BURNSIDE

Sheridan Park Drive Extension Municipal Class Environmental Assessment

Project File Report

City of Mississauga

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City of Mississauga

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Record of Revisions

Revision	Date	Description
0	August 25, 2017	Initial Submission to City (Progress Report 1)
1	December 12, 2017	Second Submission to City (Progress Report 2)
2	January 10, 2018	Final Draft Submission to City
3	January 12, 2018	Draft Executive Summary Submission to Agencies
4	February 5, 2018	Final Report for 30-Day Public Review Period

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Executive Summary

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 and 2015), which is an approved process under the Ontario *Environmental Assessment Act, 1990.*

Description of the Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive / Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City-owned right-of-way (ROW).

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Planning Overview

This Study is a step in the ongoing implementation of the City of Mississauga's Strategic Plan process as well as the City's Official Plan and the Draft Sheridan Park Land Use Master Plan. The objective of these plans is to create complete, multi-modal oriented communities that are a meaningful place for all citizens and also continues to attract businesses, growth and investment into the cities key industries, while meeting employment needs.

In addition to these municipal planning initiatives, the Study has considered applicable provincial and regional planning policies including the Provincial Policy Statement, the Growth Plan for the Greater Golden Horseshoe, Region of Peel Strategic Plan, Moving Mississauga and the City's Cycling Master Plan.

Problem / Opportunity Statement

Through this Study, the City is exploring the opportunity to connect the east and west sections of Sheridan Park Drive to create options for alternate routes. At present, the east-west accesses through the neighbourhood are via Homelands Drive (through a residential neighbourhood) or Speakman Drive (through the business park). The implementation of this link would be an important piece of the City's overall road network, which would improve the connectivity in Sheridan Park and the surrounding commercial areas and create an overall reduction of traffic and alternative route to reduce traffic in the Sheridan Homelands neighbourhood. Linking the east and west segments of Sheridan Park Drive will also improve access for emergency services within the Study Area.

The science and technology facilities in Sheridan Park will continue to develop to support the growth of a contemporary science and business park, and new office uses may also be developed. At the same time, the natural areas of Sheridan Park should be protected while continuing to provide aesthetic benefits to the employees within Sheridan Park.

Through this EA, the City has an opportunity to:

- Improve network redundancy in the wider road network to improve traffic flow and increase access routes for emergency services;
- Support multi-modal transportation and encourage transit;
- Reduce traffic volumes in the Sheridan Homelands neighbourhood; and
- Maintain the natural feel and recreational benefits of the Study Area by minimizing impacts to existing natural heritage features and introducing low impact development features and plantings to increase biodiversity.

Transportation and Traffic Analysis

A Transportation and Traffic Analysis Report was completed as part of the EA Study in order to assess both the existing and future predicted traffic conditions within the Transportation Study Area, which varies slightly from the EA Study Area described above and is generally bound by Homeland Drive to the north, Speakman Drive to the south, Erin Mills Parkway to the east and Winston Churchill Boulevard to the west.

Key findings from a review of the traffic conditions are:

- The extension of Sheridan Park Drive will divert traffic from the Sheridan Homelands neighborhood and results in Sheridan Homelands neighborhood traffic utilizing the extension.
- The extension of Sheridan Park Drive will provide additional network capacity for all modes of transportation.

- The extension of Sheridan Park Drive will improve access to the growing Sheridan Park Corporate Centre.
- A proposed westbound right turn lane on Sheridan Park Drive at the intersection with Winston Churchill Boulevard will address afternoon congestion.
- A proposed advanced eastbound / westbound left turn phase at the Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way intersection will address afternoon congestion and improve overall safety.

The City's EMME Travel Demand Model was utilized to project traffic volumes for 2021 and 2031 horizon years for three possible future network scenarios:

- Do-nothing scenario – the Do-nothing scenario (assumes 4 lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
- Sheridan Park Drive Extension (with 4 lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).
- Speakman Drive widening to 4 lanes (no Sheridan Park Drive extension, 4 lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

The 2021 horizon year model runs were utilized to compare the impacts of the three possible future network scenarios. This assessment was completed as a sensitivity analysis to understand how the proposed road network changes may impact travel along Homelands Drive / Sheridan Residential Neighbourhood. The key findings are as follows:

- The traffic along Homelands Drive will decrease by approximately 2% (4 vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction during AM peak hours and by approximately 3% (10 vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction during PM peak hours with the Sheridan Park Drive Extension in place as compared to the Do-nothing scenario.
- The widening of Speakman Drive to 4 lanes generally results in an increase in traffic along Homelands Drive as compared to the Sheridan Park Drive Extension scenario with approximately 16% (40 vehicles) more traffic in the eastbound direction and 18% (36 vehicles) in the westbound direction during AM peak hours and with approximately 3% (10 vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction during PM peak hours.
- The greatest reduction in traffic will occur on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions) in the AM peak hours and by approximately 25% (average in both directions) in the PM peak hours with Sheridan Park Drive Extension in place as compared to the Do-nothing scenario.
- The number of through trips ('cut through' traffic) utilizing Homelands Drive is projected to decrease with the Sheridan Park Drive Extension in place by

approximately 17% in the AM peak hour and 13% in the PM peak hour as compared to the Do-nothing scenario. In comparison, the Speakman Drive widening to 4 lanes scenario, results in a 22% increase (AM peak hour) and 9% increase (PM peak hour) in the number of through trips using Homelands Drive as compared to the Do-nothing scenario.

- The Sheridan Park Drive Extension will play an important role in providing additional access to and from the Sheridan Homelands Residential Community. Approximately 77% of the trips during the AM peak hour and 72% of the trips during the PM peak hour that utilize the Sheridan Park Drive Extension either originate from or are destined to Sheridan Homelands neighbourhood. This results in an increase in traffic on the eastern end of Homelands Drive (east of Thorn Lodge Drive east intersection) by approximately 24% and 40% for AM and PM peak hours respectively (average for both directions) as the residential community travel patterns change and they divert to this section of Homelands Drive to access the extension. However, there is a corresponding drop in traffic on the western section of Homelands Drive.

In conclusion, the results indicate that the Sheridan Park Drive Extension will play an important role in providing additional opportunities for residents living in the Sheridan Homelands neighbourhood to access their neighbourhood. The extension results in an overall reduction in traffic along sections of Homelands Drive and in addition results in a decrease in through traffic on sections of Homelands Drive. The widening of Speakman Drive to 4 lanes generally does not provide a benefit to the residents living in the Sheridan Homelands neighbourhood as it does not reduce the amount of traffic utilizing Homelands Drive.

Through previous work undertaken by the Region of Peel, the need for an exclusive westbound right turn lane at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection was identified and has been added to their Development Charges Study. This was confirmed as part of the review of existing traffic conditions and has been carried as a proposed improvement as part of this Study.

Future traffic operations were assessed based on the 2021 and 2031 traffic forecasts for the AM and PM peak hours. The following road network improvements are recommended:

- To improve operations at Sheridan Park Drive / Speakman Drive intersection, a roundabout is recommended to be installed as part of the proposed Sheridan Park Drive Extension.
- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. Eastbound and westbound left turn lanes could be installed to improve operations; however, the best improvement for this intersection would be a roundabout. Even if the extension was not in place, a roundabout would be required by 2031.

- At the Sheridan Park Drive / Fifth Line intersection, delays will be experience with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required by plus the installation of traffic signals. Without the Extension, eastbound and westbound left turn lanes would need to be installed by 2021; and the traffic signals would be required by 2031.

Safety Performance Review

A safety performance review was conducted at six intersections within the Transportation Study Area to identify any safety issues and deficiencies, locations with higher collision rates than projected, and to identify any potential mitigation measures. The six intersections included in the safety performance review are: Erin Mills Parkway / Sheridan Park Drive; Winston Churchill Boulevard / Sheridan Park Drive; Fifth Line West / Sheridan Park Drive; Homelands Drive / Sheridan Park Drive / Speakman Drive; Hadwen Road / Speakman Drive; and Speakman Drive / Flavelle Boulevard. A field investigation was undertaken as well as a review of collision history provided by the City and Region for the years 2010 through 2014 (five years of data).

Over the five years, there were a total of 121 collisions at the six intersections reviewed. Collisions were either property damage (85% of collisions) or injury (15% of collisions) and there were no fatalities. The Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way intersection experienced the highest number of collisions at 74 (60% of all collisions in the study area). To improve safety, the Region of Peel could consider left turn advances on the east-west traffic signal phase.

The Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection experienced the second highest number of collisions at 31 (26% of all collisions in the Study Area). However, this intersection is experiencing an average number of collisions as to what would be projected for a similar intersection.

The proposed roundabouts will enhance road safety within the neighbourhood.

Description of the Existing Environment

Transportation and Built Environments

Sheridan Park Drive is an east-west major collector road with a two lane cross-section. The road intersects Erin Mills Parkway in the east and Winston Churchill Boulevard in the west; however, at present the road terminates in two places where it intersects with Speakman Drive. Speakman Drive is a minor collector road with a two lane cross-section. Homelands Drive is an east-west minor collector road with a two lane cross-section that intersects with Sheridan Park Drive and Winston Churchill Boulevard. Thorn

Lodge Drive is also a minor collector road that connects at both ends to Homelands Drive.

The City maintains a paved MUT that runs through the Study Area within the utility corridor from Winston Churchill Boulevard to Homelands Drive / Speakman Drive. The MUT is part of the Sheridan Trail that was developed through the City's Cycling Master Plan. This section of the trail continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides opportunities for active transportation within the Study Area including walking, jogging, cycling and roller skating. The Sheridan Trail is actively used by local residents, employees and recreational / commuter cyclists.

There are several existing utilities within the Study Area and surrounding lands. Alectra Utilities Inc. operates two above ground hydro lines that traverse the Study Area in an east-west direction. Enbridge Gas operates a natural gas main within the Study Area that runs approximately 280 m east of Winston Churchill Boulevard through the City-owned ROW before it turns north and continues east along the utility corridor. There are existing Bell Canada telecommunications services within the City-owned ROW running through the west end of the Study Area to service the properties in the west end of Sheridan Park. There are also Bell Canada services along the west side of Speakman Drive and the east side of Homelands Drive. Lastly, there are existing underground municipal services within the Study Area including sanitary sewers and watermains.

Stormwater Management and Drainage

Sheridan Park Drive is located within the headwaters area of Sheridan Creek, which connects to Lake Ontario through the Rattray Marsh Conservation Area, some 6 km downstream of the Study Area. The channel meanders through a heavily urbanized area of Mississauga. There are remnants of natural drainage systems within the Study Area, but the area is drained predominantly by engineered drainage systems. There are two main storm sewer systems that drain the Sheridan Homelands subdivision through the Study Area. One system drains the westerly portion of the Sheridan Homelands development and the section of Sheridan Park Drive abutting Winston Churchill Boulevard, which currently terminates at Speakman Drive. The second system drains the easterly portion of the Sheridan Homelands development through the Study Area.

The development of these lands resulted in the conversion of open channels to a combination of storm sewers, to convey minor storms, and overland flow routes in the form of roads, with curbs, to convey major storm events to a suitable outlet. Based on information provided by the City, the minor storm sewer system appears to be based on the 1:10-year storm.

Physical Environment

The Study Area is located within the broad, low-lying area known as the Iroquois Plain physiographic region of southern Ontario. Ministry of Environment and Climate Change (MOECC) water well records in the area of the Study Area indicate that the area is generally underlain by till and shale formations (red or grey in colour), the latter of which typically contained the water table.

Natural Environment

For the purposes of the Natural Environment Assessment, existing terrestrial and aquatic environment features were assessed within two defined areas: the Study Area, which includes the proposed road extension area and lands within approximately 120 m of the proposed road extension; and, the Study Area Vicinity, which includes lands within approximately 500 m of the proposed road extension beyond the boundaries of the Study Area and therefore outside the proposed road extension area.

Terrestrial Environment

Vegetation communities were characterized using the Ecological Land Classification system at the ecosite level for the Study Area using protocols outlined in Lee *et al*. (1998). Three vegetation community types were identified in the Study Area, split between eight distinct vegetation community polygons. The communities identified were:

- Fresh-Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest (FOD9-1 / FOD9-4);
- Cultural Thicket (CUT); and
- Cultural Meadow (CUM).

Significant Woodland was identified within the Study Area and confirmed during field studies to extend into the City-owned ROW. The extent of the Significant Woodland within the ROW is 0.44 ha; however, based on the preliminary preferred design plan, less than 0.05 ha of the Significant Woodland would be impacted by the proposed road extension.

Breeding bird surveys were completed following the general principles outlined in the Ontario Breeding Bird Atlas (OBBA) Guide for Participants (OBBA, 2001), tailored to the needs of this project. A total of 29 summer resident bird species exhibiting some level of breeding evidence were observed in the Study Area during the breeding bird surveys conducted in 2017. Two bird species listed as either provincially and/or federally significant were observed in the Study Area during the breeding bird surveys: Eastern Wood-pewee (*Contopus virens*) (Special Concern) and Barn Swallow (Threatened).

Suitable nesting habitat is present for Eastern Wood-pewee in the FOD9-1 / FOD9-4 ecosites of the Study Area.

No amphibians were heard calling during any of the monitoring events and no significant amphibian breeding habitat was identified within the Study Area.

Bat habitat surveys were conducted based the Ministry of Natural Resources and Forestry (MNRF) April 2017 Survey Protocol for Species at Risk Bats within Treed Habitats for Three of Ontario's Four Endangered Bat Species (Little Brown Myotis – *Myotis lucifugus*; Northern Myotis – *Myotis septontrionalis*; Tri-colored Bat – *Perimyotis subflavus*) (MNRF, 2017). Leaf-off surveys for bat maternity habitat (BMH) identified 19 candidate habitat trees for Northern Myotis and Little Brown Myotis and leaf on surveys found eight suitable habitat trees for Tri-colored Bat within the corridor of anticipated road impacts. Removal of candidate BMH trees will require appropriate compensation during the appropriate timing windows, including the installation of bat house(s) to compensate for loss of habitat. The recommended approach from MNRF includes proactive establishment of alternate bat habitat features within the Study Area to avoid the requirement for permitting under the ESA. The Study Team has recommended compensation for the removal of the eight trees with a combination of either bat boxes or artificial bark at a 1:1 ratio. At the time of preparing this Project File, this recommendation was provided to MNRF for approval. The details of this compensation will be confirmed through correspondence with MNRF during the detailed design phase of the Project.

191 trees of 10 cm diameter at breast height (DBH) or greater were inventoried as part of the Study. 27 species were observed (approximately 62% native to Ontario). No tree Species at Risk (SAR) were present. Based on the preliminary preferred design plan, some trees would need to be removed, while others can be protected and/or preserved. Approximately 62% of the trees for removal are Green Ash. There is concern about the long term survivability of Green Ash throughout most of Ontario due to Emerald Ash Borer (EAB). The City's policy is to remove ash species where necessary during construction due to their short lifespan.

A Tree Preservation Plan has been prepared, which provides a number of mitigation measures to prevent impacts to the root zones of trees adjacent to the proposed road extension that are being preserved. The extent of vegetation removal must be clearly delineated. All vegetation must be cut in a way that it stays within the work zone. Tree protection and Erosion and Sediment Control (ESC) measures shall be installed prior to Site disturbance. Tree protection hoarding is recommended for the work zone adjacent to woodlots and shall be installed based on City Standards. Inspection of tree protection measures shall be undertaken and coordinated with ESC measures. An arborist will review all trees adjacent to the work zone prior to the opening of the road extension for use by the general public to inspect for damaged branches or trunks that may damage or injury.

Compensation and mitigation plantings will be implemented as follows:

- New trees will be planted along the roadside as streetscaping with trees installed 12 m on centre in conformity with the Transportation Association of Canada;
- Shrubs planted where the new road interfaces with the two woodlots; and
- Shrubs installed within the meadow area in the central portion of the Study Area.

Based on the existing species and vegetation community attributes of the area, a replacement value of 2:1 trees was determined to be appropriate as part of the proposed project. The total number of replacement trees will be confirmed during the detailed design phase of the Project. Replacement trees will be planted to the extent possible within the City-owned ROW of the road extension corridor. The City will explore opportunities to plant the remainder of the replacement trees as a suitable off-Site location as necessary. A possible method of determining the number of replacement trees required is to use the Trunk Formula Method of the International Society of Arboriculture (ISA). The ISA formula takes into consideration a variety of factors to determine the value of a tree, including size, age, species, health, and location. It is not possible to recreate the forest edge immediately but the goal is to both replace and improve the habitat features by providing Site-specific restoration recommendations to ensure no net loss of forest within the Study Area.

Aquatic Environment

The aquatic environment in the Study Area comprised of two watercourses and three headwater features of Sheridan Creek. All watercourses flow generally from northwest to southeast through the Study Area. No fish were observed during field investigations and subject aquatic features appear to provide little to no potential to support direct fish habitat.

Significant Wildlife Habitat and Species at Risk

The four categories of Significant Wildlife Habitat (SWH) are identified as:

1. Habitats of seasonal concentrations of animals;
2. Rare vegetation communities or specialized habitat for wildlife;
3. Habitat of Species of Conservation Concern; and
4. Animal movement corridors.

Confirmed and candidate SWH were found in the Study Area and Study Area Vicinity.

Two SAR were identified as being potentially present in the Study Area Vicinity but not within the Study Area itself; therefore outside the area that would be impacted by the proposed road extension. These species are Barn Swallow and Chimney Swift.

Socio-Economic Environment

Within the Study Area, over 2,700 people are currently employed in Sheridan Park Corporate Centre (which is classified as a regionally significant center of business). The key existing economic clusters within the City include life sciences and CIT (community, information and technology), both of which are represented in Sheridan Park.

The Sheridan Homelands neighborhood consists of over 2,000 households, bounded to the north by Dundas Street, to the east by Erin Mills Parkway, to the south by the utility corridor, and to the west by Winston Churchill Boulevard. This area has a vibrant community lead by the Sheridan Homelands Ratepayers' Association (SHORA).

Archaeology and Built Heritage

The Stage 1 Archaeological Assessment determined that no previously registered archaeological sites are located within 1 km of the Study Area; however, four sites are within 2 km of the Study Area. According to the background research, no previous reports detail fieldwork was undertaken within 50 m of the Study Area. The property inspection completed on May 12, 2017 determined that parts of the Study Area exhibit archaeological potential and will require Stage 2 assessment prior to development. The remainder of the Study Area has been subjected to deep soil disturbance events associated with the construction of the existing ROWs, MUT, and buried utilities and do not retain archaeological potential. A Stage 2 Archaeological Assessment was undertaken and determined that there are no archaeological resources present within the areas of impact of the proposed road extension and no further investigation is required.

A Cultural Heritage Resource Assessment was completed for the Study Area through which Sheridan Park was identified as a cultural heritage landscape. However, no significant cultural heritage impacts to this resource will result from the proposed extension of Sheridan Park Drive.

Air Quality

An Air Quality Impact Assessment was completed as part of this Study. Based on the forecasted 2031 traffic volumes, future predicted air quality levels with and without a road extension were compared to the existing air quality levels to understand the impact of a potential road extension on local air quality. Typical contaminants from automobile exhaust were evaluated including Particulate Matter (PM2.5 and PM10), Total

Suspended Particulates (TSP), Nitrogen Oxides (NOx), Carbon Monoxide (CO), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde.

The future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) were all below the MOECC criteria with the exception of Benzene, which already exceeds the criteria based on background air quality.

The Air Quality Assessment shows that change in concentration of benzene at any location in the Study Area is negligible. The variability in the National Air Pollution Surveillance (NAPS) background measurements (standard deviation of 0.22 $\mu g/m^3$) is much higher than the predicted change in impact (0.0003 $\mu g/m^3$ worst case impact). The background benzene concentration is continuing to fall as shown in Figure 19 of the Air Quality in Ontario 2015 Report. As a result, based on the analysis, there is no expectation that the benzene concentration will increase because of the project.

It should be noted that the elevated Benzene levels detected are not isolated to the Sheridan Park area, but observed all over the Province. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level. Local reductions have a limited effect as a result reducing benzene concentrations requires a provincial solution. According to Air Quality in Ontario 2015 Report published by the MOECC, over the 10 year period from 2005 to 2014, benzene concentrations have decreased 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial / commercial operations emitting benzene in the vicinity of the project area.

Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the city.

Noise

As part of the Sheridan Park Drive Extension EA, a noise study was undertaken to determine noise impacts as a result of the proposed Sheridan Park Drive extension. The future predicted noise levels at Points of Reception (PORs) were found to be no more than 1 dBA greater than the existing noise levels. Therefore, the extension has negligible impact on the noise levels in the neighbourhood. In general, sound level increases of less than 3 dBA are not noticeable to the human ear. Since the predicted future noise levels are below the MTO Noise Guide and City Noise Policy, no noise mitigation measures (sound barriers) are required. The City has committed to post-construction monitoring of sound levels within the Study Area to confirm the findings of this analysis.

Phase One Environmental Site Assessment

A Phase One Environmental Site Assessment (ESA) was completed to identify and document the current and historical environmental conditions of the Site and assess the risk from both on-Site and off-Site sources of contamination. Based on the information collected as part of this Phase One ESA, the Study Area was agricultural in 1880 and the area within the City-owned ROW (the Site) has been vacant since 1934. There were no underground storage tanks or aboveground storage tanks identified on the Site currently or historically. There were no Potentially Contaminating Activities identified on the Site. The records review, interview and Site visit indicate there are no Areas of Potential Environmental Concern on the Site.

Assessment of Alternative Solutions

The following alternative solutions were identified to address the Project Opportunity Statement:

- Alternative 1 – Do Nothing;
- Alternative 2 – Limit / Manage Growth;
- Alternative 3 – Extend Roadway; and
- Alternative 4 – Provide Alternative Routes for Existing and Future Traffic

The evaluation of the Alternative solutions was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during the study process.

Alternative 1 (Do Nothing) and **Alternative 2** (Limit / Manage Growth) are unable to address the Project Opportunity Statement with the exception of preserving the natural feel and recreational benefits of the Study Area.

Alternative 3 (Extend Sheridan Park Drive) can fully address the Project Opportunity Statement, because it:

- Supports multi-modal transportation for all users;
- Has the potential to divert traffic from the residential neighbourhood;
- Improves network redundancy;
- Improves access to the Study Area; and
- Will preserve the natural feel and recreational benefits of the Study Area by implementing appropriate mitigation.

Alternative 4 (Improve Alternative Routes, e.g., Speakman Drive or North Sheridan Way) partially addresses the Project Opportunity Statement as it supports multi-modal transportation; however, it does not improve network redundancy or improve access to the Study Area. Based on the traffic analysis, widening Speakman Drive to four lanes does not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive. Even with widening Speakman Drive, the traffic analysis indicates that there will be an increase of 22% in the AM peak hour and 9% in the PM peak hour on Homelands Drive without the extension in place. As a result, widening Speakman Drive will serve the Sheridan Park Corporate Centre only.

Similarly, it is not expected that the widening of North Sheridan Way would provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive.

Through a process of evaluating alternative solutions, the Study Team identified **Alternative 3**, extending Sheridan Park Drive, as the preferred solution as it provides several benefits for the Study Area. Specifically, the extension will improve network connectivity, increase access to a growing Sheridan Park, encourage walking, cycling and transit, potentially divert traffic from the adjacent neighbourhood, preserve the natural look and recreational benefits of the Study Area and at the same time, minimize negative impacts to local wildlife and the natural spaces in the area.

The Sheridan Park Drive extension will play an important role in providing additional access to and from the residential community. The traffic analysis indicates approximately 77% of trips along the extension in the AM peak hour and 72% in the PM peak hour originate from or are destined to the Sheridan Homelands neighbourhood. Further, there is an overall reduction of vehicles along Homelands Drive (e.g., from Winston Churchill Boulevard to Thorn Lodge Drive east) as compared to no Sheridan Park Drive extension.

Study Consultation

A wide range of stakeholders were identified and contacted at the onset of the study and during the EA process including relevant review agencies and organizations, Indigenous communities and local residents who may be affected or have interest in the study. These stakeholders were contacted through direct distribution of notices as well as publications within local newspapers and on the City of Mississauga website. A number of consultation activities were undertaken. The table below details the consultation program:

EA Phase 1 Consultation		
Date	**Correspondence**	**Recipients / Distribution**
January 24, 2017	Information Letter, Project Response Form and Notice of Commencement	Property Owners, Resident Ratepayers, Potentially Interested Organizations, Review agencies and Indigenous communities. In addition to 33 review agencies and organizations, notices were mailed to approximately 860 property owners and resident ratepayers in the vicinity of the Study Area.
January 26, 2017 and February 2, 2017	Notice of Study Commencement	Mississauga News.
January 26, 2017	Online Study Commencement Survey	Property Owners, Resident Ratepayers, Potentially Interested Organizations, Review agencies and Indigenous communities were informed of the availability of the Online Study Commencement Survey through the distribution of the Notice of Study Commencement.
EA Phase 2 Consultation		
Date	**Correspondence**	**Recipients / Distribution**
June 12, 2017 (mail) and June 15, 2017 (emailed)	Notice of Public Information Centre (PIC)	Property Owners, Resident Ratepayers, Potentially Interested Organizations, Review agencies, and Indigenous communities In addition to 34 review agencies and organizations, notices were mailed to approximately

		860 property owners and resident ratepayers in the vicinity of the Study Area.
June 15, 2017 and June 22, 2017	Notice of PIC	Mississauga News
October 19, 2017	Notice of Availability of PIC Summary Report	All participants of PIC

A study commencement online survey was indicated in the Notice of Study Commencement (NOCm) and available for completion on the City of Mississauga website. The survey was designed to help gather input on the study and potential extension of Sheridan Park Drive at the onset of the study. The online survey received 133 responses in total. In general, survey respondents noted the following things were important to them if the roadway is extended: 24% maintaining natural features; 19% landscaping; 18% speed management; 18% pedestrian facilities; 14% cycling; and 7% other. 65% of the respondents indicated that they were comfortable with roundabouts. The key comments received from the online survey were that respondents were concerned about the impact to existing natural spaces and wildlife; felt that the extension would decrease traffic and speeding through the Homelands neighbourhood; and concerns about the potential increases safety risk to residents, cyclists and pedestrians.

The Public Information Centre (PIC) was held on June 27, 2017 from 6:00 pm to approximately 8:00 pm and was attended by approximately 97 people including local residents, representatives from Sheridan Homelands Ratepayers Association, Sheridan Park Association and Councillor Ras. The PIC was arranged primarily as an open house style session where participants were given the opportunity to review the display boards and representatives from the Study Team were available to answer questions and discuss the project with interested members of the public on a one-on-one basis or in small groups. A presentation was made by City staff followed by a group discussion.

There were 56 written comment responses received during the comment period following the PIC. The table below provides a summary of the key issues that were raised and the Project Team response to these issues.

Comment	Project Team Response
Safety	
Pedestrian safety	Designated pedestrian crossings will be provided at proposed intersection locations which are located at Speakman Drive and at Homelands Drive / Speakman Drive.

Comment	Project Team Response
	Roundabouts are proposed at the two intersection locations. Roundabouts provide a safe pedestrian crossing as only one direction of traffic is crossed at a time by a pedestrian. In addition, vehicles slow down to navigate a roundabout, decreasing travel speed within the intersection and crosswalks. As part of this project, the existing multi-use trail is to be maintained in its current location to support pedestrian and cycling activity. It is located on average 15 to 20 m north from the proposed extension and will be separated by a combination of the existing vegetation as well as new plantings.
Speeding along extension	A variety of speed management features are being considered. Wide medians are proposed to mitigate potential speeding, as vehicles will be required to slow down to navigate around the medians. In addition, roundabouts are proposed for both ends of the extension, which will also control speeding, as vehicles will be required to slow down in order to enter and circulate through the roundabout.
Air Quality	
Local air quality	An Air Quality Impact Assessment has been completed for this project. Based on the forecasted 2031 traffic volumes, future predicted air quality levels with and without a road extension were compared to the existing air quality levels to understand the impact of a potential road extension on local air quality. Typical contaminants from automobile exhaust were evaluated including Particulate Matter (PM2.5 and PM10), Total Suspended Particulates (TSP), Nitrogen Oxides (NOx), Carbon Monoxide (CO), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde. The future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) **were all below the MOECC criteria with the exception of Benzene, which already exceeds the criteria based on background air quality.** The Air Quality Assessment shows that change in concentration of benzene at any location in the Study Area is negligible. The variability in the National Air Pollution

Comment	Project Team Response
	Surveillance (NAPS) background measurements (standard deviation of 0.22 µg/m^3) is much higher than the predicted change in impact (0.0003 µg/m^3 worst case impact). The background benzene concentration is continuing to fall as shown in Figure 19 of the Air Quality in Ontario 2015 Report. As a result, based on the analysis, **there is no expectation that the benzene concentration will increase because of the project**. It should be noted that the **elevated Benzene levels detected are not isolated to the Sheridan Park area, but observed all over the Province**. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level. Local reductions have a limited effect as a result reducing benzene concentrations requires a provincial solution. According to Air Quality in Ontario 2015 Report published by the MOECC, over the 10 year period from 2005 to 2014, benzene concentrations have decreased 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial / commercial operations emitting benzene in the vicinity of the project area. Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the city.
Noise	
Increase in noise levels	Based on the forecasted 2031 traffic volumes, the future predicted noise levels at the closest POR were found to be **no more than 1 dBA** greater than the existing noise levels. Therefore, **the extension has negligible impact on the noise levels in the neighbourhood**. In general, sound level increases of less than 3 dBA are not noticeable to the human ear.

Comment	Project Team Response
	A Noise Impact Assessment has been completed within the Study Area. The existing noise levels were measured at various POR in the Study Area (e.g., at fence line of residential house). The existing noise levels at this POR were found to be 47 dBA during daytime hours (7:00 AM-11:00 PM) and 40 dBA during nigh time hours (11:00 PM-7:00 AM). The predicted future noise levels are below provincial and City of Mississauga standards. No noise mitigation measures (sound barriers) are required.
Environment	
Impacts to the natural areas	The project is being carried out to balance several objectives. The protection of and minimization of negative impacts to the environment is one of the important objectives of the study. The proposed alignment of the Sheridan Park Drive extension as illustrated on the Preliminary Preferred Design Plan (as presented at the PIC on June 27, 2017) has avoided encroachment into the private wooded areas. **Approximately 114 trees will need to be removed** within the City-owned lands. 62% of these trees to be removed are Ash trees. Currently the City is focusing on City-owned ash tree removals in high risk areas next to roadways, trails and paths, homes, schools and buildings / facilities. All trees being removed will be **replaced at a 2:1 ratio**, of varying maturity and species. Wherever possible, existing trees can be preserved by implementing tree protection measures during construction. It is expected that the existing trees between the MUT and proposed roadway will be maintained. The proposed medians provide the opportunity to implement additional landscaping and low impact development (LID). LID is a design approach to manage stormwater runoff and emphasizes conservation and use of on-site natural features to protect water quality. Proper mitigation measures will be implemented to minimize any potential negative impacts to wildlife in the Study Area. The road extension is proposed to be narrowed in areas to reduce impacts to wooded and meadow areas within the City-owned lands.

Comment	Project Team Response
	There are **no Provincially Significant Wetlands, Areas of Natural or Scientific Interest or Environmentally Significant Areas**. No Threatened or Endangered SAR were observed. There are three wooded areas southeast of the Sheridan Park Drive ROW that are designated as Significant Natural Areas in the City's Natural Areas System (2017 Update).
Impacts to views from homes (back onto utility corridor)	There will be **no impacts to the views of the residents** that back onto the existing utility corridor. The ROW of the extension will run parallel to the MUT on the south side of the utility corridor. The MUT will be separated from the proposed extension by a combination of the existing vegetation as well as new plantings.
Justification of Proposed Extension	
Why the extension is being considered	The Sheridan Park Drive extension has been in the City's Official Plan since 1987. All of the City's roadway initiatives are reviewed yearly and prioritized. The recently completed draft Sheridan Park Land Use Master Plan has provided additional guidance on the future vision of Sheridan Park Corporate Centre. Therefore, the City determined that it was appropriate to review the needs, opportunities and impacts of this corridor given the new policy and zoning regulations in the Sheridan Park Corporate Centre and existing Homelands neighbourhood.
No destinations on the road extension	The primary function of the proposed Sheridan Park Drive extension is to provide an alternate route for the Study Area and provide redundancy in the broader road network rather than providing access to a specific destination on the road extension itself. In addition to providing increased connectivity within Sheridan Park Corporate Centre and Sheridan Homelands neighbourhood, the road extension will also provide an alternate route for destinations east and west of the Study Area. This will assist with minimizing traffic infiltration within the Sheridan Homelands neighbourhood.
Who will use Sheridan Park Drive extension	The Sheridan Park Drive extension will play an important role in providing additional access to and from the residential community. The traffic analysis indicates approximately 77% of trips along the extension in the morning rush hours and

Comment	Project Team Response
	72% in the evening rush hours originate from or are destined to the Sheridan Homelands neighbourhood. Further, there is an overall reduction of vehicles along Homelands Drive (e.g., from Winston Churchill Boulevard to Thorn Lodge Drive east) by as compared to no Sheridan Park Drive extension.
Consider alternative routes (e.g., widening of Speakman Drive or North Sheridan Way)	Following the PIC, the widening of Speakman Drive was investigated further as an alternative route (Alternative Solutions – Alternative 4). Based on the traffic analysis, Speakman Drive widening to four lanes, does not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive. Even with widening Speakman Drive, the traffic analysis indicates that there will be an increase of 22% in the AM peak hour and 9% in the PM peak hour on Homelands Drive without the extension in place. As a result, widening Speakman Drive will serve the Sheridan Park Corporate Centre only. Similarly, it is not expected that the widening of North Sheridan Way would not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive.
Rationale for Selecting Alternative 3 (Extension of Sheridan Park Drive) as Preliminary Preferred Solution	Through a process of evaluating alternative solutions, the Study Team identified extending Sheridan Park Drive as the preliminary preferred solution as it provides several benefits for the Study Area. Specifically, the extension will improve network connectivity, increase access to a growing Sheridan Park, encourage walking, cycling and transit, potentially divert traffic from the adjacent neighbourhood, preserve the natural look and recreational benefits of the Study Area and at the same time, minimize negative impacts to local wildlife and the natural spaces in the area.

Guiding Principles for Road Extension Design Concepts

In developing the preliminary preferred design concept, the following key constraints and design elements were considered:

- Compatibility with Adjacent Communities;
- Compatibility with Natural Areas;
- Access to Sheridan Park Corporate Centre;
- Speed Management Features;
- Opportunities for Streetscaping;
- Provisions for Pedestrians and Cyclists;
- Compatibility with Major Utilities in Study Area;
- Geometric Design Requirements; and
- Compatibility with Existing and Future Traffic Operations.

Preliminary Preferred Design Concept

Including the guiding design principles, a preliminary preferred design concept was presented to members of the public at the PIC on June 27, 2017. A copy of this concept plan is provided at the end of this Executive Summary. This concept included the following key features:

- Two lane roadway;
- Two vegetated horizontal deflection islands (for speed management);
- Roundabout at intersection of Sheridan Park Drive and Speakman Drive (approximately 130 m east of Winston Churchill Boulevard) with optional alternative four-way stop;
- Roundabout at intersection of Sheridan Park Drive and Homelands Drive / Speakman Drive with optional alternative four-way stop;
- Narrowed roadway in areas to reduce impacts to existing woodlots; and
- Opportunity for low impact development (stormwater treatment), landscaping and/or public art within centre of roundabouts).

Renderings of the potential roundabout (west end) and horizontal median are illustrated on the figures below.

Rendering of Potential Roundabout

View Looking East along Sheridan Park Drive from near Winston Churchill Boulevard

Rendering of Potential Median

View Looking East along Sheridan Park Drive extension corridor showing potential median (horizontal deflection)

A Preliminary Streetscape Plan has also been prepared to illustrate the landscaping features associated with the preliminary design concept. This plan will be further refined during the detailed design phase of the project.

Speed Management

A variety of speed management features are being considered. Wide medians are proposed to mitigate potential speeding, as vehicles will be required to slow down to navigate around the medians. In addition, roundabouts are proposed for both ends of the extension, which will also control speeding, as vehicles will be required to slow down in order to enter and circulate through the roundabout.

Designated pedestrian crossings will be provided at proposed intersection locations, which are located at Speakman Drive and at Homelands Drive / Speakman Drive.

Roundabouts are proposed at the two intersection locations. Roundabouts provide a safe pedestrian crossing as only one direction of traffic is crossed at a time by a pedestrian. In addition, vehicles slow down to navigate a roundabout, decreasing travel speed within the intersection and crosswalks.

As part of this project, the existing MUT is to be maintained in its current location to support pedestrian and cycling activity. The MUT is located on average 15 to 20 m north from the proposed road extension and will be separated by a combination of the existing vegetation as well as new plantings.

Stormwater Management

A Stormwater Management Report has been prepared as part of the EA Study. A preliminary hydrologic and hydraulic analysis was completed to ensure that upstream lands are adequately conveyed through the ROW as part of the proposed road design. Based on the application of the criteria of ‘100 Year Post to 100 Year Predevelopment Control’, the proposed roadway extension does not alter the runoff potential for the catchment studied and thus no mitigation measures would be required for peak flows. According to the Credit Valley Conservation Stormwater Management Criteria (August 2012), the Flood Control criteria for new development in the Sheridan Creek Watershed is ‘100 Year Post to 2 Year Predevelopment Control’. Therefore, additional analysis was undertaken applying the ‘100 Year Post to 2 Year Predevelopment Control’ criteria. When the stricter controls are applied, there is a storage volume requirement of 590 m^3. These stormwater calculations are preliminary and will be finalized, together with the approach to storing / managing stormwater attributed to the road extension during the detailed design phase of the Project. Where possible, the City will explore opportunities to combine the flood storage requirement for the Sheridan Park Drive Extension with an adjacent (hydrologically-connected) development.

A bioretention area has been designed in one of the proposed horizontal deflection medians in order to capture and treat road runoff based on LID principles. Runoff which cannot be treated and infiltrated at this location will be intercepted by an overflow system and directed to an existing drainage feature.

Geotechnical Investigation

Peto MacCallum Ltd. (PML) was retained to complete a geotechnical and pavement investigation for the proposed road extension. The assessment included review of background documentation as well as advancing a total of eighteen boreholes and submitting soil samples for quality analysis. Several of the analyzed soils are impacted with salt, which are most likely attributed to winter de-icing activities. The soils from one borehole are impacted with F3 petrochemical hydrocarbons (PHCs) exceeding residential / parkland standards but complied with the industrial / commercial standards.

Based on visual inspection, the existing pavement surface on the travelled portions of Sheridan Park Drive shows signs of distress. Boreholes drilled in the existing pavement also revealed an existing granular base and subbase with materials containing a higher level of fines, which renders the pavement structure susceptible to damaging effects of frost action. For these reasons, PML recommends that the existing pavement be rehabilitated by full depth reconstruction.

For the road extension segment of Sheridan Park Drive, PML recommends use of the City's pavement thickness standard over the American Association of State Highway and Transportation Officials (AASHTO) as it is more conservative (thicker), which will address location conditions such as frost susceptibility of the road subgrade.

Preliminary Cost Estimate

Based on the preliminary design concept, an estimate of the cost for constructing the road extension has been prepared. The overall estimated cost of roadway construction at this preliminary stage of the Project is $2,328,000. The cost estimate for the roadway construction will be further refined during the detailed design phase of the Project.

Environmental Impacts, Mitigation Measures, and Monitoring

In order to mitigate potential impacts of the proposed project on the environmental features of the study area, several mitigation measures are proposed for the construction, operation and maintenance of the proposed road extension within the Study Area have been identified. All mitigation measures and monitoring activities shall be reviewed during the detailed design phase of the project. In general, mitigation measures have been proposed for the following aspects of the environment:

- Transportation and Built Environments
  - Human Health and the Environment
  - Transportation Infrastructure
- Physical Environment
  - Surface Water
  - Ground Water
  - Headwater Feature
  - Vegetation
  - Wildlife and Wildlife Habitat
  - Breeding Birds
  - Woodlands
  - Cultural Thicket / Cultural Meadow
  - Fish Habitat
- Cultural Environment
  - Archaeology
- Noise and Air Quality

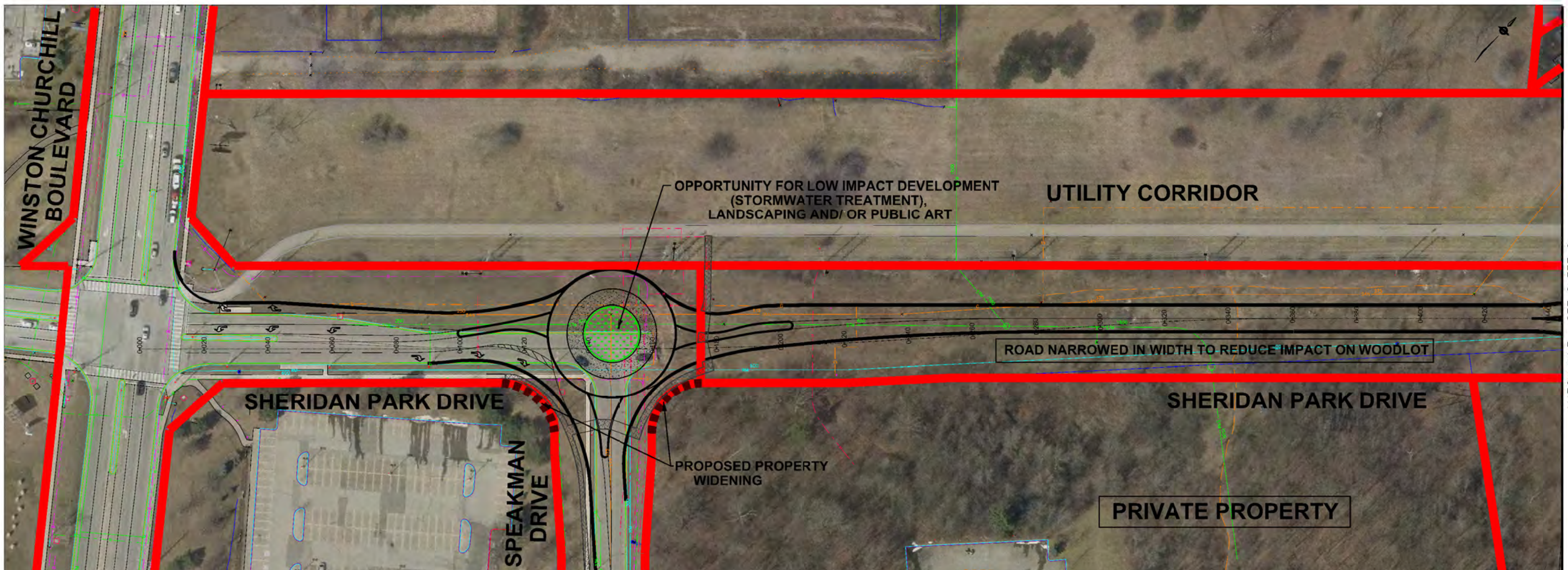
Project Implementation

Phase 5 or 'Project Implementation' of the Municipal Class EA process involves the completion of detailed design drawings, specifications and tender documents to be provided to a successful contractor for the construction of the proposed project. During the implementation phase, the City will need to adhere to several mitigation measures and monitoring plans as documented in this Project File Report, some of which will be need to be in place prior to and during construction. Permits will need to be applied for from various regulatory agencies.

ALTERNATIVE INTERSECTION

RENDERING OF POTENTIAL ROUNDABOUT

RENDERING OF POTENTIAL MEDIAN



MISSISSAUGA

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web www.rjburnside.com

RJB Project No. 300039474

LEGEND

- WATERCOURSE
- HEADWATER DRAINAGE FEATURE
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

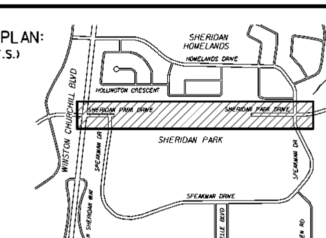
PRODUCED FOR - T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION

STA 0+000 TO STA 1+285

SCALE N.T.S.	AREA X-XX	PROJECT No. XX-XXX
C.A.D.D. BY L.R.	CHECKED BY D.A.	PLAN No.1
DATE JUNE 2017	SHEET 1 OF 3	

KEY PLAN: (N.T.S.)



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
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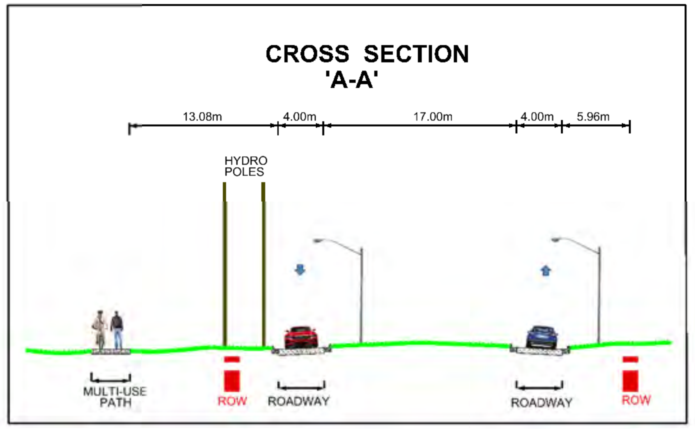
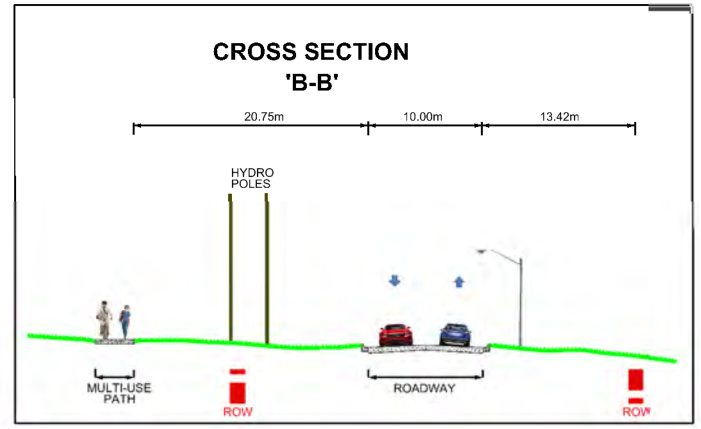
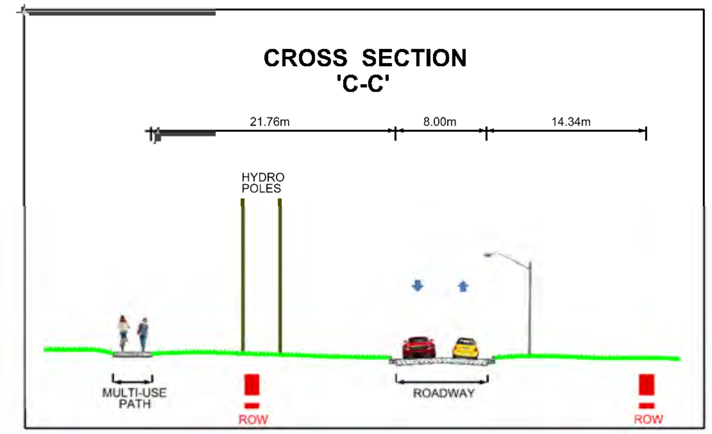
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

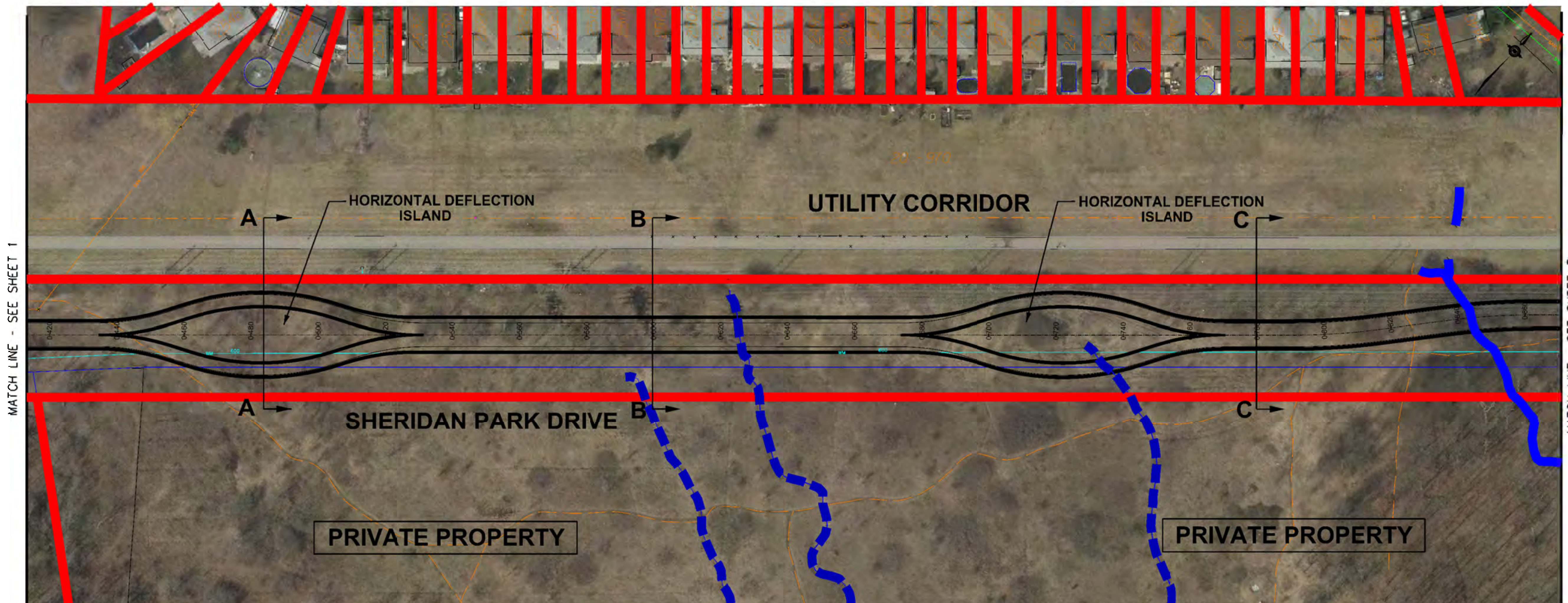
REVISIONS

DATE	DETAILS	INIT.









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RJB Project No. 300039474

LEGEND:
- WATERCOURSE
- HEADWATER DRAINAGE FEATURE
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

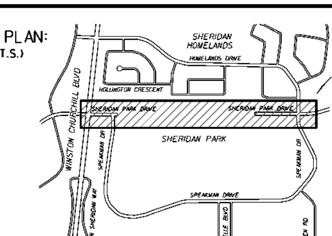
PRODUCED FOR - T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION

STA 0+420 TO STA 0+870

SCALE N.T.S.	AREA X-XX	PROJECT No. XX-XXX
C.A.D.D. BY L.R.	CHECKED BY D.A.	PLAN No.1
DATE JUNE 2017	SHEET 2 OF 3	

KEY PLAN:
(N.T.S.)



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STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

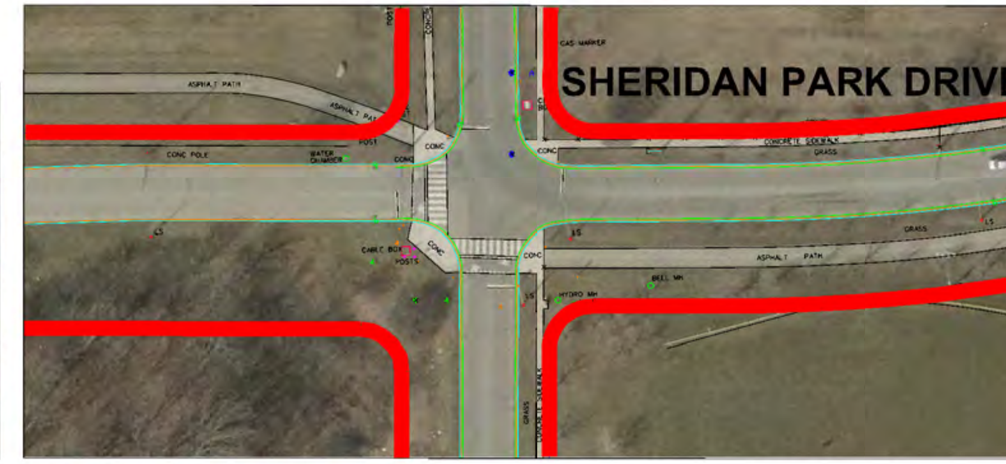
SPEED MANAGEMENT OPPORTUNITIES

CENTRE ISLAND

EDGE LINES

HORIZONTAL DEFLECTION

ALTERNATIVE INTERSECTION



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RJB Project No. 300039474

LEGEND:

- WATERCOURSE
- HEADWATER DRAINAGE FEATURE
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE

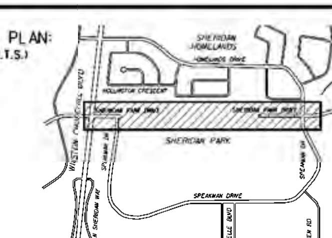
PRODUCED FOR - T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION

STA 0+870 TO STA 1+285

SCALE N.T.S.	AREA X-XX	PROJECT No. XX-XXX
C.A.D.D. BY L.R.	CHECKED BY D.A.	PLAN No.1
DATE JUNE 2017	SHEET 3 OF 3	

KEY PLAN:
(N.T.S.)



SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

Glossary

City	City of Mississauga
CVC	Credit Valley Conservation
EA	Environmental Assessment
ESA	Environmental Site Assessment
MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MOP	Mississauga Official Plan
MTO	Ontario Ministry of Transportation
MUT	Multi-Use Trail
OP	Official Plan
PIC	Public Information Centre
POR	Point of Reception
PPS	Provincial Policy Statement
ROP	Region of Peel Official Plan
ROW	Right-of-Way
SWH	Significant Wildlife Habitat
SAR	Species at Risk

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Tables

Figures

Appendices

Disclaimer

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 and 2015), which is an approved process under the Ontario *Environmental Assessment (EA) Act, 1990.*

The variety of land uses within and adjacent to the Sheridan Park Drive right-of-way (ROW) presented a unique landscape upon which to study. Existing land uses include a residential area (Sheridan Park Homelands neighbourhood), a utility corridor, a multi-use recreational trail, a City-owned ROW and naturalized areas on privately owned lands that are part of the Sheridan Park Corporate Centre. The Municipal Class EA process has allowed for all uses of this corridor to be considered and balanced when evaluating different alternatives.

1.1 Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive / Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1.1. The proposed extension of Sheridan Park Drive falls within the existing City-owned ROW, which runs through the centre part of the Study Area.

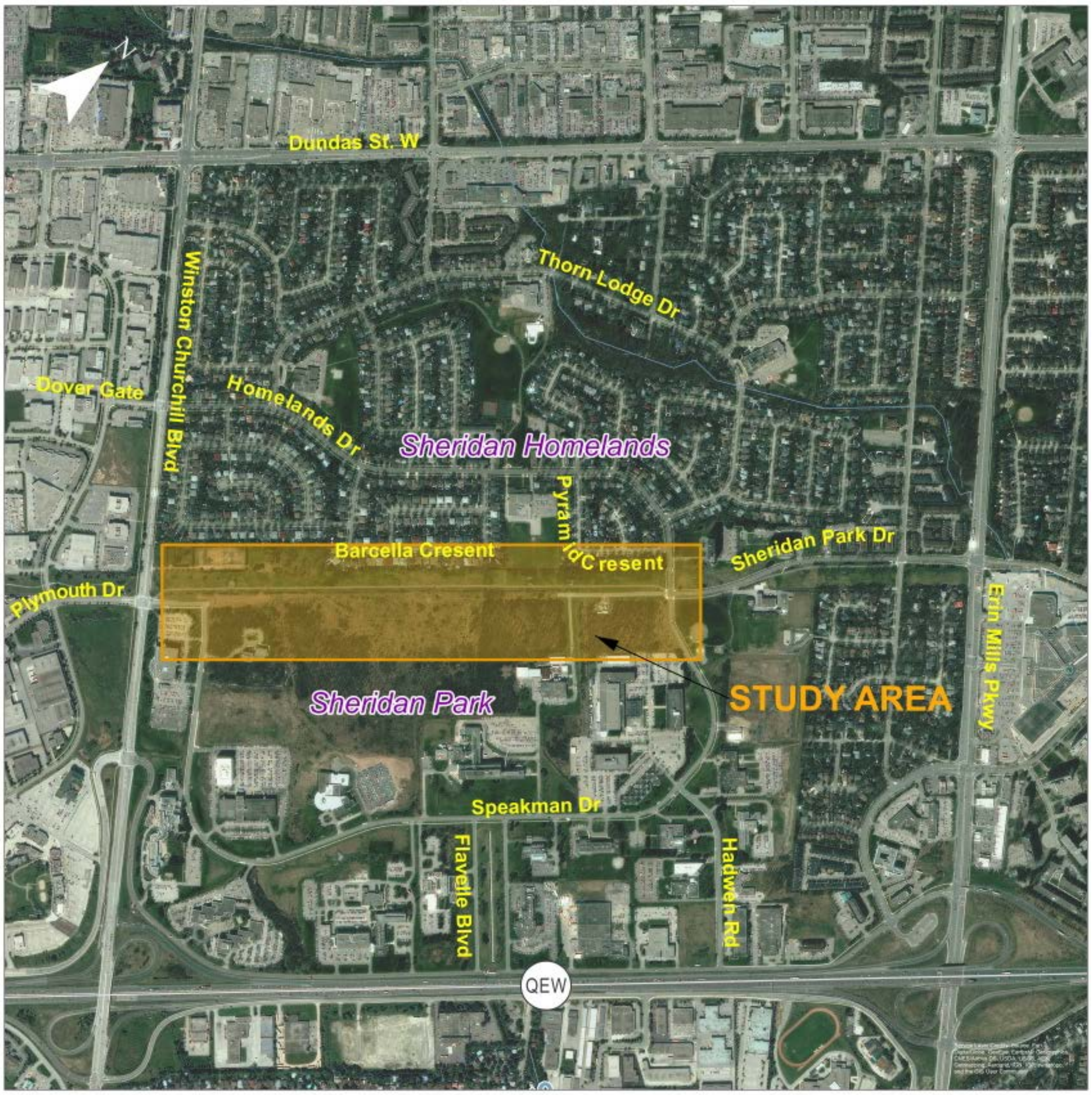
The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the Mississauga Official Plan (MOP). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as

Significant Natural Areas in the City's Natural Areas System (2017 Update). Sheridan Park is also identified as one of the City's cultural landscapes due to its scenic and distinct visual qualities.

The City maintains a paved MUT through the utility corridor from Winston Churchill Boulevard to Homelands Drive / Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Figure 1.1: Study Area



1.2 Municipal Class EA Process

The planning of major municipal infrastructure projects or activities is subject to the *EA Act, 1990* and requires the proponent to complete an EA. The Municipal Class EA process was developed by the Municipal Engineers Association, in consultation with the Ministry of the Environment and Climate Change (MOECC). The Municipal Class EA solicits input and approval from regulatory agencies, the municipality and the public at the local level. This process leads to an evaluation of the alternatives in view of the significance of environmental impacts and the choice of effective mitigation measures.

1.2.1 Municipal Class EA Process

There are three categories of assessment within the Municipal Class EA process that are dependent on the complexity and potential for environmental impact.

- **Schedule A** - Projects are limited in scale, have minimal adverse environmental impacts and require no public notification or documentation.
- **Schedule A+** - Projects are limited in scale, have minimal adverse environmental impacts and require no documentation. The public is to be advised prior to implementation.
- **Schedule B** - Projects have the potential for some adverse environmental impacts. The proponent is required to undertake a screening process, involving mandatory contact with the directly affected public and regulatory agencies, to ensure that they are aware of the Project and that their concerns are addressed. Schedule B Projects require that a Project File be prepared and made available for public review. Proponents undertaking Schedule B Projects are required to complete Phase 1, 2 and 5 of the Municipal Class EA Process.
- **Schedule C** - Projects have the potential for significant environmental impacts and must proceed under the full planning and documentation procedures of the Municipal Class EA document. Schedule C projects require that an Environmental Study Report (ESR) be prepared and filed on the public record for review by the public and regulatory agencies. Proponents undertaking Schedule C Projects are required to complete Phase 1 through 5 of the Municipal Class EA Process.

The phases of the Municipal Class EA are summarized in the Municipal Class EA document as follows:

- **Phase 1** - Identify the problem (deficiency) or opportunity.
- **Phase 2** - Identify alternative solutions to address the problem or opportunity by taking into consideration the existing environment, and establish the preferred solution taking into account public and review agency input. At this point, determine the appropriate schedule for the undertaking and document decisions in a Project

File for Schedule B projects, or proceed through the following phases for Schedule C projects.

- **Phase 3** - Examine alternative methods of implementing the preferred solution, based upon the existing environment, public and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- **Phase 4** - Document, in an ESR, a summary of the rationale, and the planning, design and consultation process of the project as established through the above phases, and make such documentation available for scrutiny by review agencies and the public.
- **Phase 5** - Complete contract drawings and documents, and proceed to construction and operation; monitor construction for adherence to environmental provisions and commitments. Where special conditions dictate, also monitor the operation of the completed facilities.

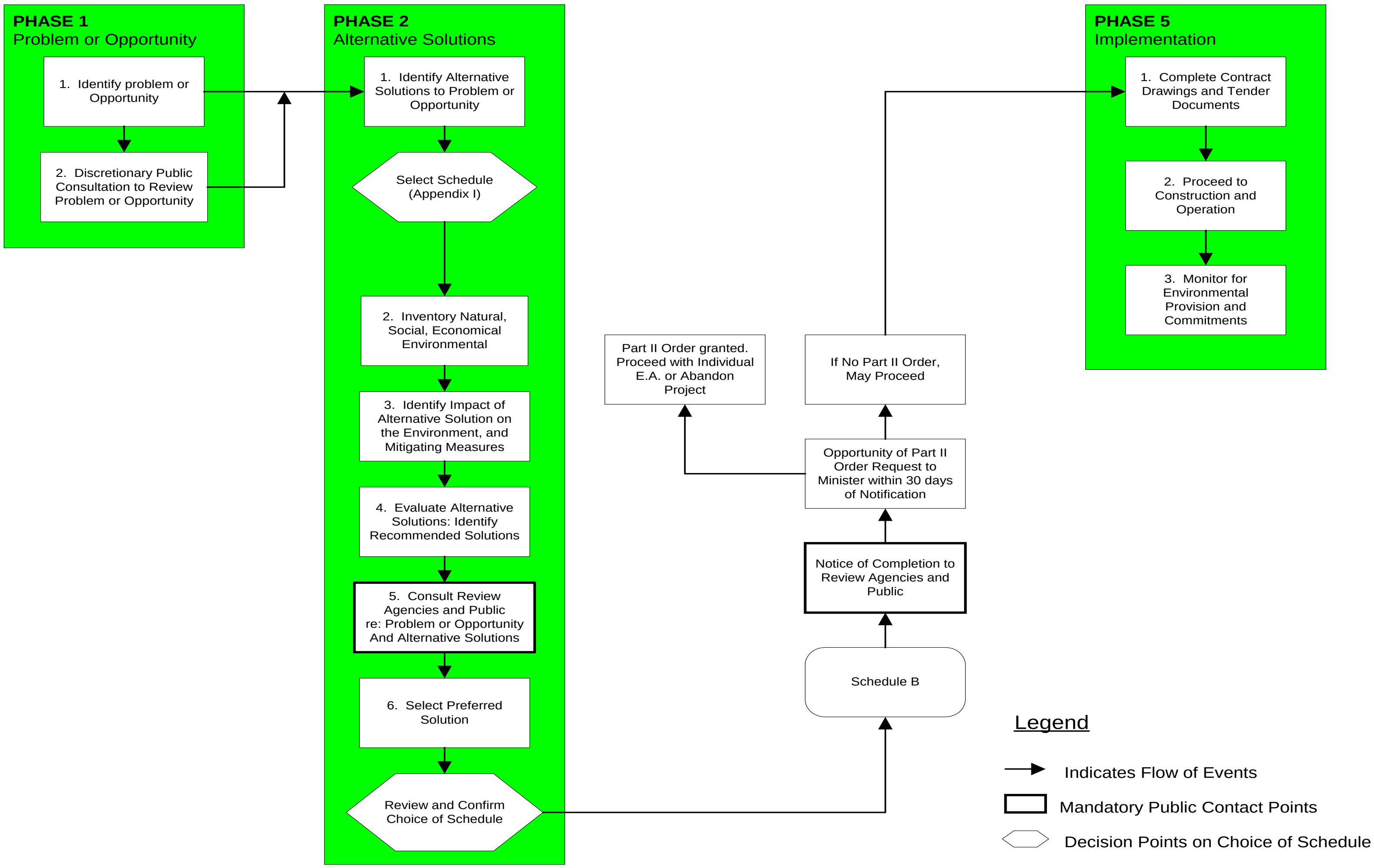
1.2.2 Class EA Schedule Confirmation

The proposed extension of Sheridan Park Drive is identified as a **Schedule B Project** under Appendix 1 - Project Schedule on page 1 to 5 under Item 21 of the Municipal Class EA document.

> *"Construction of new roads or other linear paved facilities (e.g., HOV lanes) and the construction value is less than 2.4 million."*

At the time of conducting this Study, the proposed extension is anticipated to cost under $2.4 million to construct. As such, this Study has followed the Schedule B Municipal Class EA Process that is illustrated in Figure 1.2.

Figure 1.2: Municipal Class EA Process for Schedule B Undertakings



2.0 Need / Justification

The proposed extension of Sheridan Park Drive between Homelands Drive / Speakman Drive and Winston Churchill Boulevard is supported by the directives of both provincial and regional policy. Further to this adherence to policy, the City has also identified several opportunities that the proposed extension will offer the Study Area and surrounding residents.

2.1 Project Opportunity Statement

Through this Study, the City is exploring the opportunity to connect the east and west sections of Sheridan Park Drive to create options for alternate routes. At present, the east-west accesses through the neighbourhood are via Homelands Drive (through a residential neighbourhood) or Speakman Drive (through the business park). The implementation of this link would be an important piece of the City's overall road network, which would improve the connectivity in Sheridan Park and the surrounding commercial areas and create an overall reduction of traffic and alternative route to reduce traffic in the Sheridan Homelands neighbourhood. Linking the east and west segments of Sheridan Park Drive will also improve access for emergency services within the Study Area.

The science and technology facilities in Sheridan Park will continue to develop to support the growth of a contemporary science and business park, and new office uses may also be developed. At the same time, the natural areas of Sheridan Park should be protected while continuing to provide aesthetic benefits to the employees within Sheridan Park.

The City fully recognizes that this Study Area offers diverse and complimentary land uses that need to be carefully considered when looking at the opportunity to extend / link Sheridan Park Drive.

Through this EA, the City has an opportunity to:

- Improve network redundancy in the wider road network to improve traffic flow and increase access routes for emergency services;
- Support multi-modal transportation and encourage transit;
- Reduce traffic volumes in the Sheridan Homelands neighbourhood; and
- Maintain the natural feel and recreational benefits of the Study Area by minimizing impacts to existing natural heritage features and introducing low impact development features and plantings to increase biodiversity.

2.2 Planning Overview

This Study is a step in the ongoing implementation of the City of Mississauga's Strategic Plan process as well as the City's Official Plan and the Draft Sheridan Park Land Use Master Plan. The objective of these plans is to create complete, multi-modal oriented communities that are a meaningful place for all citizens and also continues to attract businesses, growth and investment into the cities key industries, while meeting employment needs.

In addition to these municipal planning initiatives, the Study must consider applicable provincial and regional planning policies including the Provincial Policy Statement and the Growth Plan for the Greater Golden Horseshoe.

2.2.1 Provincial Planning Policies

2.2.1.1 Provincial Policy Statement

The 2014 Provincial Policy Statement (PPS) is the complimentary policy document to the *Planning Act, 1990*, issued under Section 3 of the Act.

The PPS states that municipal projects should be directed to existing settlement areas, create stronger and improved communities, and have little to no impact on the natural features of the area. In general projects should have consideration for future needs to ensure the benefits of the project are far-reaching. Section 1.6 of the PPS contains specific guidance on Infrastructure and Public Service Facilities:

> *"1.6.1 Infrastructure and public services facilities shall be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate changes while accommodating projected needs.*
>
> *Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning so that they are:*
>
> *a) financially viable over their life cycle, which may be demonstrated through asset management planning; and*
> *b) available to meet current and projected needs.*
>
> *1.6.3 Before consideration is given to developing new infrastructure and public service facilities:*
>
> *a) the use of existing infrastructure and public service facilities should be optimized; and*

b) opportunities for adaptive re-use should be considered, wherever feasible.

1.6.5 Public service facilities should be co-located in community hubs, where appropriate, to promote cost-effectiveness and facilitate service integration, access to transit and active transportation."

As such, improvements made to public infrastructure, including the potential extension of Sheridan Park Drive are consistent with the PPS.

2.2.1.2 Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (2017) is a Provincial Plan that directs how regional growth in the Greater Golden Horseshoe (GGH) is to be managed up to 2041. The plan carries policies forward from the Provincial Policy Statement (PPS), working to reduce development sprawl and providing direction in where intensification should take place. There are several provisions within the policy that are relevant to the Sheridan Park Drive extension. Section 3.2.2 of the Growth Plan outlines the general provisions of Transportation for the GGH. According to this policy, the transportation system within the GGH will be planned and managed to:

a) "Provide connectivity among transportation modes for moving people and moving goods;

b) Offer a balance of transportation choices that reduces reliance upon the automobile and promotes transit and active transportation."

Section 4 of the Growth Plan details the protection of natural features within the GGH. Within the Natural Heritage System:

iii. "the removal of other natural features, not identified as key natural heritage features and key hydrologic features is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible."

Climate change is also addressed in Section 4 of the Growth Plan. According to the growth plan, in planning to reduce greenhouse gas emissions and address the impacts of climate change, municipalities are encouraged to:

a) "develop strategies to reduce greenhouse gas emissions and improve resilience through the identification of vulnerabilities to climate change, land use planning, planning for infrastructure including transit and energy, green infrastructure, and low impact development, and the conservation objectives in policy 4.2.9.1."

2.2.2 Region of Peel

With the major theme of sustainability and smart growth, the Region of Peel Official Plan (ROP) reinforces the policies of the PPS and the Growth Plan, allocating growth targets to municipalities. While providing direction for local Official Plans (OPs), the ROP focuses on policies affecting regional systems and services. The City is located within the Region's urban system and Sheridan Park is designated as an employment area.

2.2.3 Strategic Plan

The Mississauga Strategic Plan identifies five Strategic Pillars for Change, intended to provide guidance towards the creation of a city for the 21st century.

The most relevant include to this study include:

- Increasing transportation capacity by creating additional links in street networks and active mobility choices;
- Creation of complete streets with inclusive cross-sections and an urban form that supports walking and active modes of transportation;
- Develop walkable, connected communities;
- Build and maintain infrastructure;
- Maintain a safe city;
- Attract innovative businesses;
- Meet employment needs; and
- Conserve, enhance and connect natural environments by minimizing impacts to existing natural heritage features and introducing low impact development features and plantings to increase biodiversity.

2.2.4 City of Mississauga Official Plan

The Mississauga Official Plan (MOP) provides a policy framework to protect, enhance, restore and expand the Natural Areas System, protect the health of the natural environment and the climate, to direct growth to where it will benefit the urban form, support a strong public transportation system, and address the long term sustainability of the City.

As a key element to the consolidated MOP the City adopted a new approach to land use planning in Mississauga, one that blends transportation, land use, and urban design objectives. Key to the delivery of this new approach is the MOP's section on building a multi-modal city by:

- Developing and promoting an efficient and safe transportation system for all users;
- Promoting a transportation network that connects nodes with a range of transportation modes;
- Implementing a viable, active transportation network for cyclists and pedestrians;
- Encouraging the application of transportation demand management techniques;
- Developing a seamless network of mobility hubs; and,
- Providing an alternative route for goods movement in the business park.

