Movement of Design Vehicles



Extent of Construction Site – Phase 1A

Extent of Construction Site – Phase 1B

Resident Improvement Areas

100 Bay Street, Suite 200
Toronto, ON, Canada, M5H 4A6
t. +1.416.206.2500 f. +1.416.206.2555

1 Dundas St, West, Suite 2000
Toronto, ONM5G 1Z3
t. +1.416.217.2000

401 Smyth Rd
Ottawa, ONM1H 8L1
t. +1.613.737.7600

1Door4Care
CHEO Integrated Treatment Centre

FIRE TRUCK TURNING MOVEMENT

Appendix G

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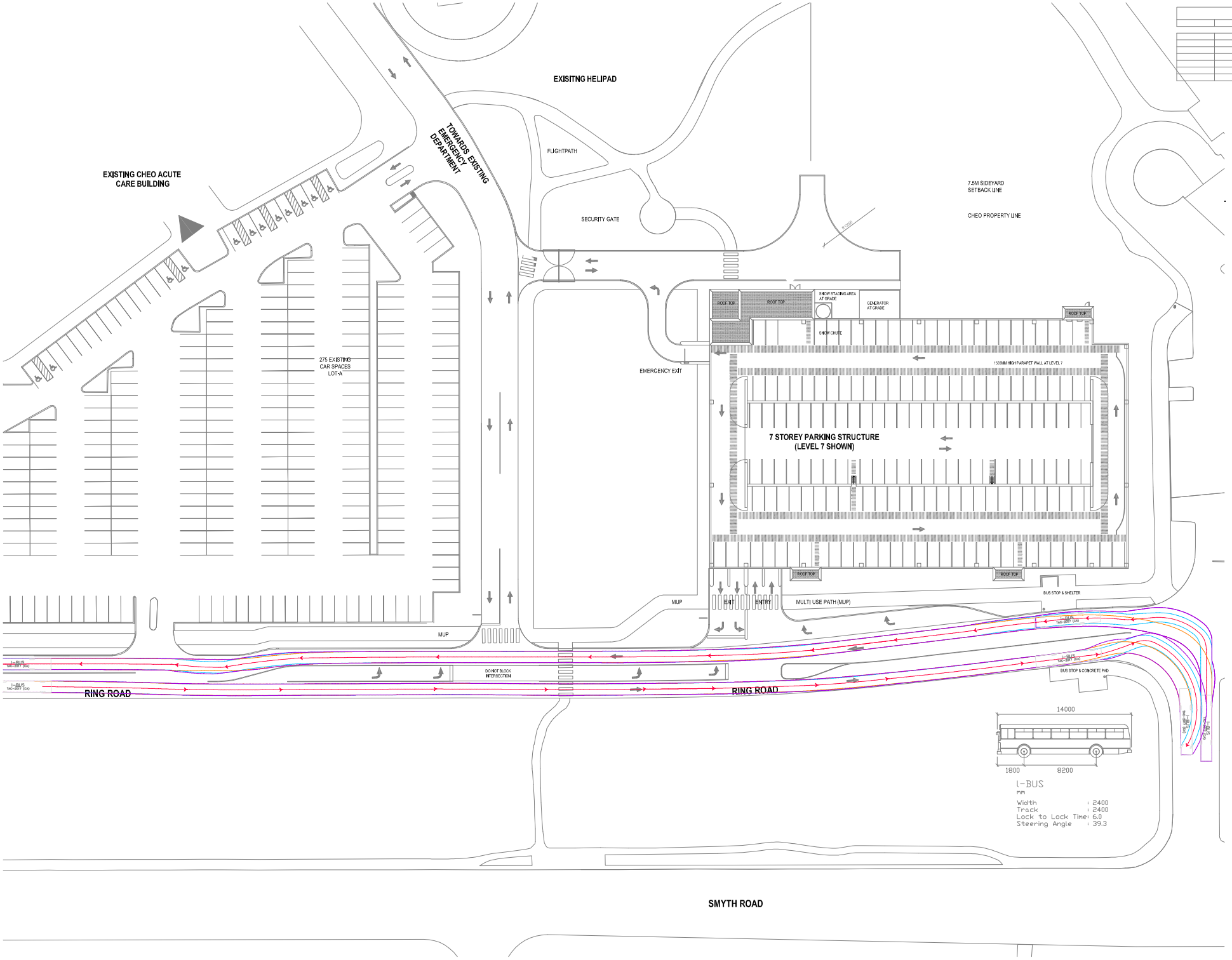

Extent of Construction Site – Phase 1A

Extent of Construction Site – Phase 1B

Retained Improvement Areas

1Door4Care

CHEO Integrated Treatment Centre

CITY TRANSIT BUS TURNING MOVEMENT

Appendix G

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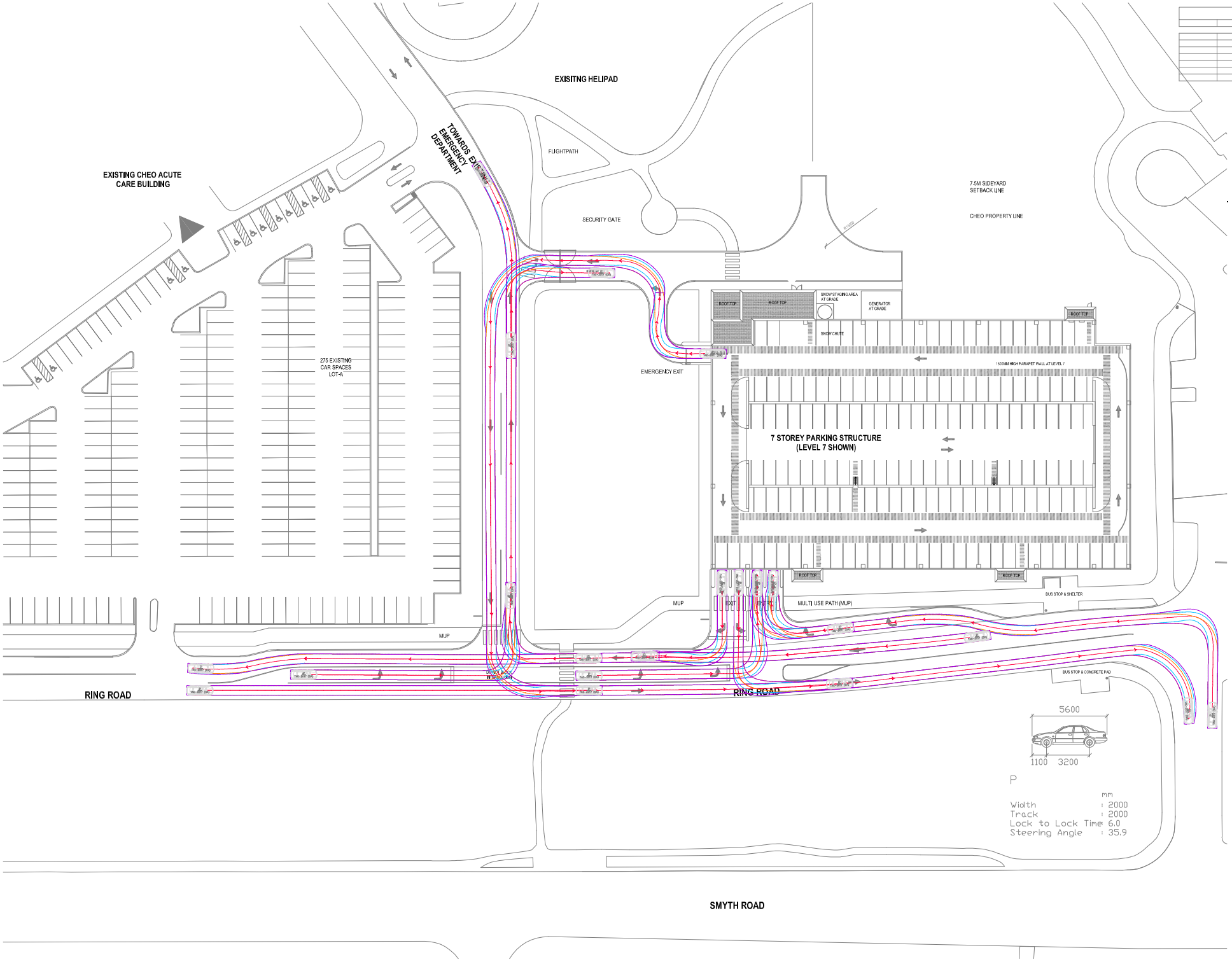

Extent of Construction Site – Phase 1A

Extent of Construction Site – Phase 1B

Retained Improvement Areas

1Door4Care

CHEO Integrated Treatment Centre

PASSENGER CAR TURNING MOVEMENT

Appendix G

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Appendix H

Detailed Segment MMLOS Calculation

Multi-Modal Level of Service Data Entry Form
CHEO Parking Garage TIA
Boundary Street - Appendix H

