

CATHOLIC DISTRICT SCHOOL BOARD OF EASTERN ONTARIO
P.O. 61992

TRAFFIC IMPACT STUDY FOR ST. JOSEPH'S ELEMENTARY SCHOOL ADDITION

SEPTEMBER 05, 2018





TRAFFIC IMPACT
STUDY FOR ST.
JOSEPH'S
ELEMENTARY
SCHOOL ADDITION
235 GEORGIANA
STREET, GANANOQUE

CATHOLIC DISTRICT SCHOOL BOARD OF
EASTERN ONTARIO

PROJECT NO.: 181-11741-00
CLIENT REF: P.O. 61992
DATE: SEPTEMBER 05, 2018

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September 05, 2018

CATHOLIC DISTRICT SCHOOL BOARD OF EASTERN ONTARIO
2755 Highway 43
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Attention: Roger Cauley, Manager of Plant and Maintenance

Dear Madam/Sir:

Subject: Traffic Impact Study for New Daycare Addition to St. Joseph's Catholic School, Gananoque

Client ref.: P.O. 61992

WSP is pleased to provide the attached Traffic Impact Study for the proposed expansion of St. Joseph Catholic School in Gananoque, Ontario, to accommodate a new daycare and EarlyON child and family centre. Overall, traffic in the vicinity of the site with the expansion in place is expected to operate at acceptable levels of service, and the proposed site plan is compliant with all relevant By-Law regulations related to parking and site access.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Adam Howell'.

Adam Howell, P.Eng.
Project Manager, Transportation
Planning

WSP ref.: 181-11741-00

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FIRST ISSUE

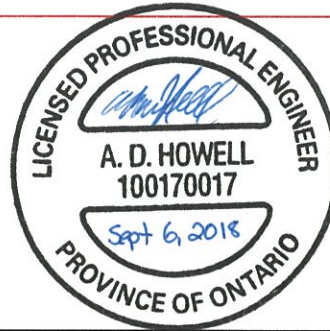
September 5, 2018	First Issue to CDSBEO and Town of Gananoque			
Prepared By	Reviewed by			
Adam Howell, P.Eng.	Kimberley Hunton, P.Eng.			

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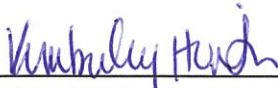


Adam Howell, P.Eng.
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Date

APPROVED¹ BY



Kimberley Hurton, P.Eng.
Senior Project Manger, Transportation
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Date

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1 PROJECT DESCRIPTION

The Catholic District School Board of Eastern Ontario (CDSBEO) is planning an expansion to St. Joseph Catholic School in Gananoque, Ontario. This expansion is proposed to accommodate a new daycare facility with space for 49 children and EarlyON child and family centre to be built at the west end of the school. The proposed expansion includes a new parking lot adjacent to the daycare expansion to accommodate 21 spaces and the reconfiguration of the existing parking lot at the east side of the school to accommodate the existing 36 spaces plus an additional 7 for a total parking supply of 64 spaces.

The St. Joseph School Site is located at 235 Georgiana Street, Gananoque, and is bounded by Georgiana Street to the north, Charles Street N to the west, North Street to the south, and William Street N to the east. The Site Location and local road context is illustrated in Figure 1. The site is zoned as residential in the Gananoque Community Planning Permit (Zoning) By-Law; this By-Law includes Public and Private Schools as discretionary uses under the Residential designation. The existing school includes 18 classrooms and an existing population of approximately 330 students and 35 staff. The school covers a wide catchment area including the Town of Gananoque and many of the surrounding municipalities; student transportation from the outlying areas is provided by Student Transportation of Eastern Ontario (STEO).

The purpose of this study and report is to provide a review of existing conditions in the vicinity of the school site and a review of the proposed expansion from a transportation operations perspective with due consideration of associated impacts. The analysis and evaluation is therefore intended to support a recommendation for a preferred concept plan and any additional measures that ensures the provision of an adequate level of service for all transportation movements. The study area for this review includes the four roads bounding the site as well as the site itself.



Figure 1: Study Area and Local Road Context

2 EXISTING CONDITIONS

2.1 EXISTING ROAD NETWORK

Charles Street North is a collector road that runs on a north-south alignment between King Street East and Stone Street North with a posted speed limit of 40 km/h and free-flow conditions along its entire length with the exception of stop control at the intersection with Georgiana Street. Charles Street N is configured with a single lane of traffic in each direction; the road has a marked centreline between Stone Street N and Cemetery Road and is unmarked outside of this segment. There is no on-street parking permitted along the east side of the street, with the exception of the segment between Georgiana Street and North Street. South of North Street, parking on the west side of the street is prohibited between 8 AM and 6 PM Monday to Saturday. Charles Street North is signed as a community safety zone between Georgiana Street and North Street.



Figure 2: Charles Street N, Looking South from Georgiana Street

William Street North is a local road that runs on a north-south alignment between Georgiana Street and King Street E. There are no posted speed limit signs, and is therefore taken to be 50 km/h; William Street S includes a reduced speed limit of 40 km/h under the Town of Gananoque Traffic and Parking By-Law (2015-070), but this does not appear to extend into the community safety zone north of King Street E. William Street N has a two-lane cross-section with a single lane in each direction and no marked centreline. There is a storage lane signed as a school bus loading zone located on the west side of the road adjacent to the St. Joseph Catholic School property and extends from Georgiana Street to Forsyth Street. There are no additional signed parking restrictions along the street. William Street N is signed as a community safety zone between Georgiana Street and North Street.

Georgiana Street is a local road that runs on an east-west alignment between Stone Street N and James Street and has a posted speed limit of 40 km/h. Georgiana Street has a two-lane cross-section with a single lane in each direction and no marked centreline. The main entrance to St. Joseph Catholic School and access to the existing parking lot are located on Georgiana Street. The segment of Georgiana Street adjacent to the school between Charles Street N and William Street N is signed with a no stopping prohibition along the north side from 8:00-9:30 AM and 2:30-4:00 PM. There are two stopping bays provided along the south side of the street adjacent to the school: a short bay immediately to the east of Charles Street North that is signed as 15-minute parking, a long bay that is signed as a bus loading zone with no stopping except for a small section behind the bus loading area that is signed for 15-minute parking. Outside of the segment passing in front of the school, on-street parking is permitted on both sides of the road. Georgiana Street is signed as a community safety zone between Charles Street N and William Street N.



Figure 3: Georgiana Street in Front of St. Joseph Catholic School

North Street is a local road that runs on an east-west alignment between Adelaide Street and Herbert Street. There is a posted speed limit of 40 km/h. North Street is an unmarked road and has a two-lane cross-section with a single lane in each direction, with the exception of the segment between Adelaide Street and Stone Street North, which is signed as one-way westbound. There is no on-street parking permitted on the north side of the street between Adelaide Street and William Street.

INTERSECTIONS

Intersections on the existing road network included in the traffic operations analysis include the following:

Charles Street North at Georgiana Street is an unsignalized all-way stop controlled intersection. There is a single lane on all approaches. Pedestrian crosswalks are provided on the west leg crossing of Georgiana Street and the south leg crossing of Charles Street North. The intersection includes school crossing signs on both approaches along Charles Street N.

The intersection of **Georgiana Street at William Street North** is an unsignalized intersection that is all-way stop controlled. All approaches at this intersection have a single lane in each direction. There are no existing pedestrian crossings on any of the legs of the intersection. The north leg is the entrance/exit to Gananoque Cemetery.

The intersection of **North Street at William Street North** is an unsignalized intersection with a free flow operation along William Street North and stop control on the approaches from North Street. All approaches at this intersection have a single lane in each direction. Pedestrian crosswalks are provided on the west leg crossing of North Street and the north leg crossing William Street North.

The intersection of **Charles Street North at North Street** is an unsignalized intersection with stop control on the approaches from North Street and free-flow conditions along Charles Street North. All approaches at this intersection have a single lane in each direction. A pedestrian crosswalk is provided on the east and west crossings of North Street.



Figure 4: Intersection of Charles Street N and Georgiana Street, Looking North



Figure 5: Intersection of William Street N and North Street, Looking South

2.2 EXISTING TRAFFIC VOLUMES AND OPERATIONS

WSP carried out turning movement counts at the four study area intersections during a site visit on August 14, 2018. These counts were collected between 7:00 AM and 9:00 AM and 3:30 and 5:30 PM; the count at Charles Street N and Georgiana Street was collected for the full duration of these periods, while the counts at the remaining intersections were collected over one 30-minute interval for each location during these times. The existing traffic volumes from these counts are summarized in Figure 6; the 30-minute counts have been factored up to hourly volumes based on the distribution of 15-minute volumes from the full count at Charles Street N and Georgiana Street. The full traffic counts have been included as Appendix A.

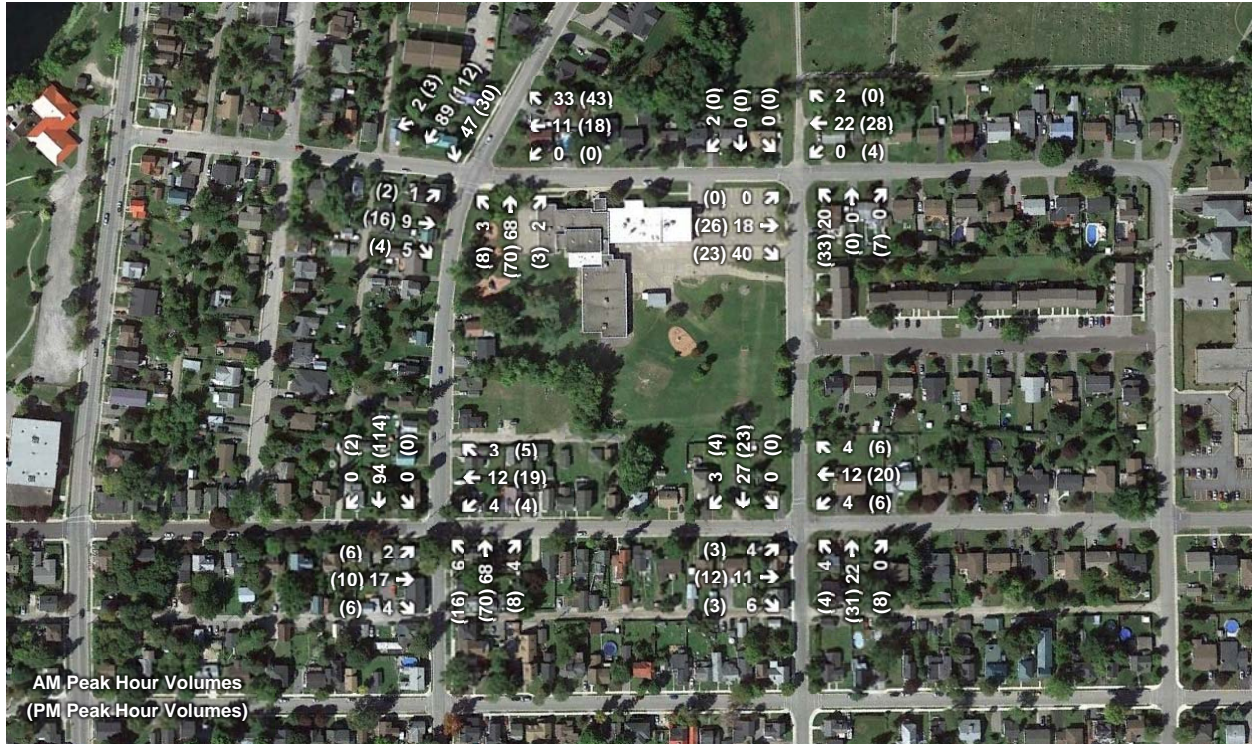


Figure 6: Existing (August 2018) Traffic Volumes

The analysis of traffic operations under these existing volumes at the four study area intersections has been completed using Synchro-10, a macroscopic traffic analysis software based on Highway Capacity Manual (HCM) methodology. A summary of this traffic analysis is summarized in Table 1; detailed analysis output is included as Appendix B.

Table 1: Summary of Traffic Operations Analysis - Existing (2018) Traffic Volumes with Estimated School Traffic

Intersection	Control Type	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS ¹	Delay (seconds)	Critical Movements (v/c) ²	LOS ¹	Delay (seconds)	Critical Movements (v/c) ²
Charles Street N at Georgiana Street	Unsignalized (all-way stop)	A	8.1	--	A	8.2	--
Charles Street N at North Street	Unsignalized (two-way stop)	B	10.2	--	B	10.3	--
William Street N at Georgiana Street	Unsignalized (all-way stop)	A	7.1	--	A	7.2	--
William Street N at North Street	Unsignalized (all-way stop)	A	7.2	--	A	7.2	--

Notes:

1. The LOS at a unsignalized intersection is defined by the movement with the highest delay.
2. Critical Movements are those with a volume-to-capacity (v/c) ratio with a LOS D, E or F.

The analysis of the existing volumes indicates that all the intersections in the vicinity of the school site operate at an acceptable LOS of B or better, with low delays and queue formation. The LOS B at the intersection of Charles Street North at North Street is a result of the stop-controlled side approaches from North Street, the free flow of traffic along Charles Street N provides fewer gaps for vehicles turning from the side street compared with the other intersections where the intersecting street is also stop-controlled.

It is noted that the volumes assessed above were collected in August, and thus do not reflect the traffic that would be generated by the school during the school year. As there were no additional traffic volumes available from the Town

of Gananoque to quantify the additional traffic generated by the school, this traffic has been estimated based in the ITE Trip Generation Manual 10th Edition. The calculation of the trips generated by the school based on the existing school population is summarized in Table 2.

Table 2: Estimation of Existing School Generated Trips

AM Peak Hour									
Land Use	ITE Code	Size	Unit	Avg. Rate	% in	% out	Total Trips	Trips In	Trips Out
Elementary School	520	330	Students	0.65	54%	46%	215	116	99
PM Peak Hour									
Land Use	ITE Code	Size	Unit	Avg. Rate	% in	% out	Total Trips	Trips In	Trips Out
Elementary School	520	330	Students	0.34	45%	55%	112	50	62

Based on the ITE Trip Generation Manual, the school will generate an additional 215 and 112 trips during the weekday AM and PM peak hours during the school year, respectively. For the analysis, these trips have been distributed to the existing road network based on the proportions of existing traffic volumes; under these proportions approximately 60-70% of the trips use Charles Street N to access the school site, with the remaining trips distributed among routes via William Street N, North Street and Georgiana Street. The existing traffic volumes including the estimated additional volumes generated with the school in operation are summarized in Figure 7.

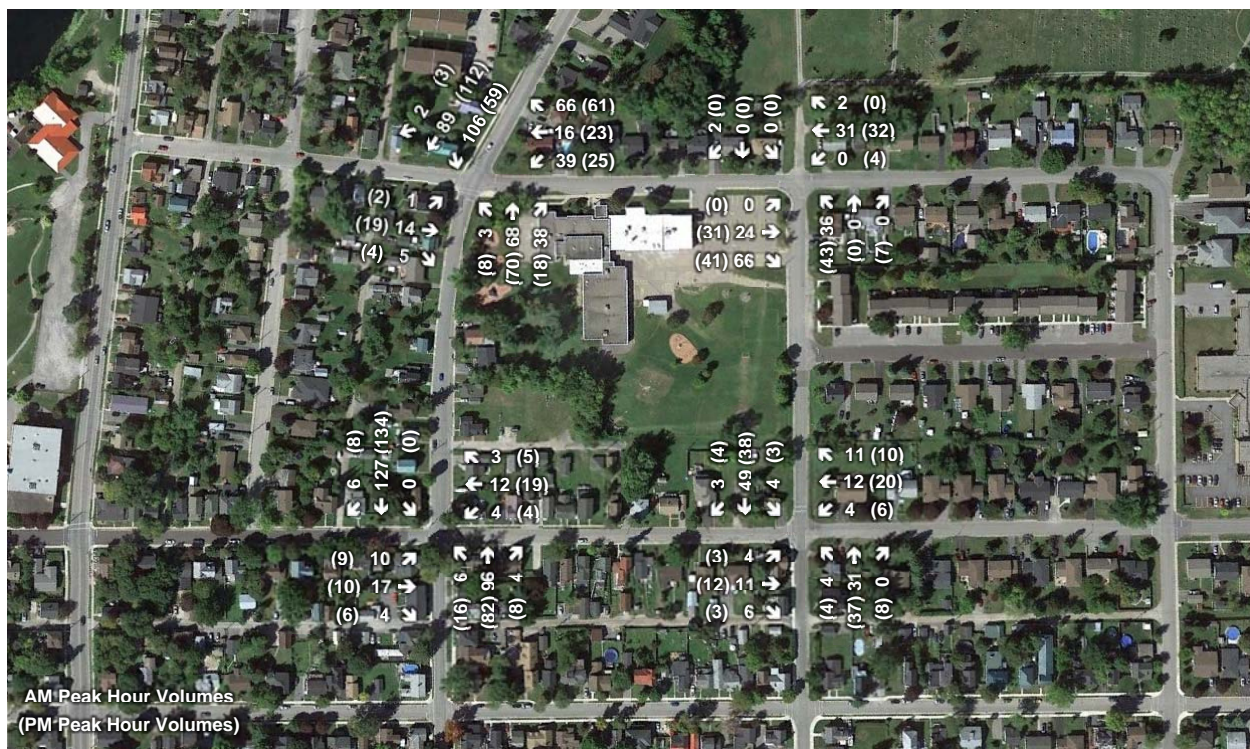


Figure 7: Existing (2018) Traffic Volumes with Estimated School Traffic

The volumes with the estimated school traffic have been assessed using Synchro-10. The results of this analysis are summarized in Table 3; detailed output from the analysis is included in Appendix B.