MOP defines the role of arterials as principal transportation corridors for high volumes of people and goods. Major collectors in neighbourhoods, like Sheridan Park Drive (proposed), will be designed to accommodate moderate volumes of traffic and encourage active transportation, by minimizing conflicts with the various uses of active transportation. The City supports opportunities for multi-modal uses where feasible.

Within MOP, Sheridan Park is identified as a special policy area, which will provide for employment uses and densities similar to major nodes (less density than downtown, but more than elsewhere). MOP Land Use Map (Schedule 10) designates most of Sheridan Park as Business Employment, which generally permits a wide range of commercial or industrial uses. However, the policies specific to the Corporate Centre supersede the general permissions.

MOP recognizes the strong role of life sciences, communication and information technology industries in the City. Section 10.1.5 states that the City will provide a large range of employment opportunities, including diversified employment uses, the City will:

- Strive to increase office employment;
- Encourage the establishment of knowledge based industries and support their growth; and
- Support smaller, more innovative industries and their growth.

2.2.5 Draft Sheridan Park Master Land Use Plan

In 2014, the City completed the Draft Sheridan Park Master Land Use Plan, a study to review existing conditions of the area and recommend amendments to the land use designations and zoning regulations within Sheridan Park. Future land use amendments would facilitate multiple businesses and increased accessory uses in Sheridan Park, while maintaining the unique campus feel of the area for nearby residents. The renewed focus of Sheridan Park is on pilot plants, innovation and science and technology; however, future land uses also include offices, daycare, utility and open spaces. Schools are permitted on a site-specific basis; however are not the preferred use of the land.

The existing zoning in Sheridan Park is primarily E2-5, which permits science and technology buildings and office uses. One of the zoning exceptions in Sheridan Park is E2-101, which permits a range of more diverse commercial and employment uses including hotels at the eastern end of Sheridan Park.

The Draft Land Use Master Plan is directed by Amendment No. 40 to the MOP. The purpose of the amendment is to update the Sheridan Park Corporate Centre character area policies to reflect the Draft Land Use Master Plan. The changes include:

- Changes to the ‘Business Employment’ designation to allow a broader range of uses; and
- Changes to Greenland mapping to reflect the presence of significant natural areas and natural hazard lands associated with Sheridan Creek.

The amended polices of allow a broader range of uses to encourage redevelopment to occur in Sheridan Park.

2.2.6 Moving Mississauga: From Vision to Action – Mississauga’s Interim Transportation Strategy

Moving Mississauga (2011) was developed by the City as a first step in the development of a transportation master plan. Within the strategy document, the City has identified 46 actions to be pursued over a five year period following the release of the strategy. Moving Mississauga builds upon several key City initiatives including:

- City of Mississauga New Official Plan, 2010;
- City of Mississauga Strategic Plan Our Future Mississauga;
- City of Mississauga Cycling Master Plan, 2010;
- Strategic Transit Network Opportunities Study, 2008;
- Mississauga BRT Environmental Assessment, March 2010; and
- City of Mississauga Transit Ridership Growth Strategy.

The Vision of Moving Mississauga is:

> *"The City of Mississauga will have a safe and connected multi-modal transportation system that enhances our environment, supports our economy, connects people to places and moved goods to market."*

Moving Mississauga identifies a number of Emerging Issues. Two of those issues are:

Complete Streets

> *"As Mississauga intensifies to accommodate future growth the design of streets play a significant role in facilitating movement of pedestrians, cyclists, transit, trucks and the private automobile. Balancing this broad spectrum of potential users in the design of our road network is an important aspect as the City retrofits the existing road network that was originally designed predominantly for the automobile. To support the complete street concept the City's Official Plan re-defines the road hierarchy to ensure the design speeds and volume of traffic support the safe integration of pedestrians, cyclists and transit within the road right-of-way where appropriate."*

Context Sensitive Design

> *"Context Sensitive Design (CSD) is the art of creating public works projects that meet the needs of the users, the neighbouring communities, and the environment. It integrates projects into the context or setting in a sensitive manner through careful planning, consideration of different perspectives, and tailoring designs to particular project circumstances. Mississauga's Official Plan recognizes the benefits of the CSD approach by ensuring the design of roads have regard for existing and planned land sues, urban design and community needs."*

Through the process of several Stakeholder Advisory Committee meetings, Project Team meetings and a Public Information Centre the EA process has strived to find a balance to accommodate the many future uses of the proposed new and reconstructed roadways.

As such, the proposed road improvements and this Class EA are in alignment and consistent with the goals and approach outlined in Moving Mississauga.

2.2.7 Cycling Master Plan

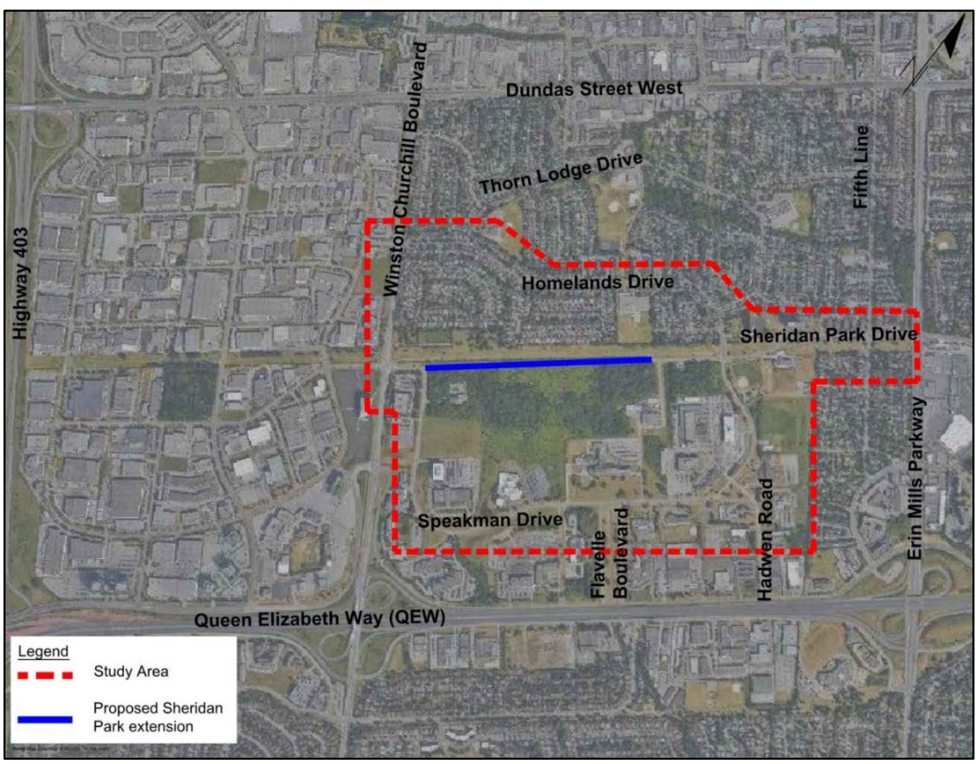
The Mississauga Cycling Master Plan (2010) focuses on fostering cycling as a way of life in the City, building an integrated network of over 900 km on-road and off-road cycling routes over the next 20 years and aims to adopt a safety first approach to cycling. The plan is comprised of 17 recommendations and 79 action items including the establishment of a cycling office, fostering community cycling events, adding an average of 30 km/year to the cycling network, developing and implementing a comprehensive signage and way finding system and establishing an educational plan for motorists and cyclists.

The City recognizes the importance of cycling as an active and environmentally sustainable transportation option and is actively working to improve cycling facilities across the City. Within the Mississauga Cycling Master Plan (2010) Sheridan Park Drive was identified as a Primary off-road route and has been constructed within the utility corridor.

2.3 Transportation Forecasts and Operations

A Transportation and Traffic Analysis Report (Transportation Report) was completed as part of the EA Study; which assessed both the existing and future predicted traffic conditions within the Transportation Study Area illustrated on Figure 2.1. The Transportation Study Area varies slightly from the EA Study Area, which is illustrated on Figure 1.1 as the transportation analysis conducted as part of the Transportation Report included review of roads within the vicinity of the EA Study Area. A copy of the Transportation Report is provided in **Appendix A**. The key findings of this report are provided in the following sections.

Figure 2.1: Transportation Study Area



2.3.1 Existing Traffic Conditions

As part of the transportation analysis completed for the Transportation Report, the existing transportation system with in the Transportation Study Area illustrated on Figure 2.1 was evaluated. Sheridan Park Drive is discontinuous through the area shown for the proposed extension and this is a missing link in the roadway network to provide east-west connectivity.

Cycling and pedestrian movement is accommodated by a MUT within the utility corridor along the north side of the Sheridan Park corridor. There is a sidewalk on the north side of Sheridan Park Drive east of Homelands Drive. Between Winston Churchill Boulevard and Speakman Drive there is a sidewalk on the south side of Sheridan Park Drive. Residents and employees currently walk through the MUT area.

The Sheridan Homelands neighbourhood is serviced by transit on the arterial road network and within the neighbourhood via Route 29. Sheridan Park is serviced internally by Routes 45A and 71.

Key intersections in the Study Area were assessed to evaluate operations during the weekday morning (AM) and afternoon (PM) peak hours. Signalized intersections are operating at an overall level of service C during the weekday AM and PM peak hours. Priority for green time has been given to the north-south roads of Winston Churchill Boulevard and Erin Mills Parkway. This can result in reduced operations on the side streets (i.e., longer delays), but the movements are operating within capacity and the signal timings give priority to the higher traffic volume roads.

During the PM peak hours, it is common to observe queues within employment areas as employees typically exit around similar times especially if the employment use is similar within the area (e.g., majority office). This is the case at the Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive intersection where westbound queues from Winston Churchill Boulevard were observed for through right turn movements. Through previous work undertake by the Region of Peel, the need for an exclusive westbound right turn lane was identified and has been added to their Development Charges Study. This improvement would reduce queues and improve operations for vehicles exiting Sheridan Park during the weekday PM peak hour.

The unsignalized two-way stop intersections assessed in the Transportation Study Area, the critical movement intersections critical movements are operating with level of service C or better and no changes are identified for these intersections.

The unsignalized four-way stop intersection movements are operating at level of service C or better with the exceptions of eastbound movements at the Fifth Line / Sheridan Park Drive intersection. This intersection has been identified as needing traffic signals in the future.

The City is undertaking a separate study to address Sheridan Homelands neighbourhood resident's concerns with respect to operations on their streets including speeding. The effect that the Sheridan Park extension could have on the neighbourhood in the future conditions has been considered.

Based on the traffic data available, it is observed that trucks (which include buses) are using Homelands Drive; however, there is no evidence that the trucks are using the route to access Sheridan Park Corporate Centre or the employment lands on the west side of Winston Churchill Boulevard. Included in the traffic data numbers are trucks and buses that would have a destination / purpose within the neighbourhood such as garbage pick-up and home delivery services. There is some evidence that trucks might be using Homelands Drive and Sheridan Park Drive (east of Homelands Drive) as an east-west route between Winston Churchill Boulevard and Erin Mills Parkway.

Some of the key findings of the existing traffic conditions review are illustrated on Figure 2.2.

Figure 2.2: Key Findings of Existing Traffic Conditions Review

2.3.2 Future Travel Demand

EMME Travel Demand Traffic Volume Projections

To assess effects of the various network scenarios, the City's EMME Travel Demand Model was utilized to project traffic volumes for 2021 and 2031 horizon years. In addition, the model was also utilized to assess the impact of the various network scenarios on travel along Homelands Drive / the Sheridan residential neighbourhood. This assessment was completed for the 2021 horizon year and examined the following::

1. How much traffic utilizes Homelands Drive when comparing the following scenarios:

    b) Do-nothing scenario – the Do-nothing scenario (assumes four lanes only on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    c) Sheridan Park Drive Extension (with four lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    d) Speakman Drive widening to four lanes (no Sheridan Park Drive extension, four lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection)

2. Origin and destination of trips utilizing Homelands Drive

3. Origin and destination of trips utilizing the Sheridan Park Drive Extension

It should be noted that the EMME model is used for macro analysis to provide analysis / results generally at a higher level, i.e., freeways, arterials and major collectors. As such the numbers presented in this document should not be taken for exact but are intended to help in comparing how the various scenarios impact travel demand in the area.

The 2021 horizon year model runs were utilized to compare the impacts of the various road network options assumed as identified above. The key findings are as follows:

AM Peak Hour

- With the Sheridan Park Drive Extension, the model shows a decrease in traffic along Homelands Drive by approximately 2% (4 vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction compared to the Do-nothing scenario.
- The widening of Speakman Drive to four lanes generally results in an increase in traffic along Homelands Drive as compared to the Sheridan Park Drive Extension scenario with approximately 16% (40 vehicles) more traffic in the eastbound direction and 18% (36 vehicles) in the westbound direction.
- With the Sheridan Park Drive Extension scenario, the greatest reduction in traffic will occur on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions) in the AM peak hour as compared to the Do-nothing scenario.
- With the Sheridan Park Drive Extension in place, the number of through trips (‘cut through’ traffic) utilizing Homelands Drive is projected to decrease by approximately 17% in the AM peak hour as compared to the Do-nothing scenario. This in comparison to the Speakman Drive widening to four lanes scenario, which results in a 22% increase in the number of through trips using Homelands Drive as compared to the Do-nothing scenario.

- The Sheridan Park Drive Extension will play an important role in providing additional access to and from the Sheridan Homelands Residential Community. During the AM peak hour approximately 77% of the trips that utilize the Sheridan Park Drive Extension either originate from or are destined to the residential area to the north of Sheridan Park Drive. This results in an increase in traffic on the eastern end of Homelands Drive (east of Thorn Lodge Drive east intersection) by approximately 24% (average for both directions) as the residential community travel patterns change and they divert to this section of Homelands Drive to access the extension. However, there is a corresponding drop in traffic on the western section of Homelands Drive.

PM Peak Hour

- During the PM peak hour the Sheridan Park Drive Extension results in an average decrease in traffic along Homelands Drive by approximately 3% (10 vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction compared to the Do-nothing scenario.
- Comparing the Speakman Drive widening to four lanes scenario against the Sheridan Park Drive Extension scenario, the widening of Speakman Drive to four lanes results in an increase in traffic along Homelands Drive by approximately 3% (10 vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction.
- As a result of the Sheridan Park Drive Extension, the greatest traffic reductions will be experienced on the western end of Homelands Drive with volumes decreasing by approximately 25% (average for both directions).
- As a result of the Sheridan Park Drive Extension, the number of through trips utilizing Homelands Drive is projected to decrease by approximately 13% as compared to the Do-nothing scenario. With the Speakman Drive widening to four lanes scenario, the model projects an increase in the number of through trips along Homelands Drive by approximately 9% as compared to the Do-nothing scenario.
- Similar to the AM Peak Hour, the Sheridan Park Drive Extension will have an important role in serving the Sheridan Homelands Residential Community to the north with approximately 72% of the traffic using the extension having an origin or destination in the residential community. This again results in a diversion in traffic in the residential community which can be seen by the 40% increase (average for both directions) in traffic utilizing the eastern end of Homelands Drive. There is an associated drop in traffic to the west on Homelands Drive.

In conclusion, the results indicate that the Sheridan Park Drive Extension will play an important role in providing additional opportunities for residents living in the Sheridan Homelands neighbourhood to access their neighbourhood. The extension results in an overall reduction in traffic along sections of Homelands Drive and in addition results in a decrease in through traffic on Homelands Drive. The widening of Speakman Drive to four lanes generally does not provide a benefit to the residents living in the Sheridan

Homelands neighbourhood as it does not reduce the amount of traffic utilizing Homelands Drive.

2021 Road Network

As identified for existing conditions, the addition of the westbound right turn lane has been assumed as part of the road network at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection.

A traffic operations analysis was conducted for 2021 traffic conditions for the AM and PM peak hours. To accommodate the 2021 traffic forecasts, the following improvements to the road network are recommended:

- The Sheridan Park Drive / Speakrman Drive (west leg) intersection will have a volume to capacity ratio of 0.78. To improve intersection operations, a roundabout is recommended to be installed with the Sheridan Park Drive Extension.
- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. Eastbound and westbound left turn lanes could be installed to improve operations; however, the best improvement would be a roundabout that would result in improving the level of service to B or better for each leg. Even if the extension was not in place, a roundabout would be required by 2031.
- At the Sheridan Park Drive / Fifth Line intersection, delays will be experience with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required plus the installation of traffic signals. Without the Extension, east and westbound left turn lanes would need to be installed by 2021; however, installation of traffic signals would be required by 2031.

At the signalized intersections to Winston Churchill Boulevard and Erin Mills Parkway, delays will be experienced for some movements and some movements will approach capacity; however, there is sufficient capacity to accommodate the demand.

2031 Road Network

A traffic operations analysis was conducted for the 2031 traffic projections. In addition to the transportation improvements identified for existing and 2021 traffic conditions, the following additional improvements are identified:

The Sheridan Park Drive / Fifth Line intersection will require traffic signals to be installed prior to 2031 without the Sheridan Park Drive Extension. It was previously identified as needing traffic signals by 2021 with the extension.

2.4 Safety Performance Review

A safety performance review was conducted of six intersections within the Transportation Study Area to identify any safety issues and deficiencies, locations with higher collision rates than projected, and to identify any potential mitigation measures. The six intersections included in the safety performance review are: Erin Mills Parkway / Sheridan Park Drive; Winston Churchill Boulevard / Sheridan Park Drive; Fifth Line West / Sheridan Park Drive; Homelands Drive / Sheridan Park Drive / Speakman Drive; Hadwen Road / Speakman Drive; and Speakman Drive / Flavelle Boulevard. A field investigation was undertaken as well as a review of collision history provided by the City and Region for the years 2010 through 2014 (five years of data). A copy of the Safety Performance Review Report is provided in **Appendix B**.

Over the five years, there were a total of 121 collisions at the six intersections reviewed. Collisions were either property damage (85% of collisions) or injury (15% of collisions) and there were no fatalities. Conditions such as wet versus dry roads or daylight versus nighttime did not influence the collision pattern. Rear end, and angle and turning collisions types accounted for the majority of collisions at 43% and 40% respectfully. There was no time of day pattern, other than at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection where 50% of collisions at the intersection occurred during the weekday PM peak period.

The Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way intersection experienced the highest number of collisions at 74 (60% of all collisions in the study area). This intersection also has a higher number of collisions than what is projected for similar intersections. To improve safety, left turn advances could be considered on the east-west traffic signal phase.

The Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection experienced the second highest number of collisions at 31 (26% of all collisions in the Study Area). However, this intersection is experiencing an average number of collisions as to what would be projected for a similar intersection. There is a pattern to rear end collisions for southbound traffic. There is a slight slope downwards and drivers may not be providing sufficient distance to allow stopping. The potential for safety improvement calculation indicates there is limited benefit to undertaking safety improvements at the intersection.

There were no significant patterns or number of collisions identified at the other area intersections. The proposed roundabouts will enhance road safety within the neighbourhood.

3.0 Description of the Environment

3.1 Transportation and Built Environments

3.1.1 Roads

The following sections provide brief descriptions of the existing roads within the Study Area and surrounding lands.

Sheridan Park Drive

Sheridan Park Drive is an east-west major collector road with a two lane cross-section. The road intersects Erin Mills Parkway in the east and Winston Churchill Boulevard in the west; however, at present the road terminates in two places where it intersects with Speakman Drive. The gap between these two terminuses is within a City-owned 35 m wide ROW. This gap is designated in the MOP as Future Major Collector. The speed limit on Sheridan Park Drive is 50 km/hr.

Speakman Drive

Speakman Drive is a minor collector road with a two lane cross-section. As noted above, Speakman Drive intersects with the east and west segments of Sheridan Park Drive. The speed limit on Speakman Drive is 50 km/hr with the exception of a 40 km/hr school zone.

Homelands Drive

Homelands Drive is an east-west minor collector road with a two lane cross-section that intersects with Sheridan Park Drive and Winston Churchill Boulevard. Thorn Lodge Drive is also a minor collector road that connects at both ends to Homelands Drive. The speed limit on Homelands Drive is 50 km/hr with the exception of a 40 km/hr school zone near Homelands Senior Public School.

3.1.2 Transit

There are three MiWay transit routes that provide service within the vicinity of the Study Area including:

- Route 29 Park Royal – Homelands
  - Provides daily regular north-south directional transit service between Erin Mills Transitway Station in the north to Orr Road in south (south of Lakeshore Road).
  - Major stops include the South Common Centre, Sheridan Centre and Clarkson GO Station.
  - Within the vicinity of the Study Area, Route 29 travels along Homelands Drive and eastern segment of Sheridan Park Drive.

- Route 45A Winston Churchill-Speakman
  - Provides daily rush hour north-south directional transit services between Meadowvale Town Centre and Clarkson GO Station.
  - Within the vicinity of the Study Area, Route 45A travels along Winston Churchill Boulevard to Speakman Drive.
- Route 71 Sheridan – Subway
  - Provides daily rush hour west-east service only between commercial shopping area in Oakville (Winston Park Drive) in the west to Kipling GO / TTC Station and Islington TTC Station in the east.
  - Within the vicinity of the Study Area, Route 71 travels along Sheridan Park Drive to Speakman Drive.

3.1.3 Active Transportation Facilities

The City maintains a paved MUT that runs through the Study Area within the utility corridor from Winston Churchill Boulevard to Homelands Drive / Speakman Drive. The MUT is part of the Sheridan Trail that continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides opportunities for active transportation within the Study Area including walking, jogging, cycling and roller skating. The Sheridan Trail is actively used by local residents, employees and residential / commuter cyclists.

3.1.4 Utilities

There are several existing utilities within the Study Area and surrounding lands including:

- **Hydro**: Alectra Utilities Inc. operates two above ground hydro lines that traverse the Study Area in an east-west direction. There are number of buried hydro lines within the Study Area with more concentration in the east end of the Study Area by the hydro transformer station located on the south side of Sheridan Park Drive.
- **Natural Gas**: Enbridge Gas operates a natural gas main within the Study Area that runs approximately 280 m east of Winston Churchill Boulevard through the City-owned ROW before it turns north and continues east along the utility corridor. The gas main continues through the utility corridor east of Homelands Drive.
- **Communications**: There are existing Bell Canada telecommunications services within the City-owned ROW running through the west end of the Study Area to service the properties in the west end of Sheridan Park. There are also Bell Canada services along the west side of Speakman Drive and the east side of Homelands Drive.

3.1.5 Underground Municipal Services

There are existing underground municipal services within the Study Area including:

- **Sanitary Sewers**: The Region of Peel maintains sanitary sewers within the Study Area including a 300 mm diameter sewer draining from the Sheridan Homelands neighbourhood connecting to a 375 mm diameter sewer that runs west along the City-owned ROW to Speakman Drive where it joins a 375 mm diameter sewer that drains south outside the Study Area. There is also short length of 250 mm diameter sewer along the north side of Sheridan Park Drive (approximately 60 m east of Winston Churchill Boulevard) that joins to the 375 mm diameter sewer running along Speakman Drive. There is 250 mm diameter sewer collecting wastewater from the Sheridan Homelands neighbourhood that runs across the utility corridor to the City-owned ROW and along the south side of Sheridan Park Drive to connect with a 375 mm sanitary sewer that runs south along Speakman Drive.
- **Watermains**: The Region of Peel maintains some watermains within the Study Area including a 600 mm diameter watermain through the City-owned ROW that connects in the west to a 600 mm diameter watermain on the east side of Winston Churchill Boulevard. This watermain continues along Sheridan Park Drive east of the Study Area. There is also a 600 mm diameter watermain that runs north to the Sheridan Homelands neighbourhood along the west side of Homelands Senior Public School.

3.1.6 Stormwater Management and Drainage

Sheridan Park Drive is located within the headwaters area of Sheridan Creek, which empties connects to Lake Ontario through the Rattray Marsh Conservation Area, some 6 km downstream of the Study Area. The channel meanders through a heavily urbanized area of the City.

There are remnants of natural drainage systems within the Study Area, but the area is drained predominantly by engineered drainage systems. Lands to the north have been developed as a residential subdivision, referred to as Sheridan Homelands. The development of these lands resulted in the conversion of open channels to a combination of storm sewers, to convey minor storms, and overland flow routes in the form of roads, with curbs, to convey major storm events to a suitable outlet.

There are two main storm sewer systems that drain the Sheridan Homelands subdivision through the Study Area. One system drains the westerly portion of the Sheridan Homelands development and the section of Sheridan Park Drive abutting Winston Churchill Boulevard, which currently terminates at Speakman Drive. The system outlets into an open channel via a 1,500 mm diameter storm sewer, roughly 330 m east of Winston Churchill Blvd, on the south of the Sheridan Park Drive ROW. The second system drains the easterly portion of the Sheridan Homelands development through the

Study Area. This system eventually drains into a concrete-lined channel on the south side of the ROW, via a 1,650 mm diameter storm sewer.

Based on information provided by the City, the minor storm sewer system appears to be based on the 1:10-year storm..

At the time that these systems were installed, they did not appear to incorporate any type of quantity control or water quality treatment. Today, these systems would include measures such as stormwater management facilities, to prevent flow increases associated with development and also to enhance water quality, prior to discharge to the natural environment.

3.2 Physical Environment

3.2.1 Physiography, Geology and Topography

The Study Area is located within the broad, low-lying area known as the Iroquois Plain physiographic region of southern Ontario. This physiographic region was formed by the lacustrine deposits of the historic Lake Iroquois, a waterbody that existed in the late Pleistocene Era. The Iroquois Plain extends around the western portion of Lake Ontario, from the Niagara River to the Trent River (Chapman and Putnam, 1984). As could be anticipated, conditions along this extensive region vary greatly depending on the location. The historic Lake Iroquois shorelines include bars, beaches, boulder and cliff pavements (Chapman and Putnam, 1984), while old sand and gravel bars are considered to be good aquifers and sources of aggregate material. The physiography in the vicinity of the Study Area is characterized by shale plains and is located north and west of two historic beaches and a shore cliff formed by Lake Iroquois. The reviewed surficial geology mapping in the region of the Study Area indicates that the Study Area is underlain by glaciolacustrine deposits of clay to silt till and Paleozoic bedrock (Ontario Geological Survey, 2010). MOECC water well records in the area of the Study Area indicate that the area is generally underlain by till and shale formations (red or grey in colour), the latter of which typically contained the water table.

3.2.2 Source Water Protection

The Study Area falls within the Credit Valley Source Water Protection Area. According to the Source Water Protection Information Atlas (MOECC, 2017), there are no Wellhead Protection Areas (WHPAs), Highly Vulnerable Aquifers (HVAs), Event Based Areas or Issue Contributing Areas (ICAs) within the Study Area. Sheridan Park Drive is located upstream and outside of the Intake Protection Zone (IPZ). There is a Significant Groundwater Recharge Areas (SGRA) with a score of 2 mapped at the west end of the Study Area along Sheridan Park Drive near the intersections of Speakman Drive and Winston Churchill Boulevard. This score indicated this SGRA has a low intrinsic vulnerability. Although no specific policies apply to this SGRA, any reduction of groundwater recharge from this area will be offset by the provision for a stormwater bioretention features within the proposed road extension area. These features are discussed in Section 6.5.

3.3 Natural Environment

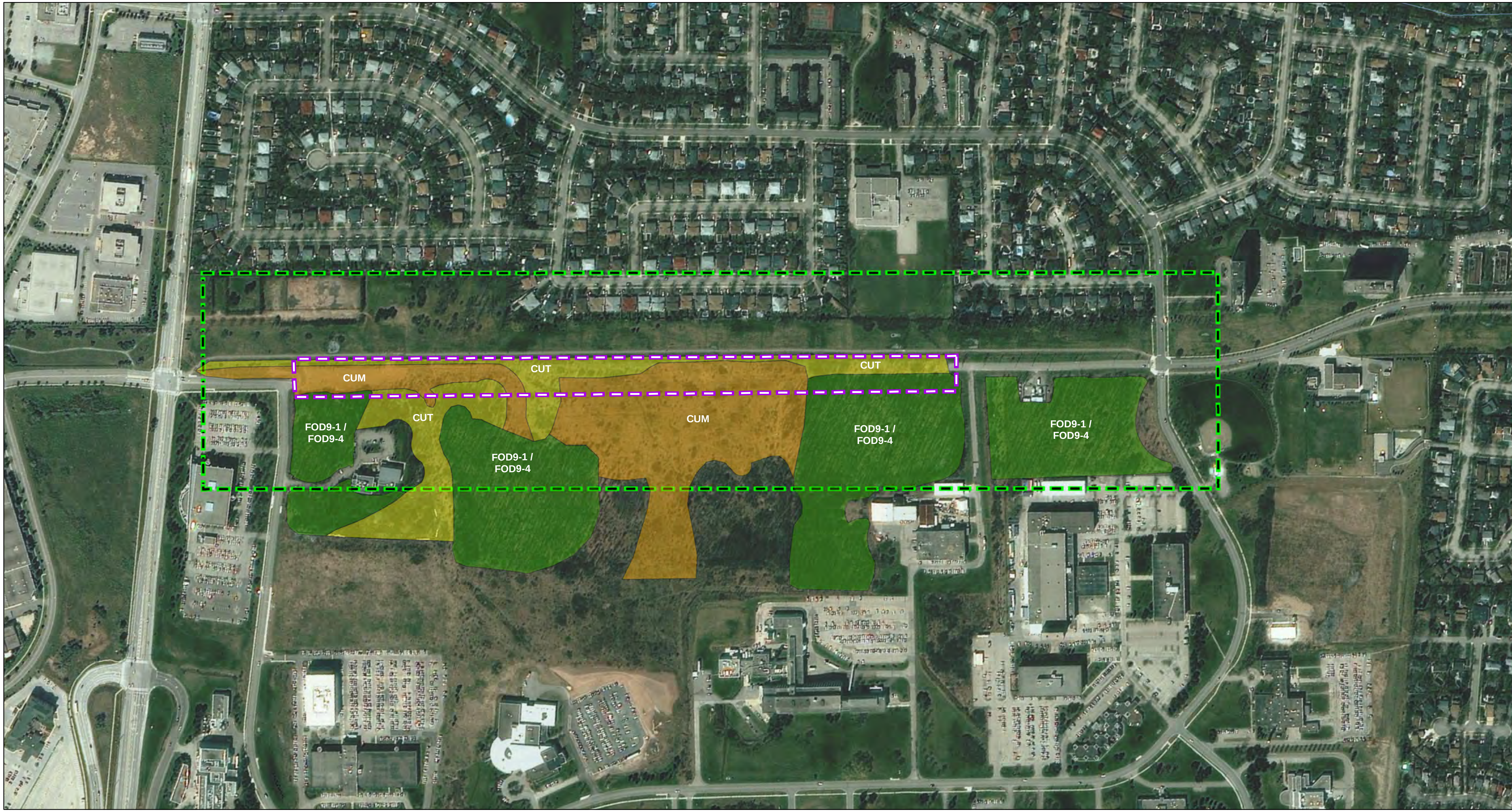
For the purposes of the Natural Environment Assessment, existing terrestrial and aquatic environment features were assessed within two defined areas: the Study Area, which includes the proposed road extension area and lands within approximately 120 m of the proposed road extension; and, the Study Area Vicinity, which includes lands within approximately 500 m of the proposed road extension beyond the boundaries of the Study Area and therefore outside the proposed road extension area. The existing features within these two areas are described in the following sections.

3.3.1 Terrestrial Environment

3.3.1.1 Vegetation Communities and Significant Natural Areas

Vegetation communities were characterized using the Ecological Land Classification (ELC) system at the ecosite level for the Study Area using protocols outlined in Lee *et al*. (1998). Information on the plant species encountered within the Study Area was also compiled into a plant inventory. Field surveys were conducted on June 7, 2017. Three vegetation community types were identified in the Study Area as illustrated on Figure 3.1, split between eight distinct vegetation community polygons. The communities identified were:

- Fresh-Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest (FOD9-1 / FOD9-4);
- Cultural Thicket (CUT); and
- Cultural Meadow (CUM).



Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Rotation: -51.2	Scale Factor: 0.99960

True North

0 100 200 300 400

Metres

Vegetation Community Classification

- CUM - Cultural Meadow
- CUT - Cultural Thicket
- FOD9-1 / FOD9-4 - Fresh Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest
- Sheridan Park Drive Right-of-Way
- Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BURNSIDE

Client

CITY OF MISSISSAUGA

Figure Title

SHERIDAN PARK DRIVE EXTENSION

ECOLOGICAL LAND CLASSIFICATION

Drawn	Checked	Date	Figure No.
HN	PD	2018/01/09	3.1
Scale		Project No.	
H 1:5,000		300039474	

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Provincially Significant Wetlands

No Provincially Significant Wetlands (PSW) were identified within the Study Area or on any adjacent lands from Natural Heritage Information Centre (NHIC) records. There are three headwater drainage features and tributaries located central to the natural portions of the Study Area. These areas were not identified as wetlands during ELC surveys.

A constructed linear drainage swale was also identified. This swale did have the presence of obligate wetland species such as Narrow-leaved Cattail (*Typha angustifolia*). This system was determined to be a constructed SWM feature, and as such has no potential to be evaluated as a PSW.

Significant Valleylands

It was determined based on aerial photo interpretation and background information, and confirmed during field investigations, that no valleylands are present within the Study Area.

Significant Woodlands

The MOP defines Significant Woodlands as any woodlands, excluding cultural savannahs, greater than or equal to four hectares (City of Mississauga, 2017). Significant Woodland was identified within the Study Area and confirmed during field studies to extend into the City-owned ROW based on the size criteria, as described in Section 5.1.3 of the Natural Environment Report (see **Appendix C**). The extent of the Significant Woodland within the ROW is 0.44 ha; however, based on the preliminary preferred design plan, less than 0.05 ha of the Significant Woodland would be impacted by the proposed road extension.

Significant Areas of Natural and Scientific Interest (ANSI)

No ANSI's were identified through the background information review for the Study Area or Study Area Vicinity.

3.3.1.2 Avifauna (Breeding Birds)

Breeding bird surveys were completed for this project on June 1 and 13, 2017 by an Avian Biologist. Breeding bird surveys were completed following the general principles outlined in the Ontario Breeding Bird Atlas (OBBA) Guide for Participants (OBBA, 2001), tailored to the needs of this project.

A total of 29 summer resident bird species exhibiting some level of breeding evidence were observed in the Study Area during the breeding bird surveys conducted in 2017. Two bird species listed as either provincially and/or federally significant were observed in the Study Area during the breeding bird surveys: Eastern Wood-pewee (*Contopus* *virens*) (Special Concern) and Barn Swallow (Threatened). Suitable nesting habitat is present for Eastern Wood-pewee in the FOD9-1 / FOD9-4 ecosites of the Study Area. Based on a background review of the Study Area, other avian Species at Risk (SAR) may be present in the vicinity of the Study Area but were not observed during field investigations. The areas surveyed for breeding birds and the locations of Eastern Wood-pewee observations are illustrated on Figure 3.2

3.3.1.3 Herpetofauna (Amphibians)

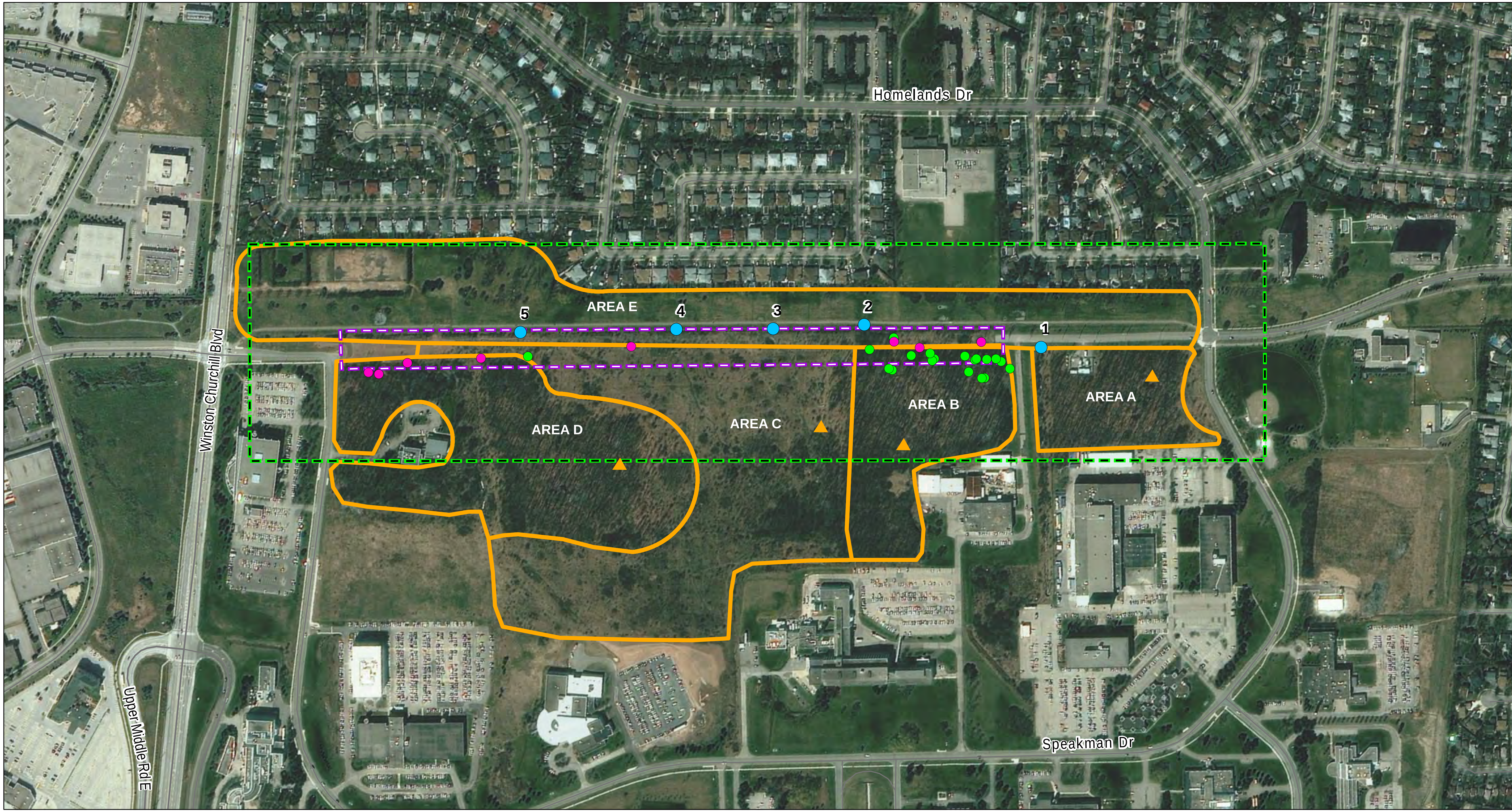
Amphibian breeding call surveys were conducted throughout the Study Area during the first two weeks of April, May, and June, 2016, respectively to determine the presence of breeding amphibians. No amphibians were heard calling during any of the monitoring events and no significant amphibian breeding habitat was identified within the Study Area. Locations of amphibian breeding call surveys are illustrated on Figure 3.2.

3.3.1.4 Bats

Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-coloured Bat (*Perimyotis subflavus*) are small, insectivorous species of the Family Vespertilionidae. The three species were emergency listed as Endangered on Schedule 1 of the federal *Species at Risk Act (SARA), 2002* in 2014 because of sudden and dramatic declines across the eastern portions of the ranges of Little Brown Myotis and Northern Myotis, and throughout the entire Canadian range of Tri-colored Bat. These declines are the direct result of white-nose syndrome (WNS). The single greatest threat to Little Brown Myotis and Northern Myotis is WNS. Because of the significance of WNS, where appropriate, this recovery strategy differentiates between areas affected by WNS and those not yet affected (e.g., within population and distribution objectives, threats, and recovery approaches).

In April 2017, the Ministry of Natural Resources and Forestry (MNRF) Guelph District released the Survey Protocol for Species at Risk Bats within Treed Habitats for Three of Ontario’s Four Endangered Bat Species (Little Brown Myotis – *Myotis lucifugus*; Northern Myotis – *Myotis septontrionalis*; Tri-colored Bat – *Perimyotis subflavus*) (MNRF, 2017).

The 2017 protocol is separated into two sub-protocols, a “leaf-off” and a “leaf-on” survey which each target different species. These two surveys focus on treed habitat features, including forests, swamps and cultural woodlands. The findings of these two surveys may result in the MNRF requirement for acoustic surveys to confirm the presence of endangered bat species within an area of study.



Datum: North American 1983
Coord. System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Central Meridian: 81°0'0.00"W
False Easting: 500,000m | False Northing: 0m
Rotation: -51.2 | Scale Factor: 0.99960

True North

0 100 200 300 400
Metres

- Candidate Bat Maternity Habitat Tree (Leaf-On)
- Candidate Bat Maternity Habitat Tree (Leaf-Off)
- Amphibian Monitoring Location
- EAWP Location
- Sheridan Park Drive Right-of-Way
- Breeding Bird Survey Location
- Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BURNSIDE

Client
CITY OF MISSISSAUGA

Figure Title
SHERIDAN PARK DRIVE EXTENSION
ECOLOGICAL SURVEYS

Drawn	Checked	Date	Figure No.
HN	PD	2018/01/09	3.2
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Leaf-off Survey

Leaf-off surveys of treed habitat for maternity / roosting colonies focus on Little Brown Myotis and Northern Myotis. These species roost in tree cavities or under loose bark. Leaf-off surveys were completed on April 11, 2017. The locations of Candidate Bat Maternity trees based on the Leaf-off survey are illustrated on Figure 3.2.

Leaf-on Survey

Tri-colored Bat show strong preference to roosting in the foliage of oak and maple trees, especially those that feature dead or dying clusters of leaves. This survey protocol targets these genera specifically. Leaf-on Surveys were completed on June 7, 2017.

Leaf-off surveys for bat maternity habitat (BMH) identified 19 candidate habitat trees for Northern Myotis and Little Brown Myotis, and leaf-on surveys found eight suitable habitat trees for Tri-colored Bat within the corridor of anticipated road impacts. The eight suitable bat habitat trees based on the Leaf-on survey are illustrated on Figure 3.2.

The Study Team has recommended compensation for the removal of the eight trees with a combination of either bat boxes or artificial bark at a 1:1 ratio. At the time of preparing this Project File, this recommendation was provided to MNRF for approval. A copy of this correspondence is provided in **Appendix M6**. The details of this compensation will be confirmed through correspondence with MNRF during the detailed design phase of the Project.

Further details about terrestrial habitat inventory and surveys can be found in the Natural Environmental Report in **Appendix C**.

3.3.2 Tree Inventory

191 trees 10 cm diameter at breast height (DBH) or greater were identified within the Sheridan Park Drive ROW. 27 species were observed (approximately 62% native to Ontario). No tree SAR were present. Based on the preliminary preferred design plan, some trees would need to be removed, while others can be protected and/or preserved. Approximately 62% of the trees for removal are Green Ash. There is concern about the long term survivability of Green Ash throughout most of Ontario due to Emerald Ash Borer (EAB). The City’s policy is to remove ash species where necessary during construction due to their short lifespan.

Further details about trees included in the tree inventory can be found in the Tree Inventory and Preservation Report in **Appendix D**.

3.3.3 Aquatic Environment

The aquatic environment in the Study Area comprised of two watercourses and three headwater features of Sheridan Creek. All watercourses flow generally from northwest to southeast through the Study Area.

Watercourse 1

Watercourse 1 was assessed as likely intermittent. The segment of this watercourse within the Study Area features significant riparian vegetation that would provide shade and contribute to potential habitat to resident fish. Streambanks were identified as slightly unstable; undercutting was observed along limited sections of the banks. Small amounts of Watercress were observed along the eastern bank of the channel, which can be a potential indication of groundwater contribution.

Watercourse 2

Watercourse 2 was located southwest of Watercourse 1 and originated upstream of the paved trail. This watercourse likely receives its water from overland sheet flow contributed by surrounding lands. Downstream of the paved trail, the watercourse becomes ponded by a footpath, which indicated a barrier to potential fish migration. This watercourse was assessed as appearing to be incapable of providing direct fish habitat; it was noted, however, that this watercourse does likely contribute to water quality and quantity to Sheridan Creek during the spring freshet and in periods of extended precipitation.

Fish Habitat

No fish were observed during the field investigations and subject aquatic features appear to provide little to no potential to support direct fish habitat. Fish populations have also been identified as being likely limited in the upstream reaches of Sheridan Creek and its tributaries. These factors, intermittent or ephemeral flows, low water quantity, in-stream barriers, and potentially degraded water quality contribute to the conclusion that there is likely no direct fish habitat within the Study Area. No records of aquatic SAR were identified as potentially inhabiting the watercourse within the Study Area itself, or within the Sheridan Creek Watershed.

Further details about aquatic environment, habitat inventory and surveys can be found in the Natural Environmental Report in **Appendix C**.

3.3.4 Significant Natural Heritage Features

3.3.4.1 Significant Wildlife Habitat

The four categories of Significant Wildlife Habitat (SWH) are identified as:

1. Habitats of seasonal concentrations of animals;
2. Rare vegetation communities or specialized habitat for wildlife;
3. Habitat of Species of Conservation Concern; and
4. Animal movement corridors.

Table 3.1 summarizes Confirmed and Candidate SWH in the Study Area. It also lists Candidate SWH assessed as having moderate or high potential to be present in the Study Area Vicinity.

Table 3.1: Confirmed and Candidate SWH in the Study Area and Study Area Vicinity

Study Area (within 120 m of proposed project area)	Study Area Vicinity (within 500 m of proposed project area)
Seasonal Concentration Areas of Animals	
• Candidate Waterfowl Stopover and Staging Areas (Terrestrial) • Candidate Raptor Wintering Area • Candidate Bat Maternity Colonies • Candidate Reptile Hibernaculum • Candidate Monarch Butterfly Stopover Areas • Candidate Landbird Migratory Stopover Areas	• Candidate Waterfowl Stopover and Staging Areas (Terrestrial) • Candidate Raptor Wintering Area • Candidate Bat Maternity Colonies • Candidate Reptile Hibernaculum • Candidate Monarch Butterfly Stopover Areas • Candidate Landbird Migratory Stopover Areas
Rare Vegetation Communities or Specialized Habitat for Wildlife	
• Candidate Old Growth Forest • Candidate Amphibian Breeding Habitat (Woodland)	• Candidate Old Growth Forest • Candidate Amphibian Breeding Habitat (Woodland)
Habitat of Species of Conservation Concern	
• Candidate Shrub / Early Successional Bird Breeding Habitat • Confirmed Special Concern and Rare Wildlife Species – Eastern Wood-pewee – Monarch	• Candidate Shrub / Early Successional Bird Breeding Habitat • Confirmed Special Concern and Rare Wildlife Species – Eastern Wood-pewee – Monarch
Animal Movement Corridors	
• Candidate Amphibian Movement Corridors	• Candidate Amphibian Movement Corridors

In addition, Credit Valley Conservation (CVC) has provided mapping for candidate SWH based on the Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study (North-South Environmental Inc. *et al.*, 2009). City mapping showed the presence of three candidate SWH in the Study Area Vicinity (Migratory Land Bird Stopover Successional, Migratory Land Bird Stopover Natural, Foraging Areas with Abundant Mast).

3.3.4.2 Habitat of Endangered and Threatened Species

Burnside's background review and correspondence with MNRF area biologists revealed the potential for SAR in the Study Area and Vicinity. All findings can be found in the SCC and SAR screening table in the Natural Environment Report (see **Appendix C**). **Table 3.2** summarizes confirmed and candidate habitat for endangered and threatened species in the Study Area and Vicinity.

Table 3.2: Confirmed and Candidate Habitat for Endangered (END) and Threatened (THR) Species in Study Area and Vicinity

	Study Area (within 120 m of proposed project area)	Study Area Vicinity (within 500 m of proposed project area)
Confirmed Habitat Present	None	None
Candidate Habitat Present	• Little Brown Myotis (Endangered (END)) • Northern Myotis (END) • Tri-colored Bat (END) • Eastern Meadowlark (Threatened (THR)) • Butternut (END)	• Little Brown Myotis (END) • Northern Myotis (END) • Tri-colored Bat (END) • Barn Swallow (THR) • Eastern Meadowlark (THR) • Chimney Swift (THR) • Butternut (END)

3.3.4.3 Species at Risk

Two SAR were identified as being potentially present in the Study Area Vicinity but not within the Study Area itself. These species are Barn Swallow (THR) and Chimney Swift (THR).

No SAR were identified during Site-specific field studies conducted as part of the EA. Candidate habitat exists on the Study Area for Eastern Meadowlark (THR), Little Brown Myotis (END), Northern Myotis (END), Tri-colored Bat (END), and Butternut (END). In the Study Area Vicinity there is also potential habitat for Barn Swallow (THR) and Chimney Swift (THR).

The most effective way to minimize impacts to these candidate habitats is to reduce the footprint of road works as much as possible. In the event that tree removal will be required, trees to be removed must be assessed on a case-by-case basis to determine whether they may be suitable as BMH. If a BMH tree must be removed, permitting may be required from the MNRF to remove SAR habitat and compensatory offsetting may be required.

Although no Butternut trees were identified in the areas predicted to be impacted by the road, trees to be removed should be confirmed to the species level during the detailed design phase of the project to avoid the incidental removal of Butternut. No impacts to candidate habitat for Eastern Meadowlark are anticipated.

Further details about significant natural heritage features can be found in the Natural Environmental Report in **Appendix C**.

3.4 Socio-Economic Environment

As part of the EA Study, Burnside has completed a social and economic assessment of the Study Area to characterize the local economy and social environment. A review of municipal planning documents, relevant policy, land use plans and available data have been used to determine the character of the Study Area. A copy of the Socio-Economic Assessment Memo is provided in **Appendix E**.

According to the 2016 census published by Statistics Canada in 2016, the enumerated population of the City was 721,599. The land area of the City is 292.43 km^2 and the population density was 2,468 people/km^2. In 2016, there were 240,913 private dwellings occupied in the City, which represent a change of 2.7% from 2011. The population of the City is expected to increase to 878,000 by 2041 (currently 766,000). The population in Sheridan Homelands fell by 1.1% from 2011 to 2016. Employment fell by 12%, but is expected to increase again by the next census.

Within the Study Area, over 2,700 people are currently employed in Sheridan Park Corporate Centre (which is classified as a regionally significant center of business). The key existing economic clusters within the City include life sciences and CIT (community, information and technology), both of which are represented in Sheridan Park. These sectors are poised to experience continued growth into the future, as the City becomes a growing hub for these industries. The relevant policies have poised Sheridan Park Corporate Centre as a major area for economic growth within the city and regionally.

The Sheridan Homelands neighborhood consists of over 2,000 households, bounded to the north by Dundas Street, to the east by Erin Mills Parkway, to the south by the utility corridor, and to the west by Winston Churchill Boulevard. This area has a vibrant community lead by the Sheridan Homelands Ratepayers' Association (SHORA).

SHORA works to cultivate a strong sense of community with various events, community meetings, membership, and a neighborhood newsletter.

3.4.1 Archaeology

Archaeological Services Inc. (ASI) was retained to conduct a Stage 1 Archaeological Assessment for the Study Area. The Stage 1 Archaeological Assessment Report (July 2017) is provided in **Appendix F**. The Stage 1 background study determined that no previously registered archaeological sites are located within 1 km of the Study Area, however four sites are within 2 km of the Study Area. According to the background research, no previous reports detail fieldwork was undertaken within 50 m of the Study Area. The property inspection completed on May 12, 2017, determined that parts of the Study Area exhibits archaeological potential and will require Stage 2 assessment, prior to development. The remainder of the Study Area has been subjected to deep soil disturbance events associated with the construction of the existing ROWs, MUT, and buried utilities and do not retain archaeological potential. These areas do not require further survey.

Based on the recommendations of the Stage 1 assessment, ASI completed a Stage 2 Archaeological Assessment for the Study Area to assess archaeological potential. The Stage 2 Archaeological Assessment Report (October 2017) is provided in **Appendix G**. The Stage 2 field studies determined that there are no archaeological resources present within the areas of impact of the proposed road extension and no further investigation is required.

3.4.2 Built Heritage

ASI was retained to conduct a Cultural Heritage Resource Assessment for the Study Area. The Cultural Heritage Resource Assessment Report (July 2017) is provided in **Appendix H**. The results of background historic research and a review of secondary source material, including historical mapping, revealed a Study Area with a rural land use history dating back to the early nineteenth century. A review of federal registers and municipal and provincial inventories revealed that there is one previously identified feature of cultural heritage value adjacent to the Study Area, which is the Sheridan Park Corporate Centre. No significant cultural heritage impacts to this resource will result from the proposed extension of Sheridan Park Drive.

3.5 Air Quality

An Air Quality Impact Assessment has been completed for this project and is provided in **Appendix I**. Based on the forecasted 2031 traffic volumes, future predicted air quality levels with and without a road extension were compared to the existing air quality levels to understand the impact of a potential road extension on local air quality. Typical contaminants from automobile exhaust were evaluated including Particulate Matter

(PM2.5 and PM10), Total Suspended Particulates (TSP), Nitrogen Oxides (NOx), Carbon Monoxide (CO), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde.

The future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) were all below the MOECC criteria with the exception of Benzene, which already exceeds the criteria based on background air quality.

The Air Quality Impact Assessment shows that change in concentration of benzene at any location in the Study Area is negligible. The variability in the National Air Pollution Surveillance (NAPS) background measurements (standard deviation of 0.22 µg/m^3) is much higher than the predicted change in impact (0.0003 µg/m^3 worst case impact). The background benzene concentration is continuing to fall as shown in Figure 19 of the Air Quality in Ontario 2015 Report (MOECC, 2015). As a result, based on the analysis, there is no expectation that the benzene concentration will increase because of the project.

It should be noted that the elevated Benzene levels detected are not isolated to the Sheridan Park area, but observed all over the Province. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level. Local reductions have a limited effect as a result reducing benzene concentrations requires a provincial solution. According to Air Quality in Ontario 2015 Report (MOECC, 2015), over the 10 year period from 2005 to 2014, benzene concentrations have decreased 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial / commercial operations emitting benzene in the vicinity of the project area.

Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the city.

3.6 Noise

As part of the Sheridan Park Drive Extension EA, a noise study was undertaken to determine noise impacts as a result of the proposed Sheridan Park Drive extension. A copy of the Noise Impact Assessment Report is provided **Appendix J**. The noise study followed the Ontario Ministry of Transportation's (MTO) Environmental Guide for Noise (MTO Noise Guide) (MTO, 2006) and the City of Mississauga Policy 09-03-03, Noise Attenuation Barriers on Major Roadways (City Noise Policy) (City of Mississauga, 2015).

Based on the MTO Noise Guide, where an existing roadway is proposed to be modified / widened adjacent to a Noise Sensitive Area (NSA) or a new road is proposed, MTO requires that the future noise levels without the proposed improvements be compared to the future noise level with the proposed improvements. The assessment is done at the outdoor living area (typically backyards) of each NSA. The provision of noise mitigation is to be investigated should the future noise level with the proposed improvements result in a greater than 5 dBA increase over the future noise level without the proposed improvements. If noise mitigation is provided, the objective is a minimum 5 dBA reduction. Mitigation will attempt to achieve levels as close to, or lower than, the objective level.

For the purpose of the noise analysis carried out for this Class EA study, the City Noise Policy states "*Noise barriers may be constructed by the City in conjunction with a road widening project if no noise attenuation barriers exist, and the proposed additional lanes of traffic are found to adversely affect the daytime noise level beyond the established criteria (the noise level must be greater than 60 dBA (Leq daytime)"*. (Leq means "equivalent sound level" and daytime means 7:00 AM to 11:00 PM. Leq daytime means daytime average.)

The Sheridan Homelands neighbourhood to the north of the Study Area is considered an NSA. The outdoor living areas of three residential houses adjacent to the utility corridor as well as the Homelands Senior Public School yard were selected as representative Points of Reception (PORs) for the purposes of assessing future noise levels within the NSA. The future sound levels at the four PORs were predicted based on the traffic forecast for 2031 calendar year for three scenarios: Current, Future No Build, and Future Build. Future No Build scenario represents conditions in the future without proposed road extension; while Future Build scenario includes proposed road extension in the future.

The future predicted noise levels at these PORs were found to be no more than 1 dBA greater than the existing noise levels. Therefore, the extension has negligible impact on the noise levels in the neighbourhood. In general, sound level increases of less than 3 dBA are not noticeable to the human ear. Since the predicted future noise levels are below the MTO Noise Guide and City Noise Policy, no noise mitigation measures (sound barriers) are required.

3.7 Phase One Environmental Site Assessment

What is a Phase One Environmental Site Assessment?

Phase One Site Assessments are conducted to investigate the current and past history and uses of the property in question. These investigations determine if there are any conditions that are indicative of releases of petroleum or hazardous materials or chemicals at the Site, now or in the past; and if additional study is required. As such, Phase One assessments are meant to identify recognized environmental conditions (REC) of a subject property.

A Phase One Environmental Site Assessment (ESA) was completed to identify and document the current and historical environmental conditions of the Site and assess the risk from both on-Site and off-Site sources of contamination. Based on the information collected as part of this Phase One ESA, the Study Area was agricultural in 1880 and the area within the City-owned ROW (the Site) has been vacant since 1934. There were no underground storage tanks or aboveground storage tanks identified on the Site currently or historically. There were no Potentially Contaminating Activities identified on the Site. The records review, interview and Site visit indicate there are no Areas of Potential Environmental Concern on the Site. A copy of the Phase One ESA is provided in **Appendix K**.

4.0 Assessment of Alternative Solutions

4.1 Identification of Alternative Solutions

The following alternative solutions were identified to address the Project Opportunity Statement:

- Alternative 1 – Do Nothing;
- Alternative 2 – Limit / Manage Growth;
- Alternative 3 – Extend Roadway; and
- Alternative 4 – Provide Alternative Routes for Existing and Future Traffic

4.1.1 Alternative 1 – Do Nothing

Under the 'Do Nothing' solution, the City would not make any changes or improvements to the existing road network. New roads including the extension of Sheridan Park Drive would not be constructed.

4.1.2 Alternative 2 – Limit / Manage Growth

Under the 'Limit / Manage Growth' solution, the City would limit growth in the surrounding areas by reducing or stopping the approval of development applications in order to stay within the current road capacity and infrastructure service capacity as it existing today.

4.1.3 Alternative 3 – Extend Roadway

Under the 'Extend Roadway' solution, the City would construct a new road segment along the City-owned ROW between Speakman Drive to Homelands Drive.

4.1.4 Alternative 4 – Provide Alternative Routes for Existing and Future Traffic

Under the 'Alternative Routes' solution, the City would implement improvements (e.g., widening of Speakman Drive, North Sheridan Way, etc.) of existing roads to enable existing and future traffic to use alternate route options in the surrounding areas.

4.2 Evaluation of Alternative Solutions

The overall objective of the evaluation was to identify a Preferred Solution among the four alternatives identified that would provide the most favourable solution to the Project Opportunity Statement.

To this end, a set of Evaluation Criteria were grouped under four key areas established as part of the Class EA process to comparatively evaluate the Alternative solutions identified above. The Evaluation Criteria included:

- Natural Environment;
- Socio-Economic Environment;
- Cultural Environment; and
- Transportation Engineering Environment.

4.2.1 Evaluation Results

The evaluation of the Alternative solutions was based on an assessment of potential impacts and a review of input received from the public and regulatory agencies during the study process. Table 4.1 provides a summary of the evaluation of alternative solutions. A detailed evaluation matrix is provided in **Appendix L**.

Alternative 1 (Do Nothing) and Alternative 2 (Limit / Manage Growth) are unable to address the Project Opportunity Statement with the exception of preserving the natural feel and recreational benefits of the Study Area.

Alternative 3 (Extend Sheridan Park Drive) can fully address the Project Opportunity Statement, because it:

- Supports multi-modal transportation for all users;
- Has the potential to divert traffic from the residential neighbourhood;
- Improves network redundancy;
- Improves access to the Study Area; and
- Will preserve the natural feel and recreational benefits of the Study Area by implementing appropriate mitigation.

Alternative 4 (Improve Alternative Routes) partially addresses the Project Opportunity Statement as it supports multi-modal transportation; however, it does not improve network redundancy or improve access to the Study Area.

Therefore, based on this evaluation, Alternative 3 was identified as the Preliminary Preferred Alternative.

Table 4.1: Summary of Evaluation of Alternative Solutions

Evaluation Criteria	Alternative 1: Do Nothing		Alternative 2: Limit / Manage Growth		Alternative 3: Extend Roadway (Sheridan Park Drive)		Alternative 4: Improve Alternatives Routes for Existing or Anticipated Traffic	
Natural Environment	●	No impacts to existing conditions.	●	No impacts to existing conditions.	◑	Requires tree / vegetation removals; however, impacts can be mitigated by tree plantings at a 2:1 replacement ratio. No tree SAR observed in Study Area. The proposed road extension will not directly affect wildlife habitat, any potential impacts will be mitigated. Road extension not anticipated to impact the form and function of vegetation and headwater drainage features.	◑	Avoids potential impact to natural environment in the Study Area, but potential for impacts to natural features along other roadways.
Socio-Economic Environment	◑	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	◑	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	●	Connectivity will be improved for all modes of transportation. Provides improved access routes for emergency services. No changes to pedestrian and cycling use of corridor.	◑	Providing alternate route options does not increase connectivity within the Study Area. No changes to pedestrian and cycling use of corridor.
Cultural Environment	●	No impacts to existing conditions.	●	No impacts to existing conditions.	◑	Based on archaeological assessment, there are no archaeological resources within the Study Area. No impacts anticipated to cultural heritage features.	◑	No impacts to existing conditions within the Study Area. Some potential for impacts to archaeological resources and cultural heritage resources in other corridors.
Transportation Engineering Environment	○	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	○	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	●	Consistent with City planning policies (e.g., Official Plan). Addresses anticipated transportation needs. Improves network connectivity and provides alternate route options for all travel modes.	○	Would potentially provide capacity in other corridors; however, does not improve network connectivity or provide alternate route options for all travel modes within the Study Area.
Addresses Project Opportunity Statement	✘		✘		✓		✘	
Overall Summary	**Not Carried Forward**		**No Carried Forward**		**Carried Forward**		**Not Carried Forward**	

4.2.2 Preliminary Preferred Solution

Based on the results of the evaluation, Alternative 3 (Extend Sheridan Park Drive) was identified as the preliminary preferred solution. The Study Team presented Alternative 3 as the Preliminary Preferred Solution at the Public Information Centre (PIC) held on June 27, 2017. A preliminary design plan was also presented to give attendees an idea what the proposed road extension might look like if implemented.

4.2.3 Consideration of Stakeholder Input

The Study Team received comments from a number of local residents as a result of the PIC. The results of the PIC are discussed in more detail in Section 5.3.2. One of the concerns raised by some local residents was to further review the consideration of alternative routes (Alternative 4) such as Speakman Drive or North Sheridan Way.

Following the PIC, the widening of Speakman Drive was investigated further as an alternative route. Based on the traffic analysis (see **Appendix A**), widening Speakman Drive to four lanes does not provide alternate routing for Sheridan Homelands neighbourhood or remove cut-through traffic along Homelands Drive. Even with widening Speakman Drive, the traffic analysis indicates that there will be an increase of 17% in the morning rush hours on Homelands Drive without the extension in place. As a result, widening Speakman Drive will serve the Sheridan Park Corporate Centre only.

Similarly, it is not expected that the widening of North Sheridan Way would not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive, since this roadway is further south than Speakman Drive.

Additional input received from local residents on the preliminary road design concept presented at the PIC was also taken into consideration by the Study Team. These considerations are discussed further in Section 5.3.2.

4.2.4 Confirmation of Class EA Project Schedule

As noted in Section 1.2.2, the Class EA guidelines for a Schedule B undertaking apply to construction of new roads or other linear paved facilities (e.g., HOV lanes) if the construction value is less than $2.4 million.

At the time of conducting this Study, the preferred solution to extend the Sheridan Park Drive is anticipated to incur an overall construction cost that will not surpass the cost threshold of $2.4 million (not including land acquisition or engineering costs). As such, a Schedule B undertaking is confirmed as appropriate. As such, Phases 1 and 2 of the Class EA process must be completed before the recommended alternative can proceed to implementation.

4.3 Completion of Phase 2

Based on the results of the evaluation, the preliminary preferred solution was identified by the study team to be Alternative 3 and was presented as such at the PIC in order to obtain input from stakeholders. Therefore, the study team was able to confirm that Alternative 3 was the preferred solution to the problem / opportunity statement identified in Phase 1 of the Municipal Class EA process. This decision marks the completion of Phase 2 of the process.

Since the undertaking is classified as Schedule B Project, Sections 1 through 4 (as well as Section 8, which document the public consultation components of Phases 1 and 2) satisfies the documentation requirements for Schedule B Projects.

However, for the purpose of a more comprehensive consultation and to provide public and stakeholders with an improved understanding of the proposed Sheridan Park Drive extension, a preliminary design concept was prepared and presented at the PIC. The preliminary design concept is discussed in Section 6.2.

5.0 Study Consultation

5.1 Introduction

A key component of the study includes consultation with members of the public, review agencies, organizations, Indigenous communities, and key stakeholders. In order to ensure public, agency and stakeholder consultation, a consultation plan was initiated from the onset of the study and continued throughout. The objectives of the consultation plan were to:

- Identify potentially affected stakeholders;
- Inform stakeholders of project status and components;
- Obtain input from stakeholders during all phases of the study; and
- Integrate information received into the planning and decision-making processes.

A wide range of stakeholders were identified and contacted at the onset of the study and during the EA process including relevant review agencies and organizations, Indigenous communities and local residents who may be affected or have interest in the study. These stakeholders were contacted through direct distribution of notices as well as publications within local newspapers and on the City of Mississauga website. A number of consultation activities were undertaken to achieve the above objectives:

- Placement of Notice of Study Commencement within the Mississauga News;
- Provision of an Online Survey at the beginning of the Study;
- Scheduling of a PIC during Phase 2 of the study;
- Placement of Notice of PIC within the Mississauga News prior to the PIC;
- Advertisement of PIC by mobile sign within Study Area;
- Distribution of notices to all property owners or occupants within 300 m of the Study Area;
- Distribution of notices to review agencies, organizations and Indigenous communities;
- Receiving and responding to written comment submissions from members of the general public;
- Receiving and responding to written submissions from review agencies;
- Forming a Stakeholder Advisory Committee and hosting two meetings;
- Placement of the PIC Summary Report on the City website;
- Placement of Notice of Study Completion within the Mississauga News; and
- Placement of this ESR on the Public Record and provision of a Notice of Study Completion to all stakeholders on the study contact lists during Phase 2 of the study.

5.2 EA Phase 1 Consultation

5.2.1 Notice of Study Commencement

A Notice of Study Commencement (NOCm) was advertised in the Mississauga News on January 26, 2017 and February 2, 2017. The NOCm was delivered to approximately 860 property owners or occupants within the vicinity of the Study Area. A copy of the NOCm is provided in **Appendix M1**.

A total of 33 agencies, organizations and Indigenous communities who may have been interested in the project, received a NOCm along with an accompanying letter. With the inclusion of a Project Response Form, recipients were asked to comment on:

- Policies, positions or guidelines implemented or administered by their agency / organization that may affect implementation of improvements to the study area;
- Background information that is pertinent to the compilation of an environmental inventory of the general study area;
- Any preliminary comments or concerns that their agency / organization has on the proposed projects; and
- Other projects within or near the general area of study.

Copies of the letters sent to agencies, organizations and Indigenous communities are provided in **Appendix M1**. The Project Contact List which identifies all the agencies and Indigenous communities contacted during the course of the Study is provided in **Appendix M2**.

5.2.2 Public Involvement

A total of five comments were received from the public in response to the NOCm. A summary of the issues raised by the public at this stage of the Study including the Study Team responses is provided in Table 5.1. A copy of all correspondence with members of the public at this and all other stages of the Study is provided in **Appendix M5**.

Table 5.1: Summary of Public Involvement - Notice of Commencement

ID	Comment	Response
A	Email received January 26, 2017 indicated that the link to the survey was not active. A second email was received on January 31, 2017 that included a photo to illustrate the increased traffic on Homelands Drive.	Comment noted. A repaired link to the survey was sent on January 31, 2017.
B	Email received January 29, 2017 indicating concerns about the project,	Comment noted. An email in response was sent February 7, 2017

ID	Comment	Response
	including loss of green space, increased traffic, noise and pollution, and safety concerns with the introduction of the extended road.	explaining that several assessment studies must be completed before a design is chosen and that the environmental effects and community character are part of this consideration. The email also indicated the upcoming PIC as a chance for participation.
C	Email received February 2, 2017 indicating concerns that the extension will create increased traffic, noise and development.	Comment noted. An email in response was sent February 7, 2017 noting the different studies to be completed and indicating the upcoming PIC as a chance for participation.
D	Email received March 7, 2017 requesting further details to assist in completing the survey, specifically the first question.	An email in response was sent April 13, 2017 indicating the survey was to gather opinions about the potential extension and that the first question was to understand what the most common use of a road extension would be to local residents.
E	Phone call on June 27, 2017 requesting to look into the need for a protected left turn phase at Winston Churchill Boulevard / Sheridan Park Drive in the northbound to westbound direction. Supports project.	Comment noted.

5.2.3 Online Survey

A study commencement online survey was indicated in the NOCm and available for completion on the City of Mississauga website. The survey was designed to help gather input on the study and potential extension of Sheridan Park Drive. The online survey received 133 responses in total. The survey responses can be found in **Appendix M3**. In general, survey respondents noted the following things were important to them if the roadway is extended: 24% maintaining natural features; 19% landscaping; 18% speed management; 18% pedestrian facilities; 14% cycling; and, 7% other. 65% of the respondents indicated that they were comfortable with roundabouts. The key comments received from the online survey were that respondents were concerned about the impact to existing natural spaces and wildlife; felt that the extension would decrease traffic and speeding through the Homelands neighbourhood; and, concerns about the potential increases safety risk to residents, cyclists and pedestrians.

5.2.4 Agency Involvement

A total of 16 comments were received from agencies (including utilities) in response to the NOCm. A summary of the agency comments at this stage of the Study including the Study Team responses is provided in Table 5.2. A copy of all correspondence with agencies at this and all other stages of the Study is provided in **Appendix M7**.

Table 5.2: Summary of Agency Involvement - Notice of Commencement

Agency / Organization	Comment	Response
City of Mississauga Accessibility Advisory Committee	Project response form dated January 26, 2017 requesting to be consulted if the project involves on-street parking, and that the City of Mississauga 2015 Facility Accessibility Design Standards need to be followed.	Comment noted. No on street parking is proposed for this project.
Infrastructure Ontario	Letter dated January 30, 2017 received indicating that if Ministry of Infrastructure lands are going to be impacted by the project, written notice should be given.	Comment noted.
Zayo	Email received February 6, 2017 indicating there are no objections as there are no facilities in the project area.	Comment noted.
Enbridge Pipelines Inc.	Email received February 6, 2017 indicating there are no facilities in the area.	Comment noted.
Trans Northern Pipeline Inc.	Project response form received February 8, 2017 requesting to be removed from the project contact list.	Comment noted.
Ministry of the Environment and Climate Change (MOECC)	Letter dated February 9, 2017 received providing details for appropriate consultation with Aboriginal communities.	Comment noted. The Indigenous communities noted by MOECC have been notified and

Agency / Organization	Comment	Response
		contacted during the course of this Study.
Credit Valley Conservation	Project response form dated February 10, 2017 indicating a potential protected watercourse adjacent to the study area, core woodland and significant wildlife habitat. Requested to be a member of Stakeholder Advisory Committee (SAC). Email received June 7, 2017 providing comments on the project regarding Fisheries and Oceans Canada (DFO), the natural heritage field studies, and permit requirements. Email received June 7, 2017 in response to background information request indicating a Data Sharing Agreement will be required once the data has been compiled. Email received June 19, 2017 containing the Data Sharing Agreement. Email received July 10, 2017 containing the data from the background information request and comments from ecology and water resources staff.	Comment noted. Email sent April 7, 2017 noting the natural heritage field studies commencing the following week. Email sent May 11, 2017 requesting background information on the study area. Email sent July 6, 2017 with the signed Data Sharing Agreement.
Mississauga Fire and Emergency Services	Project response form dated February 10, 2017 noting that the fire hydrants will need to be installed on the road and the road extension will offer additional access routes for emergency services.	Comment noted.
Region of Peel	Project response form dated February 15, 2017 indicating an	Comment noted.