		Emergency Access Road	General Hospital Access Road	Ring Road (E-W)
Pedestrian	Sidewalk Wdith	2.0 or more	2.0 or more	2.0 or more
	Boulevard Width	0m	0m	0m
	Average Daily Curb Lane Traffic Volume	<3000 vpd	<3000 vpd	<3000 vpd
	On-street Parking	No	No	No
	Operating Speed (considered the posted speed plus 10km/h)	60km/h	60km/h	50km/h
	Level of Service	C	C	C
	Target	C	C	C
Cyclist	Road Classification	Local	Local	Local
	Bike Route Classification	N/A	N/A	N/A
	Type of Bikeway	Mixed	Mixed	Mixed
	Travel Lanes	2	2	2
	Centerline Markings	No	No	Yes
	Operating Speed (considered the posted speed plus 10km/h)	60km/h	60km/h	50km/h
	Level of Service	C	C	B
	Target	D	D	D
Transit	Facility Type	Mixed	Mixed	Mixed
	Friction/Congestion/Incident Potential	Limited	Limited	Limited
	Level of Service	D	D	E
	Target	D	D	D
Truck	Lane Width	3.5m to 3.7m	3.5m to 3.7m	3.5m to 3.7m
	Travel Lanes	1	1	1
	Level of Service	C	C	C
	Target	E	E	E

Appendix I

Detailed Intersection MMLOS Calculation

Multi-Modal Level of Service Data Entry Form
CHEO Parking Garage TIA
Boundary Street - Appendix I

	Intersection	Smyth Road/Ring Road (N-S)				Smyth Road/General Hospital Access Road		
	Legs	NORTH	SOUTH	EAST	WEST	NORTH	EAST	WEST
Pedestrian	Island Refuge	Yes	No	No	No	Yes	Yes	No
	Lanes	3	2	4	4	4	4	4
	Conflicting Left Turns	permitted	permitted	no left turn	protected	permitted	permitted	protected
	Conflicting Right Turns	permitted	permitted	permitted	permitted	protected	permitted	no right turn
	Right Turn on Red	yes	yes	yes	yes	no	yes	N/A
	Pedestrian Leading Interval	no	no	no	no	no	no	no
	Parallel Radius	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m
	Parallel Channel	no channel	no channel	no channel	no channel	no channel	no channel	no channel
	Perpendicular Radius	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m	15m to 25m
	Crosswalk Type	standard	standard	standard	standard	standard	standard	standard
	PETSI Score	72	88	58	62	65	57	57
	Delay Score	37	37	34	34	34	28	28
	Level of Service	D	D	D	D	D	C	C
	Target	C				C		
Cyclist	Type of Bikeway	mixed traffic	mixed traffic	mixed traffic	mixed traffic	mixed traffic	mixed traffic	mixed traffic
	Turning Speed	slow	slow	slow	slow	slow	slow	slow
	Right Turn Storage	25m-50m	25m-50m	25m-50m	25m-50m	25m-50m	25m-50m	25m-50m
	Dual Right Turn Lanes	No	No	No	No	No	No	No
	Shared Through-Right Lane	No	No	No	No	No	No	No
	Bike Box	No	No	No	No	No	No	No
	Lanes Crossed	1	1	1	1	1	1	1
	Dual Left Turn Lanes	No	No	No	No	No	No	No
	Approach Speed	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h
	Level of Service	F	F	F	F	F	F	F
	Target	B				B		
Transit	Average Signal Delay	54.5	0.4	7.7	8.8	46.6	17.8	7.4
	Level of Service	F	A	B	B	F	C	B
	Target	D				D		
Truck	Turning Radius	10-15m	< 10m	10-15m	10-15m	10-15m	>15m	N/A
	Receiving Lanes	2	1	2	2	2	2	2
	Level of Service	A	F	A	A	A	A	-
	Target	D				D		

Appendix J

Detailed Synchro Report

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	241	117	34	72	36	87
Future Volume (vph)	241	117	34	72	36	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.956				0.904	
Flt Protected				0.984	0.986	
Satd. Flow (prot)	1668	0	0	1717	1555	0
Flt Permitted				0.984	0.986	
Satd. Flow (perm)	1668	0	0	1717	1555	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	334.8	
Travel Time (s)	28.5			20.5	24.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	268	130	38	80	40	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	398	0	0	118	137	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	19	106	0	32	21	511	99	26	72	4
Future Volume (vph)	2	0	19	106	0	32	21	511	99	26	72	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.877			0.968			0.979			0.995	
Flt Protected		0.996			0.963			0.998			0.987	
Satd. Flow (prot)	0	1524	0	0	1627	0	0	1705	0	0	1714	0
Flt Permitted		0.996			0.963			0.998			0.987	
Satd. Flow (perm)	0	1524	0	0	1627	0	0	1705	0	0	1714	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		65.7			55.2			169.5			334.8	
Travel Time (s)		4.7			4.0			12.2			24.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	21	118	0	36	23	568	110	29	80	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	0	0	154	0	0	701	0	0	113	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	14	617	130	32	165
Future Volume (vph)	58	14	617	130	32	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.973		0.977			
Flt Protected	0.962					0.992
Satd. Flow (prot)	1633	0	1705	0	0	1731
Flt Permitted	0.962					0.992
Satd. Flow (perm)	1633	0	1705	0	0	1731
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			169.5
Travel Time (s)	7.9		3.8			12.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	64	16	686	144	36	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	830	0	0	219
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			

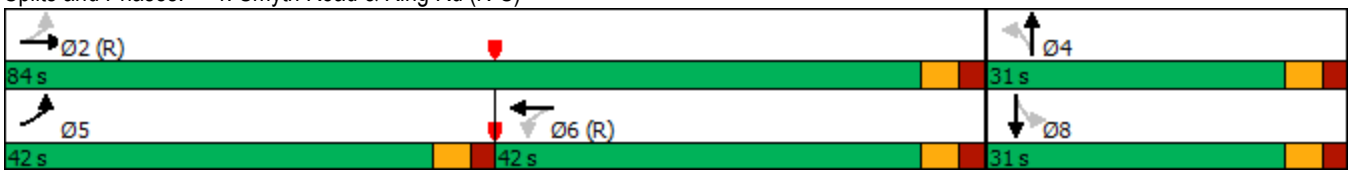
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	763	2	1	556	103	6	0	0	28	0	119
Future Volume (vph)	362	763	2	1	556	103	6	0	0	28	0	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.977						0.850	
Flt Protected		0.984						0.950		0.950		
Satd. Flow (prot)	0	3263	0	0	3239	0	0	1658	0	1658	1483	0
Flt Permitted		0.603			0.954			0.534		0.753		
Satd. Flow (perm)	0	1999	0	0	3090	0	0	932	0	1314	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19						588	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	402	848	2	1	618	114	7	0	0	31	0	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1252	0	0	733	0	0	7	0	31	132	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

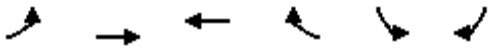
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.0	31.0		31.0	31.0	
Total Split (s)	42.0	84.0		42.0	42.0		31.0	31.0		31.0	31.0	
Total Split (%)	36.5%	73.0%		36.5%	36.5%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	36.6	78.3		36.3	36.3		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		91.2			91.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.79			0.79			0.11		0.11	0.11	
v/c Ratio		0.79			0.30			0.07		0.22	0.19	
Control Delay		12.7			8.2			44.0		48.2	0.6	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		12.7			8.2			44.0		48.2	0.6	
LOS		B			A			D		D	A	
Approach Delay		12.7			8.2			44.0			9.7	
Approach LOS		B			A			D			A	
Queue Length 50th (m)		56.8			12.0			1.5		6.7	0.0	
Queue Length 95th (m)		#160.0			100.5			5.2		14.2	0.0	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1585			2454			206		291	786	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.79			0.30			0.03		0.11	0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		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.