Table 3: Summary of Traffic Operations Analysis - Existing (2018) Traffic Volumes with Estimated School Traffic

Intersection	Control Type	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS ¹	Delay (seconds)	Critical Movements (v/c) ²	LOS ¹	Delay (seconds)	Critical Movements (v/c) ²
Charles Street N at Georgiana Street	Unsignalized (all-way stop)	A	9.3	--	A	8.9	--
Charles Street N at North Street	Unsignalized (two-way stop)	B	10.9	--	B	11.0	--
William Street N at Georgiana Street	Unsignalized (all-way stop)	A	7.3	--	A	7.5	--
William Street N at North Street	Unsignalized (all-way stop)	A	7.7	--	A	7.7	--

Notes:

1. The LOS at a unsignalized intersection is defined by the movement with the highest delay.
2. Critical Movements are those with a volume-to-capacity (v/c) ratio with a LOS D, E or F.

The analysis of traffic operations with the additional school-generated traffic in place indicates that the addition of the school traffic will result in minor increases to delays at all study area intersections, but none of these increases will result in any intersections or traffic movements reaching a higher level of service than were observed with the August traffic counts. While the analysis indicates acceptable traffic operations during the school year, it is noted the analysis is based on a one-hour analysis period. As school traffic generally experiences short periods within the peak hours with concentrated arrivals and departures before and after the school bells, there may be brief periods within the peak hours that will experience higher traffic delays than reported in the analysis.

The school bell times will be a significant factor in determining how much interaction may occur between the peak periods of commuter traffic and the peak periods of school-generated traffic. The assessment of the site generated volumes is conservatively based on the peak commuter traffic and traffic generated by the proposed daycare generated traffic periods occurring at the same time, however it is noted that the existing bell times at St. Joseph Catholic School (9:10 AM and 3:30 PM) are located outside of the peak hours of traffic and as such, will result in less concentrated traffic impacts that is indicated during the analysis during the peak hours of vehicle traffic (7:45-8:45 AM and 4:30-5:30 PM).

2.3 EXISTING PEDESTRIAN AND CYCLING FACILITIES

Within the vicinity of the school, the Town of Gananoque road network includes sidewalks along one or both sides of the road within the study area. Specific pedestrian facilities in the study area include the following:

- Charles Street N includes sidewalks along the west side between King Street E and Emma Street to the north of Georgiana Street, and along the east side between King Street E and Georgiana Street. There is a stop-controlled pedestrian crossing at the intersection with Georgiana Street to provide a crossing to the school.
- Georgiana Street includes a sidewalk along the south side between Stone Street N and William Street N; there is no sidewalk along the north side. East of William Street N, Georgiana Street does not include a sidewalk on either side and requires pedestrians to walk on the road. Georgiana Street includes a pedestrian crossing at the intersection with Charles Street N, connecting to the west-side sidewalk along Charles Street N. As there are no other connecting sidewalks, there are no pedestrian crosswalks marked at the intersection with William Street N.



Figure 8: East Sidewalk on Charles Street N, Looking North

- William Street N includes a sidewalk along the west side between King Street E and Georgiana Street, and an additional sidewalk along the east side to the south of the school site between King Street E and Brock Street. William Street N formerly included a pedestrian crossing on the north leg of the intersection with North Street, but this crossing was removed as part of this intersection's conversion to an all-way stop and has not yet been reinstated.
- North Street includes a sidewalk along the south side between Adelaide Street and William Street N; east of William Street N, there are no sidewalks on either side of the road. Stop-controlled pedestrian crossings of North Street are included at the intersections with Charles Street N (east and west sides) and William Street N (west side).



Figure 9: Pedestrian Gate to Schoolyard from William Street N

Access to the school site is primarily from Georgiana Street, which includes the main school doors and accesses to the schoolyard through gates from the parking area and to the west of the school doors. Additional accesses to the school yard include a gate from William Street N adjacent to the bus loading area, a pedestrian access from William Street N at the southeast corner of the school, and a gate from Charles Street N.

There are no existing on-street cycling facilities on any of the roads in the study area.

3 PROPOSED DEVELOPMENT

3.1 PROPOSED SITE PLAN

The proposed site plan for St. Joseph Catholic School includes a new daycare facility to be constructed on the west side of the existing school building adjacent to Charles Street North. The new facility will have a gross floor area of approximately 6,758 square feet (628 square meters) and accommodate 49 children and 14 staff. The facility will include a new parking area with a capacity of 21 spaces including 2 accessible spaces. The new parking lot will be accessed from Charles Street North at approximately the location of the existing west gate of the site, and will include a new pedestrian connection between the Charles Street North sidewalk and the door to the new facility.

The construction of the facility also includes the reconfiguration of the existing school parking lot on the east side of the school to accommodate 43 parking spaces including 2 accessible spaces, for a total parking supply on the site of 64 parking spaces. This reconfiguration of the east parking lot will also include a diversion of the existing fire route access from William Street to the south.

The proposed daycare expansion is planned to begin operation in during the 2018-2019 School year. The proposed site plan is illustrated in Figure 10; a larger version is included as Appendix C.

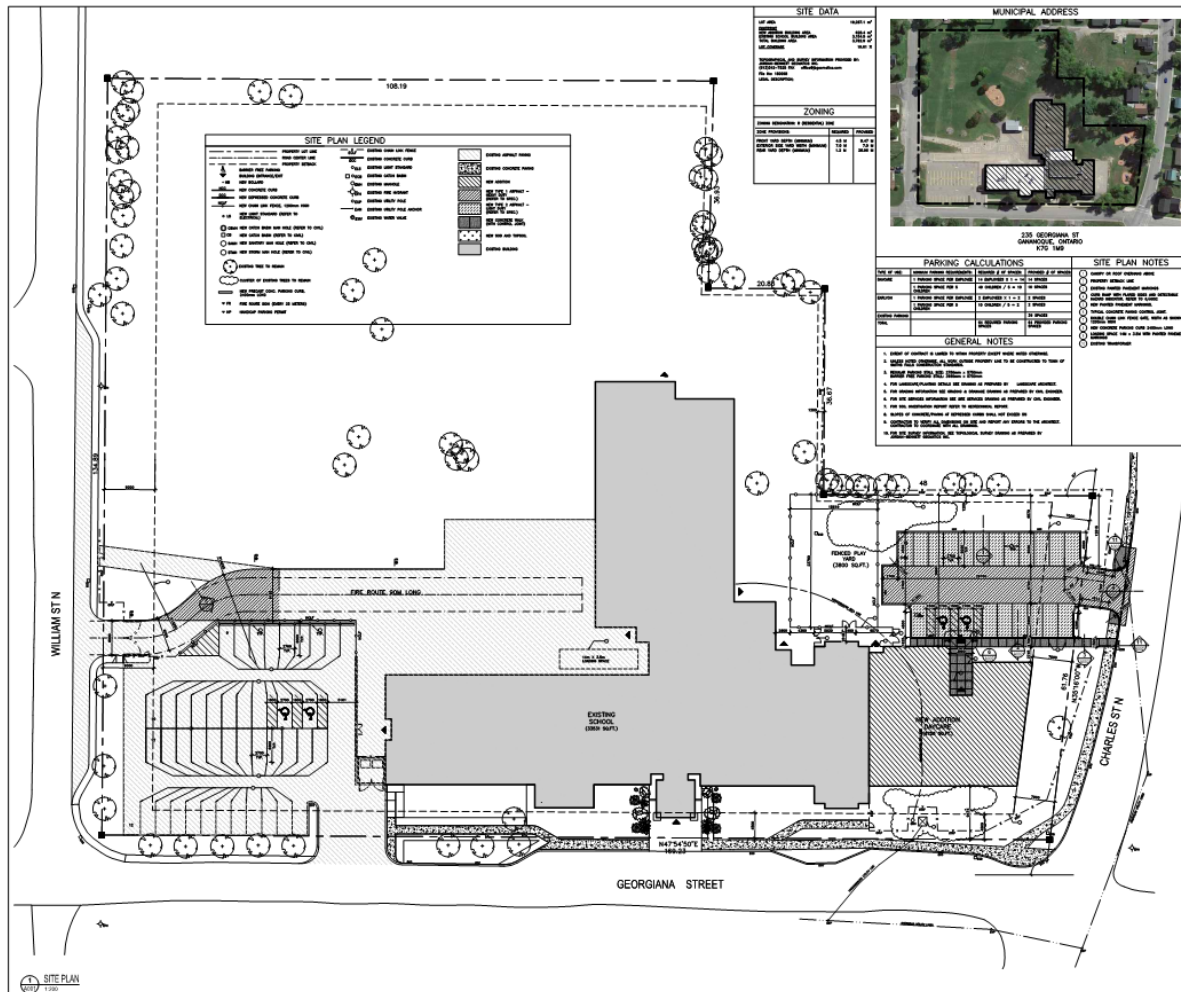


Figure 10: Site Plan for Proposed Daycare Expansion

3.2 FUTURE TRAFFIC GROWTH

3.2.1 BACKGROUND GROWTH

The Town of Gananoque Official Plan (2009) anticipates modest growth of the Town into the future, and is based on a projected population of 5,900 people by 2029. However, the population of Gananoque decreased from 5,194 to 5,159 between 2011 and 2016 censuses, representing an approximate 0.7% decrease in population between the two census years and falling short of the population growth trend referenced in the Official Plan.

The Town of Gananoque has indicated that there are no proposed developments in the vicinity of the St. Joseph Catholic School site that would further increase traffic volumes, and as such, the future growth of background traffic has been based on population growth. A conservative assumption of the Town of Gananoque's population reaching 5,900 people as projected in the Official Plan would result in an annual growth rate of approximately 1.1% per year from the 2016 census population. This 1.1% annual growth rate has been applied for the projection of future background traffic volumes for this study.

3.2.2 SITE GENERATED TRIPS

Estimates of the new trips generated to the St. Joseph Catholic School site from the new daycare expansion are based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. The estimation of the site-generated trips for the proposed daycare facility are summarized in Table 4; these calculations are based on the number of children anticipated for the daycare centre (49) and EarlyON centre (10) combined.

Table 4: Estimated of Site-Generated Trips from Proposed Daycare Expansion

AM Peak Hour									
Land Use	ITE Code	Size	Unit	Avg. Rate	% in	% out	Total Trips	Trips In	Trips Out
Daycare	565	59	Students	0.79	53%	47%	47	25	22
PM Peak Hour									
Land Use	ITE Code	Size	Unit	Avg. Rate	% in	% out	Total Trips	Trips In	Trips Out
Daycare	565	59	Students	0.81	47%	53%	48	22	25

The trip generation projections include a total of 21 inbound and 18 outbound trips during the weekday morning peak hour, and 19 inbound and 21 outbound trips during the weekday afternoon peak hour. The balance between the inbound and outbound trips during both hours represents the student pickup and drop-off that will occur on site, with vehicles making these trips counting for one inbound and one outbound trip.

As with the previously estimated trips generated by the school, the estimated trips generated by the daycare have been added to the study area road network based on the existing volumes from the traffic counts undertaken by WSP. As a result, it is anticipated that approximately 60-70% of the traffic generated by the daycare will arrive and depart via Charles Street N to the north and south, with the remaining traffic distributed among other routes through the surrounding neighbourhood. The total estimated 2018 traffic volumes with the school and daycare in operation are illustrated in Figure 11.

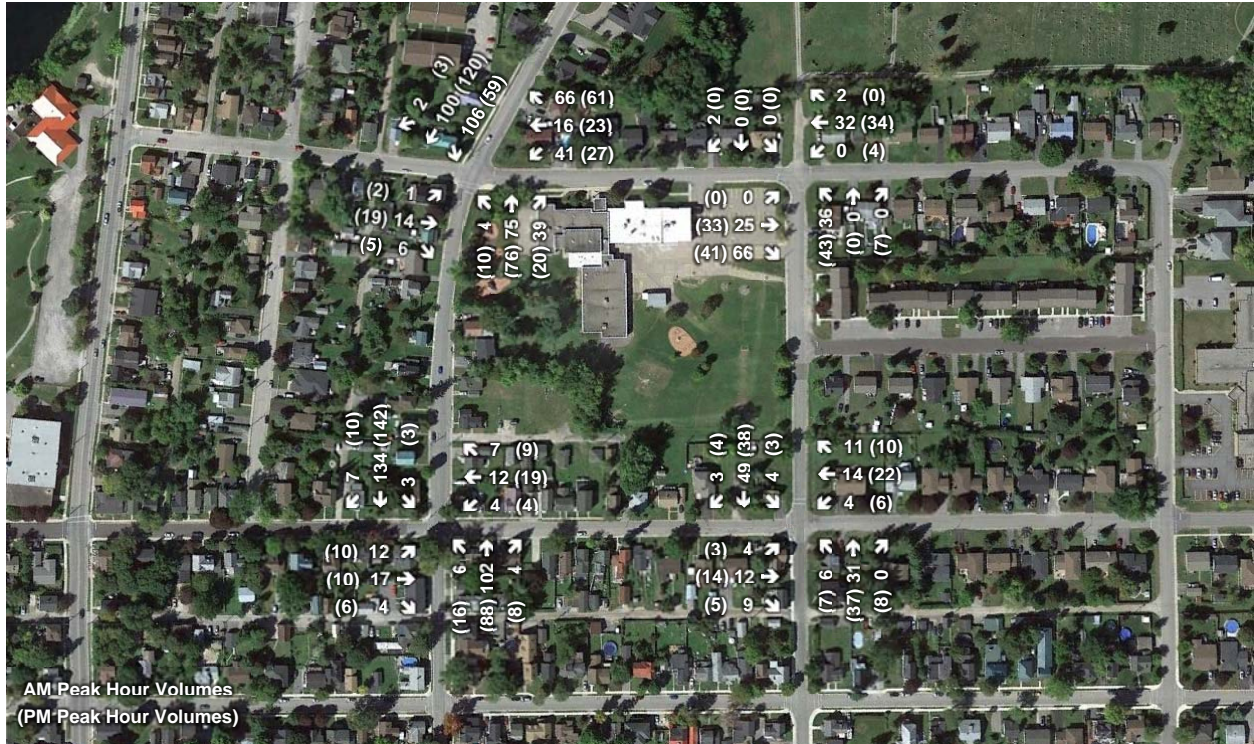


Figure 11: Existing (2018) Traffic Volumes with Estimated School Traffic and Projected Daycare Trips

4 IMPACTS TO TRAFFIC AND TRANSPORTATION

4.1 VEHICLE TRAFFIC

Traffic operations under the total 2018 vehicle volumes including traffic generated by the school and proposed daycare facility have been analyzed using Synchro-10. The results of this analysis are summarized in Table 5; detailed output from this analysis has been included in Appendix B.

Table 5: Summary of Traffic Operations Analysis - Existing (2018) Traffic Volumes with Estimated School Traffic

Intersection	Control Type	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS ¹	Delay (seconds)	Critical Movements (v/c) ²	LOS ¹	Delay (seconds)	Critical Movements (v/c) ²
Charles Street N at Georgiana Street	Unsignalized (all-way stop)	A	9.5	--	A	9.0	--
Charles Street N at North Street	Unsignalized (two-way stop)	B	11.3	--	B	11.1	--
William Street N at Georgiana Street	Unsignalized (all-way stop)	A	7.3	--	A	7.5	--
William Street N at North Street	Unsignalized (all-way stop)	A	7.7	--	A	7.7	--

Notes:

1. The LOS at a unsignalized intersection is defined by the movement with the highest delay.
2. Critical Movements are those with a volume-to-capacity (v/c) ratio with a LOS D, E or F.

The analysis of the projected 2018 volumes reflecting the opening of the proposed daycare indicate the same level of service as existing conditions at all intersections in the study area, indicating that all intersections can accommodate the additional traffic generated by the proposed daycare and continue to operate at an acceptable level of service. As noted previously, there may be brief periods with concentrated arrivals and departures to and from the school which may result in short periods of higher delays; however, given that the existing bell times fall outside the peak hours of general traffic, it is not generally anticipated that these periods will overlap with peak traffic.