Agency / Organization	Comment	Response
	interest in improvements to Winston Churchill Boulevard / Sheridan Park Drive intersection and in a provision of the right turn lane. Requested to be a member of SAC.	
Peel District School Board	Letter dated February 16, 2017 requesting to be kept informed on the project.	Comment noted.
Ministry of Tourism, Culture and Sport	Letter dated February 16, 2017 providing information surrounding protocol of protecting Ontario's cultural heritage.	Comment noted.
Sheridan Homelands Ratepayers' Association	Project response form dated February 16, 2017 indicating concern about noise levels, pedestrian safety, and the loss of recreational park space. Requested to be a member of SAC.	Comment noted.
Sheridan Park Association	Project response form dated February 16, 2017 indicating interest in the summary of the study once completed.	Comment noted.
MHBC Planning on behalf of TransCanada Pipelines Ltd.	Project response form dated March 23, 2017 indicating they would like to remain on the project contact list.	Comments noted.
Alectra Utilities	Project response form dated April 5, 2017 requesting to be a member of SAC.	Comment noted.
Ministry of Natural Resources and Forestry	Email received April 18, 2017 indicating the background request had been forwarded to the appropriate person. Email received May 29, 2017 providing background information on the area, primarily SAR.	Email sent April 17, 2017 requesting background information on the study area. Email sent December 7, 2017 providing the estimated area loss in candidate Bat Maternity

Agency / Organization	Comment	Response
		Habitat (BMH) and that eight BMH trees have been identified for removal. Recommended compensation for BMH tree removal.

5.2.5 Indigenous Engagement

No comments were received from Indigenous communities in response to the NOCm. Follow-up telephone calls were placed with the Indigenous communities to confirm receipt of the NOCm and inquire about their level of interest in the Study. A record of the telephone calls and correspondence with Indigenous communities is provided in **Appendix M7**.

5.3 EA Phase 2 Consultation

5.3.1 Notice of Public Information Centre

A Notice of PIC was advertised in the Mississauga News on June 15, 2017 and June 22, 2017. The Notice of PIC was delivered to approximately 860 property owners or occupants within the vicinity of the Study Area and 34 agencies, organizations and Indigenous communities on the Project Contact List. A copy of the Notice of PIC is provided in **Appendix M4**.

5.3.2 Public Information Centre

The PIC was held on June 27, 2017 from 6:00 PM to approximately 8:00 PM. The PIC was arranged primarily as an open house style session where participants were given the opportunity to review the display boards and representatives from the Study Team were available to answer questions and discuss the project with interested members of the public on a one-on-one basis or in small groups. A copy of the display boards is provided in the PIC Summary Report (see **Appendix M4**).

Participants were requested to provide input by completing the available comment sheets. For those who were not able to attend the meeting, comments sheets were provided on the City of Mississauga website. A total of 97 people signed in at the PIC excluding the Study Team members. A total of 56 written comment responses were received during the comment period following the PIC. Comments were provided through three methods including paper comment sheets supplied at the PIC, an online version of the comment sheet (available on the study website) or via email.

A detailed table of the study team responses to these concerns can be found in the PIC Summary Report (see **Appendix M4**).

5.3.3 Post-PIC Public Involvement

A total of nine comments were received from members of the public after the PIC comment period had closed. A summary of the issues raised by the public at this stage of the Study including the Study Team responses is provided in Table 5.3. A copy of all correspondence with members of the public at this and all other stages of the Study is provided in **Appendix M5**.

Table 5.3: Summary of Public Involvement - Post PIC

ID	Comment	Response
F	Email received August 11, 2017 requesting any studies related to traffic and noise impacts.	An email in response was sent August 28, 2017 indicating that once the documentation for all of the technical studies is completed the Project File will be available for public review.
G	Email received August 23, 2017 requesting information about the next public meeting and clarification on how the preferred alternative was chosen.	An email in response was sent August 24, 2017 advising that the PIC Summary Report will be available in the fall and that the Project File will be available once all of the technical studies are completed, which will discuss the rationale for choosing the preferred alternative.
H	Email received September 1, 2017 requesting an update on a date for a second public meeting mentioned during the PIC in June, and asking if the study has been expanded to include Speakman Drive and North Service Road. A second email was received September 4, 2017 requesting further clarification on the second public meeting.	An email in response was sent September 1, 2017 advising that a PIC Summary Report will be provided this fall, and that the Project File will be available for public review once the technical studies are completed, allowing for discussion of the rationale for the preferred alternative. A second email was sent September 6, 2017 noting that a public meeting will be held in the fall or winter as part of the Thorn Lodge / Homelands Neighbourhood Traffic

ID	Comment	Response
		Calming Review. The PIC boards of the study timeline were attached.
I	Email received September 6, 2017 inquiring about the timing of the Sheridan Park Drive Extension.	An email in response was sent September 6, 2017 indicating the timing would be considered once the technical studies were completed and a preferred alternative is selected.
J	Email received October 19, 2017 with concerns regarding: • Mitigation measures / traffic on Homelands; • Whether the extension needs to be built now or in the future; • The lack of community benefits addressed in the PIC Summary Report; and • The increased potential for flooding with the removal of trees.	An email in response was sent November 10, 2017 addressing the concerns: • The traffic analysis shows that the extension would provide additional access for the Sheridan Homelands residential community and would reduce vehicles along Homelands Drive; • Pending EA approval and selection of the preferred design, the extension is included in the City's 10 Year Capital Roads Program; • Suggestions for community improvements will be brought to the attention of the City. The EA process identifies mitigation measures for any social / cultural / natural environmental impacts. There was focus placed on minimizing impacts to natural features. • A stormwater management system is being designed. The City will investigate the potential flooding issue further. All trees removed would be replaced at 2:1 ratio.
K	Email received October 19, 2017 expressing support for the extension to help with growing levels of traffic along Homelands Drive and its	An email in response was sent November 10, 2017 expressing thanks for the support and indicating all comments will be reviewed by the

ID	Comment	Response
	intersections, as well as the safety benefits for children at Homelands Drive Public School.	Study Team before confirming the preferred solution and issuing the 30 day Public Review Period.
L	Email received November 21, 2017 requesting a copy of the Noise Impact Assessment Report, as well as details about the sound level measuring equipment (model, age, calibration date, placement, etc.).	An email in response was sent November 27, 2017 indicating that the Noise Impact Assessment Report would be available in early 2018 as part of the Project File Report. Details were provided about the sound level meter and calibrator.
M	Email received October 27, 2017 requesting a "sound review study" be undertaken to justify the recommendation of not building a wall. A second email was received November 27, 2017 providing clarification that the sound review be completed once the road is construction to measure the real time sound levels and see if a noise wall is required.	An email in response was sent November 27, 2017 asking for clarification of the request for a "sound review study" and indicating that a Noise Impact Assessment had been completed and would be available in early 2018 as part of the Project File Report. A second email was sent December 7, 2017 noting that the City will commit to completing an noise assessment after construction of the road extension to reassess the Study Team's recommendation that a noise barrier is not required.
N	Email received December 7, 2017 with specific concerns relating to impacts to: existing trees and vegetation communities; wildlife; hazard lands; surface water quality and drainage (storm water management); and ground water quality.	An email response was sent December 13, 2017 providing responses related to the specific concerns raised. Information was provided relating to: proposed tree removal and the compensation plan for trees; existing wildlife observations in Study Area and proposed mitigation measures; clarification of areas designated as hazard lands within Study Area (two watercourses and two headwater drainage features); how stormwater will be managed for proposed road extension and information about the

ID	Comment	Response
		City's salt management program; and commitment to reviewing need for hydrogeological study (to assess groundwater quality) during the detailed design phase of the project.
O	Email received December 17, 2017 with specific concerns about student safety; disruptions to nature and residents due to traffic; noise impacts; tree loss; reduced accessibility to MUT with roundabout and no parking; removal of mature trees and forest.	An email response was sent on December 21, 2017 providing responses related to the specific concerns. Clarification was provided to note that the proposed road extension will have no impacts on the existing MUT and that the City will explore opportunities for planting additional vegetation within the utility corridor to further enhance natural features of the area. The Study Team clarified that students will continued to be accommodated on the existing MUT and that the MUT is set back from the proposed road extension by 14 m which is greater than the standard separation to a public road include arterial roads. Information was provided with respect to the safe use of roundabouts and about the City's initiative to provide awareness and education about roundabouts in 2018. Information was provided about the proposed tree removal and the compensation plan for trees. Information was provided about findings of the noise impact assessment including the conclusion that the predicted future noise levels at sensitive receptors (residential backyards) are below Provincial and City of Mississauga standards and that no noise mitigation measures (sound barriers) are required. The Study Team noted that the traffic analysis indicated a reduction of

ID	Comment	Response
		vehicles along Homelands Drive after the road extension.

5.3.4 Post-PIC Agency Involvement

Following the PIC the Study Team received comments from the Sheridan Park Association (SPA) on July 10, 2017 indicating general support for the proposed road extension amongst the businesses in the association's membership. An email was received from TransCanada Pipelines on October 16, 2017 indicating the presence of an abandoned pipeline crossing in the area and detailing the requirements for activity / crossings within 30 m of a TransCanada pipeline. The Study Team followed up with TransCanada Pipelines on November 22, 2017 and it was confirmed that the abandoned pipeline is located beyond 30 m of the proposed road extension area and would not be impacted by the project.

A copy of all correspondence with agencies at this and all other stages of the Study is provided in **Appendix M6**.

5.3.5 Indigenous Engagement

Following receipt of the Notice of PIC, an inquiry was made on the status of the EA by Mississaugas of the New Credit First Nation (MNCFN). No other comments were received from the other Indigenous communities in response to the Notice of PIC. Follow-up telephone calls were placed with the Indigenous communities to confirm receipt of the Notice of PIC and inquire again about their level of interest in the Study. Additional correspondence was made with MNCFN on October 24, 2017 providing an update on the status of the archaeological studies for the project. MNCFN requested to receive a copy of the complete Stage 2 Archaeological Assessment Report and it was provided on December 11, 2017. A record of the telephone calls and correspondence with Indigenous communities is provided in **Appendix M7**.

5.4 Stakeholder Advisory Committee

5.4.1 Purpose

As part of the consultation process, the City formed a Stakeholder Advisory Committee (SAC). The purpose of the SAC was to provide comments and advice pertaining to decisions to be made by the City with regard to the Sheridan Park Drive Extension. The SAC mandate was to be a forum for more in-depth discussion of the key study issues, concerns or solutions, and to provide advice to the Study Team. The role of the SAC was advisory in nature, with no voting undertaken.

5.4.2 Members

The invitations for the SAC were distributed as part of the NOCm to various agencies, utilities and interest groups with a presence in the Study Area. The following representatives agreed to be members of the SAC and represent their organizations by participating in two meetings throughout the Study.

Brandon Weidemann	Sheridan Homelands Ratepayers Association
Ken Thajer	Credit Valley Conservation
Jimmy Truong	Alectra Utilities
Angela Stockman	Region of Peel, Water & Wastewater Program Planning
Serguei Kabanov	Region of Peel, Transportation Division

5.4.3 Meetings 1 and 2

Meeting No. 1 of the SAC took place on May 9, 2017. The format of SAC Meeting No.1 was as follows:

1. Introductions and Discussion of the SAC Meeting Purpose / Mandate;
2. Presentation by Study Team; and
3. Q&A Period / Group Discussion.

Through the Presentation and the Q&A Period, the following topics were covered:

- An overview of the EA Study and Study Area;
- A summary of the existing conditions within the Study Area;
- Presentation of the Opportunity Statement;
- A summary of studies/assessments being undertaken to support the EA Study;
- A discussion of the potential alternative solutions;
- A summary of the criteria being considered by the Study Team to evaluation the alternative solutions; and
- A discussion surrounding any initial concerns or interests that the SAC members may have regarding the EA Study.

Meeting No. 2 of the SAC took place on June 12, 2017. The Meeting covered the following topics:

- The results of the various studies / assessments (that have been completed to date);
- The results of the evaluation of alternative solutions;
- An overview of the Draft PIC boards to date;
- A discussion about the preliminary preferred solution;
- A presentation of the preliminary design concepts being considered; and
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

A copy of the presentations made at the SAC Meeting and meeting minutes can be found in **Appendix M8**.

5.5 Utility Consultation

Following the PIC, the two main utility companies with services or land holdings in the Study Area (Hydro One and Enbridge Gas) were contacted to discuss the project and obtain input on any potential impacts of the proposed road extension on these services.

A meeting was held with Enbridge Gas on August 23, 2017 to discuss the project. A copy of the meeting minutes from this meeting are provided in **Appendix M9**. Hydro One indicated that it was too early to meet about the project, but provided information about the next steps once design plans were available for review. Copies of correspondence with these two utilities are provided in **Appendix M9**.

5.6 Notice of Study Completion

A Notice of Study Completion of this Municipal Class EA will be prepared and published in the Mississauga News. The Notice will also be mailed to all agencies and stakeholders that had expressed an interest in the project.

If concerns arise regarding this project which cannot be resolved in discussion with the Region, a person or party may request that the Minister of Environment and Climate Change make an Order for the project to comply with Part II of the *Environmental Assessment Act, 1990* (referred to as a Part II Order), which addresses individual Environments Assessments. Requests must be received by the Minister within 30 calendar days of the issuance of the Notice of Study Completion.

If the Minister does not receive Part II Orders regarding this request, the project will continue forward through detailed design / approvals and ultimately construction.

6.0 Road Extension Design Concepts

6.1 Guiding Principles for Design Concept Development

In developing the preliminary preferred design concept, the following key constraints and design elements were considered:

- Compatibility with Adjacent Communities;
- Compatibility with Natural Areas;
- Access to Sheridan Park Corporate Centre;
- Speed Management Features;
- Opportunities for Streetscaping;
- Provisions for Pedestrians and Cyclists;
- Compatibility with Major Utilities in Study Area;
- Geometric Design Requirements; and
- Compatibility with Existing and Future Traffic Operations.

6.2 Preliminary Preferred Design Concept

A preliminary preferred design concept was presented to members of the public at the PIC on June 27, 2017. A copy of the preliminary preferred design concept is provided with the PIC Summary Report in **Appendix M4**. This concept included the following key features:

- Two lane roadway;
- Two vegetated horizontal deflection islands (for speed management and stormwater management);
- Roundabout at intersection of Sheridan Park Drive and Speakman Drive (approximately 130 m east of Winston Churchill Boulevard) with optional alternative four-way stop;
- Roundabout at intersection of Sheridan Park Drive and Homelands Drive / Speakman Drive with optional alternative four-way stop;
- Narrowed roadway in areas to reduce impacts to existing woodlots; and
- Opportunity for low impact development (stormwater treatment), landscaping and/or public art within centre of roundabouts.

Renderings of the potential roundabout (west end) and horizontal median are illustrated on Figure 6.1 and Figure 6.2.

Figure 6.1: Rendering of Potential Roundabout

View Looking East along Sheridan Park Drive from near Winston Churchill Boulevard

Figure 6.2: Rendering of Potential Median

View Looking East along Sheridan Park Drive extension corridor showing potential median (horizontal deflection)

6.3 Preliminary Streetscape Plan

Based on feedback received from the PIC and input from City staff a Preliminary Streetscape Plan has been prepared based on the preliminary design concept plan for the road extension. This plan will be further refined during the detailed design phase of the project. A copy of the Preliminary Streetscape Plan is provided in **Appendix N**.

6.4 Utilities and Illumination

Formal definition of impacts on utilities is to be determined during detailed design. All utility information should be updated prior to construction to ensure that the data is accurate and to finalize relocation requirements as necessary. The need for and type of illumination within the various sections of the study corridor is to be confirmed at the detailed design stage.

6.5 Stormwater Management

A Stormwater Management Report has been prepared as part of the EA Study and is provided in **Appendix O**.

A preliminary hydrologic and hydraulic analysis was completed to ensure that upstream lands are adequately conveyed through the ROW following the construction of the extension. Based on the application of the criteria of '100 Year Post to 100 Year Predevelopment Control', the proposed roadway extension does not alter the runoff potential for the catchment studied and thus no mitigation measures would be required for peak flows.

According to Section 3.0, Table 3-1 of the Credit Valley Conservation Stormwater Management Criteria (August 2012), the Flood Control criteria for new development in the Sheridan Creek Watershed is '100 Year Post to 2 Year Predevelopment Control'. Therefore, additional analysis was undertaken applying the '100 Year Post to 2 Year Predevelopment Control' criteria. When the stricter controls are applied, there is a storage volume requirement of 590 m^3. Storage containment options within a road right-of-way are somewhat limited. Storage volume may be provided in the form of over-sized stormsewer (i.e., superpipe) or possibly underground storage chambers. These stormwater calculations are preliminary and will be finalized, together with the approach to storing / managing stormwater attributed to the road extension during the detailed design phase of the Project. If development has occurred within the tributary catchment between the EA Phase and detailed design phase of the project, the relevant hydrologic parameters will need to be updated. If there are opportunities to combine the flood storage requirement for the Sheridan Park Drive Extension with an adjacent (hydrologically-connected) development where space is less restricted, and the timing is favourable, this is strongly encouraged.

A 'best efforts' approach is proposed to address impacts to water quality which are, again, anticipated to be minimal. Nonetheless, a relatively large portion of the new road will be directed to a bioretention area, located within one of the proposed horizontal deflection medians. Runoff which cannot be treated and infiltrated at this location will be intercepted by an overflow system and directed to an existing drainage feature.

6.6 Geotechnical and Pavement Investigation

Peto MacCallum Ltd. (PML) was retained to complete a geotechnical and pavement investigation for the proposed road extension. A copy of the Geotechnical Investigation Report is provided in **Appendix P**. The assessment included review of background documentation as well as advancing a total of eighteen boreholes and submitting soil samples for quality analysis. The Study Area is underlain by varying thicknesses of fill and a combination of native silt and clay. The depth to bedrock along the eastern segment of Sheridan Park Drive, especially near the intersection of Homelands Drive / Speakman Drive is anticipated to be shallow.

Soil samples were retrieved from the boreholes and sent to an accredited laboratory for chemical analysis. Nine soil samples were analyzed for sodium adsorption parameter and five samples were analyzed for F2 through F4 petroleum hydrocarbons (PHCs) parameters. Soil samples analyzed from boreholes BH1, BH3 and BH16 exceeded the sodium adsorption value for residential / parkland and industrial / commercial standards while soil from BH14 and BH18 exceeded sodium adsorption values for residential / parkland standards only. The elevated levels of SAR are most likely related to the winter de-icing activites. Soil sample analyzed from BH5 exceeded F3 PHCs values for residential / parkland standards but complied with industrial / commercial standards.

The report recommended that impacted soils should be disposed of off-Site to industrial / commercial construction site. Salt impacted soil should not be disposed of to any environmentally sensitive site and the disposed materials should not be in contact with the surface runoff and/or groundwater table. It is also recommended that the Site earthwork operations and disposal of the impacted soils be monitored and documented under full time inspection and review of a field staff under supervision of a Qualified Person (QP, as defined under Ontario Regulation 511/09) to ensure that the removed soils are consistent with the geo-environmental soil characterization program that was carried out during the sampling and testing programs.

Based on visual inspection, the existing pavement surface on the travelled portions of Sheridan Park Drive shows signs of distress including pavement cracking, distortion and coarse aggregate loss. Boreholes drilled in the existing pavement also revealed an existing granular base and subbase with materials containing a higher level of fines, which renders the pavement structure susceptible to damaging effects of frost action. For these reasons, PML recommends that the existing pavement be rehabilitated by full depth reconstruction.

For the road extension segment of Sheridan Park Drive, PML recommends use of the City's pavement thickness standard over the American Association of State Highway and Transportation Officials (AASHTO) as it is more conservative (thicker) which will address location conditions such as frost susceptibility of the road subgrade. Details of the proposal pavement structure for both existing and new segments of Sheridan Park Drive are provided in the Geotechnical Investigation Report (see **Appendix P**).

6.7 Preliminary Cost Estimate

The estimated cost to construct the road extension has been prepared based on the preliminary design concept plans. This cost estimate will need to be revisited and revised accordingly during the detailed design phase of the Project once detailed design plans are established. The overall estimated cost of roadway construction at this preliminary stage of the Project is $2,328,000. A breakdown of estimated costs for the roadway construction is provided in **Appendix Q**.

7.0 Environmental Impacts, Mitigation Measures and Monitoring

The potential environmental impacts associated with construction, operation and maintenance of the proposed road extension within the Study Area have been identified and are summarized Table 7.1 below. Proposed measures to mitigate these impacts and monitoring activities to ensure that the mitigation measures are implemented effectively are also provided in the table. All mitigation measures and monitoring activities shall be reviewed during the detailed design phase of the project.

Table 7.1: Potential Impacts, Mitigation Measures and Monitoring Plan

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Transportation and Built Environments	Human Health and Safety	Potential safety hazard from construction activities, heavy equipment and increased construction traffic.	**Construction Mitigation** The contractor shall develop a Health and Safety Plan (HASP) and have it reviewed and approved by the City prior to implementing. The HASP shall follow the *Occupational Health and Safety Act, 1990* and regulatory requirements.	N/A	No net effects anticipated.
Transportation and Built Environments	Transportation Infrastructure	Potential safety hazard from construction activities, heavy equipment and increased construction traffic.	**General Mitigation** Operation of construction related vehicles will be done in accordance with all appropriate safety policies and procedures, and based on Canadian Standards (Transport Canada, etc.). **Construction Mitigation** All contractors will be required to complete and follow appropriate construction site training and adhere to appropriate road safety regulations during construction. Work shall be done in such a manner as to minimize disruption to the adjacent residential and commercial neighbourhood. Noise and dust emissions shall be controlled. Contract specifications shall ensure that all equipment and vehicles are compliant with noise and air emission standards for applicable equipment.	An environmental monitor shall regularly inspect construction work areas to ensure that noise control measures and dust suppression measures are being adequately applied. If noise control measures and dust suppression measures are not functioning properly, alternative measures shall be implemented immediately and prioritized above other construction activities.	No net effects anticipated.
		Temporary traffic flow / access disruptions.	**General Mitigation** Additional easement beyond road ROW to be determined during the detailed design phase of the project. Consult with public agency and/or adjacent land owners / tenants regarding temporary access routes. **Construction Mitigation** Contractor will be required to develop and implement a traffic management plan in coordination with region(s) /	N/A	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			municipality(ies). Adequate signage to give advance notice of disruptions and detours is to be provided by the contractor.		
Physical Environment	Surface Water	Potential for erosion and sedimentation impacts.	**General Mitigation** The City is required to comply with the *Ontario Water Resources Act, 1990, c. O.40* with respect to the quality of water discharging into natural receivers. The footprint of disturbed areas shall be minimized to the extent possible. For example, vegetated buffers shall be left in place adjacent to natural vegetation features (forested areas) to the maximum extent possible. A Soil Management Plan (SMP) will be prepared by a Qualified Professional (QP) as defined in Ontario Regulation 160/06 for managing soil materials on-Site (includes excavation, location of stockpiles, reuse and off-Site disposal). An Erosion and Sediment Control (ESC) Plan will be developed during detailed design in consultation with CVC and will conform to industry best management practices and recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Any construction works within CVC regulated areas will require a permit under Ontario Regulation 160/06. **Construction Mitigation** Any in-water work will be conducted in isolation of flowing water. All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone. ESC measures shall be installed and maintained during the construction phase and until all areas of the construction Site have been stabilized. ESC measures shall be inspected daily to confirm they are functioning and maintained as required. If ESC measures are not functioning properly, no further work in	A qualified Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC are being followed. A qualified Environmental Inspector shall inspect, suggest and confirm the repair of ESC measures as needed.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			the affected areas will occur until the sediment and/or erosion problem is resolved. All disturbed areas of the construction Site will be stabilized and re-vegetated as soon as conditions allow. Wet weather restrictions shall be applied during Site preparation and excavation.		
Physical Environment	Surface and Ground Water	Potential for localized surface water or groundwater impacts as a result of spills, discharge or dumping of materials, fluids and other wastes during construction of proposed road extension and associated surface water facilities (e.g., swales).	**Construction Mitigation** Refueling and maintenance of construction equipment should occur within designated areas only. Any hazardous materials used for construction will be handled in accordance to appropriate regulations. A Construction Emergency Response and Communications Plan shall be developed and followed throughout the construction phase (including spill response plans). The Contractor shall develop spill prevention and contingency plans for the construction of new landfill cells and general Site preparation for proposed road extension. Personnel shall be trained in how to apply the plans and the plans shall be reviewed to strengthen their effectiveness and continuous improvement. Spills or depositions into watercourses shall be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on-Site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.	A qualified Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC are followed. Workers shall report any instances of spills to their supervisors.	No net effects anticipated.
Physical Environment	Surface and Groundwater (Headwater feature)	Change in water balance to seasonally flooded or wet habitat within natural vegetation communities affecting groundwater recharge functions.	**General Mitigation** Incorporation of Low Impact Development (LID) to direct surface water flow to grassed swales, bioretention gardens and infiltration galleries in close proximity to the natural heritage features (refer to CVC Grey to Green Road Retrofits). LID elements should be designed to preserve local	Monitoring of vegetation communities for changes in plant species composition and soil moisture regime.	No net effects anticipated

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			predevelopment water balance as they reduce runoff volume through the processes of infiltration and evapotranspiration and improve stormwater quality through a variety of physical and biological treatment processes.		
Natural Environment	Vegetation	Direct effects of construction activities will include the limited clearing and loss of both herbaceous and woody vegetation. Indirect effects include the increase to edge habitats, which includes a number of potential effects, such as wind throw and sunscald, introduction of invasive plant and wildlife species which may outcompete or predate native species, change in soil moisture regime and water availability to plants and plant communities, increases in light penetration (pollution) and noise, soil compaction, equipment and pedestrian "traffic", equipment laydown and spills.	**General Mitigation** Plant species loss should be minimized, where possible, and compensatory planting plans established in areas of the Study Area when no clearing activities are proposed, referencing CVC's Plant Selection Guidelines for the existing soil and vegetation communities. Potential for establishing pollinator species of plants should also be included when establishing a formal planting plan. The inclusion of bio swales, infiltration galleries or other features to promote localized surface water infiltration to maintain the existing water balance should be included as part of the detailed design and landscape plan for the road extension. **Construction Mitigation** Construction hoarding should be installed prior to commencement of construction activities to prevent pedestrian access, prevent the unnecessary encroachment / disturbance by humans and machinery into vegetation communities and to prevent wildlife from entering the construction areas. Hoarding should be installed and inspected prior to any land disturbance. Hoarding should be installed at the dripline of any trees to be preserved. Construction activity should be outside of the dripline of any trees that are to remain.	Fencing shall be inspected regularly to ensure damage is repaired in a timely manner and that additional risk to wildlife is minimized. Hoarding Site visit required.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Natural Environment	Trees	Potential impacts to trees adjacent to road extension construction area.	**Construction Mitigation** Clearly delineate the extent of vegetation removal for the vegetation clearing and grubbing contractor. All vegetation must be cut in a way that it stays within the work zone. Install all tree protection and erosion and sediment control (ESC) measures prior to Site disturbance. Install tree protection hoarding based on City standard (provided in Appendix D of Tree Inventory and Preservation Report and in locations shown on Plan C: Tree Preservation Plan of the Tree Inventory and Preservation Report). The work zone adjacent to the woodlots at the east and west limits of the unopened right-of-way are recommended to receive this enhanced treatment.	Inspection of tree protection measures by the site supervisor or environmental inspector to be coordinated with review of ESC measures throughout the construction period. All damaged, sagging or deficient measures must be fixed immediately. An arborist shall review all trees adjacent to the work zone and prior to opening the road for use by the general public. Branches and trunks damaged during the construction period that may cause damage or injury must be mitigated.	
Natural Environment	Wildlife and Wildlife Habitat (General) – Breeding Birds	Potential for disturbance or destruction of migratory breeding birds and their habitat by the landfill expansion (prohibitions under the *Migratory Bird Convention Act*, *1994*).	**General Mitigation** To reduce the risk of contravening the *Migratory Bird Convention Act, 1994*, timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from April 1st to August 31st for most species (regardless of the calendar year). Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the *Endangered Species Act (ESA), 2007*, cannot be destroyed at any time of the year. The destruction of inactive nests for some species may also be prohibited. **Construction Mitigation** If a nesting migratory bird (or SAR protected under *ESA, 2007*) is identified within or adjacent to the construction Site (or during operations and maintenance activities) and the activities are such that continuing works in that area would result in a	An Avian Biologist may be required on-Site as needed should a nesting migratory bird (or SAR protected under *ESA, 2007*) be identified within or adjacent to the construction Site. The Avian Biologist may be required to confirm the presence and identification of an active nest and/or breeding bird prior to contacting MNRF for further advice.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			contravention of the *Migratory Birds Convention Act, 1994* or *ESA, 2007*, all activities will stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures with the City. Should SAR be identified, all activities will stop and MNRF will be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the City, the MNRF and/or Environment Canada.		
Natural Environment	Wildlife and Wildlife Habitat (General)	Temporary displacement of, and disturbance to, wildlife and wildlife habitat during the construction phase (i.e., vegetation removals, noise, light trespass), including SAR. Development in these habitats may limit wildlife movement and reduce useable habitat. Wildlife habitat may be removed as a result of the proposed activities. • Removal of SWH including; – Candidate Waterfowl Stopover and Staging Areas (Terrestrial); – Candidate Raptor Wintering Areas; – Candidate Bat Maternity Colonies (Non-SAR); – Candidate Reptile Hibernacula; – Candidate Foraging Areas with Abundant Mass (Peel-Caledon); – Candidate Old Growth Forest; – Confirmed Special Concern and Rare Wildlife Species; ▪ Eastern Wood-pewee (Special Concern); and ▪ Monarch (Special Concern).	**Construction Mitigation** In the event that an animal is encountered during construction and does not move from the construction zone, the Contract Administrator will be notified. If the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location will temporarily stop and the MNRF shall be contacted for direction. If temporary construction hoarding is used at a location, it shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning. The excluded area should be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife should be safely relocated, or permitted to escape, to a suitable habitat. All works should stop immediately and MNRF contacted should a SAR be encountered within a construction or operational area to ensure compliance with the ESA. Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between wintering and summer habitats).	Fencing shall be inspected regularly to ensure damage is repaired in a timely manner and that additional risk to wildlife is minimized.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Natural Environment	Woodlands	Removal of snag trees suitable as BMH on the edge of forests directly adjacent to proposed road extension. a) Potential for direct environmental effects to woodland habitat (FOD9-1 / FOD9-4) during clearing and construction activities for the proposed road extension. b) Potential for indirect environmental effects to adjacent woodland features. Potential indirect effects may include noise disturbance as a result of construction and/or operations and maintenance activities. Noise disturbance may impact breeding success of avian species, including SCC (Wood Thrush, Eastern Wood-pewee), whose habitat is considered SWH.	**General Mitigation** a) A permit under the ESA may be required before any work can occur in Regulated habitat at any time during the year – as such, mitigation measures outlined below will be refined during the permitting process, including details of construction hoarding, timing of works, etc. a) Removal of candidate BMH trees will require appropriate compensation during the appropriate timing windows, including the installation of bat house(s) to compensate for loss of habitat. The recommended approach from MNRF includes proactive establishment of alternate bat habitat features within the Study Area to avoid the requirement for permitting under the ESA. a) A mitigation plan will be designed and implemented to compensate for the temporary removal of vegetation and provide enhancement of the existing features. b) To reduce the risk of disturbing breeding birds (and contravening the *Migratory Bird Convention Act, 1994*), timing constraints shall be applied to avoid vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from end of March to end of August for most species (regardless of the calendar year) (see Breeding Birds for more detail). **Construction Mitigation** a) Prior to construction works commencing, installation of construction hoarding is recommended along the perimeter to prevent pedestrian access around the limit of construction, which includes all areas required for excavation and spoil stockpile, vehicle and worker access and material laydown in order to prevent any wildlife from attempting to access the construction zone during construction works – specifically, fencing shall be installed at the beginning of April or earlier.	a) A Biologist shall be on-Site during construction works in the event that wildlife is trapped within the construction zone and requires removal and relocation to land outside of the construction zone. They may also be required on-Site as needed should a species that is protected under the *ESA, 2007* be identified within or adjacent to the construction Site. The Biologist may be required to confirm the presence and identification of a particular species prior to contacting the MNRF for further advice. a) Fencing should be monitored on a regular basis to ensure there is no damage that may result in a decrease in function or opportunities for injury or death to wildlife species. b) An Avian Biologist may be required on-Site as needed should a nesting migratory bird (or SAR protected under *ESA, 2007*) be identified within or adjacent to the construction Site. b) The Avian Biologist may be required to confirm the presence and identification of an active nest and/or breeding bird prior to contacting MNRF for further advice.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			a) If designated areas are created during construction for the stockpiling of materials, especially fill, soil and gravel, the Contractor shall install temporary construction hoarding around the perimeter of these areas to prevent any reptile species from entering the area and attempting to nest (reptiles are attracted to these materials for nesting). a) Any wildlife should be safely relocated, or permitted to escape, to a suitable habitat no more than 200 m away from the work zone. Wildlife shall be released no more than 200 m away from the work zone in a similar ecosystem type. a) In the event that SAR are found within the construction zone all activities will stop and mitigation options shall be discussed with the City, whereby an MNRF SAR Biologist may be contacted for advice as these animals are protected under *ESA, 2007*. a) Educational material shall be provided by a Biologist to construction personnel prior to commencement of construction works to assist personnel in identifying SAR species, should they be encountered. These materials shall also include protocols to be followed to prevent contravention of the *ESA, 2007*, should any SAR be encountered. a) SAR identification training shall be provided by a Biologist to construction personnel prior to commencement of construction works to assist personnel in identifying SAR species, should they be encountered. Educational materials shall also include protocols to be followed to prevent contravention of the *ESA, 2007*, should any SAR be encountered. All construction personnel will be trained on how to identify and deal with SAR encountered during work.		
Natural Environment	Cultural Thicket-Cultural Meadow	Potential for direct environmental effects (i.e., habitat removal) to cultural thicket and cultural meadow which composes most of	**General Mitigation** a) Prior to construction, surveys should be conducted by an Avian Biologist in winter to determine if the Site is	N/A	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
		the proposed road extension footprint area. This feature is candidate SWH for raptor wintering area and shrub / early successional bird breeding habitat, and is confirmed habitat for breeding birds generally. a) Candidate raptor wintering area: Modification to, or removal of, vegetation structure or drainage patterns in fields or forests supporting a winter roost may make it unattractive. b) Shrub / early successional bird breeding habitat: permanent removal of candidate habitat reduces overall size of available habitat for bird species that depend on this type of vegetation structure for food, cover and nesting. A reduction in overall size will also reduce the ecological function in the remaining habitat due to fragmentation. c) Potential for indirect environmental effects may include noise disturbance as a result of construction and/or operations and maintenance activities. Noise disturbance may impact nesting success of bird species nesting in this habitat.	significant habitat for raptors. If this is not possible due to project time constraints, habitat shall be considered "candidate" habitat. Consultation with MNRF is required prior to construction to determine what mitigation measures are appropriate to avoid potential negative effects. d) To reduce the risk of disturbing breeding birds (and contravening the *Migratory Bird Convention Act, 1994*), timing constraints shall be applied to avoid vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from end of March to end of August for most species (regardless of the calendar year) (see Breeding Birds for more detail).		
Natural Environment	Fish Habitat	Potential indirect impacts to downstream fish habitat from water quality and quantity impairments (sediment loading; fuels and lubricants from machinery) as a result of construction works (earthworks-based activities).	**General Mitigation** Compliance with the *Ontario Water Resources Act, 1990* shall be maintained with respect to the quality of water discharging into natural receivers. SMP and ESC Plans shall be developed. ESC plans and a spill response plan shall be developed and shall include, but not be limited to, the details described below.	An Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC plans are followed. Workers shall report any instances of spills or impacts to surface water features.	No net effects anticipated

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			CVC shall be consulted during detailed design with regard to potential works within or in close proximity flood regulated areas, as appropriate. **Construction Mitigation** Wet weather restrictions shall be applied during Site preparation and excavation. Work will be avoided near watercourses and headwater drainage features during periods of excessive precipitation and/or excessive snow melt. Sediment and erosion control measures (such as silt fence barriers, etc.) shall be installed and maintained during the work phase and until the Site has been stabilized. Control measures shall be inspected daily to ensure they are functioning and are maintained as required. If control measures are not functioning properly, no further work shall occur until the problem is resolved. All temporary ESC measures shall be installed in accordance with recognized provincial standards. Extra silt fence / turbidity curtain shall be stored on-Site, should additional sediment control be required. Any stockpiled material shall be stored and stabilized away from the surface water features. All materials and equipment used for the purpose of Site preparation and road construction shall be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water.		
Cultural Environment	Archaeology	Based on the results of the Stage 2 Archaeological Assessment, the Study Area does not retain archaeological potential; however, no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deep buried archaeological deposit. Therefore, it is	In the event that archeological remains are found by the Contractor during subsequent construction activities, the consultant archaeologist, approval authority and the Cultural Program Unit of the Ministry of Tourism Culture and Sport the shall immediately notified by the Contractor.	N/A	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
		possible that archaeological remains may be found during construction.			
Noise and Air Quality	Noise	Potential for noise through the use of large equipment for construction of the proposed road extension.	**General Mitigation** A complaint response protocol for nuisance impacts including construction noise shall be prepared during the detailed design phase of the project and implemented prior to construction. **Construction Mitigation** Noise control measures shall be implemented where required during the construction phase, such as restricted hours of operation and the use of appropriate machinery and mufflers. The noise produced by the equipment can be limited through proper equipment maintenance. All construction activities shall conform to the criteria set out in NPC-115 of 83 dB. The construction contractor will be required to develop a Construction Management Plan (CMP) that specifically addresses noise controls, mitigation to be implemented and frequency of equipment inspection. **Post-Construction Mitigation** Conduct post-construction sound level measurements in the Noise Sensitive Area to confirm the requirement for noise barriers.	An environmental monitor shall regularly monitor construction noise to ensure that noise control measures are being adequately applied and confirm the requirements outlined in the CMP are being followed. If noise control measures are not functioning properly, alternative measures shall be implemented immediately and prioritized above other construction activities.	No net effects anticipated.
	Air Quality	Potential air quality impacts during construction.	**General Mitigation** A complaint response protocol for nuisance impacts including dust emissions will be prepared during the detailed design phase of the project and implemented prior to construction. **Construction Mitigation** During construction, the following mitigation measures shall be used: • The road shall be graded as required to remove potholes, ruts and ripples in the road surface. Efforts to prevent	An environmental monitor shall regularly inspect construction work areas to ensure that dust suppression measures are being adequately applied and confirm the requirements outlined in the CMP are being followed. If dust suppression measures are not functioning properly, alternative measures shall be implemented	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			contamination of the road surface, such as spilling sands, silts and clays, will also help to minimize dust. • If appropriate equipment is available, the roadway should be sprayed with water as required to minimize dust generation prior to paving. • The construction contractor will be required to develop a Construction Management Plan (CMP) that specifically addresses dust controls, and contingency plans to mitigate dust when it occurs. • Vehicles / machinery and equipment shall be in good repair, equipped with emission controls, as applicable, and operated within regulatory requirements. The contractor shall also be required to implement dust suppression measures to reduce the potential for airborne particulate matter resulting from construction activities. This should be in the form of water applications on exposed soils.	immediately and prioritized above other construction activities.	

8.0 Project Implementation

Phase 5 of the Municipal Class EA process involves the completion of detailed design drawings, specifications and tender documents to be provided to a successful contractor for the construction of the proposed project. During the implementation phase, the City will need to adhere to several mitigation measures and monitoring plans as documented in this Project File Report, some of which will be need to be in place prior to and during construction. Permits will need to be applied for from various regulatory agencies.

8.1 Follow-up Commitments

The following list provides a preliminary set of commitments to be undertaken during the detailed design phase or construction phase of the Project to ensure that work is being completed in accordance with the Project File Report. These commitments shall be revisited during the detailed design phase of the Project at which time any additional commitments shall be identified.

8.1.1 Detailed Design Commitments

Natural Heritage

- A compensation plan for removal of bat maternity habitat trees shall be confirmed through consultation with MNRF.
- The total number of replacement trees will be confirmed by a certified Arborist.
- An Erosion and Sediment Control (ESC) Plan will be developed during detailed design in consultation with CVC and will conform to industry best management practices and recognized standard specifications such as Ontario Provincial Standards Specification (OPSS).
- Although no Butternut trees were identified in the areas predicted to be impacted by the road extension, trees to be removed shall be confirmed to the species level during the detailed design phase of the project to avoid the incidental removal of Butternut.
- The inclusion of bio swales, infiltration galleries or other features to promote localized surface water infiltration to maintain the existing water balance shall be included as part of the detailed design and landscape plans for the road extension.
- CVC shall be consulted during detailed design with regard to potential works within or in close proximity flood regulated areas, as appropriate.
- Prior to construction, surveys shall be conducted by an Avian Biologist in winter to determine if the Site is significant habitat for raptors. If this is not possible due to project time constraints, habitat shall be considered “candidate” habitat.

Consultation with MNRF is required prior to construction to determine what mitigation measures are appropriate to avoid potential negative effects.

Groundwater

- The City will review the need for hydrogeological study (to assess groundwater quality) in the Study Area during the detailed design phase of the Project.

Noise and Air Quality

- A complaint response protocol for nuisance impacts including construction noise and dust emissions shall be prepared during the detailed design phase of the project and implemented prior to construction.

Streetscaping

- The Preliminary Streetscape Plan provided in the Project File Report will be refined based on the detailed design plans for the road extension by a licensed Landscape Architect.

Stormwater Management

- Calculations for stormwater quantity control will be finalized, together with the approach to storing / managing stormwater attributed to the road extension during the detailed design phase of the Project. If development has occurred within the tributary catchment between the EA Phase and detailed design phase of the project, the relevant hydrologic parameters will be updated. Where possible, the City will explore opportunities to combine the flood storage requirement for the Sheridan Park Drive Extension with an adjacent (hydrologically-connected) development.

8.1.2 Construction Commitments

Natural Heritage

- Any in-water work will be conducted in isolation of flowing water. All work zones will be clearly marked on drawings and the ESC Plan to indicate that no work should occur outside the work zone.
- ESC measures shall be installed and maintained during the construction phase and until all areas of the construction Site have been stabilized. ESC measures shall be inspected daily to confirm they are functioning and maintained as required. If ESC measures are not functioning properly, no further work in the affected areas will occur until the sediment and/or erosion problem is resolved.
- Any stockpiled material shall be stored and stabilized away from the surface water features. All materials and equipment used for the purpose of Site preparation and road construction shall be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water.

- Construction hoarding should be installed prior to commencement of construction activities to prevent pedestrian access, prevent the unnecessary encroachment / disturbance by humans and machinery into vegetation communities and to prevent wildlife from entering the construction areas. In the event that an animal is encountered during construction and does not move from the construction zone, the Contract Administrator will be notified. If the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location will temporarily stop and the MNRF shall be contacted for direction.
- Vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between wintering and summer habitats) shall be avoided.
- Trees that have been assigned a good condition rating are recommended for transplant, if their current location will be impacted by the proposed improvements.
- If trees cannot be transplanted immediately, they should be staged by planting them in a soft landscaped area (e.g., park) and maintained (e.g., watered) as needed.
- If a nesting migratory bird (or SAR protected under *ESA, 2007*) is identified within or adjacent to the construction Site and the activities are such that continuing works in that area would result in a contravention of the *Migratory Birds Convention Act, 1994* or *ESA, 2007*, all activities will stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures with the City. Should SAR be identified, all activities will stop and MNRF will be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the City, the MNRF and/or Environment Canada.

Archaeology

- In the event that archeological remains are found by the Contractor during subsequent construction activities, the consultant archaeologist, approval authority and the Cultural Program Unit of the Ministry of Tourism Culture and Sport the shall immediately notified by the Contractor.

Noise

- Post-construction sound level measurements in the Noise Sensitive Area shall be conducted by a quality professional to confirm the requirement for noise barriers.

Construction Plans

The following plans will need to be prepared by the contractor and implemented prior to construction:

- Erosion and Sediment Control Plan;
- Emergency Response and Communications Plan;
- Stormwater Management Plan;
- Complaint Response Protocol;
- Construction Management Plan;
- Health and Safety Plans; and
- Traffic Management Plan.

8.2 Permit Requirements

The following list provides a preliminary set of permit requirements that will need to be undertaken by the contractor. A final list of permits shall be determined during the detailed design phase of the Project.

8.2.1 General Permitting Requirements

- Contractor will need to obtain an Occupancy Permit from the City.
- A Permit to Take Water (PTTW) may be required should dewatering be necessary. Requirements for dewatering will be determined during the detailed design phase of the Project.
- The City is required to comply with the *Ontario Water Resources Act, 1990* with respect to the quality of water discharging into natural receivers. The footprint of disturbed area will be minimized as much as possible. For example, minimizing distribution of excavated soil to minimize sedimentation to storm sewers.
- An erosion and sediment control plan will be developed in consultation with CVC. Implementation of the erosion and sediment control measures will conform to recognized standard specifications such as Ontario Provincial Standards Specification (OPSS) and the requirements of the CVC. The erosion and sediment control plan will also take into account the Greater Golden Horseshoe Area Conservation Authorities (GGHACA) Erosion and Sediment Control Guidelines for Urban Construction.
- A permit approval will be required from CVC in accordance with *O.Reg 160/06 Credit Valley Conservation Authority: Regulation of Development, Interference with Wetlands and Alteration to Shorelines and Watercourses* for construction works in CVC regulated areas.

8.2.2 Utility Permits and Approvals

Enbridge Pipelines Ltd.

- Consult with utility during the detailed design phase of the Project to ascertain conflicts with gas main and proposed roundabout at the intersection of Sheridan Park Drive and Speakman Drive (approximately 150 m east of Winston Churchill Boulevard) and determine requirements and cost for relocation of the gas main.

Hydro One Networks Inc.

- Consult with utility during the detailed design phase of the Project to confirm and complete requirements for operational land sale for the daylight triangles at the location of the roundabout at the intersection of Sheridan Park Drive / Homelands Drive / Speakman Drive and modifications to the existing easement license for the multi-use trail to add provision for additional trail connections through the utility corridor.

Infrastructure Ontario

- Consult with Infrastructure Ontario (IO) during the detailed design phase of the Project to confirm IO requirements related to the operational land sale of Hydro One lands.

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Appendix A

Transportation and Traffic Analysis Report

Sheridan Park Drive Extension Transportation Report

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON   L5N 8R9 CANADA

January 2018
300039474.0000

R.J. Burnside & Associates Limited

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Executive Summary

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

As part of the EA Study, Burnside has completed a transportation analysis to identify whether the proposed Sheridan Park Drive Extension will impact transportation within the Study Area and determine if any potential mitigation measures are required. The results of this analysis is documented in the *Sheridan Park Drive Extension Transportation Report.*

Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The study area for the traffic analysis is shown in Figure A.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood. The City's Official Plan (MOP) has identified the completion of Sheridan Park Drive segment as a future major collector road, which is shown on Schedule 5 in the MOP.

Sheridan Park Drive is a two-lane major collector road located in the southwest quadrant of the City. The existing Sheridan Park Drive to the east of the subject area terminates approximately 275 meters west of Sheridan Park Drive / Speakman Drive / Homelands Drive intersection. From the west of the study area, Sheridan Park Drive terminates approximately 160 meters east of Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection. As a result, there is an approximate 850 meter gap between the two terminuses. The City owns the property between the existing terminuses.

R. J. Burnside & Associates Limited (Burnside) was retained by the City to undertake a study providing a comprehensive and environmentally sound planning process that incorporates the interest of the public and differing parties. This report is the existing and future transportation study and forms one of the background reports to the overall Project Report File for the study.

Figure A: Traffic Study Area

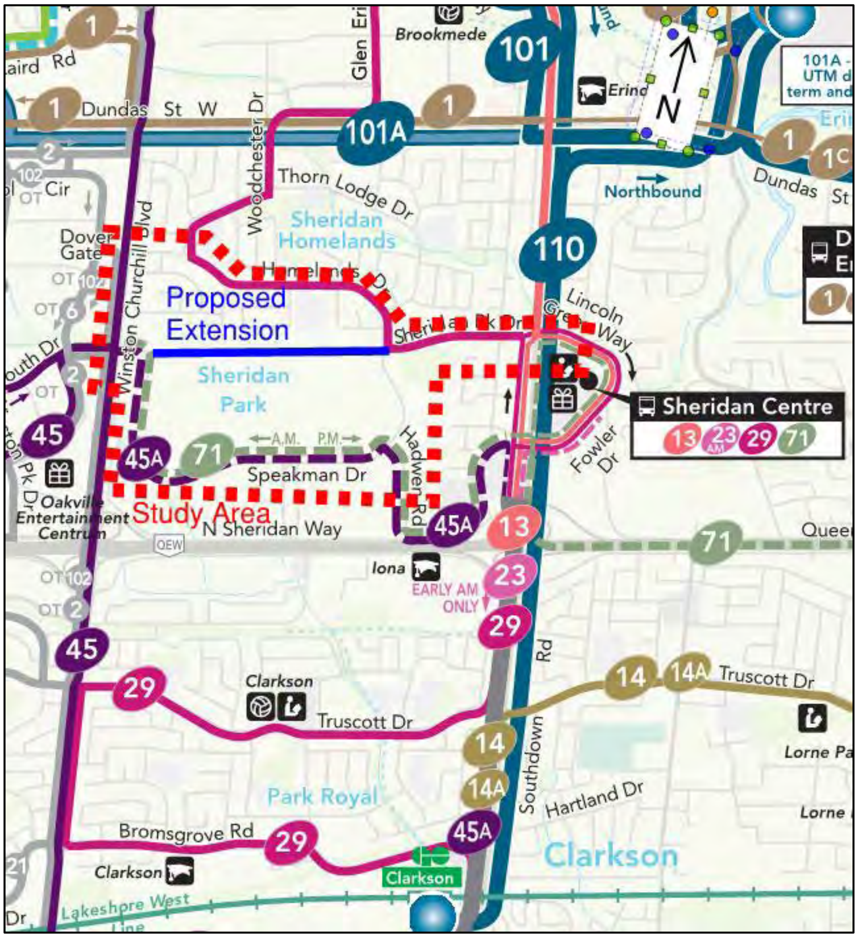
Existing Transportation System

As part of the transportation analysis, the existing transportation system within the transportation study area was evaluated. Sheridan Park Drive is discontinuous through the area shown for the proposed extension and this is a missing link in the roadway network to provide east-west connectivity.

Cycling and pedestrian movement is accommodated by a MUT within the utility corridor along the north side of the Sheridan Park corridor. Sheridan Park Drive east of Homelands Drive has a sidewalk on the north side and east of the west leg of Speakman Drive, the sidewalk is on the south side of the street. Residents and employees currently walk through the MUT area.

Transit service is provided in the area by MiWay with routes shown in Figure B.

Figure B: MiWay Transit Service



The Sheridan Homelands neighbourhood is serviced by transit on the arterial road network and within the neighbourhood via Route 29. Sheridan Park is serviced internally by Routes 45A and 71.

Key study area intersections were assessed to evaluate operations during the weekday morning (AM) and afternoon (PM) peak hours. Signalized intersections are operating at an overall level of service C during the weekday AM and PM peak hours. Priority for green time has been given to the north-south roads of Winston Churchill Boulevard and Erin Mills Parkway. This can result in lower operations on the side streets, but the movements are operating within capacity.

During the PM period, it is common to observe queues within employment areas as employees typically exit around similar times especially if the employment use is similar within in the area (e.g. majority office). This is the case at the Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive intersection where westbound queues from Winston Churchill Boulevard were observed for through right turn movements.

Through previous work undertake by the Region of Peel, the need for an exclusive westbound right turn lane was identified and has been added to their Development Charges Study. This improvement would reduce queues and improve operations for vehicles exiting Sheridan Park during the weekday PM peak hour.

For the unsignalized two-way stop intersections assessed in the study area, the critical movements are operating with level of service C or better and no changes are identified for these intersections.

The unsignalized four-way stop intersection movements are operating at level of service C or better with the exceptions of eastbound movements at the Fifth Line / Sheridan Park Drive intersection. This intersection has been identified as needing traffic signals in the future.

The City is undertaking a separate study to address Sheridan Homelands neighbourhood residents' concerns with respect to operations on their streets including speeding. The effect that the Sheridan Park extension could have on the neighbourhood in the future conditions has been considered.

Based on the traffic data available, it is observed that trucks (which includes buses) are using Homelands Drive; however, there is no evidence that the trucks are using the route to access Sheridan Park Corporate Centre or the employment lands on the west side of Winston Churchill Boulevard. Included in the traffic data numbers are trucks and buses that would have a destination / purpose within the neighbourhood such as garbage pick-up and home delivery services. There is some evidence that trucks might be using Homelands Drive and Sheridan Park Drive (east of Homelands Drive) as an east-west route between Winston Churchill Boulevard and Erin Mills Parkway.

Some of the key findings are shown in Figure C.

Figure C: Key Findings

EMME Travel Demand Traffic Volume Projections

To assess effects of the various network scenarios, the City's EMME Travel Demand Model was utilized to project traffic volumes for 2021 and 2031 horizon years. In addition, the model was also utilized to assess the impact of the various network scenarios on travel along Homelands Drive/ the Sheridan residential neighbourhood. This assessment was completed for the 2021 horizon year and examined the following:

1. How much traffic utilizes Homelands Drive when comparing the following scenarios:

    a) Do-nothing scenario – the Do-nothing scenario (assumes four (4) lanes only on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    b) Sheridan Park Drive Extension (with four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    c) Speakman Drive widening to four (4) lanes (no Sheridan Park Drive extension, four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

2. Origin and destination of trips utilizing Homelands Drive.

3. Origin and destination of trips utilizing the Sheridan Park Drive Extension.

It should be noted that the EMME model is used for macro analysis to provide analysis/ results generally at a higher level, i.e. freeways, arterials and major collectors. As such the numbers presented in this document should not be taken for exact but are intended to help in comparing how the various scenarios impact travel demand in the area.

The 2021 horizon year model runs were utilized to compare the impacts of the various road network options assumed as identified above. The key findings are as follows:

AM Peak Hour

- With the Sheridan Park Drive Extension, the model shows a decrease in traffic along Homelands Drive by approximately 2% (four (4) vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction compared to the Do-nothing scenario.
- The widening of Speakman Drive to four (4) lanes generally results in an increase in traffic along Homelands Drive as compared to the Sheridan Park Drive Extension scenario with approximately 16% (40 vehicles) more traffic in the eastbound direction and 18% (36 vehicles) in the westbound direction.
- With the Sheridan Park Drive Extension scenario, the greatest reduction in traffic will occur on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions) in the AM peak hour as compared to the Do-nothing scenario.
- With the Sheridan Park Drive Extension in place, the number of through trips ('cut through' traffic) utilizing Homelands Drive is projected to decrease by approximately 17% in the AM peak hour as compared to the Do-nothing scenario. This in comparison to the Speakman Drive widening to four (4) lanes scenario, which results in a 22% increase in the number of through trips using Homelands Drive as compared to the Do-nothing scenario.
- The Sheridan Park Drive Extension will play an important role in providing additional access to and from the Sheridan Homelands Residential Community. During the AM peak hour approximately 77% of the trips that utilize the Sheridan Park Drive Extension either originate from or are destined to the residential area to the north of Sheridan Park Drive. This results in an increase in traffic on the eastern end of Homelands Drive (east of Thorn Lodge Drive east intersection) by approximately 24% (average for both directions) as the residential communities' travel patterns change and they divert to this section of Homelands Drive to access the extension. However, there is a corresponding drop in traffic on the western section of Homelands Drive.

PM Peak Hour

- During the PM peak hour, the Sheridan Park Drive Extension results in an average decrease in traffic along Homelands Drive by approximately 3% (ten (10) vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction compared to the Do-nothing scenario.

- Comparing the Speakman Drive widening to four (4) lanes scenario against the Sheridan Park Drive Extension scenario, the widening of Speakman Drive to four (4) lanes results in an increase in traffic along Homelands Drive by approximately 3% (ten (10) vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction.
- As a result of the Sheridan Park Drive Extension, the greatest traffic reductions will be experienced on the western end of Homelands Drive with volumes decreasing by approximately 25% (average for both directions).
- Because of the Sheridan Park Drive Extension, the number of through trips utilizing Homelands Drive is projected to decrease by approximately 13% as compared to the Do-nothing scenario. With the Speakman Drive widening to four (4) lanes scenario, the model projects an increase in the number of through trips along Homelands Drive by approximately 9% as compared to the Do-nothing scenario.
- Similar to the AM Peak Hour, the Sheridan Park Drive Extension will have an important role in serving the Sheridan Homelands Residential Community to the north with approximately 72% of the traffic using the extension having an origin or destination in the residential community. This again results in a diversion in traffic in the residential community which can be seen by the 40% increase (average for both directions) in traffic utilizing the eastern end of Homelands Drive. There is an associated drop in traffic to the west on Homelands Drive.

In conclusion, the results indicate that the Sheridan Park Drive Extension will play an important role in providing additional opportunities for residents living in the Sheridan Homelands neighbourhood to access their neighbourhood. The extension results in an overall reduction in traffic along sections of Homelands Drive and in addition results in a decrease in through traffic on Homelands Drive. The widening of Speakman Drive to four (4) lanes generally does not provide a benefit to the residents living to in the Sheridan Homelands neighbourhood as it does not reduce the amount of traffic utilizing Homelands Drive.

2021 Road Network

As identified for existing conditions, the addition of the westbound right turn lane has been assumed as part of the road network at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection.

A traffic operations analysis was conducted for 2021 traffic conditions for the AM and PM peak hours. To accommodate the 2021 traffic forecasts, the following improvements to the road network are recommended:

- The Sheridan Park Drive / Speakman Drive (west leg) intersection will have a volume to capacity ratio of 0.78. To improve intersection operations, a roundabout is recommended to be installed with the Sheridan Park Drive Extension.

- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. Eastbound and westbound left turn lanes could be installed to improve operations; however, the best improvement would be a roundabout that would result in improving the level of service to B or better for each leg. Even if the extension was not in place, a roundabout would be required by 2031.
- At the Sheridan Park Drive / Fifth Line intersection, delays will be experience with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required plus the installation of traffic signals. Without the Extension, installation of traffic signals would be required by 2031.

At the signalized intersections of Winston Churchill Boulevard and Erin Mills Parkway, delays will be experienced for some movements and some movements will approach capacity; however, there is sufficient capacity to accommodate the demand.

2031 Road Network

A traffic operations analysis was conducted for the 2031 traffic projections. In addition to the transportation improvements identified for existing and 2021 traffic conditions, the following additional improvements are identified:

- The Sheridan Park Drive / Fifth Line intersection will require traffic signals to be installed prior to 2031 without the Sheridan Park Drive Extension. It was previously identified as needing traffic signals by 2021 with the extension.

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1.0 Introduction

1.1 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The EA Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The EA Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act.*

As part of the EA Study, Burnside has completed a transportation analysis to identify whether the proposed Sheridan Park Drive extension will impact transportation within the Study Area and determine if any potential mitigation measures are required. This report provides a summary of existing and future transportation conditions and forms one of the background reports required for the Project Report File for the study. The focus of this report is to examine the existing transportation system, existing traffic operations within the subject area, identify preliminary concerns to establish the Problem / Opportunity Statement, assess future transportation operations, and identify the preferred transportation network.

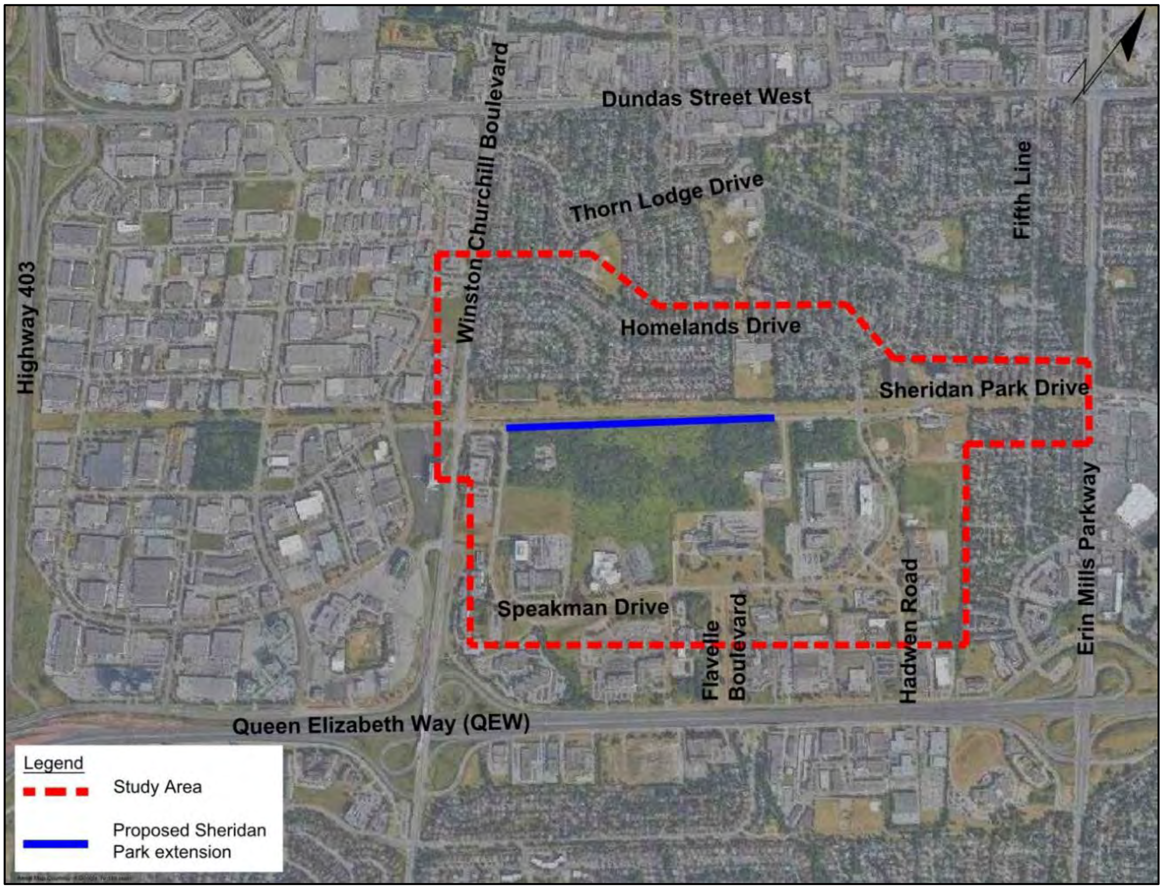
1.2 Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The study area for the traffic analysis is shown in Figure 1.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Figure 1: Study Area



Sheridan Park is a 340-acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved MUT through the utility corridor from Winston Churchill Boulevard to Homelands Drive/Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Sheridan Park Drive is a two-lane major collector road located in the southwest quadrant of Mississauga. It extends between Winston Churchill Boulevard and Erin Mills Parkway with a missing connection between approximately 275 meters west of the Speakman

Drive / Homelands Drive intersection and the west leg of Speakman Drive. The missing link is identified as a future major collector in the MOP as illustrated on Schedule 5 Long Term Road Network from the MOP.

According to the "*Sheridan Park Corporate Centre Draft Land Use Master Plan*" (the Park's Master Plan) completed by Urban Strategies Inc. dated December 2014, the Sheridan Park area is proposed to intensify and diversify the existing dominant land uses of science and technology facilities and office uses. The renewed focus of Sheridan Park is on pilot plants, innovation and science and technology; however, future land uses also include offices, daycare, utility and open spaces with schools permitted on a site specific basis. In order to accommodate the future development of the park, the Park's Master Plan has identified the need for the missing Sheridan Park Drive segment. This segment is also recommended by the MOP as an important link in the road network to serve a significantly larger area. A connection between the west and east sections of Sheridan Park Drive would improve access for the Corporate Centre and the Sheridan Homelands residential neighbourhood to the north.

1.3 Traffic Study Area

The overall study area is generally bound by Homelands Drive to the north, the Speakman Drive to the south, Erin Mills Parkway to the east and Winston Churchill Boulevard to the west. This study focuses on the following key roadways:

- Sheridan Park Drive
- Erin Mills Parkway
- Winston Churchill Boulevard
- Homelands Drive
- Speakman Drive

The study includes the following intersections:

- Winston Churchill Boulevard / Homelands Drive / Dover Gate
- Homelands Drive / Thorn Lodge Drive
- Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive
- Sheridan Park Drive / Homelands Drive / Speakman Drive
- Sheridan Park Drive / Fifth Line
- Erin Mills Parkway / Sheridan Park Drive
- Speakman Drive / Hadwen Road
- Speakman Drive / Flavelle Boulevard
- Proposed Sheridan Park Extension

1.4 Study Approach / Scope of Work

This existing conditions study provides a preliminary assessment of the key transportation related issues, including a review of all relevant background reports / studies and existing traffic data.

This study also includes an evaluation of the existing traffic operations in the study area and based on that identifies opportunities to improve traffic operations. This provides the City an opportunity to:

- Review road and access options for potential development in the Sheridan Park area.
- Facilitate an improved active transportation network for pedestrians and cyclists by connecting the residential area in the north to the business corporate area in the south.
- Provide a multi-modal facility that is safe and efficient and can be shared by all modes of travel.

Future horizon year operations were assessed for 2021 and 2031 traffic conditions with the recommended lane needs identified.

1.5 Intersection Analysis Methodology

Intersection operations were assessed for the intersections in the study area using the software program Synchro 9, which employs methodology from the *Highway Capacity Manual (HCM2000 and HCM 2010)*, published by the Transportation Research Board National Research Council. Synchro 9 can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections. The analysis has utilized the HCM2000 methodology.

The signalized intersection analysis considers two separate measures of performance:

- The capacity of all intersection movements, which is based on a volume to capacity ratio that measures the degree of capacity utilized.
- The level of service for all intersection movements, which is based on the average control delay per vehicle for the various movements through the intersection and the overall intersection delay. Delay is an indicator of how long a vehicle must wait to complete a movement and is represented by a letter between A and F, with F being the longest delay. The link between LOS and delay (in seconds) for signalized intersections is summarized below.

Level of Service	Control Delay per Vehicle(s)
A	≤10
B	> 10 – 20
C	> 20 – 35
D	> 35 – 55
E	> 55 – 80
F	> 80

The two-way stop and all-way stop unsignalized intersection analysis considers two separate measures of performance:

- The capacity of the intersection’s critical movements, which is based on a volume to capacity ratio.
- The level of service for the critical movements within the intersection, which is based on the average control delay per vehicle for the various critical movements. The link between LOS and delay (in seconds) for unsignalized intersections is summarized below.
-

Level of Service	Control Delay per Vehicle(s)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Intersections operations for roundabouts were assessed using Arcady. The operational analysis takes into account geometries such as entry width, approach width, flare length, conflict angle, inscribed circle diameter and entry radius, which is linked to driver behavior. The output results in predicted capacities, queues, delays and level of service.

The level of service ranges for a roundabout are as follows:

Level of Service	Control Delay per Vehicle(s)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

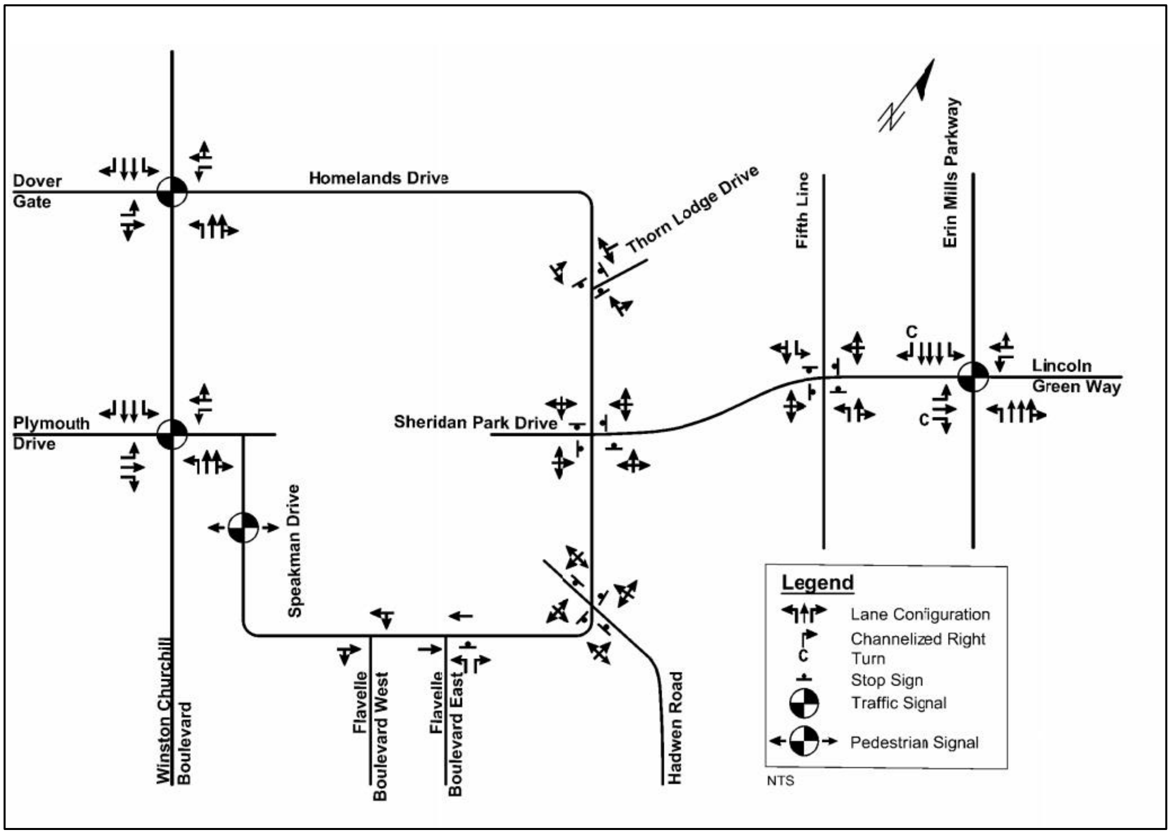
2.0 Existing Conditions

2.1 Road Network

The existing road network is described below and is illustrated in Figure 2, including existing traffic control. All roadways are under the jurisdiction of the City with the exception of Winston Churchill Boulevard and Erin Mills Parkway, which are under the jurisdiction of the Region of Peel.

Sheridan Park Drive	Sheridan Park Drive is a two-lane east-west major collector road. The road extends west from Erin Mills Parkway and terminates at approximately 275 m west of Speakman Drive (east leg) / Homelands Drive. The road is discontinuous west of that point, but then continues approximately 150 m east of Winston Churchill Boulevard at Speakman Drive (west leg). The posted speed limit is 50 km/h and parking is prohibited on both sides of the road. A MUT is provided on the south side of the road between Erin Mills Parkway and Homelands Drive / Speakman Drive (east leg). The MUT then runs on the north side of the road between Homelands Drive / Speakman Drive (east leg) and Winston Churchill Boulevard within the utility corridor. A sidewalk is provided on the north side of the road between Erin Mills Parkway and Speakman Drive (east leg) / Homelands Drive and continues on the south side, between Winston Churchill Boulevard and Speakman Drive (west leg).
Winston Churchill Boulevard	Winston Churchill Boulevard is a north-south arterial road consisting of a 4-lane urban cross section with 2 lanes per direction. It has a posted speed limit of 60 km/h and sidewalks are provided on both sides of the road. Turn lanes are provided at intersections.
Erin Mills Parkway	Erin Mills Parkway is a north-south arterial road consisting of a 6-lane urban cross section with 3 lanes per direction. It has a posted speed limit of 70 km/h. A sidewalk is provided on both sides of the road and stopping is prohibited on both sides of the road. Turn lanes are provided at intersections.