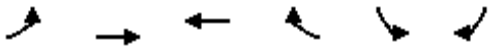
Splits and Phases: 4: Smyth Road & Ring Rd (N-S)





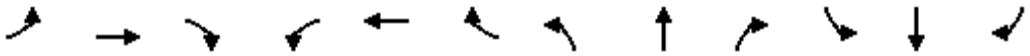
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	124	69	81	36	3
Future Volume (vph)	38	124	69	81	36	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.927		0.991	
Flt Protected		0.988			0.956	
Satd. Flow (prot)	0	1724	1618	0	1653	0
Flt Permitted		0.988			0.956	
Satd. Flow (perm)	0	1724	1618	0	1653	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	42	138	77	90	40	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	180	167	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.5%		ICU Level of Service A	
Analysis Period (min) 15			



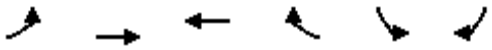
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	132	53	69	51	20	21
Future Volume (vph)	132	53	69	51	20	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.943		0.931	
Flt Protected		0.966			0.976	
Satd. Flow (prot)	0	1686	1646	0	1586	0
Flt Permitted		0.966			0.976	
Satd. Flow (perm)	0	1686	1646	0	1586	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	158.0		74.3	
Travel Time (s)		9.4	11.4		5.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	147	59	77	57	22	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	206	134	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.3%		ICU Level of Service A	
Analysis Period (min) 15			

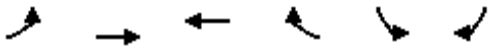


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	35	22	173	23	7	132	157	516	21	141	10
Future Volume (vph)	16	35	22	173	23	7	132	157	516	21	141	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.960			0.995			0.913			0.992	
Flt Protected		0.989			0.959			0.992			0.994	
Satd. Flow (prot)	0	1657	0	0	1665	0	0	1581	0	0	1721	0
Flt Permitted		0.989			0.959			0.992			0.994	
Satd. Flow (perm)	0	1657	0	0	1665	0	0	1581	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			97.8			54.4			67.4	
Travel Time (s)		11.4			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	39	24	192	26	8	147	174	573	23	157	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	226	0	0	894	0	0	191	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	378	536	687	427	133	203	
Future Volume (vph)	378	536	687	427	133	203	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.258				0.950		
Satd. Flow (perm)	450	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				474		39	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	420	596	763	474	148	226	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	420	596	763	474	148	226	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

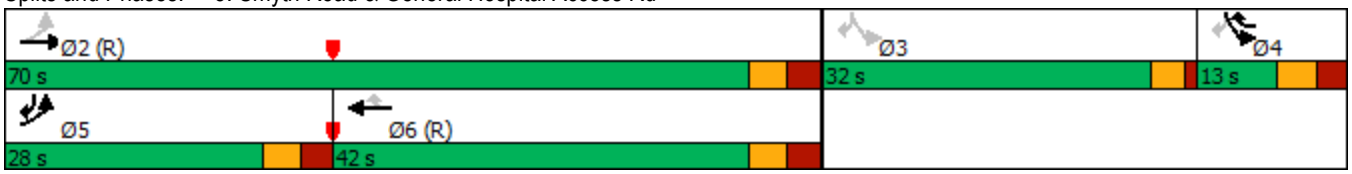


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	10.0
Minimum Split (s)	23.9	24.4	41.4	11.1	11.1	23.9	32.0
Total Split (s)	28.0	70.0	42.0	13.0	13.0	28.0	32.0
Total Split (%)	24.3%	60.9%	36.5%	11.3%	11.3%	24.3%	28%
Maximum Green (s)	22.1	63.6	35.6	6.9	6.9	22.1	28.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	None	None	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				21.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	87.3	86.8	56.7	71.2	15.7	46.0	
Actuated g/C Ratio	0.76	0.75	0.49	0.62	0.14	0.40	
v/c Ratio	0.71	0.24	0.47	0.43	0.34	0.37	
Control Delay	19.4	5.3	22.9	2.3	44.6	19.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	19.4	5.3	22.9	2.3	44.6	19.8	
LOS	B	A	C	A	D	B	
Approach Delay		11.1	15.0		29.6		
Approach LOS		B	B		C		
Queue Length 50th (m)	25.0	13.4	54.0	0.0	16.5	30.3	
Queue Length 95th (m)	m#96.9	29.5	103.0	9.9	19.2	32.2	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	600	2502	1636	1098	438	621	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.70	0.24	0.47	0.43	0.34	0.36	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 43 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

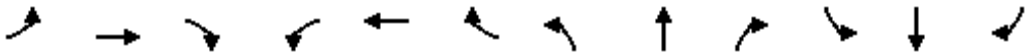
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Smyth Road & General Hospital Access Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	241	117	34	72	36	87
Future Volume (vph)	241	117	34	72	36	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.956				0.904	
Flt Protected				0.984	0.986	
Satd. Flow (prot)	1668	0	0	1717	1555	0
Flt Permitted				0.984	0.986	
Satd. Flow (perm)	1668	0	0	1717	1555	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	334.8	
Travel Time (s)	28.5			20.5	24.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	268	130	38	80	40	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	398	0	0	118	137	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



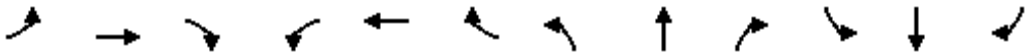
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	19	106	0	32	21	511	99	26	72	4
Future Volume (vph)	2	0	19	106	0	32	21	511	99	26	72	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.877			0.968			0.979			0.995	
Flt Protected		0.996			0.963			0.998			0.987	
Satd. Flow (prot)	0	1524	0	0	1627	0	0	1705	0	0	1714	0
Flt Permitted		0.996			0.963			0.998			0.987	
Satd. Flow (perm)	0	1524	0	0	1627	0	0	1705	0	0	1714	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		65.7			55.2			169.5			334.8	
Travel Time (s)		4.7			4.0			12.2			24.1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	21	118	0	36	23	568	110	29	80	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	0	0	154	0	0	701	0	0	113	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.5%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	14	617	130	32	165
Future Volume (vph)	58	14	617	130	32	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.973		0.977			
Flt Protected	0.962					0.992
Satd. Flow (prot)	1633	0	1705	0	0	1731
Flt Permitted	0.962					0.992
Satd. Flow (perm)	1633	0	1705	0	0	1731
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			169.5
Travel Time (s)	7.9		3.8			12.2
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	64	16	686	144	36	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	80	0	830	0	0	219
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 53.6%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	362	763	2	1	556	103	6	0	0	28	0	119
Future Volume (vph)	362	763	2	1	556	103	6	0	0	28	0	119
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.977						0.850	
Flt Protected		0.984						0.950		0.950		
Satd. Flow (prot)	0	3263	0	0	3239	0	0	1658	0	1658	1483	0
Flt Permitted		0.603			0.954			0.534		0.753		
Satd. Flow (perm)	0	1999	0	0	3090	0	0	932	0	1314	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					26						349	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	402	848	2	1	618	114	7	0	0	31	0	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1252	0	0	733	0	0	7	0	31	132	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

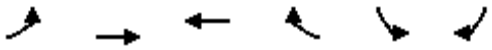


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.5	31.5		31.5	31.5	
Total Split (s)	16.0	78.0		62.0	62.0		37.0	37.0		37.0	37.0	
Total Split (%)	13.9%	67.8%		53.9%	53.9%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	10.6	72.3		56.3	56.3		31.5	31.5		31.5	31.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		91.2			91.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.79			0.79			0.11		0.11	0.11	
v/c Ratio		0.79			0.30			0.07		0.22	0.28	
Control Delay		12.7			11.2			44.0		48.2	1.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		12.7			11.2			44.0		48.2	1.5	
LOS		B			B			D		D	A	
Approach Delay		12.7			11.2			44.0			10.4	
Approach LOS		B			B			D			B	
Queue Length 50th (m)		56.8			22.2			1.5		6.7	0.0	
Queue Length 95th (m)		#160.0			90.3			5.2		14.2	0.0	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1585			2456			255		359	659	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.79			0.30			0.03		0.09	0.20	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 75.6%		ICU Level of Service D	
Analysis Period (min) 15			

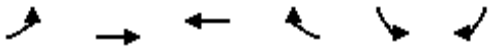
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Smyth Road & Ring Rd (N-S)



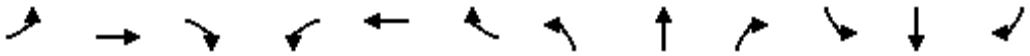
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	124	69	81	36	3
Future Volume (vph)	38	124	69	81	36	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.927		0.991	
Flt Protected		0.988			0.956	
Satd. Flow (prot)	0	1724	1618	0	1653	0
Flt Permitted		0.988			0.956	
Satd. Flow (perm)	0	1724	1618	0	1653	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	42	138	77	90	40	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	180	167	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.5%		ICU Level of Service A	
Analysis Period (min) 15			



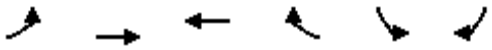
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	132	53	69	51	20	21
Future Volume (vph)	132	53	69	51	20	21
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.943		0.931	
Flt Protected		0.966			0.976	
Satd. Flow (prot)	0	1686	1646	0	1586	0
Flt Permitted		0.966			0.976	
Satd. Flow (perm)	0	1686	1646	0	1586	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	158.0		74.3	
Travel Time (s)		9.4	11.4		5.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	147	59	77	57	22	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	206	134	0	45	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.3%		ICU Level of Service A	
Analysis Period (min) 15			

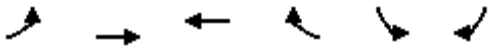


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	35	22	173	23	7	132	157	516	21	141	10
Future Volume (vph)	16	35	22	173	23	7	132	157	516	21	141	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.960			0.995			0.913			0.992	
Flt Protected		0.989			0.959			0.992			0.994	
Satd. Flow (prot)	0	1657	0	0	1665	0	0	1581	0	0	1721	0
Flt Permitted		0.989			0.959			0.992			0.994	
Satd. Flow (perm)	0	1657	0	0	1665	0	0	1581	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		158.0			97.8			54.4			67.4	
Travel Time (s)		11.4			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	39	24	192	26	8	147	174	573	23	157	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	81	0	0	226	0	0	894	0	0	191	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Free			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	378	536	687	427	133	203	
Future Volume (vph)	378	536	687	427	133	203	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.179				0.950		
Satd. Flow (perm)	312	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				474		43	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	420	596	763	474	148	226	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	420	596	763	474	148	226	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