The analysis of traffic operations for the St. Joseph Catholic School site also includes the assessment of a 2023 future planning scenario, 5 years after the opening of the new daycare facility. Future traffic volumes for this scenario have been projected based on the 1.1% annual growth rate as established in Section 3.2.1 of this report; this annual growth has been applied to the background traffic volumes only and assumes that the population of the school and daycare will remain relatively constant and will not result in a growth in site generated trips. The resulting 2023 projected volumes are summarized in Figure 12.

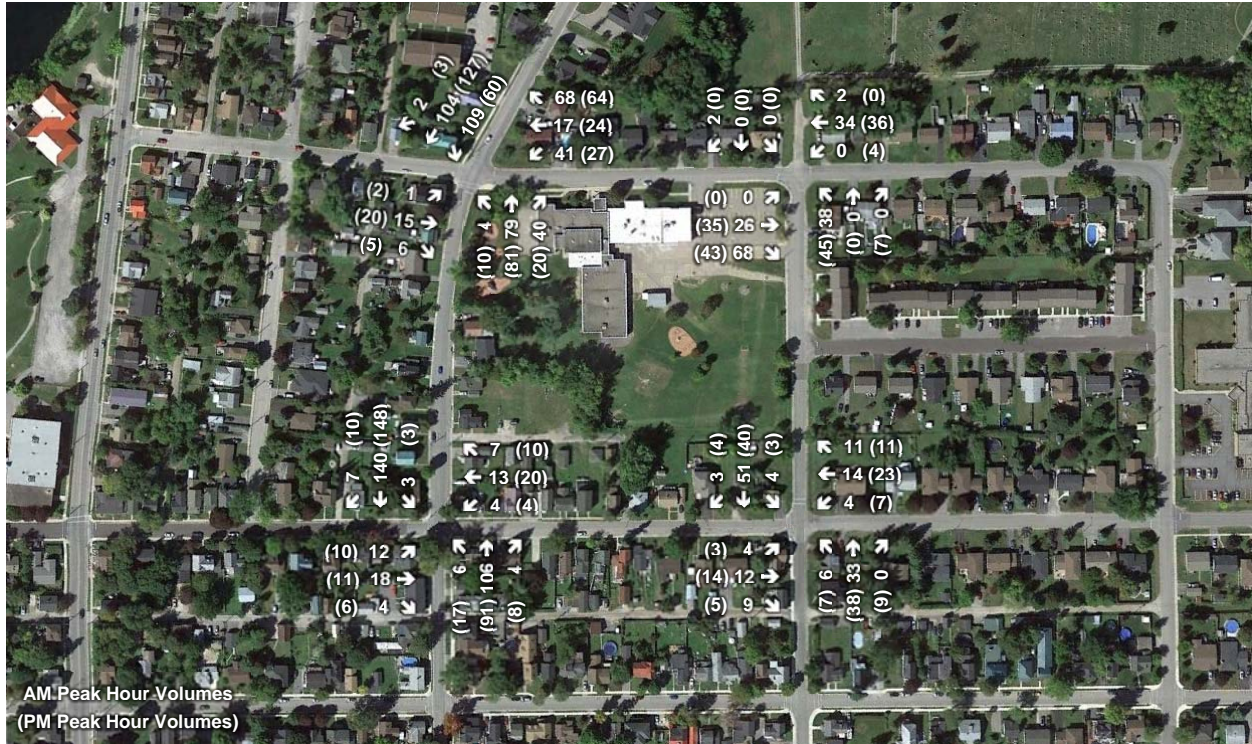


Figure 12: Projected (2023) Traffic Volumes with Estimated School Traffic and Projected Daycare Trips

Traffic operations under the projected 2023 traffic volumes have been analyzed using Synchro-10. The results of this analysis are summarized in Table 6; detailed output from the analysis is included in Appendix B.

Table 6: Summary of Traffic Operations Analysis - Existing (2018) Traffic Volumes with Estimated School Traffic

Intersection	Control Type	Weekday AM Peak Hour			Weekday PM Peak Hour		
		LOS ¹	Delay (seconds)	Critical Movements (v/c) ²	LOS ¹	Delay (seconds)	Critical Movements (v/c) ²
Charles Street N at Georgiana Street	Unsignalized (all-way stop)	A	9.6	--	A	9.1	--
Charles Street N at North Street	Unsignalized (two-way stop)	B	11.4	--	B	11.3	--
William Street N at Georgiana Street	Unsignalized (all-way stop)	A	7.6	--	A	7.6	--
William Street N at North Street	Unsignalized (all-way stop)	A	7.7	--	A	7.3	--

Notes:

- The LOS at a unsignalized intersection is defined by the movement with the highest delay.
- Critical Movements are those with a volume-to-capacity (v/c) ratio with a LOS D, E or F.

The results of the analysis of the projected future traffic volumes indicates minor increases in delay at the study area intersections as a result of the future growth in traffic; none of these increases in delay are expected to result in a reduction in the level of service from existing at any of these intersections.

Overall, the traffic analysis indicates that the intersections in the study area are operating at an acceptable level of service under existing traffic volumes, and have sufficient residual capacity to accommodate the estimated future traffic growth and traffic generated by the school and proposed daycare with only minor increases in vehicle delays and no reductions in the existing levels of service.

4.2 PEDESTRIANS AND CYCLISTS

The proposed daycare expansion at St. Joseph Catholic School will not result in any modifications to pedestrian circulation within the study area. Overall, the existing sidewalk network provides sufficient coverage to allow walking trips from most of the area surrounding the school site to the existing school and schoolyard accesses without having to walk along roads or make road crossings at unmarked locations. The exception to this is the area to the east of William Street N, where the roads do not include sidewalks and there are no marked crossings of William Street N. For these locations and others within the school catchment area outside of the coverage of the existing sidewalk network, it is anticipated that walking trips to the St. Joseph Catholic School will continue to be evaluated based on the STEO's Hazard Bussing methodology and student transportation will be provided for these areas as warranted.

The construction of the new parking lot adjacent to the proposed daycare expansion will create a new vehicle access from Charles Street N and introduce a potential conflict point between vehicle and pedestrian movements. It is anticipated that this will operate under similar staff supervision during school arrival and departure times as the existing parking lot access from Georgiana Street.

It is noted that most of the new walking or cycling trips to the St. Joseph Catholic School site generated by the new daycare expansion will be by younger children who will be accompanied by parents or guardians. It is therefore anticipated that these trips will include an additional level of supervision and help for the younger children to navigate any crossings of roadways or site access safely.

4.3 SITE CIRCULATION

The most significant change to site circulation based on the proposed site plan will be the additional vehicle movements between the new parking area adjacent to the proposed daycare expansion and Charles Street North. The design of the new parking area includes a sidewalk along the north side connection between Charles Street North and the access doors of the new daycare expansion; this clear and direct connection is anticipated to significantly reduce the potential for pedestrians to cross through the parking lot to reach the daycare, which will in turn reduce the potential for pedestrian-vehicle conflicts. As noted above, many of the trips to and from the new daycare expansion will be by young children accompanied by parents or guardians, and as such this level of supervision will provide an additional measure of safety for any crossings of the parking lot or vehicle access from Charles Street North that may occur. The new pedestrian connection to the daycare expansion is designed with a width of 1,500mm on the proposed site plan; this is compliant with the requirements of the Accessibility for Ontarians with Disabilities Act (AODA) for exterior paths of travel (80.23.1).

Vehicle and pedestrian circulation for the remainder of the site is not anticipated to be impacted by the proposed site plan and will continue to operate as it does under the existing configuration. It is noted that the bus bays and short-term parking for student pickup and drop-off on Georgiana Street and William Street North are configured to allow direct access between stopped vehicles and the school site without encouraging crossings of these streets, which provides a beneficial measure of separation between vehicles and pedestrians.

It has been noted by Town of Gananoque staff that periods of congestion do exist on Georgiana Street resulting from student pickup and drop-off at the school. Based on a review of the site, it is noted that the restrictions for parking and stopping are well signed and that the provided short term parking bays do provide a measure of separation between stopped vehicles and through traffic along Georgiana Street. Enforcement of the existing signage by Town By-Law officers will be the most direct method of discouraging vehicle stops on Georgiana Street that would impede through traffic and bus movements.

4.4 PROPOSED PARKING AND SITE ACCESSES

The Town of Gananoque Community Planning Permit (Zoning) By-Law (2010-75) includes a number of provisions that outline minimum requirements for the parking supply and access dimensions required for new developments in

the City. Key requirements relating to the proposed site plan for the St. Joseph Catholic School site are assessed and summarized in Table 7.

Table 7: Review of Town of Gananoque Community Planning Permit (Zoning) By-Law Requirements

By-Law Item	By-Law Provisions	Implications to School Site
3.32	<p>Parking area for more than four vehicles, supplementary regulations:</p> <p>Ingress and egress directly to and from every parking space shall be by means of a driveway, lane or aisle having a width of at least 6.0 m (19.7ft.) for two-way traffic and 3.5 m (11.5 ft.) for one-way traffic.</p>	<p>The proposed site plan indicates that the access to the new parking lot from Charles Street N will include a lane 6.7m in width to accommodate two-way vehicle movements. This configuration is compliant with the By-Law requirements.</p>
3.32	<p>Barrier Free Parking</p> <p>One barrier-free parking space shall be provided for every 20 standard parking spaces or part thereof and shall be included in the total number of parking spaces required under the Schedule for Parking Requirements.</p>	<p>With the new parking lot and modifications to the existing parking lot in the proposed site plan, there will be a total of 64 parking spaces on site, which will require 4 barrier-free spaces under the By-Law requirements. The proposed site plan includes a total of 4 barrier free spaces, which is compliant with the By-Law requirements.</p>
3.32	<p>Schedule for Parking Requirements (Excerpt)</p> <ul style="list-style-type: none"> • Day Nursery – licensed: 1 space per employee and 1 space per 5 children • School: Two spaces per classroom 	<p>The existing St. Joseph Catholic School includes 18 classrooms, which will require 36 parking spaces under the By-Law requirements. The proposed daycare expansion is projected to accommodate 14 employees and 49 children, plus an additional 2 employees and 10 children for EarlyON programming; in total, the expansion will require an additional 24 spaces under the By-Law requirements. This results in a total require parking supply for the site of 64 spaces under the by-law requirements.</p> <p>The proposed site plan includes a total parking supply of 64 spaces for the site between the new lot and reconfigured existing lot, which will be compliant with the by-law requirements.</p>

5 CONCLUSIONS AND RECOMMENDATIONS

The Catholic District School Board of Eastern Ontario has proposed an addition to the St Joseph Catholic School in Gananoque, Ontario, to accommodate a new daycare and EarlyON Child and Family Centre. The Daycare and EarlyON centre are anticipated to accommodate 49 children and 10 children, respectively. The expansion will include a new parking lot adjacent to the daycare centre that will accommodate 21 parking spaces, and the reconfiguration of the existing parking lot to accommodate an additional 43 spaces.

Traffic counts on Charles Street N, Georgiana Street, William Street N and North Street were undertaken by WSP as a basis for the analysis of traffic operations and the anticipated impacts of the daycare addition. The analysis indicated that the intersections in the vicinity of the school operate at an acceptable level of service under existing traffic volumes; the addition of approximately 40 peak hour trips generated by the daycare facility will be low enough to allow these intersections to continue operating efficiently without any significant increases in traffic delays. The analysis considered traffic operations as far in the future as 2023, indicating that the intersections have sufficient capacity to accommodate future growth as well as traffic generated by the school and new daycare.

The existing walking network surrounding the school provides good connectivity to the school site from the surrounding neighbourhood, although it is noted that there are no sidewalks on many of the local roads to the east of William Street. It is anticipated that many of the walking trips to the daycare centre will be young children accompanied by parents that will provide a degree of mitigation to the potential risks of walking on the roads where required; for older students, it is anticipated that these areas without sidewalks will continue to be assessed under STEO's hazard bussing methodology and student transportation will be provided as warranted. The new parking lot access on the school site will create a new potential conflict between vehicles and pedestrians, but it is anticipated that this crossing will be well supervised and operate similarly to the existing access on Georgiana Street.

Town of Gananoque Staff have indicated that there is some congestion on Georgiana Street before and after the school bell times as a result of student pickup and drop-off. A review of the existing signage indicates that restrictions to stopping and parking on Georgiana Street during these times are clearly communicated, and that the most effective measure to prevent traffic delays on Georgiana Street will be increased By-Law enforcement of the existing stopping restrictions.

The proposed access to the new parking lot and expanded parking supply for the site have been reviewed with respect to the requirements of the Town of Gananoque Community Planning Permit (Zoning) By-Law. This review indicates that the proposed access and parking supply are in compliance with the By-Law requirements.

APPENDIX

A TRAFFIC COUNTS

A large, white, stylized chevron shape pointing downwards, located in the lower-left quadrant of the page. It is composed of two overlapping triangles, one pointing up and one pointing down, creating a central white space.



MMM Group Limited - Ottawa
1145 Hunt Club Road

Ottawa, Ontario, Canada K1V 0Y3
613.736.7200 huntonk@mmm.ca

Count Name: Charles & Georgiana
Site Code:
Start Date: 08/14/2018
Page No: 1

Turning Movement Data

Start Time	Charles Street North Southbound						Georgiana Street Westbound						Charles Street North Northbound						Georgiana Street Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	7	9	2	0	0	18	0	0	16	0	0	16	1	11	0	0	0	12	0	2	0	0	0	2	48
7:15 AM	7	9	0	0	0	16	1	0	8	0	0	9	1	17	0	0	3	18	0	1	1	0	1	2	45
7:30 AM	3	16	2	0	0	21	0	2	6	0	0	8	2	12	0	0	0	14	0	3	0	0	2	3	46
7:45 AM	17	19	1	0	0	37	0	4	7	0	0	11	0	19	1	0	0	20	0	3	0	0	0	3	71
Hourly Total	34	53	5	0	0	92	1	6	37	0	0	44	4	59	1	0	3	64	0	9	1	0	3	10	210
8:00 AM	11	26	0	0	0	37	0	3	9	0	0	12	1	14	0	0	0	15	0	0	2	0	1	2	66
8:15 AM	8	22	0	0	0	30	0	0	7	0	0	7	0	17	1	0	1	18	0	4	1	0	0	5	60
8:30 AM	11	22	1	0	0	34	0	4	10	0	0	14	2	18	0	0	0	20	1	3	2	0	3	6	74
8:45 AM	6	21	1	0	0	28	2	1	4	0	0	7	0	21	0	0	2	21	0	1	2	0	1	3	59
Hourly Total	36	91	2	0	0	129	2	8	30	0	0	40	3	70	1	0	3	74	1	8	7	0	5	16	259
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	9	31	0	0	0	40	1	5	13	0	0	19	2	16	0	0	0	18	0	3	3	0	3	6	83
3:45 PM	7	24	0	0	0	31	0	5	9	0	0	14	2	16	0	0	5	18	0	1	0	0	3	1	64
Hourly Total	16	55	0	0	0	71	1	10	22	0	0	33	4	32	0	0	5	36	0	4	3	0	6	7	147
4:00 PM	13	25	0	0	0	38	1	2	11	0	0	14	2	19	1	0	5	22	0	1	1	0	2	2	76
4:15 PM	9	15	1	0	0	25	0	3	5	0	0	8	3	23	0	0	0	26	0	6	3	0	1	9	68
4:30 PM	4	26	1	0	0	31	0	5	9	0	0	14	0	15	0	0	0	15	0	6	1	0	2	7	67
4:45 PM	10	25	0	0	0	35	0	6	20	0	0	26	2	15	0	0	0	17	1	4	1	0	0	6	84
Hourly Total	36	91	2	0	0	129	1	16	45	0	0	62	7	72	1	0	5	80	1	17	6	0	5	24	295
5:00 PM	9	37	1	0	0	47	0	5	6	0	0	11	4	18	1	0	0	23	0	1	2	0	1	3	84
5:15 PM	7	27	1	0	0	35	0	2	8	0	0	10	2	22	2	0	1	26	1	5	0	0	1	6	77
Grand Total	138	354	11	0	0	503	5	47	148	0	0	200	24	273	6	0	17	303	3	44	19	0	21	66	1072
Approach %	27.4	70.4	2.2	0.0	-	-	2.5	23.5	74.0	0.0	-	-	7.9	90.1	2.0	0.0	-	-	4.5	66.7	28.8	0.0	-	-	-
Total %	12.9	33.0	1.0	0.0	-	46.9	0.5	4.4	13.8	0.0	-	18.7	2.2	25.5	0.6	0.0	-	28.3	0.3	4.1	1.8	0.0	-	6.2	-
Lights	132	345	11	0	-	488	5	47	146	0	-	198	24	266	5	0	-	295	3	43	19	0	-	65	1046
% Lights	95.7	97.5	100.0	-	-	97.0	100.0	100.0	98.6	-	-	99.0	100.0	97.4	83.3	-	-	97.4	100.0	97.7	100.0	-	-	98.5	97.6
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	3	7	0	0	-	10	0	0	1	0	-	1	0	6	1	0	-	7	0	0	0	0	-	0	18
% Trucks	2.2	2.0	0.0	-	-	2.0	0.0	0.0	0.7	-	-	0.5	0.0	2.2	16.7	-	-	2.3	0.0	0.0	0.0	-	-	0.0	1.7
Bicycles on Road	3	2	0	0	-	5	0	0	1	0	-	1	0	1	0	0	-	1	0	1	0	0	-	1	8
% Bicycles on Road	2.2	0.6	0.0	-	-	1.0	0.0	0.0	0.7	-	-	0.5	0.0	0.4	0.0	-	-	0.3	0.0	2.3	0.0	-	-	1.5	0.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.9	-	-	-	-	-	14.3	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	16	-	-	-	-	-	18	-	-