Figure 2: Existing Road Network



Homelands Drive	Homelands Drive is an east-west minor collector road that transitions into a north-south road, north of Sheridan Park Drive. It consists of a 2 lane urban cross section. The roadway commences at Winston Churchill Boulevard, opposite Dover Gate and transitions to Speakman Drive, south of Sheridan Park Drive. Homelands Drive has a posted speed limit of 50 km/h, except within the Homelands Senior School zone, where the posted speed limit is 40 km/h. A sidewalk is provided on both sides of the road. Stopping and U-turns are prohibited within the vicinity of the school zone. Homelands Drive serves the Sheridan Homelands residential neighborhood.
Speakman Drive	Speakman Drive is a north-south and east-west minor collector road that forms a crescent connecting to Sheridan Park Drive. It consists of a 2-lane urban cross section and is the southerly continuation of Homelands Drive at its east leg. The roadway then terminates at the west segment of Sheridan Park Drive just east of Winston Churchill Boulevard. The road has a posted speed limit of 50 km/h, except within the Olive Grove School zone, where the posted speed limit is reduced to 40 km/h. A

sidewalk is provided on the south side, east side on the east leg and west side on the west leg of the road.

As well, a pedestrian signal is located approximately 265 meters south of Sheridan Park Drive on the west leg of Speakman Drive. Parking and stopping are prohibited on both sides of the road. Speakman Drive serves Sheridan Park.

Fifth Line — Fifth Line is a north-south road consisting of a 2-lane urban cross section. North of Sheridan Park Drive, it is a minor collector road. South of Sheridan Park Drive, it is a local road. It has a posted speed limit of 50 km/h. There are designated bicycle lanes provided on both sides of the road. Sidewalks are provided on both sides of the road north of Sheridan Park Drive and on the west side of the road south of Sheridan Park Drive. Parking is prohibited on both sides of the road.

Thorn Lodge Drive — Thorn Lodge Drive is an east-west minor collector road consisting of a 2- lane urban cross section. It has a posted speed limit of 40 km/h. A sidewalk is provided on both sides of the road. Thorn Lodge Drive serves the residential Sheridan Homelands neighourhood.

Hadwen Road — Hadwen Road is a north-south minor collector road consisting of a 2 -lane urban cross section. Hadwen Road has an assumed speed limit of 50 km/h. A sidewalk is provided on the west side of the road and parking is prohibited on the west side.

Flavelle Boulevard — Flavelle Boulevard is a north-south minor collector road that is separated into two one-way roads that are approximately 75 m apart. The west road is for southbound traffic only and the east road is for northbound traffic only. Both have assumed speed limits of 50 km/h. No pedestrian facilities are provided along the road.

2.2 Transit Network

The study area is currently well served by three main transit agencies. MiWay provides local bus service within Mississauga. Oakville Transit provides local bus service within Oakville along Winston Churchill Boulevard. GO Transit provides inter-regional connections.

2.2.1 MiWay Transit

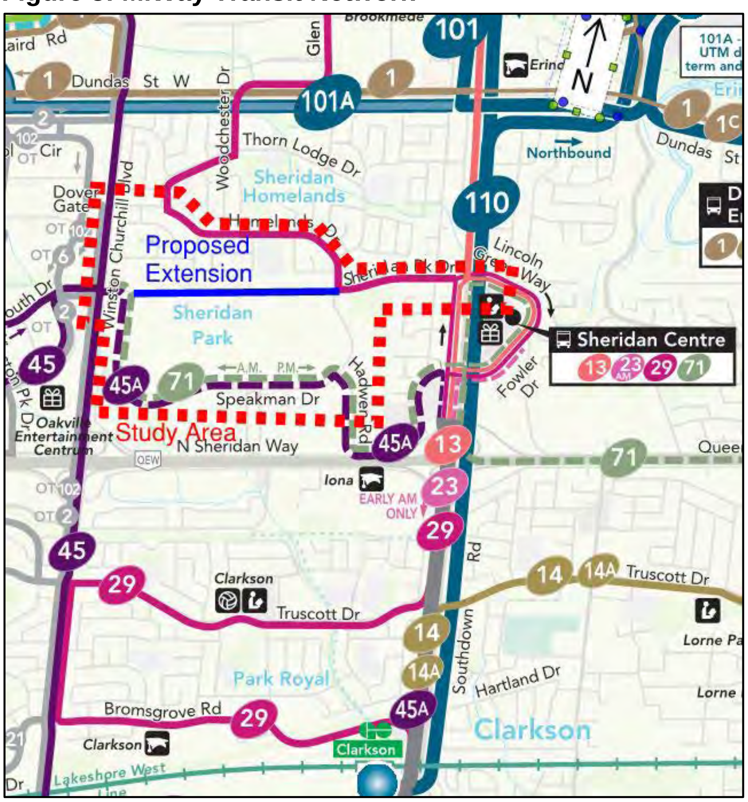
MiWay is operated by the City of Mississauga. There are several routes that run near or through the study area. Table 1 summarizes local MiWay routes within the vicinity of the study area and their service frequency. A route map is illustrated in Figure 3.

Table 1: MiWAy Transit Route Frequency

Transit Route	Weekday (mins)		Weekend (mins)
	AM Peak Period	PM Peak Period	Midday Period
#13 Glen Erin	16-23	10-23	33
#23 Lakeshore[1]	8	NA	NA
#29 Royal Park Homelands	23-30	23-30	33
#45 Winston Churchill	26-36	31-34	45
#45A Winston Churchill-Speakman	28-40	15-30	NA
#71 Sheridan-Subway East[2]	NA	37	NA
#71 Sheridan-Subway West	50	NA	NA

Notes: NA = Service not available
1. Route #23 Lakeshore only operates during the Weekday AM Peak Period and the service does not fall within the adjacent street peak hour of 7:00 AM to 9:00 AM. The frequency indicated in the table is the most frequent service for the duration of 4:00 AM to 5:15 AM
2. Route #71 Sheridan Subway East only operates during the Weekday PM Peak Period from 4:30PM to 5:30AM
3. Route #71 Sheridan Subway West only operates during the Weekday AM Peak hour from 8:00AM to 9:00AM

Figure 3: MiWay Transit Network



Reference: Miway Weekday System Map, January 2017

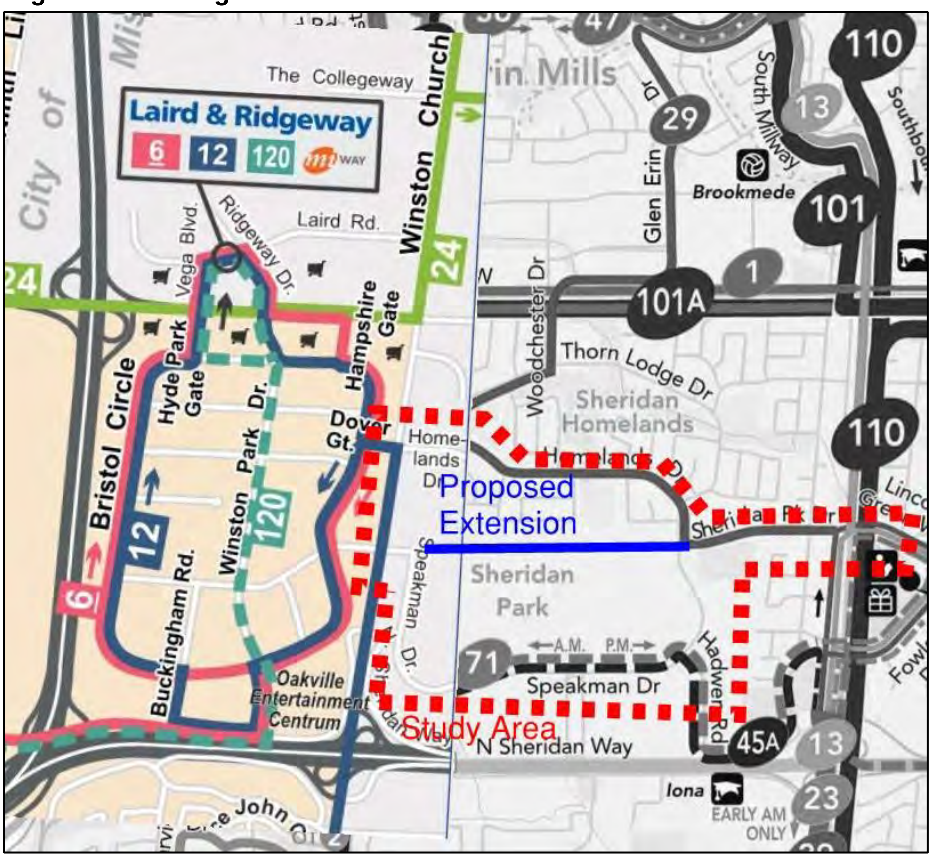
2.2.2 Oakville Transit

Oakville Transit is operated by the City of Oakville with transit routes #6 Upper Middle, #12 Winston Park and #120 Industrial Park that operate west of the study area. These routes are within 500 meters walking distance from the study area. Route #6 and Route #12 have a transit stop located approximately 220 meters from the study area. Route #120 has a transit stop located approximately 500 meters from the study area. Table 2 summarizes the routes within the vicinity of the study area and their service frequency. The route map is illustrated in Figure 4.

Table 2: Oakville Transit Route Frequency

Transit Route	Weekday AM and PM Peak hour (mins)	Weekend Frequency (mins) Midday Period
#6 Upper Middle	60	60
#12 Winston Park	30	-
#120 East Industrial	30	-

Figure 4: Existing Oakville Transit Network



Reference: Oakville Transit System Map, January 2017

2.2.3 GO Transit

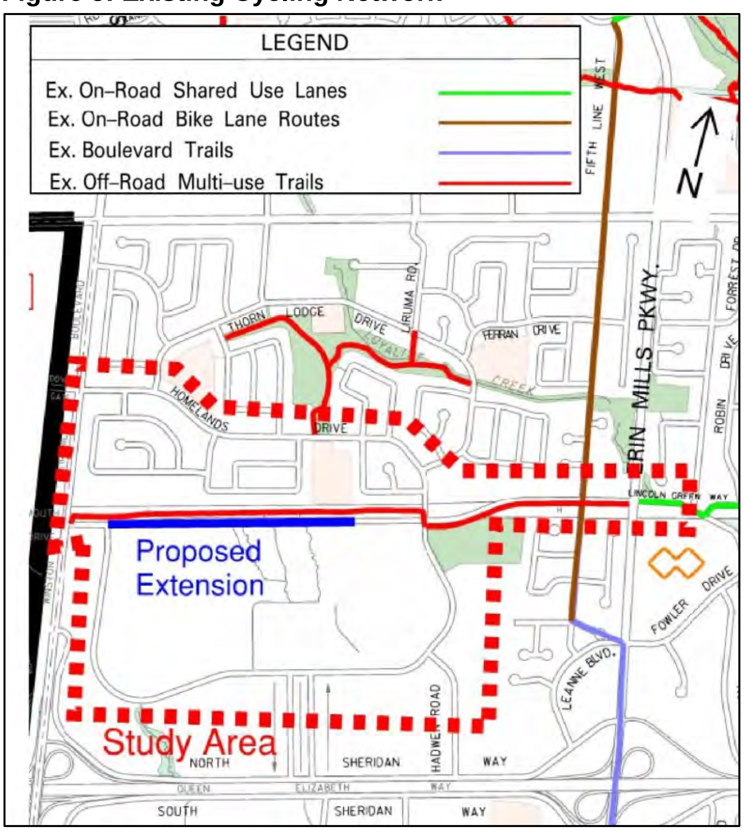
GO Transit, a division of Metrolinx, provides inter-regional commuter-based transit service for the Greater Toronto and Hamilton Area (GTHA) and has routes that extend to the communities across the Greater Golden Horseshoe. The closest GO Transit station is Clarkson GO station, which is located approximately 2.3 kilometers away from the study area. The station is a transit hub for the GO Rail Lakeshore West Line and a local bus terminal for both MiWay and Oakville Transit buses. MiWay routes provide connections between the bus terminal and the study area. During the AM peak period, train frequency is every 5 to 15 minutes towards Union Station and every 25 minutes towards Hamilton. During the PM peak period, train frequency is every 15 to 30 minutes towards Union Station and every 10 to 20 minutes towards Hamilton.

2.3 Active Transportation Network

2.3.1 Cycling Network

Existing cycling facilities are shown in Figure 5, which is an excerpt from the City's Cycling Master Plan.

Figure 5: Existing Cycling Network

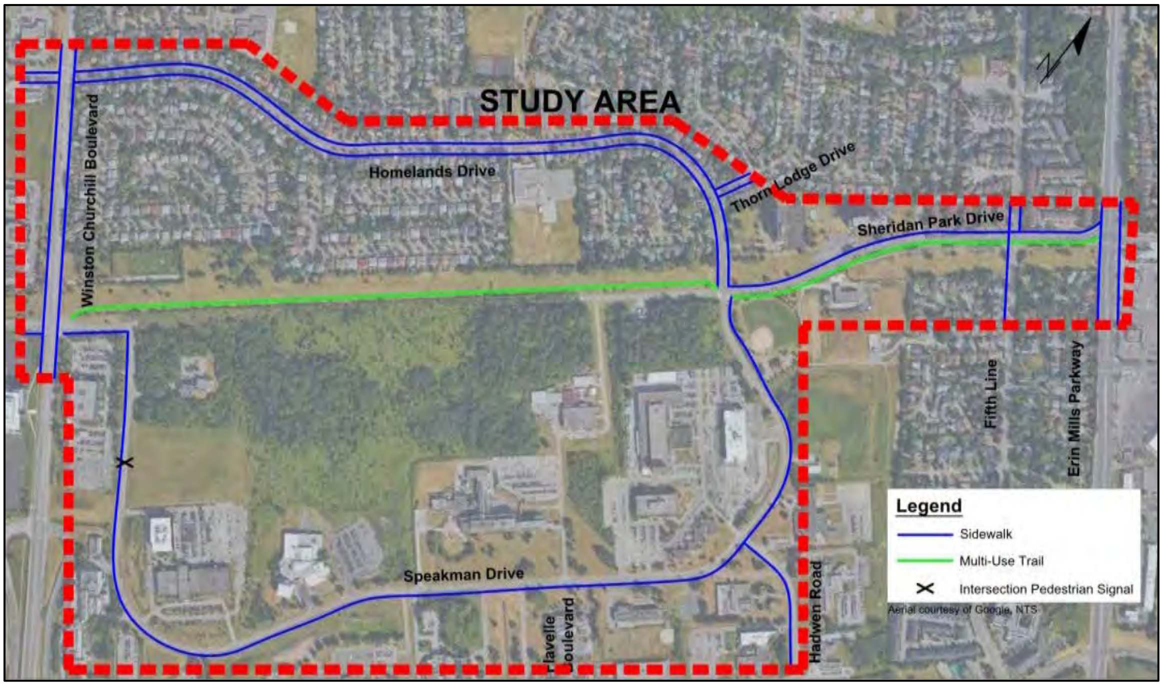


Reference: Mississauga Cycling Master Plan, iTRANS Consulting Inc., September 2010

2.3.2 Pedestrian Network

Existing pedestrian facilities are shown in Figure 6. The blue lines illustrate the sidewalk system and the green lines indicate the MUT.

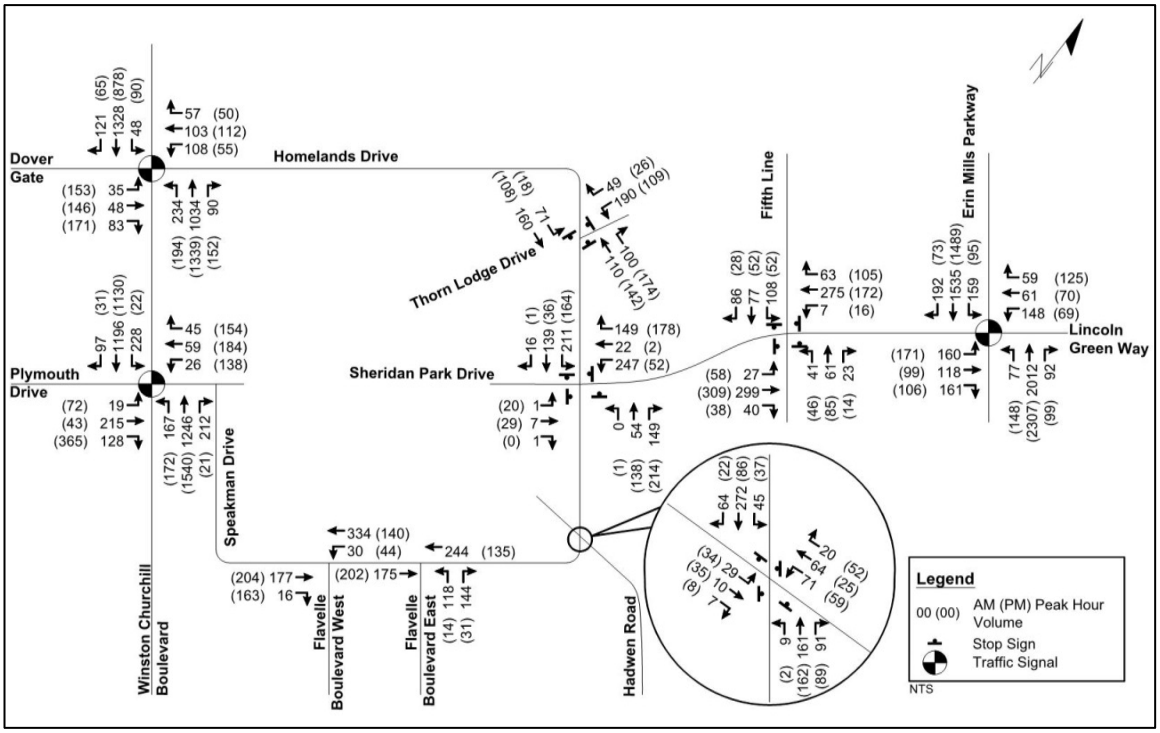
Figure 6: Existing Pedestrian Network



2.4 Traffic Volumes

Existing traffic counts were conducted at study intersections by Accu-Traffic on behalf of Burnside, with the exception of the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection and Speakman Drive / Hadwen Road intersection. Turning movement counts for these two intersections were provided by the City and were conducted on Thursday, January 14, 2016 and Wednesday, March 4, 2015, respectively. Burnside's traffic counts were conducted on Wednesday, November 23, 2016 during the weekday AM (7:00 - 9:00 AM) and PM (4:00 - 6:00 PM) peak periods. The weekday AM and PM peak hours were selected as these are the typical peak traffic periods. Summaries of the traffic counts are provided in Appendix A. Existing traffic volumes are shown in Figure 7.

Figure 7: Existing Traffic Volumes



2.5 Existing Operations

Existing traffic operations were assessed based on the existing road network shown in Figure 2 and the existing volumes shown in Figure 7. Existing traffic operations are provided in Table 3, Table 4, and Table 5 for signalized, two-way stop, and all-way stop intersections, respectively. Detail Synchro reports can be found in Appendix B.

Under existing conditions, all signalized study intersections are operating at an overall level of service C. Individual movements are operating with excess capacity and a level of service E or better, with the exception of the westbound left turn movement at the Winston Churchill Boulevard / Dover Gate / Homelands Drive intersection. Site observations were made on Thursday, January 26, 2017 during the PM peak hour for this movement. The westbound green time was sufficient to clear all westbound queued vehicles. Green priority has been given to north-south movements that have higher traffic volumes and results in better overall performance. There is capacity that additional time could be provided to the east-west movements, and would be further reviewed by the Region of Peel and City of Mississauga staff.

During the weekday PM peak hour, delays are seen for eastbound left turns onto Erin Mills Parkway from Sheridan Park Drive; however, the movement is operating within the available capacity.

Table 3: Existing Signalized Intersection Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Winston Churchill Boulevard / Dover Gate / Homelands Drive				
Overall	0.74	C	0.75	C
Eastbound Left	0.35	E	0.78	E
Eastbound Through-Right	0.42	E	0.87	E
Westbound Left	0.83	F	0.81	F
Westbound Through-Right	0.67	E	0.43	D
Northbound Left	0.70	E	0.51	A
Northbound Through-Right	0.47	A	0.73	B
Southbound Left	0.23	B	0.47	B
Southbound Through	0.70	C	0.43	B
Southbound Right	0.11	B	0.05	B
Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive				
Overall	0.74	C	0.87	C
Eastbound Left	0.10	D	0.43	D
Eastbound Through	0.75	E	0.11	D
Eastbound Right	0.26	D	0.89	E
Westbound Left	0.29	D	0.38	D
Westbound Through-Right	0.31	D	0.64	D
Northbound Left	0.74	D	0.89	E
Northbound Through-Right	0.75	C	0.80	C
Southbound Left	0.69	E	0.20	B
Southbound Through	0.47	A	0.59	B
Southbound Right	0.06	A	0.02	A
Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way				
Overall	0.78	C	0.86	C
Eastbound Left	0.80	E	0.93	F
Eastbound Through	0.38	D	0.26	D
Eastbound Right	0.46	D	0.07	D
Westbound Left	0.75	E	0.26	D
Westbound Through-Right	0.36	D	0.43	D
Northbound Left	0.48	C	0.62	B
Northbound Through-Right	0.70	B	0.84	C
Southbound Left	0.76	D	0.62	D
Southbound Through	0.43	A	0.53	B
Southbound Right	0.13	A	0.06	B

Notes: 1. v/c (volume to capacity), LOS (level of service)
2. Based on existing signal timings as provided by the City

Given the volume of traffic exiting Sheridan Park in the PM peak hour, delays were observed for traffic trying to turn onto Winston Churchill Boulevard as illustrated in Photo 1.

Photo 1: PM Westbound Queues on Sheridan Park from Winston Churchill

Queues in employment areas are not unusual when employees are trying to exit after the work day. The length of the through-right turn queue extended beyond where left turning vehicles could get into the left turn lane, which result in left turning vehicles be added as part of the queue. This was previously identified by the Region of Peel. They have identified that a westbound right turn lane would be beneficial at the Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive intersection and have included this improvement as part of their development charges. This change is appropriate, as the right turn lane would provide additional capacity. Further calibration of the analysis model has not been undertaken.

Table 4: Existing Two-Way Stop Intersection Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Speakman Drive / Flavelle Boulevard West				
Westbound Left-Through	0.03	A	0.05	A
Speakman Drive / Flavelle Boulevard East				
Northbound Left-Right	0.56	C	0.08	B

Notes: v/c (volume to capacity), LOS (level of service)

Under existing conditions, the two-way stop unsignalized study intersections have critical movements operating with excess capacity and with level of service C or better. No changes are necessary.

Table 5: Existing All-way Stop Intersection Operations

Intersection & Movement	Weekday AM Peak Hour		Weekday PM Peak Hour	
	v/c	LOS	v/c	LOS
Homelands Drive / Thorn Lodge Drive				
Westbound Left-Right	0.47	B	0.22	A
Northbound Through-Right	0.38	B	0.42	B
Southbound Left-Through	0.44	B	0.19	A
Speakman Drive / Homelands Drive / Sheridan Park Drive				
Eastbound Left-Through-Right	0.02	B	0.10	A
Westbound Left-Through-Right	0.85	D	0.39	B
Northbound Left-Through-Right	0.42	B	0.55	B
Southbound Left-Through-Right	0.78	D	0.36	B
Fifth Line / Sheridan Park Drive				
Eastbound Left-Through-Right	0.75	D	0.67	C
Westbound Left-Through-Right	0.71	C	0.49	B
Northbound Left	0.12	B	0.11	B
Northbound Through-Right	0.21	B	0.20	B
Southbound Left	0.28	B	0.12	B
Southbound Through-Right	0.38	B	0.16	A
Speakman Drive / Hadwen Drive				
Eastbound Left-Through-Right	0.11	B	0.14	A
Westbound Left-Through-Right	0.35	B	0.24	A
Northbound Left-Through-Right	0.50	B	0.40	B
Southbound Left-Through-Right	0.71	C	0.25	A

Notes: v/c (volume to capacity), LOS (level of service)

Under existing conditions, all all-way stop unsignalized study intersections have movements operating with excess capacity and with level of service D or better.

2.6 Queueing Analysis

Queueing was reviewed for critical movements under existing conditions during both AM and PM Peak periods. A comparison of the existing storage and analysed queue lengths for critical movements are summarized in Table 6. Detail Synchro outputs for the queuing results can be found in Appendix C.

Table 6: Existing 95th Percentile Queuing Summary

Intersection and Movement	Existing Storage (m)	Existing Queue Length (m)	
		AM Peak Period Hour	PM Peak Period Hour
Winston Churchill Boulevard / Homelands Drive / Dover Gate			
Eastbound Through-Right	100	41	123
Westbound Left	20	52	40
Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive			
Westbound Left	35	15	46
Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way			
Eastbound Left	20	65	95
Eastbound Right	35	47	15

The results of the queue length review are discussed below for each intersection.

2.6.1 Winston Churchill Boulevard / Homelands Drive / Dover Gate

The eastbound through movement, during the PM peak hour, is currently exceeding the existing distance to the upstream constraint (ie. length of lane or next intersection) by 23 m under existing conditions. The westbound left turn movement, during the AM peak hour, is also exceeding existing storage by 32 m. These queues can be reduced with improved signal timing as there is excess green time for north/south movements.

2.6.2 Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive

The westbound left turn movement is exceeding the provided storage by 11 m. Field observations found that queueing for the westbound left turn movement was being impacted by the longer westbound through-right queue. However, the westbound green time was sufficient to clear all westbound queued vehicles. As previously identified, a westbound right turn lane was identified as an improvement by the Region of Peel, which would improve intersection operations and queues.

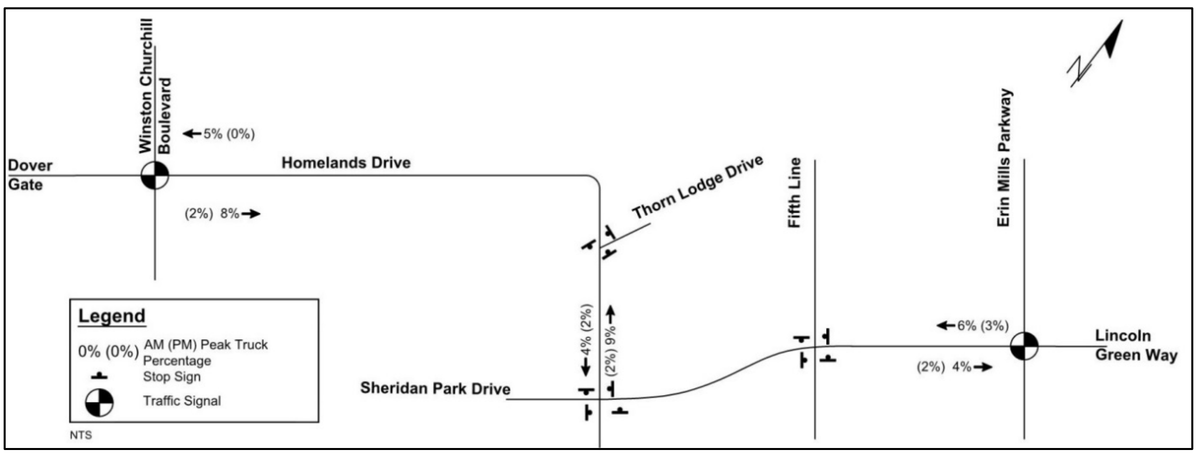
2.6.3 Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way

The eastbound left turn movement, during the PM peak hour, is exceeding the existing storage by 75 m. The storage length is also exceeded during the AM peak hour. Field observations found that there was sufficient green time allocated to clear the eastbound left turn queue. In addition, the eastbound right turn movement during the AM peak hour is exceeding the existing storage by 12 m. These queues can be reduced with improved signal timing as there is excess green time for north/south movements.

2.7 Truck Infiltration

Currently, there are posted signs prohibiting heavy trucks from 7:00 PM to 7:00 AM any day, along Sheridan Park Drive, between Erin Mills Parkway and the east terminus of the eastern section of Sheridan Park Drive. In addition, heavy trucks are prohibited at any time on Homelands Drive, north of Sheridan Park Drive. Despite these signed prohibitions, residents have reported truck traffic infiltrating the area. Existing truck traffic along Homelands Drive and Sheridan Park Drive was assessed. Figure 8 shows the percentage of truck traffic during the AM and PM peak hours traveling along Homelands Drive and Sheridan Park Drive, with the exception of the intersection of Sheridan Park Drive / Homelands Drive / Speakman Drive intersection where the percentages are based on 8 hour counts conducted by Accu-Traffic on behalf of Burnside on Wednesday, November 23, 2016 from 7:00 AM to 6:00 PM over eight hours. It should be noted that truck traffic would include buses and heavy trucks associated with home delivery services as well garbage pick-up, etc. Some truck traffic would have a purpose in the neighbourhood.

Figure 8: Existing Truck Percentages



The truck percentages appear to indicate that there could be some truck infiltration within the Sheridan Homelands neighbourhood. Truck volumes are lower during the weekday PM period, which is supported by field observations that were undertaken on Thursday, January 26, 2017.

Utilizing the traffic counts, truck traffic using Homelands Drive to access Sheridan Park were reviewed and there was only one southbound truck in the weekday AM peak hour and one northbound truck in the weekday PM peak hour. Trucks using Homelands Drive to access the employment lands west of Winston Churchill Boulevard was one eastbound truck in the AM peak hour and no trucks in the weekday PM peak hour. Therefore, it is not conclusive that trucks are using Homelands Drive to access the employment areas to the south or west.

During the weekday AM peak hour, some trucks may be using Sheridan Park Drive and Homelands Drive to travel in a westerly direction between Erin Mills Parkway and Winston Churchill Boulevard. Some of this could be occurring in the weekday AM peak hour in the eastbound direction as well. There is insufficient evidence that this is occurring in the weekday PM peak period.

2.8 Homelands Drive

Sheridan Homelands residents expressed concerns regarding traffic volumes and speeding along Homelands Drive and within their neighbourhood. The City is undertaking another study that is addressing neighbourhood concerns regarding traffic calming in the neighbourhood.

This study has reviewed traffic volumes along Homelands Drive including trucks. The impact of the Sheridan Park Drive Extension on traffic volumes along Homelands Drive has also been reviewed and discussed below.

3.0 Future Traffic Projections

Future traffic volumes with and without Sheridan Park Drive Extension were developed from the City's EMME transportation model. The EMME traffic projection model results for 2011, 2021, and 2031 years are provided in Appendix D. To further understand how the Sheridan Park Drive Extension impacts the residential neighbourhood, the City's Travel Demand Model was utilized to assist in understanding how the travel patterns changed for each alternative transportation solutions proposed and to complete a number of sensitivity checks to assist in selecting a preferred solution for the study area. Specifically the model was utilized to assess the following:

1. How much traffic utilizes Homelands Drive when comparing the following scenarios:

    a) Do-nothing scenario – the Do-nothing scenario (assumes four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    b) Sheridan Park Drive Extension (with four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection).

    c) Speakman Drive widening to four (4) lanes (no Sheridan Park Drive Extension, four (4) lanes on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection)

Note: For the purpose of the sensitivity analysis, as part of the Do-Nothing scenarios includes a 4-lane cross-section on Sheridan Park Drive between Winston Churchill Boulevard and Speakman Drive west intersection as the modelling analysis indicated that with a 2 lane cross-section this section of Sheridan Park Drive experienced capacity constraints in the future horizon years which limited the amount of traffic demand which utilizes the Sheridan Park Drive extension/ Speakman Drive.

2. Origin and destination of trips utilizing Homelands Drive

3. Origin and destination of trips utilizing the Sheridan Park Drive Extension

It is important to note that the City's Travel Demand Model used in this work is developed to provide analysis/ results generally at a higher level, i.e. Freeways, Arterials and Major Collectors. Therefore, the numbers presented should not be taken as exact, but are intended to assist in comparing how the various scenarios impact travel demand in the area and thus help in selecting the preferred transportation solution for the area.

The following sections describe the results and approach taken to develop future traffic volumes.

3.1 Population and Employment Projections

The City provided population and employment forecast for the surrounding area. Table 7 summarizes the 2011, 2021 and 2031 projected population and employment within the Sheridan Homelands residential neighbourhood and Sheridan Park Corporate Centre.

Table 7: Projected Population and Employment Within the Study Area

	2011	2021	2031
Population	8500	8500	8540
Employment	7340	8650	9550

There is no population growth forecasted from year 2011 to 2021 and the growth from 2021 to 2031 is approximately 1% compounded annually for the residential. As the Sheridan Neighborhood is mainly developed, there is little to no space for new developments in the area. As a result, the population growth in the area is projected to be minimal.

Employment growth from year 2011 to 2021 is expected to be approximately 1.7% compounded annually and from 2021 to 2031 the rate is expected to be approximately 1% compounded annually. It is expected that the Sheridan Park Corporate Centre area will be the catalyst for growth within the study area.

3.2 Comparison between Traffic Counts and EMME Model

The 2011 estimated traffic from the City's EMME model was compared against observed 2016 traffic counts for traffic entering and exiting the Sheridan Park Corporate Centre. The results of this comparison are summarized in Table 8 for the weekday AM and PM peak hours.

Table 8: Sheridan Park Corporate Centre Observed Counts Versus 2011 Model Estimates

	Weekday AM Peak Hour			Weekday PM Peak Hour		
	In	Out	Total	In	Out	Total
EMME Model	1537	6	1543	359	1383	1742
Observed	1459	525	1984	355	1197	1552
Difference	78	-519	-441	4	186	190

For the Sheridan Park Corporate Area, the model projected well with the exception of the weekday AM peak hour. The model did not project outbound trips for the area; however, outbound trips are occurring.

As the traffic count data did not encompass the Sheridan Homelands residential neighbourhood at all connection points to the neighbourhood, a review of trips for the Sheridan Homelands trip projections was not undertaken. However, a review of link volumes along Homelands Drive and the 2016 traffic counts determined that estimates were within a reasonable range of the traffic counts along Homelands Drive.

To project the future traffic projections for 2021 and 2031, the growth rates between the model existing traffic and the projected traffic was determined and applied to the existing traffic counts.

3.3 Traffic Patterns for Various Scenarios

The following sections present the various scenarios reviewed to determine the traffic impacts along Homelands Drive.

3.3.1 Impact of Scenarios on the Amount of Vehicles Travelling along Homelands Drive

This section discusses the comparison of the Sheridan Park Drive Extension scenario and if it resulted in a reduction in overall traffic on Homelands Drive when compared to a Do-nothing scenario or the widening of Speakman Drive to four (4) lanes scenario. Table 9 depicts the 2021 horizon year simulated traffic along Homelands Drive for the three scenarios mentioned above with the traffic volumes summarized by direction for three separate segments along Homelands Drive. An average for the three segments is also provided. Based on the data, the following conclusions are made:

AM Peak Hour

- With the Sheridan Park Drive Extension, there will be an average decrease in traffic by approximately 2% (four (4) vehicles) in the eastbound direction and 16% (38 vehicles) in the westbound direction on Homelands Drive compared to the Do-nothing scenario.
- With the widening of Speakman Drive to four (4) lanes, there will be approximately 16% (40 vehicles) more traffic on Homelands Drive in the eastbound direction and 18% (36 vehicles) in the westbound direction as compared to the extension of Sheridan Park Drive scenario.
- With the Sheridan Park Drive Extension scenario, the greatest reductions in traffic will be experienced on the western end of Homelands Drive (west of the Thorn Lodge Drive east intersection) with volumes decreasing by approximately 29% (average for both directions).
- The eastern end of Homelands Drive (east of the Thorn Lodge Drive east intersection) will experience an increase in use (by approximately 24% - average for both directions) as the residential community is diverting to the extension. This results in the reduction in traffic volumes on Homelands Drive east of the Thorn Lodge Drive east intersection.

Table 9: Volumes Along Homelands Drive Between Winston Churchill Boulevard and Sheridan Park Drive (2021 Horizon Year)

AM Peak Hour								
Scenarios	**EB Direction**				**WB Direction**			
	Btwn WCB & Thorn Lodge	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**
Do-Nothing	223	137	416	259	447	201	74	241
Sheridan Park Dr Extension	178	87	499	255	396	102	111	203
Speakman widening to 4 Lanes	256	172	457	295	444	196	78	239
Comparison between Scenarios	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**
Sheridan Park Dr Extension vs Do-Nothing	-20%	-36%	20%	-2%	-11%	-49%	50%	-16%
Speakman widening to 4 Lanes vs Sheridan Park Dr Extension	44%	98%	-8%	16%	12%	92%	-30%	18%

PM Peak Hour								
Scenarios	**EB Direction**				**WB Direction**			
	Btwn WCB & Thorn Lodge	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**
Do-nothing	482	247	142	290	417	230	396	348
Sheridan Park Dr Extension	447	150	244	280	360	133	509	334
Speakman widening to 4 Lanes	487	238	145	290	427	232	435	365
Comparison between Scenarios	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**
Sheridan Park Dr Extension vs Do-Nothing	-7%	-39%	72%	-3%	-14%	-42%	29%	-4%
Speakman widening to 4 Lanes vs Sheridan Park Dr Extension	9%	59%	-41%	3%	19%	74%	-15%	9%

Absolute Difference	**EB Direction**				**WB Direction**			
	Btwn WCB & Thorn Lodge	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**	**Btwn WCB & Thorn Lodge**	**Btwn Thorn Lodge & Thorn Lodge**	**Btwn Thorn Lodge & Sheridan Park**	**Average for Direction**
Sheridan Park Dr Extension vs Do-Nothing AM	-45	-50	83	-4	-51	-99	37	-38
Speakman widening to 4 Lanes vs Sheridan Park Dr Extension AM	78	85	-42	40	48	94	-33	36
Sheridan Park Dr Extension vs Do-Nothing PM	-35	-97	102	-10	-57	-97	113	-14
Speakman widening to 4 Lanes vs Sheridan Park Dr Extension PM	40	88	-99	10	67	99	-74	31

Sheridan Park Drive Extension vs Do-Nothing Change along West End and East End of Homelands	**AM**	**PM**
Average for West End	-29%	-25%
Average for East End	24%	40%

PM Peak Hour

- Because of the Sheridan Park Drive Extension, Homelands Drive will experience an average decrease in traffic by approximately 3% (ten (10) vehicles) in the eastbound direction and 4% (14 vehicles) in the westbound direction.
- Comparing the Speakman Drive widening to four (4) lanes scenario against the Sheridan Park Drive Extension scenario, the widening will result in an increase in traffic along Homelands Drive by approximately 3% (10 vehicles) in the eastbound direction and 9% (31 vehicles) in the westbound direction.
- Similar to the AM peak hour, the Sheridan Park Drive Extension will result in the greatest traffic reduction on the western end of Homelands Drive with volumes decreasing by approximately 25% (average for both directions). The eastern end of Homelands Drive will see an increase in traffic by approximately 40% (average for both directions) as the residential community diverts to this link to access the extension.

Overall the results indicate that with the Sheridan Park Drive Extension, Homelands Drive will experience on average a decrease in traffic, while the Speakman Drive widening to four (4) lanes scenario will result in an overall increase in traffic on Homelands Drive. The Sheridan Park Drive Extension scenario leads to the residents living in the area to change their travel patterns to access the external road network via the extension. This in turn leads to a reduction in traffic in some sections of Homelands Drive while other sections experience an increase in neighbourhood traffic as residents utilize these sections to access the extension.

3.3.2 Origin and Destination of Trips Utilizing Homelands Drive

The previous analysis concluded that with the Sheridan Park Drive Extension in place, the number of vehicles utilizing sections of Homelands Drive will decrease. The origins and destination of trips utilizing Homelands Drive have been reviewed in this section and how those travel patterns changed between the scenarios analyzed. The objective of this analysis was to determine how the scenarios impact the number of trips utilizing Homelands Drive as a through route, i.e. not originating or destined to the residential area bounded by Dundas Street, Winston Churchill Boulevard, Erin Mills Parkway, and Sheridan Park Drive. A select link analysis was conducted using the City's model, where a select link analysis allows the user to select a link in the transportation network and review where the trips are coming from and going to using that link.

In this analysis, the link that was selected is located along Homelands Drive between Sheridan Park Drive and Thorn Lodge Drive (east intersection). The results of the select link analysis for the 2021 horizon year is summarized in Table 10. The table highlights the total number of vehicles that utilize the selected link and the number of vehicles that utilize the link but that are either originating/destined to the residential area or are originating/destined to an area outside the residential area.

Table 10: Through Trips Along Homelands Drive (2021 Horizon Year)

AM Peak Hour			
Scenarios	**Total Trips**	**OD within Res. Area**	**OD outside of Res. Area**
Do-Nothing	491	279	212
Sheridan Park Dr Extension	610	433	176
Speakman widening to four (4) Lanes	535	277	258
Change in through traffic along Homelands Drive between Scenarios			
Sheridan Park Dr Extension vs Do-nothing	-17%		
Speakman widening to four (4) Lanes vs Do-nothing	22%		
PM Peak Hour			
Scenarios	**Total Trips**	**OD within Res. Area**	**OD outside of Res. Area**
Do-nothing	538	251	287
Sheridan Park Dr Extension	753	504	249
Speakman widening to four (4) Lanes	580	268	312
Change in through traffic along Homelands Drive between Scenarios			
Sheridan Park Dr Extension vs Do-nothing	-13%		
Speakman widening to four (4) Lanes vs Do-Nothing	9%		

The results from the select link analysis indicate the following for Homelands Drive:

- With the Sheridan Park Drive Extension in place, the number of through trips utilizing Homelands Drive will decrease by approximately 17% in the AM peak hour and 13% in the PM peak hour as compared to the Do-nothing scenario.
- With the Speakman Drive widening to four 4 lanes scenario, there will be an increase in the number of through trips along Homelands Drive by approximately 22% in the AM peak hour and 9% in the PM peak hour as compared to the Do-nothing scenario.
- Generally, the results indicate that the Sheridan Park Drive Extension scenario has the greatest impact of reducing the number of trips utilizing Homelands Drive as a through route.

It is noted that the link traffic volumes analyzed for the scenario of Sheridan Park Extension or the Speakman Drive widening to four (4) lanes scenario had higher traffic volumes than the Do-nothing scenario. For the Sheridan Park Extension scenario, this is due to a change in residential traffic patterns and more residential traffic utilizing this section of the link rather than Homelands Drive further to the west.

3.3.3 Origin and Destination of Trips Utilizing Sheridan Park Drive Extension

Similar to the analysis presented in the previous section, a select link analysis was completed for the Sheridan Park Drive Extension. The purpose of the analysis was to understand where the trips are originating from and destined to that are using the Sheridan Park Drive Extension. The following three origin/destination areas were defined:

- Sheridan Homelands Residential Neighbourhood bounded by Dundas Street, Winston Churchill Boulevard, Erin Mills Parkway and Sheridan Park Drive
- Corporate Park Area bounded by Sheridan Park Drive, Winston Churchill Boulevard, Erin Mills Parkway and Queen Elizabeth Way.
- All other Origin's and Destinations outside the Residential and Corporate Park areas.

The select link analysis for the 2021 horizon year for the Sheridan Park Drive Extension link is summarized in Table 11. The table shows both absolute values and what those values translate into as a percentage of the total trips.

Table 11: Origin and Destination of Trips Using the Sheridan Park Drive Extension (2021 Horizon Year)

AM Peak Hour		
	Traffic Volume	**as a percentage**
Total Trips	233	
OD within Residential Area	179	77%
OD within Corporate Park Area	15	6%
OD outside of Residential and Corporate Area	38	16%
PM Peak Hour		
	Traffic Volume	**as a percentage**
Total Trips	383	
OD within Residential Area	278	72%
OD within Corporate Park Area	38	10%
OD outside of Residential and Corporate Area	68	18%

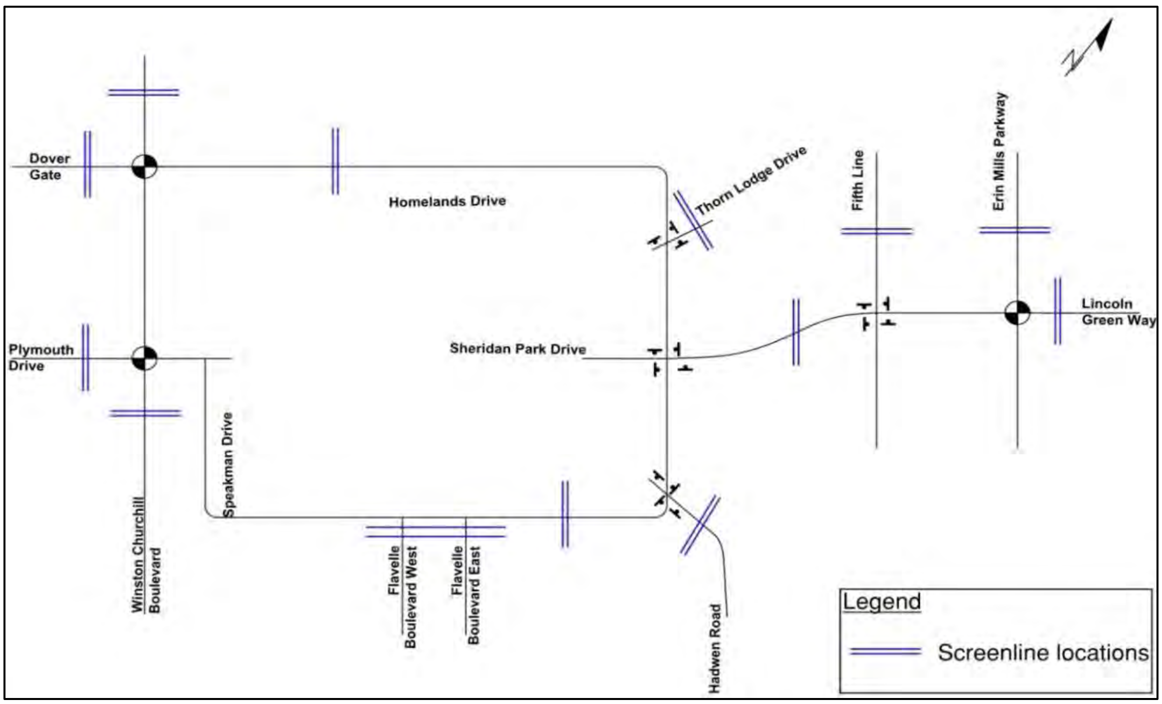
The results from the table indicate the following:

- For the AM peak hour, approximately 77% of the trips that utilize the Sheridan Park Drive Extension either originate from or are destined to the residential area to the north of Sheridan Park Drive. Only about 6% originate from or are destined to the Corporate Park, while approximately 16% of the traffic using the extension has neither an origin nor destination in the residential and Corporate Park areas.
- In the PM peak hour, approximately 72% of the traffic using the Sheridan Park Drive Extension has either an origin or destination in the residential area, 10% has an origin or destination in the Corporate Park area and approximately 18% of the traffic using the extension is originating from or are destined to areas outside of the residential and Corporate Park areas.
- The results indicate that the Sheridan Park Drive Extension will serve a large proportion of trips that are either originating from or are destined to the residential area to the north of the extension. The extension will provide additional network capacity in the area and provide additional opportunities for the residents living in the area to access and exit their neighbourhood.

3.4 Traffic Growth Rate

Based on the traffic projections from the City's EMME model for 2011, 2021 and 2031 traffic conditions during the weekday AM and PM peak hours, proposed growth rates along the study roadways have been identified. Note that the traffic projections provided included a with and without Sheridan Park Drive connection. To determine the projected traffic volume along the study roadways a screenline analysis was completed. A screenline analysis involves evaluating the total amount of traffic crossing a physical or imaginary boundary. Figure 9 illustrates the location of the traffic volumes screenlines that were considered in the analysis.

Figure 9: Screenline Locations



The total traffic volumes modelled at the screenlines were summarized for each of the study scenarios mentioned. A compounded annual growth rate at each screenline was determined based on the difference between the forecasted scenarios (projected EMME 2021 and 2031 with and without extension volumes) and the EMME 2011 modelled traffic volumes. The growth rates between weekday AM and PM peak hours were compared to determine a recommended growth rate along the main corridor.

The growth rates utilized by roadway are summarized in Table 12.

Table 12: Roadway Annual Growth Rates

Street	2021	2031
Winston Churchill Boulevard	0.5%	1.5%
Dover Gate	0%	0%
Plymouth Drive	3.5%	2.0%
Speakman Drive	1.0%	1.0%
Flavelle Boulevard	1.0%	1.0%
Hadwen Road	0.5%	1.0%
Erin Mills Parkway	0.5%	0.1%
Lincoln Green Way	0%	0%
Fifth Line	1.5%	0.5%
Sheridan Park Drive between Homelands Drive and Erin Mills Parkway		
Without Extension	1.5%	1.5%
With Extension	2.0%	1.5%
Thorn Lodge Drive		
Without Extension	1.0%	0.5%
With Extension	0.5%	0.5%
Homelands Drive between Winston Churchill Boulevard and Thorn Lodge Drive		
Without Extension	0.5%	1.0%
With Extension	-3.0%	-1.0%

The changes in traffic volumes occurred internally within the study area with the Sheridan Park Drive extension and there was limited impact on the greater external road network. Hence growth rates were kept the same on the external road network. Growth rates increase on Winston Churchill Boulevard for 2031 as it is planned to widen Winston Churchill Boulevard to six lanes by 2031 and the modelled assumed the widening. This likely relates to the reduce growth on Erin Mills Parkway as there is more north-south capacity with the widening of Winston Churchill Boulevard.

The growth rates were then applied to the existing traffic volumes to obtain estimates of traffic volumes for 2021 and 2031.

The projected 2021 and 2031 traffic volumes without and with Sheridan Park Drive Extension are shown in Figure 10 through Figure 13.

Figure 10: 2021 Traffic Volumes Without the Extension

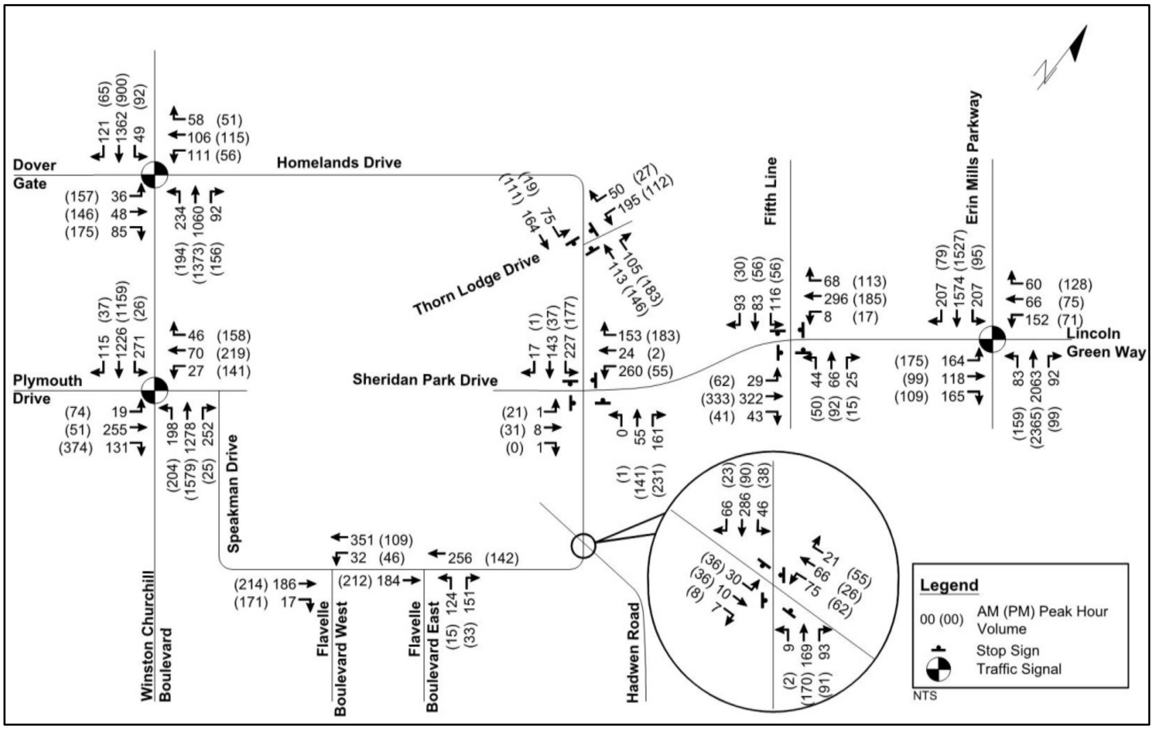


Figure 11: 2021 Traffic Volumes With Sheridan Park Drive Extension

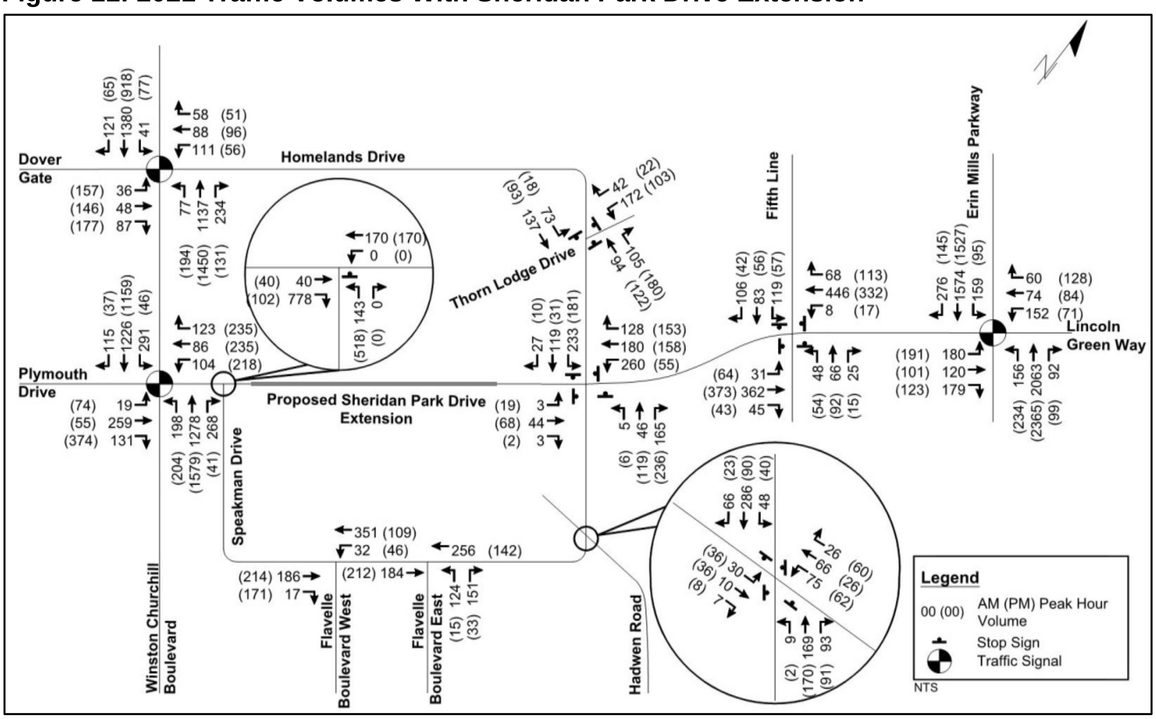


Figure 12: 2031 Traffic Volumes Without the Extension

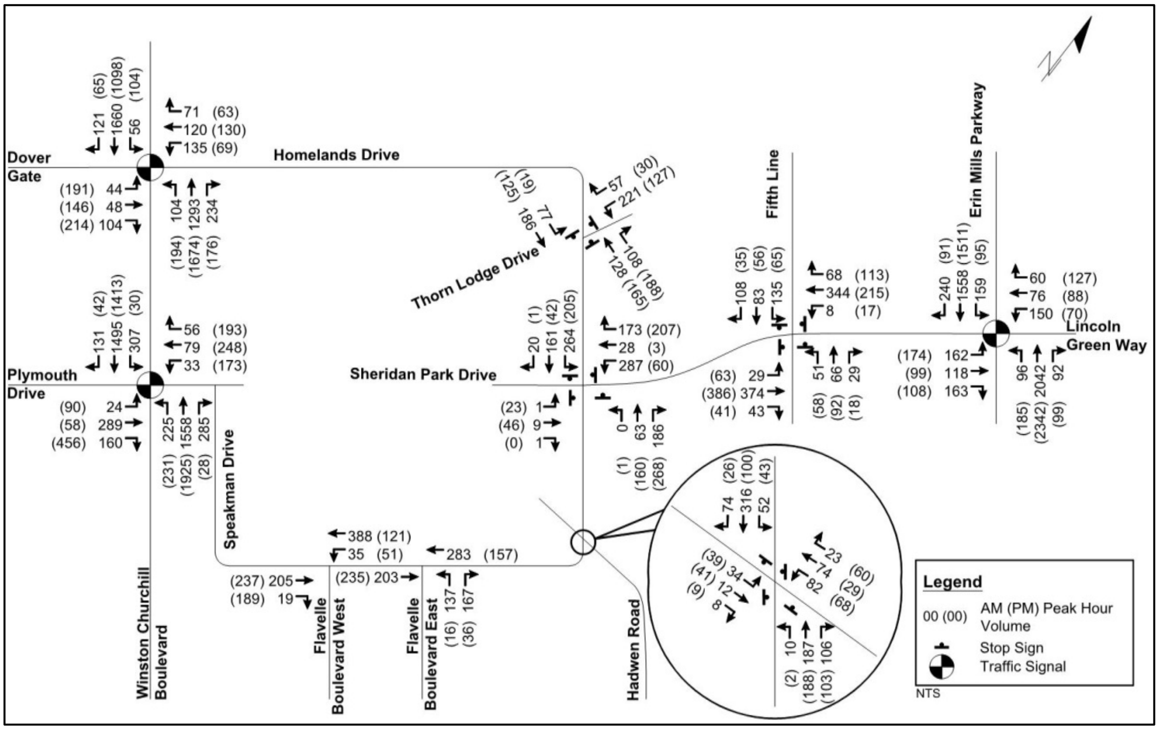
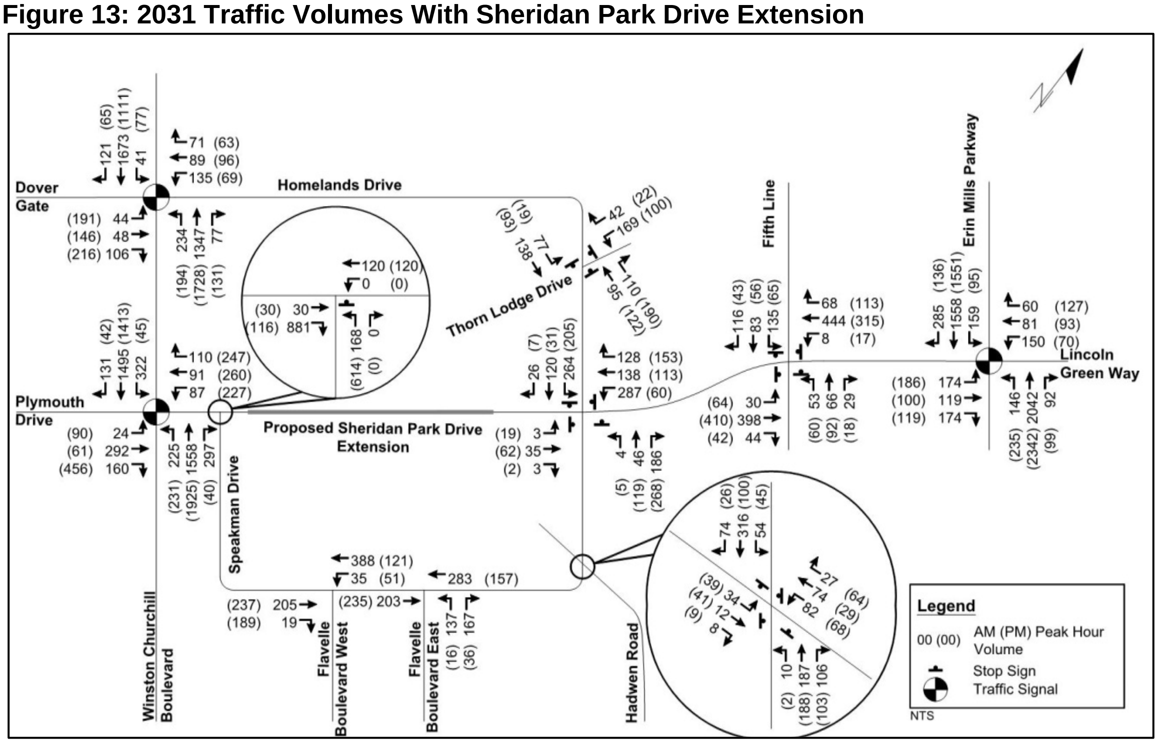


Figure 13: 2031 Traffic Volumes With Sheridan Park Drive Extension



3.5 Road Network Improvements for 2021 and 2031 Horizon Years

Within the study area, the EMME model had Winston Churchill Boulevard improved to 3 lanes per direction by 2031. This improvement will be assumed for the 2031 analysis. The EMME model does not include any other roadway improvements within the study area and there are no other planned improvements.

4.0 Traffic Operations

4.1 2021 Conditions

Intersection operations were assessed for 2021 traffic conditions with and without extensions utilizing the volumes found in their respective figures. The results for all study intersections are summarized in Table 13 and Table 14 for weekday AM and PM peak hour respectively. Detailed Synchro and Arcady reports are provided in Appendix E for without Sheridan Park Extension and in Appendix F for with Sheridan Park Extension.

As identified for existing conditions, the addition of the westbound right turn lane has been assumed as part of the road network at the Winston Churchill Boulevard / Sheridan Park Drive / Plymouth Drive intersection.

The following improvements are recommended to accommodate 2021 traffic volumes:

- The Sheridan Park Drive / Speakman Drive (west leg) intersection will have a volume to capacity ratio of 0.78 during the PM peak hour. To improve intersection operations, a roundabout is recommended to be installed with the Sheridan Park Drive Extension.
- The Sheridan Park Drive / Speakman Drive / Homelands Drive intersection will experience delays with or without Sheridan Park Drive Extension. East and westbound left turn lanes could be installed to improve operations; however, the best improvement would be a roundabout that would result into improving level of service to B or better for each leg during both peak hours.
- At the Sheridan Park Drive / Fifth Line intersection, delays will be experience with or without the Sheridan Park Drive Extension. However, with the Sheridan Park Drive Extension a left turn in the east and westbound directions would be required plus the installation of traffic signals.

At the signalized intersections to Winston Churchill Boulevard and Erin Mills Parkway, delays will be experienced for some movements; however, there is sufficient capacity to accommodate the demand.

Table 13: 2021 AM Peak Hour Intersection Operations

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Flavelle Boulevard West / Speakman Drive																
Westbound Left-Through	0.03	A	0.03	A												
Flavelle Boulevard East / Speakman Drive																
Northbound Left	0.35	C	0.35	C												
Northbound Right	0.25	B	0.25	B												
Speakman Drive / Sheridan Park Drive Extension																
Westbound Left-Through	N/A		0.01	A							0.19	A				
Northbound Left-Right	N/A		0.22	B							0.15	A				
Eastbound											0.63	A				
Homelands Drive / Thorn Lodge Drive																
Westbound Left-Right					0.48	B	0.41	B								
Northbound Through-Right					0.40	B	0.35	B								
Southbound Left-Through					0.46	B	0.39	B								
Sheridan Park Dr. / Speakman Dr. / Homelands Dr.																
Eastbound Left-Through-Right					0.03	B	N/A		0.02	A	0.09	A				
Eastbound Left					N/A		0.01	B								
Eastbound Through-Right							0.13	B								
Westbound Left-Through-Right					0.92	E	N/A		0.48	A	0.61	A				
Westbound Left					N/A		0.66	C								
Westbound Through-Right							0.71	C								
Northbound Left-Through-Right					0.46	B	0.47	C	0.29	A	0.31	A				
Southbound Left-Through-Right					0.84	E	0.84	D	0.46	A	0.54	A				
Sheridan Park Drive / Fifth Line																
Eastbound Left-Through-Right					0.85	E	N/A									
Eastbound Left					N/A		0.08	F							0.12	A
Eastbound Through-Right							0.96	F							0.53	A
Westbound Left-Through-Right					0.81	D	N/A									
Westbound Left					N/A		0.02	F							0.03	A
Westbound Through-Right							1.21	F							0.68	A
Northbound Left					0.13	B	0.14	B							0.20	B
Northbound Through-Right															0.22	B
Southbound Left					0.32	B	0.32	C							0.40	B
Southbound Through-Right															0.44	B
Speakman Drive / Hadwen Drive																
Eastbound Left-Through-Right					0.12	B	0.12	B								
Westbound Left-Through-Right					0.37	B	0.38	B								
Northbound Left-Through-Right					0.53	B	0.53	B								
Southbound Left-Through-Right					0.76	C	0.77	C								

Table 13: 2021 AM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Winston Churchill Blvd. / Dover Gate / Homelands Dr.																
Eastbound Left													0.35	E	0.31	E
Eastbound Through-Right													0.52	D	0.52	D
Westbound Left													0.83	F	0.84	F
Westbound Through-Right													0.69	E	0.61	E
Northbound Left													0.72	D	0.73	D
Northbound Through-Right													0.49	A	0.51	A
Southbound Left													0.24	B	0.22	B
Southbound Through													0.72	C	0.73	C
Southbound Right													0.14	A	0.14	A
Winston Churchill / Plymouth Dr. / Sheridan Park Dr.																
Eastbound Left													0.09	D	0.09	D
Eastbound Through													0.78	E	0.78	E
Eastbound Right													0.41	D	0.39	B
Westbound Left													0.31	E	0.67	E
Westbound Through													0.21	D	0.19	D
Westbound Right													0.15	B	0.26	A
Northbound Left													0.95	E	0.72	C
Northbound Through-Right													0.82	C	0.98	D
Southbound Left													0.89	E	0.93	E
Southbound Through													0.50	A	0.70	C
Southbound Right													0.10	A	0.14	A
Erin Mills Parkway / Sheridan Park / Lincoln Green Way																
Eastbound Left													0.81	F	0.86	F
Eastbound Through													0.37	D	0.35	D
Eastbound Right													0.54	D	0.43	A
Westbound Left													0.74	E	0.70	E
Westbound Through-Right													0.42	D	0.43	D
Northbound Left													0.54	D	0.63	C
Northbound Through-Right													0.72	C	0.74	C
Southbound Left													0.77	E	0.74	D
Southbound Through													0.45	A	0.54	B
Southbound Right													0.18	A	0.27	A

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

Table 14: 2021 PM Peak Hour Intersection Operations

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Flavelle Boulevard West / Speakman Drive																
Westbound Left-Through	0.06	A	0.06	A												

Table 14: 2021 PM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Flavelle Boulevard East / Speakman Drive																
Northbound Left	0.03	B	0.03	B												
Northbound Right	0.05	A	0.05	A												
Speakman Drive / Sheridan Park Drive Extension																
Westbound Left-Through	N/A		0.01	A							0.24	A				
Northbound Left-Right			0.78	C							0.53	A				
Eastbound											0.07	A				
Homelands Drive / Thorn Lodge Drive																
Westbound Left-Right					0.23	A	0.20	A								
Northbound Through-Right					0.44	B	0.40	A								
Southbound Left-Through					0.20	A	0.17	A								
Sheridan Park Dr. / Speakman Dr. / Homelands Dr.																
Eastbound Left-Through-Right					0.11	B	NA		0.06	A	0.11	A				
Eastbound Left					NA		0.05	B								
Eastbound Through-Right							0.17	B								
Westbound Left-Through-Right					0.42	B	NA		0.30	A	0.44	A				
Westbound Left					NA		0.13	B								
Westbound Through-Right							0.70	C								
Northbound Left-Through-Right					0.60	C	0.68	C	0.51	A	0.52	B				
Southbound Left-Through-Right					0.40	B	0.47	C	0.22	A	0.27	A				
Fifth Line / Sheridan Park Drive																
Eastbound Left-Through-Right					0.75	C	NA									
Eastbound Left					NA		0.14	D							0.19	A
Eastbound Through-Right							0.82	D							0.55	A
Westbound Left-Through-Right					0.54	C	NA									
Westbound Left					NA		0.4	E							0.05	A
Westbound Through-Right							0.87	E							0.59	A
Northbound Left					0.12	B	0.13	B							0.18	B
Northbound Through-Right															0.25	B
Southbound Left					0.13	B	0.14	B							0.20	B
Southbound Through-Right															0.23	A
Speakman Drive / Hadwen Drive																
Eastbound Left-Through-Right					0.15	A	0.15	A								
Westbound Left-Through-Right					0.26	A	0.26	B								
Northbound Left-Through-Right					0.42	B	0.43	B								
Southbound Left-Through-Right					0.26	A	0.27	A								

Table 14: 2021 PM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Winston Churchill Blvd. / Dover Gate / Homelands Dr.																
Eastbound Left													0.81	F	0.74	E
Eastbound Through-Right													0.89	E	0.89	E
Westbound Left													0.83	F	0.85	F
Westbound Through-Right													0.46	D	0.40	D
Northbound Left													0.51	A	0.52	A
Northbound Through-Right													0.75	B	0.78	B
Southbound Left													0.49	B	0.44	B
Southbound Through													0.44	B	0.45	B
Southbound Right													0.07	A	0.07	A
Winston Churchill / Plymouth Dr. / Sheridan Park Dr.																
Eastbound Left													0.43	E	0.49	E
Eastbound Through													0.18	D	0.21	D
Eastbound Right													0.88	D	0.87	D
Westbound Left													0.48	D	0.54	D
Westbound Through													0.53	D	0.45	D
Westbound Right													0.37	B	0.46	C
Northbound Left													0.66	C	0.71	C
Northbound Through-Right													0.72	C	0.83	C
Southbound Left													0.16	A	0.33	C
Southbound Through													0.68	B	0.79	C
Southbound Right													0.04	A	0.05	A
Erin Mills Parkway / Sheridan Park / Lincoln Green Way																
Eastbound Left													0.95	F	0.93	F
Eastbound Through													0.25	D	0.23	D
Eastbound Right													0.27	A	0.28	A
Westbound Left													0.26	D	0.41	E
Westbound Through-Right													0.51	D	0.79	E
Northbound Left													0.66	C	0.77	D
Northbound Through-Right													0.86	C	0.90	C
Southbound Left													0.62	D	0.61	D
Southbound Through													0.55	C	0.64	C
Southbound Right													0.09	A	0.18	A

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

The queues were reviewed with and without the extension with results summarized in Table 15 with details provided in Appendix G.

Table 15: 2021 95th Percentile Queues

Intersection and Movement (Peak Period)	Storage (m)	Without Extension		With Extension	
		AM Peak	PM Peak	AM Peak	PM Peak
Winston Churchill Boulevard / Dover Gate / Homelands Drive					
Eastbound Through-Right	100	41	125	42	126
Westbound Left	20	53	42	53	42
Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive					
Westbound Left	59	16	47	37	63
Southbound Left	112	141	4	157	14
Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way					
Eastbound Left	20	66	79	74	79
Eastbound Right	25	48	14	19	15
Westbound Left	35	61	29	62	33

In general, the queues with and without the extension are similar.

4.2 2031 Intersection Operations

Intersection operations were assessed for 2031 traffic conditions with and without the Sheridan Park Drive Extension. The results for all study intersections are summarized in Table 16 and Table 17 for weekday AM and PM peak hour respectively. Detailed Synchro reports are provided in Appendix H for without Sheridan Park Extension and in Appendix I for with Sheridan Park Extension.

In addition to the transportation improvements identified for 2021 traffic conditions, the following additional improvements are identified:

- The Sheridan Park Drive / Fifth Line intersection will require traffic signals to be installed prior to 2031 without the Sheridan Park Drive Extension. It was previously identified as needing traffic signals by 2021 with the extension.