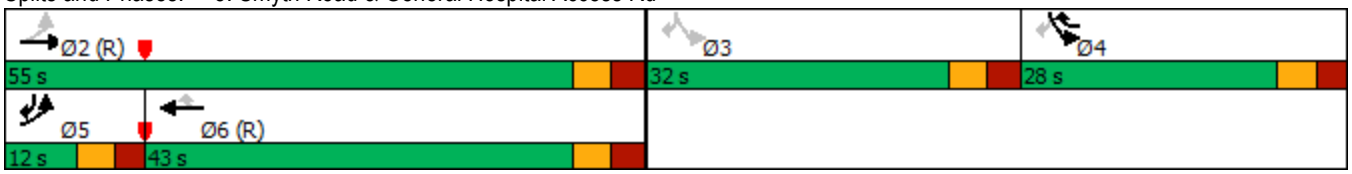


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	24.4	41.4	11.1	11.1	10.9	29.3
Total Split (s)	12.0	55.0	43.0	28.0	28.0	12.0	32.0
Total Split (%)	10.4%	47.8%	37.4%	24.3%	24.3%	10.4%	28%
Maximum Green (s)	6.1	48.6	36.6	21.9	21.9	6.1	25.7
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Max	C-Max	None	None	Min	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				16.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	86.6	86.1	42.2	57.9	16.4	60.5	
Actuated g/C Ratio	0.75	0.75	0.37	0.50	0.14	0.53	
v/c Ratio	0.62	0.24	0.63	0.48	0.32	0.28	
Control Delay	23.8	5.9	32.7	2.7	43.7	13.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	23.8	5.9	32.7	2.7	43.7	13.8	
LOS	C	A	C	A	D	B	
Approach Delay		13.3	21.2		25.6		
Approach LOS		B	C		C		
Queue Length 50th (m)	41.1	13.3	66.5	0.0	16.5	24.4	
Queue Length 95th (m)	m#135.1	32.9	101.6	9.1	18.3	32.5	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	679	2483	1218	1082	776	799	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.62	0.24	0.63	0.44	0.19	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 59 (51%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 61.7%		ICU Level of Service B	
Analysis Period (min) 15			

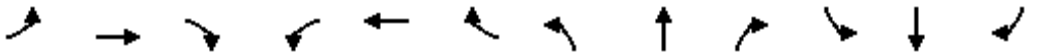
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Smyth Road & General Hospital Access Rd



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	241	170	34	72	63	87
Future Volume (vph)	241	170	34	72	63	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.944				0.922	
Flt Protected				0.984	0.979	
Satd. Flow (prot)	1647	0	0	1717	1575	0
Flt Permitted				0.984	0.979	
Satd. Flow (perm)	1647	0	0	1717	1575	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	325.9	
Travel Time (s)	28.5			20.5	23.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	241	170	34	72	63	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	411	0	0	106	150	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

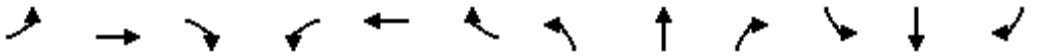


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	19	32	0	10	21	560	30	8	143	4
Future Volume (vph)	2	0	19	32	0	10	21	560	30	8	143	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.878			0.968			0.993			0.997	
Flt Protected		0.995			0.963			0.998			0.997	
Satd. Flow (prot)	0	1525	0	0	1627	0	0	1729	0	0	1735	0
Flt Permitted		0.995			0.963			0.998			0.997	
Satd. Flow (perm)	0	1525	0	0	1627	0	0	1729	0	0	1735	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		82.9			57.3			178.5			325.9	
Travel Time (s)		6.0			4.1			12.9			23.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	19	32	0	10	21	560	30	8	143	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	42	0	0	611	0	0	155	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

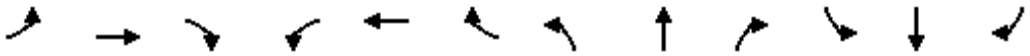
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.1%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	91	63	617	174	103	165
Future Volume (vph)	91	63	617	174	103	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.945		0.970			
Flt Protected	0.971					0.981
Satd. Flow (prot)	1601	0	1693	0	0	1712
Flt Permitted	0.971					0.981
Satd. Flow (perm)	1601	0	1693	0	0	1712
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			178.5
Travel Time (s)	7.9		3.8			12.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	91	63	617	174	103	165
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	0	791	0	0	268
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			



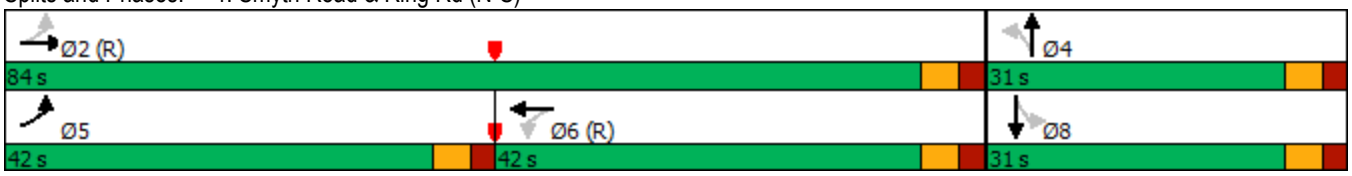
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	406	778	2	1	567	103	6	0	0	28	0	152
Future Volume (vph)	406	778	2	1	567	103	6	0	0	28	0	152
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.977						0.850	
Flt Protected		0.983						0.950		0.950		
Satd. Flow (prot)	0	3259	0	0	3239	0	0	1658	0	1658	1483	0
Flt Permitted		0.613			0.954			0.454		0.754		
Satd. Flow (perm)	0	2033	0	0	3090	0	0	792	0	1316	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19						598	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	406	778	2	1	567	103	6	0	0	28	0	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1186	0	0	671	0	0	6	0	28	152	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

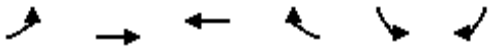


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.0	31.0		31.0	31.0	
Total Split (s)	42.0	84.0		42.0	42.0		31.0	31.0		31.0	31.0	
Total Split (%)	36.5%	73.0%		36.5%	36.5%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	36.6	78.3		36.3	36.3		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		91.2			91.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.79			0.79			0.11		0.11	0.11	
v/c Ratio		0.74			0.27			0.07		0.19	0.22	
Control Delay		10.6			8.6			44.2		47.6	0.7	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		10.6			8.6			44.2		47.6	0.7	
LOS		B			A			D		D	A	
Approach Delay		10.6			8.6			44.2			8.0	
Approach LOS		B			A			D			A	
Queue Length 50th (m)		48.0			11.5			1.3		6.0	0.0	
Queue Length 95th (m)		126.9			93.9			4.9		13.2	0.0	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1612			2454			175		291	794	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.74			0.27			0.03		0.10	0.19	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 9.8		Intersection LOS: A	
Intersection Capacity Utilization 79.3%		ICU Level of Service D	
Analysis Period (min) 15			

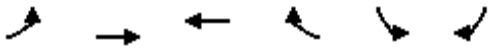
Splits and Phases: 4: Smyth Road & Ring Rd (N-S)





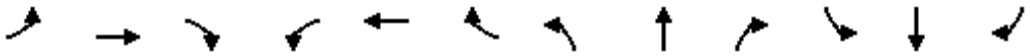
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	187	151	24	11	1
Future Volume (vph)	11	187	151	24	11	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.981		0.989	
Flt Protected		0.997			0.956	
Satd. Flow (prot)	0	1740	1712	0	1650	0
Flt Permitted		0.997			0.956	
Satd. Flow (perm)	0	1740	1712	0	1650	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	187	151	24	11	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	198	175	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.9%		ICU Level of Service A	
Analysis Period (min) 15			



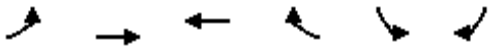
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	26	222	111	10	4	4
Future Volume (vph)	26	222	111	10	4	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	35.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.989		0.932	
Flt Protected		0.995			0.976	
Satd. Flow (prot)	0	3299	1726	0	1587	0
Flt Permitted		0.995			0.976	
Satd. Flow (perm)	0	3299	1726	0	1587	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	64.8		106.6	
Travel Time (s)		9.4	4.7		7.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	26	222	111	10	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	248	121	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.4%		ICU Level of Service A	
Analysis Period (min) 15			

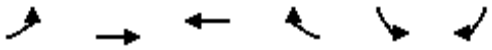


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	35	96	173	23	7	196	157	516	21	141	10
Future Volume (vph)	16	35	96	173	23	7	196	157	516	21	141	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.912			0.995			0.920			0.992	
Flt Protected		0.995			0.959			0.989			0.994	
Satd. Flow (prot)	0	1584	0	0	1665	0	0	1588	0	0	1721	0
Flt Permitted		0.995			0.959			0.989			0.994	
Satd. Flow (perm)	0	1584	0	0	1665	0	0	1588	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		93.1			97.8			54.4			67.4	
Travel Time (s)		6.7			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	35	96	173	23	7	196	157	516	21	141	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	147	0	0	203	0	0	869	0	0	172	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		