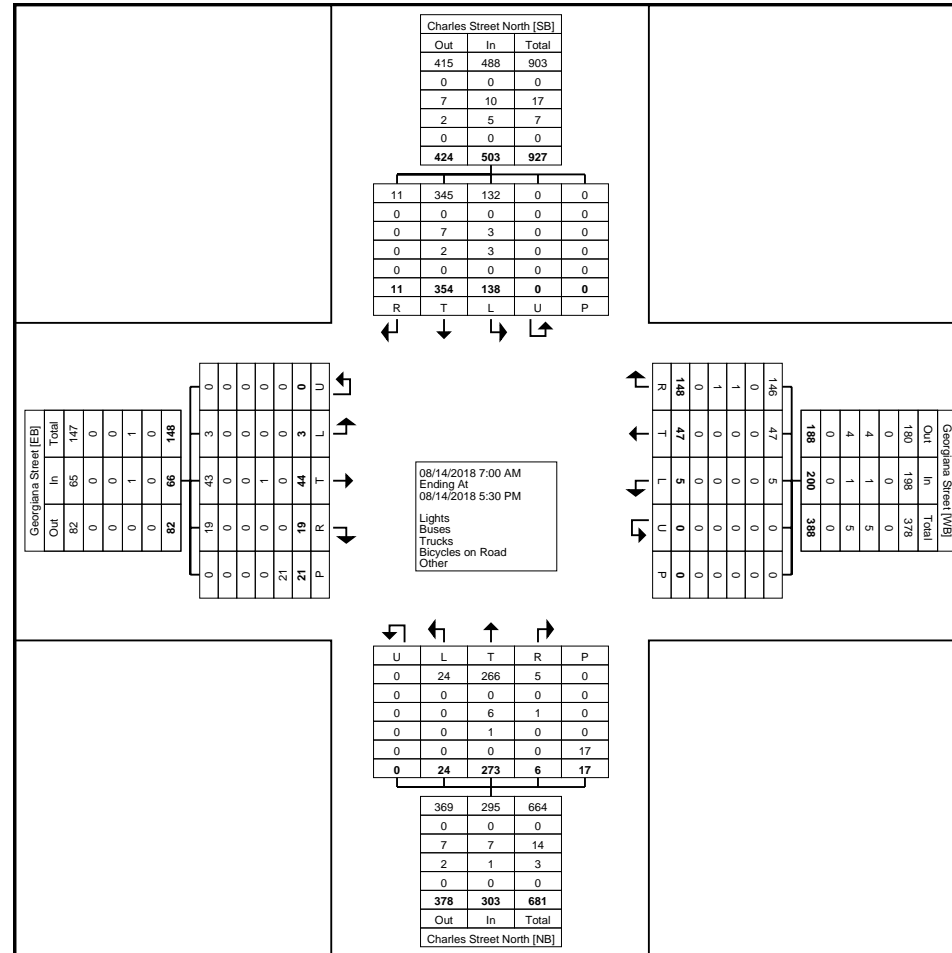
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94.1	-	-	-	-	-	85.7	-	-
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Count Name: Charles & Georgiana
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Start Date: 08/14/2018
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Turning Movement Data Plot



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Turning Movement Peak Hour Data (7:45 AM)

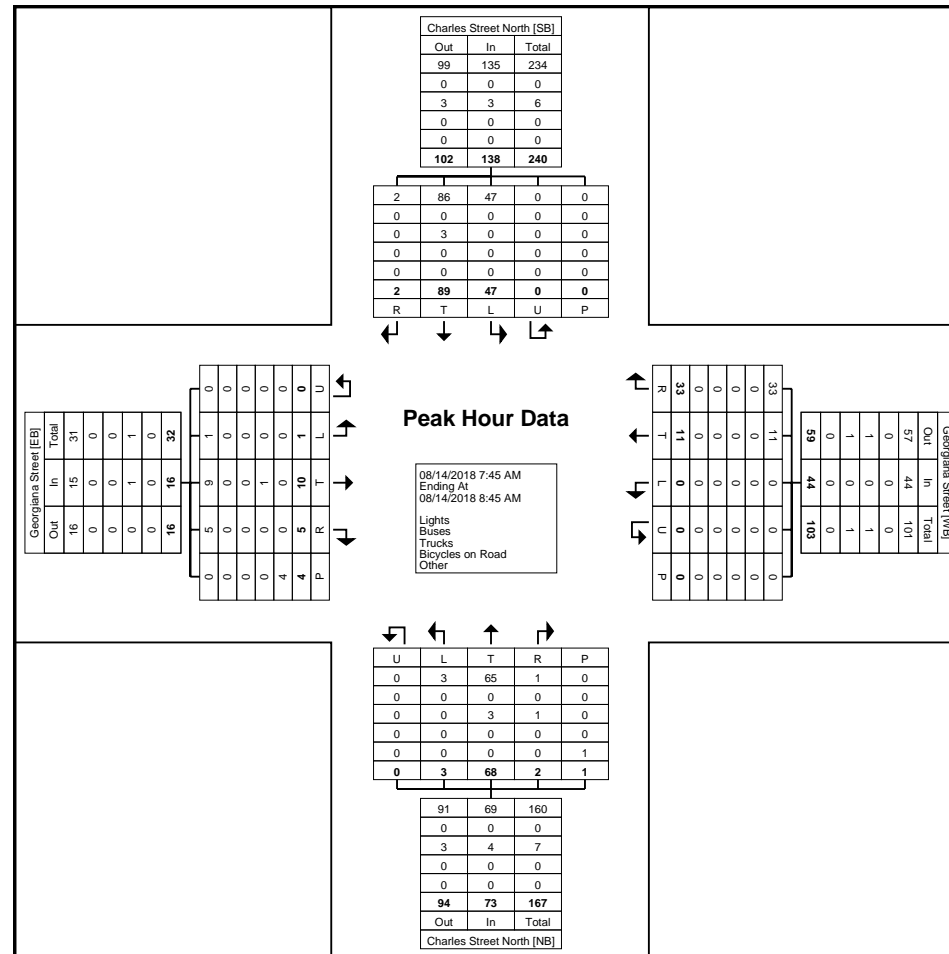
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7:45 AM	17	19	1	0	0	37	0	4	7	0	0	11	0	19	1	0	0	20	0	3	0	0	0	3	71
8:00 AM	11	26	0	0	0	37	0	3	9	0	0	12	1	14	0	0	0	15	0	0	2	0	1	2	66
8:15 AM	8	22	0	0	0	30	0	0	7	0	0	7	0	17	1	0	1	18	0	4	1	0	0	5	60
8:30 AM	11	22	1	0	0	34	0	4	10	0	0	14	2	18	0	0	0	20	1	3	2	0	3	6	74
Total	47	89	2	0	0	138	0	11	33	0	0	44	3	68	2	0	1	73	1	10	5	0	4	16	271
Approach %	34.1	64.5	1.4	0.0	-	-	0.0	25.0	75.0	0.0	-	-	4.1	93.2	2.7	0.0	-	-	6.3	62.5	31.3	0.0	-	-	-
Total %	17.3	32.8	0.7	0.0	-	50.9	0.0	4.1	12.2	0.0	-	16.2	1.1	25.1	0.7	0.0	-	26.9	0.4	3.7	1.8	0.0	-	5.9	-
PHF	0.691	0.856	0.500	0.000	-	0.932	0.000	0.688	0.825	0.000	-	0.786	0.375	0.895	0.500	0.000	-	0.913	0.250	0.625	0.625	0.000	-	0.667	0.916
Lights	47	86	2	0	-	135	0	11	33	0	-	44	3	65	1	0	-	69	1	9	5	0	-	15	263
% Lights	100.0	96.6	100.0	-	-	97.8	-	100.0	100.0	-	-	100.0	100.0	95.6	50.0	-	-	94.5	100.0	90.0	100.0	-	-	93.8	97.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	3	0	0	-	3	0	0	0	0	-	0	0	3	1	0	-	4	0	0	0	0	-	0	7
% Trucks	0.0	3.4	0.0	-	-	2.2	-	0.0	0.0	-	-	0.0	0.0	4.4	50.0	-	-	5.5	0.0	0.0	0.0	-	-	0.0	2.6
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	10.0	0.0	-	-	6.3	0.4
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



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Turning Movement Peak Hour Data Plot (7:45 AM)



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Turning Movement Peak Hour Data (4:30 PM)

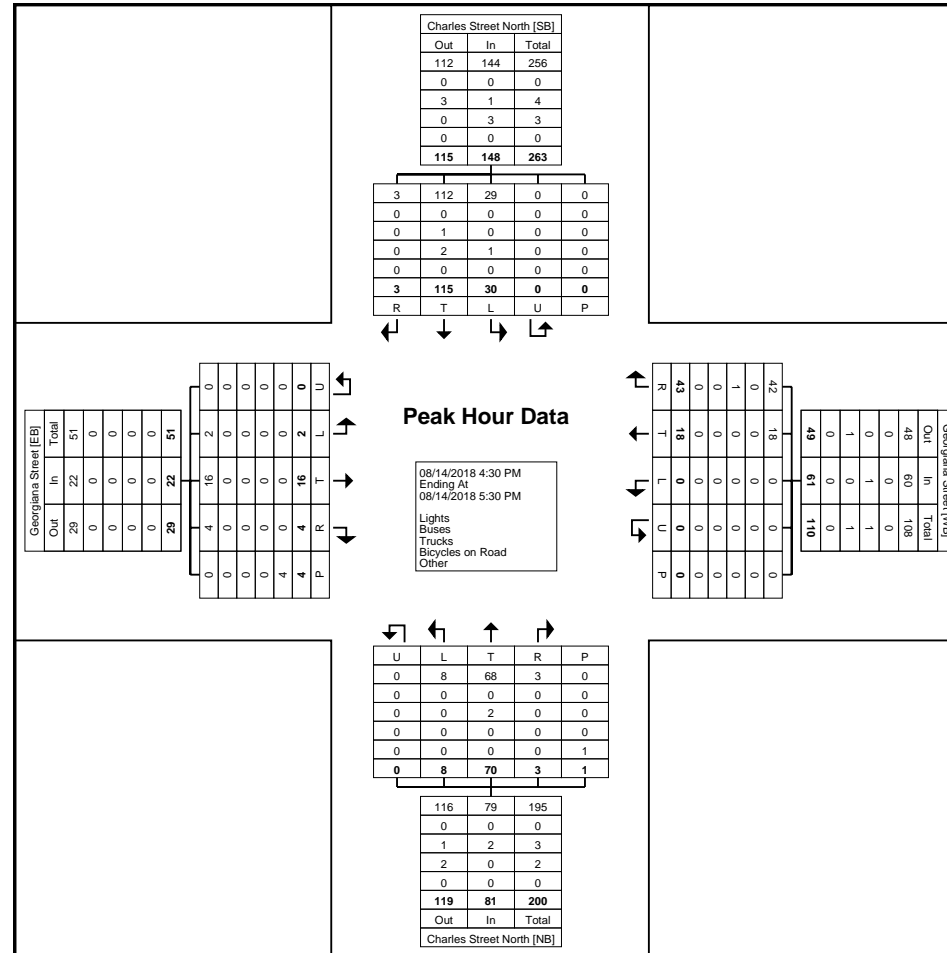
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	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:30 PM	4	26	1	0	0	31	0	5	9	0	0	14	0	15	0	0	0	15	0	6	1	0	2	7	67
4:45 PM	10	25	0	0	0	35	0	6	20	0	0	26	2	15	0	0	0	17	1	4	1	0	0	6	84
5:00 PM	9	37	1	0	0	47	0	5	6	0	0	11	4	18	1	0	0	23	0	1	2	0	1	3	84
5:15 PM	7	27	1	0	0	35	0	2	8	0	0	10	2	22	2	0	1	26	1	5	0	0	1	6	77
Total	30	115	3	0	0	148	0	18	43	0	0	61	8	70	3	0	1	81	2	16	4	0	4	22	312
Approach %	20.3	77.7	2.0	0.0	-	-	0.0	29.5	70.5	0.0	-	-	9.9	86.4	3.7	0.0	-	-	9.1	72.7	18.2	0.0	-	-	-
Total %	9.6	36.9	1.0	0.0	-	47.4	0.0	5.8	13.8	0.0	-	19.6	2.6	22.4	1.0	0.0	-	26.0	0.6	5.1	1.3	0.0	-	7.1	-
PHF	0.750	0.777	0.750	0.000	-	0.787	0.000	0.750	0.538	0.000	-	0.587	0.500	0.795	0.375	0.000	-	0.779	0.500	0.667	0.500	0.000	-	0.786	0.929
Lights	29	112	3	0	-	144	0	18	42	0	-	60	8	68	3	0	-	79	2	16	4	0	-	22	305
% Lights	96.7	97.4	100.0	-	-	97.3	-	100.0	97.7	-	-	98.4	100.0	97.1	100.0	-	-	97.5	100.0	100.0	100.0	-	-	100.0	97.8
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0.0	0.0	0.0	-	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Trucks	0	1	0	0	-	1	0	0	1	0	-	1	0	2	0	0	-	2	0	0	0	0	-	0	4
% Trucks	0.0	0.9	0.0	-	-	0.7	-	0.0	2.3	-	-	1.6	0.0	2.9	0.0	-	-	2.5	0.0	0.0	0.0	-	-	0.0	1.3
Bicycles on Road	1	2	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	3
% Bicycles on Road	3.3	1.7	0.0	-	-	2.0	-	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	1.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	25.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	75.0	-	-



MMM Group Limited - Ottawa
1145 Hunt Club Road

Ottawa, Ontario, Canada K1V 0Y3
613.736.7200 huntonk@mmm.ca

Count Name: Charles & Georgiana
Site Code:
Start Date: 08/14/2018
Page No: 7

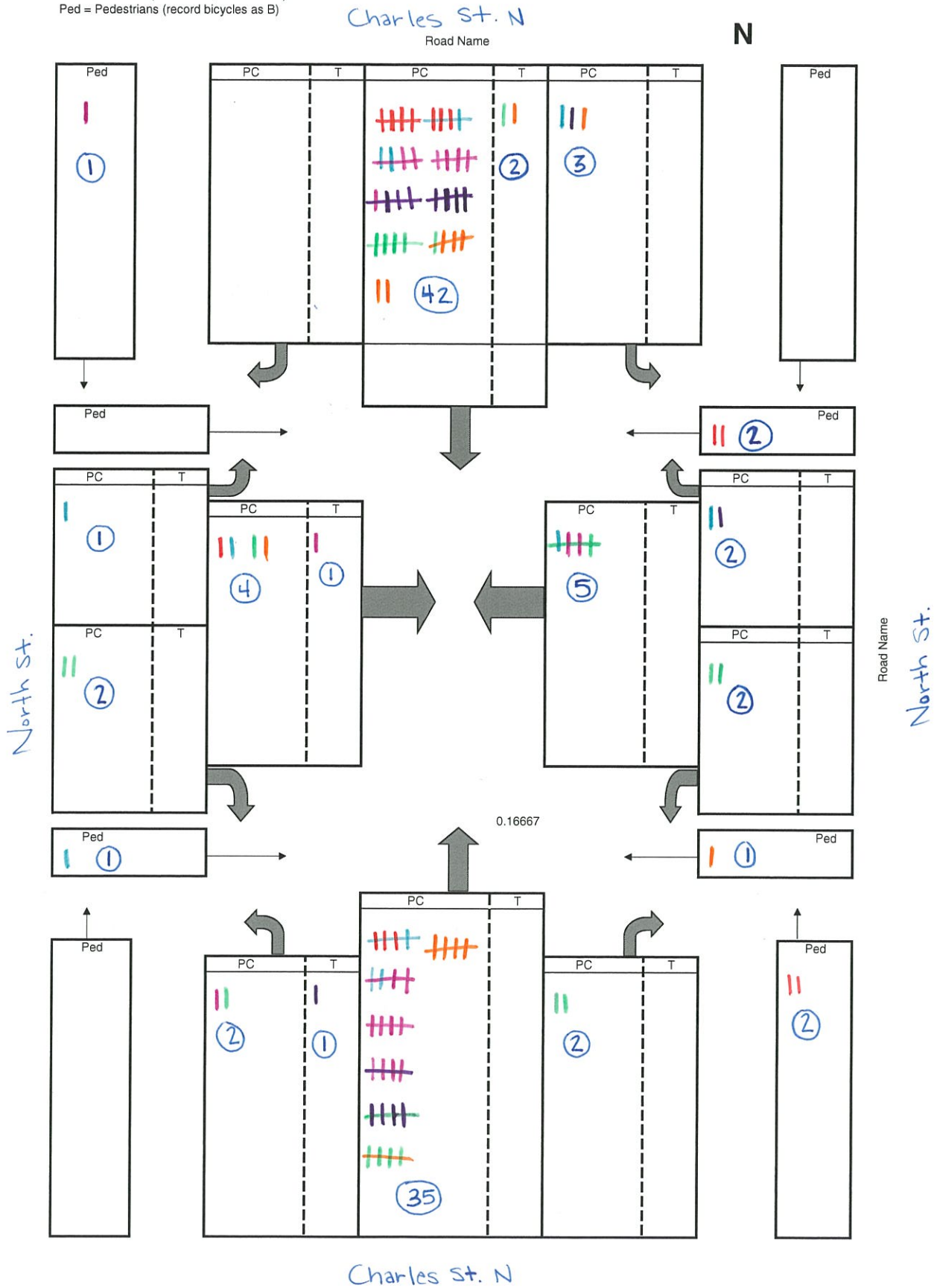


Turning Movement Peak Hour Data Plot (4:30 PM)