At the arterial intersections, some movements will approach capacity and experience delays; however, the intersection movements will operate within the available capacity.

Table 16: 2031 AM Peak Hour Intersection Operations

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Flavelle Boulevard West / Speakman Drive																
Westbound Left-Through	0.03	A	0.03	A												
Flavelle Boulevard East / Speakman Drive																
Northbound Left	0.42	C	0.42	C												
Northbound Right	0.29	B	0.29	B												
Speakman Drive / Sheridan Park Drive Extension																
Westbound Left-Through	N/A		0.02	A							0.13	A				
Northbound Left-Right			0.24	B							0.16	A				
Eastbound											0.73	A				
Homelands Drive / Thorn Lodge Drive																
Westbound Left-Right					0.57	C	0.40	B								
Northbound Through-Right					0.46	B	0.36	B								
Southbound Left-Through					0.53	B	0.40	B								
Sheridan Park Dr. / Speakman Dr. / Homelands Dr.																
Eastbound									0.02	A	0.07	A				
Westbound									0.51	A	0.56	A				
Northbound									0.33	A	0.33	A				
Southbound									0.51	A	0.53	A				
Fifth Line / Sheridan Park Drive																
Eastbound Left					0.07	F							0.10	A	0.12	A
Eastbound Through-Right					1.00	F							0.60	B	0.57	B
Westbound Left					0.02	F							0.03	A	0.03	A
Westbound Through-Right					0.99	F							0.60	B	0.67	B
Northbound Left					0.15	B							0.19	B	0.22	B
Northbound Through-Right													0.21	B	0.22	B
Southbound Left					0.38	C							0.41	B	0.44	B
Southbound Through-Right													0.41	B	0.46	B
Speakman Drive / Hadwen Drive																
Eastbound Left-Through-Right					0.14	B	0.14	B								
Westbound Left-Through-Right					0.44	B	0.45	C								
Northbound Left-Through-Right					0.63	C	0.64	C								
Southbound Left-Through-Right					0.90	E	0.90	E								
Winston Churchill Blvd. / Dover Gate / Homelands Dr.																
Eastbound Left													0.40	E	0.32	D
Eastbound Through-Right													0.51	D	0.51	C
Westbound Left													0.90	F	0.90	F
Westbound Through-Right													0.69	E	0.57	D
Northbound Left													0.84	E	0.80	E
Northbound Through-Right													0.463	A	0.43	A
Southbound Left													0.40	C	0.31	C
Southbound Through													0.62	C	0.64	C
Southbound Right													0.14	A	0.15	A

Table 16: 2031 AM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Winston Churchill / Plymouth Dr. / Sheridan Park Dr.																
Eastbound Left													0.10	D	0.10	D
Eastbound Through													0.81	E	0.78	E
Eastbound Right													0.45	C	0.43	C
Westbound Left													0.42	E	0.82	F
Westbound Through													0.22	D	0.30	D
Westbound Right													0.17	B	0.32	B
Northbound Left													0.75	C	0.72	D
Northbound Through-Right													0.76	C	0.81	D
Southbound Left													0.87	E	0.82	E
Southbound Through													0.56	C	0.57	C
Southbound Right													0.15	A	0.15	A
Erin Mills Parkway / Sheridan Park / Lincoln Green Way																
Eastbound Left													0.82	F	0.82	E
Eastbound Through													0.36	D	0.54	E
Eastbound Right													0.53	D	0.53	B
Westbound Left													0.72	E	0.65	E
Westbound Through-Right													0.46	D	0.71	E
Northbound Left													0.62	D	0.58	B
Northbound Through-Right													0.71	C	0.75	C
Southbound Left													0.78	E	0.71	D
Southbound Through													0.45	A	0.55	C
Southbound Right													0.20	A	0.29	A

Notes: v/c (volume-to-capacity ratio), LOS (level of service)

Table 17: 2031 PM Peak Hour Intersection Operations

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Flavelle Boulevard West / Speakman Drive																
Westbound Left-Through	0.07	A	0.07	A												
Flavelle Boulevard East / Speakman Drive																
Northbound Left	0.07	A	0.07	A												
Northbound Right	0.05	A	0.05	A												
Speakman Drive / Sheridan Park Drive Extension																
Westbound Left-Through	N/A		0.01	A							0.17	A				
Northbound Left-Right			0.81	B							0.59	A				
Eastbound											0.07	A				

Table 17: 2031 PM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Homelands Drive / Thorn Lodge Drive																
Westbound Left-Right					0.26	B	0.20	A								
Northbound Through-Right					0.49	B	0.41	A								
Southbound Left-Through					0.23	A	0.17	A								
Sheridan Park Dr. / Speakman Dr. / Homelands Dr.																
Eastbound									0.07	A	0.10	A				
Westbound									0.33	A	0.37	A				
Northbound									0.59	B	0.55	B				
Southbound									0.24	A	0.26	A				
Fifth Line / Sheridan Park Drive																
Eastbound Left					0.13	D							0.15	A	0.18	A
Eastbound Through-Right					0.81	D							0.57	A	0.58	A
Westbound Left					0.04	C							0.05	A	0.05	A
Westbound Through-Right					0.63	C							0.44	A	0.55	A
Northbound Left					0.14	B							0.19	B	0.21	B
Northbound Through-Right													0.25	B	0.26	B
Southbound Left					0.16	B							0.22	B	0.23	B
Southbound Through-Right													0.21	A	0.24	A
Speakman Drive / Hadwen Drive																
Eastbound Left-Through-Right					0.18	A	0.18	B								
Westbound Left-Through-Right					0.29	B	0.30	B								
Northbound Left-Through-Right					0.49	B	0.49	B								
Southbound Left-Through-Right					0.30	B	0.31	B								
Winston Churchill Blvd. / Dover Gate / Homelands Dr.																
Eastbound Left													0.88	F	0.77	E
Eastbound Through-Right													0.85	E	0.85	E
Westbound Left													0.86	F	0.86	F
Westbound Through-Right													0.46	D	0.37	D
Northbound Left													0.58	C	0.59	C
Northbound Through-Right													0.68	B	0.67	B
Southbound Left													0.60	C	0.49	C
Southbound Through													0.41	B	0.42	B
Southbound Right													0.08	A	0.08	A

Table 17: 2031 PM Peak Hour Intersection Operations continued

Intersection	Two-way Stop				All-way Stop				Roundabout				Signalized			
	Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension		Without Extension		With Extension	
	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS	v/c	LOS
Winston Churchill / Plymouth Dr. / Sheridan Park Dr.																
Eastbound Left													0.49	E	0.43	D
Eastbound Through													0.18	D	0.17	D
Eastbound Right													0.91	D	0.92	D
Westbound Left													0.53	D	0.47	C
Westbound Through													0.54	D	0.41	D
Westbound Right													0.42	C	0.42	B
Northbound Left													0.74	D	0.85	E
Northbound Through-Right													0.64	C	0.78	C
Southbound Left													0.21	B	0.34	C
Southbound Through													0.64	C	0.78	C
Southbound Right													0.05	A	0.06	A
Erin Mills Parkway / Sheridan Park / Lincoln Green Way																
Eastbound Left													0.97	F	0.90	F
Eastbound Through													0.25	D	0.22	D
Eastbound Right													0.27	A	0.26	A
Westbound Left													0.26	D	0.38	E
Westbound Through-Right													0.54	D	0.79	E
Northbound Left													0.72	C	0.78	D
Northbound Through-Right													0.86	C	0.90	C
Southbound Left													0.61	D	0.62	D
Southbound Through													0.56	C	0.64	C
Southbound Right													0.11	A	0.17	A

Notes: v/c (volume-to-capacity ratio), LOS (level of service)
2. Optimized signal timing while maintaining the existing cycle length

The queues for 2031 conditions were reviewed and are summarized in Table 18 with the details provided in Appendix J.

Table 18: 2031 95th Percentile Queues

Intersection and Movement (Peak Period)	Storage (m)	Without Extension		With Extension	
		AM Peak	PM Peak	AM Peak	PM Peak
Winston Churchill Boulevard / Dover Gate / Homelands Drive					
Eastbound Left	100	25	105	23	96
Eastbound Through-Right	100	47	149	45	151
Westbound Left	20	75	55	68	55
Winston Churchill Boulevard / Plymouth Drive / Sheridan Park Drive					
Eastbound Left	28	13	53	12	39
Westbound Left	59	20	56	48	64
Northbound Left	98	66	118	70	103
Southbound Left	112	115	6	124	16
Erin Mills Parkway / Sheridan Park Drive / Lincoln Green Way					
Eastbound Left	20	65	82	62	74
Eastbound Right	25	47	14	20	14
Westbound Left	35	59	29	54	32

The queue lengths are similar with or without the Sheridan Park Drive extension.

[The Difference is our People]

Appendix A

Existing Traffic Counts and Signal Timing Plans

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Mississauga
Site #: 1618100001
Intersection: Winston Churchill Blvd & Homeland
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 2623
North Entering: 1497
North Peds: 3
Peds Cross: ⋈

Heavys	1	31	4	36
Trucks	1	21	1	23
Cars	119	1276	43	1438
Totals	121	1328	48	

Heavys	37
Trucks	20
Cars	1069
Totals	1126

East Leg Total: 454
East Entering: 268
East Peds: 5
Peds Cross: ⧗

Winston Churchill Blvd

Heavys	Trucks	Cars	Totals
3	1	454	458

Dover Gt

Cars	Trucks	Heavys	Totals
47	1	9	57
103	0	0	103
105	0	3	108
255	1	12	

N
W E
S

Heavys	Trucks	Cars	Totals
1	2	32	35
0	1	47	48
7	2	74	83
8	5	153	

Homelands Dr

Cars	Trucks	Heavys	Totals
172	4	10	186

Winston Churchill Blvd

Peds Cross: ⧗
West Peds: 7
West Entering: 166
West Leg Total: 624

Cars	1455
Trucks	23
Heavys	41
Totals	1519

Cars	232	990	82	1304
Trucks	0	17	2	19
Heavys	2	27	6	35
Totals	234	1034	90	

Peds Cross: ⋈
South Peds: 5
South Entering: 1358
South Leg Total: 2877

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

Municipality: Mississauga
Site #: 1618100001
Intersection: Winston Churchill Blvd & Homeland
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Winston Churchill Blvd runs N/S

North Leg Total: 2575
North Entering: 1033
North Peds: 4
Peds Cross: ⋈

Heavys	1	17	1	19
Trucks	0	14	2	16
Cars	64	847	87	998
Totals	65	878	90	

Heavys	28
Trucks	8
Cars	1506
Totals	1542

East Leg Total: 605
East Entering: 217
East Peds: 8
Peds Cross: ⧗

Winston Churchill Blvd

Heavys	Trucks	Cars	Totals
3	4	364	371

Dover Gt

Cars	Trucks	Heavys	Totals
50	0	0	50
112	0	0	112
54	1	0	55
216	1	0	

N
W E
S

Heavys	Trucks	Cars	Totals
2	0	151	153
0	0	146	146
3	0	168	171
5	0	465	

Homelands Dr

Cars	Trucks	Heavys	Totals
382	5	1	388

Winston Churchill Blvd

Peds Cross: ⧗
West Peds: 6
West Entering: 470
West Leg Total: 841

Cars	1069
Trucks	15
Heavys	20
Totals	1104

Cars	188	1305	149	1642
Trucks	4	8	3	15
Heavys	2	26	0	28
Totals	194	1339	152	

Peds Cross: ⋈
South Peds: 8
South Entering: 1685
South Leg Total: 2789

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		**One Hour Peak**	
From:	7:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Mississauga
Site #: 1618100002
Intersection: Homelands Dr & Thorn Lodge Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Homelands Dr runs N/S

North Leg Total: 390
North Entering: 231
North Peds: 3
Peds Cross: ⋈

Homelands Dr (north approach)

Heavys	10	5	15
Trucks	1	0	1
Cars	149	66	215
Totals	160	71	

Heavys	20
Trucks	0
Cars	139
Totals	159

East Leg Total: 410
East Entering: 239
East Peds: 10
Peds Cross: ⧗

Thorn Lodge Dr (east approach)

Cars	Trucks	Heavys	Totals
45	0	4	49
187	0	3	190
232	0	7	

Cars	Trucks	Heavys	Totals
163	0	8	171

N
W E
S

Homelands Dr (south approach)

Cars	336
Trucks	1
Heavys	13
Totals	350

Cars	94	97	191
Trucks	0	0	0
Heavys	16	3	19
Totals	110	100	

Peds Cross: ⋈
South Peds: 11
South Entering: 210
South Leg Total: 560

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Mississauga
Site #: 1618100002
Intersection: Homelands Dr & Thorn Lodge Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Homelands Dr runs N/S

North Leg Total: 294
North Entering: 126
North Peds: 0
Peds Cross: ⋈

Homelands Dr (north approach)

	Southbound through	Southbound left (to east)	Total
Heavys	3	0	3
Trucks	3	0	3
Cars	102	18	120
Totals	108	18	

Northbound exiting (north leg)

Heavys	3
Trucks	1
Cars	164
Totals	168

East Leg Total: 327
East Entering: 135
East Peds: 2
Peds Cross: ⧗

Thorn Lodge Dr (east approach)

	Cars	Trucks	Heavys	Totals
Westbound right (to north)	26	0	0	26
Westbound left (to south)	109	0	0	109
	135	0	0	

N
W E
S

Thorn Lodge Dr (eastbound exiting)

Cars	Trucks	Heavys	Totals
191	0	1	192

Homelands Dr (south leg)

Southbound exiting

Cars	211
Trucks	3
Heavys	3
Totals	217

Northbound approach

	Northbound through	Northbound right (to east)	Total
Cars	138	173	311
Trucks	1	0	1
Heavys	3	1	4
Totals	142	174	

Peds Cross: ⋈
South Peds: 2
South Entering: 316
South Leg Total: 533

Comments

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 10:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Mississauga
Site #: 1618100003
Intersection: Speakman Dr & Sheridan Park Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs N/S

North Leg Total: 570
North Entering: 366
North Peds: 5
Peds Cross: ⋈

North approach (Homeland Dr):

Heavys	0	2	11	13
Trucks	0	0	1	1
Cars	16	137	199	352
Totals	16	139	211	

Heavys	19
Trucks	0
Cars	185
Totals	204

East Leg Total: 785
East Entering: 418
East Peds: 1
Peds Cross: ⧗

Homeland Dr

Heavys	Trucks	Cars	Totals
0	0	38	38

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
130	0	19	149
22	0	0	22
246	1	0	247
398	1	19	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	1	1
0	0	7	7
0	0	1	1
0	0	9	

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
352	2	13	367

Speakman Dr

Peds Cross: ⧗
West Peds: 1
West Entering: 9
West Leg Total: 47

Cars	384
Trucks	1
Heavys	2
Totals	387

Cars	0	54	146	200
Trucks	0	0	1	1
Heavys	0	0	2	2
Totals	0	54	149	

Peds Cross: ⋈
South Peds: 1
South Entering: 203
South Leg Total: 590

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Mississauga
Site #: 1618100003
Intersection: Speakman Dr & Sheridan Park Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs N/S

North Leg Total: 537
North Entering: 201
North Peds: 1
Peds Cross: ⋈

Homeland Dr (North approach, entering)

Heavys	0	0	3	3
Trucks	0	0	1	1
Cars	1	36	160	197
Totals	1	36	164	

North exiting

Heavys	4
Trucks	1
Cars	331
Totals	336

East Leg Total: 639
East Entering: 232
East Peds: 0
Peds Cross: ⧗

Sheridan Park Dr (West exiting)

Heavys	Trucks	Cars	Totals
0	1	3	4

Sheridan Park Dr (East approach, entering)

Cars	Trucks	Heavys	Totals
174	1	3	178
1	1	0	2
52	0	0	52
227	2	3	

N
W E
S

Sheridan Park Dr (West approach, entering)

Heavys	Trucks	Cars	Totals
0	0	20	20
0	0	29	29
0	0	0	0
0	0	49	

Sheridan Park Dr (East exiting)

Cars	Trucks	Heavys	Totals
400	3	4	407

Speakman Dr

Peds Cross: ⧗
West Peds: 1
West Entering: 49
West Leg Total: 53

South exiting

Cars	88
Trucks	0
Heavys	0
Totals	88

South approach, entering

Cars	1	137	211	349
Trucks	0	0	2	2
Heavys	0	1	1	2
Totals	1	138	214	

Peds Cross: ⋈
South Peds: 0
South Entering: 353
South Leg Total: 441

Comments

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Mississauga
Site #: 1618100004
Intersection: Sheridan Park Dr & Fifth Ln
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Sheridan Park Dr runs W/E

North (Fifth Ln)

North Leg Total: 422
North Entering: 271
North Peds: 6
Peds Cross: ⋈

Heavys	2	2	1	5
Trucks	1	0	0	1
Cars	83	75	107	265
Totals	86	77	108	

Heavys	8
Trucks	0
Cars	143
Totals	151

Fifth Ln

East

East Leg Total: 775
East Entering: 345
East Peds: 2
Peds Cross: ⧗

Cars	Trucks	Heavys	Totals
58	0	5	63
262	1	12	275
5	1	1	7
325	2	18	

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
415	2	13	430

West

Heavys	Trucks	Cars	Totals
19	2	381	402

Sheridan Park Dr

Heavys	Trucks	Cars	Totals
0	0	27	27
12	2	285	299
1	0	39	40
13	2	351	

N
W E
S

Peds Cross: ⧗
West Peds: 9
West Entering: 366
West Leg Total: 768

South (Fifth Ln)

Fifth Ln

Cars	119
Trucks	1
Heavys	4
Totals	124

Cars	36	58	23	117
Trucks	0	0	0	0
Heavys	5	3	0	8
Totals	41	61	23	

Peds Cross: ⋈
South Peds: 8
South Entering: 125
South Leg Total: 249

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:45:00
To:	18:00:00	**To:**	17:45:00

Municipality: Mississauga
Site #: 1618100004
Intersection: Sheridan Park Dr & Fifth Ln
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Sheridan Park Dr runs W/E

North Leg Total: 380
North Entering: 132
North Peds: 3
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	0	0	1	1
Cars	28	52	51	131
Totals	28	52	52	

Heavys	0
Trucks	0
Cars	248
Totals	248

East Leg Total: 668
East Entering: 293
East Peds: 1
Peds Cross: ⧗

Fifth Ln

Heavys	Trucks	Cars	Totals
3	2	241	246

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
105	0	0	105
167	2	3	172
16	0	0	16
288	2	3	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	58	58
4	3	302	309
0	2	36	38
4	5	396	

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
367	4	4	375

Fifth Ln

Peds Cross: ⧗
West Peds: 6
West Entering: 405
West Leg Total: 651

Cars	104
Trucks	2
Heavys	0
Totals	106

Cars	46	85	14	145
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	46	85	14	

Peds Cross: ⋈
South Peds: 9
South Entering: 145
South Leg Total: 251

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

Municipality: Mississauga
Site #: 1618100005
Intersection: Erin Mills Pkwy & Sheridan Park Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Erin Mills Pkwy runs N/S

North Leg Total: 4117
North Entering: 1886
North Peds: 1
Peds Cross: ⋈

Heavys	0	67	7	74
Trucks	0	25	1	26
Cars	192	1443	151	1786
Totals	192	1535	159	

Heavys	68
Trucks	17
Cars	2146
Totals	2231

East Leg Total: 637
East Entering: 268
East Peds: 6
Peds Cross: ⧗

Erin Mills Pkwy

Heavys	Trucks	Cars	Totals
17	1	312	330

Sheridan Park Dr

Cars	Trucks	Heavys	Totals
54	0	5	59
50	0	11	61
144	0	4	148
248	0	20	

N
W E
S

Heavys	Trucks	Cars	Totals
3	0	157	160
4	1	113	118
7	3	151	161
14	4	421	

Lincoln Green Way

Cars	Trucks	Heavys	Totals
346	5	18	369

Erin Mills Pkwy

Peds Cross: ⧗
West Peds: 6
West Entering: 439
West Leg Total: 769

Cars	1738
Trucks	28
Heavys	78
Totals	1844

Cars	70	1935	82	2087
Trucks	1	17	3	21
Heavys	6	60	7	73
Totals	77	2012	92	

Peds Cross: ⋈
South Peds: 11
South Entering: 2181
South Leg Total: 4025

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:30:00
To:	18:00:00	**To:**	17:30:00

Municipality: Mississauga
Site #: 1618100005
Intersection: Erin Mills Pkwy & Sheridan Park Dr
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Erin Mills Pkwy runs N/S

North Leg Total: 4260
North Entering: 1657
North Peds: 3
Peds Cross: ⋈

Heavys	0	29	8	37
Trucks	0	15	1	16
Cars	73	1445	86	1604
Totals	73	1489	95	

Heavys	41
Trucks	34
Cars	2528
Totals	2603

East Leg Total: 557
East Entering: 264
East Peds: 9
Peds Cross: ⧗

Erin Mills Pkwy

Heavys	Trucks	Cars	Totals
2	4	285	291

Cars	Trucks	Heavys	Totals
122	2	1	125
67	3	0	70
68	0	1	69
257	5	2	

Sheridan Park Dr

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	170	171
2	0	97	99
1	4	101	106
3	5	368	

Lincoln Green Way

Cars	Trucks	Heavys	Totals
278	3	12	293

Erin Mills Pkwy

Peds Cross: ⧗
West Peds: 9
West Entering: 376
West Leg Total: 667

Cars	1614
Trucks	19
Heavys	31
Totals	1664

Cars	145	2236	95	2476
Trucks	1	31	2	34
Heavys	2	40	2	44
Totals	148	2307	99	

Peds Cross: ⋈
South Peds: 13
South Entering: 2554
South Leg Total: 4218

Comments

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	From:	8:00:00
To:	9:00:00	To:	9:00:00

Municipality: Mississauga
Site #: 1618100006
Intersection: Speakman Dr & Flavelle Blvd_East
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs W/E

East Leg Total: 563
East Entering: 244
East Peds: 0
Peds Cross: ⌛

Speakman Dr (westbound, leaving west)

Heavys	Trucks	Cars	Totals
4	1	357	362

East approach

	Cars	Trucks	Heavys	Totals
Through	240	0	4	244
Left	0	0	0	0
Total	240	0	4	

West approach (Speakman Dr)

	Heavys	Trucks	Cars	Totals
Through	3	0	172	175
Right	0	0	0	0
Total	3	0	172	

Speakman Dr (eastbound, leaving east)

Cars	Trucks	Heavys	Totals
315	0	4	319

N
W E
S

Flavelle Blvd_East

Peds Cross: ⌛
West Peds: 0
West Entering: 175
West Leg Total: 537

Cars	0
Trucks	0
Heavys	0
Totals	0

	Left	Right	
Cars	117	143	260
Trucks	1	0	1
Heavys	0	1	1
Totals	118	144	

Peds Cross: ⋈
South Peds: 0
South Entering: 262
South Leg Total: 262

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:30:00
To:	18:00:00	**To:**	17:30:00

Municipality: Mississauga
Site #: 1618100006
Intersection: Speakman Dr & Flavelle Blvd_East
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs W/E

East Leg Total: 368
East Entering: 135
East Peds: 0
Peds Cross: ⧗

Speakman Dr (westbound exiting, west side)

Heavys	Trucks	Cars	Totals
3	3	143	149

East approach

Cars	Trucks	Heavys	Totals
129	3	3	135
0	0	0	0
129	3	3	

N
W E
S

Speakman Dr

West approach

Heavys	Trucks	Cars	Totals
7	2	193	202
0	0	0	0
7	2	193	

Speakman Dr (eastbound exiting, east side)

Cars	Trucks	Heavys	Totals
224	2	7	233

Flavelle Blvd_East

Peds Cross: ⧗
West Peds: 0
West Entering: 202
West Leg Total: 351

Cars	0
Trucks	0
Heavys	0
Totals	0

Cars	14	31	45
Trucks	0	0	0
Heavys	0	0	0
Totals	14	31	

Peds Cross: ⋈
South Peds: 1
South Entering: 45
South Leg Total: 45

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		One Hour Peak	
From:	7:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Mississauga
Site #: 1618100006
Intersection: Speakman Dr & Flavelle Blvd_West
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs W/E

East Leg Total: 541
East Entering: 364
East Peds: 0
Peds Cross:

Speakman Dr (westbound leaving)

Heavys	Trucks	Cars	Totals
3	1	330	334

Speakman Dr (east approach)

Cars	Trucks	Heavys	Totals
330	1	3	334
29	0	1	30
359	1	4	

N
W E
S

West approach

Heavys	Trucks	Cars	Totals
4	0	173	177
0	0	16	16
4	0	189	

Speakman Dr (eastbound leaving)

Cars	Trucks	Heavys	Totals
173	0	4	177

Flavelle Blvd_West

Peds Cross:
West Peds: 0
West Entering: 193
West Leg Total: 527

Cars	45
Trucks	0
Heavys	1
Totals	46

Cars	0	0	0
Trucks	0	0	0
Heavys	0	0	0
Totals	0	0	

Peds Cross:
South Peds: 0
South Entering: 0
South Leg Total: 46

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:30:00
To:	18:00:00	**To:**	17:30:00

Municipality: Mississauga
Site #: 1618100006
Intersection: Speakman Dr & Flavelle Blvd_West
TFR File #: 1
Count date: 23-Nov-16

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Speakman Dr runs W/E

East Leg Total: 352
East Entering: 148
East Peds: 0
Peds Cross: ⌛

Speakman Dr (westbound leaving, west leg)

Heavys	Trucks	Cars	Totals
3	2	99	104

Speakman Dr (east approach)

Cars	Trucks	Heavys	Totals
99	2	3	104
43	1	0	44
142	3	3	

N
W E
S

Speakman Dr (west approach)

Heavys	Trucks	Cars	Totals
8	1	195	204
0	0	163	163
8	1	358	

Speakman Dr (eastbound leaving, east leg)

Cars	Trucks	Heavys	Totals
195	1	8	204

Flavelle Blvd_West

Peds Cross: ⌛
West Peds: 0
West Entering: 367
West Leg Total: 471

Cars	206
Trucks	1
Heavys	0
Totals	207

Cars	0	0	0
Trucks	0	0	0
Heavys	0	0	0
Totals	0	0	

Peds Cross: ⋈
South Peds: 3
South Entering: 0
South Leg Total: 207

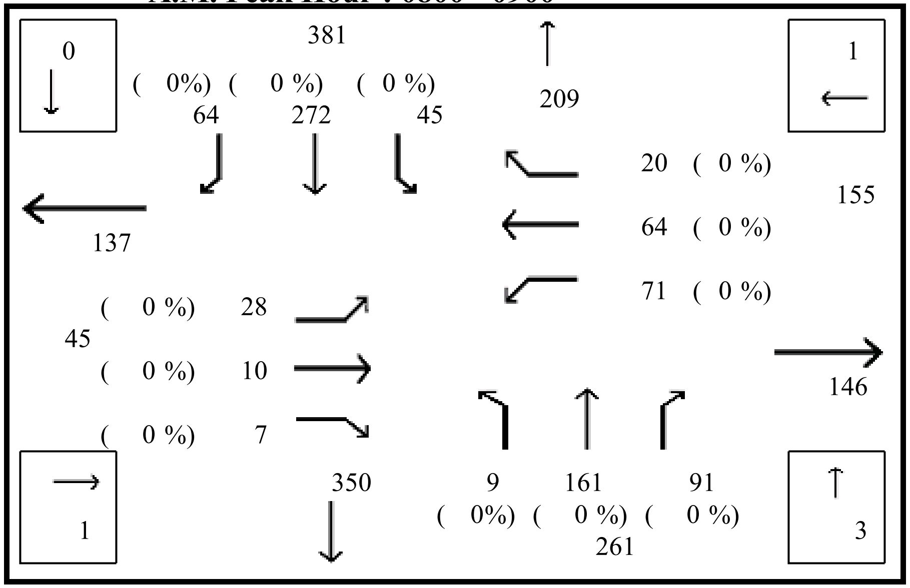
Comments

MISSISSAUGA
Leading today for tomorrow

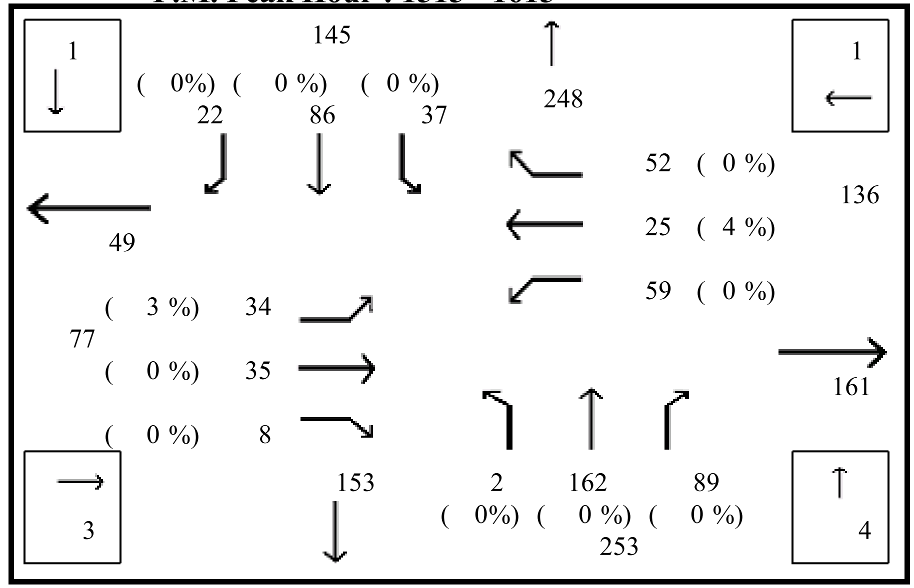
Count Date : Wednesday March 4 2015 2016/08/15

[HAD-SPE-01-N] HADWEN RD/SPEAKMAN DR

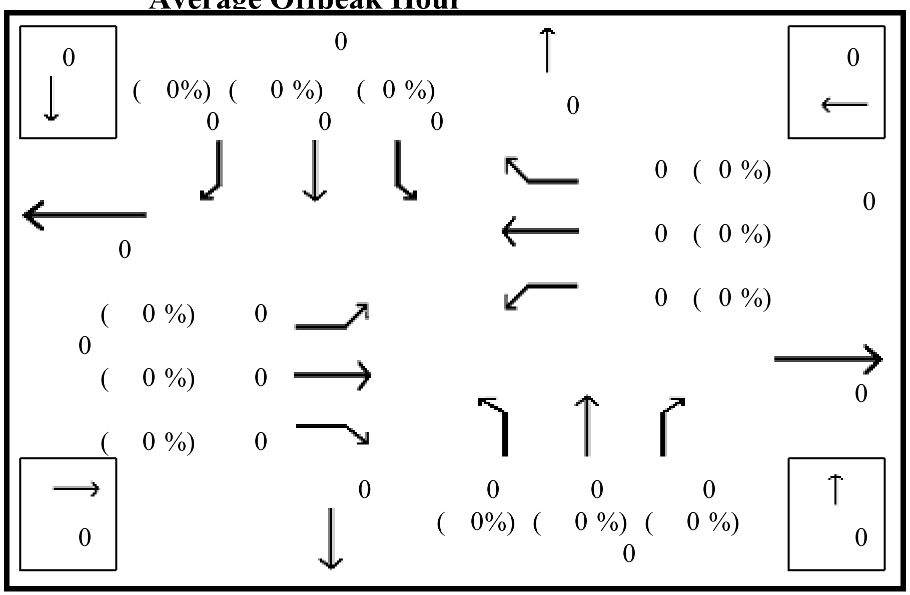
A.M. Peak Hour : 0800 - 0900



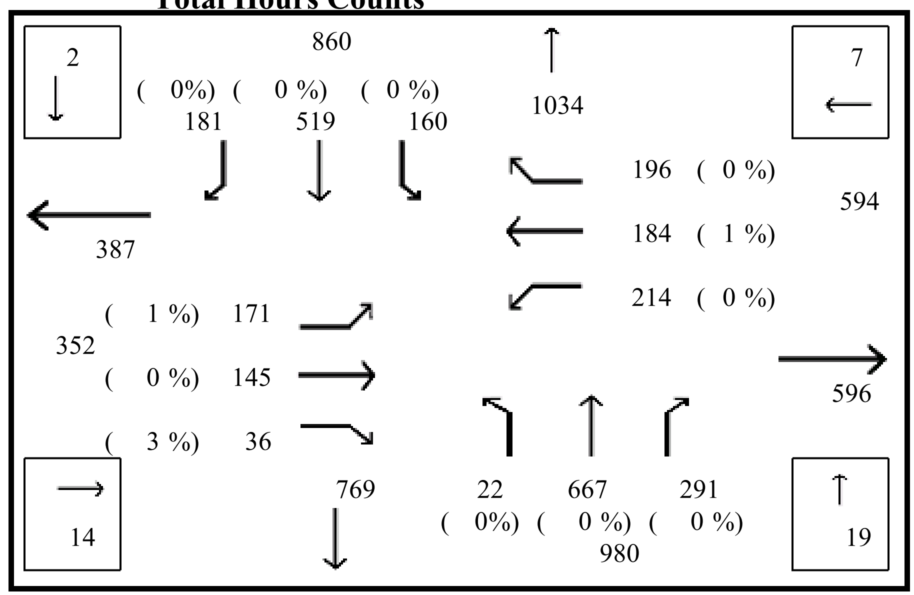
P.M. Peak Hour : 1515 - 1615



Average Offpeak Hour



Total Hours Counts



Note: North is at the top of the page

Value in (parenthesis) indicates truck/heavy vehicle percentages

Region of Peel
10 Peel Centre Drive
Suite B - 4th Floor
Brampton, Ontario, Canada L6T 4B9
(905) 791-7800 Josh.DiRocco@peelregion.ca

Count Name: Winston Churchill Boulevard at Sheridan Park Drive/Plymouth Drive
Site Code: 01905013
Start Date: 01/14/2016

Winston Churchill

Out	In	Total
1253	1478	2731
22	15	37
35	28	63
0	0	0
0	0	0
1310	**1521**	**2831**

93	1162	223	0	0
4	8	3	0	0
0	26	2	0	0
0	0	0	0	0
0	0	0	0	3
97	**1196**	**228**	**0**	**3**
R	T	L	U	P

Plymouth Dr [W]

Out	In	Total
306	343	649
7	8	15
9	11	20
1	0	1
0	0	0
323	**362**	**685**

0	14	213	116	0
0	4	0	4	0
0	1	2	8	0
0	0	0	0	0
0	0	0	0	9
0	**19**	**215**	**128**	**9**
U	L	T	R	P

Peak Hour Data

01/14/2016 7:45 AM
Ending At
01/14/2016 8:45 AM

Lights
Buses
Trucks
Bicycles on Road
Other

41	59	24	0	0
3	0	0	0	0
1	0	2	0	0
0	0	0	0	0
0	0	0	0	4
45	**59**	**26**	**0**	**4**
R	T	L	U	P

Sheridan Park Drive [E]

Out	In	Total
646	124	770
4	3	7
5	3	8
0	0	0
0	0	0
655	**130**	**785**

U	L	T	R	P
0	154	1198	210	0
0	3	15	1	0
0	9	33	1	0
0	1	0	0	0
0	0	0	0	7
0	**167**	**1246**	**212**	**7**

1302	1562	2864
12	19	31
36	43	79
0	1	1
0	0	0
1350	**1625**	**2975**
Out	In	Total

Winston Churchill

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

Region of Peel
10 Peel Centre Drive
Suite B - 4th Floor
Brampton, Ontario, Canada L6T 4B9
(905) 791-7800 Josh.DiRocco@peelregion.ca

Count Name: Winston Churchill Boulevard at Sheridan Park Drive/Plymouth Drive
Site Code: 01905013
Start Date: 01/14/2016
Page No: 11

Peak Hour Data

01/14/2016 4:30 PM
Ending At
01/14/2016 5:30 PM

Lights
Buses
Trucks
Bicycles on Road
Other

Winston Churchill (North)

Out	In	Total
1736	1160	2896
10	8	18
20	14	34
0	1	1
0	0	0
1766	**1183**	**2949**

R	T	L	U	P
28	1114	18	0	0
3	2	3	0	0
0	13	1	0	0
0	1	0	0	0
0	0	0	0	5
31	**1130**	**22**	**0**	**5**

Plymouth Dr [W]

Out	In	Total
373	468	841
8	5	13
6	7	13
0	0	0
0	0	0
387	**480**	**867**

U	L	T	R	P
0	69	43	356	0
0	2	0	3	0
0	1	0	6	0
0	0	0	0	0
0	0	0	0	2
0	**72**	**43**	**365**	**2**

Sheridan Park Drive [E]

Out	In	Total
82	474	556
3	2	5
1	0	1
0	0	0
0	0	0
86	**476**	**562**

R	T	L	U	P
152	184	138	0	0
2	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	11
154	**184**	**138**	**0**	**11**

Winston Churchill (South)

U	L	T	R	P
0	161	1515	21	0
0	5	6	0	0
0	6	19	0	0
0	0	0	0	0
0	0	0	0	4
0	**172**	**1540**	**21**	**4**

Out	In	Total
1608	1697	3305
5	11	16
19	25	44
1	0	1
0	0	0
1633	**1733**	**3366**

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

07:47 USER 2/4 PRINT DAILY INT REP, INT 52 66 652, AS 1-3

DAILY INTERSECTION REPORT FOR ACT SCH 1 (MON TUE WED THU FRI)

INT	TIME	SELECTION PLANS IN USE						ALTERNATES					
		MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC	MODE	CYC LEN	OFF NO.	SPLT NO.	SPEC FUNC	DUP ISEC
52	00:00	/	/	/	/	/	/	LO	101	2	2	2	
52	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1099
52	09:30	1/1	/	/	/	1/1	/	CC	135	2	2	2	1099
52	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1099
52	19:30	1/1	/	/	/	1/1	/	CC	135	2	2	2	1099
66	00:00	/	/	/	/	/	/	LO	101	2	2	2	
66	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1137
66	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137
66	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1137
66	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137
652	00:00	/	/	/	/	/	/	LO	101	2	2	2	
652	06:00	1/1	/	/	/	1/1	/	CC	140	1	1	1	1137
652	09:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137
652	15:00	1/1	/	/	/	1/1	/	CC	140	3	3	3	1137
652	19:30	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137

DAILY INTERSECTION REPORT FOR ACT SCH 2 (SAT)

52	00:00	/	/	/	/	/	/	LO	101	2	2	2	
52	07:00	1/1	/	/	/	1/1	/	CC	135	2	2	2	1099
66	00:00	/	/	/	/	/	/	LO	101	2	2	2	
66	07:00	1/1	/	/	/	1/1	/	CC	100	4	4	4	
652	00:00	/	/	/	/	/	/	LO	101	2	2	2	
652	07:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137

DAILY INTERSECTION REPORT FOR ACT SCH 3 (SUN HOL)

52	00:00	/	/	/	/	/	/	LO	101	2	2	2	
52	08:00	1/1	/	/	/	1/1	/	CC	135	2	2	2	1099
52	23:00	/	/	/	/	/	/	LO	101	2	2	2	1099
66	00:00	/	/	/	/	/	/	LO	101	2	2	2	
66	08:00	1/1	/	/	/	1/1	/	CC	100	4	4	4	
66	23:00	/	/	/	/	/	/	LO	101	2	2	2	
652	00:00	/	/	/	/	/	/	LO	101	2	2	2	
652	08:00	1/1	/	/	/	1/1	/	CC	120	2	2	2	1137
652	23:00	/	/	/	/	/	/	LO	101	2	2	2	1137

07:49 USER 2/4 PRINT CDT 52 66 652

CYCLE DEFINITION TABLE: 52

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	NBL	5			3		1		ERIN MILLS PKWY
2	SB		12	19	5	2	1	C	ERIN MILLS PKWY
3							1		
4	WB		12	19	4	3	1		LINCOLN GREEN
5	SBL	5			3		1		ERIN MILLS PKWY
6	NB		12	19	5	2	1	C	ERIN MILLS PKWY
7							1		
8	EB		12	19	4	3	1		SHERIDAN PARK

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

CYCLE DEFINITION TABLE: 66

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1	NBL	5			3		1		WIN CHURCHILL B
2	SB		7	12	4	2	1	C	WIN CHURCHILL B
3							1		
4	WB	8	11	17	4	3	1		HOMELANDS DRIVE
5	SBL	5			3		1		WIN CHURCHILL B
6	NB		7	12	4	2	1	C	WIN CHURCHILL B
7							1		
8	EB	8	11	17	4	3	1		HOMELANDS DRIVE

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

CYCLE DEFINITION TABLE: 652

PHASE	DIR	VEH MIN	PED MIN	PED CLEAR	AMBER	ALL RED	COMM DELAY	SPECIAL FEATURE	STREET NAME
1							1		
2	SB		12	18	4	2	1	C	WCB
3							1		
4	WB	8	13	21	4	3	1	E	SHERIDAN PARK
5	SBL	5			3		1		WCB
6	NB		12	18	4	2	1	C	WCB
7	WBL	5			3		1		SHERIDAN PARK
8	EB	8	13	21	4	3	1	E	SHERIDAN PARK

VALID SPECIAL FUNCTIONS(Y/N)

1	2	3	1&2	1&3	2&3	ALL
Y	Y	Y	Y	Y	Y	Y

```
07:50 USER   2/4 PRINT SPF 1-4, INT 52 66 652
  SPECIAL FUNCTIONS
   INTERSECTION    52    EMP@LINCOLN/SHERIDAN
   SPECIAL    IN(Y)/OUT(N)
   FUNCTION   #  1   2   3
               NBL SBL CAL    PHASE OMIT
     1          Y   N   N
     2          N   N   N
     3          N   N   N
     4          N   N   N
   INTERSECTION    66    WCHURCH @ HOMELANDS
               NBL SBL CAL    PHASE OMIT
     1          N   Y   N
     2          Y   Y   N
     3          N   N   N
     4          Y   N   N
   INTERSECTION   652    WCB @ SHER PARK/PLYM
               SBL WBL CAL    PHASE OMIT
     1          N   Y   N
     2          Y   Y   N
     3          N   N   N
     4          N   N   N
```

```
07:51 USER   2/4 PRINT OFFSET 1-4, INT 52 66 652
  OFFSET TABLE
   INTERSECTION   52           EMP@LINCOLN/SHERIDAN
   OFFSET #   OFFSET %
       1         99
       2         85
       3         63
       4          0
   INTERSECTION   66           WCHURCH @ HOMELANDS
       1         66
       2         36
       3         77
       4         57
   INTERSECTION  652           WCB @ SHER PARK/PLYM
       1         79
       2         33
       3         64
       4          0
```

07:51 USER 2/4 PRINT SPLIT 1-4, INT 52 66 652

SPLIT TABLE

TABLE	(SPLIT) PHASE NUMBER								(MAX SPLIT) PHASE NUMBER							
NO.	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
INTERSECTION 52					EMP@LINCOLN/SHERIDAN											
	NBL	SB		WB	SBL	NB		EB								
1	0	69		31	14	55		31	0	0		0	22	0		0
2	12	53		35	15	50		35	15	0		0	19	0		0
3	13	53		34	11	55		34	21	0		0	18	0		0
4	0	0		0	0	0		0	0	0		0	0	0		0
INTERSECTION 66					WCHURCH @ HOMELANDS											
	NBL	SB		WB	SBL	NB		EB								
1	8	64		28	0	72		28	0	0		0	0	0		0
2	0	67		33	0	67		33	0	0		0	0	0		0
3	8	64		28	11	61		28	0	0		0	0	0		0
4	0	67		33	12	55		33	0	0		0	0	0		0
INTERSECTION 652					WCB @ SHER PARK/PLYM											
		SB		WB	SBL	NB	WBL	EB								
1		77		23	10	67	0	23		0		0	0	0	0	0
2		77		23	0	77	0	23		0		0	0	0	0	0
3		63		37	9	54	13	24		0		0	13	0	0	0
4		0		0	0	0	0	0		0		0	0	0	0	0

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

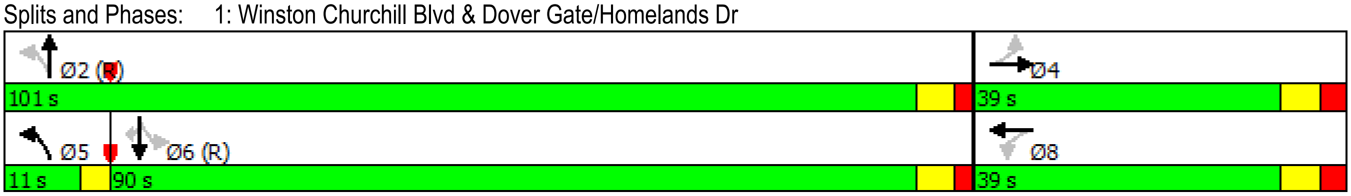
Existing Traffic Operations

Appendix B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	35	48	108	103	234	1034	48	1328	121
Future Volume (vph)	35	48	108	103	234	1034	48	1328	121
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	25.0	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	101.0	90.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	72.1%	64.3%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	6.0	6.0	6.0
Lead/Lag					Lead		Lag	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	20.0	20.0	20.0	20.0	110.0	107.0	84.2	84.2	84.2
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.79	0.76	0.60	0.60	0.60
v/c Ratio	0.35	0.52	0.83	0.69	0.70	0.47	0.23	0.70	0.14
Control Delay	60.0	38.3	96.9	63.7	46.3	6.0	16.1	21.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	38.3	96.9	63.7	46.3	6.0	16.1	21.5	5.7
LOS	E	D	F	E	D	A	B	C	A
Approach Delay		42.9		77.1		12.9		20.0	
Approach LOS		D		E		B		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 86.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	48	83	108	103	57	234	1034	90	48	1328	121
Future Volume (vph)	35	48	83	108	103	57	234	1034	90	48	1328	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.90		1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1669	1594		1762	1699		1807	3444		1654	3510	1528
Flt Permitted	0.45	1.00		0.55	1.00		0.10	1.00		0.22	1.00	1.00
Satd. Flow (perm)	789	1594		1016	1699		185	3444		389	3510	1528
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	53	92	120	114	63	260	1149	100	53	1476	134
RTOR Reduction (vph)	0	50	0	0	15	0	0	3	0	0	0	31
Lane Group Flow (vph)	39	95	0	120	162	0	260	1246	0	53	1476	103
Confl. Peds. (#/hr)	3		5	5		3	7		5	5		7
Heavy Vehicles (%)	9%	2%	11%	3%	0%	18%	1%	4%	9%	10%	4%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	20.0	20.0		20.0	20.0		107.0	107.0		84.2	84.2	84.2
Effective Green, g (s)	20.0	20.0		20.0	20.0		107.0	107.0		84.2	84.2	84.2
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.76	0.76		0.60	0.60	0.60
Clearance Time (s)	7.0	7.0		7.0	7.0		3.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	112	227		145	242		370	2632		233	2111	918
v/s Ratio Prot		0.06			0.10		c0.10	0.36			0.42	
v/s Ratio Perm	0.05			c0.12			c0.44			0.14		0.07
v/c Ratio	0.35	0.42		0.83	0.67		0.70	0.47		0.23	0.70	0.11
Uniform Delay, d1	54.1	54.7		58.3	56.9		28.3	6.1		12.9	19.2	11.9
Progression Factor	1.00	1.00		1.00	1.00		2.00	0.82		1.00	1.00	1.00
Incremental Delay, d2	1.9	1.3		30.5	6.8		4.5	0.5		2.3	2.0	0.2
Delay (s)	56.0	56.0		88.8	63.7		61.2	5.4		15.1	21.1	12.2
Level of Service	E	E		F	E		E	A		B	C	B
Approach Delay (s)		56.0			73.8			15.0			20.2	
Approach LOS		E			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	190	49	110	100	71	160
Future Volume (vph)	190	49	110	100	71	160
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	244	63	141	128	91	205

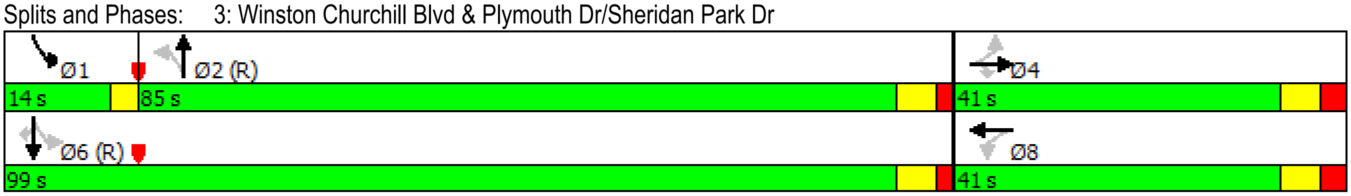
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	307	269	296
Volume Left (vph)	244	0	91
Volume Right (vph)	63	128	0
Hadj (s)	0.09	-0.13	0.18
Departure Headway (s)	5.5	5.1	5.4
Degree Utilization, x	0.47	0.38	0.44
Capacity (veh/h)	619	665	636
Control Delay (s)	13.1	11.3	12.6
Approach Delay (s)	13.1	11.3	12.6
Approach LOS	B	B	B

Intersection Summary			
Delay	12.4		
Level of Service	B		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	19	215	128	26	59	167	1246	228	1196	97
Future Volume (vph)	19	215	128	26	59	167	1246	228	1196	97
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		4			8		2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	41.0	41.0	36.0	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	85.0	85.0	14.0	99.0	99.0
Total Split (%)	29.3%	29.3%	29.3%	29.3%	29.3%	60.7%	60.7%	10.0%	70.7%	70.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag						Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	22.1	22.1	22.1	22.1	22.1	82.2	82.2	107.9	104.9	104.9
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.59	0.59	0.77	0.75	0.75
v/c Ratio	0.10	0.75	0.44	0.29	0.36	0.74	0.75	0.69	0.47	0.08
Control Delay	48.8	71.6	24.0	57.7	41.8	44.3	24.6	45.2	6.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	71.6	24.0	57.7	41.8	44.3	24.6	45.2	6.5	1.2
LOS	D	E	C	E	D	D	C	D	A	A
Approach Delay		53.5			44.9		26.6		12.0	
Approach LOS		D			D		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 23.8	Intersection LOS: C
Intersection Capacity Utilization 90.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	215	128	26	59	45	167	1246	212	228	1196	97
Future Volume (vph)	19	215	128	26	59	45	167	1246	212	228	1196	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		6.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	0.99		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1731	1902	1505	1678	1769		1736	3458		1807	3579	1589
Flt Permitted	0.67	1.00	1.00	0.34	1.00		0.22	1.00		0.08	1.00	1.00
Satd. Flow (perm)	1217	1902	1505	601	1769		404	3458		154	3579	1589
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	20	226	135	27	62	47	176	1312	223	240	1259	102
RTOR Reduction (vph)	0	0	73	0	22	0	0	9	0	0	0	26
Lane Group Flow (vph)	20	226	62	27	87	0	176	1526	0	240	1259	76
Confl. Peds. (#/hr)	4		9	9		4	3		7	7		3
Heavy Vehicles (%)	5%	1%	6%	8%	0%	2%	5%	3%	1%	1%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	22.1	22.1	22.1	22.1	22.1		82.2	82.2		104.9	104.9	104.9
Effective Green, g (s)	22.1	22.1	22.1	22.1	22.1		82.2	82.2		104.9	104.9	104.9
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.59	0.59		0.75	0.75	0.75
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		6.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	300	237	94	279		237	2030		347	2681	1190
v/s Ratio Prot		c0.12			0.05			c0.44		c0.10	0.35	
v/s Ratio Perm	0.02		0.04	0.04			0.44			0.42		0.05
v/c Ratio	0.10	0.75	0.26	0.29	0.31		0.74	0.75		0.69	0.47	0.06
Uniform Delay, d1	50.5	56.3	51.8	52.0	52.2		21.2	21.4		32.4	6.8	4.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.57	0.82	0.91
Incremental Delay, d2	0.2	10.2	0.6	1.7	0.6		18.8	2.6		4.4	0.4	0.1
Delay (s)	50.7	66.6	52.4	53.7	52.9		40.0	24.0		55.3	6.0	4.3
Level of Service	D	E	D	D	D		D	C		E	A	A
Approach Delay (s)		60.7			53.0			25.6			13.3	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	7	1	247	22	149	0	54	149	211	139	16
Future Volume (vph)	1	7	1	247	22	149	0	54	149	211	139	16
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	9	1	301	27	182	0	66	182	257	170	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	11	510	248	447
Volume Left (vph)	1	301	0	257
Volume Right (vph)	1	182	182	20
Hadj (s)	-0.04	-0.02	-0.42	0.15
Departure Headway (s)	7.4	6.0	6.1	6.2
Degree Utilization, x	0.02	0.85	0.42	0.78
Capacity (veh/h)	417	585	538	549
Control Delay (s)	10.5	34.1	13.5	27.5
Approach Delay (s)	10.5	34.1	13.5	27.5
Approach LOS	B	D	B	D

Intersection Summary			
Delay	27.2		
Level of Service	D		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	27	299	40	7	275	63	41	61	23	108	77	86
Future Volume (vph)	27	299	40	7	275	63	41	61	23	108	77	86
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	31	348	47	8	320	73	48	71	27	126	90	100

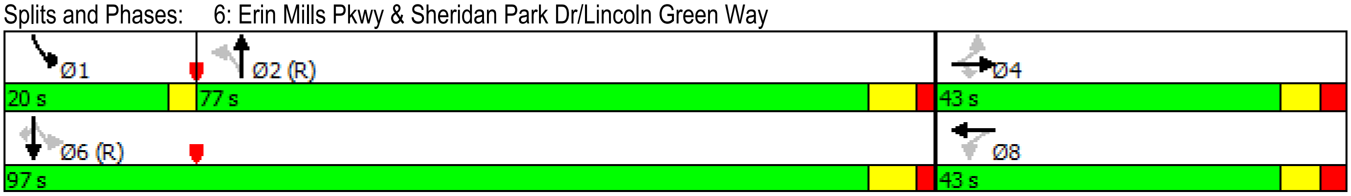
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	426	401	48	98	126	190
Volume Left (vph)	31	8	48	0	126	0
Volume Right (vph)	47	73	0	27	0	100
Hadj (s)	0.02	0.00	0.70	-0.13	0.52	-0.32
Departure Headway (s)	6.3	6.4	8.7	7.8	8.0	7.2
Degree Utilization, x	0.75	0.71	0.12	0.21	0.28	0.38
Capacity (veh/h)	549	538	372	408	412	452
Control Delay (s)	25.8	23.3	11.6	11.7	13.0	13.3
Approach Delay (s)	25.8	23.3	11.7		13.2	
Approach LOS	D	C	B		B	

Intersection Summary			
Delay	20.3		
Level of Service	C		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	160	118	161	148	61	77	2012	159	1535	192
Future Volume (vph)	160	118	161	148	61	77	2012	159	1535	192
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		4			8		2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	9.5	38.0	38.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	77.0	77.0	20.0	97.0	97.0
Total Split (%)	30.7%	30.7%	30.7%	30.7%	30.7%	55.0%	55.0%	14.3%	69.3%	69.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag						Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	23.9	23.9	23.9	23.9	23.9	86.2	86.2	106.1	102.1	102.1
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17	0.62	0.62	0.76	0.73	0.73
v/c Ratio	0.80	0.38	0.54	0.75	0.41	0.48	0.70	0.75	0.43	0.16
Control Delay	81.3	53.1	40.1	76.1	39.9	32.5	21.7	52.4	8.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.3	53.1	40.1	76.1	39.9	32.5	21.7	52.4	8.6	1.6
LOS	F	D	D	E	D	C	C	D	A	A
Approach Delay		58.6			59.9		22.1		11.6	
Approach LOS		E			E		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 23.4	Intersection LOS: C
Intersection Capacity Utilization 83.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	118	161	148	61	59	77	2012	92	159	1535	192
Future Volume (vph)	160	118	161	148	61	59	77	2012	92	159	1535	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		3.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1847	1500	1750	1563		1672	4988		1738	4948	1579
Flt Permitted	0.64	1.00	1.00	0.64	1.00		0.15	1.00		0.05	1.00	1.00
Satd. Flow (perm)	1200	1847	1500	1185	1563		266	4988		85	4948	1579
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	163	120	164	151	62	60	79	2053	94	162	1566	196
RTOR Reduction (vph)	0	0	46	0	27	0	0	3	0	0	0	50
Lane Group Flow (vph)	163	120	118	151	95	0	79	2144	0	162	1566	146
Confl. Peds. (#/hr)	1		11	11		1	6		6	6		6
Heavy Vehicles (%)	2%	4%	6%	3%	18%	8%	9%	4%	11%	5%	6%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	23.9	23.9	23.9	23.9	23.9		86.2	86.2		102.1	102.1	102.1
Effective Green, g (s)	23.9	23.9	23.9	23.9	23.9		86.2	86.2		102.1	102.1	102.1
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.62	0.62		0.73	0.73	0.73
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		7.0	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	204	315	256	202	266		163	3071		214	3608	1151
v/s Ratio Prot		0.06			0.06			0.43		c0.07	0.32	
v/s Ratio Perm	c0.14		0.08	0.13			0.30			c0.48		0.09
v/c Ratio	0.80	0.38	0.46	0.75	0.36		0.48	0.70		0.76	0.43	0.13
Uniform Delay, d1	55.7	51.5	52.3	55.2	51.3		14.7	18.1		38.7	7.5	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.3	0.8	1.3	14.0	0.8		10.0	1.3		14.2	0.4	0.2
Delay (s)	75.0	52.3	53.6	69.2	52.1		24.7	19.5		52.9	7.9	5.9
Level of Service	E	D	D	E	D		C	B		D	A	A
Approach Delay (s)		61.0			61.5			19.7			11.5	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	10	7	71	64	20	9	161	91	45	272	64
Future Volume (vph)	29	10	7	71	64	20	9	161	91	45	272	64
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	38	13	9	92	83	26	12	209	118	58	353	83

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	60	201	339	494
Volume Left (vph)	38	92	12	58
Volume Right (vph)	9	26	118	83
Hadj (s)	0.04	0.01	-0.20	-0.08
Departure Headway (s)	6.6	6.2	5.3	5.2
Degree Utilization, x	0.11	0.35	0.50	0.71
Capacity (veh/h)	456	517	636	671
Control Delay (s)	10.4	12.4	13.5	20.0
Approach Delay (s)	10.4	12.4	13.5	20.0
Approach LOS	B	B	B	C

Intersection Summary			
Delay	16.1		
Level of Service	C		
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	177	16	30	334	0	0
Future Volume (Veh/h)	177	16	30	334	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	221	20	38	418	0	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			241		725	231
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			241		725	231
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1320		384	813

Direction, Lane #	EB 1	WB 1
Volume Total	241	456
Volume Left	0	38
Volume Right	20	0
cSH	1700	1320
Volume to Capacity	0.14	0.03
Queue Length 95th (m)	0.0	0.7
Control Delay (s)	0.0	0.9
Lane LOS		A
Approach Delay (s)	0.0	0.9
Approach LOS		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	175	0	0	244	118	144
Future Volume (Veh/h)	175	0	0	244	118	144
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	233	0	0	325	157	192
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			233		558	233
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			233		558	233
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		68	76
cM capacity (veh/h)			1346		492	809

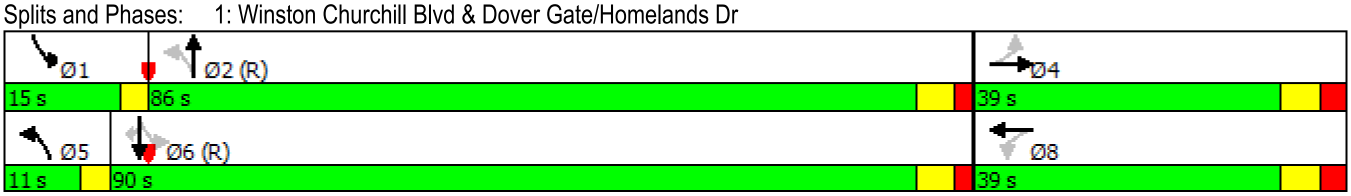
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	233	325	157	192
Volume Left	0	0	157	0
Volume Right	0	0	0	192
cSH	1700	1700	492	809
Volume to Capacity	0.14	0.19	0.32	0.24
Queue Length 95th (m)	0.0	0.0	10.3	7.0
Control Delay (s)	0.0	0.0	15.7	10.8
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	13.0	
Approach LOS			B	

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	153	146	55	112	194	1339	90	878	65
Future Volume (vph)	153	146	55	112	194	1339	90	878	65
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	9.5	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	86.0	15.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	61.4%	10.7%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.5	28.5	28.5	28.5	98.5	87.2	98.3	87.2	87.2
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.62	0.70	0.62	0.62
v/c Ratio	0.79	0.88	0.81	0.45	0.50	0.73	0.46	0.43	0.07
Control Delay	77.9	71.7	114.2	47.6	9.2	12.5	13.4	14.8	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	71.7	114.2	47.6	9.2	12.5	13.4	14.8	3.4
LOS	E	E	F	D	A	B	B	B	A
Approach Delay		73.7		64.6		12.1		14.0	
Approach LOS		E		E		B		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 24.5	Intersection LOS: C
Intersection Capacity Utilization 90.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	146	171	55	112	50	194	1339	152	90	878	65
Future Volume (vph)	153	146	171	55	112	50	194	1339	152	90	878	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.95		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1799	1724		1780	1822		1770	3476		1772	3510	1534
Flt Permitted	0.54	1.00		0.19	1.00		0.26	1.00		0.09	1.00	1.00
Satd. Flow (perm)	1022	1724		360	1822		480	3476		162	3510	1534
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	163	155	182	59	119	53	206	1424	162	96	934	69
RTOR Reduction (vph)	0	31	0	0	12	0	0	5	0	0	0	23
Lane Group Flow (vph)	163	306	0	59	160	0	206	1581	0	96	934	46
Confl. Peds. (#/hr)	4		8	8		4	6		8	8		6
Heavy Vehicles (%)	1%	0%	2%	2%	0%	0%	3%	3%	2%	3%	4%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	28.5	28.5		28.5	28.5		95.5	87.2		95.5	87.2	87.2
Effective Green, g (s)	28.5	28.5		28.5	28.5		95.5	87.2		95.5	87.2	87.2
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.68	0.62		0.68	0.62	0.62
Clearance Time (s)	7.0	7.0		7.0	7.0		3.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	208	350		73	370		403	2165		205	2186	955
v/s Ratio Prot		c0.18			0.09		c0.03	c0.45		0.03	0.27	
v/s Ratio Perm	0.16			0.16			0.32			0.29		0.03
v/c Ratio	0.78	0.87		0.81	0.43		0.51	0.73		0.47	0.43	0.05
Uniform Delay, d1	52.8	54.0		53.1	48.7		9.1	18.3		15.8	13.6	10.3
Progression Factor	1.00	1.00		1.00	1.00		0.94	0.57		1.00	1.00	1.00
Incremental Delay, d2	17.3	20.7		46.1	0.8		0.7	1.4		1.7	0.6	0.1
Delay (s)	70.2	74.7		99.2	49.5		9.2	11.8		17.5	14.2	10.4
Level of Service	E	E		F	D		A	B		B	B	B
Approach Delay (s)		73.2			62.2			11.5			14.2	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	109	26	142	174	18	108
Future Volume (vph)	109	26	142	174	18	108
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	125	30	163	200	21	124

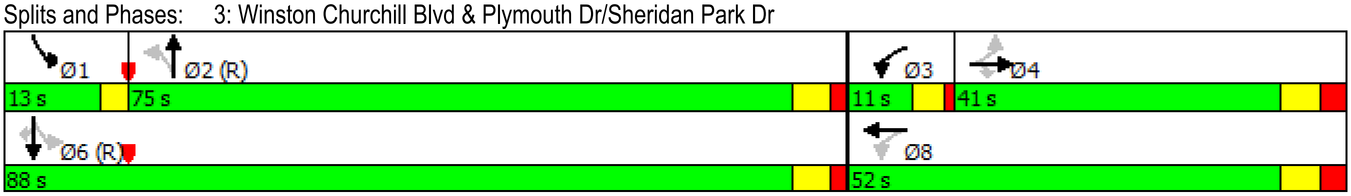
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	155	363	145
Volume Left (vph)	125	0	21
Volume Right (vph)	30	200	0
Hadj (s)	0.05	-0.30	0.12
Departure Headway (s)	5.1	4.2	4.8
Degree Utilization, x	0.22	0.42	0.19
Capacity (veh/h)	650	828	705
Control Delay (s)	9.5	10.3	9.0
Approach Delay (s)	9.5	10.3	9.0
Approach LOS	A	B	A

Intersection Summary			
Delay	9.8		
Level of Service	A		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	72	43	365	138	184	172	1540	22	1130	31
Future Volume (vph)	72	43	365	138	184	172	1540	22	1130	31
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	3	8	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	36.0	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	11.0	52.0	75.0	75.0	13.0	88.0	88.0
Total Split (%)	29.3%	29.3%	29.3%	7.9%	37.1%	53.6%	53.6%	9.3%	62.9%	62.9%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead		Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes	Yes		Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.7	29.7	29.7	43.2	40.7	80.5	80.5	89.3	86.3	86.3
Actuated g/C Ratio	0.21	0.21	0.21	0.31	0.29	0.58	0.58	0.64	0.62	0.62
v/c Ratio	0.43	0.11	0.91	0.36	0.66	0.87	0.78	0.16	0.59	0.03
Control Delay	54.5	42.9	64.2	38.2	45.0	67.6	28.4	11.4	13.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	42.9	64.2	38.2	45.0	67.6	28.4	11.4	13.6	0.1
LOS	D	D	E	D	D	E	C	B	B	A
Approach Delay		60.8			43.0		32.3		13.2	
Approach LOS		E			D		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 130	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 31.3	Intersection LOS: C
Intersection Capacity Utilization 93.9%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	43	365	138	184	154	172	1540	21	22	1130	31
Future Volume (vph)	72	43	365	138	184	154	172	1540	21	22	1130	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	4.5	7.0		6.0	6.0		3.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1793	1921	1578	1823	1770		1752	3606		1807	3230	1582
Flt Permitted	0.44	1.00	1.00	0.63	1.00		0.19	1.00		0.06	1.00	1.00
Satd. Flow (perm)	824	1921	1578	1212	1770		358	3606		107	3230	1582
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	75	45	380	144	192	160	179	1604	22	23	1177	32
RTOR Reduction (vph)	0	0	84	0	23	0	0	0	0	0	0	12
Lane Group Flow (vph)	75	45	296	144	329	0	179	1626	0	23	1177	20
Confl. Peds. (#/hr)	11		2	2		11	5		4	4		5
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	4%	1%	0%	1%	13%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		4		3	8			2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	29.7	29.7	29.7	40.7	40.7		79.3	79.3		86.3	86.3	86.3
Effective Green, g (s)	29.7	29.7	29.7	40.7	40.7		79.3	79.3		86.3	86.3	86.3
Actuated g/C Ratio	0.21	0.21	0.21	0.29	0.29		0.57	0.57		0.62	0.62	0.62
Clearance Time (s)	7.0	7.0	7.0	4.5	7.0		6.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	174	407	334	380	514		202	2042		114	1991	975
v/s Ratio Prot		0.02		0.02	c0.19			0.45		0.01	c0.36	
v/s Ratio Perm	0.09		c0.19	0.09			c0.50			0.12		0.01
v/c Ratio	0.43	0.11	0.89	0.38	0.64		0.89	0.80		0.20	0.59	0.02
Uniform Delay, d1	47.8	44.5	53.5	39.2	43.3		26.4	24.0		20.9	16.2	10.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.86	0.72	0.00
Incremental Delay, d2	1.7	0.1	23.5	0.6	2.7		39.3	3.3		0.8	1.2	0.0
Delay (s)	49.5	44.6	77.0	39.9	46.0		65.7	27.3		18.7	12.9	0.0
Level of Service	D	D	E	D	D		E	C		B	B	A
Approach Delay (s)		70.0			44.2			31.1			12.6	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.5
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	29	0	52	2	178	1	138	214	164	36	1
Future Volume (vph)	20	29	0	52	2	178	1	138	214	164	36	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	23	34	0	60	2	207	1	160	249	191	42	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	57	269	410	234
Volume Left (vph)	23	60	1	191
Volume Right (vph)	0	207	249	1
Hadj (s)	0.08	-0.38	-0.35	0.19
Departure Headway (s)	6.2	5.3	4.9	5.6
Degree Utilization, x	0.10	0.39	0.55	0.36
Capacity (veh/h)	479	621	699	598
Control Delay (s)	9.8	11.7	13.7	11.8
Approach Delay (s)	9.8	11.7	13.7	11.8
Approach LOS	A	B	B	B

Intersection Summary			
Delay	12.5		
Level of Service	B		
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	58	309	38	16	172	105	46	85	14	52	52	28
Future Volume (vph)	58	309	38	16	172	105	46	85	14	52	52	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	64	340	42	18	189	115	51	93	15	57	57	31

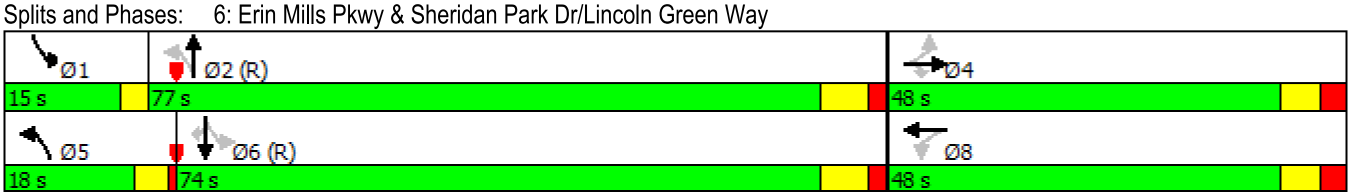
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	446	322	51	108	57	88
Volume Left (vph)	64	18	51	0	57	0
Volume Right (vph)	42	115	0	15	0	31
Hadj (s)	0.01	-0.17	0.50	-0.10	0.53	-0.25
Departure Headway (s)	5.4	5.4	7.4	6.8	7.5	6.7
Degree Utilization, x	0.67	0.49	0.11	0.20	0.12	0.16
Capacity (veh/h)	641	627	426	469	425	473
Control Delay (s)	18.6	13.4	10.1	10.4	10.3	9.8
Approach Delay (s)	18.6	13.4	10.3		10.0	
Approach LOS	C	B	B		B	

Intersection Summary			
Delay	14.7		
Level of Service	B		
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	171	99	106	69	70	148	2307	95	1489	73
Future Volume (vph)	171	99	106	69	70	148	2307	95	1489	73
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	18.0	77.0	15.0	74.0	74.0
Total Split (%)	34.3%	34.3%	34.3%	34.3%	34.3%	12.9%	55.0%	10.7%	52.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	30.0	30.0	30.0	30.0	30.0	96.5	83.8	94.5	81.4	81.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.69	0.60	0.68	0.58	0.58
v/c Ratio	0.93	0.26	0.27	0.26	0.50	0.61	0.84	0.62	0.53	0.08
Control Delay	100.9	45.0	8.2	45.4	35.3	20.8	27.5	41.4	20.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.9	45.0	8.2	45.4	35.3	20.8	27.5	41.4	20.2	6.9
LOS	F	D	A	D	D	C	C	D	C	A
Approach Delay		60.0			38.0		27.1		20.8	
Approach LOS		E			D		C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 28.1	Intersection LOS: C
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	99	106	69	70	125	148	2307	99	95	1489	73
Future Volume (vph)	171	99	106	69	70	125	148	2307	99	95	1489	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.0	7.0	7.0	7.0	7.0		4.5	7.0		3.0	7.0	7.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	1.00		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.90		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1802	1883	1510	1779	1673		1789	5050		1674	5092	1568
Flt Permitted	0.48	1.00	1.00	0.69	1.00		0.11	1.00		0.05	1.00	1.00
Satd. Flow (perm)	906	1883	1510	1292	1673		207	5050		87	5092	1568
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	180	104	112	73	74	132	156	2428	104	100	1567	77
RTOR Reduction (vph)	0	0	88	0	51	0	0	2	0	0	0	23
Lane Group Flow (vph)	180	104	24	73	155	0	156	2530	0	100	1567	54
Confl. Peds. (#/hr)	3		13	13		3	9		9	9		9
Heavy Vehicles (%)	1%	2%	5%	1%	4%	2%	2%	3%	4%	9%	3%	0%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)	30.0	30.0	30.0	30.0	30.0		93.9	83.8		90.6	81.4	81.4
Effective Green, g (s)	30.0	30.0	30.0	30.0	30.0		93.9	83.8		90.6	81.4	81.4
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.67	0.60		0.65	0.58	0.58
Clearance Time (s)	7.0	7.0	7.0	7.0	7.0		4.5	7.0		3.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	194	403	323	276	358		252	3022		160	2960	911
v/s Ratio Prot		0.06			0.09		c0.04	c0.50		0.04	0.31	
v/s Ratio Perm	c0.20		0.02	0.06			0.37			0.36		0.03
v/c Ratio	0.93	0.26	0.07	0.26	0.43		0.62	0.84		0.62	0.53	0.06
Uniform Delay, d1	53.9	45.7	43.9	45.8	47.6		12.4	22.6		29.2	17.7	12.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	44.1	0.3	0.1	0.5	0.8		4.5	2.9		7.4	0.7	0.1
Delay (s)	98.0	46.1	44.0	46.3	48.5		16.9	25.5		36.6	18.4	12.8
Level of Service	F	D	D	D	D		B	C		D	B	B
Approach Delay (s)		69.1			47.9			25.0			19.2	
Approach LOS		E			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	34	35	8	59	25	52	2	162	89	37	86	22
Future Volume (vph)	34	35	8	59	25	52	2	162	89	37	86	22
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	42	43	10	73	31	64	2	200	110	46	106	27