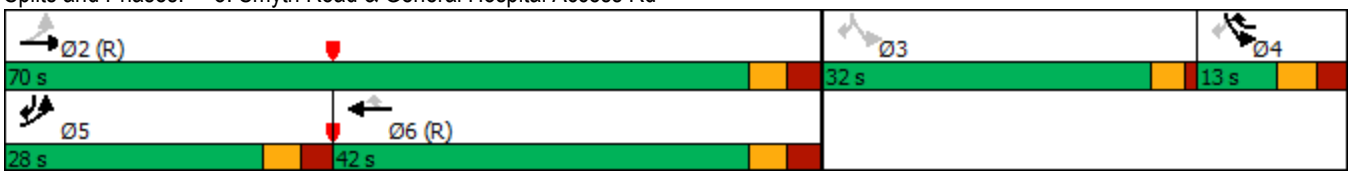
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	368	437	701	482	187	174	
Future Volume (vph)	368	437	701	482	187	174	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.307				0.950		
Satd. Flow (perm)	536	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				482		52	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	368	437	701	482	187	174	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	368	437	701	482	187	174	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

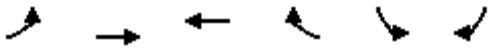


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	10.0
Minimum Split (s)	23.9	24.4	41.4	11.1	11.1	23.9	32.0
Total Split (s)	28.0	70.0	42.0	13.0	13.0	28.0	32.0
Total Split (%)	24.3%	60.9%	36.5%	11.3%	11.3%	24.3%	28%
Maximum Green (s)	22.1	63.6	35.6	6.9	6.9	22.1	28.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	None	None	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				21.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	86.1	85.6	63.9	79.6	16.9	38.8	
Actuated g/C Ratio	0.75	0.74	0.56	0.69	0.15	0.34	
v/c Ratio	0.66	0.18	0.38	0.41	0.40	0.33	
Control Delay	13.3	5.3	18.5	2.1	44.8	18.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.3	5.3	18.5	2.1	44.8	18.5	
LOS	B	A	B	A	D	B	
Approach Delay		9.0	11.8		32.1		
Approach LOS		A	B		C		
Queue Length 50th (m)	15.6	9.8	38.7	0.0	20.9	21.5	
Queue Length 95th (m)	53.4	20.8	93.3	10.0	23.6	22.3	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	616	2468	1842	1174	472	613	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.60	0.18	0.38	0.41	0.40	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 43 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 14.0		Intersection LOS: B	
Intersection Capacity Utilization 63.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: Smyth Road & General Hospital Access Rd



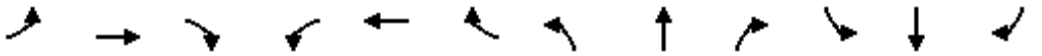


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	169	74	106	149	74	82
Future Volume (vph)	169	74	106	149	74	82
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1745	1745	1483	1658	1483
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1745	1745	1483	1658	1483
Link Speed (k/h)		50	50		50	
Link Distance (m)		64.8	93.1		57.0	
Travel Time (s)		4.7	6.7		4.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	169	74	106	149	74	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	169	74	106	149	74	82
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 27.5%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	56	42	85	195	122	53
Future Volume (vph)	56	42	85	195	122	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942				0.959	
Flt Protected				0.985	0.966	
Satd. Flow (prot)	1644	0	0	1719	1617	0
Flt Permitted				0.985	0.966	
Satd. Flow (perm)	1644	0	0	1719	1617	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	325.9	
Travel Time (s)	28.5			20.5	23.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	62	47	94	217	136	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	109	0	0	311	195	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.7%		ICU Level of Service A	
Analysis Period (min) 15			

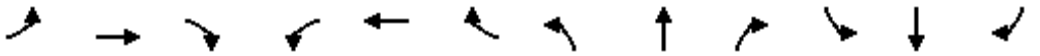


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	17	37	0	5	7	205	7	3	590	1
Future Volume (vph)	2	0	17	37	0	5	7	205	7	3	590	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.878			0.983			0.996				
Flt Protected		0.995			0.958			0.998				
Satd. Flow (prot)	0	1525	0	0	1643	0	0	1735	0	0	1745	0
Flt Permitted		0.995			0.958			0.998				
Satd. Flow (perm)	0	1525	0	0	1643	0	0	1735	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		82.9			57.3			178.5			325.9	
Travel Time (s)		6.0			4.1			12.9			23.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	19	41	0	6	8	228	8	3	656	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	47	0	0	244	0	0	660	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	127	120	114	80	62	669
Future Volume (vph)	127	120	114	80	62	669
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.934		0.944			
Flt Protected	0.975					0.996
Satd. Flow (prot)	1589	0	1647	0	0	1738
Flt Permitted	0.975					0.996
Satd. Flow (perm)	1589	0	1647	0	0	1738
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			178.5
Travel Time (s)	7.9		3.8			12.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	141	133	127	89	69	743
Shared Lane Traffic (%)						
Lane Group Flow (vph)	274	0	216	0	0	812
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.5%		ICU Level of Service D	
Analysis Period (min) 15			

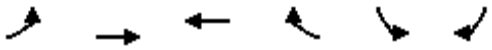


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	531	4	4	896	11	5	0	4	127	1	366
Future Volume (vph)	118	531	4	4	896	11	5	0	4	127	1	366
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.998			0.946			0.850	
Flt Protected		0.991						0.971		0.950		
Satd. Flow (prot)	0	3283	0	0	3309	0	0	1603	0	1658	1483	0
Flt Permitted		0.598			0.953			0.481		0.751		
Satd. Flow (perm)	0	1981	0	0	3154	0	0	794	0	1311	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			1			77			234	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	131	590	4	4	996	12	6	0	4	141	1	407
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	725	0	0	1012	0	0	10	0	141	408	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.5	31.5		31.5	31.5	
Total Split (s)	16.0	78.0		62.0	62.0		37.0	37.0		37.0	37.0	
Total Split (%)	13.9%	67.8%		53.9%	53.9%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	10.6	72.3		56.3	56.3		31.5	31.5		31.5	31.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		82.4			82.4			21.4		21.4	21.4	
Actuated g/C Ratio		0.72			0.72			0.19		0.19	0.19	
v/c Ratio		0.51			0.45			0.05		0.58	0.88	
Control Delay		10.2			8.4			0.4		50.3	38.0	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		10.2			8.4			0.4		50.3	38.0	
LOS		B			A			A		D	D	
Approach Delay		10.2			8.4			0.4			41.2	
Approach LOS		B			A			A			D	
Queue Length 50th (m)		34.7			25.3			0.0		29.0	39.9	
Queue Length 95th (m)		64.0			95.0			0.0		44.5	72.4	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1418			2259			273		359	576	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.51			0.45			0.04		0.39	0.71	

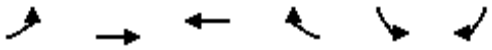
Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Smyth Road & Ring Rd (N-S)



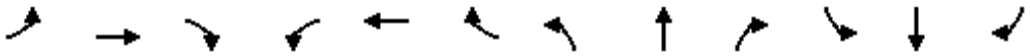
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	97	240	12	7	2
Future Volume (vph)	8	97	240	12	7	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.973	
Flt Protected		0.996			0.962	
Satd. Flow (prot)	0	1738	1735	0	1633	0
Flt Permitted		0.996			0.962	
Satd. Flow (perm)	0	1738	1735	0	1633	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	9	108	267	13	8	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	117	280	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 24.1%		ICU Level of Service A	
Analysis Period (min) 15			



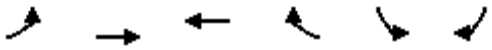
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	124	161	3	9	3
Future Volume (vph)	5	124	161	3	9	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	35.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.969	
Flt Protected		0.998			0.963	
Satd. Flow (prot)	0	3309	1742	0	1628	0
Flt Permitted		0.998			0.963	
Satd. Flow (perm)	0	3309	1742	0	1628	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	64.8		106.6	
Travel Time (s)		9.4	4.7		7.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	6	138	179	3	10	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	144	182	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.1%		ICU Level of Service A	
Analysis Period (min) 15			

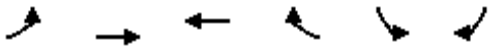


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	10	179	459	28	36	101	155	123	21	155	26
Future Volume (vph)	20	10	179	459	28	36	101	155	123	21	155	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.884			0.991			0.956			0.983	
Flt Protected		0.995			0.958			0.987			0.995	
Satd. Flow (prot)	0	1535	0	0	1657	0	0	1647	0	0	1707	0
Flt Permitted		0.995			0.958			0.987			0.995	
Satd. Flow (perm)	0	1535	0	0	1657	0	0	1647	0	0	1707	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		93.1			97.8			54.4			67.4	
Travel Time (s)		6.7			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	11	199	510	31	40	112	172	137	23	172	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	232	0	0	581	0	0	421	0	0	224	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		