**VEHICLE TURNING MOVEMENT COUNT
FOUR-APPROACH FIELD SHEET**

N/S Street Charles St. N Time 8:30 AM to 9:00 AM
 E/W Street North St. Date 14/08/2018 Day 1
 City Gananoque, ON Weather Cloudy
 Observer Nicola Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)

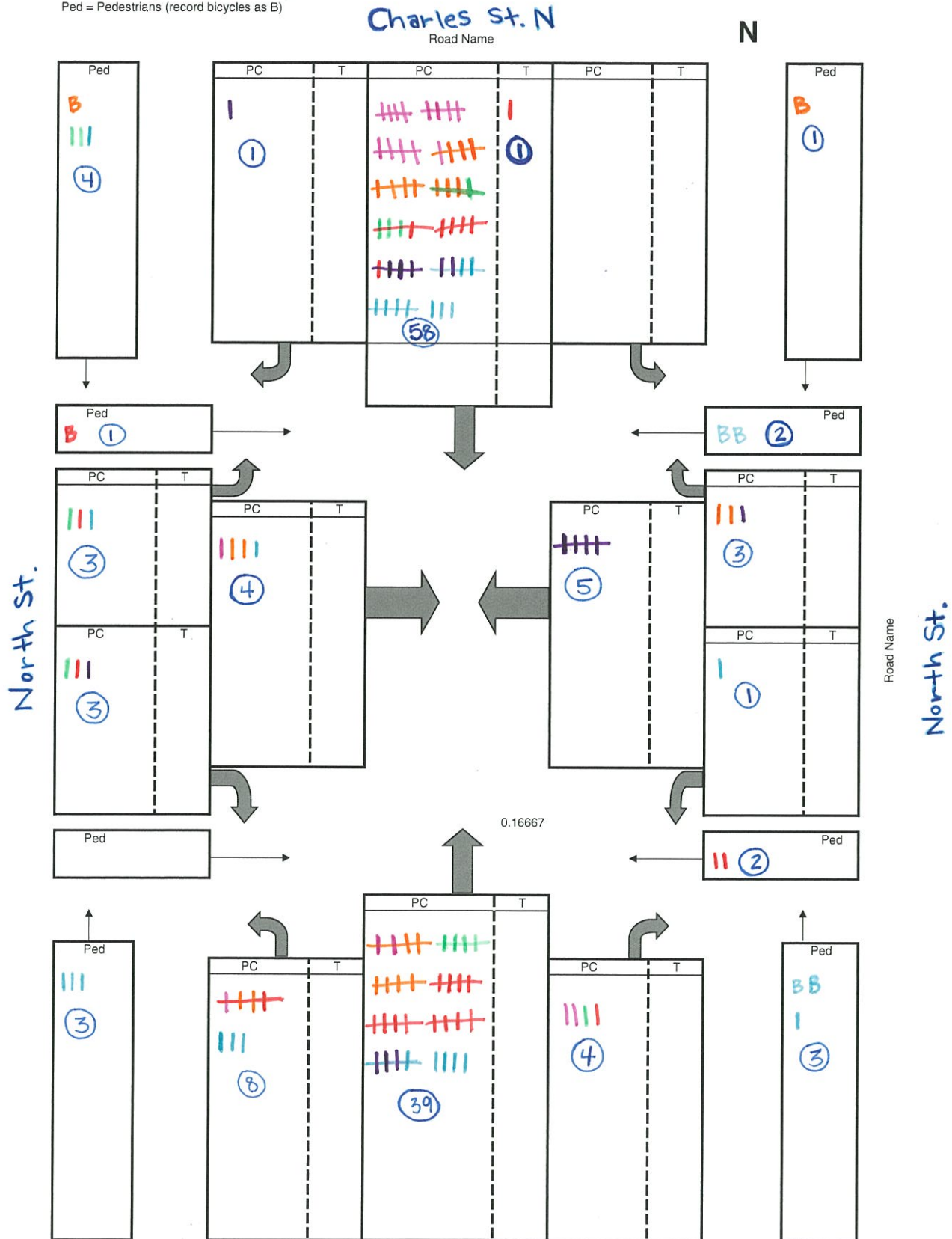


★ Each colour represents a 5 minute time interval

VEHICLE TURNING MOVEMENT COUNT FOUR-APPROACH FIELD SHEET

N/S Street Charles St. N Time 5:00 PM to 5:30 PM
 E/W Street North St. Date 14/08/2018 Day 1
 City Gananoque, ON Weather Overcast
 Observer Nicole Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)



Charles St. N

★ Each colour represents a 5 minute time interval

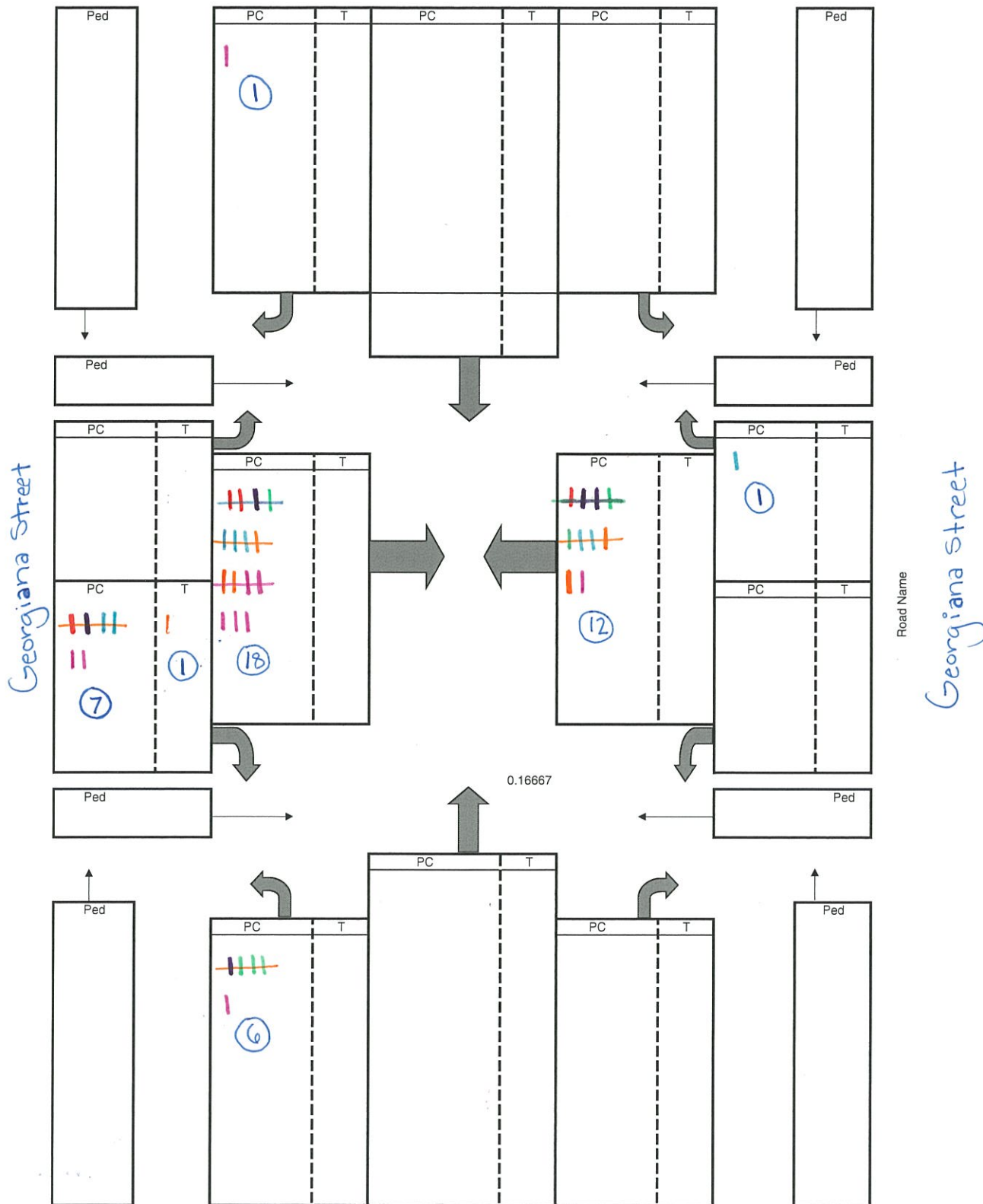
**VEHICLE TURNING MOVEMENT COUNT
FOUR-APPROACH FIELD SHEET**

N/S Street William St. N Time 7:30 AM to 8:00 AM
 E/W Street Georgiana St. Date 14/08/2018 Day 1
 City Gananoque, ON Weather Cloudy
 Observer Nicole Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)

William Street North

N



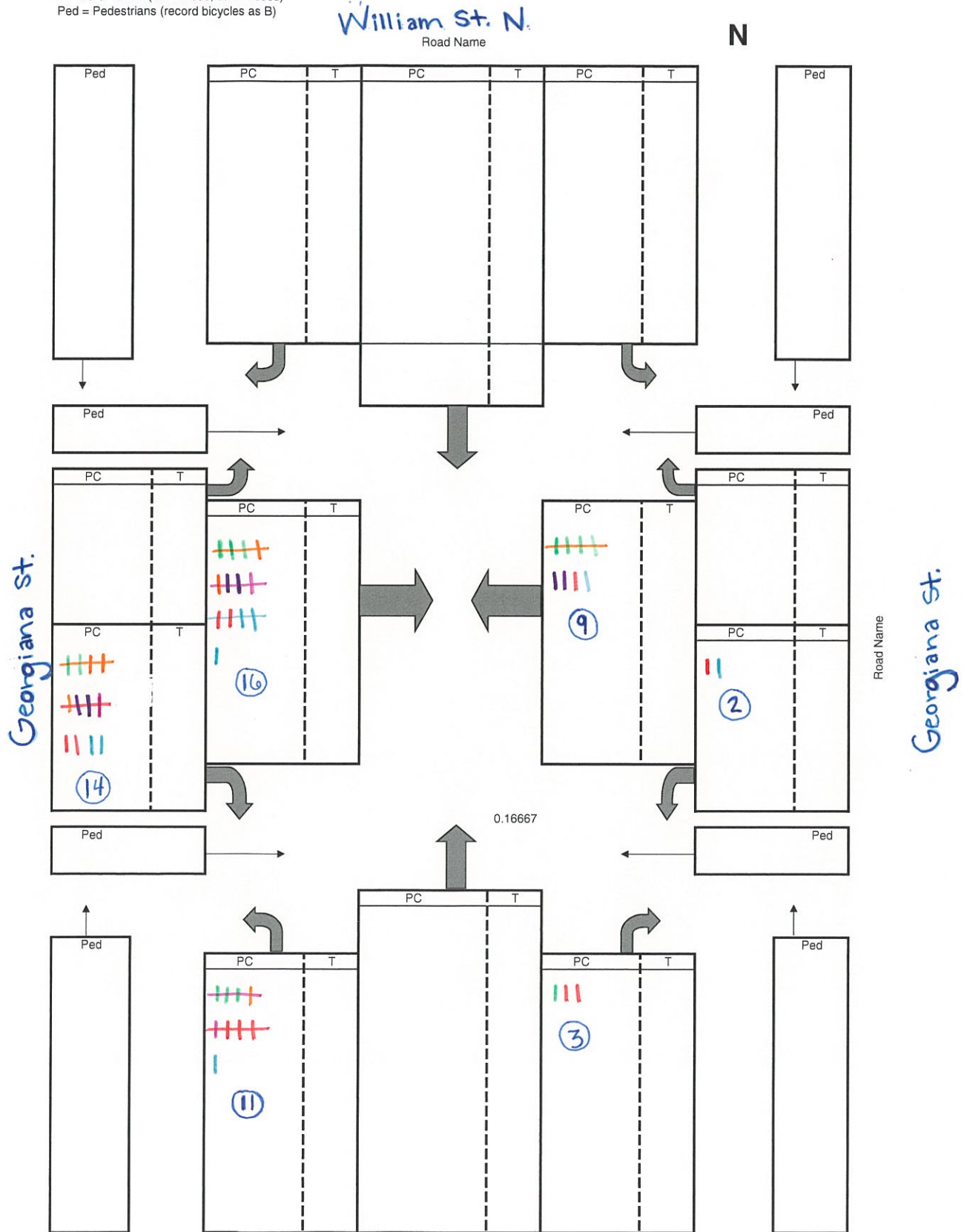
William Street North

* Each colour represents a 5 minute time interval

**VEHICLE TURNING MOVEMENT COUNT
FOUR-APPROACH FIELD SHEET**

N/S Street William St. N Time 4:00 PM to 4:30 PM
 E/W Street Georgiana St. Date 14/08/2018 Day 1
 City Gananogue, ON Weather Cloudy and light rain
 Observer Nicole Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)



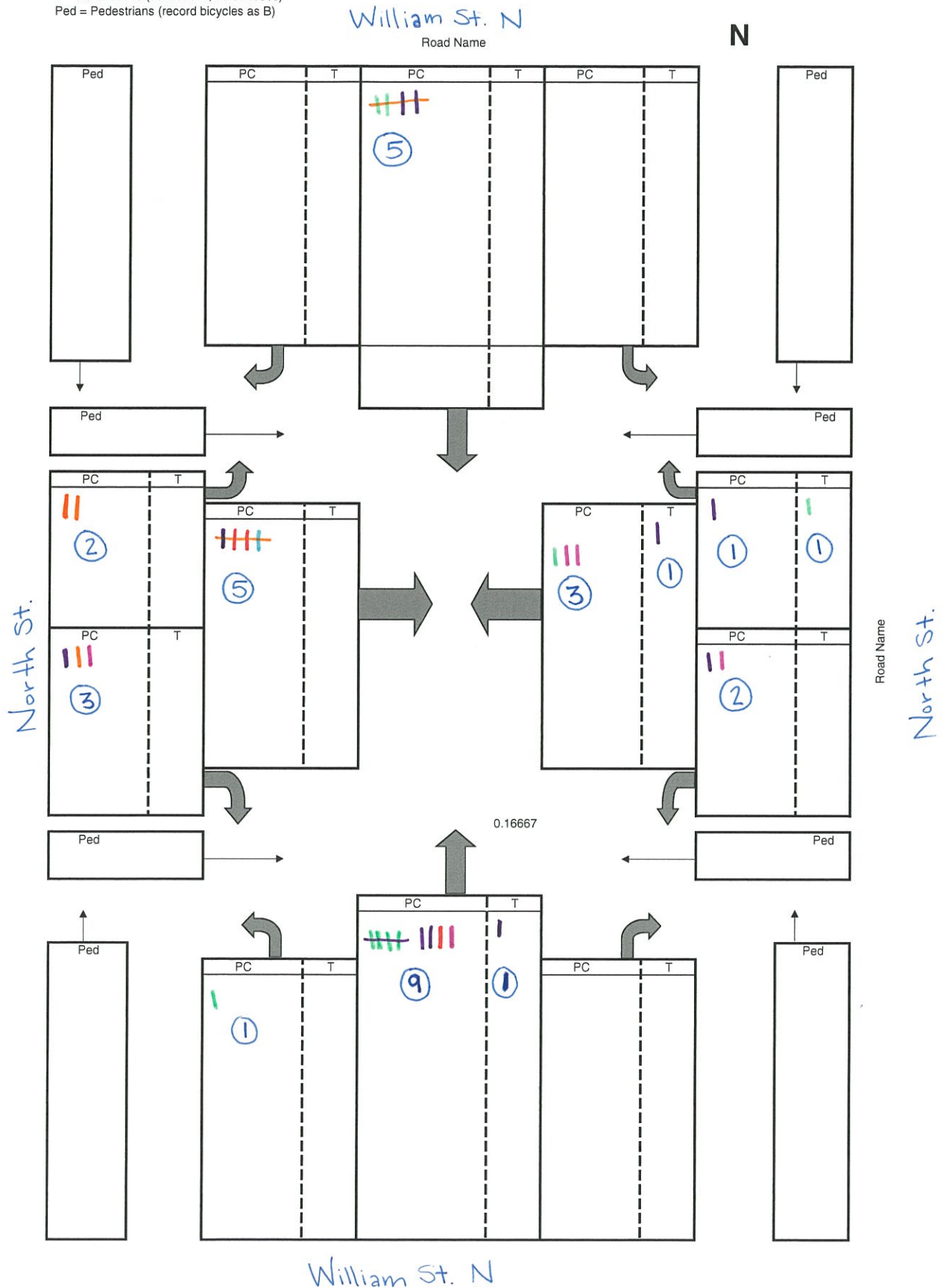
William St. N.