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	95	168	312	179
Volume Left (vph)	42	73	2	46
Volume Right (vph)	10	64	110	27
Hadj (s)	0.05	-0.13	-0.21	-0.04
Departure Headway (s)	5.4	5.1	4.6	5.0
Degree Utilization, x	0.14	0.24	0.40	0.25
Capacity (veh/h)	591	637	736	670
Control Delay (s)	9.3	9.7	10.7	9.6
Approach Delay (s)	9.3	9.7	10.7	9.6
Approach LOS	A	A	B	A

Intersection Summary			
Delay	10.1		
Level of Service	B		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	204	163	44	104	0	0
Future Volume (Veh/h)	204	163	44	104	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	272	217	59	139	0	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			489		638	380
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			489		638	380
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	100
cM capacity (veh/h)			1074		420	671

Direction, Lane #	EB 1	WB 1
Volume Total	489	198
Volume Left	0	59
Volume Right	217	0
cSH	1700	1074
Volume to Capacity	0.29	0.05
Queue Length 95th (m)	0.0	1.3
Control Delay (s)	0.0	2.9
Lane LOS		A
Approach Delay (s)	0.0	2.9
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	202	0	0	135	14	31
Future Volume (Veh/h)	202	0	0	135	14	31
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	253	0	0	169	18	39
Pedestrians					1	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			254		423	254
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		423	254
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1322		591	789

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	253	169	18	39
Volume Left	0	0	18	0
Volume Right	0	0	0	39
cSH	1700	1700	591	789
Volume to Capacity	0.15	0.10	0.03	0.05
Queue Length 95th (m)	0.0	0.0	0.7	1.2
Control Delay (s)	0.0	0.0	11.3	9.8
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.3	
Approach LOS			B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		

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Appendix C

Existing 95th Percentile Queues

Appendix C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	39	145	120	177	260	1249	53	1476	134
v/c Ratio	0.35	0.52	0.83	0.69	0.70	0.47	0.23	0.70	0.14
Control Delay	60.0	38.3	96.9	63.7	46.3	6.0	16.1	21.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	38.3	96.9	63.7	46.3	6.0	16.1	21.5	5.7
Queue Length 50th (m)	9.9	22.2	32.7	42.4	50.9	40.4	6.5	141.6	6.3
Queue Length 95th (m)	20.4	41.3	52.0	63.0	m#91.3	60.1	14.8	166.3	15.2
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	180	409	232	402	374	2634	233	2111	949
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.35	0.52	0.44	0.70	0.47	0.23	0.70	0.14

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	20	226	135	27	109	176	1535	240	1259	102
v/c Ratio	0.10	0.75	0.44	0.29	0.36	0.74	0.75	0.69	0.47	0.08
Control Delay	48.8	71.6	24.0	57.7	41.8	44.3	24.6	45.2	6.5	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	71.6	24.0	57.7	41.8	44.3	24.6	45.2	6.5	1.2
Queue Length 50th (m)	4.8	60.7	11.7	6.7	20.6	35.1	161.0	46.4	43.2	0.0
Queue Length 95th (m)	11.7	83.4	29.9	15.5	36.3	#82.7	196.0	#82.1	70.4	m3.1
Internal Link Dist (m)		197.7			123.8		371.2		464.2	
Turn Bay Length (m)	32.0		30.0	30.0		170.0		78.0		130.0
Base Capacity (vph)	295	461	431	145	449	237	2039	350	2681	1216
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.31	0.19	0.24	0.74	0.75	0.69	0.47	0.08

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	163	120	164	151	122	79	2147	162	1566	196
v/c Ratio	0.80	0.38	0.54	0.75	0.41	0.48	0.70	0.75	0.43	0.16
Control Delay	81.3	53.1	40.1	76.1	39.9	32.5	21.7	52.4	8.6	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.3	53.1	40.1	76.1	39.9	32.5	21.7	52.4	8.6	1.6
Queue Length 50th (m)	44.0	29.9	27.8	40.4	22.1	11.2	137.4	27.0	55.8	0.7
Queue Length 95th (m)	64.0	44.7	46.9	60.0	38.1	#41.1	207.5	51.7	84.6	9.1
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	308	474	426	304	426	163	3073	270	3607	1201
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.25	0.38	0.50	0.29	0.48	0.70	0.60	0.43	0.16

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	163	337	59	172	206	1586	96	934	69
v/c Ratio	0.79	0.88	0.81	0.45	0.50	0.73	0.46	0.43	0.07
Control Delay	77.9	71.7	114.2	47.6	9.2	12.5	13.4	14.8	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	71.7	114.2	47.6	9.2	12.5	13.4	14.8	3.4
Queue Length 50th (m)	42.1	79.8	15.3	37.4	10.2	57.0	7.6	70.7	0.7
Queue Length 95th (m)	#71.9	#122.8	#40.1	59.3	m19.6	92.2	13.4	85.5	6.8
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	233	424	82	428	413	2170	255	2186	978
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.79	0.72	0.40	0.50	0.73	0.38	0.43	0.07

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	75	45	380	144	352	179	1626	23	1177	32
v/c Ratio	0.43	0.11	0.91	0.36	0.66	0.87	0.78	0.16	0.59	0.03
Control Delay	54.5	42.9	64.2	38.2	45.0	67.6	28.4	11.4	13.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	42.9	64.2	38.2	45.0	67.6	28.4	11.4	13.6	0.1
Queue Length 50th (m)	17.6	9.8	75.2	28.9	75.4	45.4	197.3	1.7	77.6	0.0
Queue Length 95th (m)	33.2	20.2	#124.3	45.7	107.4	#97.7	238.8	m3.9	86.3	m0.0
Internal Link Dist (m)		197.7			123.8		371.2		464.2	
Turn Bay Length (m)	32.0		30.0	30.0		170.0		78.0		130.0
Base Capacity (vph)	199	466	463	402	590	205	2073	189	1990	999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.10	0.82	0.36	0.60	0.87	0.78	0.12	0.59	0.03

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	180	104	112	73	206	156	2532	100	1567	77
v/c Ratio	0.93	0.26	0.27	0.26	0.50	0.61	0.84	0.62	0.53	0.08
Control Delay	100.9	45.0	8.2	45.4	35.3	20.8	27.5	41.4	20.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.9	45.0	8.2	45.4	35.3	20.8	27.5	41.4	20.2	6.9
Queue Length 50th (m)	49.3	24.2	0.0	17.0	34.3	12.8	196.9	11.4	91.3	2.5
Queue Length 95th (m)	72.8	36.7	14.0	28.4	53.3	32.0	#293.1	32.9	133.1	11.9
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	265	551	521	378	535	297	3027	195	2959	934
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.19	0.21	0.19	0.39	0.53	0.84	0.51	0.53	0.08

Intersection Summary

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

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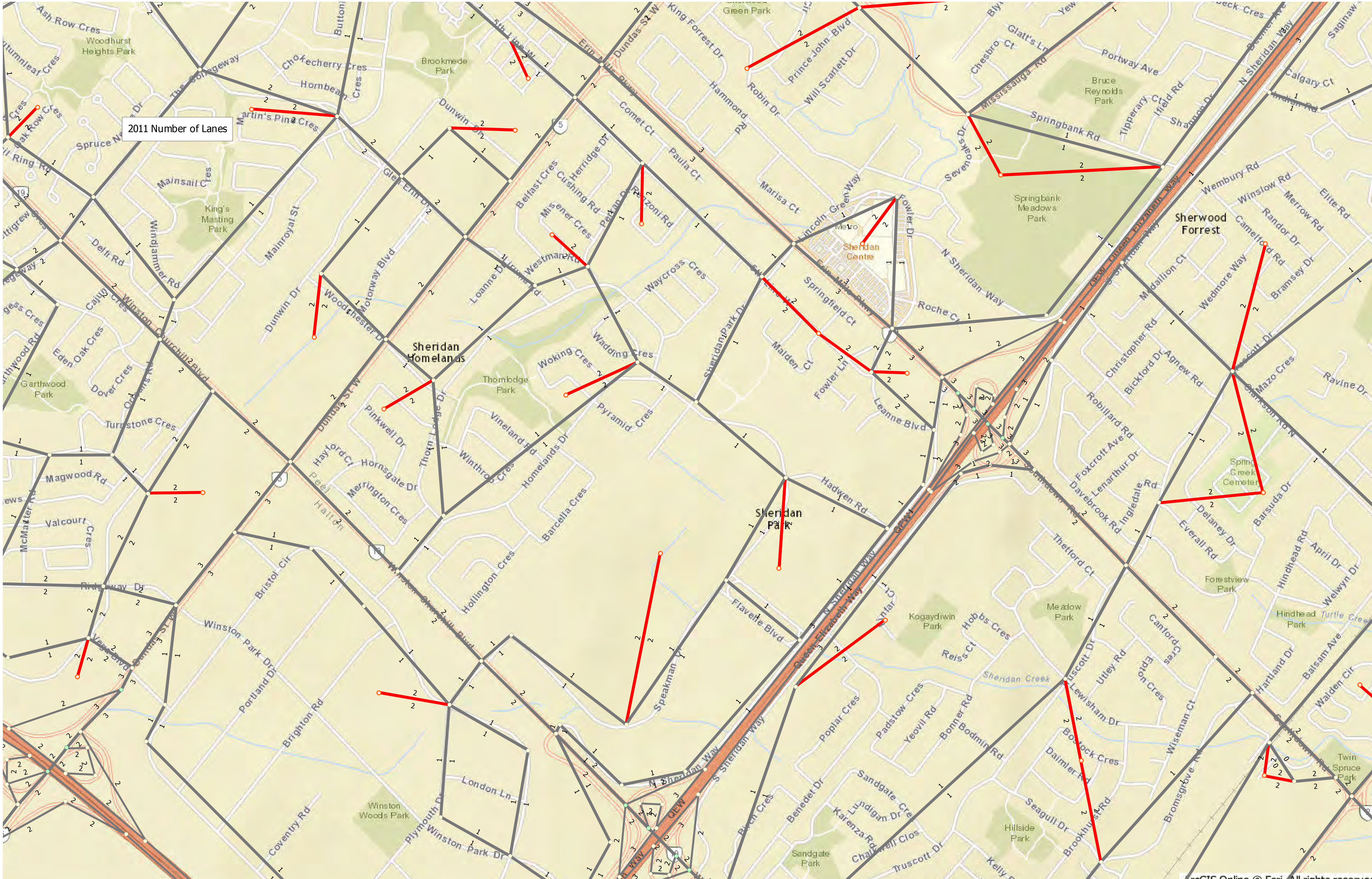
Appendix D

EMME Model Output

Appendix D

Existing Conditions



2011 Number of Lanes
Sheridan Homelands
Sheridan Park
Sherwood Forrest
Woodhurst Heights Park
Brookmede Park
King's Masting Park
Thornlodge Park
Garthwood Park
Bruce Reynolds Park
Springbank Meadows Park
Sheridan Centre
Kogaydiwin Park
Meadow Park
Forestview Park
Hindhead Park
Spring Creek Cemetery
Twin Spruce Park
Winston Woods Park
Sandgate Park
Hillside Park
Green Park
Dundas St W
Winston Churchill Blvd
Erin Mills Pkwy
N Sheridan Way
S Sheridan Way
Mississauga Rd
QEW
Queen Elizabeth Way
Speakman Dr
Sheridan Park Dr
Winston Park Dr
The Collegeway
Glen Erin Dr
Ridgeway Dr
Peel
Halton
Sheridan Creek
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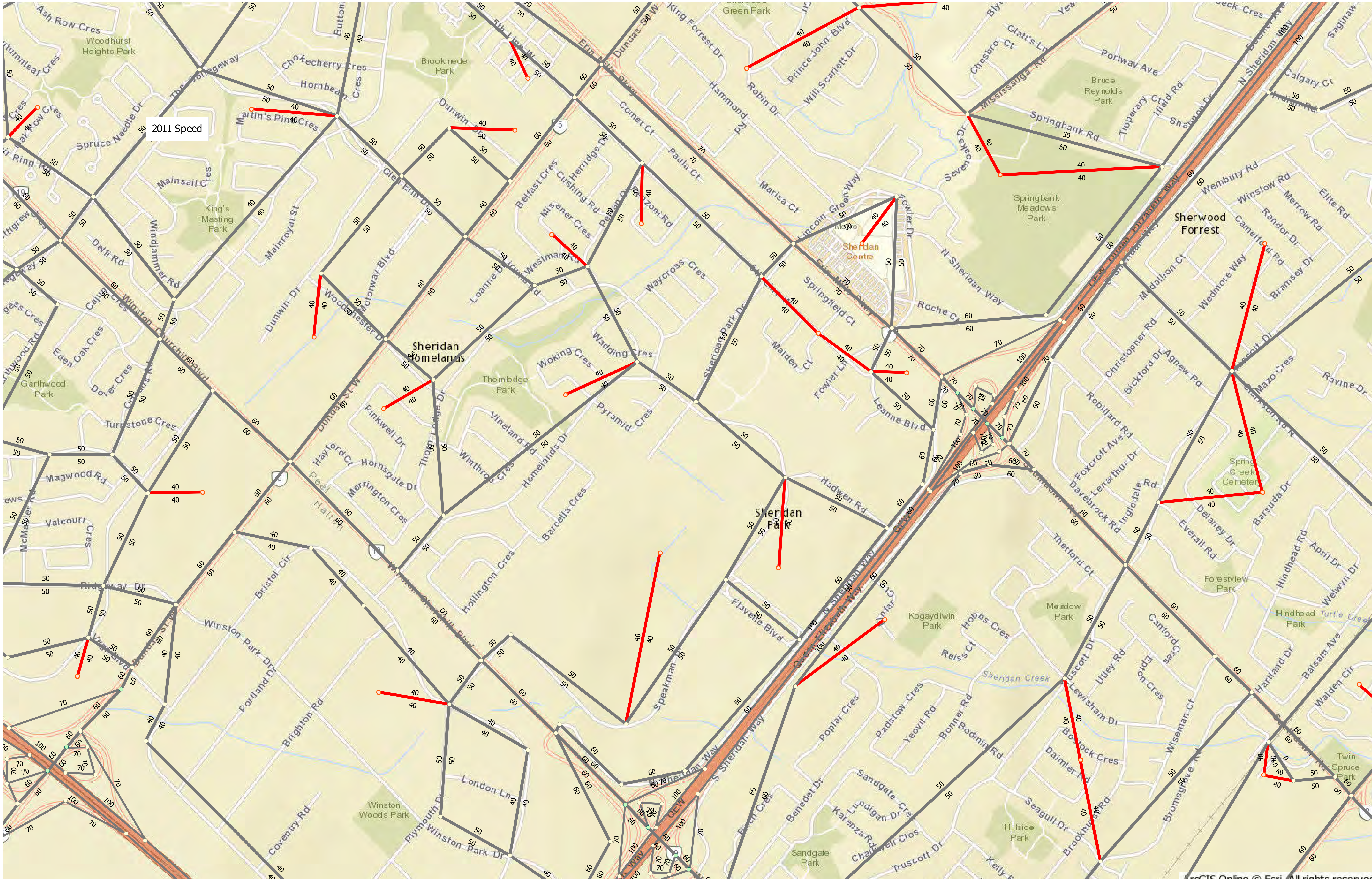
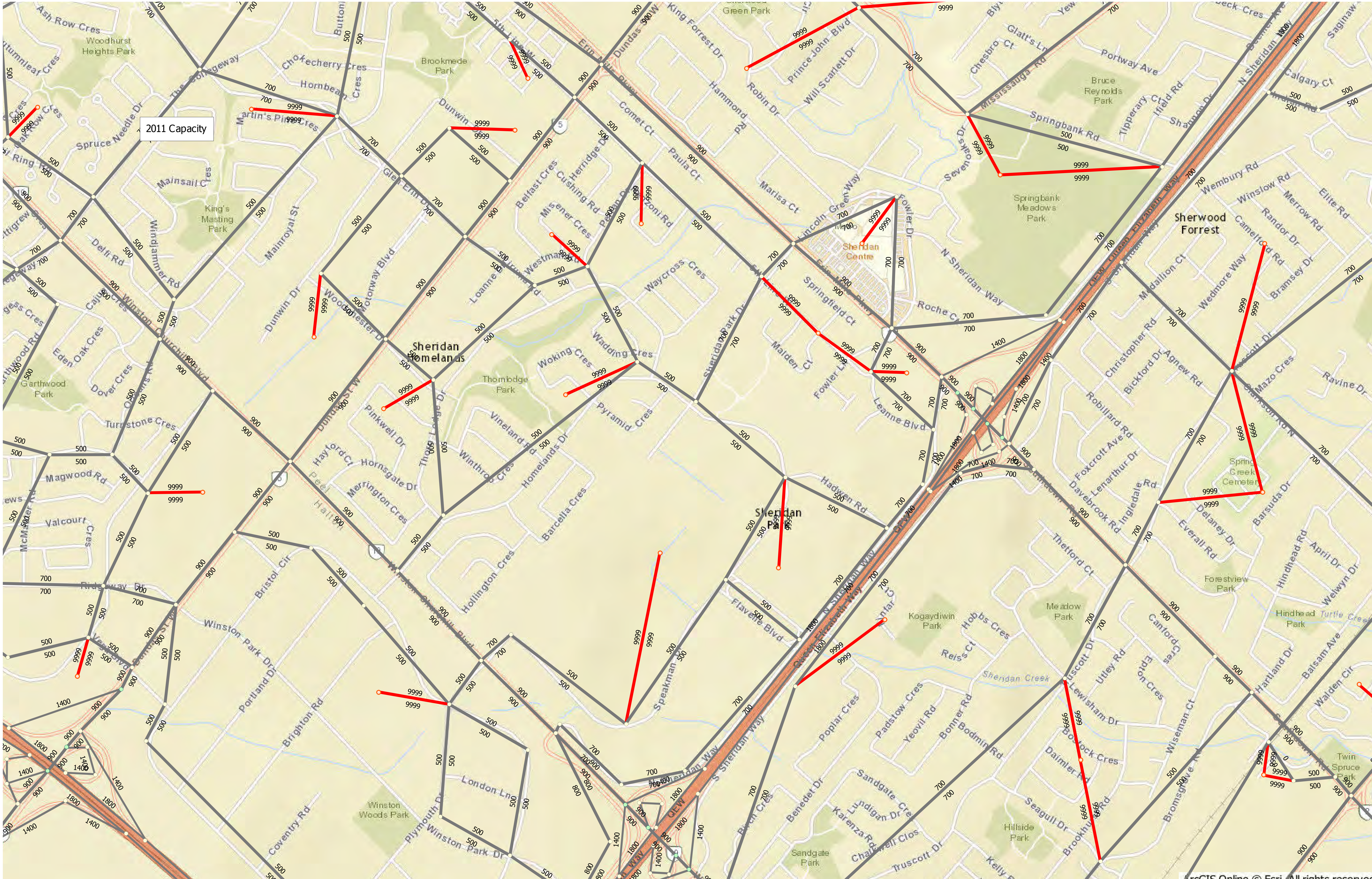
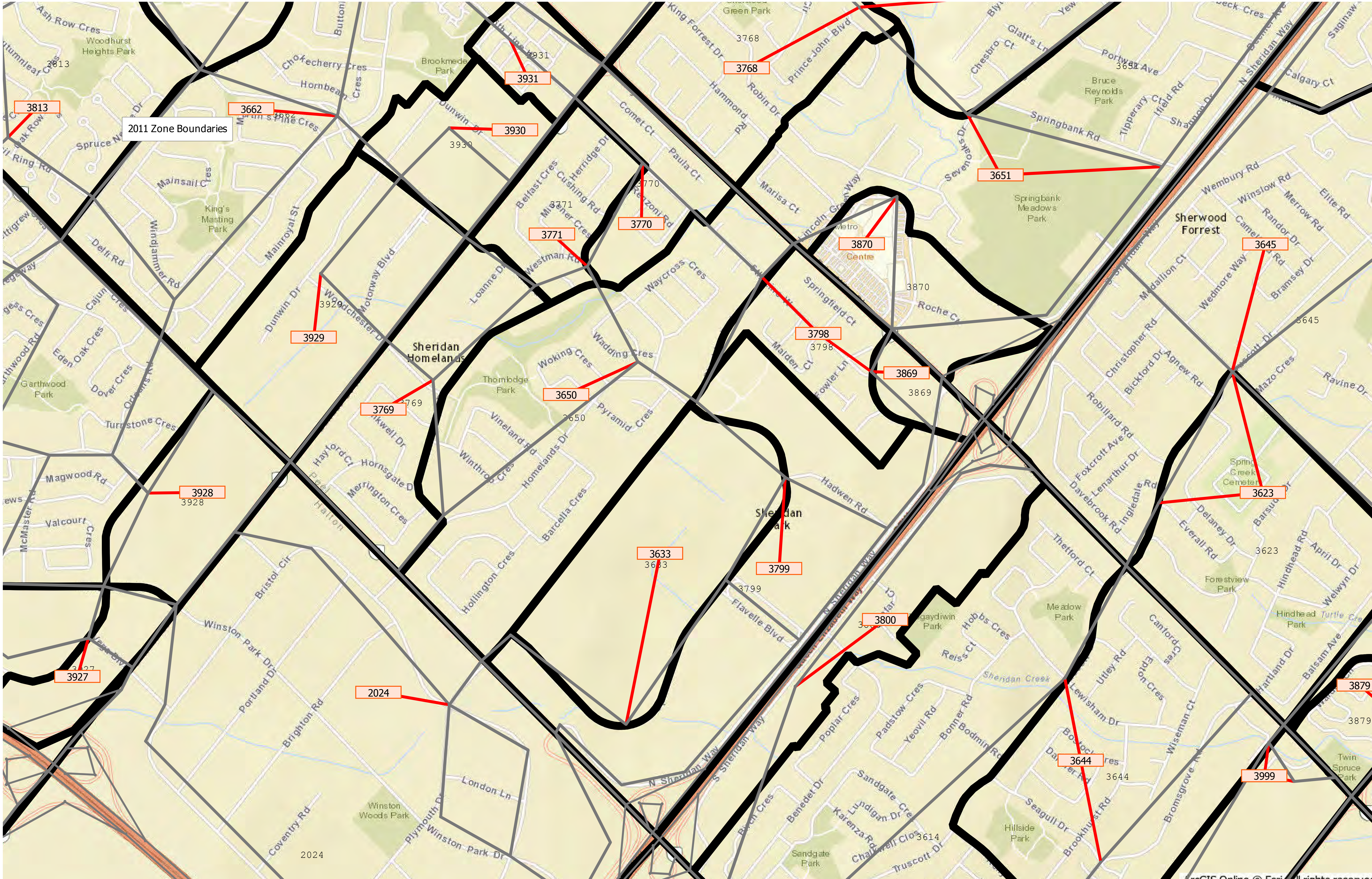

2011 Speed
Sheridan Homelands
Sheridan Park
Sherwood Forrest
Sheridan Centre
Woodhurst Heights Park
King's Masting Park
Brookmede Park
Thornlodge Park
Garthwood Park
Bruce Reynolds Park
Springbank Meadows Park
Spring Creek Cemetery
Kogaydiwin Park
Meadow Park
Forestview Park
Hindhead Park
Twin Spruce Park
Hillside Park
Sandgate Park
Winston Woods Park
Green Park
Winston Churchill Blvd
Dundas St W
Erin Mills Pkwy
Mississauga Rd
N Sheridan Way
S Sheridan Way
Queen Elizabeth Way
QEW
The Collegeway
Speakman Dr
Winston Park Dr
Sheridan Creek
Peel
Halton
ArcGIS Online © Esri. All rights reserved.


2011 Capacity
Sheridan Homelands
Sheridan Park
Sherwood Forrest
Sheridan Centre
Brookmede Park
Woodhurst Heights Park
King's Masting Park
Thorndlodge Park
Garthwood Park
Bruce Reynolds Park
Springbank Meadows Park
Spring Creek Cemetery
Forestview Park
Meadow Park
Kogaydiwin Park
Hindhead Park
Hillside Park
Sandgate Park
Winston Woods Park
Twin Spruce Park
Sheridan Creek
ArcGIS Online © Esri, All rights reserved.



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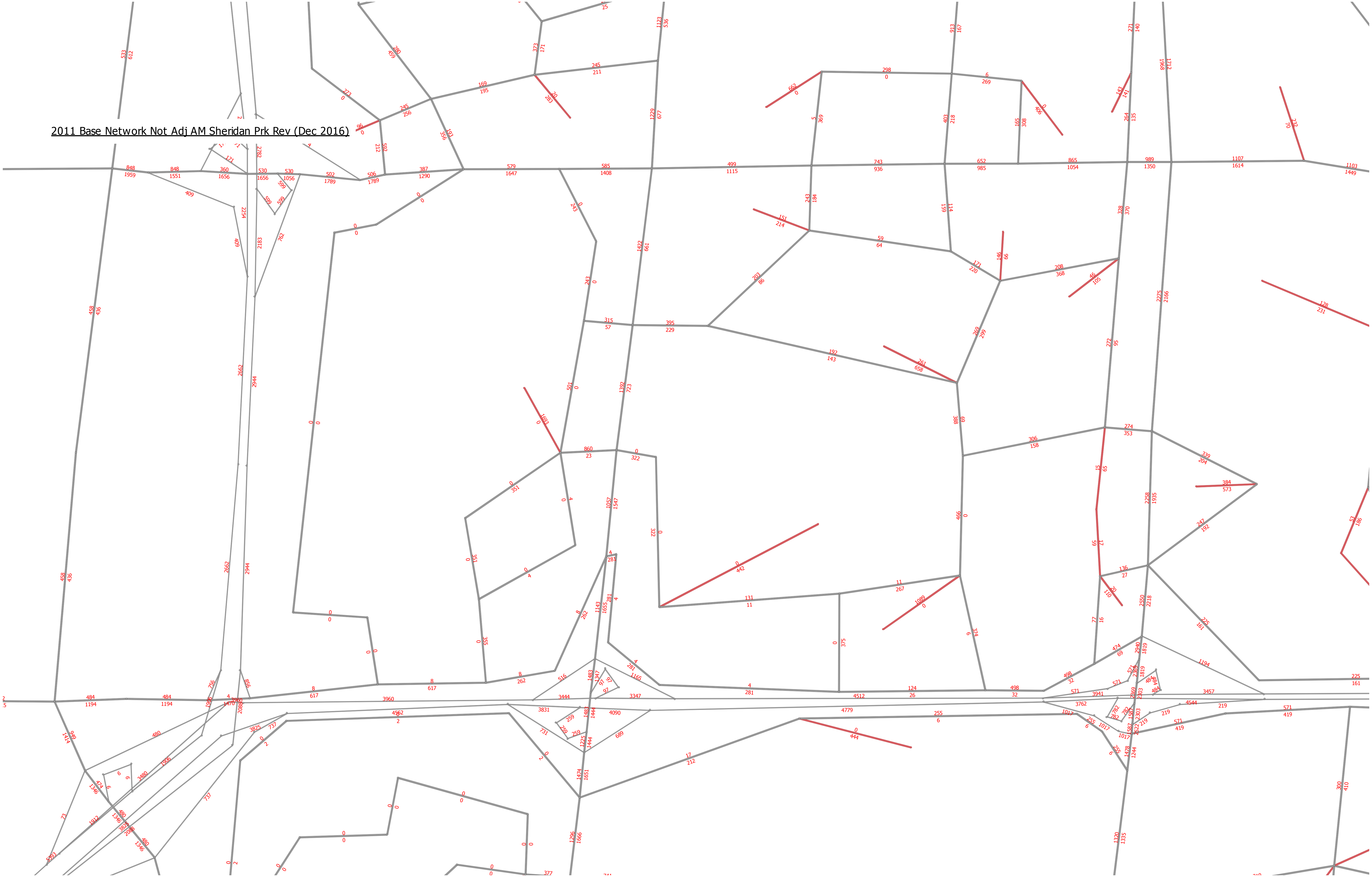
2011 Base Network Not Adj AM Sheridan Prk Rev (Dec 2016)



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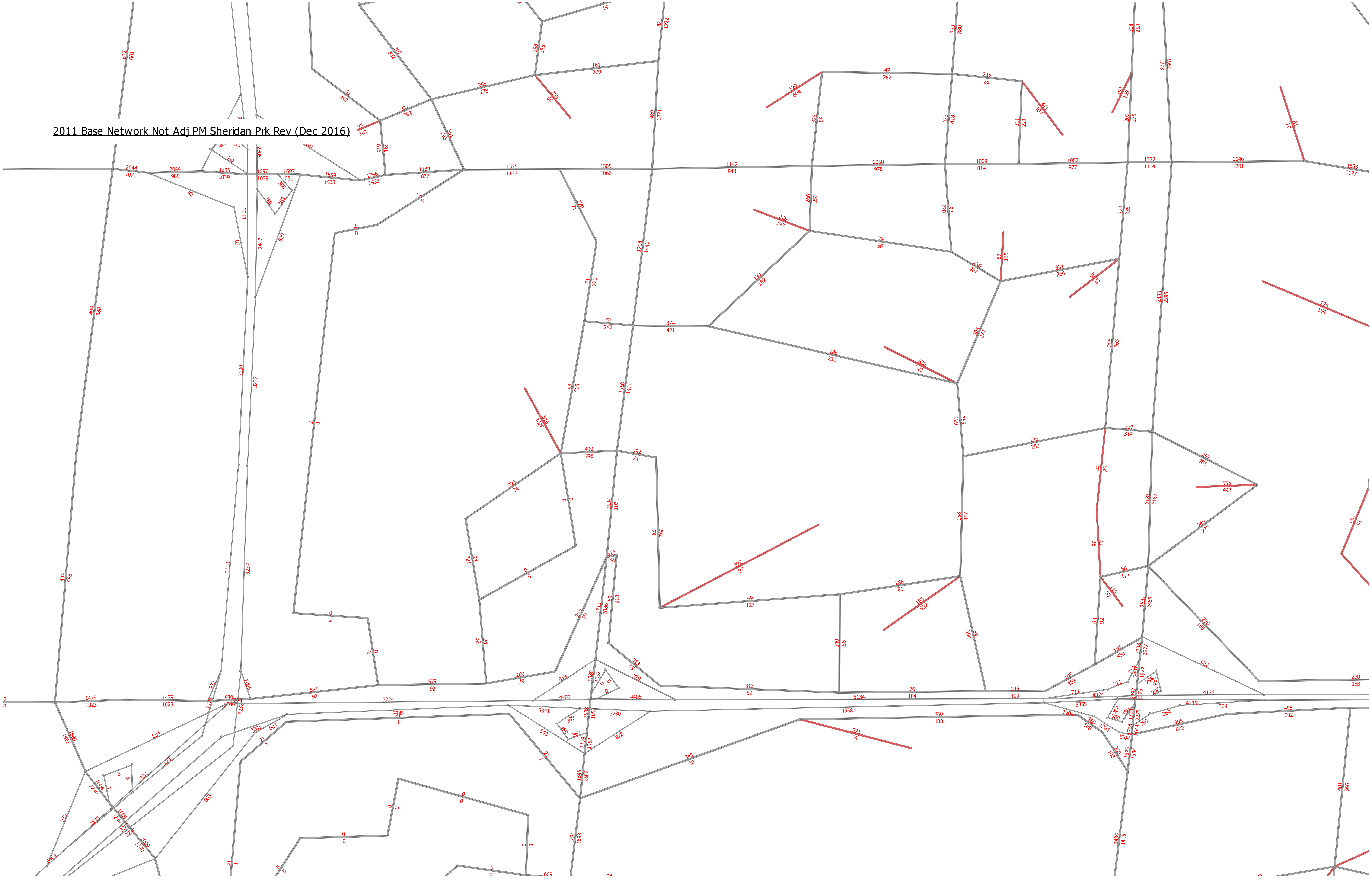
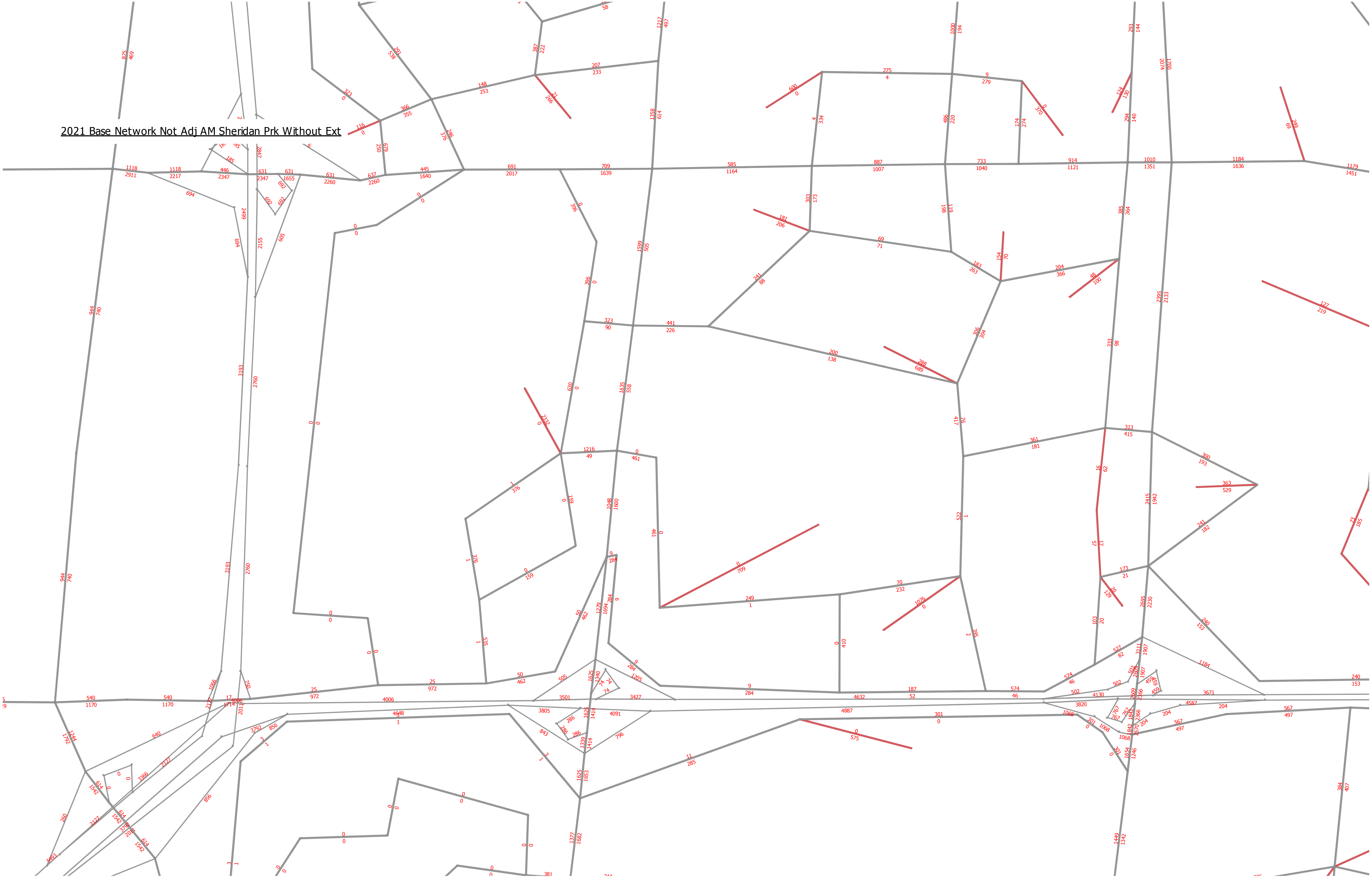
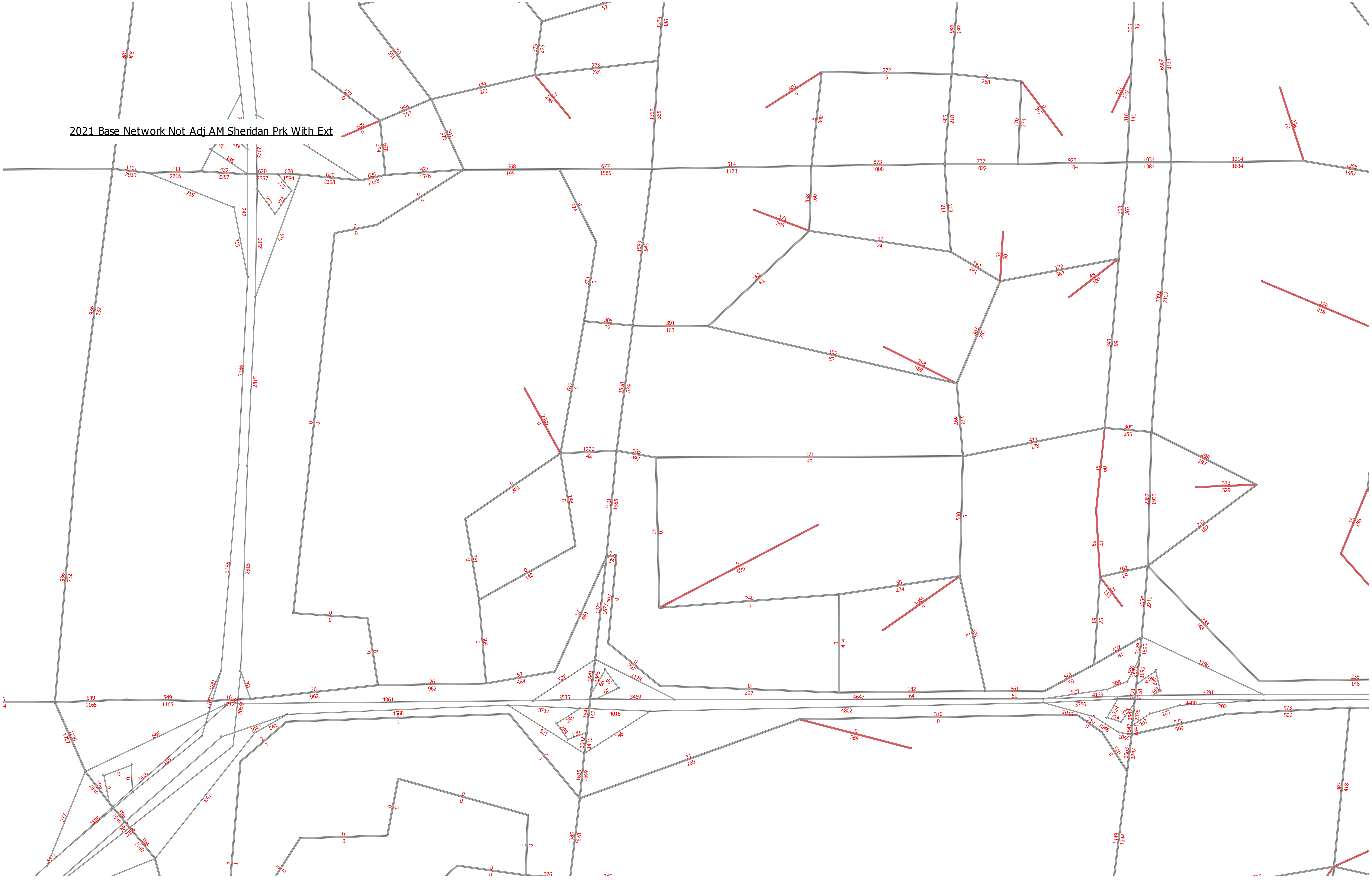


2021 Conditions

AM

2021 Base Network Not Adj AM Sheridan Prk Without Ext

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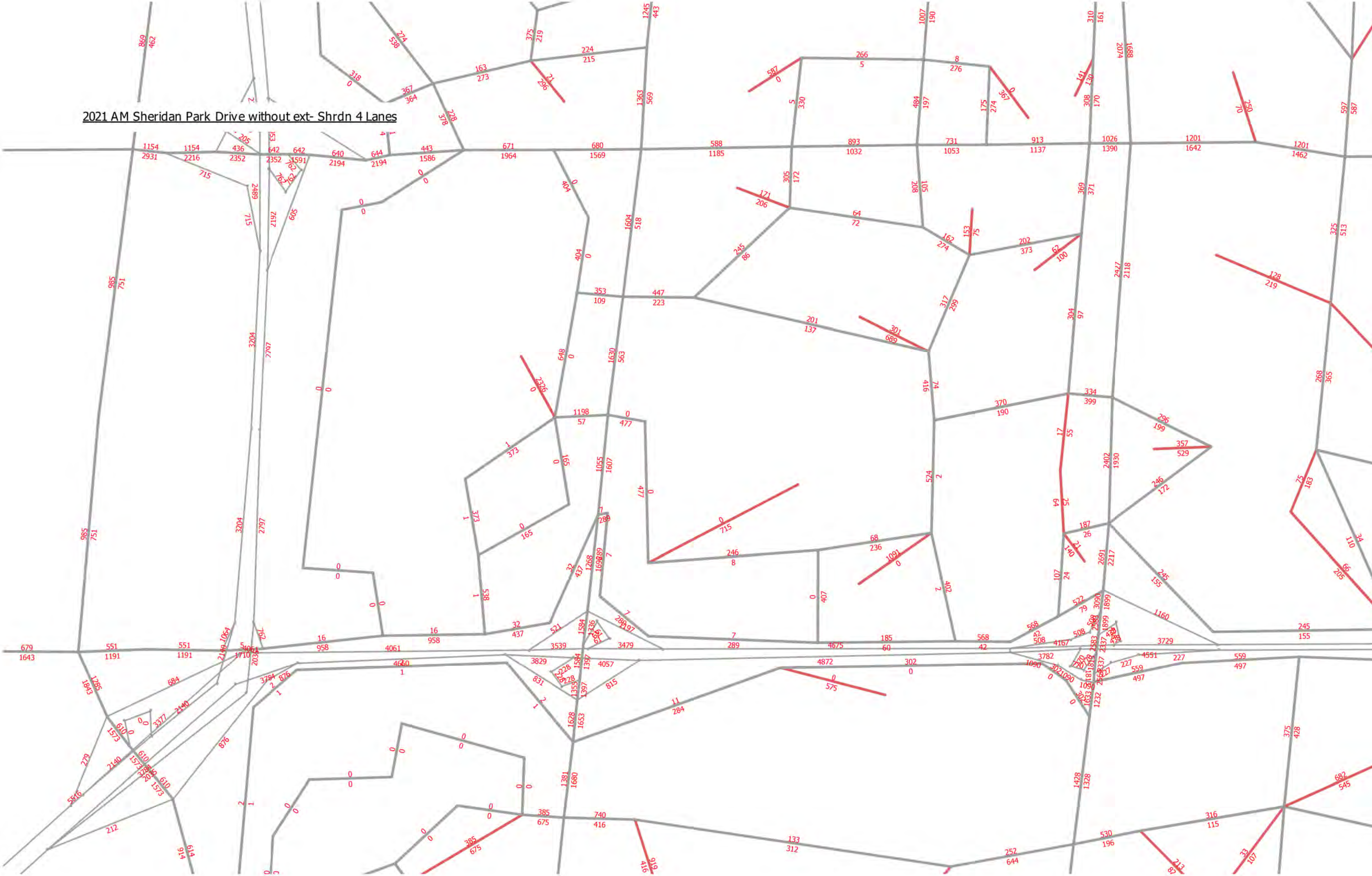
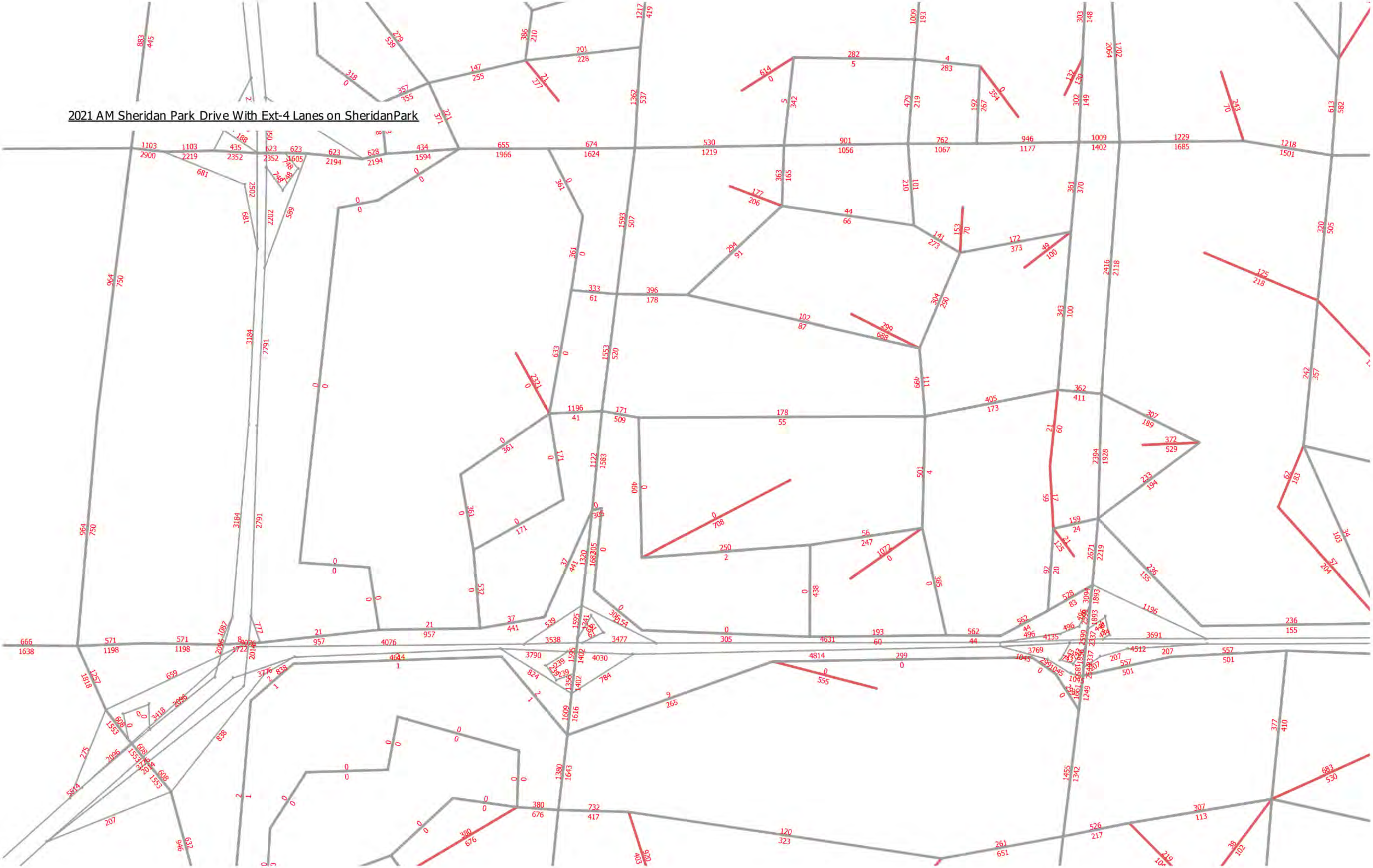
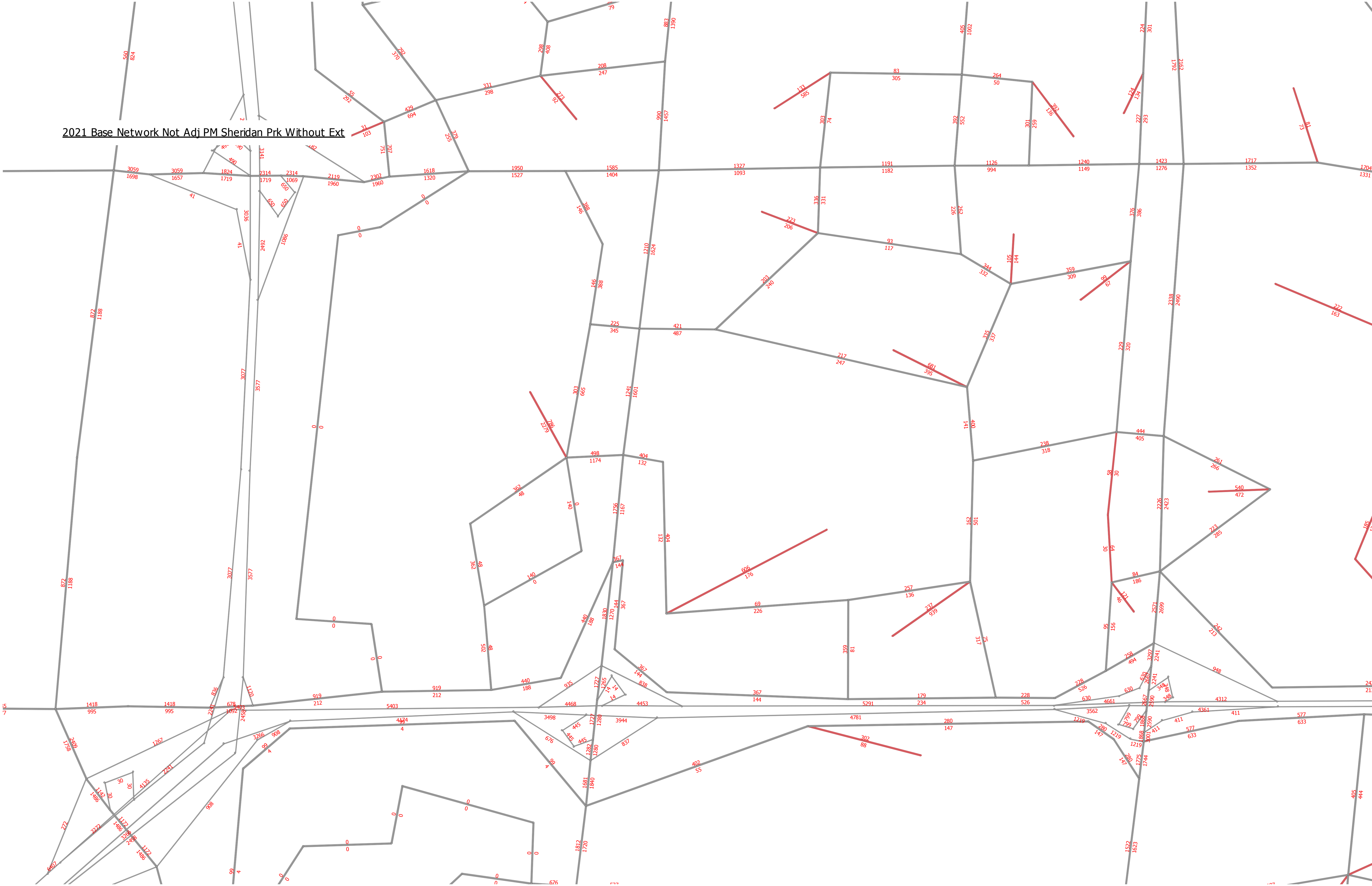
2021 AM Sheridan Park Drive without ext- Shrdn 4 Lanes



2021 AM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



PM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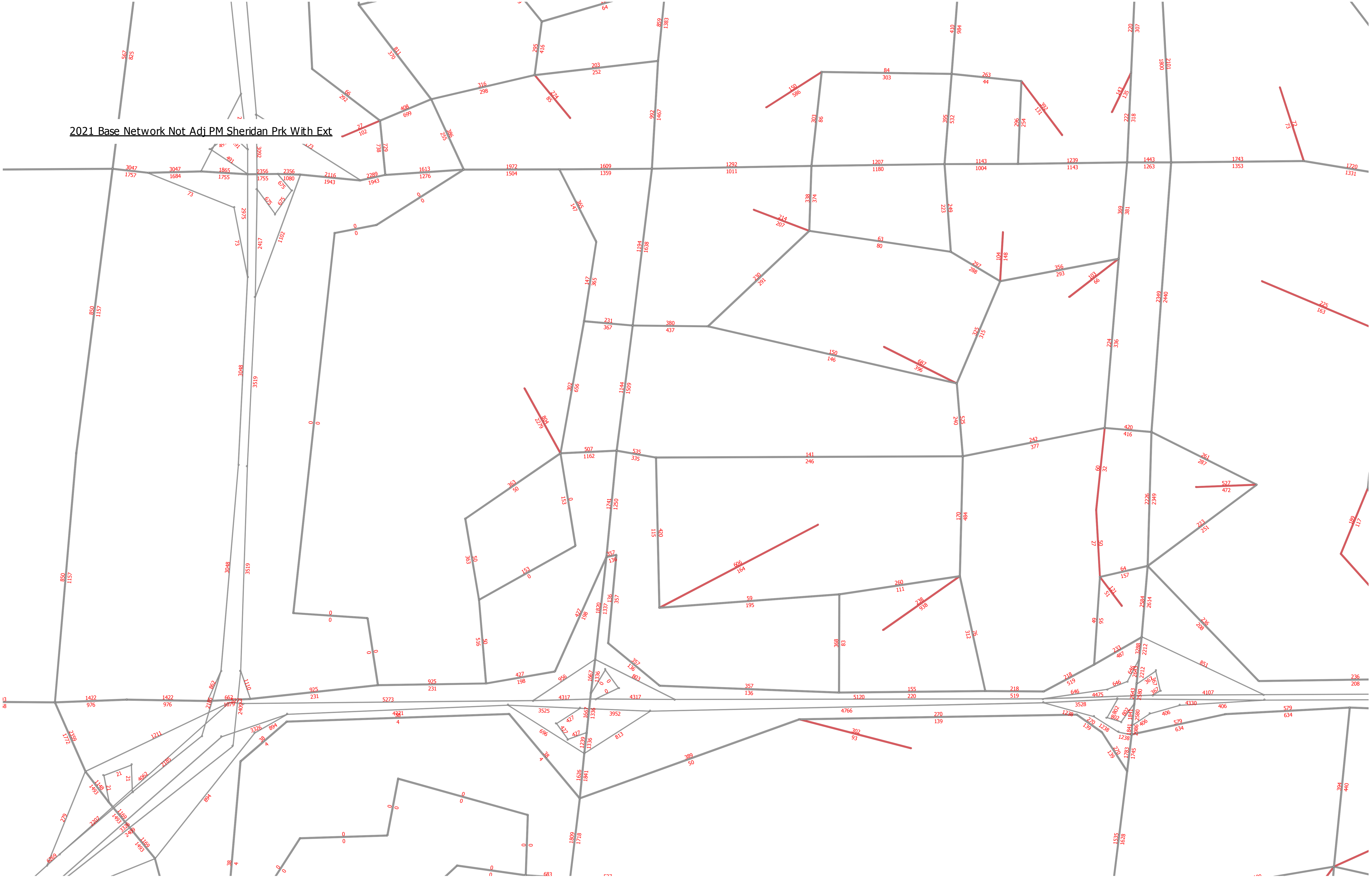
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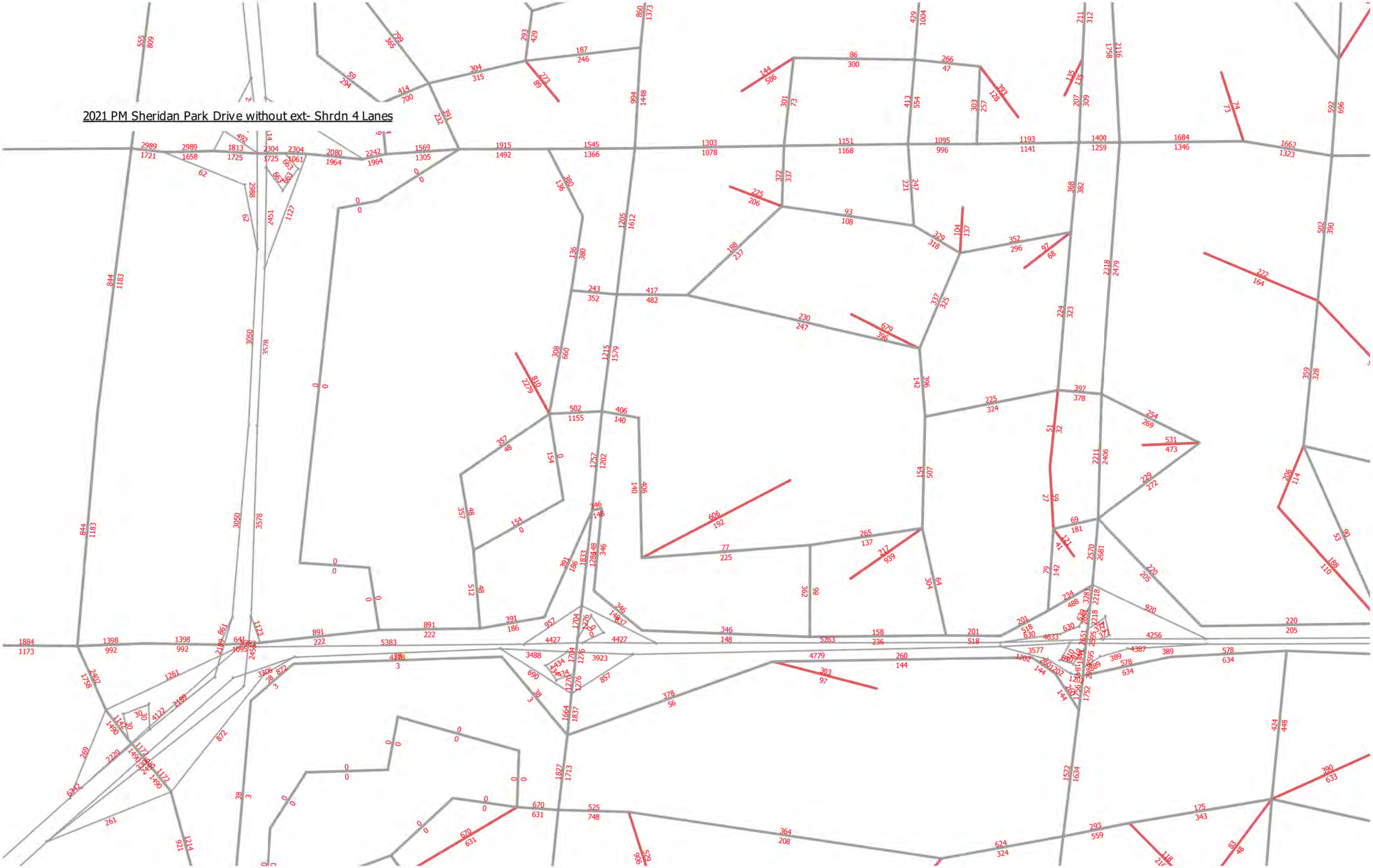
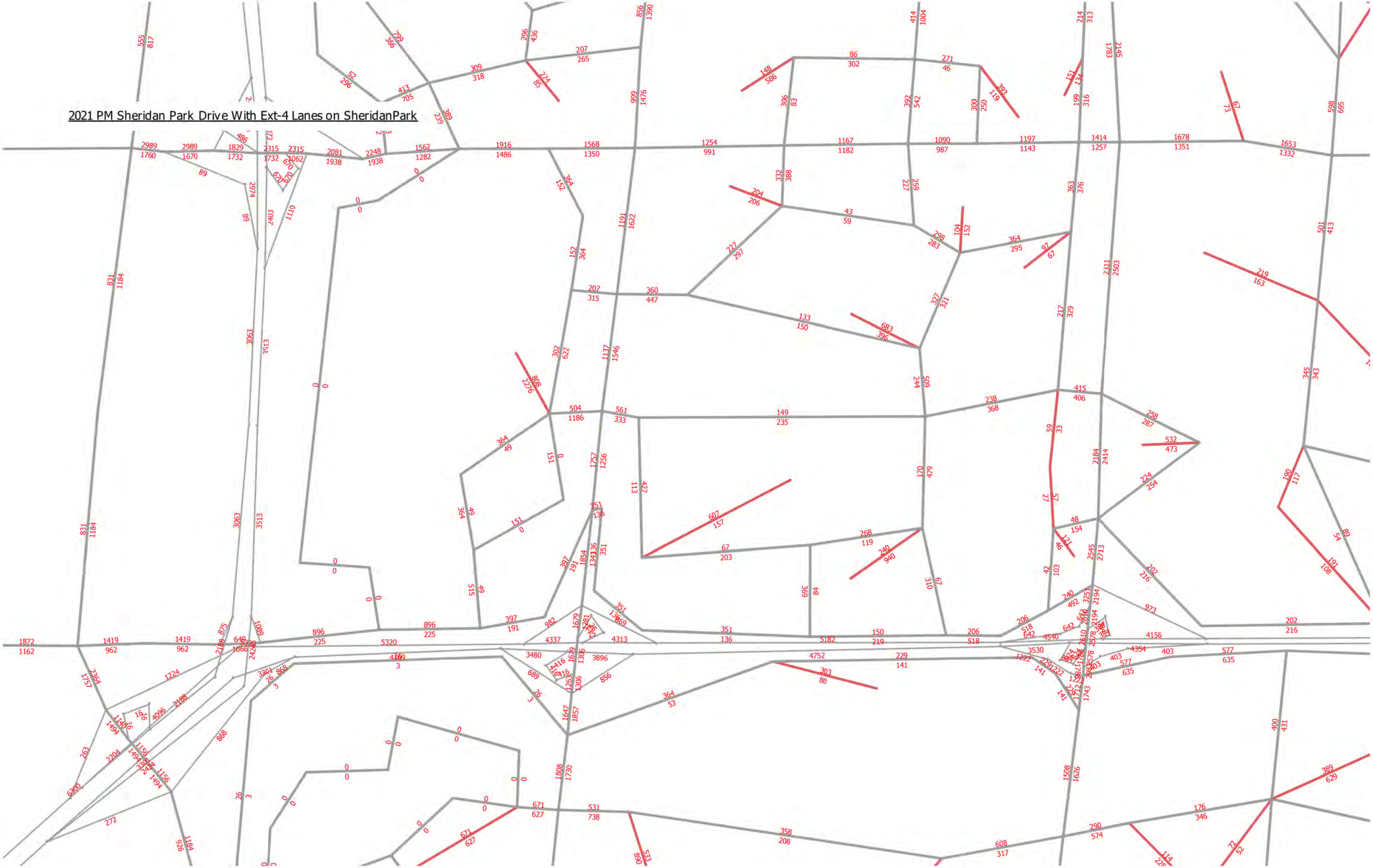
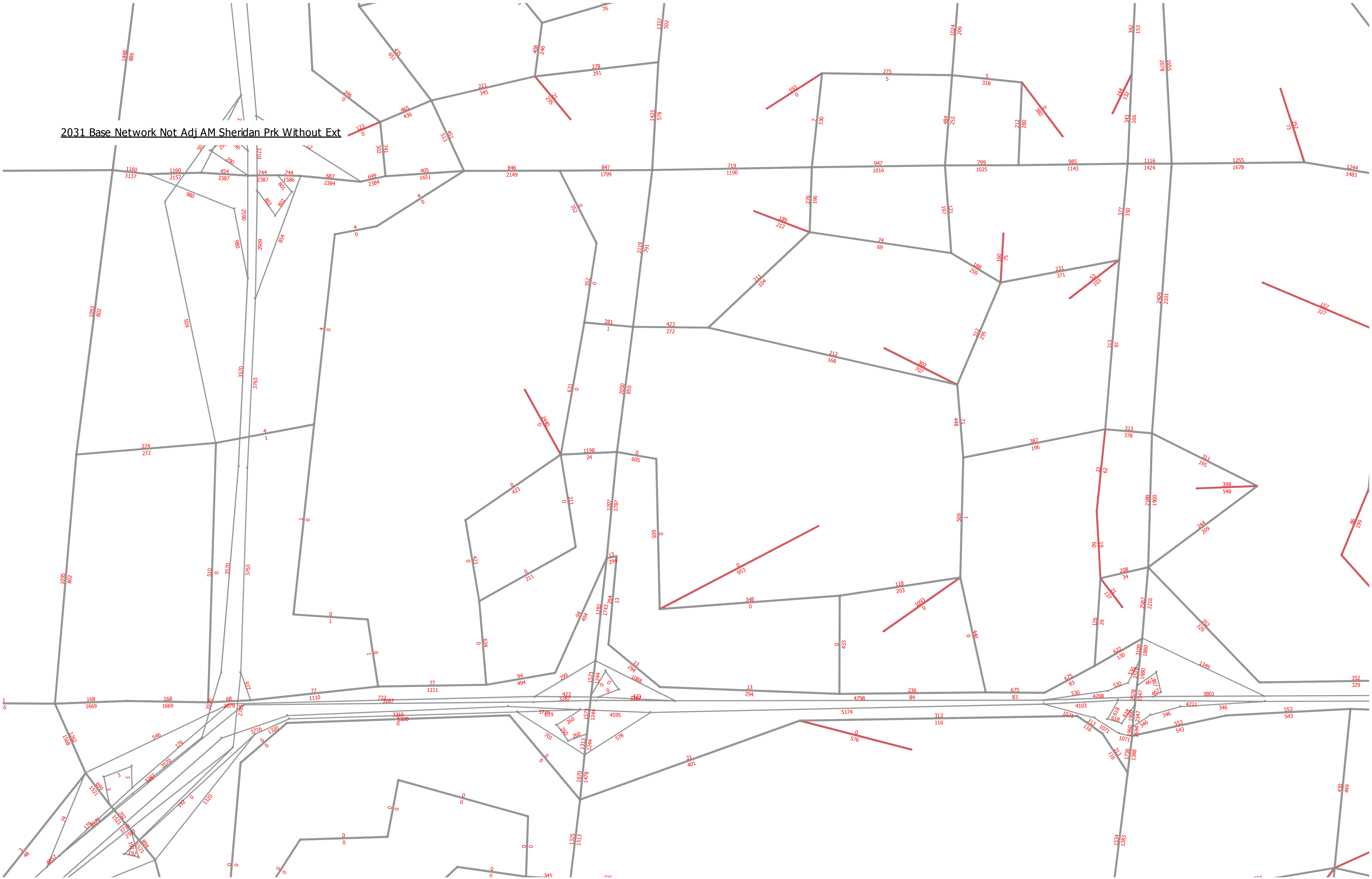