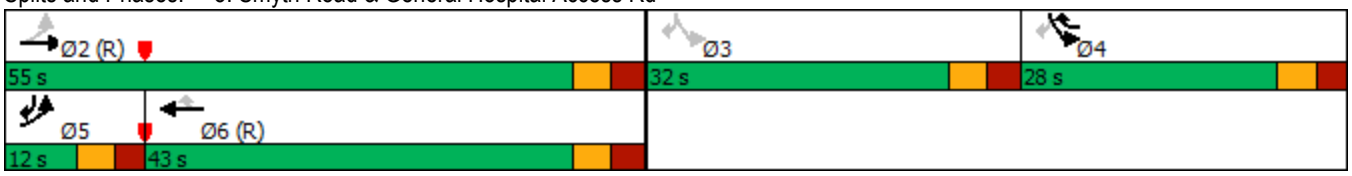
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	130	816	560	204	424	369	
Future Volume (vph)	130	816	560	204	424	369	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.334				0.950		
Satd. Flow (perm)	583	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				227		81	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	144	907	622	227	471	410	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	144	907	622	227	471	410	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

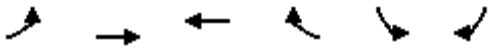


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	24.4	41.4	11.1	11.1	10.9	29.3
Total Split (s)	12.0	55.0	43.0	28.0	28.0	12.0	32.0
Total Split (%)	10.4%	47.8%	37.4%	24.3%	24.3%	10.4%	28%
Maximum Green (s)	6.1	48.6	36.6	21.9	21.9	6.1	25.7
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Max	C-Max	None	None	Min	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				16.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	78.5	78.0	62.0	85.9	24.5	40.7	
Actuated g/C Ratio	0.68	0.68	0.54	0.75	0.21	0.35	
v/c Ratio	0.29	0.40	0.35	0.20	0.69	0.71	
Control Delay	8.0	8.1	17.8	1.4	46.2	31.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.0	8.1	17.8	1.4	46.2	31.2	
LOS	A	A	B	A	D	C	
Approach Delay		8.1	13.4		39.2		
Approach LOS		A	B		D		
Queue Length 50th (m)	7.1	36.3	37.5	0.0	52.2	66.8	
Queue Length 95th (m)	20.9	56.3	73.4	6.8	56.5	72.2	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	491	2247	1787	1207	795	577	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.29	0.40	0.35	0.19	0.59	0.71	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 59 (51%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 19.6		Intersection LOS: B	
Intersection Capacity Utilization 52.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Smyth Road & General Hospital Access Rd



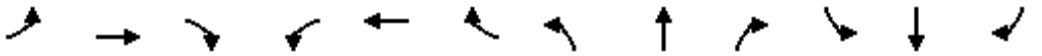


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	54	117	125	47	94	105
Future Volume (vph)	54	117	125	47	94	105
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1745	1745	1483	1658	1483
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1745	1745	1483	1658	1483
Link Speed (k/h)		50	50		50	
Link Distance (m)		64.8	93.1		57.0	
Travel Time (s)		4.7	6.7		4.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	60	130	139	52	104	117
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	130	139	52	104	117
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	97			97	97	97
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.8%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	241	179	34	72	69	87
Future Volume (vph)	241	179	34	72	69	87
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.942				0.925	
Flt Protected				0.984	0.978	
Satd. Flow (prot)	1644	0	0	1717	1579	0
Flt Permitted				0.984	0.978	
Satd. Flow (perm)	1644	0	0	1717	1579	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	325.9	
Travel Time (s)	28.5			20.5	23.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	241	179	34	72	69	87
Shared Lane Traffic (%)						
Lane Group Flow (vph)	420	0	0	106	156	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	50.6%	ICU Level of Service	A
Analysis Period (min)	15		

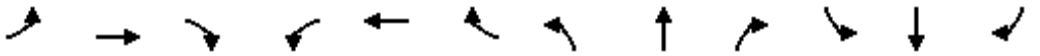


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	19	32	0	10	21	566	30	8	152	4
Future Volume (vph)	2	0	19	32	0	10	21	566	30	8	152	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.878			0.968			0.993			0.997	
Flt Protected		0.995			0.963			0.998			0.998	
Satd. Flow (prot)	0	1525	0	0	1627	0	0	1729	0	0	1736	0
Flt Permitted		0.995			0.963			0.998			0.998	
Satd. Flow (perm)	0	1525	0	0	1627	0	0	1729	0	0	1736	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		82.9			57.3			178.5			325.9	
Travel Time (s)		6.0			4.1			12.9			23.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	19	32	0	10	21	566	30	8	152	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	42	0	0	617	0	0	164	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

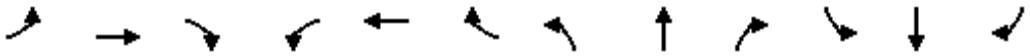
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.7%		ICU Level of Service B	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	95	69	617	203	112	165
Future Volume (vph)	95	69	617	203	112	165
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.943		0.967			
Flt Protected	0.972					0.980
Satd. Flow (prot)	1600	0	1688	0	0	1710
Flt Permitted	0.972					0.980
Satd. Flow (perm)	1600	0	1688	0	0	1710
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			178.5
Travel Time (s)	7.9		3.8			12.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	95	69	617	203	112	165
Shared Lane Traffic (%)						
Lane Group Flow (vph)	164	0	820	0	0	277
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 83.0%		ICU Level of Service E	
Analysis Period (min) 15			



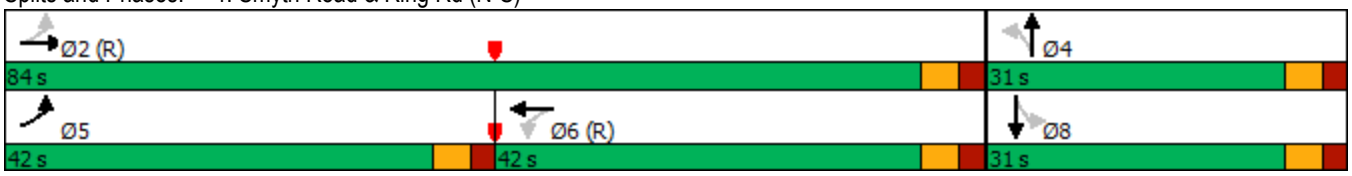
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	435	778	2	1	567	103	6	0	0	28	0	156
Future Volume (vph)	435	778	2	1	567	103	6	0	0	28	0	156
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt					0.977						0.850	
Flt Protected		0.982						0.950		0.950		
Satd. Flow (prot)	0	3256	0	0	3239	0	0	1658	0	1658	1483	0
Flt Permitted		0.608			0.954			0.438		0.754		
Satd. Flow (perm)	0	2016	0	0	3090	0	0	764	0	1316	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					19						598	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	435	778	2	1	567	103	6	0	0	28	0	156
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1215	0	0	671	0	0	6	0	28	156	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

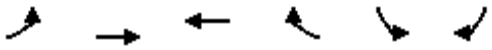


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.0	31.0		31.0	31.0	
Total Split (s)	42.0	84.0		42.0	42.0		31.0	31.0		31.0	31.0	
Total Split (%)	36.5%	73.0%		36.5%	36.5%		27.0%	27.0%		27.0%	27.0%	
Maximum Green (s)	36.6	78.3		36.3	36.3		25.5	25.5		25.5	25.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		91.2			91.2			12.6		12.6	12.6	
Actuated g/C Ratio		0.79			0.79			0.11		0.11	0.11	
v/c Ratio		0.76			0.27			0.07		0.19	0.22	
Control Delay		11.5			8.6			44.3		47.6	0.8	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		11.5			8.6			44.3		47.6	0.8	
LOS		B			A			D		D	A	
Approach Delay		11.5			8.6			44.3			7.9	
Approach LOS		B			A			D			A	
Queue Length 50th (m)		51.8			11.5			1.3		6.0	0.0	
Queue Length 95th (m)		137.9			93.9			4.9		13.2	0.0	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1598			2454			169		291	794	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.76			0.27			0.04		0.10	0.20	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 10.3		Intersection LOS: B	
Intersection Capacity Utilization 80.4%		ICU Level of Service D	
Analysis Period (min) 15			

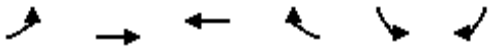
Splits and Phases: 4: Smyth Road & Ring Rd (N-S)





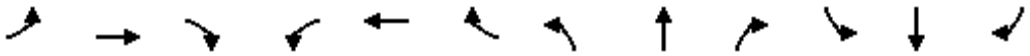
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	11	226	161	24	11	1
Future Volume (vph)	11	226	161	24	11	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.982		0.989	
Flt Protected		0.998			0.956	
Satd. Flow (prot)	0	1742	1714	0	1650	0
Flt Permitted		0.998			0.956	
Satd. Flow (perm)	0	1742	1714	0	1650	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	11	226	161	24	11	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	237	185	0	12	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.0%		ICU Level of Service A	
Analysis Period (min) 15			