★ Each colour represents a 5 minute time interval

VEHICLE TURNING MOVEMENT COUNT FOUR-APPROACH FIELD SHEET

N/S Street William St. N Time 8:00 AM to 8:30 AM
 E/W Street North St. Date 14/08/2018 Day 1
 City Gananoque, ON Weather Overcast
 Observer Nicole Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)

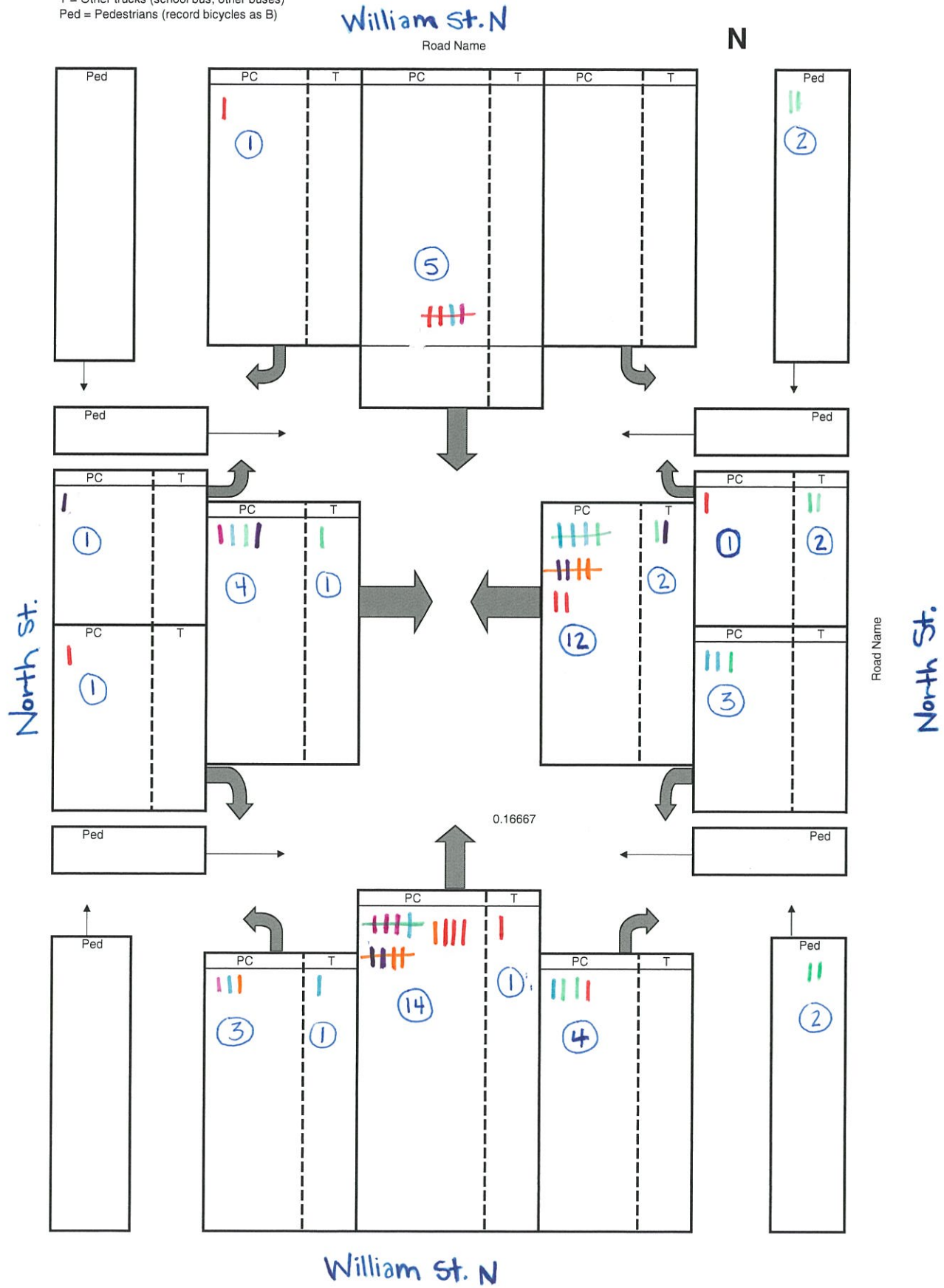


* Each colour represents a 5 minute time interval

VEHICLE TURNING MOVEMENT COUNT FOUR-APPROACH FIELD SHEET

N/S Street William St. N Time 4:30 PM to 5:00 PM
 E/W Street North St. Date 14/08/2018 Day 1
 City Gananoque, ON Weather Cloudy
 Observer Nical Tsiolas

PC = Passenger cars, station wagons, motor cycles, pick-up trucks
 T = Other trucks (school bus, other buses)
 Ped = Pedestrians (record bicycles as B)



















★ Each colour represents a 5 minute time interval

APPENDIX

B TRAFFIC ANALYSIS (SYNCHRO)

HCM Unsignalized Intersection Capacity Analysis
 1: Charles Street N & Georgiana Street

Existing AM Peak Hour
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	9	5	0	11	33	3	68	2	47	89	2
Future Volume (vph)	1	9	5	0	11	33	3	68	2	47	89	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	10	5	0	12	36	3	74	2	51	97	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	16	48	79	150								
Volume Left (vph)	1	0	3	51								
Volume Right (vph)	5	36	2	2								
Hadj (s)	-0.17	-0.45	0.08	0.09								
Departure Headway (s)	4.3	4.0	4.3	4.2								
Degree Utilization, x	0.02	0.05	0.09	0.18								
Capacity (veh/h)	791	853	817	838								
Control Delay (s)	7.4	7.2	7.7	8.1								
Approach Delay (s)	7.4	7.2	7.7	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			24.4%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: William Street N & Georgiana Street

















Existing AM Peak Hour
 09/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	18	40	0	22	2	20	0	0	0	0	2
Future Volume (vph)	0	18	40	0	22	2	20	0	0	0	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	20	43	0	24	2	22	0	0	0	0	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	63	26	22	2								
Volume Left (vph)	0	0	22	0								
Volume Right (vph)	43	2	0	2								
Hadj (s)	-0.35	-0.05	0.20	-0.60								
Departure Headway (s)	3.6	4.0	4.3	3.5								
Degree Utilization, x	0.06	0.03	0.03	0.00								
Capacity (veh/h)	978	896	814	997								
Control Delay (s)	6.9	7.1	7.4	6.5								
Approach Delay (s)	6.9	7.1	7.4	6.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.0									
Level of Service			A									
Intersection Capacity Utilization			17.8%	ICU Level of Service								A
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
 3: Charles Street N & North Street

Existing AM Peak Hour
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	17	4	4	12	3	6	68	4	0	94	0
Future Volume (Veh/h)	2	17	4	4	12	3	6	68	4	0	94	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	18	4	4	13	3	7	74	4	0	102	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	202	194	102	205	192	76	102			78		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202	194	102	205	192	76	102			78		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	100	97	100	99	98	100	99			100		
cM capacity (veh/h)	745	680	959	736	703	991	1317			1533		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	20	85	102								
Volume Left	2	4	7	0								
Volume Right	4	3	4	0								
cSH	720	742	1317	1533								
Volume to Capacity	0.03	0.03	0.01	0.00								
Queue Length 95th (m)	0.8	0.7	0.1	0.0								
Control Delay (s)	10.2	10.0	0.7	0.0								
Lane LOS	B	A	A									
Approach Delay (s)	10.2	10.0	0.7	0.0								
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			18.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: William Street N & North Street

Existing AM Peak Hour
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	11	6	4	12	4	4	22	0	0	27	3
Future Volume (vph)	4	11	6	4	12	4	4	22	0	0	27	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	7	4	13	4	4	24	0	0	29	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	21	28	32								
Volume Left (vph)	4	4	4	0								
Volume Right (vph)	7	4	0	3								
Hadj (s)	-0.15	-0.08	0.03	-0.06								
Departure Headway (s)	3.9	4.0	4.1	4.0								
Degree Utilization, x	0.02	0.02	0.03	0.04								
Capacity (veh/h)	902	887	866	893								
Control Delay (s)	7.0	7.1	7.2	7.1								
Approach Delay (s)	7.0	7.1	7.2	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.1									
Level of Service			A									
Intersection Capacity Utilization			14.6%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 1: Charles Street N & Georgiana Street

Existing PM Peak Hour
 09/05/2018



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	16	4	0	18	43	8	70	3	30	112	3
Future Volume (vph)	2	16	4	0	18	43	8	70	3	30	112	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	17	4	0	19	46	9	75	3	32	120	3

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	23	65	87	155
Volume Left (vph)	2	0	9	32
Volume Right (vph)	4	46	3	3
Hadj (s)	-0.09	-0.40	0.04	0.04
Departure Headway (s)	4.4	4.1	4.3	4.2
Degree Utilization, x	0.03	0.07	0.10	0.18
Capacity (veh/h)	764	823	808	831
Control Delay (s)	7.6	7.4	7.8	8.2
Approach Delay (s)	7.6	7.4	7.8	8.2
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.9	
Level of Service		A	
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)		15	

















HCM Unsignalized Intersection Capacity Analysis
 2: William Street N & Georgiana Street

Existing PM Peak Hour
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	26	23	4	28	0	33	0	7	0	0	0
Future Volume (vph)	0	26	23	4	28	0	33	0	7	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	28	25	4	30	0	35	0	8	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	53	34	43	0								
Volume Left (vph)	0	4	35	0								
Volume Right (vph)	25	0	8	0								
Hadj (s)	-0.28	0.02	0.05	0.00								
Departure Headway (s)	3.7	4.1	4.1	4.1								
Degree Utilization, x	0.06	0.04	0.05	0.00								
Capacity (veh/h)	942	869	844	865								
Control Delay (s)	7.0	7.2	7.3	7.1								
Approach Delay (s)	7.0	7.2	7.3	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			14.8%	ICU Level of Service	A							
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
3: Charles Street N & North Street

Existing PM Peak Hour
09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	10	6	4	19	5	16	70	8	0	114	2
Future Volume (Veh/h)	6	10	6	4	19	5	16	70	8	0	114	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	6	11	6	4	20	5	17	75	9	0	123	2
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	252	242	124	249	238	80	125			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	252	242	124	249	238	80	125			84		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	99	97	99	99			100		
cM capacity (veh/h)	679	655	932	689	658	986	1474			1526		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	23	29	101	125								
Volume Left	6	4	17	0								
Volume Right	6	5	9	2								
cSH	718	703	1474	1526								
Volume to Capacity	0.03	0.04	0.01	0.00								
Queue Length 95th (m)	0.8	1.0	0.3	0.0								
Control Delay (s)	10.2	10.3	1.3	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.2	10.3	1.3	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			21.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: William Street N & North Street

Existing PM Peak Hour
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	12	3	6	20	6	4	31	8	0	23	4
Future Volume (vph)	3	12	3	6	20	6	4	31	8	0	23	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	13	3	6	22	6	4	33	9	0	25	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	19	34	46	29								
Volume Left (vph)	3	6	4	0								
Volume Right (vph)	3	6	9	4								
Hadj (s)	-0.06	-0.07	-0.10	-0.08								
Departure Headway (s)	4.0	4.0	3.9	4.0								
Degree Utilization, x	0.02	0.04	0.05	0.03								
Capacity (veh/h)	871	877	889	888								
Control Delay (s)	7.1	7.2	7.1	7.1								
Approach Delay (s)	7.1	7.2	7.1	7.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.1									
Level of Service			A									
Intersection Capacity Utilization			15.5%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 1: Charles Street N & Georgiana Street

















2018 AM Peak Hour with School
 09/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	14	5	39	16	66	3	68	38	106	89	2
Future Volume (vph)	1	14	5	39	16	66	3	68	38	106	89	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	15	5	42	17	72	3	74	41	115	97	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	21	131	118	214								
Volume Left (vph)	1	42	3	115								
Volume Right (vph)	5	72	41	2								
Hadj (s)	-0.13	-0.27	-0.08	0.21								
Departure Headway (s)	4.7	4.4	4.4	4.6								
Degree Utilization, x	0.03	0.16	0.15	0.27								
Capacity (veh/h)	693	749	772	749								
Control Delay (s)	7.8	8.3	8.2	9.3								
Approach Delay (s)	7.8	8.3	8.2	9.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			37.7%	ICU Level of Service	A							
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
 2: William Street N & Georgiana Street

2018 AM Peak Hour with School
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	24	66	0	31	2	36	0	0	0	0	2
Future Volume (vph)	0	24	66	0	31	2	36	0	0	0	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	72	0	34	2	39	0	0	0	0	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	98	36	39	2								
Volume Left (vph)	0	0	39	0								
Volume Right (vph)	72	2	0	2								
Hadj (s)	-0.22	-0.03	0.20	-0.60								
Departure Headway (s)	3.8	4.0	4.4	3.6								
Degree Utilization, x	0.10	0.04	0.05	0.00								
Capacity (veh/h)	927	872	790	952								
Control Delay (s)	7.3	7.2	7.6	6.6								
Approach Delay (s)	7.3	7.2	7.6	6.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			20.7%	ICU Level of Service	A							
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
3: Charles Street N & North Street

2018 AM Peak Hour with School
09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	17	4	4	12	3	6	96	4	0	127	6
Future Volume (Veh/h)	10	17	4	4	12	3	6	96	4	0	127	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	18	4	4	13	3	7	104	4	0	138	7
Pedestrians					20							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	271	284	142	294	285	126	145			128		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271	284	142	294	285	126	145			128		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	98	97	100	99	98	100	99			100		
cM capacity (veh/h)	661	596	912	622	614	914	1268			1446		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	20	115	145								
Volume Left	11	4	7	0								
Volume Right	4	3	4	7								
cSH	644	647	1268	1446								
Volume to Capacity	0.05	0.03	0.01	0.00								
Queue Length 95th (m)	1.3	0.8	0.1	0.0								
Control Delay (s)	10.9	10.7	0.5	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.9	10.7	0.5	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			21.8%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: William Street N & North Street

2018 AM Peak Hour with School
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	11	6	4	12	11	4	31	0	4	49	3
Future Volume (vph)	4	11	6	4	12	11	4	31	0	4	49	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	7	4	13	12	4	34	0	4	53	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	29	38	60								
Volume Left (vph)	4	4	4	4								
Volume Right (vph)	7	12	0	3								
Hadj (s)	-0.15	-0.22	0.02	0.28								
Departure Headway (s)	4.0	3.9	4.1	4.3								
Degree Utilization, x	0.03	0.03	0.04	0.07								
Capacity (veh/h)	872	891	855	817								
Control Delay (s)	7.1	7.0	7.3	7.7								
Approach Delay (s)	7.1	7.0	7.3	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			21.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 1: Charles Street N & Georgiana Street

2018 PM Peak Hour with School
 09/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	19	4	25	23	61	8	70	18	49	112	3
Future Volume (vph)	2	19	4	25	23	61	8	70	18	49	112	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	20	4	27	25	66	9	75	19	53	120	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	26	118	103	176								
Volume Left (vph)	2	27	9	53								
Volume Right (vph)	4	66	19	3								
Hadj (s)	-0.08	-0.27	0.01	0.06								
Departure Headway (s)	4.6	4.3	4.4	4.4								
Degree Utilization, x	0.03	0.14	0.13	0.22								
Capacity (veh/h)	717	778	773	779								
Control Delay (s)	7.8	8.0	8.1	8.6								
Approach Delay (s)	7.8	8.0	8.1	8.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			35.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: William Street N & Georgiana Street

