2021 PM Sheridan Park Drive without ext- Shrdn 4 Lanes

2021 PM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



2031 Conditions

AM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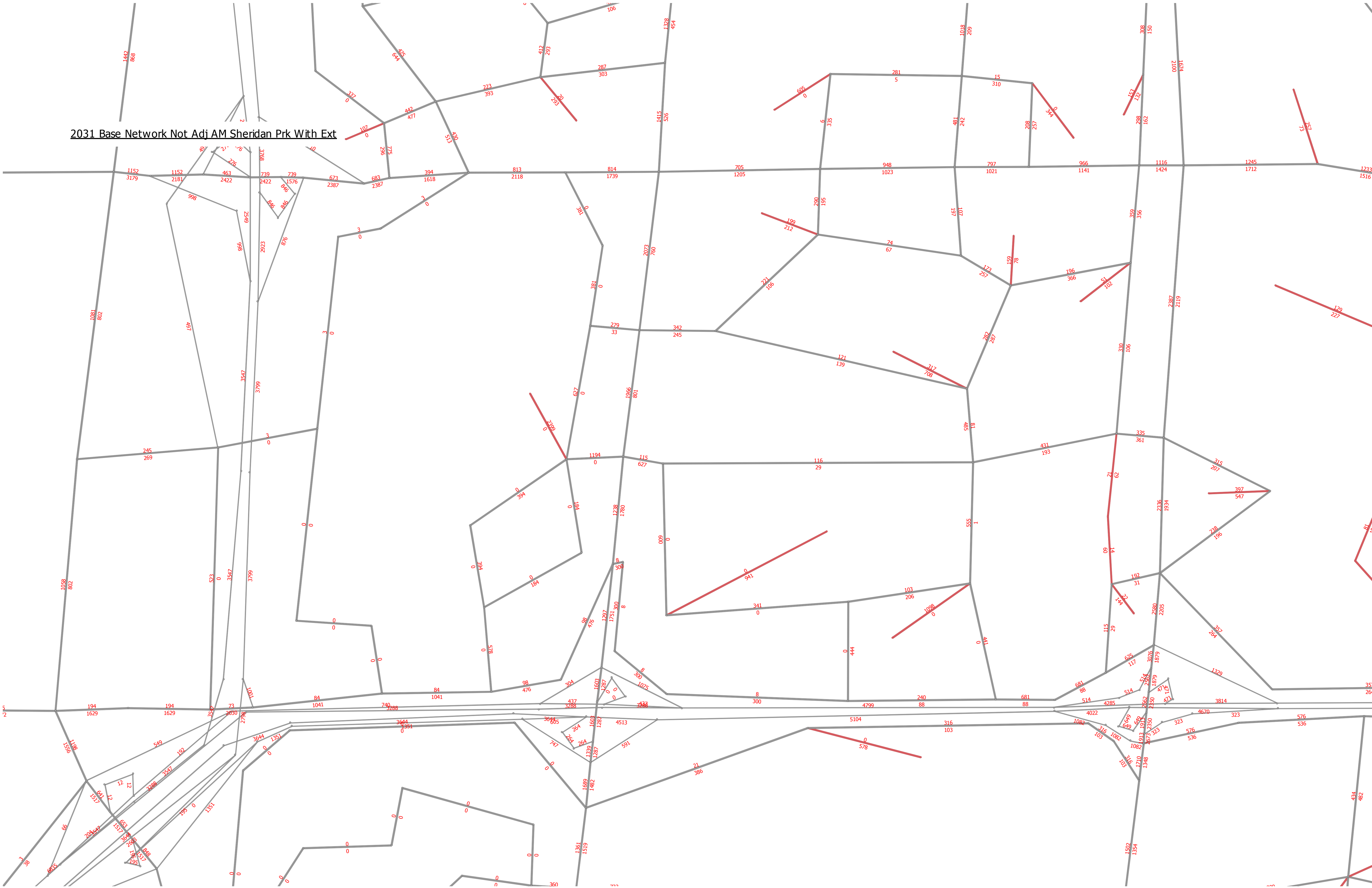
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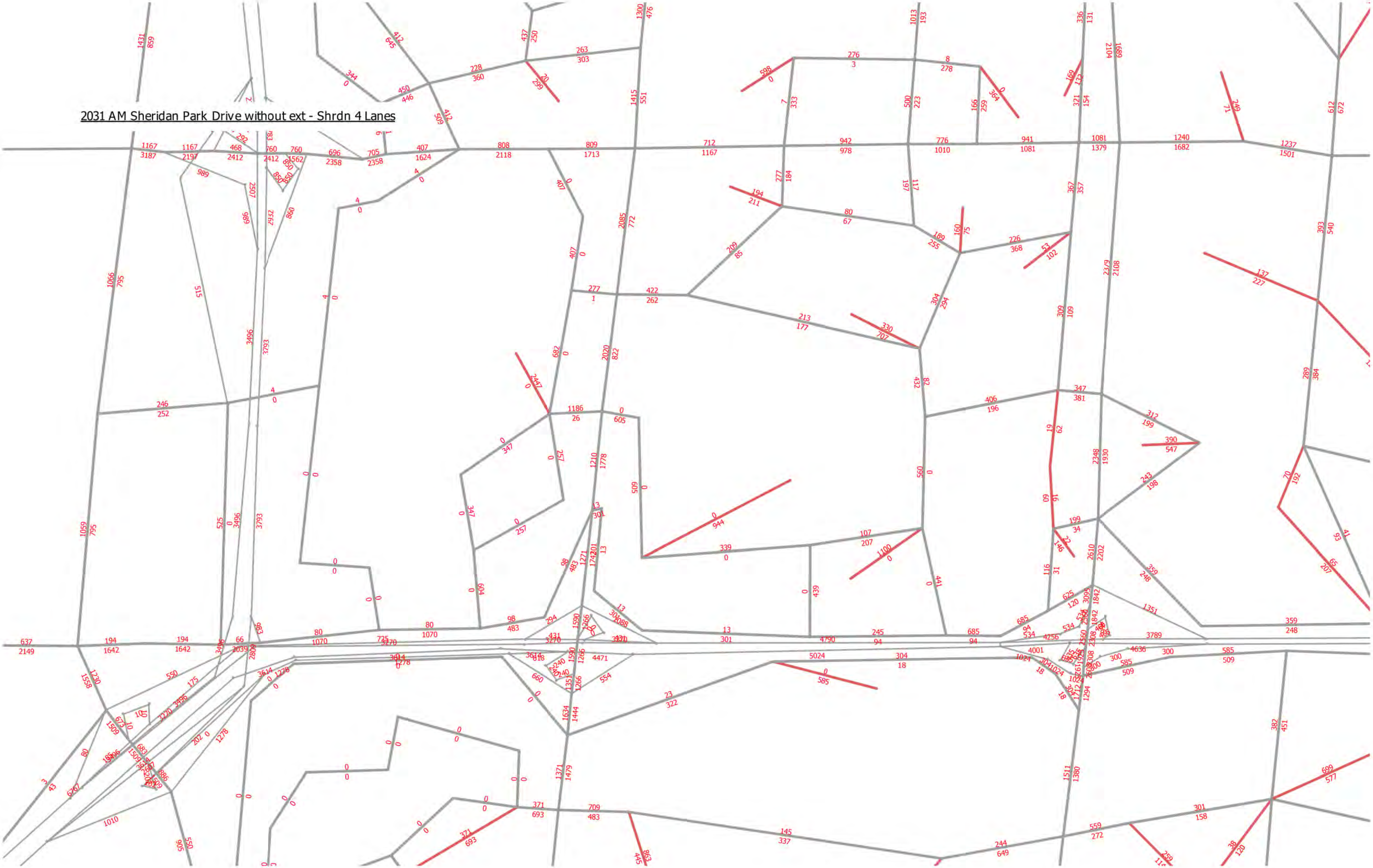
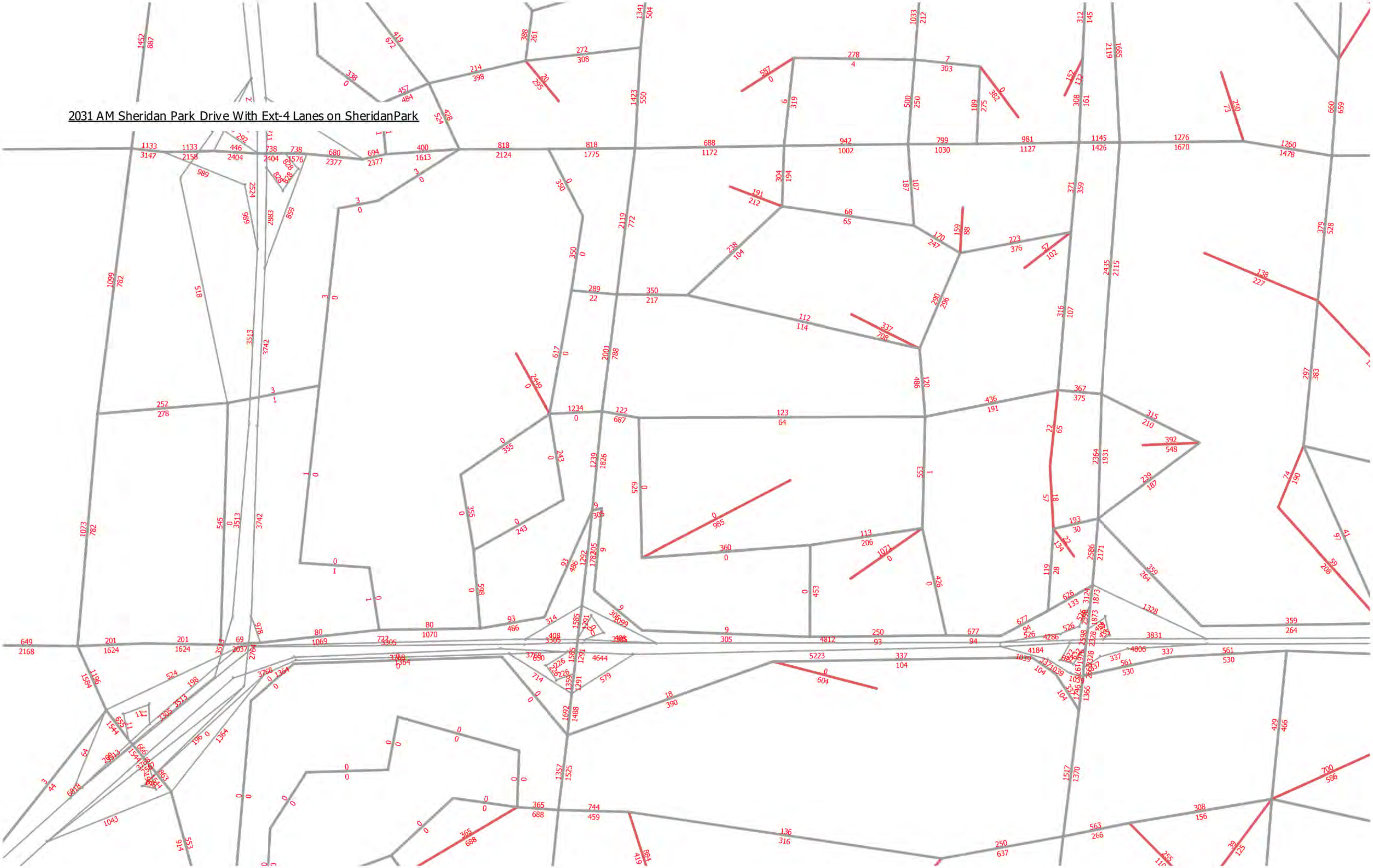
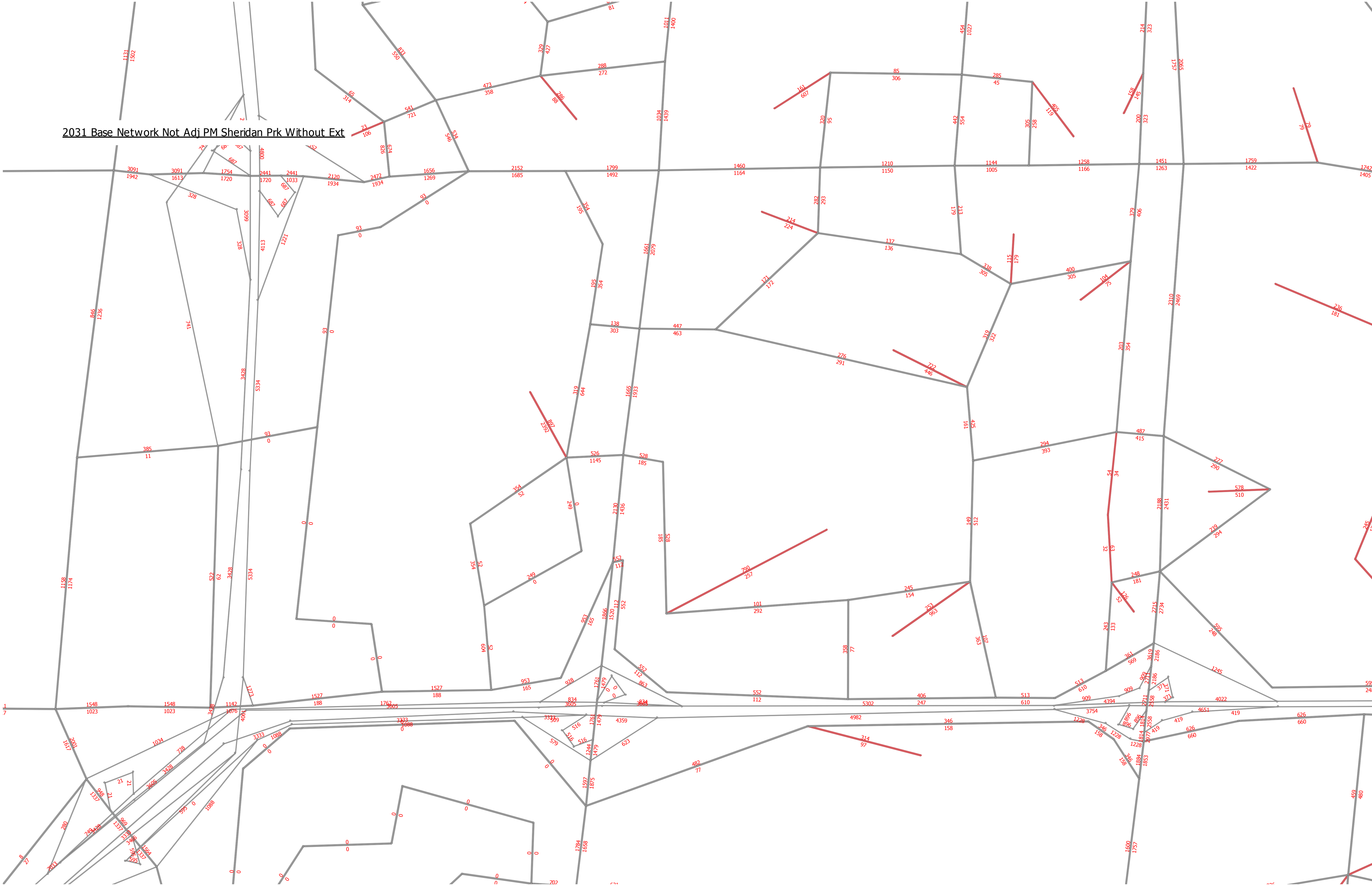
2031 AM Sheridan Park Drive without ext - Shrdn 4 Lanes



2031 AM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



PM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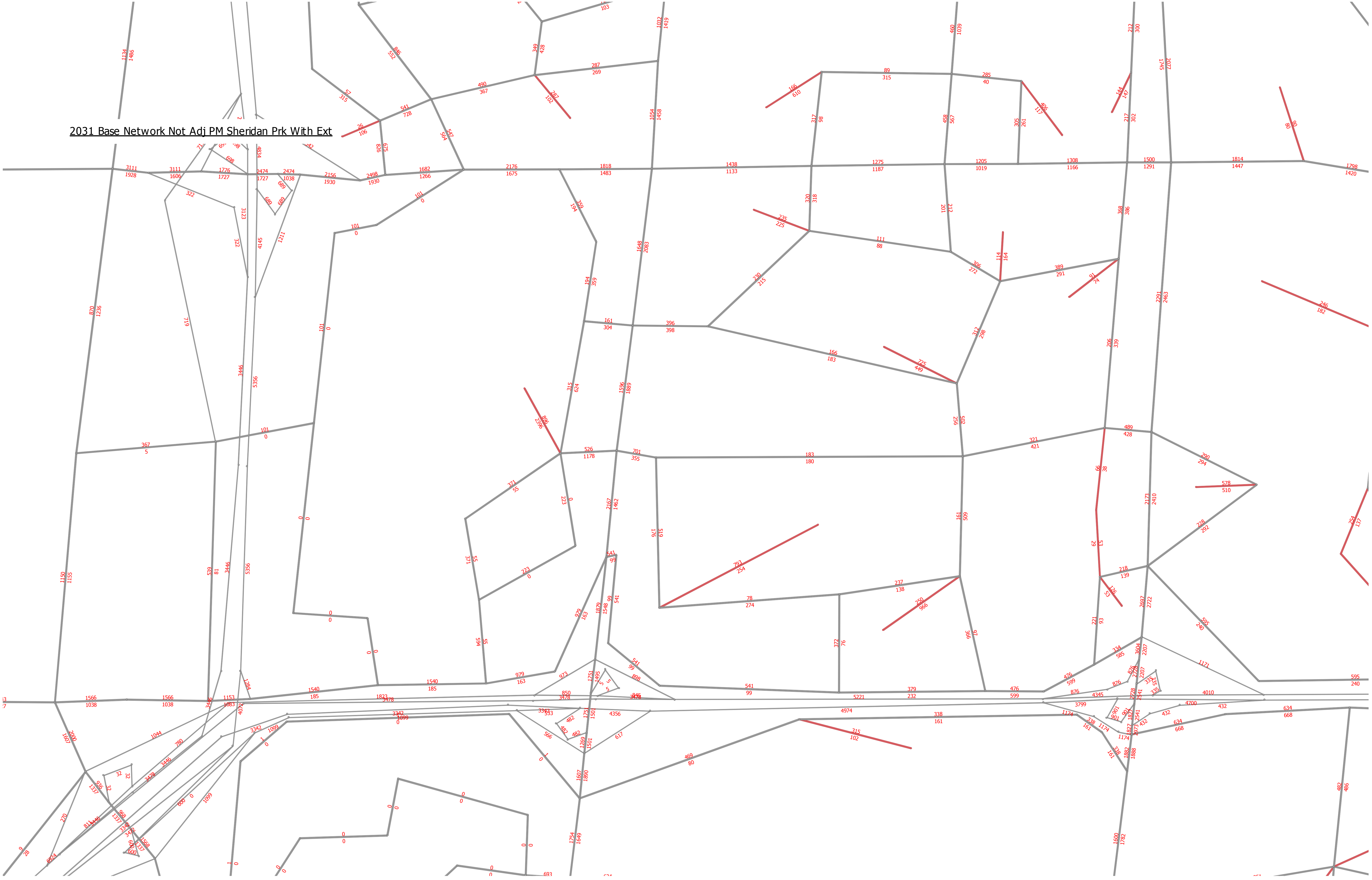
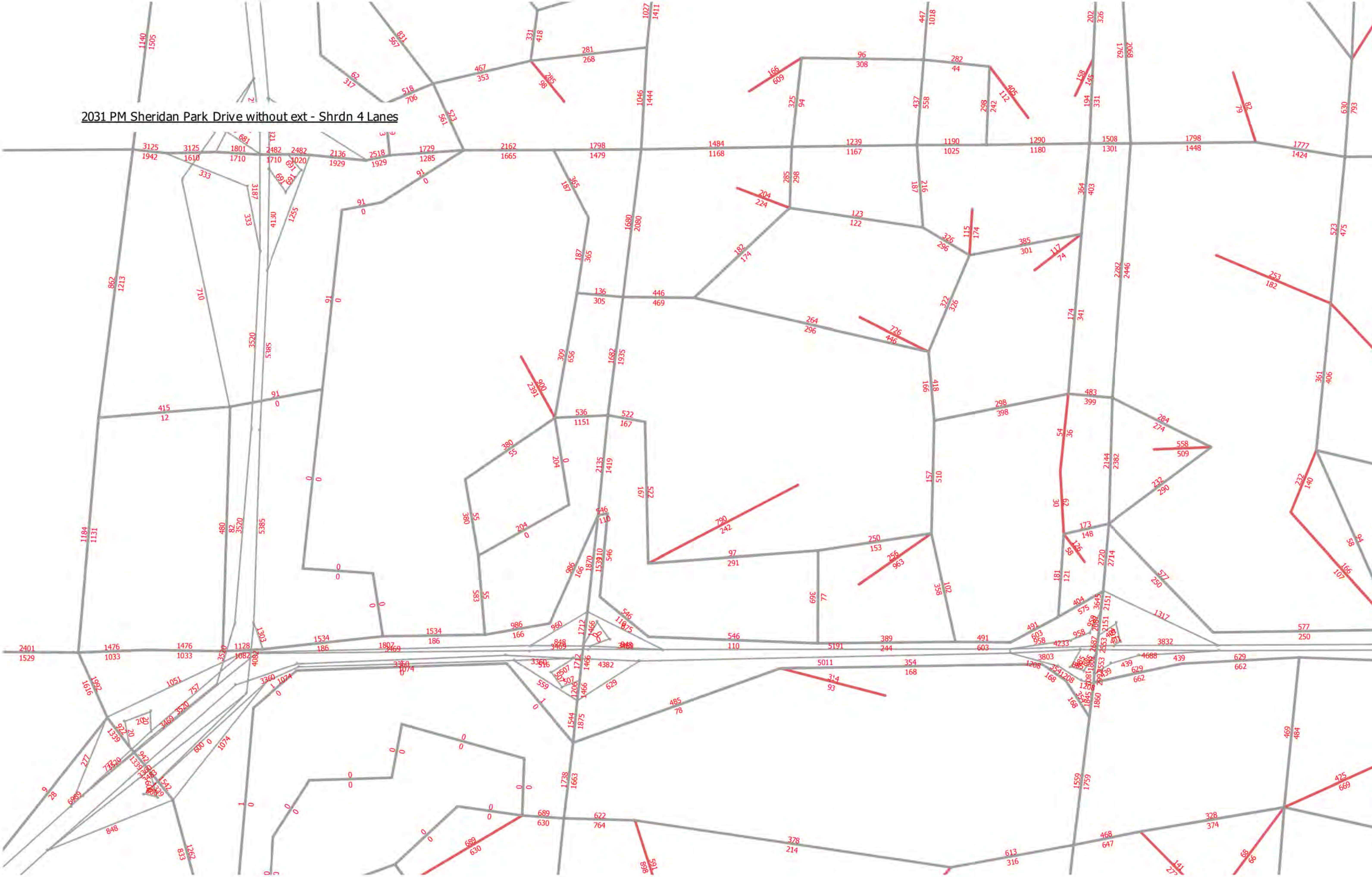
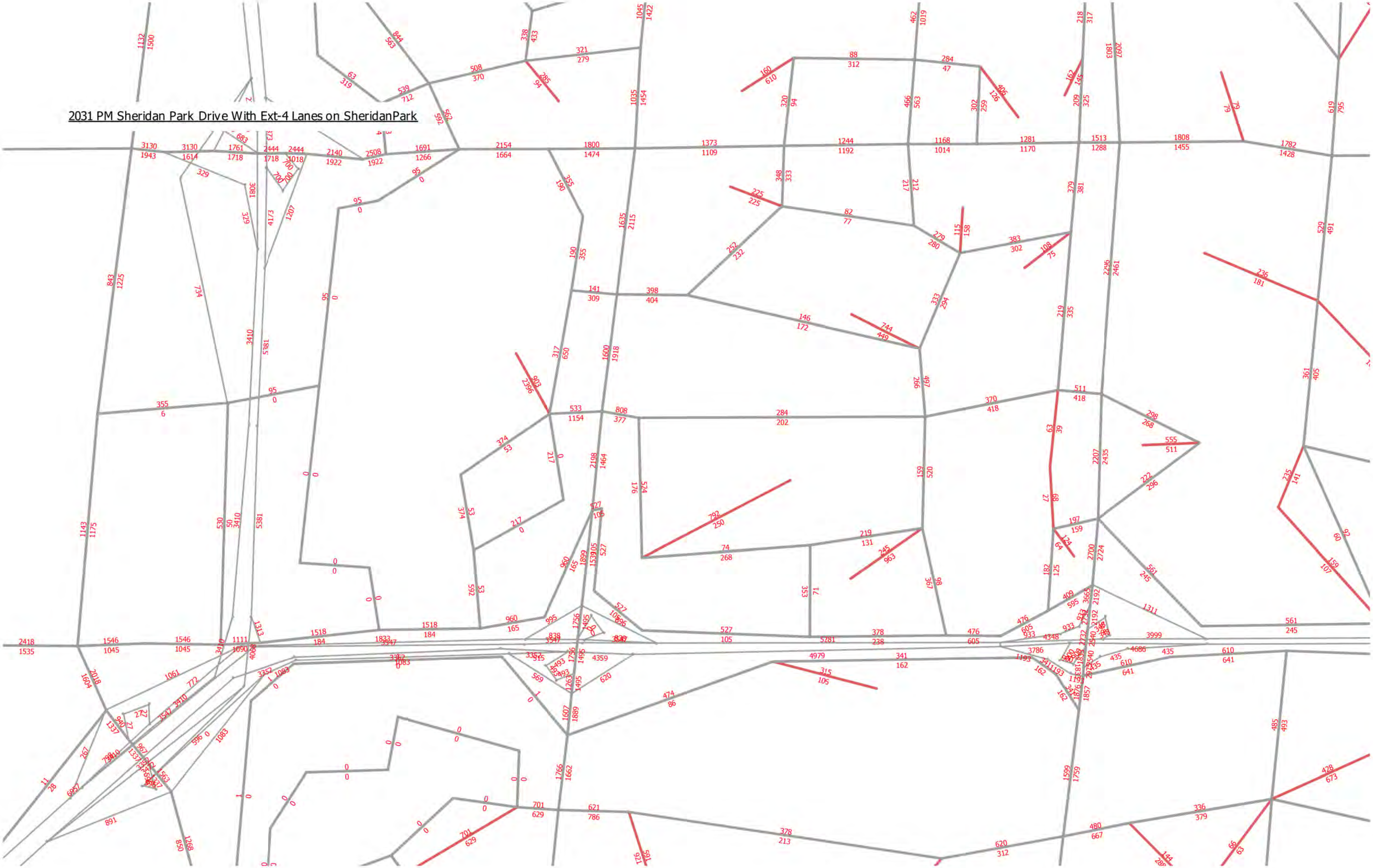

2031 Base Network Not Adj PM Sheridan Prk With Ext

2031 PM Sheridan Park Drive without ext - Shrdn 4 Lanes



2031 PM Sheridan Park Drive With Ext-4 Lanes on SheridanPark



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Appendix E

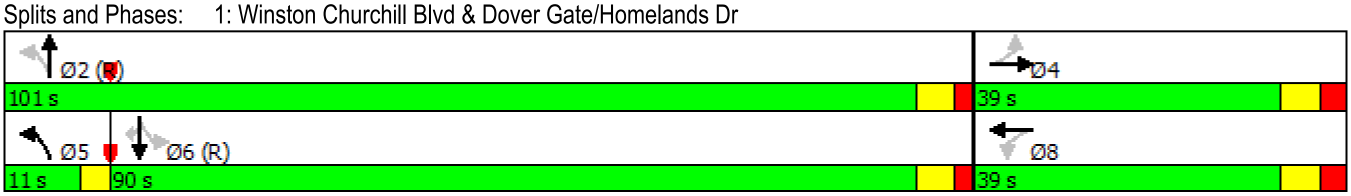
2021 Traffic Operations Without Sheridan Park Drive Extension

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	36	48	111	106	234	1060	49	1362	121
Future Volume (vph)	36	48	111	106	234	1060	49	1362	121
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	25.0	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	101.0	90.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	72.1%	64.3%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	6.0	6.0	6.0
Lead/Lag					Lead		Lag	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	20.5	20.5	20.5	20.5	109.5	106.5	84.0	84.0	84.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.78	0.76	0.60	0.60	0.60
v/c Ratio	0.35	0.52	0.83	0.69	0.72	0.49	0.24	0.72	0.14
Control Delay	59.9	37.8	96.6	63.5	48.1	6.7	16.5	22.2	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	37.8	96.6	63.5	48.1	6.7	16.5	22.2	5.9
LOS	E	D	F	E	D	A	B	C	A
Approach Delay		42.5		76.8		13.7		20.7	
Approach LOS		D		E		B		C	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 23.5 Intersection LOS: C
Intersection Capacity Utilization 87.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	195	50	113	105	75	164
Future Volume (vph)	195	50	113	105	75	164
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	250	64	145	135	96	210

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	314	280	306
Volume Left (vph)	250	0	96
Volume Right (vph)	64	135	0
Hadj (s)	0.09	-0.13	0.18
Departure Headway (s)	5.5	5.2	5.4
Degree Utilization, x	0.48	0.40	0.46
Capacity (veh/h)	612	659	630
Control Delay (s)	13.6	11.6	13.0
Approach Delay (s)	13.6	11.6	13.0
Approach LOS	B	B	B

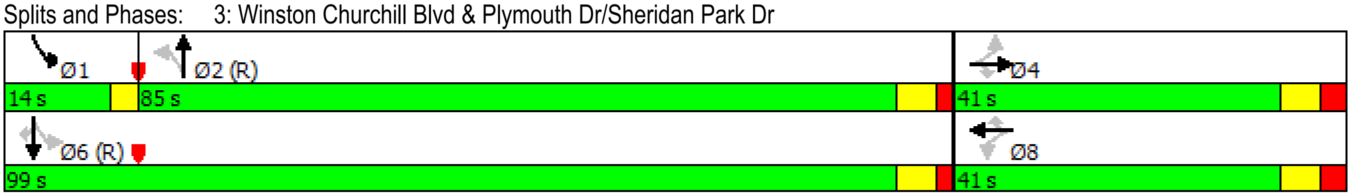
Intersection Summary			
Delay	12.8		
Level of Service	B		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	19	255	131	27	70	46	198	1278	271	1226	115
Future Volume (vph)	19	255	131	27	70	46	198	1278	271	1226	115
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA	Perm
Protected Phases		4			8			2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	36.0	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	85.0	85.0	14.0	99.0	99.0
Total Split (%)	29.3%	29.3%	29.3%	29.3%	29.3%	29.3%	60.7%	60.7%	10.0%	70.7%	70.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0	3.0	6.0	6.0
Lead/Lag							Lag	Lag	Lead		
Lead-Lag Optimize?							Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.3	25.3	25.3	25.3	25.3	25.3	79.0	79.0	104.7	101.7	101.7
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.18	0.56	0.56	0.75	0.73	0.73
v/c Ratio	0.09	0.78	0.41	0.31	0.21	0.15	0.95	0.82	0.89	0.50	0.10
Control Delay	45.5	70.0	24.2	56.5	48.4	12.2	78.6	28.9	68.7	7.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	70.0	24.2	56.5	48.4	12.2	78.6	28.9	68.7	7.8	1.4
LOS	D	E	C	E	D	B	E	C	E	A	A
Approach Delay		54.0			38.3			34.6		17.6	
Approach LOS		D			D			C		B	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 29.7 Intersection LOS: C
Intersection Capacity Utilization 95.8% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



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	8	1	260	24	153	0	55	161	227	143	17
Future Volume (vph)	1	8	1	260	24	153	0	55	161	227	143	17
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	10	1	317	29	187	0	67	196	277	174	21

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	12	533	263	472
Volume Left (vph)	1	317	0	277
Volume Right (vph)	1	187	196	21
Hadj (s)	-0.03	-0.01	-0.42	0.16
Departure Headway (s)	7.8	6.2	6.3	6.4
Degree Utilization, x	0.03	0.92	0.46	0.84
Capacity (veh/h)	412	571	545	539
Control Delay (s)	11.0	44.3	14.7	35.1
Approach Delay (s)	11.0	44.3	14.7	35.1
Approach LOS	B	E	B	E

Intersection Summary			
Delay	34.5		
Level of Service	D		
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	322	43	8	296	68	44	66	25	116	83	93
Future Volume (vph)	29	322	43	8	296	68	44	66	25	116	83	93
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	34	374	50	9	344	79	51	77	29	135	97	108

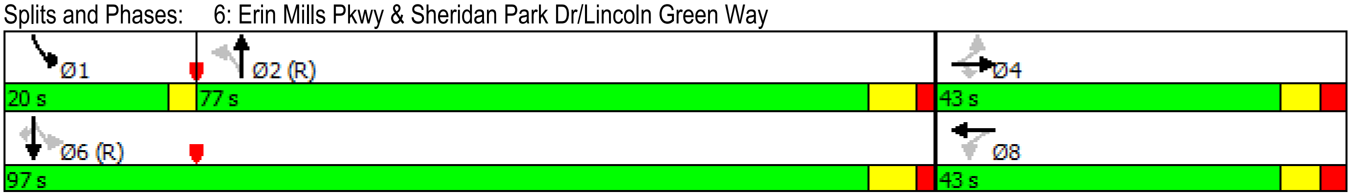
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	458	432	51	106	135	205
Volume Left (vph)	34	9	51	0	135	0
Volume Right (vph)	50	79	0	29	0	108
Hadj (s)	0.02	0.00	0.70	-0.13	0.52	-0.32
Departure Headway (s)	6.7	6.7	9.2	8.3	8.5	7.6
Degree Utilization, x	0.85	0.81	0.13	0.25	0.32	0.43
Capacity (veh/h)	458	511	367	402	406	448
Control Delay (s)	37.0	32.2	12.4	12.8	14.2	15.1
Approach Delay (s)	37.0	32.2	12.7		14.7	
Approach LOS	E	D	B		B	

Intersection Summary			
Delay	27.3		
Level of Service	D		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	164	118	165	152	66	83	2063	159	1574	207
Future Volume (vph)	164	118	165	152	66	83	2063	159	1574	207
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		4			8		2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	9.5	38.0	38.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	77.0	77.0	20.0	97.0	97.0
Total Split (%)	30.7%	30.7%	30.7%	30.7%	30.7%	55.0%	55.0%	14.3%	69.3%	69.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag						Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	24.7	24.7	24.7	24.7	24.7	85.7	85.7	105.3	101.3	101.3
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.61	0.61	0.75	0.72	0.72
v/c Ratio	0.81	0.37	0.54	0.74	0.42	0.54	0.72	0.77	0.45	0.18
Control Delay	81.8	52.2	40.0	74.3	40.6	37.2	22.6	56.0	9.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	52.2	40.0	74.3	40.6	37.2	22.6	56.0	9.1	1.7
LOS	F	D	D	E	D	D	C	E	A	A
Approach Delay		58.6			59.1		23.1		12.2	
Approach LOS		E			E		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	10	7	75	66	21	9	169	93	46	286	66
Future Volume (vph)	30	10	7	75	66	21	9	169	93	46	286	66
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	39	13	9	97	86	27	12	219	121	60	371	86

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	61	210	352	517
Volume Left (vph)	39	97	12	60
Volume Right (vph)	9	27	121	86
Hadj (s)	0.04	0.02	-0.20	-0.08
Departure Headway (s)	6.8	6.4	5.4	5.3
Degree Utilization, x	0.12	0.37	0.53	0.76
Capacity (veh/h)	440	504	624	662
Control Delay (s)	10.7	13.0	14.4	23.2
Approach Delay (s)	10.7	13.0	14.4	23.2
Approach LOS	B	B	B	C

Intersection Summary			
Delay	18.0		
Level of Service	C		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	186	17	32	351	0	0
Future Volume (Veh/h)	186	17	32	351	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	233	21	40	439	0	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			254		762	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		762	244
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1305		364	800

Direction, Lane #	EB 1	WB 1
Volume Total	254	479
Volume Left	0	40
Volume Right	21	0
cSH	1700	1305
Volume to Capacity	0.15	0.03
Queue Length 95th (m)	0.0	0.7
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	184	0	0	256	124	151
Future Volume (Veh/h)	184	0	0	256	124	151
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	245	0	0	341	165	201
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			245		586	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			245		586	245
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		65	75
cM capacity (veh/h)			1333		474	796

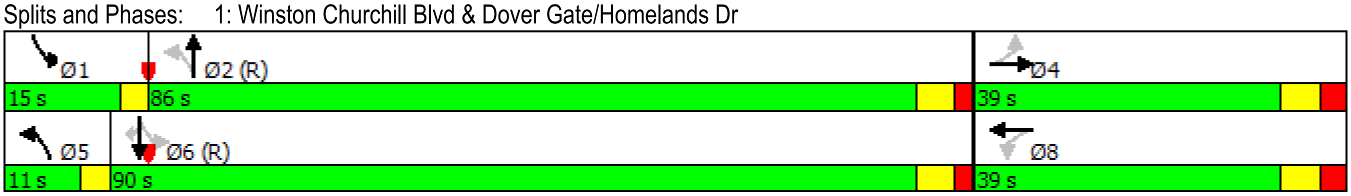
Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	245	341	165	201
Volume Left	0	0	165	0
Volume Right	0	0	0	201
cSH	1700	1700	474	796
Volume to Capacity	0.14	0.20	0.35	0.25
Queue Length 95th (m)	0.0	0.0	11.7	7.6
Control Delay (s)	0.0	0.0	16.6	11.0
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	13.5	
Approach LOS			B	

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	157	146	56	115	194	1373	92	900	65
Future Volume (vph)	157	146	56	115	194	1373	92	900	65
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	9.5	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	86.0	15.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	61.4%	10.7%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.7	28.7	28.7	28.7	98.0	86.7	98.4	87.0	87.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.70	0.62	0.70	0.62	0.62
v/c Ratio	0.81	0.89	0.83	0.46	0.51	0.75	0.49	0.44	0.07
Control Delay	80.8	71.9	120.4	47.7	8.9	10.7	16.6	15.0	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.8	71.9	120.4	47.7	8.9	10.7	16.6	15.0	3.5
LOS	F	E	F	D	A	B	B	B	A
Approach Delay		74.8		66.2		10.5		14.4	
Approach LOS		E		E		B		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 24.1	Intersection LOS: C
Intersection Capacity Utilization 92.2%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	112	27	146	183	19	111
Future Volume (vph)	112	27	146	183	19	111
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	129	31	168	210	22	128

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	160	378	150
Volume Left (vph)	129	0	22
Volume Right (vph)	31	210	0
Hadj (s)	0.05	-0.30	0.12
Departure Headway (s)	5.1	4.2	4.9
Degree Utilization, x	0.23	0.44	0.20
Capacity (veh/h)	644	824	699
Control Delay (s)	9.6	10.6	9.1
Approach Delay (s)	9.6	10.6	9.1
Approach LOS	A	B	A

Intersection Summary			
Delay	10.0		
Level of Service	B		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	74	51	374	141	219	158	204	1579	26	1159	37
Future Volume (vph)	74	51	374	141	219	158	204	1579	26	1159	37
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	9.8	50.8	50.8	21.0	79.7	9.5	68.2	68.2
Total Split (%)	29.3%	29.3%	29.3%	7.0%	36.3%	36.3%	15.0%	56.9%	6.8%	48.7%	48.7%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	21.7	21.7	21.7	34.0	31.5	31.5	97.0	89.8	86.5	77.4	77.4
Actuated g/C Ratio	0.16	0.16	0.16	0.24	0.22	0.22	0.69	0.64	0.62	0.55	0.55
v/c Ratio	0.43	0.18	0.88	0.48	0.53	0.37	0.66	0.72	0.16	0.68	0.04
Control Delay	57.8	48.7	43.7	47.6	50.6	17.6	21.3	21.9	9.6	19.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	48.7	43.7	47.6	50.6	17.6	21.3	21.9	9.6	19.7	0.1
LOS	E	D	D	D	D	B	C	C	A	B	A
Approach Delay		46.3			39.7			21.8		18.9	
Approach LOS		D			D			C		B	

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

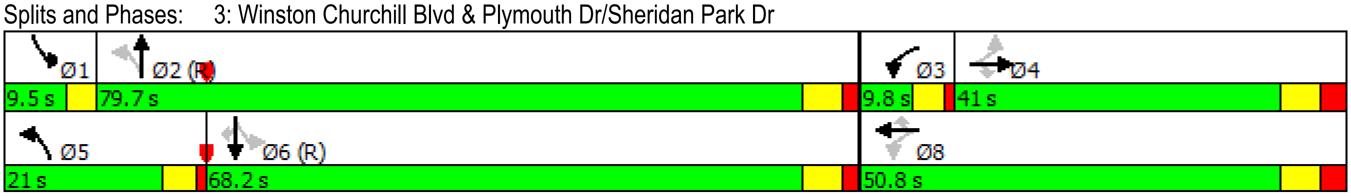
Maximum v/c Ratio: 0.88

Intersection Signal Delay: 26.2 Intersection LOS: C

Intersection Capacity Utilization 89.5% ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	21	31	0	55	2	183	1	141	231	177	37	1
Future Volume (vph)	21	31	0	55	2	183	1	141	231	177	37	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	24	36	0	64	2	213	1	164	269	206	43	1

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	60	279	434	250
Volume Left (vph)	24	64	1	206
Volume Right (vph)	0	213	269	1
Hadj (s)	0.08	-0.38	-0.35	0.19
Departure Headway (s)	6.4	5.4	5.0	5.7
Degree Utilization, x	0.11	0.42	0.60	0.40
Capacity (veh/h)	461	602	688	585
Control Delay (s)	10.1	12.3	15.0	12.5
Approach Delay (s)	10.1	12.3	15.0	12.5
Approach LOS	B	B	C	B

Intersection Summary			
Delay	13.4		
Level of Service	B		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	62	333	41	17	185	113	50	92	15	56	56	30
Future Volume (vph)	62	333	41	17	185	113	50	92	15	56	56	30
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	68	366	45	19	203	124	55	101	16	62	62	33

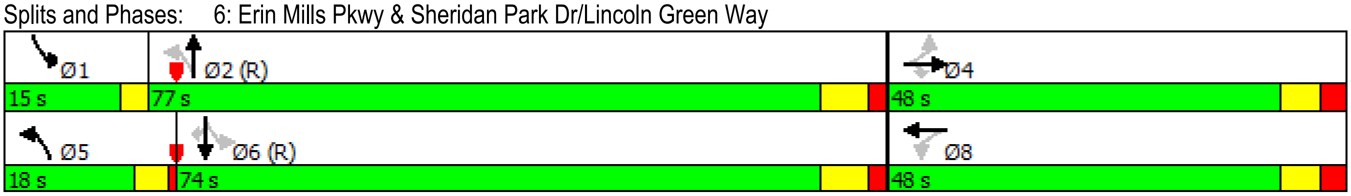
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	479	346	55	117	62	95
Volume Left (vph)	68	19	55	0	62	0
Volume Right (vph)	45	124	0	16	0	33
Hadj (s)	0.01	-0.17	0.50	-0.10	0.53	-0.24
Departure Headway (s)	5.6	5.7	7.7	7.1	7.8	7.0
Degree Utilization, x	0.75	0.54	0.12	0.23	0.13	0.19
Capacity (veh/h)	479	602	409	440	419	443
Control Delay (s)	23.2	15.2	10.6	11.1	10.8	10.4
Approach Delay (s)	23.2	15.2	10.9		10.6	
Approach LOS	C	C	B		B	

Intersection Summary			
Delay	17.3		
Level of Service	C		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	175	99	109	71	75	159	2365	95	1527	79
Future Volume (vph)	175	99	109	71	75	159	2365	95	1527	79
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	18.0	77.0	15.0	74.0	74.0
Total Split (%)	34.3%	34.3%	34.3%	34.3%	34.3%	12.9%	55.0%	10.7%	52.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	30.8	30.8	30.8	30.8	30.8	96.4	83.0	93.0	79.9	79.9
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.69	0.59	0.66	0.57	0.57
v/c Ratio	0.95	0.25	0.27	0.26	0.51	0.66	0.86	0.62	0.55	0.09
Control Delay	104.5	44.3	8.0	45.0	36.5	25.8	29.3	41.4	21.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.5	44.3	8.0	45.0	36.5	25.8	29.3	41.4	21.4	7.7
LOS	F	D	A	D	D	C	C	D	C	A
Approach Delay		61.5			38.7		29.1		21.9	
Approach LOS		E			D		C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.95	
Intersection Signal Delay: 29.6	Intersection LOS: C
Intersection Capacity Utilization 97.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	36	36	8	62	26	55	2	170	91	38	90	23
Future Volume (vph)	36	36	8	62	26	55	2	170	91	38	90	23
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	44	44	10	77	32	68	2	210	112	47	111	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	177	324	186
Volume Left (vph)	44	77	2	47
Volume Right (vph)	10	68	112	28
Hadj (s)	0.05	-0.13	-0.21	-0.04
Departure Headway (s)	5.5	5.2	4.7	5.1
Degree Utilization, x	0.15	0.26	0.42	0.26
Capacity (veh/h)	580	628	727	660
Control Delay (s)	9.5	10.0	11.2	9.8
Approach Delay (s)	9.5	10.0	11.2	9.8
Approach LOS	A	A	B	A

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	214	171	46	109	0	0
Future Volume (Veh/h)	214	171	46	109	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	285	228	61	145	0	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			513		666	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			513		666	399
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	100
cM capacity (veh/h)			1052		403	655

Direction, Lane #	EB 1	WB 1
Volume Total	513	206
Volume Left	0	61
Volume Right	228	0
cSH	1700	1052
Volume to Capacity	0.30	0.06
Queue Length 95th (m)	0.0	1.4
Control Delay (s)	0.0	2.9
Lane LOS		A
Approach Delay (s)	0.0	2.9
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	212	0	0	142	15	33
Future Volume (Veh/h)	212	0	0	142	15	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	265	0	0	178	19	41
Pedestrians					1	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			266		444	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			266		444	266
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1308		575	777

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	265	178	19	41
Volume Left	0	0	19	0
Volume Right	0	0	0	41
cSH	1700	1700	575	777
Volume to Capacity	0.16	0.10	0.03	0.05
Queue Length 95th (m)	0.0	0.0	0.8	1.3
Control Delay (s)	0.0	0.0	11.5	9.9
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.4	
Approach LOS			B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Junctions 9
ARCADY 9 - Roundabout Module
Version: 9.0.0.4211 [] © Copyright TRL Limited, 2017
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Filename: 039474_Roundabout_Analysis 85 BG.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 7/25/2017 8:50:49 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2021 Background															
1 - Homelands Dr - N	0.9	2.7	7.44	0.46	A	7.01	A	65 % [1 - Homelands Dr - N]	0.3	1.3	4.42	0.22	A	6.88	A	40 % [3 - Speakman Dr - S]
2 - Sheridan Park Dr - E	0.9	2.3	7.01	0.48	A				0.4	1.8	5.92	0.30	A			
3 - Speakman Dr - S	0.4	1.6	6.29	0.29	A				1.1	3.0	9.31	0.51	A			
4 - Sheridan Park Dr - W	0.0	0.5	6.14	0.02	A				0.1	0.5	4.27	0.06	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

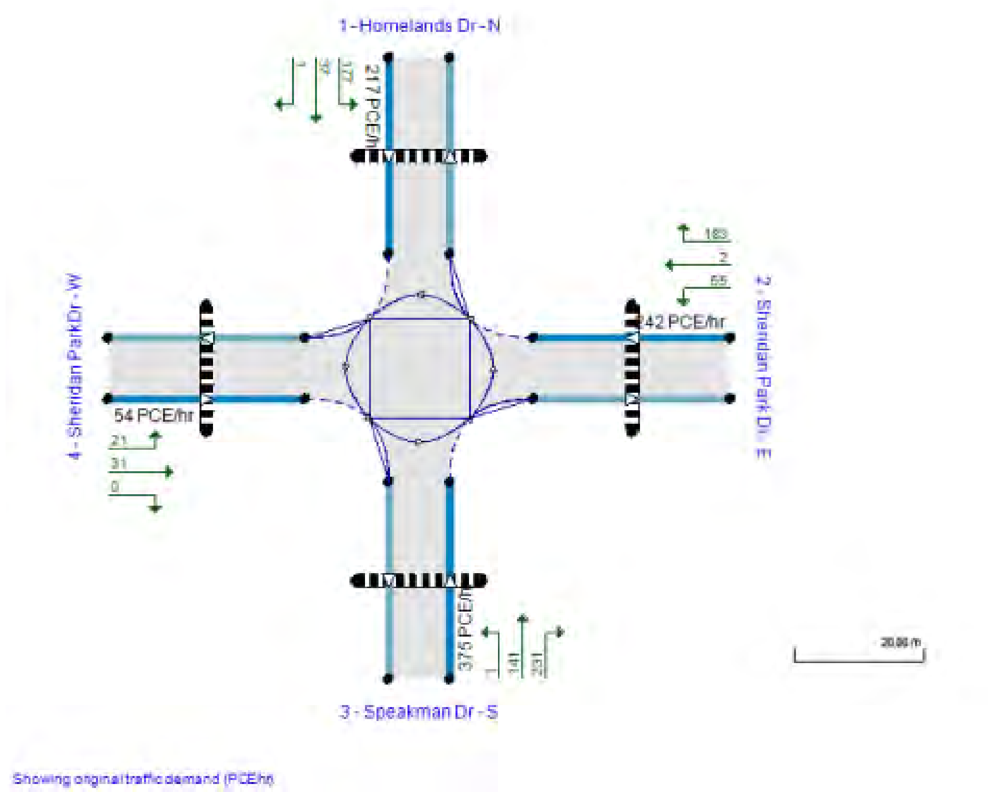
File summary

File Description

Title	Sheridan Park Drive 85 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Background	AM	ONE HOUR	08:00	09:30	15	✓
2021 Background	PM	ONE HOUR	16:00	17:30	15	✓

Single Lane Roundabout - 2021 Background, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - Homelands Dr - N	0.46	7.44	0.9	2.7	A	356.95	535.43
2 - Sheridan Park Dr - E	0.48	7.01	0.9	2.3	A	402.83	604.25
3 - Speakman Dr - S	0.29	6.29	0.4	1.6	A	200.04	300.06
4 - Sheridan Park Dr - W	0.02	6.14	0.0	0.5	A	11.01	16.52

Single Lane Roundabout - 2021 Background, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - Homelands Dr - N	0.22	4.42	0.3	1.3	A	199.12	298.68
2 - Sheridan Park Dr - E	0.30	5.92	0.4	1.8	A	222.06	333.10
3 - Speakman Dr - S	0.51	9.31	1.1	3.0	A	344.11	516.16
4 - Sheridan Park Dr - W	0.06	4.27	0.1	0.5	A	49.55	74.33

[The Difference is our People]

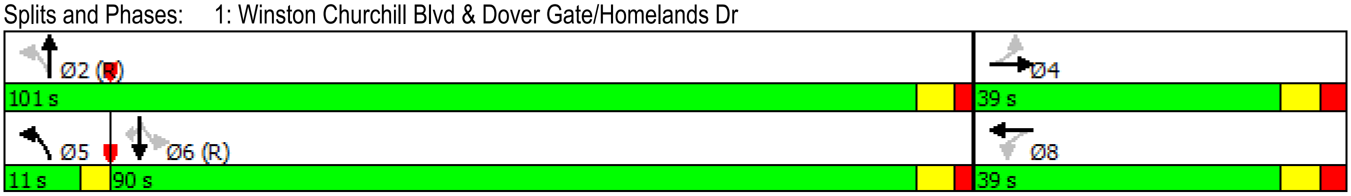
Appendix F

2021 Traffic Operations with Sheridan Park Drive Extension

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	36	48	111	88	234	1137	41	1380	121
Future Volume (vph)	36	48	111	88	234	1137	41	1380	121
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	25.0	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	101.0	90.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	72.1%	64.3%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	6.0	6.0	6.0
Lead/Lag					Lead		Lag	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	20.7	20.7	20.7	20.7	109.3	106.3	84.0	84.0	84.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.78	0.76	0.60	0.60	0.60
v/c Ratio	0.31	0.52	0.84	0.61	0.73	0.51	0.22	0.73	0.14
Control Delay	56.8	37.5	97.4	56.8	48.5	6.0	16.2	22.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	37.5	97.4	56.8	48.5	6.0	16.2	22.5	6.0
LOS	E	D	F	E	D	A	B	C	A
Approach Delay		41.6		74.3		12.9		21.0	
Approach LOS		D		E		B		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 22.6	Intersection LOS: C
Intersection Capacity Utilization 87.8%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	172	42	94	105	73	137
Future Volume (vph)	172	42	94	105	73	137
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	221	54	121	135	94	176

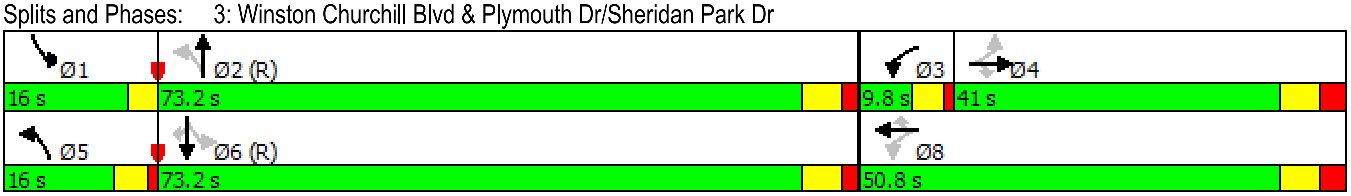
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	275	256	270
Volume Left (vph)	221	0	94
Volume Right (vph)	54	135	0
Hadj (s)	0.10	-0.17	0.19
Departure Headway (s)	5.3	4.9	5.2
Degree Utilization, x	0.41	0.35	0.39
Capacity (veh/h)	633	694	653
Control Delay (s)	11.9	10.5	11.5
Approach Delay (s)	11.9	10.5	11.5
Approach LOS	B	B	B

Intersection Summary			
Delay	11.3		
Level of Service	B		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	19	259	131	104	86	123	198	1278	291	1226	115
Future Volume (vph)	19	259	131	104	86	123	198	1278	291	1226	115
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	9.8	50.8	50.8	16.0	73.2	16.0	73.2	73.2
Total Split (%)	29.3%	29.3%	29.3%	7.0%	36.3%	36.3%	11.4%	52.3%	11.4%	52.3%	52.3%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.6	25.6	25.6	37.9	35.4	35.4	83.2	67.2	93.3	72.6	72.6
Actuated g/C Ratio	0.18	0.18	0.18	0.27	0.25	0.25	0.59	0.48	0.67	0.52	0.52
v/c Ratio	0.09	0.78	0.39	0.67	0.19	0.26	0.72	0.98	0.93	0.70	0.14
Control Delay	45.2	69.9	20.0	60.8	40.3	7.0	33.1	52.1	74.8	25.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	69.9	20.0	60.8	40.3	7.0	33.1	52.1	74.8	25.0	5.7
LOS	D	E	B	E	D	A	C	D	E	C	A
Approach Delay		52.8			34.1			49.9		32.5	
Approach LOS		D			C			D		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 150	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 42.1	Intersection LOS: D
Intersection Capacity Utilization 101.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



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	44	3	260	180	128	5	46	165	233	119	27
Future Volume (vph)	3	44	3	260	180	128	5	46	165	233	119	27
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	4	54	4	317	220	156	6	56	201	284	145	33

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	4	58	317	376	263	462
Volume Left (vph)	4	0	317	0	6	284
Volume Right (vph)	0	4	0	156	201	33
Hadj (s)	0.50	-0.05	0.50	-0.20	-0.43	0.15
Departure Headway (s)	8.8	8.3	7.5	6.8	6.5	6.5
Degree Utilization, x	0.01	0.13	0.66	0.71	0.47	0.84
Capacity (veh/h)	378	402	467	513	521	543
Control Delay (s)	10.7	11.3	23.0	23.7	15.1	34.6
Approach Delay (s)	11.3		23.4		15.1	34.6
Approach LOS	B		C		C	D

Intersection Summary			
Delay	24.9		
Level of Service	C		
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	31	362	45	8	446	68	48	66	25	119	83	106
Future Volume (vph)	31	362	45	8	446	68	48	66	25	119	83	106
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	36	421	52	9	519	79	56	77	29	138	97	123

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	36	473	9	598	56	106	138	220
Volume Left (vph)	36	0	9	0	56	0	138	0
Volume Right (vph)	0	52	0	79	0	29	0	123
Hadj (s)	0.50	0.00	0.99	0.00	0.70	-0.13	0.52	-0.34
Departure Headway (s)	7.8	7.3	8.3	7.3	9.1	8.3	8.5	7.6
Degree Utilization, x	0.08	0.96	0.02	1.21	0.14	0.25	0.32	0.47
Capacity (veh/h)	451	486	423	498	376	411	407	454
Control Delay (s)	10.2	57.0	10.3	136.1	12.4	12.8	14.3	16.0
Approach Delay (s)	53.7		134.3		12.7		15.3	
Approach LOS	F		F		B		C	

Intersection Summary			
Delay	71.1		
Level of Service	F		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	31	362	8	446	48	66	119	83
Future Volume (vph)	31	362	8	446	48	66	119	83
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	51.0	51.0	51.0	51.0	29.0	29.0	29.0	29.0
Total Split (%)	63.8%	63.8%	63.8%	63.8%	36.3%	36.3%	36.3%	36.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	19.5	19.5	19.5	19.5	10.5	10.5	10.5	10.5
Actuated g/C Ratio	0.49	0.49	0.49	0.49	0.26	0.26	0.26	0.26
v/c Ratio	0.12	0.53	0.03	0.68	0.20	0.22	0.40	0.44
Control Delay	6.8	9.3	5.9	12.1	15.8	12.4	18.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	9.3	5.9	12.1	15.8	12.4	18.2	12.4
LOS	A	A	A	B	B	B	B	B
Approach Delay		9.2		12.0		13.6		14.6
Approach LOS		A		B		B		B

Intersection Summary

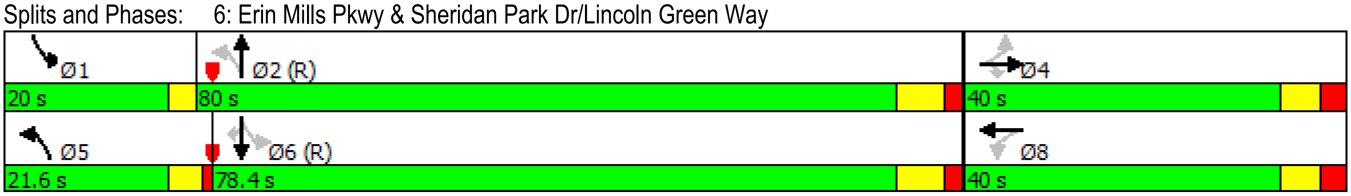
Cycle Length: 80
Actuated Cycle Length: 39.8
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 55.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: Fifth Line & Sheridan Park Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	180	120	179	152	74	156	2063	159	1574	276
Future Volume (vph)	180	120	179	152	74	156	2063	159	1574	276
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	40.0	40.0	40.0	40.0	40.0	21.6	80.0	20.0	78.4	78.4
Total Split (%)	28.6%	28.6%	28.6%	28.6%	28.6%	15.4%	57.1%	14.3%	56.0%	56.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	26.3	26.3	26.3	26.3	26.3	97.4	83.5	101.0	83.9	83.9
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.70	0.60	0.72	0.60	0.60
v/c Ratio	0.86	0.35	0.43	0.70	0.43	0.63	0.74	0.74	0.54	0.27
Control Delay	87.5	50.8	9.0	68.6	42.9	22.7	23.9	52.8	18.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	50.8	9.0	68.6	42.9	22.7	23.9	52.8	18.9	6.1
LOS	F	D	A	E	D	C	C	D	B	A
Approach Delay		48.9			56.5		23.8		19.8	
Approach LOS		D			E		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 26.4	Intersection LOS: C
Intersection Capacity Utilization 92.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	10	7	75	66	26	9	169	93	48	286	66
Future Volume (vph)	30	10	7	75	66	26	9	169	93	48	286	66
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	39	13	9	97	86	34	12	219	121	62	371	86

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	61	217	352	519
Volume Left (vph)	39	97	12	62
Volume Right (vph)	9	34	121	86
Hadj (s)	0.04	0.00	-0.20	-0.08
Departure Headway (s)	6.9	6.4	5.5	5.3
Degree Utilization, x	0.12	0.38	0.53	0.77
Capacity (veh/h)	437	505	620	658
Control Delay (s)	10.8	13.2	14.6	23.9
Approach Delay (s)	10.8	13.2	14.6	23.9
Approach LOS	B	B	B	C

Intersection Summary			
Delay	18.3		
Level of Service	C		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	186	17	32	351	0	0
Future Volume (Veh/h)	186	17	32	351	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	233	21	40	439	0	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			254		762	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			254		762	244
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1305		364	800

Direction, Lane #	EB 1	WB 1
Volume Total	254	479
Volume Left	0	40
Volume Right	21	0
cSH	1700	1305
Volume to Capacity	0.15	0.03
Queue Length 95th (m)	0.0	0.7
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	184	0	0	256	124	151
Future Volume (Veh/h)	184	0	0	256	124	151
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	245	0	0	341	165	201
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			245		586	245
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			245		586	245
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		65	75
cM capacity (veh/h)			1333		474	796

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	245	341	165	201
Volume Left	0	0	165	0
Volume Right	0	0	0	201
cSH	1700	1700	474	796
Volume to Capacity	0.14	0.20	0.35	0.25
Queue Length 95th (m)	0.0	0.0	11.7	7.6
Control Delay (s)	0.0	0.0	16.6	11.0
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	13.5	
Approach LOS			B	

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	40	778	10	170	143	10
Future Volume (Veh/h)	40	778	10	170	143	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	846	11	185	155	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	149					
pX, platoon unblocked						
vC, conflicting volume			889		250	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			889		250	43
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		79	99
cM capacity (veh/h)			762		728	1027

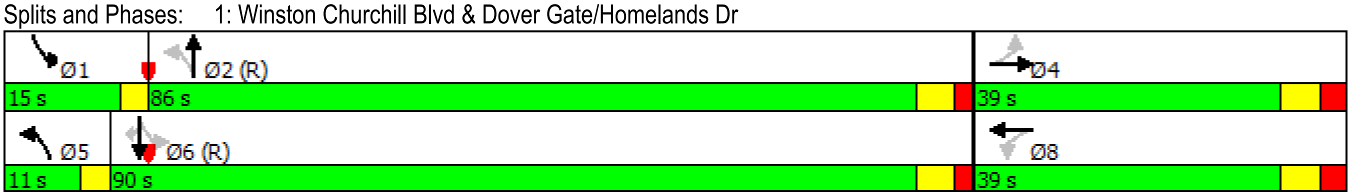
Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	43	846	196	166
Volume Left	0	0	11	155
Volume Right	0	846	0	11
cSH	1700	1700	762	742
Volume to Capacity	0.03	0.50	0.01	0.22
Queue Length 95th (m)	0.0	0.0	0.3	6.5
Control Delay (s)	0.0	0.0	0.7	11.2
Lane LOS			A	B
Approach Delay (s)	0.0		0.7	11.2
Approach LOS				B

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	157	146	56	96	194	1450	77	918	65
Future Volume (vph)	157	146	56	96	194	1450	77	918	65
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	9.5	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	11.0	86.0	15.0	90.0	90.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	7.9%	61.4%	10.7%	64.3%	64.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	28.8	28.8	28.8	28.8	98.1	86.9	98.0	86.9	86.9
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.70	0.62	0.70	0.62	0.62
v/c Ratio	0.74	0.89	0.85	0.40	0.52	0.78	0.44	0.45	0.07
Control Delay	71.9	72.1	122.8	44.8	9.5	11.0	15.3	15.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	72.1	122.8	44.8	9.5	11.0	15.3	15.2	3.6
LOS	E	E	F	D	A	B	B	B	A
Approach Delay		72.0		66.5		10.8		14.5	
Approach LOS		E		E		B		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 23.5	Intersection LOS: C
Intersection Capacity Utilization 92.8%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	103	22	122	180	18	93
Future Volume (vph)	103	22	122	180	18	93
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	118	25	140	207	21	107

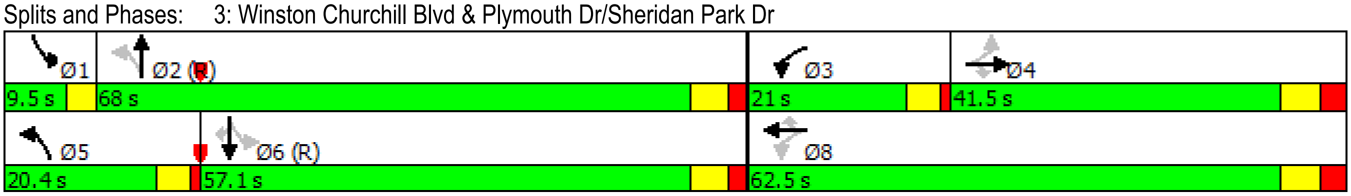
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	143	347	128
Volume Left (vph)	118	0	21
Volume Right (vph)	25	207	0
Hadj (s)	0.06	-0.33	0.12
Departure Headway (s)	5.0	4.1	4.8
Degree Utilization, x	0.20	0.40	0.17
Capacity (veh/h)	661	847	715
Control Delay (s)	9.2	9.8	8.7
Approach Delay (s)	9.2	9.8	8.7
Approach LOS	A	A	A

Intersection Summary			
Delay	9.4		
Level of Service	A		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	74	55	374	218	235	235	204	1579	46	1159	37
Future Volume (vph)	74	55	374	218	235	235	204	1579	46	1159	37
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	41.5	41.5	41.5	21.0	62.5	62.5	20.4	68.0	9.5	57.1	57.1
Total Split (%)	29.6%	29.6%	29.6%	15.0%	44.6%	44.6%	14.6%	48.6%	6.8%	40.8%	40.8%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	19.4	19.4	19.4	42.4	39.9	39.9	88.6	79.0	76.3	66.5	66.5
Actuated g/C Ratio	0.14	0.14	0.14	0.30	0.28	0.28	0.63	0.56	0.54	0.48	0.48
v/c Ratio	0.49	0.21	0.87	0.54	0.45	0.46	0.71	0.83	0.33	0.79	0.05
Control Delay	63.0	51.5	37.6	42.1	42.0	21.9	33.3	31.8	26.3	28.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	51.5	37.6	42.1	42.0	21.9	33.3	31.8	26.3	28.8	0.1
LOS	E	D	D	D	D	C	C	C	C	C	A
Approach Delay		42.9			35.2			32.0		27.9	
Approach LOS		D			D			C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 32.6	Intersection LOS: C
Intersection Capacity Utilization 90.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	68	2	55	158	153	6	119	236	181	31	10
Future Volume (vph)	19	68	2	55	158	153	6	119	236	181	31	10
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	22	79	2	64	184	178	7	138	274	210	36	12

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total (vph)	22	81	64	362	419	258
Volume Left (vph)	22	0	64	0	7	210
Volume Right (vph)	0	2	0	178	274	12
Hadj (s)	0.50	-0.02	0.50	0.10	-0.37	0.16
Departure Headway (s)	8.1	7.6	7.4	6.9	5.8	6.6
Degree Utilization, x	0.05	0.17	0.13	0.70	0.68	0.47
Capacity (veh/h)	368	396	464	496	591	496
Control Delay (s)	10.4	11.0	10.3	23.3	20.1	15.5
Approach Delay (s)	10.8		21.3		20.1	15.5
Approach LOS	B		C		C	C

Intersection Summary			
Delay	18.7		
Level of Service	C		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	64	373	43	17	332	113	54	92	15	57	56	42
Future Volume (vph)	64	373	43	17	332	113	54	92	15	57	56	42
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	70	410	47	19	365	124	59	101	16	63	62	46

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	70	457	19	489	59	117	63	108
Volume Left (vph)	70	0	19	0	59	0	63	0
Volume Right (vph)	0	47	0	124	0	16	0	46
Hadj (s)	0.50	-0.03	0.50	-0.14	0.50	-0.10	0.53	-0.30
Departure Headway (s)	7.0	6.5	7.0	6.4	8.2	7.6	8.2	7.4
Degree Utilization, x	0.14	0.82	0.04	0.87	0.13	0.25	0.14	0.22
Capacity (veh/h)	493	545	493	554	401	429	404	448
Control Delay (s)	9.9	31.2	9.1	36.4	11.2	11.8	11.4	11.3
Approach Delay (s)	28.4		35.4		11.6		11.3	
Approach LOS	D		E		B		B	

Intersection Summary			
Delay	26.7		
Level of Service	D		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	64	373	17	332	54	92	57	56
Future Volume (vph)	64	373	17	332	54	92	57	56
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	67.0	67.0	67.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	67.0%	33.0%	33.0%	33.0%	33.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	14.0	14.0	14.0	14.0	7.6	7.6	7.6	7.6
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.25	0.25	0.25	0.25
v/c Ratio	0.19	0.55	0.05	0.59	0.18	0.25	0.20	0.23
Control Delay	6.5	8.8	5.0	9.1	12.3	11.7	12.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	8.8	5.0	9.1	12.3	11.7	12.5	9.3
LOS	A	A	A	A	B	B	B	A
Approach Delay		8.4		8.9		11.9		10.5
Approach LOS		A		A		B		B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 30.9	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 50.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Fifth Line & Sheridan Park Dr

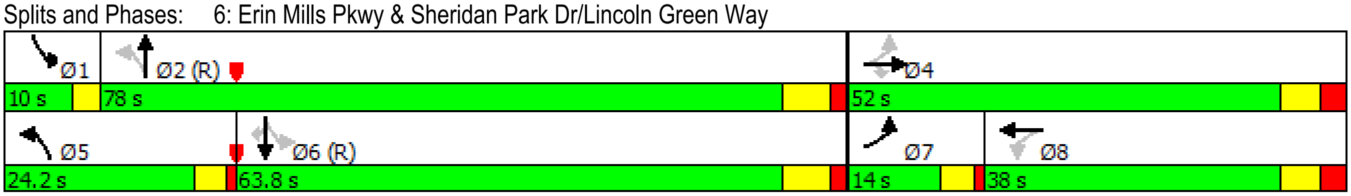
Timings
6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way

01/18/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	191	101	123	71	84	234	2365	95	1527	145
Future Volume (vph)	191	101	123	71	84	234	2365	95	1527	145
Turn Type	pm+pt	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	14.0	52.0	52.0	38.0	38.0	24.2	78.0	10.0	63.8	63.8
Total Split (%)	10.0%	37.1%	37.1%	27.1%	27.1%	17.3%	55.7%	7.1%	45.6%	45.6%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	36.5	34.0	34.0	20.0	20.0	94.5	79.7	82.1	68.9	68.9
Actuated g/C Ratio	0.26	0.24	0.24	0.14	0.14	0.68	0.57	0.59	0.49	0.49
v/c Ratio	0.93	0.23	0.28	0.41	0.79	0.77	0.90	0.61	0.64	0.18
Control Delay	91.6	42.2	7.4	59.4	62.8	44.1	32.9	43.0	29.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	42.2	7.4	59.4	62.8	44.1	32.9	43.0	29.6	6.8
LOS	F	D	A	E	E	D	C	D	C	A
Approach Delay		54.7			61.9		33.9		28.4	
Approach LOS		D			E		C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 35.2	Intersection LOS: D
Intersection Capacity Utilization 96.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	36	36	8	62	26	60	2	170	91	40	90	23
Future Volume (vph)	36	36	8	62	26	60	2	170	91	40	90	23
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	44	44	10	77	32	74	2	210	112	49	111	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	98	183	324	188
Volume Left (vph)	44	77	2	49
Volume Right (vph)	10	74	112	28
Hadj (s)	0.05	-0.15	-0.21	-0.04
Departure Headway (s)	5.5	5.2	4.7	5.1
Degree Utilization, x	0.15	0.26	0.43	0.27
Capacity (veh/h)	577	628	723	657
Control Delay (s)	9.5	10.1	11.2	9.9
Approach Delay (s)	9.5	10.1	11.2	9.9
Approach LOS	A	B	B	A

Intersection Summary			
Delay	10.4		
Level of Service	B		
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	214	171	46	109	0	0
Future Volume (Veh/h)	214	171	46	109	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	285	228	61	145	0	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			513		666	399
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			513		666	399
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	100
cM capacity (veh/h)			1052		403	655

Direction, Lane #	EB 1	WB 1
Volume Total	513	206
Volume Left	0	61
Volume Right	228	0
cSH	1700	1052
Volume to Capacity	0.30	0.06
Queue Length 95th (m)	0.0	1.4
Control Delay (s)	0.0	2.9
Lane LOS		A
Approach Delay (s)	0.0	2.9
Approach LOS		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	212	0	0	142	15	33
Future Volume (Veh/h)	212	0	0	142	15	33
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	265	0	0	178	19	41
Pedestrians					1	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			266		444	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			266		444	266
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	95
cM capacity (veh/h)			1308		575	777

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	265	178	19	41
Volume Left	0	0	19	0
Volume Right	0	0	0	41
cSH	1700	1700	575	777
Volume to Capacity	0.16	0.10	0.03	0.05
Queue Length 95th (m)	0.0	0.0	0.8	1.3
Control Delay (s)	0.0	0.0	11.5	9.9
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.4	
Approach LOS			B	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	21.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	40	102	10	170	518	10
Future Volume (Veh/h)	40	102	10	170	518	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	111	11	185	563	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148					
pX, platoon unblocked						
vC, conflicting volume			154		250	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			154		250	43
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		23	99
cM capacity (veh/h)			1426		733	1027

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	43	111	196	574
Volume Left	0	0	11	563
Volume Right	0	111	0	11
cSH	1700	1700	1426	737
Volume to Capacity	0.03	0.07	0.01	0.78
Queue Length 95th (m)	0.0	0.0	0.2	58.4
Control Delay (s)	0.0	0.0	0.5	24.9
Lane LOS			A	C
Approach Delay (s)	0.0		0.5	24.9
Approach LOS				C

Intersection Summary			
Average Delay	15.5		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 85 With Ext.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 1/9/2018 11:52:11 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2021 With Extension															
1 - East End - 1 - Homelands Dr - N	1.2	3.1	10.26	0.54	B	9.05	A	23 % [2 - West End - 4 - Sheridan Park Dr - W]	0.4	1.2	5.42	0.27	A	7.54	A	35 % [1 - East End - 3 - Speakman Dr - S]
1 - East End - 2 - Sheridan Park Dr - E	1.6	2.0	9.33	0.61	A				0.8	2.8	7.11	0.44	A			
1 - East End - 3 - Speakman Dr - S	0.5	1.9	6.81	0.31	A				1.1	3.3	10.04	0.52	B			
1 - East End - 4 - Sheridan Park Dr - W	0.1	0.5	6.45	0.09	A				0.1	0.5	4.47	0.11	A			
2 - West End - 2 - Sheridan Park Dr - E	0.2	0.7	4.43	0.19	A	6.11	A		0.3	1.4	6.18	0.24	A	6.13	A	
2 - West End - 3 - Speakman Dr - S	0.2	0.5	4.01	0.15	A				1.2	1.6	7.30	0.53	A			
2 - West End - 4 - Sheridan Park Dr - W	1.7	1.9	6.83	0.63	A				0.1	0.5	1.83	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

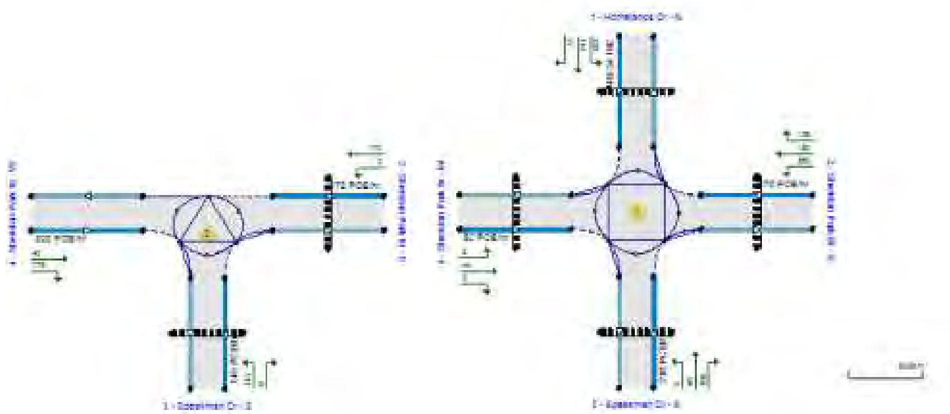
File summary

File Description

Title	Sheridan Park Drive With Extension 85 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



Showing original traffic demand (PCE/h)

The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 With Extension	AM	ONE HOUR	08:00	09:30	15	✓
2021 With Extension	PM	ONE HOUR	16:00	17:30	15	✓