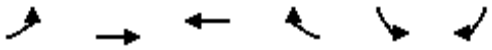
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	26	261	121	10	4	4
Future Volume (vph)	26	261	121	10	4	4
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	35.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.932	
Flt Protected		0.995			0.976	
Satd. Flow (prot)	0	3299	1728	0	1587	0
Flt Permitted		0.995			0.976	
Satd. Flow (perm)	0	3299	1728	0	1587	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	64.8		106.6	
Travel Time (s)		9.4	4.7		7.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	26	261	121	10	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	287	131	0	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.1%		ICU Level of Service A	
Analysis Period (min) 15			

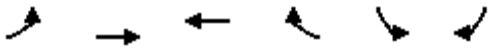


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	35	114	173	23	7	230	157	516	21	141	10
Future Volume (vph)	16	35	114	173	23	7	230	157	516	21	141	10
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.907			0.995			0.923			0.992	
Flt Protected		0.995			0.959			0.987			0.994	
Satd. Flow (prot)	0	1575	0	0	1665	0	0	1590	0	0	1721	0
Flt Permitted		0.995			0.959			0.987			0.994	
Satd. Flow (perm)	0	1575	0	0	1665	0	0	1590	0	0	1721	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		93.1			97.8			54.4			67.4	
Travel Time (s)		6.7			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour 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
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	16	35	114	173	23	7	230	157	516	21	141	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	165	0	0	203	0	0	903	0	0	172	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	368	437	701	516	205	174	
Future Volume (vph)	368	437	701	516	205	174	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.305				0.950		
Satd. Flow (perm)	532	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				516		52	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	368	437	701	516	205	174	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	368	437	701	516	205	174	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

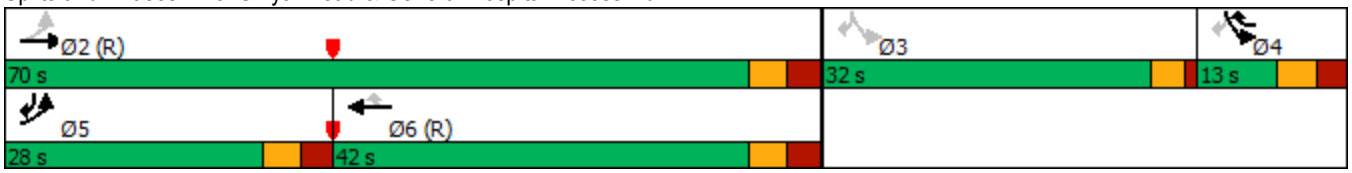


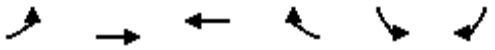
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	10.0
Minimum Split (s)	23.9	24.4	41.4	11.1	11.1	23.9	32.0
Total Split (s)	28.0	70.0	42.0	13.0	13.0	28.0	32.0
Total Split (%)	24.3%	60.9%	36.5%	11.3%	11.3%	24.3%	28%
Maximum Green (s)	22.1	63.6	35.6	6.9	6.9	22.1	28.0
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.0
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	None	None	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				21.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	85.6	85.1	63.3	79.5	17.4	39.4	
Actuated g/C Ratio	0.74	0.74	0.55	0.69	0.15	0.34	
v/c Ratio	0.67	0.18	0.38	0.44	0.42	0.32	
Control Delay	13.3	5.4	18.8	2.2	44.9	18.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.3	5.4	18.8	2.2	44.9	18.1	
LOS	B	A	B	A	D	B	
Approach Delay		9.0	11.8		32.6		
Approach LOS		A	B		C		
Queue Length 50th (m)	15.6	9.9	39.6	0.0	22.9	21.2	
Queue Length 95th (m)	m52.2	20.8	93.3	10.2	25.5	22.3	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	612	2454	1825	1184	486	618	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.60	0.18	0.38	0.44	0.42	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 43 (37%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 14.2		Intersection LOS: B	
Intersection Capacity Utilization 65.2%		ICU Level of Service C	
Analysis Period (min) 15			

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

Splits and Phases: 8: Smyth Road & General Hospital Access Rd



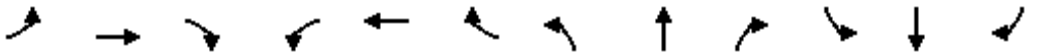


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	208	74	106	183	92	92
Future Volume (vph)	208	74	106	183	92	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1745	1745	1483	1658	1483
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1745	1745	1483	1658	1483
Link Speed (k/h)		50	50		50	
Link Distance (m)		64.8	93.1		57.0	
Travel Time (s)		4.7	6.7		4.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	208	74	106	183	92	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	208	74	106	183	92	92
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 30.9%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	56	46	85	195	136	53
Future Volume (vph)	56	46	85	195	136	53
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%			0%	0%	
Storage Length (m)		0.0	0.0		0.0	0.0
Storage Lanes		0	0		1	0
Taper Length (m)			7.6		7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.939				0.962	
Flt Protected				0.985	0.965	
Satd. Flow (prot)	1639	0	0	1719	1620	0
Flt Permitted				0.985	0.965	
Satd. Flow (perm)	1639	0	0	1719	1620	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	396.5			285.4	325.9	
Travel Time (s)	28.5			20.5	23.5	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	62	51	94	217	151	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	113	0	0	311	210	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.9			4.9	4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)		14	24		24	14
Sign Control	Stop			Stop	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

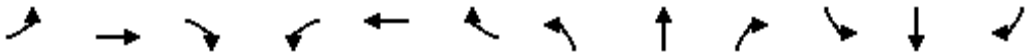


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	17	37	0	5	7	219	7	3	594	1
Future Volume (vph)	2	0	17	37	0	5	7	219	7	3	594	1
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.878			0.983			0.996				
Flt Protected		0.995			0.958			0.998				
Satd. Flow (prot)	0	1525	0	0	1643	0	0	1735	0	0	1745	0
Flt Permitted		0.995			0.958			0.998				
Satd. Flow (perm)	0	1525	0	0	1643	0	0	1735	0	0	1745	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		82.9			57.3			178.5			325.9	
Travel Time (s)		6.0			4.1			12.9			23.5	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	2	0	19	41	0	6	8	243	8	3	660	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	21	0	0	47	0	0	259	0	0	664	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.2%		ICU Level of Service A	
Analysis Period (min) 15			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	138	134	114	92	66	669
Future Volume (vph)	138	134	114	92	66	669
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)	0%		0%			0%
Storage Length (m)	0.0	0.0		0.0	0.0	
Storage Lanes	1	0		0	0	
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.933		0.940			
Flt Protected	0.975					0.996
Satd. Flow (prot)	1587	0	1640	0	0	1738
Flt Permitted	0.975					0.996
Satd. Flow (perm)	1587	0	1640	0	0	1738
Link Speed (k/h)	50		50			50
Link Distance (m)	109.2		52.2			178.5
Travel Time (s)	7.9		3.8			12.9
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	153	149	127	102	73	743
Shared Lane Traffic (%)						
Lane Group Flow (vph)	302	0	229	0	0	816
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.5		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.9		4.9			4.9
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24	14		14	24	
Sign Control	Stop		Free			Free

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			

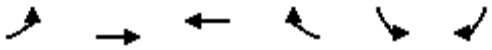


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	130	531	4	4	896	11	5	0	4	127	1	377
Future Volume (vph)	130	531	4	4	896	11	5	0	4	127	1	377
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (m)	7.6			7.6			7.6			7.6		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.999			0.998			0.946			0.850	
Flt Protected		0.990						0.971		0.950		
Satd. Flow (prot)	0	3279	0	0	3309	0	0	1603	0	1658	1483	0
Flt Permitted		0.579			0.953			0.490		0.751		
Satd. Flow (perm)	0	1918	0	0	3154	0	0	809	0	1311	1483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			1			77			234	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		446.7			395.2			147.1			52.2	
Travel Time (s)		32.2			28.5			10.6			3.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	144	590	4	4	996	12	6	0	4	141	1	419
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	738	0	0	1012	0	0	10	0	141	420	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)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	5	2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	5	2		6	6		4	4		8	8	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	5.0	10.0		10.0	10.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	10.4	31.7		31.7	31.7		31.5	31.5		31.5	31.5	
Total Split (s)	16.0	78.0		62.0	62.0		37.0	37.0		37.0	37.0	
Total Split (%)	13.9%	67.8%		53.9%	53.9%		32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	10.6	72.3		56.3	56.3		31.5	31.5		31.5	31.5	
Yellow Time (s)	3.3	3.3		3.3	3.3		3.3	3.3		3.3	3.3	
All-Red Time (s)	2.1	2.4		2.4	2.4		2.2	2.2		2.2	2.2	
Lost Time Adjust (s)		0.0			0.0			0.0		0.0	0.0	
Total Lost Time (s)		5.7			5.7			5.5		5.5	5.5	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Minimum Gap (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Recall Mode	None	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		19.0		19.0	19.0		16.0	16.0		16.0	16.0	
Pedestrian Calls (#/hr)		10		10	10		10	10		10	10	
Act Effct Green (s)		81.6			81.6			22.2		22.2	22.2	
Actuated g/C Ratio		0.71			0.71			0.19		0.19	0.19	
v/c Ratio		0.54			0.45			0.05		0.56	0.88	
Control Delay		11.2			9.1			0.4		48.5	39.5	
Queue Delay		0.0			0.0			0.0		0.0	0.0	
Total Delay		11.2			9.1			0.4		48.5	39.5	
LOS		B			A			A		D	D	
Approach Delay		11.2			9.1			0.4			41.8	
Approach LOS		B			A			A			D	
Queue Length 50th (m)		37.7			25.4			0.0		28.6	42.8	
Queue Length 95th (m)		67.5			102.5			0.0		44.5	76.8	
Internal Link Dist (m)		422.7			371.2			123.1			28.2	
Turn Bay Length (m)												
Base Capacity (vph)		1360			2237			277		359	576	
Starvation Cap Reductn		0			0			0		0	0	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.54			0.45			0.04		0.39	0.73	