2018 PM Peak Hour with School
 09/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	31	31	4	32	0	43	0	7	0	0	0
Future Volume (vph)	0	31	31	4	32	0	43	0	7	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	33	33	4	34	0	46	0	8	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	66	38	54	0								
Volume Left (vph)	0	4	46	0								
Volume Right (vph)	33	0	8	0								
Hadj (s)	-0.30	0.02	0.08	0.00								
Departure Headway (s)	3.8	4.1	4.2	4.2								
Degree Utilization, x	0.07	0.04	0.06	0.00								
Capacity (veh/h)	937	859	829	843								
Control Delay (s)	7.0	7.3	7.5	7.2								
Approach Delay (s)	7.0	7.3	7.5	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			15.0%	ICU Level of Service	A							
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis
3: Charles Street N & North Street

2018 PM Peak Hour with School
09/05/2018

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	10	6	4	19	5	16	82	8	0	134	8
Future Volume (Veh/h)	9	10	6	4	19	5	16	82	8	0	134	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	10	11	6	4	20	5	17	88	9	0	144	9
Pedestrians		14			20							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			2							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	304	314	162	306	314	112	167			117		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304	314	162	306	314	112	167			117		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	99	99	97	99	99			100		
cM capacity (veh/h)	605	581	877	606	581	930	1407			1459		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	27	29	114	153								
Volume Left	10	4	17	0								
Volume Right	6	5	9	9								
cSH	638	625	1407	1459								
Volume to Capacity	0.04	0.05	0.01	0.00								
Queue Length 95th (m)	1.1	1.2	0.3	0.0								
Control Delay (s)	10.9	11.0	1.2	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.9	11.0	1.2	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			28.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: William Street N & North Street

















2018 PM Peak Hour with School
 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	12	3	6	20	10	4	37	8	3	28	4
Future Volume (vph)	3	12	3	6	20	10	4	37	8	3	28	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	13	3	6	22	11	4	40	9	3	30	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	19	39	53	37								
Volume Left (vph)	3	6	4	3								
Volume Right (vph)	3	11	9	4								
Hadj (s)	-0.06	-0.14	-0.09	-0.05								
Departure Headway (s)	4.1	4.0	4.0	4.0								
Degree Utilization, x	0.02	0.04	0.06	0.04								
Capacity (veh/h)	860	882	881	875								
Control Delay (s)	7.2	7.1	7.2	7.2								
Approach Delay (s)	7.2	7.1	7.2	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			21.0%	ICU Level of Service								A
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 1: Charles Street N & Georgiana Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	14	5	39	16	66	3	68	38	106	89	2
Future Volume (vph)	1	14	5	39	16	66	3	68	38	106	89	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	15	5	42	17	72	3	74	41	115	97	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	21	131	118	214								
Volume Left (vph)	1	42	3	115								
Volume Right (vph)	5	72	41	2								
Hadj (s)	-0.13	-0.27	-0.08	0.13								
Departure Headway (s)	4.7	4.4	4.4	4.5								
Degree Utilization, x	0.03	0.16	0.15	0.27								
Capacity (veh/h)	695	751	773	762								
Control Delay (s)	7.8	8.3	8.2	9.2								
Approach Delay (s)	7.8	8.3	8.2	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			37.7%		ICU Level of Service				A			
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis - 2018 AM Peak Hour Total Traffic (School+Daycare)
 2: William Street N & Georgiana Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	24	66	0	31	2	36	0	0	0	0	2
Future Volume (vph)	0	24	66	0	31	2	36	0	0	0	0	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	26	72	0	34	2	39	0	0	0	0	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	98	36	39	2								
Volume Left (vph)	0	0	39	0								
Volume Right (vph)	72	2	0	2								
Hadj (s)	-0.22	-0.03	0.20	-0.60								
Departure Headway (s)	3.8	4.0	4.4	3.6								
Degree Utilization, x	0.10	0.04	0.05	0.00								
Capacity (veh/h)	927	872	790	952								
Control Delay (s)	7.3	7.2	7.6	6.6								
Approach Delay (s)	7.3	7.2	7.6	6.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			20.7%	ICU Level of Service	A							
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 3: Charles Street N & North Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	17	4	4	12	3	6	96	4	0	127	6
Future Volume (Veh/h)	10	17	4	4	12	3	6	96	4	0	127	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	18	4	4	13	3	7	104	4	0	138	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	271	264	142	274	265	106	145			108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271	264	142	274	265	106	145			108		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	98	97	100	99	98	100	99			100		
cM capacity (veh/h)	670	622	912	661	640	954	1268			1495		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	33	20	115	145								
Volume Left	11	4	7	0								
Volume Right	4	3	4	7								
cSH	663	678	1268	1495								
Volume to Capacity	0.05	0.03	0.01	0.00								
Queue Length 95th (m)	1.3	0.7	0.1	0.0								
Control Delay (s)	10.7	10.5	0.5	0.0								
Lane LOS	B	B	A									
Approach Delay (s)	10.7	10.5	0.5	0.0								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			20.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 4: William Street N & North Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	11	6	4	12	11	4	31	0	4	49	3
Future Volume (vph)	4	11	6	4	12	11	4	31	0	4	49	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	12	7	4	13	12	4	34	0	4	53	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	29	38	60								
Volume Left (vph)	4	4	4	4								
Volume Right (vph)	7	12	0	3								
Hadj (s)	-0.15	-0.22	0.02	0.13								
Departure Headway (s)	4.0	3.9	4.1	4.2								
Degree Utilization, x	0.03	0.03	0.04	0.07								
Capacity (veh/h)	873	892	856	846								
Control Delay (s)	7.1	7.0	7.3	7.5								
Approach Delay (s)	7.1	7.0	7.3	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			13.6%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 1: Charles Street N & Georgiana Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	19	5	27	23	61	10	76	20	59	119	3
Future Volume (vph)	2	19	5	27	23	61	10	76	20	59	119	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	20	5	29	25	66	11	82	22	63	128	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	27	120	115	194								
Volume Left (vph)	2	29	11	63								
Volume Right (vph)	5	66	22	3								
Hadj (s)	-0.10	-0.26	0.01	0.16								
Departure Headway (s)	4.7	4.4	4.5	4.5								
Degree Utilization, x	0.04	0.15	0.14	0.24								
Capacity (veh/h)	703	759	767	758								
Control Delay (s)	7.8	8.1	8.2	9.0								
Approach Delay (s)	7.8	8.1	8.2	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			36.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 4:15 PM Peak Hour Total Traffic (School+Daycare)
 2: William Street N & Georgiana Street 09/05/2018



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	41	4	34	0	43	0	7	0	0	0
Future Volume (vph)	0	33	41	4	34	0	43	0	7	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	35	44	4	37	0	46	0	8	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	79	41	54	0								
Volume Left (vph)	0	4	46	0								
Volume Right (vph)	44	0	8	0								
Hadj (s)	-0.11	0.02	0.08	0.00								
Departure Headway (s)	4.0	4.1	4.2	4.2								
Degree Utilization, x	0.09	0.05	0.06	0.00								
Capacity (veh/h)	891	856	818	832								
Control Delay (s)	7.3	7.3	7.5	7.2								
Approach Delay (s)	7.3	7.3	7.5	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			15.1%	ICU Level of Service								A
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 3: Charles Street N & North Street 09/05/2018



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	10	10	6	4	19	9	16	87	8	3	140	10
Future Volume (Veh/h)	10	10	6	4	19	9	16	87	8	3	140	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	11	11	6	4	20	10	17	94	9	3	151	11
Pedestrians					20							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	315	320	156	326	320	118	162			123		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	315	320	156	326	320	118	162			123		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	99	99	97	99	99			100		
cM capacity (veh/h)	604	582	894	593	582	923	1429			1452		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	28	34	120	165								
Volume Left	11	4	17	3								
Volume Right	6	10	9	11								
cSH	639	654	1429	1452								
Volume to Capacity	0.04	0.05	0.01	0.00								
Queue Length 95th (m)	1.1	1.3	0.3	0.0								
Control Delay (s)	10.9	10.8	1.2	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.9	10.8	1.2	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			24.3%		ICU Level of Service					A		
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 4: William Street N & North Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	13	5	6	21	10	6	37	8	3	38	4
Future Volume (vph)	3	13	5	6	21	10	6	37	8	3	38	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	14	5	6	23	11	6	40	9	3	41	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	22	40	55	48								
Volume Left (vph)	3	6	6	3								
Volume Right (vph)	5	11	9	4								
Hadj (s)	-0.11	-0.13	-0.08	0.34								
Departure Headway (s)	4.1	4.0	4.0	4.4								
Degree Utilization, x	0.02	0.04	0.06	0.06								
Capacity (veh/h)	858	870	872	797								
Control Delay (s)	7.2	7.2	7.3	7.7								
Approach Delay (s)	7.2	7.2	7.3	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			21.0%	ICU Level of Service	A							
Analysis Period (min)			15									

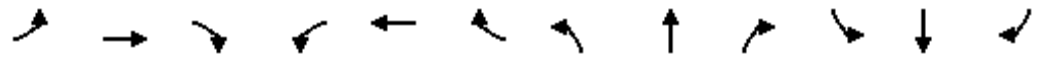
HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 1: Charles Street N & Georgiana Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	15	6	40	17	68	4	78	39	109	103	2
Future Volume (vph)	1	15	6	40	17	68	4	78	39	109	103	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1	16	6	43	18	73	4	84	42	117	111	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	134	130	230								
Volume Left (vph)	1	43	4	117								
Volume Right (vph)	6	73	42	2								
Hadj (s)	-0.15	-0.26	-0.07	0.20								
Departure Headway (s)	4.8	4.5	4.5	4.6								
Degree Utilization, x	0.03	0.17	0.16	0.30								
Capacity (veh/h)	678	735	764	745								
Control Delay (s)	7.9	8.4	8.3	9.6								
Approach Delay (s)	7.9	8.4	8.3	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.9									
Level of Service			A									
Intersection Capacity Utilization			38.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 2: William Street N & Georgiana Street 09/05/2018

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	26	68	0	33	2	38	0	0	0	0	2
Future Volume (vph)	0	26	68	0	33	2	38	0	0	0	0	2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	28	73	0	35	2	41	0	0	0	0	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	101	37	41	2								
Volume Left (vph)	0	0	41	0								
Volume Right (vph)	73	2	0	2								
Hadj (s)	-0.21	-0.03	0.20	-0.60								
Departure Headway (s)	3.8	4.1	4.4	3.6								
Degree Utilization, x	0.11	0.04	0.05	0.00								
Capacity (veh/h)	924	869	788	948								
Control Delay (s)	7.3	7.2	7.6	6.6								
Approach Delay (s)	7.3	7.2	7.6	6.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			21.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 3: Charles Street N & North Street 09/05/2018



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	12	18	4	4	13	6	6	105	4	3	138	7
Future Volume (Veh/h)	12	18	4	4	13	6	6	105	4	3	138	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	13	19	4	4	14	6	6	113	4	3	148	8
Pedestrians					20							
Lane Width (m)					3.6							
Walking Speed (m/s)					1.2							
Percent Blockage					2							
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	298	307	152	318	309	135	156			137		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	298	307	152	318	309	135	156			137		
tC, single (s)	7.1	6.6	6.2	7.1	6.5	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.5	4.0	3.3	2.5			2.2		
p0 queue free %	98	97	100	99	98	99	100			100		
cM capacity (veh/h)	631	577	900	598	594	904	1255			1435		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	36	24	123	159								
Volume Left	13	4	6	3								
Volume Right	4	6	4	8								
cSH	621	651	1255	1435								
Volume to Capacity	0.06	0.04	0.00	0.00								
Queue Length 95th (m)	1.5	0.9	0.1	0.1								
Control Delay (s)	11.2	10.7	0.4	0.2								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.2	10.7	0.4	0.2								
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			21.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis - 2018 Existing AM Peak Hour Total Traffic (School+Daycare)
 4: William Street N & North Street 09/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	12	9	4	14	11	6	33	0	4	51	3
Future Volume (vph)	4	12	9	4	14	11	6	33	0	4	51	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	4	13	10	4	15	12	6	35	0	4	55	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	27	31	41	62								
Volume Left (vph)	4	4	6	4								
Volume Right (vph)	10	12	0	3								
Hadj (s)	-0.19	-0.21	0.03	0.29								
Departure Headway (s)	4.0	4.0	4.1	4.3								
Degree Utilization, x	0.03	0.03	0.05	0.07								
Capacity (veh/h)	878	883	849	812								
Control Delay (s)	7.1	7.1	7.3	7.7								
Approach Delay (s)	7.1	7.1	7.3	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			21.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 1: Charles Street N & Georgiana Street 09/05/2018

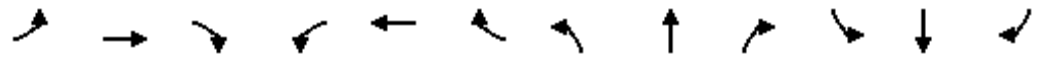
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	20	5	27	24	64	10	80	20	60	125	3
Future Volume (vph)	2	20	5	27	24	64	10	80	20	60	125	3
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	22	5	29	26	69	11	86	22	65	134	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	124	119	202								
Volume Left (vph)	2	29	11	65								
Volume Right (vph)	5	69	22	3								
Hadj (s)	-0.09	-0.27	0.00	0.16								
Departure Headway (s)	4.7	4.4	4.5	4.6								
Degree Utilization, x	0.04	0.15	0.15	0.26								
Capacity (veh/h)	695	753	762	755								
Control Delay (s)	7.9	8.2	8.3	9.1								
Approach Delay (s)	7.9	8.2	8.3	9.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			36.8%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 2: William Street N & Georgiana Street 09/05/2018



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	34	43	4	35	0	45	0	7	0	0	0
Future Volume (vph)	0	34	43	4	35	0	45	0	7	0	0	0
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	37	46	4	38	0	48	0	8	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	83	42	56	0								
Volume Left (vph)	0	4	48	0								
Volume Right (vph)	46	0	8	0								
Hadj (s)	-0.12	0.02	0.09	0.00								
Departure Headway (s)	4.0	4.1	4.2	4.2								
Degree Utilization, x	0.09	0.05	0.07	0.00								
Capacity (veh/h)	891	854	815	829								
Control Delay (s)	7.3	7.3	7.5	7.2								
Approach Delay (s)	7.3	7.3	7.5	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
Level of Service			A									
Intersection Capacity Utilization			15.2%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis - 2018 AM Peak Hour Total Traffic (School+Daycare)
 3: Charles Street N & North Street 09/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	0	0	0	4	20	9	17	90	8	3	147	10
Future Volume (Veh/h)	0	0	0	4	20	9	17	90	8	3	147	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	0	4	22	10	18	97	9	3	158	11
Pedestrians		14			20							
Lane Width (m)		3.6			3.6							
Walking Speed (m/s)		1.2			1.2							
Percent Blockage		1			2							
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	342	346	178	327	346	122	183			126		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	342	346	178	327	346	122	183			126		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	96	99	99			100		
cM capacity (veh/h)	565	556	861	599	555	920	1388			1448		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	36	124	172								
Volume Left	0	4	18	3								
Volume Right	0	10	9	11								
cSH	1700	630	1388	1448								
Volume to Capacity	0.00	0.06	0.01	0.00								
Queue Length 95th (m)	0.0	1.5	0.3	0.0								
Control Delay (s)	0.0	11.1	1.2	0.1								
Lane LOS	A	B	A	A								
Approach Delay (s)	0.0	11.1	1.2	0.1								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			25.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 2018 AM Peak Hour Total Traffic (School+Daycare)
 4: William Street N & North Street 09/05/2018

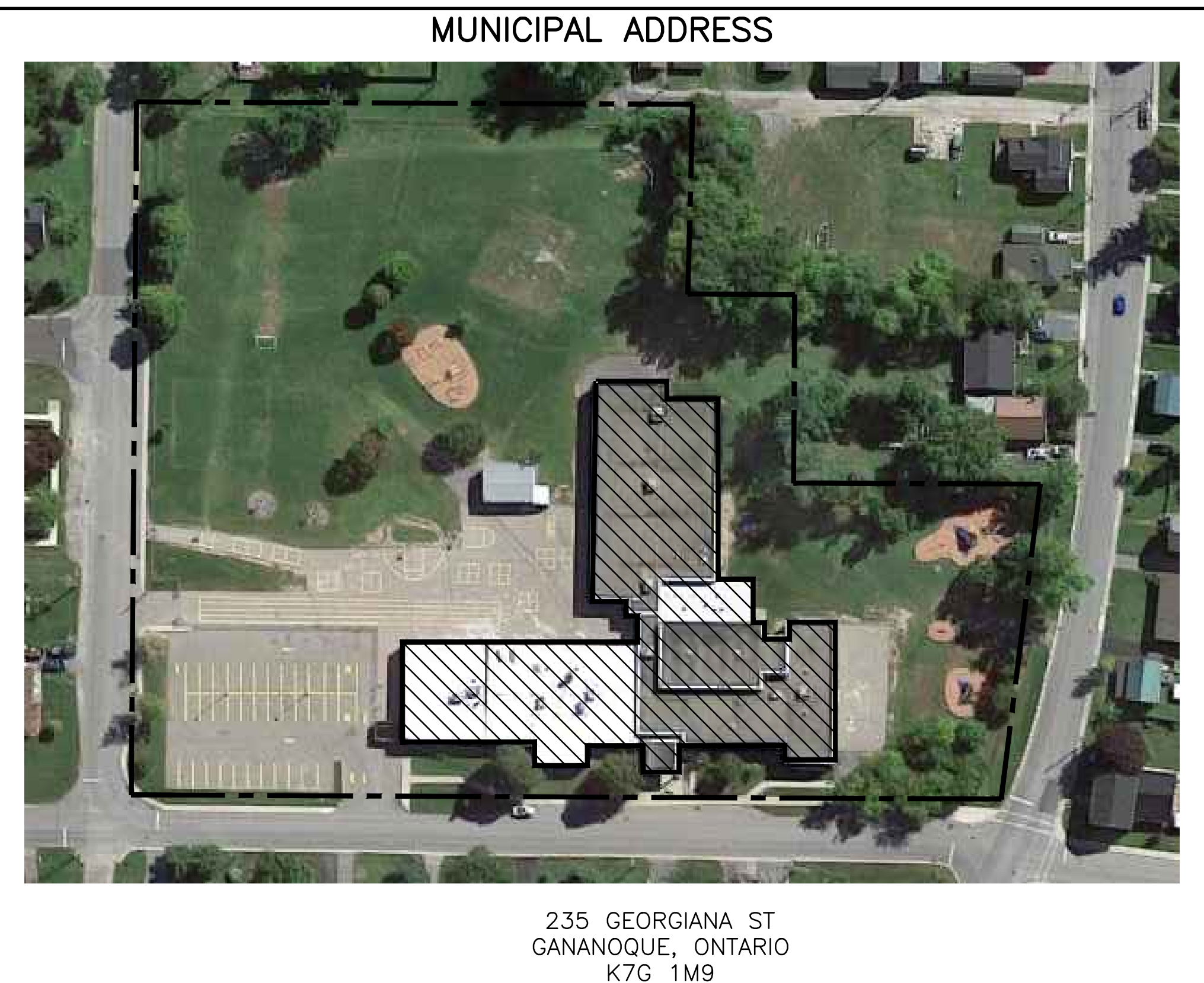
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	14	5	7	23	11	7	38	9	3	40	4
Future Volume (vph)	3	14	5	7	23	11	7	38	9	3	40	4
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	15	5	8	25	12	8	41	10	3	43	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	23	45	59	50								
Volume Left (vph)	3	8	8	3								
Volume Right (vph)	5	12	10	4								
Hadj (s)	-0.10	-0.12	-0.07	-0.04								
Departure Headway (s)	4.1	4.0	4.0	4.1								
Degree Utilization, x	0.03	0.05	0.07	0.06								
Capacity (veh/h)	854	865	868	865								
Control Delay (s)	7.2	7.2	7.3	7.3								
Approach Delay (s)	7.2	7.2	7.3	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			21.2%		ICU Level of Service				A			
Analysis Period (min)			15									

APPENDIX

C PROPOSED SITE PLAN



SITE DATA	
EXISTING LOT AREA	19,287.1 m ²
EXISTING FLOOR AREA	628.4 m ²
NEW ADDITION BUILDING AREA	3,154.5 m ²
EXISTING SCHOOL BUILDING AREA	3,792.8 m ²
TOTAL BUILDING AREA	3,792.8 m ²
LOT COVERAGE	19.61 %
TOPOGRAPHICAL AND SURVEY INFORMATION PROVIDED BY: JORDAN-BENNETT GEOMATICS INC. (613)342-7525 FAX office@jbgom.com File No: 180595 LEGAL DESCRIPTION:	



ZONING	
ZONING DESIGNATION: R (RESIDENTIAL) ZONE	
FRONT YARD DEPTH (MINIMUM)	4.5 M 9.47 M
EXTERIOR SIDE YARD WIDTH (MINIMUM)	7.0 M 7.0 M
REAR YARD DEPTH (MINIMUM)	1.2 M 26.95 M

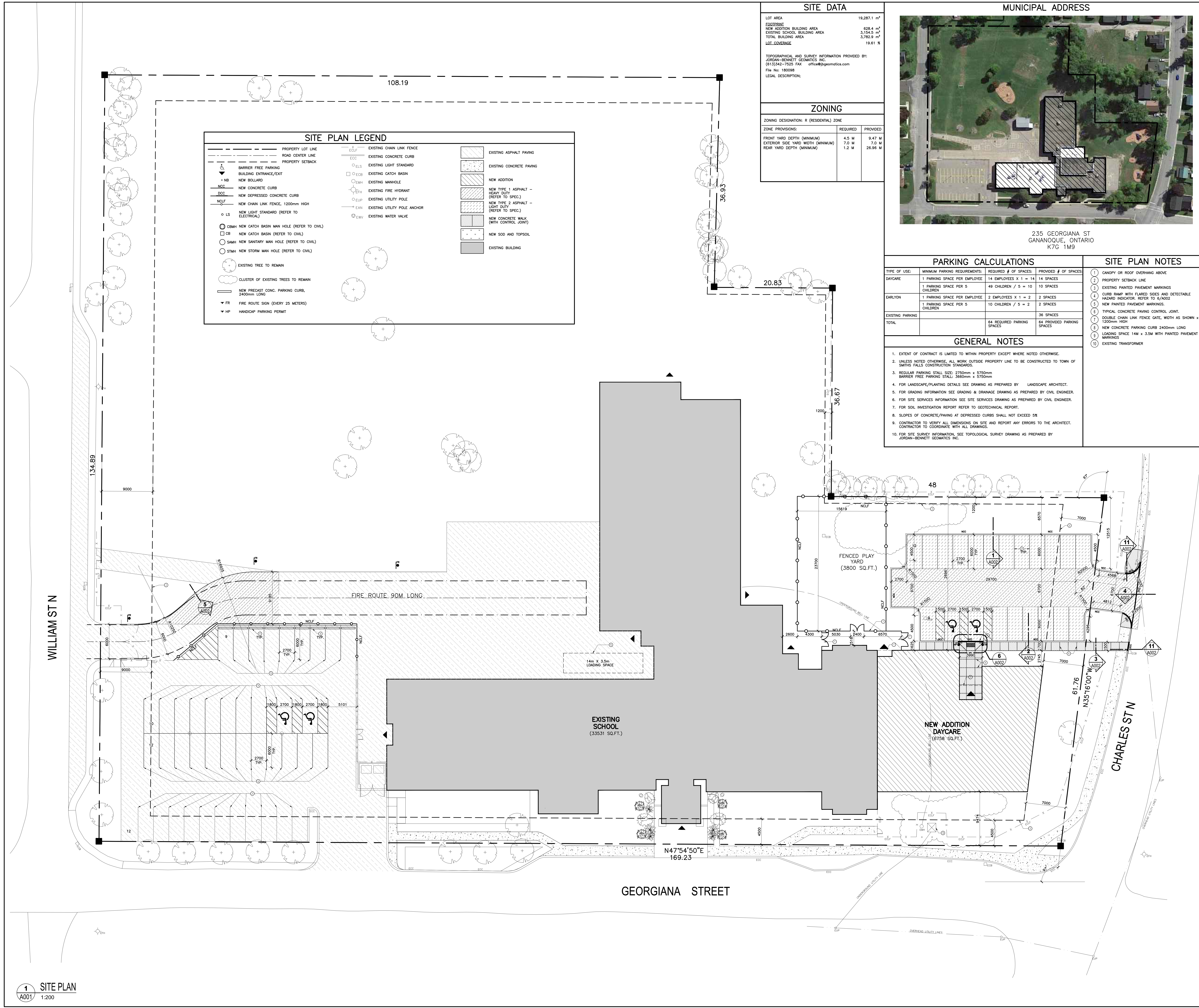
PARKING CALCULATIONS		
TYPE OF USE:	MINIMUM PARKING REQUIREMENTS:	REQUIRED # OF SPACES:
DAYCARE:	1 PARKING SPACE PER EMPLOYEE	14 EMPLOYEES X 1 = 14
	1 PARKING SPACE PER 5 CHILDREN	49 CHILDREN / 5 = 10
EARLYON:	1 PARKING SPACE PER EMPLOYEE	2 EMPLOYEES X 1 = 2
	1 PARKING SPACE PER 5 CHILDREN	10 CHILDREN / 5 = 2
EXISTING PARKING:		36 SPACES
TOTAL:	64 REQUIRED PARKING SPACES	64 PROVIDED PARKING SPACES

- SITE PLAN NOTES**
- CANOPY OR ROOF OVERHANG ABOVE
 - PROPERTY SETBACK LINE
 - EXISTING PAINTED PAVEMENT MARKINGS
 - HAZARD INDICATOR REFER TO 6/A002
 - NEW PAINTED PAVEMENT MARKINGS
 - TYPICAL CONCRETE PAVING CONTROL JOINT
 - DOUBLE CHAIN LINK FENCE GATE, WIDTH AS SHOWN X 1200mm HIGH
 - NEW CONCRETE PARKING CURB 2400mm LONG
 - LOADING SPACE 14M X 3.5M WITH PAINTED PAVEMENT MARKINGS
 - EXISTING TRANSFORMER

- GENERAL NOTES**
- EXTENT OF CONTRACT IS LIMITED TO WITHIN PROPERTY EXCEPT WHERE NOTED OTHERWISE.
 - UNLESS NOTED OTHERWISE, ALL WORK OUTSIDE PROPERTY LINE TO BE CONSTRUCTED TO TOWN OF SMITHS FALLS CONSTRUCTION STANDARDS.
 - REGULAR PARKING STALL SIZE: 2700mm x 5750mm
BARRIER FREE PARKING STALL: 3600mm x 5750mm
 - FOR LANDSCAPE/PLANTING DETAILS SEE DRAWING AS PREPARED BY LANDSCAPE ARCHITECT.
 - FOR GRADING INFORMATION SEE GRADING & DRAINAGE DRAWING AS PREPARED BY CIVIL ENGINEER.
 - FOR SITE SERVICES INFORMATION SEE SITE SERVICES DRAWING AS PREPARED BY CIVIL ENGINEER.
 - FOR SOIL INVESTIGATION REPORT REFER TO GEOTECHNICAL REPORT.
 - SLOPES OF CONCRETE/PAVING AT DEPRESSED CURBS SHALL NOT EXCEED 3%.
 - CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE AND REPORT ANY ERRORS TO THE ARCHITECT.
 - FOR SITE SURVEY INFORMATION, SEE TOPOLOGICAL SURVEY DRAWING AS PREPARED BY JORDAN-BENNETT GEOMATICS INC.

SITE PLAN LEGEND

--- PROPERTY LOT LINE	--- EXISTING CHAIN LINK FENCE	--- EXISTING ASPHALT PAVING
--- ROAD CENTER LINE	--- EXISTING CONCRETE CURB	--- EXISTING CONCRETE PAVING
--- PROPERTY SETBACK	--- EXISTING LIGHT STANDARD	--- NEW ADDITION
--- BARRIER FREE PARKING	--- EXISTING MANHOLE	--- NEW TYPE 1 ASPHALT - HEAVY DUTY (REFER TO SPEC.)
--- BUILDING ENTRANCE/EXIT	--- EXISTING DATCH BASIN	--- NEW TYPE 2 ASPHALT - LIGHT DUTY (REFER TO SPEC.)
--- NEW BOLLARD	--- EXISTING FIRE HYDRANT	--- NEW CONCRETE MULK (WITH CONTROL JOINT)
--- NEW CONCRETE CURB	--- EXISTING UTILITY POLE	--- NEW SOO AND TOPSOIL
--- NEW DEPRESSED CONCRETE CURB	--- EXISTING UTILITY POLE ANCHOR	--- EXISTING BUILDING
--- NEW CHAIN LINK FENCE, 1200mm HIGH	--- EXISTING WATER VALVE	
--- NEW LIGHT STANDARD (REFER TO ELECTRICAL)		
--- NEW CATCH BASIN MAN HOLE (REFER TO CIVIL)		
--- NEW CATCH BASIN (REFER TO CIVIL)		
--- NEW SANITARY MAN HOLE (REFER TO CIVIL)		
--- NEW STORM MAN HOLE (REFER TO CIVIL)		
--- EXISTING TREE TO REMAIN		
--- CLUSTER OF EXISTING TREES TO REMAIN		
--- NEW PRECAST CONC. PARKING CURB, 2400mm LONG		
--- FR FIRE ROUTE SIGN (EVERY 25 METERS)		
--- HP HANDICAP PARKING PERMIT		



NO.	REV.	DATE	ISSUE
1	0	2018/04/28	ISSUED FOR OWNER'S REVIEW

LES IDEES, CONCEPTS, DISPOSITIONS ET PLANS MONTRÉS OU REPRÉSENTÉS PAR CE Dessin APPARTIENNENT À EDWARD J. CUHACI AND ASSOCIATES ARCHITECTS INC. ET ONT ÉTÉ CRÉÉS, DÉVELOPPÉS POUR ÊTRE UTILISÉS DANS LE CADRE DU PRÉSENT PROJET. ILS NE DOIVENT PAS ÊTRE UTILISÉS À D'AUTRES FINS NI COMMUNIQUÉS À QUI QUE CE SOIT SANS LA PERMISSION ÉCRITE DE EDWARD J. CUHACI AND ASSOCIATES ARCHITECTS INC.

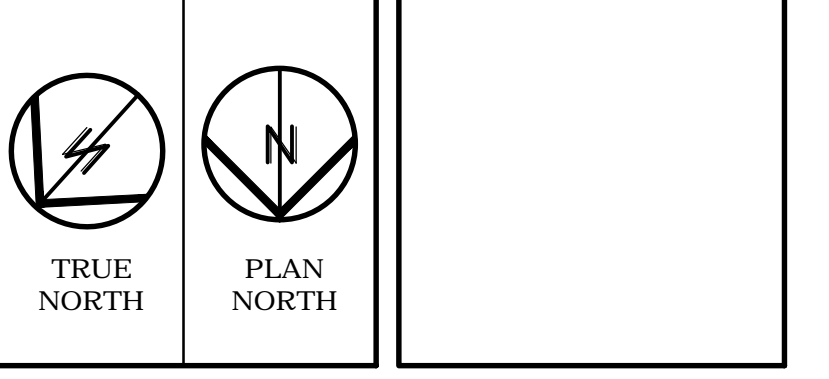
L'ARCHITECTE DÉCLINE TOUTE RESPONSABILITÉ DÉCOULANT DE PROBLÈMES FAISANT SUITE AU NON RESPECT DES PLANS ET DEVIS OU DE L'INTENTION DU CONCEPT QU'ILS TRANSMETTENT, OU DE TOUTS PROBLÈMES PROVENANT DE L'ÉTAPE DE TRAVAIL DE TRAVAIL D'OBTENIR OU DE SUIVRE LES INSTRUCTIONS DE L'ARCHITECTE RELATIVEMENT AUX DÉTAILS, OMISSIONS, INCONCISES, AMBIGÜES OU CONTRADICTIONS ALLÉGUÉES.

L'ENTREPRENEUR DOIT VÉRIFIER TOUTES LES DIMENSIONS SUR PLACE ET INFORMER L'ARCHITECTE DE TOUT ÉCART AVANT LE DÉBUT DES TRAVAUX. NE PAS MESURER LES DESSINS À L'ÉCHELLE.

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CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.



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Fax: (613) 238-1944 Telephone: (613) 238-7135 E-mail: eh@edjca.com

PROJECT TITLE/TITRE DU PROJET
ST. JOSEPH CATHOLIC SCHOOL - ADDITION
235 GEORGIANA ST, GANANOQUE, ONTARIO

CATHOLIC DISTRICT SCHOOL BOARD OF EASTERN ONTARIO
2755 HIGHWAY 43 KEMPTVILLE, ONTARIO

DRAWING TITLE/TITRE DU DESSIN
SITE PLAN

SCALE / ÉCHELLE	AS SHOWN	PROJ. No.	1822	ISSUE No.	-	REV. No.	-
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