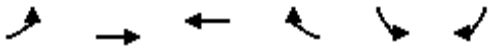
Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 35 (30%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 85.0%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 4: Smyth Road & Ring Rd (N-S)



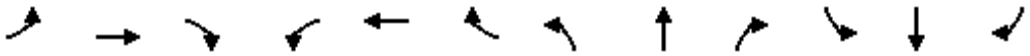
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	8	113	266	12	7	2
Future Volume (vph)	8	113	266	12	7	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.973	
Flt Protected		0.997			0.962	
Satd. Flow (prot)	0	1740	1735	0	1633	0
Flt Permitted		0.997			0.962	
Satd. Flow (perm)	0	1740	1735	0	1633	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		109.2	130.9		57.7	
Travel Time (s)		7.9	9.4		4.2	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	9	126	296	13	8	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	135	309	0	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 25.5%		ICU Level of Service A	
Analysis Period (min) 15			



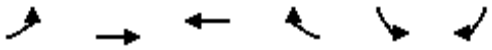
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	140	187	3	9	3
Future Volume (vph)	5	140	187	3	9	3
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	35.0			0.0	0.0	0.0
Storage Lanes	1			0	1	0
Taper Length (m)	7.6				7.6	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.969	
Flt Protected		0.998			0.963	
Satd. Flow (prot)	0	3309	1742	0	1628	0
Flt Permitted		0.998			0.963	
Satd. Flow (perm)	0	3309	1742	0	1628	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		130.9	64.8		106.6	
Travel Time (s)		9.4	4.7		7.7	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	6	156	208	3	10	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	162	211	0	13	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.9	4.9		4.9	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.6%		ICU Level of Service A	
Analysis Period (min) 15			

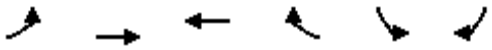


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	10	224	459	28	36	115	155	123	21	155	26
Future Volume (vph)	20	10	224	459	28	36	115	155	123	21	155	26
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%			0%			0%			0%	
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	0.0		0.0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (m)	7.6			7.6			7.6			7.6		
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												
Frt		0.881			0.991			0.958			0.983	
Flt Protected		0.996			0.958			0.986			0.995	
Satd. Flow (prot)	0	1531	0	0	1657	0	0	1648	0	0	1707	0
Flt Permitted		0.996			0.958			0.986			0.995	
Satd. Flow (perm)	0	1531	0	0	1657	0	0	1648	0	0	1707	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		93.1			97.8			54.4			67.4	
Travel Time (s)		6.7			7.0			3.9			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	22	11	249	510	31	40	128	172	137	23	172	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	282	0	0	581	0	0	437	0	0	224	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)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 95.1%		ICU Level of Service F	
Analysis Period (min) 15			



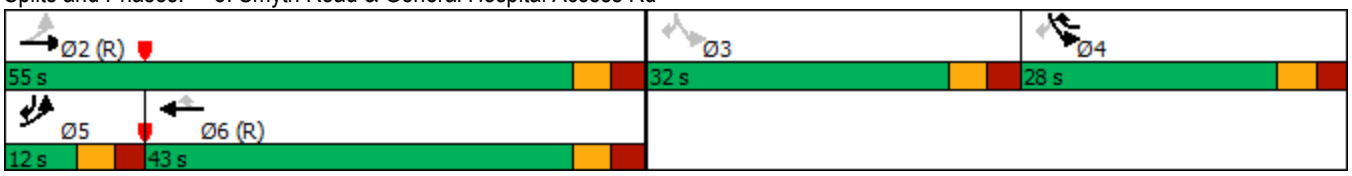
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Lane Configurations							
Traffic Volume (vph)	130	816	560	218	469	369	
Future Volume (vph)	130	816	560	218	469	369	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	
Grade (%)		0%	0%		0%		
Storage Length (m)	60.0			175.0	0.0	0.0	
Storage Lanes	1			1	2	1	
Taper Length (m)	30.0				7.6		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00	
Ped Bike Factor							
Frt				0.850		0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1658	3316	3316	1483	3216	1483	
Flt Permitted	0.330				0.950		
Satd. Flow (perm)	576	3316	3316	1483	3216	1483	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)				242		81	
Link Speed (k/h)		50	50		50		
Link Distance (m)		395.2	413.8		54.4		
Travel Time (s)		28.5	29.8		3.9		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)		0%	0%		0%		
Adj. Flow (vph)	144	907	622	242	521	410	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	144	907	622	242	521	410	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(m)		3.5	3.5		7.0		
Link Offset(m)		0.0	0.0		0.0		
Crosswalk Width(m)		4.9	4.9		4.9		
Two way Left Turn Lane							
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09	
Turning Speed (k/h)	24			14	24	14	
Number of Detectors	1	2	2	1	1	1	
Detector Template	Left	Thru	Thru	Right	Left	Right	
Leading Detector (m)	6.1	30.5	30.5	6.1	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Turn Type	pm+pt	NA	NA	pm+ov	custom	pm+ov	
Protected Phases	5	2	6	4	4	5	3
Permitted Phases	2			6	3	4 3	
Detector Phase	5	2	6	4	4	5	
Switch Phase							

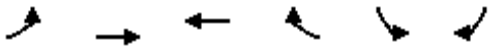


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø3
Minimum Initial (s)	5.0	10.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.9	24.4	41.4	11.1	11.1	10.9	29.3
Total Split (s)	12.0	55.0	43.0	28.0	28.0	12.0	32.0
Total Split (%)	10.4%	47.8%	37.4%	24.3%	24.3%	10.4%	28%
Maximum Green (s)	6.1	48.6	36.6	21.9	21.9	6.1	25.7
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.6	3.1	3.1	2.8	2.8	2.6	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9	6.4	6.4	6.1	6.1	5.9	
Lead/Lag	Lead		Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes		Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	Min	C-Max	C-Max	None	None	Min	None
Walk Time (s)			7.0				7.0
Flash Dont Walk (s)			28.0				16.0
Pedestrian Calls (#/hr)			10				10
Act Effct Green (s)	76.8	76.3	60.7	86.3	26.2	42.0	
Actuated g/C Ratio	0.67	0.66	0.53	0.75	0.23	0.37	
v/c Ratio	0.30	0.41	0.36	0.21	0.71	0.69	
Control Delay	8.7	8.8	18.6	1.4	45.7	29.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.7	8.8	18.6	1.4	45.7	29.7	
LOS	A	A	B	A	D	C	
Approach Delay		8.8	13.8		38.6		
Approach LOS		A	B		D		
Queue Length 50th (m)	8.5	40.7	39.0	0.0	57.1	65.2	
Queue Length 95th (m)	21.1	56.9	74.9	7.0	61.9	70.2	
Internal Link Dist (m)		371.2	389.8		30.4		
Turn Bay Length (m)	60.0			175.0			
Base Capacity (vph)	475	2198	1750	1205	818	592	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.30	0.41	0.36	0.20	0.64	0.69	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 59 (51%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 53.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Smyth Road & General Hospital Access Rd





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	70	117	125	61	139	131
Future Volume (vph)	70	117	125	61	139	131
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5
Grade (%)		0%	0%		0%	
Storage Length (m)	0.0			40.0	0.0	0.0
Storage Lanes	1			1	1	1
Taper Length (m)	2.5				2.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1658	1745	1745	1483	1658	1483
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1658	1745	1745	1483	1658	1483
Link Speed (k/h)		50	50		50	
Link Distance (m)		64.8	93.1		57.0	
Travel Time (s)		4.7	6.7		4.1	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)		0%	0%		0%	
Adj. Flow (vph)	78	130	139	68	154	146
Shared Lane Traffic (%)						
Lane Group Flow (vph)	78	130	139	68	154	146
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		1.6	1.6		1.6	
Two way Left Turn Lane						
Headway Factor	1.09	1.09	1.09	1.09	1.09	1.09
Turning Speed (k/h)	97			97	97	97
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.2%		ICU Level of Service A	
Analysis Period (min) 15			