Single Lane Roundabout - 2021 With Extension, AM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	2 - West End - 3 - Speakman Dr - S - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Intersection	Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - East End	1 - Homelands Dr - N	0.54	10.26	1.2	3.1	B	349.61	524.42
	2 - Sheridan Park Dr - E	0.61	9.33	1.6	2.0	A	523.04	784.56
	3 - Speakman Dr - S	0.31	6.81	0.5	1.9	A	200.04	300.06
	4 - Sheridan Park Dr - W	0.09	6.45	0.1	0.5	A	47.72	71.57
2 - West End	2 - Sheridan Park Dr - E	0.19	4.43	0.2	0.7	A	157.83	236.75
	3 - Speakman Dr - S	0.15	4.01	0.2	0.5	A	133.05	199.58
	4 - Sheridan Park Dr - W	0.63	6.83	1.7	1.9	A	752.45	1128.67

Single Lane Roundabout - 2021 With Extension, PM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	1 - East End - 2 - Sheridan Park Dr - E - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Intersection	Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - East End	1 - Homelands Dr - N	0.27	5.42	0.4	1.2	A	205.55	308.32
	2 - Sheridan Park Dr - E	0.44	7.11	0.8	2.8	A	337.68	506.52
	3 - Speakman Dr - S	0.52	10.04	1.1	3.3	B	333.10	499.64
	4 - Sheridan Park Dr - W	0.11	4.47	0.1	0.5	A	83.50	125.25
2 - West End	2 - Sheridan Park Dr - E	0.24	6.18	0.3	1.4	A	157.83	236.75
	3 - Speakman Dr - S	0.53	7.30	1.2	1.6	A	477.16	715.74
	4 - Sheridan Park Dr - W	0.07	1.83	0.1	0.5	A	132.14	198.21

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

2021 95th Percentile Queues

Appendix G

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	40	147	123	182	260	1280	54	1513	134
v/c Ratio	0.35	0.52	0.83	0.69	0.72	0.49	0.24	0.72	0.14
Control Delay	59.9	37.8	96.6	63.5	48.1	6.7	16.5	22.2	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	37.8	96.6	63.5	48.1	6.7	16.5	22.2	5.9
Queue Length 50th (m)	10.1	22.4	33.6	43.8	52.8	38.4	6.7	147.8	6.5
Queue Length 95th (m)	20.8	41.3	53.1	64.7	m#83.4	66.9	15.2	173.6	15.4
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	177	409	231	402	361	2622	226	2106	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.36	0.53	0.45	0.72	0.49	0.24	0.72	0.14

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	20	268	138	28	74	48	208	1610	285	1291	121
v/c Ratio	0.09	0.78	0.41	0.31	0.21	0.15	0.95	0.82	0.89	0.50	0.10
Control Delay	45.5	70.0	24.2	56.5	48.4	12.2	78.6	28.9	68.7	7.8	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	70.0	24.2	56.5	48.4	12.2	78.6	28.9	68.7	7.8	1.4
Queue Length 50th (m)	4.7	71.8	13.6	6.8	17.7	0.0	51.6	181.2	68.7	52.8	0.0
Queue Length 95th (m)	11.3	96.1	31.2	15.9	29.9	10.3	#106.1	214.0	#140.9	78.7	m4.1
Internal Link Dist (m)		197.7			123.8			371.2		464.2	
Turn Bay Length (m)	32.0		30.0	30.0			170.0		78.0		130.0
Base Capacity (vph)	313	461	426	123	466	418	220	1956	321	2600	1187
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.58	0.32	0.23	0.16	0.11	0.95	0.82	0.89	0.50	0.10

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	167	120	168	155	128	85	2199	162	1606	211
v/c Ratio	0.81	0.37	0.54	0.74	0.42	0.54	0.72	0.77	0.45	0.18
Control Delay	81.8	52.2	40.0	74.3	40.6	37.2	22.6	56.0	9.1	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.8	52.2	40.0	74.3	40.6	37.2	22.6	56.0	9.1	1.7
Queue Length 50th (m)	45.1	29.7	28.7	41.3	23.8	12.9	145.8	28.0	59.4	1.1
Queue Length 95th (m)	65.7	44.3	47.6	60.6	39.8	#47.3	215.8	53.0	89.5	10.0
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	302	474	426	306	426	156	3056	265	3581	1197
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.25	0.39	0.51	0.30	0.54	0.72	0.61	0.45	0.18

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	167	341	60	176	206	1627	98	957	69
v/c Ratio	0.81	0.89	0.83	0.46	0.51	0.75	0.49	0.44	0.07
Control Delay	80.8	71.9	120.4	47.7	8.9	10.7	16.6	15.0	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.8	71.9	120.4	47.7	8.9	10.7	16.6	15.0	3.5
Queue Length 50th (m)	43.3	80.5	15.7	38.3	8.3	41.6	7.8	73.1	0.9
Queue Length 95th (m)	#76.3	#125.3	#41.8	60.7	m19.2	66.6	17.3	88.3	6.9
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	230	424	80	428	403	2159	244	2182	976
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.80	0.75	0.41	0.51	0.75	0.40	0.44	0.07

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	77	53	390	147	228	165	213	1671	27	1207	39
v/c Ratio	0.43	0.18	0.88	0.48	0.53	0.37	0.66	0.72	0.16	0.68	0.04
Control Delay	57.8	48.7	43.7	47.6	50.6	17.6	21.3	21.9	9.6	19.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.8	48.7	43.7	47.6	50.6	17.6	21.3	21.9	9.6	19.7	0.1
Queue Length 50th (m)	19.5	12.8	45.2	33.5	55.6	12.9	19.3	166.8	1.6	88.3	0.0
Queue Length 95th (m)	32.2	23.0	78.2	47.1	72.8	29.5	45.5	243.6	m4.3	101.1	m0.0
Internal Link Dist (m)		197.7			123.8			371.2		464.2	
Turn Bay Length (m)	32.0		30.0	30.0			170.0		78.0		130.0
Base Capacity (vph)	281	466	559	304	600	571	359	2314	178	1785	930
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.11	0.70	0.48	0.38	0.29	0.59	0.72	0.15	0.68	0.04

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	104	115	75	214	167	2593	100	1607	83
v/c Ratio	0.95	0.25	0.27	0.26	0.51	0.66	0.86	0.62	0.55	0.09
Control Delay	104.5	44.3	8.0	45.0	36.5	25.8	29.3	41.4	21.4	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.5	44.3	8.0	45.0	36.5	25.8	29.3	41.4	21.4	7.7
Queue Length 50th (m)	50.4	23.9	0.0	17.3	36.9	14.3	211.3	11.6	99.3	3.3
Queue Length 95th (m)	#78.9	36.7	14.2	28.9	56.6	39.5	#305.7	32.5	137.8	13.2
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	259	551	523	378	534	288	2998	196	2904	918
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.19	0.22	0.20	0.40	0.58	0.86	0.51	0.55	0.09

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	40	150	123	162	260	1349	46	1533	134
v/c Ratio	0.31	0.52	0.84	0.61	0.73	0.51	0.22	0.73	0.14
Control Delay	56.8	37.5	97.4	56.8	48.5	6.0	16.2	22.5	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	37.5	97.4	56.8	48.5	6.0	16.2	22.5	6.0
Queue Length 50th (m)	10.0	22.7	33.6	36.8	53.0	39.8	5.6	151.3	6.6
Queue Length 95th (m)	20.5	41.8	53.1	56.1	m#63.2	m51.5	13.4	177.8	15.5
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	202	410	228	400	354	2627	211	2106	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.37	0.54	0.41	0.73	0.51	0.22	0.73	0.14

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	20	273	138	109	91	129	208	1627	306	1291	121
v/c Ratio	0.09	0.78	0.39	0.67	0.19	0.26	0.72	0.98	0.93	0.70	0.14
Control Delay	45.2	69.9	20.0	60.8	40.3	7.0	33.1	52.1	74.8	25.0	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	69.9	20.0	60.8	40.3	7.0	33.1	52.1	74.8	25.0	5.7
Queue Length 50th (m)	4.7	73.1	10.4	23.7	19.9	0.0	21.6	225.0	78.0	90.3	0.3
Queue Length 95th (m)	11.3	97.3	27.7	36.5	32.0	14.6	#64.8	#280.5	#157.3	118.2	m8.7
Internal Link Dist (m)		197.7			124.6			371.2		464.2	
Turn Bay Length (m)	32.0		30.0	50.0		60.0	170.0		78.0		130.0
Base Capacity (vph)	308	461	436	162	600	581	287	1668	330	1855	882
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.59	0.32	0.67	0.15	0.22	0.72	0.98	0.93	0.70	0.14

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	184	122	183	155	137	159	2199	162	1606	282
v/c Ratio	0.86	0.35	0.43	0.70	0.43	0.63	0.74	0.74	0.54	0.27
Control Delay	87.5	50.8	9.0	68.6	42.9	22.7	23.9	52.8	18.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.5	50.8	9.0	68.6	42.9	22.7	23.9	52.8	18.9	6.1
Queue Length 50th (m)	49.2	29.4	0.0	40.0	26.7	12.3	158.9	27.4	93.2	10.4
Queue Length 95th (m)	74.3	45.9	18.7	61.8	45.2	32.4	205.7	52.8	130.7	29.7
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	270	435	493	280	390	320	2980	264	2964	1034
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.28	0.37	0.55	0.35	0.50	0.74	0.61	0.54	0.27

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	36	473	9	598	56	106	138	220
v/c Ratio	0.12	0.53	0.03	0.68	0.20	0.22	0.40	0.44
Control Delay	6.8	9.3	5.9	12.1	15.8	12.4	18.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.8	9.3	5.9	12.1	15.8	12.4	18.2	12.4
Queue Length 50th (m)	1.0	16.6	0.3	23.3	2.7	3.9	6.9	6.8
Queue Length 95th (m)	4.9	42.5	1.9	59.0	11.5	15.6	23.6	25.2
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)	30.0		30.0		43.0		27.0	
Base Capacity (vph)	588	1716	607	1698	703	1190	874	1146
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.28	0.01	0.35	0.08	0.09	0.16	0.19

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	167	343	60	156	206	1682	82	977	69
v/c Ratio	0.74	0.89	0.85	0.40	0.52	0.78	0.44	0.45	0.07
Control Delay	71.9	72.1	122.8	44.8	9.5	11.0	15.3	15.2	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	72.1	122.8	44.8	9.5	11.0	15.3	15.2	3.6
Queue Length 50th (m)	42.5	81.0	15.7	32.3	9.8	50.9	6.5	75.1	1.0
Queue Length 95th (m)	69.1	#125.9	#42.2	53.2	m16.7	75.1	14.3	90.7	7.1
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	249	424	79	427	394	2170	234	2180	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.81	0.76	0.37	0.52	0.78	0.35	0.45	0.07

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	77	57	390	227	245	245	213	1688	48	1207	39
v/c Ratio	0.49	0.21	0.87	0.54	0.45	0.46	0.71	0.83	0.33	0.79	0.05
Control Delay	63.0	51.5	37.6	42.1	42.0	21.9	33.3	31.8	26.3	28.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	51.5	37.6	42.1	42.0	21.9	33.3	31.8	26.3	28.8	0.1
Queue Length 50th (m)	20.1	14.3	35.5	50.1	55.7	28.5	26.2	200.6	3.8	101.2	0.0
Queue Length 95th (m)	32.6	24.4	68.1	62.9	69.2	45.7	#64.7	#312.4	m14.1	#222.8	m0.3
Internal Link Dist (m)		197.7			123.8			371.2		464.2	
Turn Bay Length (m)	32.0		30.0	60.0		60.0	170.0		78.0		130.0
Base Capacity (vph)	281	473	589	422	761	701	320	2031	147	1534	817
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.12	0.66	0.54	0.32	0.35	0.67	0.83	0.33	0.79	0.05

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	201	106	129	75	223	246	2593	100	1607	153
v/c Ratio	0.93	0.23	0.28	0.41	0.79	0.77	0.90	0.61	0.64	0.18
Control Delay	91.6	42.2	7.4	59.4	62.8	44.1	32.9	43.0	29.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.6	42.2	7.4	59.4	62.8	44.1	32.9	43.0	29.6	6.8
Queue Length 50th (m)	46.5	23.7	0.0	19.1	47.0	40.9	225.2	11.1	120.5	4.0
Queue Length 95th (m)	#78.7	36.9	14.9	32.9	71.1	73.0	#301.8	#35.3	158.7	18.3
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	215	605	572	285	412	349	2879	163	2505	847
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.18	0.23	0.26	0.54	0.70	0.90	0.61	0.64	0.18

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	457	19	489	59	117	63	108
v/c Ratio	0.19	0.55	0.05	0.59	0.18	0.25	0.20	0.23
Control Delay	6.5	8.8	5.0	9.1	12.3	11.7	12.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	8.8	5.0	9.1	12.3	11.7	12.5	9.3
Queue Length 50th (m)	1.7	13.0	0.4	13.4	2.2	4.1	2.4	2.7
Queue Length 95th (m)	6.4	31.4	2.4	33.2	9.4	14.7	9.9	11.9
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)					43.0		27.0	
Base Capacity (vph)	816	1841	873	1808	1181	1687	1153	1609
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.25	0.02	0.27	0.05	0.07	0.05	0.07

Intersection Summary

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 85 BG.j9
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Report generation date: 7/25/2017 8:50:49 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2021 Background															
1 - Homelands Dr - N	0.9	2.7	7.44	0.46	A	7.01	A	65 % [1 - Homelands Dr - N]	0.3	1.3	4.42	0.22	A	6.88	A	40 % [3 - Speakman Dr - S]
2 - Sheridan Park Dr - E	0.9	2.3	7.01	0.48	A				0.4	1.8	5.92	0.30	A			
3 - Speakman Dr - S	0.4	1.6	6.29	0.29	A				1.1	3.0	9.31	0.51	A			
4 - Sheridan Park Dr - W	0.0	0.5	6.14	0.02	A				0.1	0.5	4.27	0.06	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

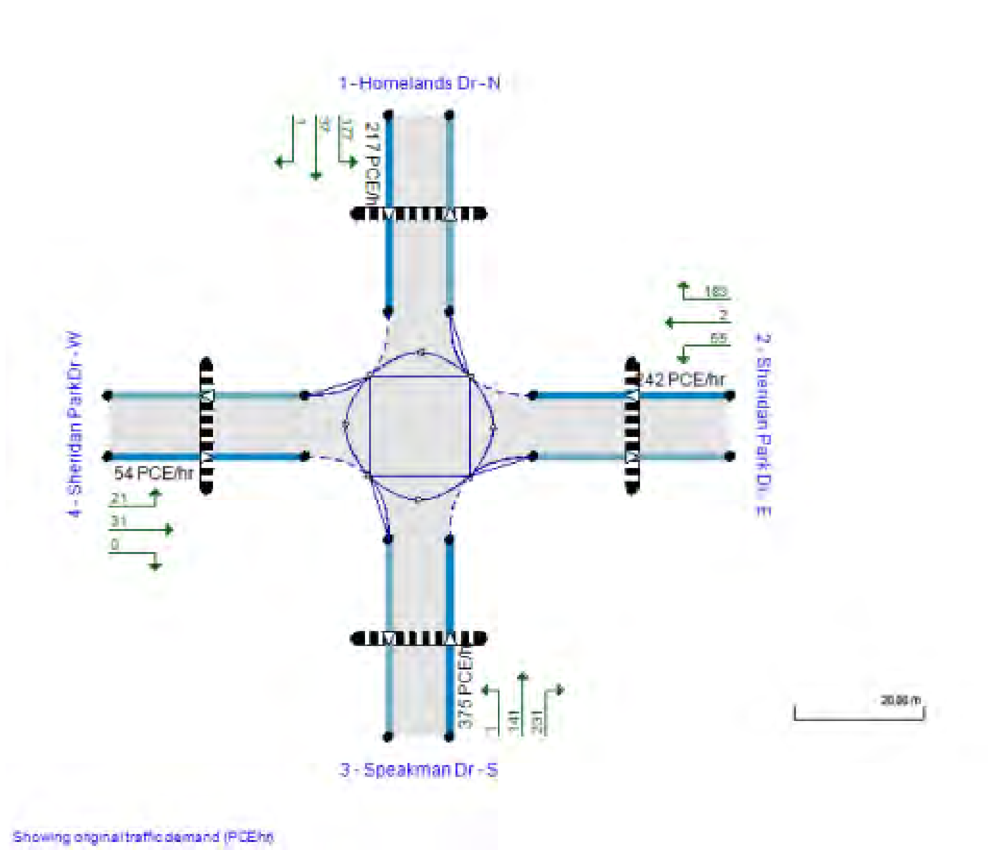
File summary

File Description

Title	Sheridan Park Drive 85 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Background	AM	ONE HOUR	08:00	09:30	15	✓
2021 Background	PM	ONE HOUR	16:00	17:30	15	✓

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 85 With Ext.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 1/9/2018 11:52:11 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2021 With Extension															
1 - East End - 1 - Homelands Dr - N	1.2	3.1	10.26	0.54	B	9.05	A	23 % [2 - West End - 4 - Sheridan Park Dr - W]	0.4	1.2	5.42	0.27	A	7.54	A	35 % [1 - East End - 3 - Speakman Dr - S]
1 - East End - 2 - Sheridan Park Dr - E	1.6	2.0	9.33	0.61	A				0.8	2.8	7.11	0.44	A			
1 - East End - 3 - Speakman Dr - S	0.5	1.9	6.81	0.31	A				1.1	3.3	10.04	0.52	B			
1 - East End - 4 - Sheridan Park Dr - W	0.1	0.5	6.45	0.09	A				0.1	0.5	4.47	0.11	A			
2 - West End - 2 - Sheridan Park Dr - E	0.2	0.7	4.43	0.19	A	6.11	A		0.3	1.4	6.18	0.24	A	6.13	A	
2 - West End - 3 - Speakman Dr - S	0.2	0.5	4.01	0.15	A				1.2	1.6	7.30	0.53	A			
2 - West End - 4 - Sheridan Park Dr - W	1.7	1.9	6.83	0.63	A				0.1	0.5	1.83	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

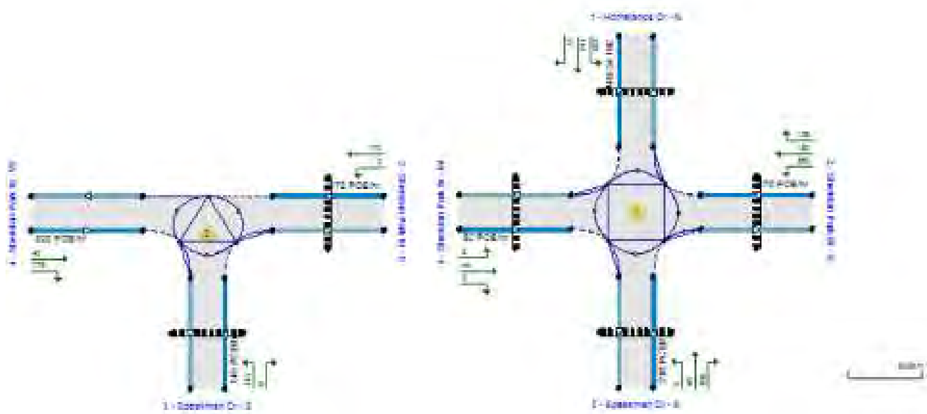
File summary

File Description

Title	Sheridan Park Drive With Extension 85 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



Showing original traffic demand (PCE/h)

The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 With Extension	AM	ONE HOUR	08:00	09:30	15	✓
2021 With Extension	PM	ONE HOUR	16:00	17:30	15	✓

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

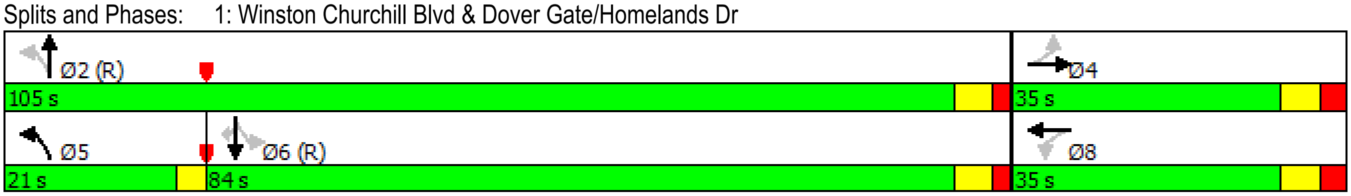
Appendix H

2031 Traffic Operations Without Sheridan Park Drive Extension

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	44	48	135	120	234	1293	56	1660	121
Future Volume (vph)	44	48	135	120	234	1293	56	1660	121
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	25.0	25.0	25.0
Total Split (s)	35.0	35.0	35.0	35.0	21.0	105.0	84.0	84.0	84.0
Total Split (%)	25.0%	25.0%	25.0%	25.0%	15.0%	75.0%	60.0%	60.0%	60.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	6.0	6.0	6.0
Lead/Lag					Lead		Lag	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	24.3	24.3	24.3	24.3	105.7	102.7	83.0	83.0	83.0
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.76	0.73	0.59	0.59	0.59
v/c Ratio	0.40	0.51	0.90	0.69	0.86	0.43	0.39	0.62	0.14
Control Delay	59.7	35.0	104.1	60.6	72.5	5.4	26.8	20.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	35.0	104.1	60.6	72.5	5.4	26.8	20.3	6.6
LOS	E	D	F	E	E	A	C	C	A
Approach Delay		40.6		78.6		15.0		19.6	
Approach LOS		D		E		B		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 23.6	Intersection LOS: C
Intersection Capacity Utilization 84.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	221	57	128	108	77	186
Future Volume (vph)	221	57	128	108	77	186
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	283	73	164	138	99	238

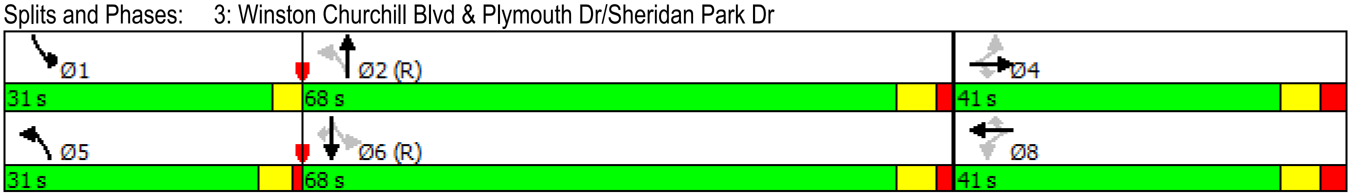
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	356	302	337
Volume Left (vph)	283	0	99
Volume Right (vph)	73	138	0
Hadj (s)	0.09	-0.11	0.18
Departure Headway (s)	5.7	5.5	5.7
Degree Utilization, x	0.57	0.46	0.53
Capacity (veh/h)	595	616	604
Control Delay (s)	15.9	13.0	14.9
Approach Delay (s)	15.9	13.0	14.9
Approach LOS	C	B	B

Intersection Summary			
Delay	14.7		
Level of Service	B		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	289	160	33	79	56	225	1558	307	1495	131
Future Volume (vph)	24	289	160	33	79	56	225	1558	307	1495	131
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	31.0	68.0	31.0	68.0	68.0
Total Split (%)	29.3%	29.3%	29.3%	29.3%	29.3%	29.3%	22.1%	48.6%	22.1%	48.6%	48.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag							Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.5	27.5	27.5	27.5	27.5	27.5	92.3	71.8	101.9	76.0	76.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.66	0.51	0.73	0.54	0.54
v/c Ratio	0.10	0.81	0.45	0.42	0.22	0.17	0.70	0.76	0.87	0.56	0.15
Control Delay	44.3	70.6	25.0	62.7	46.9	10.9	33.8	30.7	64.0	21.1	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	70.6	25.0	62.7	46.9	10.9	33.8	30.7	64.0	21.1	5.1
LOS	D	E	C	E	D	B	C	C	E	C	A
Approach Delay		53.9			38.1			31.0		26.8	
Approach LOS		D			D			C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 31.8	Intersection LOS: C
Intersection Capacity Utilization 95.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	29	374	43	8	344	68	51	66	29	135	83	108
Future Volume (vph)	29	374	43	8	344	68	51	66	29	135	83	108
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	34	435	50	9	400	79	59	77	34	157	97	126

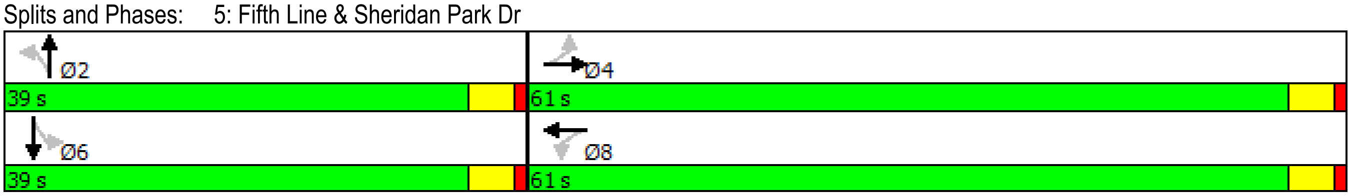
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	34	485	9	479	59	111	157	223
Volume Left (vph)	34	0	9	0	59	0	157	0
Volume Right (vph)	0	50	0	79	0	34	0	126
Hadj (s)	0.50	0.01	0.99	-0.02	0.70	-0.16	0.52	-0.34
Departure Headway (s)	7.9	7.4	8.4	7.4	9.3	8.5	8.6	7.7
Degree Utilization, x	0.07	1.00	0.02	0.99	0.15	0.26	0.38	0.48
Capacity (veh/h)	444	485	418	479	374	410	406	452
Control Delay (s)	10.3	66.5	10.4	63.8	12.8	13.2	15.5	16.5
Approach Delay (s)	62.8		62.8		13.1		16.1	
Approach LOS	F		F		B		C	

Intersection Summary			
Delay	46.0		
Level of Service	E		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	29	374	8	344	51	66	135	83
Future Volume (vph)	29	374	8	344	51	66	135	83
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	61.0	61.0	61.0	61.0	39.0	39.0	39.0	39.0
Total Split (%)	61.0%	61.0%	61.0%	61.0%	39.0%	39.0%	39.0%	39.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	16.4	16.4	16.4	16.4	10.8	10.8	10.8	10.8
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.29	0.29	0.29	0.29
v/c Ratio	0.10	0.60	0.03	0.60	0.19	0.21	0.41	0.41
Control Delay	7.1	11.4	6.6	11.4	13.1	10.4	15.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	11.4	6.6	11.4	13.1	10.4	15.7	10.9
LOS	A	B	A	B	B	B	B	B
Approach Delay		11.1		11.3		11.3		12.9
Approach LOS		B		B		B		B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 36.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

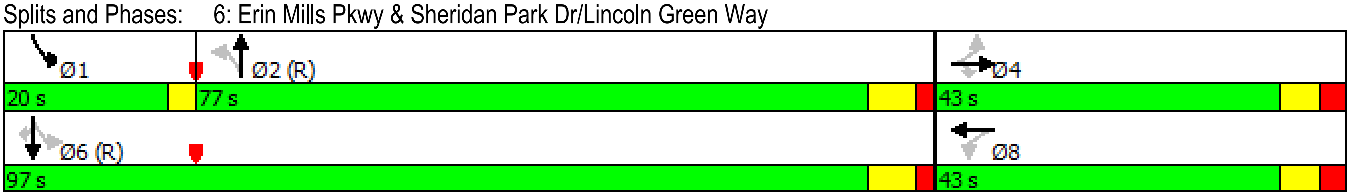
Splits and Phases: 5: Fifth Line & Sheridan Park Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	162	118	163	150	76	96	2042	159	1558	240
Future Volume (vph)	162	118	163	150	76	96	2042	159	1558	240
Turn Type	Perm	NA	Perm	Perm	NA	Perm	NA	pm+pt	NA	Perm
Protected Phases		4			8		2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	2	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	9.5	38.0	38.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	77.0	77.0	20.0	97.0	97.0
Total Split (%)	30.7%	30.7%	30.7%	30.7%	30.7%	55.0%	55.0%	14.3%	69.3%	69.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag						Lag	Lag	Lead		
Lead-Lag Optimize?						Yes	Yes	Yes		
Recall Mode	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	25.0	25.0	25.0	25.0	25.0	85.5	85.5	105.0	101.0	101.0
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.61	0.61	0.75	0.72	0.72
v/c Ratio	0.82	0.36	0.53	0.72	0.46	0.62	0.71	0.78	0.45	0.20
Control Delay	84.4	51.7	39.1	71.7	44.4	42.4	22.5	57.0	9.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	51.7	39.1	71.7	44.4	42.4	22.5	57.0	9.2	1.7
LOS	F	D	D	E	D	D	C	E	A	A
Approach Delay		59.0			58.7		23.4		12.2	
Approach LOS		E			E		C		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 91.7%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	34	12	8	82	74	23	10	187	106	52	316	74
Future Volume (vph)	34	12	8	82	74	23	10	187	106	52	316	74
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	44	16	10	106	96	30	13	243	138	68	410	96

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	70	232	394	574
Volume Left (vph)	44	106	13	68
Volume Right (vph)	10	30	138	96
Hadj (s)	0.04	0.01	-0.20	-0.08
Departure Headway (s)	7.4	6.8	5.8	5.6
Degree Utilization, x	0.14	0.44	0.63	0.90
Capacity (veh/h)	417	498	589	574
Control Delay (s)	11.7	14.9	18.3	38.3
Approach Delay (s)	11.7	14.9	18.3	38.3
Approach LOS	B	B	C	E

Intersection Summary			
Delay	26.3		
Level of Service	D		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	205	19	35	388	0	0
Future Volume (Veh/h)	205	19	35	388	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	256	24	44	485	0	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			280		841	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			280		841	268
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1277		326	776

Direction, Lane #	EB 1	WB 1
Volume Total	280	529
Volume Left	0	44
Volume Right	24	0
cSH	1700	1277
Volume to Capacity	0.16	0.03
Queue Length 95th (m)	0.0	0.8
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	203	0	0	283	137	167
Future Volume (Veh/h)	203	0	0	283	137	167
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	271	0	0	377	183	223
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		648	271
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		648	271
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		58	71
cM capacity (veh/h)			1304		437	770

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	271	377	183	223
Volume Left	0	0	183	0
Volume Right	0	0	0	223
cSH	1700	1700	437	770
Volume to Capacity	0.16	0.22	0.42	0.29
Queue Length 95th (m)	0.0	0.0	15.5	9.1
Control Delay (s)	0.0	0.0	19.1	11.6
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	15.0	
Approach LOS			B	

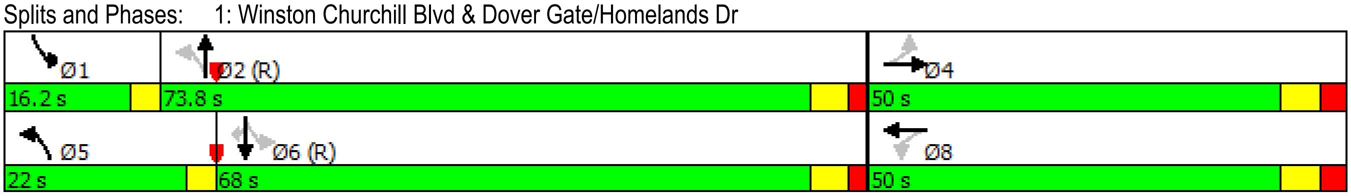
Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	191	146	69	130	194	1674	104	1098	65
Future Volume (vph)	191	146	69	130	194	1674	104	1098	65
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	9.5	25.0	25.0
Total Split (s)	50.0	50.0	50.0	50.0	22.0	73.8	16.2	68.0	68.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	15.7%	52.7%	11.6%	48.6%	48.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	33.7	33.7	33.7	33.7	95.3	80.6	91.2	78.5	78.5
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.68	0.58	0.65	0.56	0.56
v/c Ratio	0.88	0.85	0.86	0.46	0.58	0.68	0.60	0.41	0.08
Control Delay	85.8	60.0	113.9	43.1	25.0	12.2	34.4	19.6	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.8	60.0	113.9	43.1	25.0	12.2	34.4	19.6	3.6
LOS	F	E	F	D	C	B	C	B	A
Approach Delay		69.0		61.7		13.4		20.0	
Approach LOS		E		E		B		C	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 25.9 Intersection LOS: C
Intersection Capacity Utilization 88.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	127	30	165	188	19	125
Future Volume (vph)	127	30	165	188	19	125
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	146	34	190	216	22	144

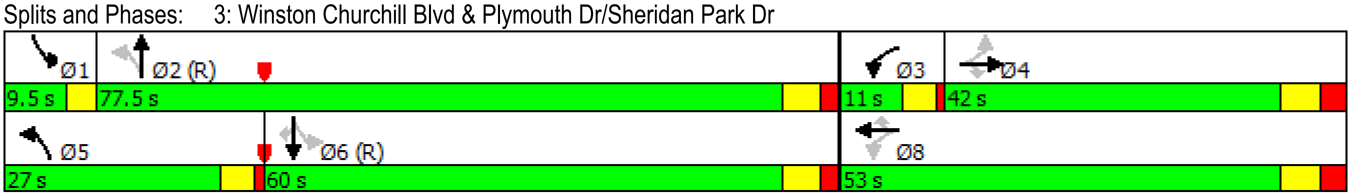
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	180	406	166
Volume Left (vph)	146	0	22
Volume Right (vph)	34	216	0
Hadj (s)	0.05	-0.29	0.11
Departure Headway (s)	5.2	4.3	5.0
Degree Utilization, x	0.26	0.49	0.23
Capacity (veh/h)	627	803	682
Control Delay (s)	10.1	11.4	9.5
Approach Delay (s)	10.1	11.4	9.5
Approach LOS	B	B	A

Intersection Summary			
Delay	10.7		
Level of Service	B		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	90	58	456	173	248	193	231	1925	30	1413	42
Future Volume (vph)	90	58	456	173	248	193	231	1925	30	1413	42
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	42.0	42.0	42.0	11.0	53.0	53.0	27.0	77.5	9.5	60.0	60.0
Total Split (%)	30.0%	30.0%	30.0%	7.9%	37.9%	37.9%	19.3%	55.4%	6.8%	42.9%	42.9%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	24.0	24.0	24.0	37.5	35.0	35.0	93.5	86.3	79.0	69.8	69.8
Actuated g/C Ratio	0.17	0.17	0.17	0.27	0.25	0.25	0.67	0.62	0.56	0.50	0.50
v/c Ratio	0.49	0.18	0.91	0.53	0.54	0.42	0.74	0.64	0.21	0.64	0.05
Control Delay	58.3	47.1	42.2	46.3	48.2	22.1	36.3	20.5	17.6	21.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	47.1	42.2	46.3	48.2	22.1	36.3	20.5	17.6	21.3	0.1
LOS	E	D	D	D	D	C	D	C	B	C	A
Approach Delay		45.0			39.5			22.1		20.6	
Approach LOS		D			D			C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 26.7	Intersection LOS: C
Intersection Capacity Utilization 84.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	63	386	41	17	215	113	58	92	18	65	56	35
Future Volume (vph)	63	386	41	17	215	113	58	92	18	65	56	35
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	69	424	45	19	236	124	64	101	20	71	62	38

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	69	469	19	360	64	121	71	100
Volume Left (vph)	69	0	19	0	64	0	71	0
Volume Right (vph)	0	45	0	124	0	20	0	38
Hadj (s)	0.50	-0.03	0.50	-0.21	0.50	-0.12	0.53	-0.27
Departure Headway (s)	6.7	6.2	7.0	6.3	7.8	7.2	7.9	7.1
Degree Utilization, x	0.13	0.81	0.04	0.63	0.14	0.24	0.16	0.20
Capacity (veh/h)	511	565	491	548	428	462	422	467
Control Delay (s)	9.5	29.2	9.0	17.9	10.9	11.3	11.1	10.6
Approach Delay (s)	26.7		17.5		11.1		10.8	
Approach LOS	D		C		B		B	

Intersection Summary			
Delay	19.5		
Level of Service	C		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		

Timings
5: Fifth Line & Sheridan Park Dr

01/12/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	63	386	17	215	58	92	65	56
Future Volume (vph)	63	386	17	215	58	92	65	56
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	66.0	66.0	66.0	66.0	34.0	34.0	34.0	34.0
Total Split (%)	66.0%	66.0%	66.0%	66.0%	34.0%	34.0%	34.0%	34.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	13.8	13.8	13.8	13.8	7.7	7.7	7.7	7.7
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.25	0.25	0.25	0.25
v/c Ratio	0.15	0.57	0.05	0.44	0.19	0.25	0.22	0.21
Control Delay	5.9	9.2	5.2	6.8	12.2	11.4	12.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	9.2	5.2	6.8	12.2	11.4	12.6	9.3
LOS	A	A	A	A	B	B	B	A
Approach Delay		8.8		6.8		11.7		10.6
Approach LOS		A		A		B		B

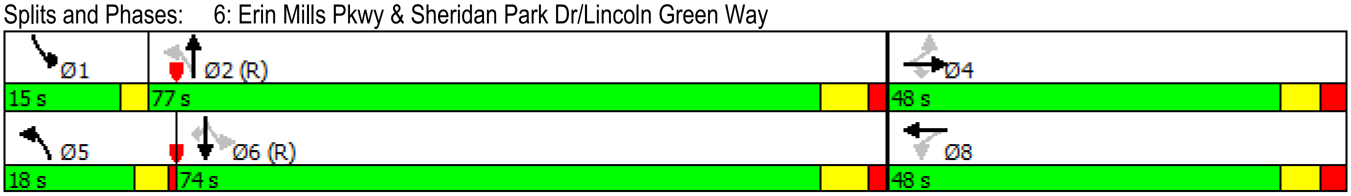
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 30.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 49.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Fifth Line & Sheridan Park Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	174	99	108	70	88	185	2342	95	1511	91
Future Volume (vph)	174	99	108	70	88	185	2342	95	1511	91
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	4	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	38.0	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	48.0	48.0	48.0	48.0	48.0	18.0	77.0	15.0	74.0	74.0
Total Split (%)	34.3%	34.3%	34.3%	34.3%	34.3%	12.9%	55.0%	10.7%	52.9%	52.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	31.4	31.4	31.4	31.4	31.4	96.6	82.5	90.8	77.7	77.7
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22	0.69	0.59	0.65	0.56	0.56
v/c Ratio	0.97	0.25	0.27	0.26	0.54	0.72	0.86	0.61	0.56	0.11
Control Delay	110.3	43.8	7.9	44.3	40.1	33.0	29.5	41.0	22.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.3	43.8	7.9	44.3	40.1	33.0	29.5	41.0	22.7	8.1
LOS	F	D	A	D	D	C	C	D	C	A
Approach Delay		63.9			41.1		29.7		23.0	
Approach LOS		E			D		C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 30.7	Intersection LOS: C
Intersection Capacity Utilization 97.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	39	41	9	68	29	60	2	188	103	43	100	26
Future Volume (vph)	39	41	9	68	29	60	2	188	103	43	100	26
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	48	51	11	84	36	74	2	232	127	53	123	32

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	194	361	208
Volume Left (vph)	48	84	2	53
Volume Right (vph)	11	74	127	32
Hadj (s)	0.05	-0.13	-0.21	-0.04
Departure Headway (s)	5.8	5.4	4.9	5.3
Degree Utilization, x	0.18	0.29	0.49	0.30
Capacity (veh/h)	547	599	692	634
Control Delay (s)	10.0	10.7	12.5	10.5
Approach Delay (s)	10.0	10.7	12.5	10.5
Approach LOS	A	B	B	B

Intersection Summary			
Delay	11.3		
Level of Service	B		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	189	51	121	0	0
Future Volume (Veh/h)	237	189	51	121	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	316	252	68	161	0	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			568		739	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			568		739	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			1004		361	620

Direction, Lane #	EB 1	WB 1
Volume Total	568	229
Volume Left	0	68
Volume Right	252	0
cSH	1700	1004
Volume to Capacity	0.33	0.07
Queue Length 95th (m)	0.0	1.7
Control Delay (s)	0.0	3.1
Lane LOS		A
Approach Delay (s)	0.0	3.1
Approach LOS		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↰	↱
Traffic Volume (veh/h)	235	0	0	157	16	36
Future Volume (Veh/h)	235	0	0	157	16	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	294	0	0	196	20	45
Pedestrians					1	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			295		491	295
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			295		491	295
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	94
cM capacity (veh/h)			1277		540	748

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	294	196	20	45
Volume Left	0	0	20	0
Volume Right	0	0	0	45
cSH	1700	1700	540	748
Volume to Capacity	0.17	0.12	0.04	0.06
Queue Length 95th (m)	0.0	0.0	0.9	1.5
Control Delay (s)	0.0	0.0	11.9	10.1
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	10.7	
Approach LOS			B	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 90 BG.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 7/25/2017 9:10:16 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2031 Background															
1 - Homelands Dr - N	1.0	2.3	7.75	0.51	A	7.27	A	54 % [1 - Homelands Dr - N]	0.3	1.4	4.29	0.24	A	7.59	A	27 % [3 - Speakman Dr - S]
2 - Sheridan Park Dr - E	1.1	1.9	7.17	0.51	A				0.5	2.2	6.01	0.33	A			
3 - Speakman Dr - S	0.5	2.3	6.65	0.33	A				1.4	3.4	11.00	0.59	B			
4 - Sheridan Park Dr - W	0.0	0.5	6.20	0.02	A				0.1	0.5	4.12	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

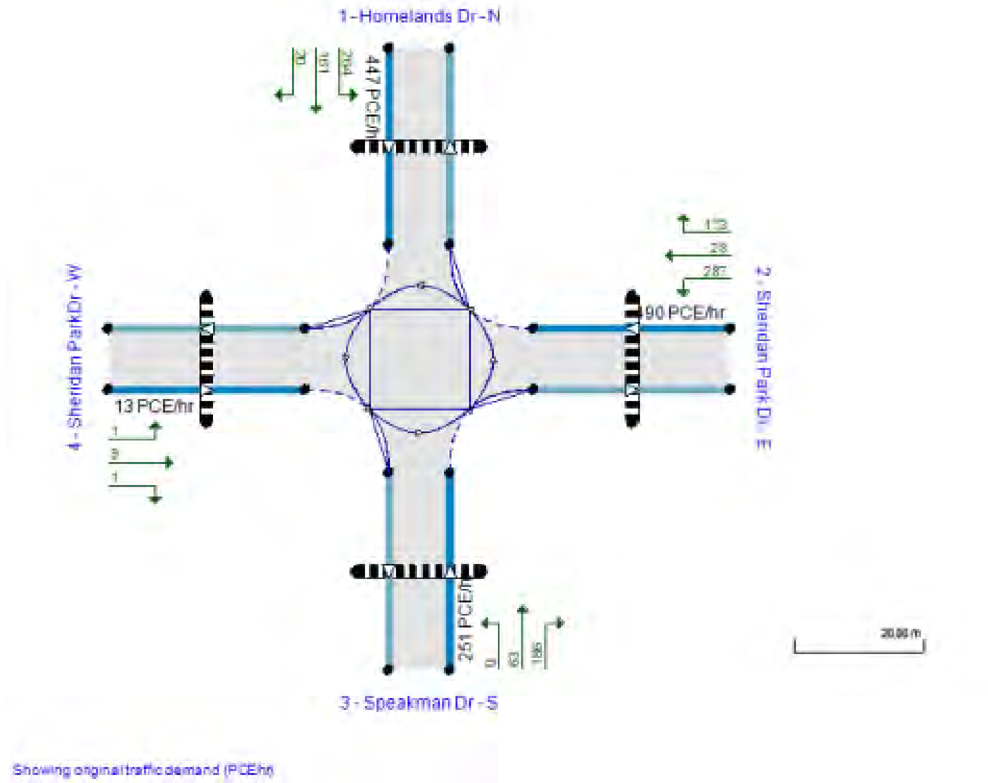
File summary

File Description

Title	Sheridan Park Drive 90 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2031 Background	AM	ONE HOUR	08:00	09:30	15	✓
2031 Background	PM	ONE HOUR	16:00	17:30	15	✓

Single Lane Roundabout - 2031 Background, AM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	2 - Sheridan Park Dr - E - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - Homelands Dr - N	0.51	7.75	1.0	2.3	A	410.18	615.26
2 - Sheridan Park Dr - E	0.51	7.17	1.1	1.9	A	449.63	674.45
3 - Speakman Dr - S	0.33	6.65	0.5	2.3	A	230.32	345.48
4 - Sheridan Park Dr - W	0.02	6.20	0.0	0.5	A	11.93	17.89

Single Lane Roundabout - 2031 Background, PM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	2 - Sheridan Park Dr - E - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - Homelands Dr - N	0.24	4.29	0.3	1.4	A	229.40	344.11
2 - Sheridan Park Dr - E	0.33	6.01	0.5	2.2	A	249.59	374.39
3 - Speakman Dr - S	0.59	11.00	1.4	3.4	B	395.49	593.24
4 - Sheridan Park Dr - W	0.07	4.12	0.1	0.5	A	55.97	83.96

BURNSIDE
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Appendix I

2031 Intersection Operations With Sheridan Park Drive Extension

Timings

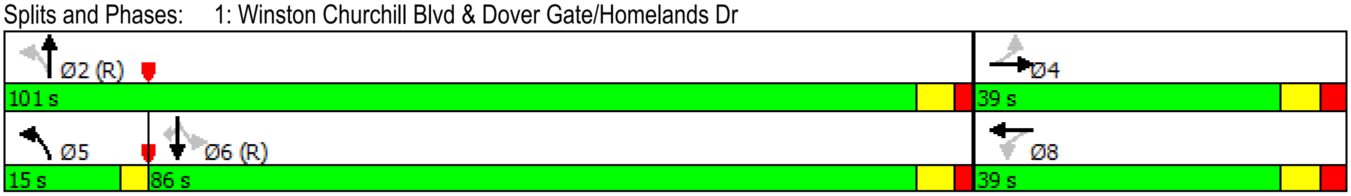
1: Winston Churchill Blvd & Dover Gate/Homelands Dr

12/19/2017

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	44	48	135	89	234	1347	41	1673	121
Future Volume (vph)	44	48	135	89	234	1347	41	1673	121
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA	Perm
Protected Phases		4		8	5	2		6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	6	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	25.0	25.0	25.0
Total Split (s)	39.0	39.0	39.0	39.0	15.0	101.0	86.0	86.0	86.0
Total Split (%)	27.9%	27.9%	27.9%	27.9%	10.7%	72.1%	61.4%	61.4%	61.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	4.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	6.0	6.0	6.0
Lead/Lag					Lead		Lag	Lag	Lag
Lead-Lag Optimize?					Yes		Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	24.6	24.6	24.6	24.6	105.4	102.4	80.3	80.3	80.3
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.75	0.73	0.57	0.57	0.57
v/c Ratio	0.32	0.51	0.90	0.57	0.80	0.43	0.31	0.64	0.15
Control Delay	53.7	33.2	103.0	50.8	67.6	3.4	22.9	21.5	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	33.2	103.0	50.8	67.6	3.4	22.9	21.5	6.1
LOS	D	C	F	D	E	A	C	C	A
Approach Delay		37.7		74.7		12.5		20.5	
Approach LOS		D		E		B		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 22.0	Intersection LOS: C
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	169	42	95	110	77	138
Future Volume (vph)	169	42	95	110	77	138
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	217	54	122	141	99	177

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	271	263	276
Volume Left (vph)	217	0	99
Volume Right (vph)	54	141	0
Hadj (s)	0.09	-0.18	0.19
Departure Headway (s)	5.3	4.9	5.2
Degree Utilization, x	0.40	0.36	0.40
Capacity (veh/h)	629	696	653
Control Delay (s)	11.9	10.6	11.7
Approach Delay (s)	11.9	10.6	11.7
Approach LOS	B	B	B

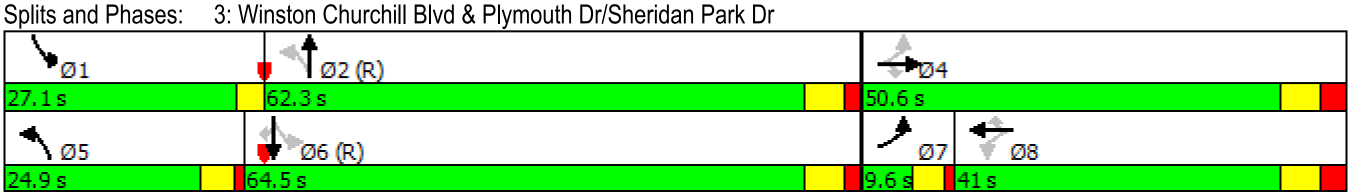
Intersection Summary			
Delay	11.4		
Level of Service	B		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	24	292	160	87	91	110	225	1558	322	1495	131
Future Volume (vph)	24	292	160	87	91	110	225	1558	322	1495	131
Turn Type	pm+pt	NA	Perm	Perm	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4			8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	7	4	4	8	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	41.0	41.0	41.0	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	9.6	50.6	50.6	41.0	41.0	41.0	24.9	62.3	27.1	64.5	64.5
Total Split (%)	6.9%	36.1%	36.1%	29.3%	29.3%	29.3%	17.8%	44.5%	19.4%	46.1%	46.1%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	31.6	29.1	29.1	23.3	23.3	23.3	87.8	67.5	100.8	74.6	74.6
Actuated g/C Ratio	0.23	0.21	0.21	0.17	0.17	0.17	0.63	0.48	0.72	0.53	0.53
v/c Ratio	0.10	0.78	0.43	0.82	0.30	0.32	0.72	0.81	0.82	0.57	0.15
Control Delay	39.9	65.5	21.6	104.0	53.1	10.4	37.7	35.1	55.3	26.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	65.5	21.6	104.0	53.1	10.4	37.7	35.1	55.3	26.3	7.8
LOS	D	E	C	F	D	B	D	D	E	C	A
Approach Delay		49.5			52.2			35.3		29.9	
Approach LOS		D			D			D		C	

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 35.5 Intersection LOS: D
Intersection Capacity Utilization 98.2% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	30	398	8	444	53	66	135	83
Future Volume (vph)	30	398	8	444	53	66	135	83
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	65.0	65.0	65.0	65.0	35.0	35.0	35.0	35.0
Total Split (%)	65.0%	65.0%	65.0%	65.0%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	21.0	21.0	21.0	21.0	11.6	11.6	11.6	11.6
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.27	0.27	0.27	0.27
v/c Ratio	0.12	0.57	0.03	0.67	0.22	0.22	0.44	0.46
Control Delay	7.1	10.4	6.2	12.3	16.5	12.9	19.4	13.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	7.1	10.4	6.2	12.4	16.5	12.9	19.4	13.7
LOS	A	B	A	B	B	B	B	B
Approach Delay		10.2		12.3		14.2		16.0
Approach LOS		B		B		B		B

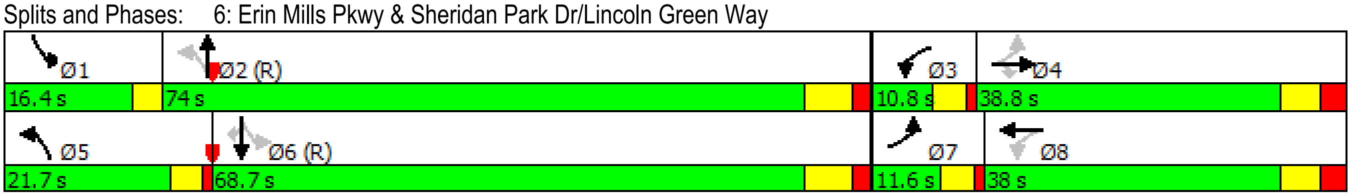
Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 42.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 12.7	Intersection LOS: B
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 5: Fifth Line & Sheridan Park Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	174	119	174	150	81	146	2042	159	1558	285
Future Volume (vph)	174	119	174	150	81	146	2042	159	1558	285
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4		3	8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	3	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.0	38.0	9.5	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	11.6	38.8	38.8	10.8	38.0	21.7	74.0	16.4	68.7	68.7
Total Split (%)	8.3%	27.7%	27.7%	7.7%	27.1%	15.5%	52.9%	11.7%	49.1%	49.1%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	1.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	7.0	7.0	4.5	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	26.6	17.0	17.0	25.0	16.2	95.7	81.2	99.7	81.7	81.7
Actuated g/C Ratio	0.19	0.12	0.12	0.18	0.12	0.68	0.58	0.71	0.58	0.58
v/c Ratio	0.82	0.54	0.53	0.65	0.71	0.58	0.75	0.71	0.55	0.29
Control Delay	77.9	65.8	12.9	62.1	67.6	19.5	25.6	48.2	20.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	65.8	12.9	62.1	67.6	19.5	25.6	48.2	20.2	7.6
LOS	E	E	B	E	E	B	C	D	C	A
Approach Delay		50.6			64.8		25.2		20.6	
Approach LOS		D			E		C		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 28.0	Intersection LOS: C
Intersection Capacity Utilization 89.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	34	12	8	82	74	27	10	187	106	54	316	74
Future Volume (vph)	34	12	8	82	74	27	10	187	106	54	316	74
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	44	16	10	106	96	35	13	243	138	70	410	96

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	70	237	394	576
Volume Left (vph)	44	106	13	70
Volume Right (vph)	10	35	138	96
Hadj (s)	0.04	0.00	-0.20	-0.08
Departure Headway (s)	7.5	6.8	5.8	5.6
Degree Utilization, x	0.14	0.45	0.64	0.90
Capacity (veh/h)	415	499	586	576
Control Delay (s)	11.7	15.2	18.5	39.6
Approach Delay (s)	11.7	15.2	18.5	39.6
Approach LOS	B	C	C	E

Intersection Summary			
Delay	27.0		
Level of Service	D		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	205	19	35	388	0	0
Future Volume (Veh/h)	205	19	35	388	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	256	24	44	485	0	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			280		841	268
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			280		841	268
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		100	100
cM capacity (veh/h)			1277		326	776

Direction, Lane #	EB 1	WB 1
Volume Total	280	529
Volume Left	0	44
Volume Right	24	0
cSH	1700	1277
Volume to Capacity	0.16	0.03
Queue Length 95th (m)	0.0	0.8
Control Delay (s)	0.0	1.0
Lane LOS		A
Approach Delay (s)	0.0	1.0
Approach LOS		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	203	0	0	283	137	167
Future Volume (Veh/h)	203	0	0	283	137	167
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	271	0	0	377	183	223
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		648	271
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		648	271
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		58	71
cM capacity (veh/h)			1304		437	770

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	271	377	183	223
Volume Left	0	0	183	0
Volume Right	0	0	0	223
cSH	1700	1700	437	770
Volume to Capacity	0.16	0.22	0.42	0.29
Queue Length 95th (m)	0.0	0.0	15.5	9.1
Control Delay (s)	0.0	0.0	19.1	11.6
Lane LOS			C	B
Approach Delay (s)	0.0	0.0	15.0	
Approach LOS			B	

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	30	881	10	120	168	10
Future Volume (Veh/h)	30	881	10	120	168	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	958	11	130	183	11
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	149					
pX, platoon unblocked						
vC, conflicting volume			991		185	33
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			991		185	33
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		77	99
cM capacity (veh/h)			698		792	1041

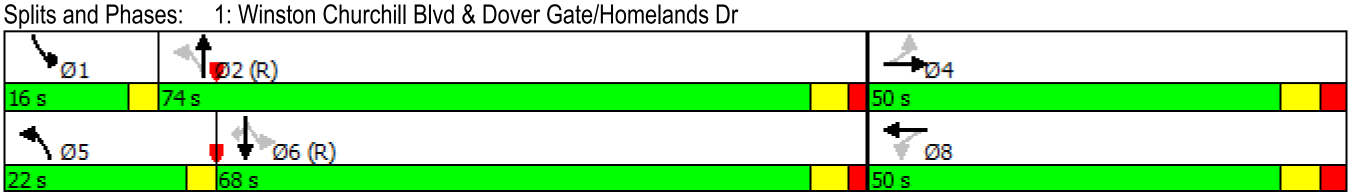
Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	33	958	141	194
Volume Left	0	0	11	183
Volume Right	0	958	0	11
cSH	1700	1700	698	802
Volume to Capacity	0.02	0.56	0.02	0.24
Queue Length 95th (m)	0.0	0.0	0.4	7.2
Control Delay (s)	0.0	0.0	1.0	10.9
Lane LOS			A	B
Approach Delay (s)	0.0		1.0	10.9
Approach LOS				B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations									
Traffic Volume (vph)	191	146	69	96	194	1728	77	1111	65
Future Volume (vph)	191	146	69	96	194	1728	77	1111	65
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		8	5	2	1	6	
Permitted Phases	4		8		2		6		6
Detector Phase	4	4	8	8	5	2	1	6	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	35.0	35.0	35.0	35.0	9.5	25.0	9.5	25.0	25.0
Total Split (s)	50.0	50.0	50.0	50.0	22.0	74.0	16.0	68.0	68.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	15.7%	52.9%	11.4%	48.6%	48.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	3.0	0.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	6.0	3.0	6.0	6.0
Lead/Lag					Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	33.8	33.8	33.8	33.8	95.9	81.9	89.7	78.4	78.4
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.68	0.58	0.64	0.56	0.56
v/c Ratio	0.77	0.85	0.86	0.37	0.59	0.67	0.49	0.42	0.08
Control Delay	68.5	60.2	114.9	38.6	25.5	12.4	25.1	19.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	60.2	114.9	38.6	25.5	12.4	25.1	19.8	3.6
LOS	E	E	F	D	C	B	C	B	A
Approach Delay		63.1		61.6		13.7		19.3	
Approach LOS		E		E		B		B	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 24.7	Intersection LOS: C
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Winston Churchill Blvd & Dover Gate/Homelands Dr



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	100	22	122	190	19	93
Future Volume (vph)	100	22	122	190	19	93
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	115	25	140	218	22	107

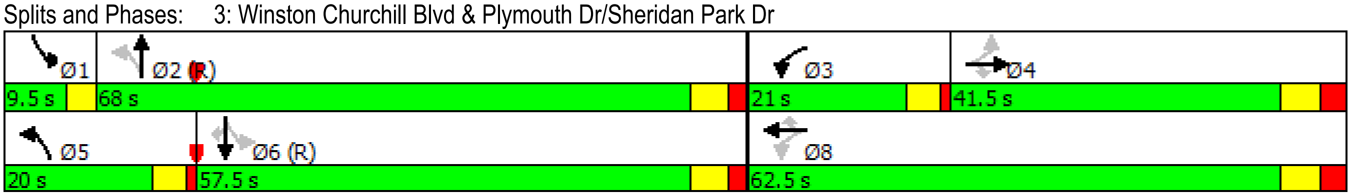
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	140	358	129
Volume Left (vph)	115	0	22
Volume Right (vph)	25	218	0
Hadj (s)	0.06	-0.34	0.12
Departure Headway (s)	5.0	4.1	4.8
Degree Utilization, x	0.20	0.41	0.17
Capacity (veh/h)	657	850	715
Control Delay (s)	9.2	9.9	8.7
Approach Delay (s)	9.2	9.9	8.7
Approach LOS	A	A	A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	90	61	456	227	260	247	231	1925	45	1413	42
Future Volume (vph)	90	61	456	227	260	247	231	1925	45	1413	42
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		4		3	8		5	2	1	6	
Permitted Phases	4		4	8		8	2		6		6
Detector Phase	4	4	4	3	8	8	5	2	1	6	6
Switch Phase											
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	41.0	41.0	41.0	9.5	41.0	41.0	9.5	36.0	9.5	36.0	36.0
Total Split (s)	41.5	41.5	41.5	21.0	62.5	62.5	20.0	68.0	9.5	57.5	57.5
Total Split (%)	29.6%	29.6%	29.6%	15.0%	44.6%	44.6%	14.3%	48.6%	6.8%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.0	4.0	4.0
All-Red Time (s)	3.0	3.0	3.0	1.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	4.5	7.0	7.0	4.5	6.0	3.0	6.0	6.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	27.5	27.5	27.5	50.5	48.0	48.0	80.5	71.3	66.3	56.9	56.9
Actuated g/C Ratio	0.20	0.20	0.20	0.36	0.34	0.34	0.58	0.51	0.47	0.41	0.41
v/c Ratio	0.43	0.17	0.92	0.47	0.41	0.42	0.85	0.78	0.34	0.78	0.06
Control Delay	53.5	45.0	49.1	34.9	36.0	19.9	61.4	32.5	29.4	30.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	45.0	49.1	34.9	36.0	19.9	61.4	32.5	29.4	30.6	0.3
LOS	D	D	D	C	D	B	E	C	C	C	A
Approach Delay		49.4			30.2			35.5		29.7	
Approach LOS		D			C			D		C	

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 34.7	Intersection LOS: C
Intersection Capacity Utilization 85.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Winston Churchill Blvd & Plymouth Dr/Sheridan Park Dr



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	64	410	17	315	60	92	65	56
Future Volume (vph)	64	410	17	315	60	92	65	56
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	67.0	67.0	67.0	67.0	33.0	33.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	67.0%	33.0%	33.0%	33.0%	33.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	14.7	14.7	14.7	14.7	7.8	7.8	7.8	7.8
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.24	0.24	0.24	0.24
v/c Ratio	0.18	0.58	0.05	0.55	0.21	0.26	0.23	0.24
Control Delay	6.2	9.2	5.1	8.5	13.1	12.2	13.4	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	9.2	5.1	8.5	13.1	12.2	13.4	9.7
LOS	A	A	A	A	B	B	B	A
Approach Delay		8.9		8.3		12.5		11.2
Approach LOS		A		A		B		B

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 31.9	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

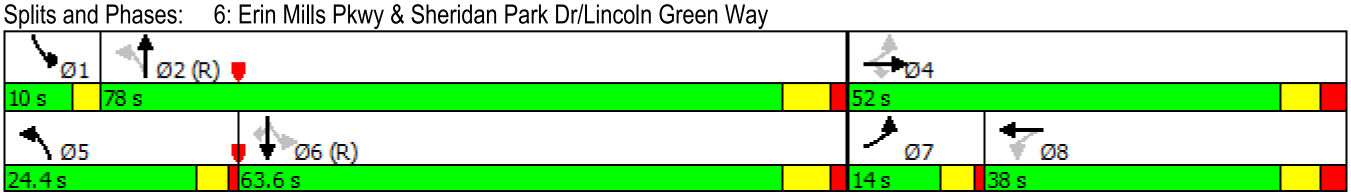
Splits and Phases: 5: Fifth Line & Sheridan Park Dr

Timings
6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way 01/18/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	186	100	119	70	93	235	2342	95	1511	136
Future Volume (vph)	186	100	119	70	93	235	2342	95	1511	136
Turn Type	pm+pt	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases	7	4			8	5	2	1	6	
Permitted Phases	4		4	8		2		6		6
Detector Phase	7	4	4	8	8	5	2	1	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	38.0	38.0	38.0	38.0	9.5	38.0	9.5	38.0	38.0
Total Split (s)	14.0	52.0	52.0	38.0	38.0	24.4	78.0	10.0	63.6	63.6
Total Split (%)	10.0%	37.1%	37.1%	27.1%	27.1%	17.4%	55.7%	7.1%	45.4%	45.4%
Yellow Time (s)	3.5	4.0	4.0	4.0	4.0	3.5	5.0	3.0	5.0	5.0
All-Red Time (s)	1.0	3.0	3.0	3.0	3.0	1.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	7.0	7.0	7.0	7.0	4.5	7.0	3.0	7.0	7.0
Lead/Lag	Lead			Lag	Lag	Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	37.6	35.1	35.1	21.1	21.1	93.4	78.9	80.9	67.9	67.9
Actuated g/C Ratio	0.27	0.25	0.25	0.15	0.15	0.67	0.56	0.58	0.48	0.48
v/c Ratio	0.90	0.22	0.26	0.38	0.79	0.78	0.90	0.62	0.64	0.17
Control Delay	83.1	41.2	7.3	57.3	64.4	45.0	33.5	43.6	30.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	41.2	7.3	57.3	64.4	45.0	33.5	43.6	30.2	6.2
LOS	F	D	A	E	E	D	C	D	C	A
Approach Delay		50.5			62.7		34.5		29.1	
Approach LOS		D			E		C		C	

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 125
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 35.5 Intersection LOS: D
Intersection Capacity Utilization 95.9% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 6: Erin Mills Pkwy & Sheridan Park Dr/Lincoln Green Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	39	41	9	68	29	64	2	188	103	45	100	26
Future Volume (vph)	39	41	9	68	29	64	2	188	103	45	100	26
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	48	51	11	84	36	79	2	232	127	56	123	32

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	110	199	361	211
Volume Left (vph)	48	84	2	56
Volume Right (vph)	11	79	127	32
Hadj (s)	0.05	-0.14	-0.21	-0.04
Departure Headway (s)	5.8	5.4	4.9	5.3
Degree Utilization, x	0.18	0.30	0.49	0.31
Capacity (veh/h)	544	599	689	631
Control Delay (s)	10.0	10.7	12.6	10.6
Approach Delay (s)	10.0	10.7	12.6	10.6
Approach LOS	B	B	B	B

Intersection Summary			
Delay	11.4		
Level of Service	B		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	237	189	51	121	0	0
Future Volume (Veh/h)	237	189	51	121	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	316	252	68	161	0	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			568		739	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			568		739	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		100	100
cM capacity (veh/h)			1004		361	620

Direction, Lane #	EB 1	WB 1
Volume Total	568	229
Volume Left	0	68
Volume Right	252	0
cSH	1700	1004
Volume to Capacity	0.33	0.07
Queue Length 95th (m)	0.0	1.7
Control Delay (s)	0.0	3.1
Lane LOS		A
Approach Delay (s)	0.0	3.1
Approach LOS		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	235	0	0	157	16	36
Future Volume (Veh/h)	235	0	0	157	16	36
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	294	0	0	196	20	45
Pedestrians					1	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			295		491	295
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			295		491	295
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		96	94
cM capacity (veh/h)			1277		540	748

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	294	196	20	45
Volume Left	0	0	20	0
Volume Right	0	0	0	45
cSH	1700	1700	540	748
Volume to Capacity	0.17	0.12	0.04	0.06
Queue Length 95th (m)	0.0	0.0	0.9	1.5
Control Delay (s)	0.0	0.0	11.9	10.1
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	10.7	
Approach LOS			B	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	22.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	30	116	0	120	614	0
Future Volume (Veh/h)	30	116	0	120	614	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	126	0	130	667	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)	148					
pX, platoon unblocked						
vC, conflicting volume			159		163	33
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		163	33
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		19	100
cM capacity (veh/h)			1420		828	1041

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	33	126	130	667
Volume Left	0	0	0	667
Volume Right	0	126	0	0
cSH	1700	1700	1420	828
Volume to Capacity	0.02	0.07	0.00	0.81
Queue Length 95th (m)	0.0	0.0	0.0	66.0
Control Delay (s)	0.0	0.0	0.0	24.7
Lane LOS				C
Approach Delay (s)	0.0		0.0	24.7
Approach LOS				C

Intersection Summary			
Average Delay	17.2		
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 90 With Ext.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 1/9/2018 11:50:17 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2031 With Extension															
1 - East End - 1 - Homelands Dr - N	1.1	2.8	8.98	0.53	A	7.93	A	13 % [2 - West End - 4 - Sheridan Park Dr - W]	0.4	1.0	4.84	0.26	A	7.25	A	29 % [1 - East End - 3 - Speakman Dr - S]
1 - East End - 2 - Sheridan Park Dr - E	1.3	1.5	7.77	0.56	A				0.6	2.7	5.92	0.37	A			
1 - East End - 3 - Speakman Dr - S	0.5	2.1	6.81	0.33	A				1.2	3.4	10.50	0.55	B			
1 - East End - 4 - Sheridan Park Dr - W	0.1	0.5	6.18	0.07	A				0.1	0.5	4.21	0.10	A			
2 - West End - 2 - Sheridan Park Dr - E	0.1	0.5	3.93	0.13	A	8.40	A		0.2	0.5	5.61	0.17	A	6.49	A	
2 - West End - 3 - Speakman Dr - S	0.2	0.5	3.82	0.16	A				1.5	1.8	7.80	0.59	A			
2 - West End - 4 - Sheridan Park Dr - W	2.7	7.8	9.86	0.73	A				0.1	0.5	1.74	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

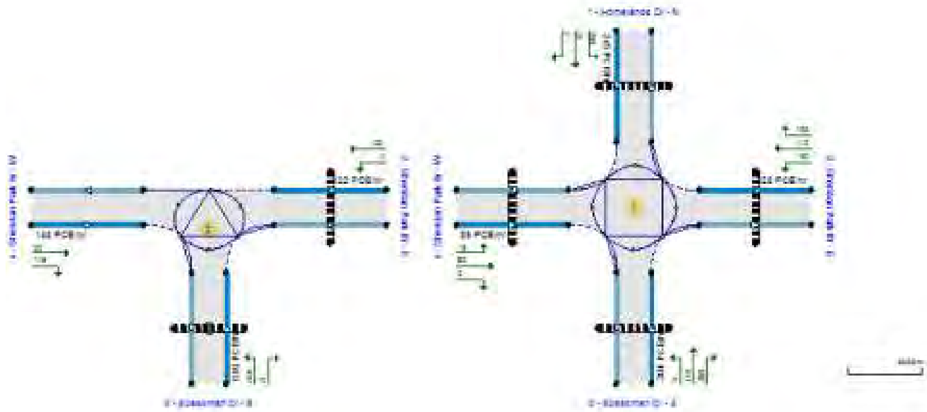
File summary

File Description

Title	Sheridan Park Drive With Extension 90 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



Showing original traffic demand (PCE/h)

The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2031 With Extension	AM	ONE HOUR	08:00	09:30	15	✓
2031 With Extension	PM	ONE HOUR	16:00	17:30	15	✓

Single Lane Roundabout - 2031 With Extension, AM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	1 - East End - 2 - Sheridan Park Dr - E - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Last Run	Last Run	2 - West End - 3 - Speakman Dr - S - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Intersection	Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - East End	1 - Homelands Dr - N	0.53	8.98	1.1	2.8	A	378.06	567.09
	2 - Sheridan Park Dr - E	0.56	7.77	1.3	1.5	A	509.28	763.92
	3 - Speakman Dr - S	0.33	6.81	0.5	2.1	A	218.39	327.59
	4 - Sheridan Park Dr - W	0.07	6.18	0.1	0.5	A	39.46	59.19
2 - West End	2 - Sheridan Park Dr - E	0.13	3.93	0.1	0.5	A	111.95	167.92
	3 - Speakman Dr - S	0.16	3.82	0.2	0.5	A	155.99	233.99
	4 - Sheridan Park Dr - W	0.73	9.86	2.7	7.8	A	837.78	1256.68

Single Lane Roundabout - 2031 With Extension, PM

Data Errors and Warnings

Severity	Area	Item	Description
Last Run	Last Run	1 - East End - 2 - Sheridan Park Dr - E - Capacity	Pedestrian Crossing causes blocking on previous leg due to traffic queing to leave the intersection in 6 timesegment(s).
Warning	Queue variations	Analysis Options	Queue percentiles may be unreliable if the mean queue in any time segment is very low or very high.

Results

Results Summary for whole modelled period

Intersection	Leg	Max V/C Ratio	Max delay (s)	Max Queue (PCE)	Max 95th percentile Queue (PCE)	Max LOS	Average Demand (PCE/hr)	Total Intersection Arrivals (PCE)
1 - East End	1 - Homelands Dr - N	0.26	4.84	0.4	1.0	A	224.82	337.22
	2 - Sheridan Park Dr - E	0.37	5.92	0.6	2.7	A	300.98	451.47
	3 - Speakman Dr - S	0.55	10.50	1.2	3.4	B	361.54	542.31
	4 - Sheridan Park Dr - W	0.10	4.21	0.1	0.5	A	78.00	117.00
2 - West End	2 - Sheridan Park Dr - E	0.17	5.61	0.2	0.5	A	111.95	167.92
	3 - Speakman Dr - S	0.59	7.80	1.5	1.8	A	565.25	847.88
	4 - Sheridan Park Dr - W	0.07	1.74	0.1	0.5	A	135.81	203.71

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix J

2031 95th Percentile Queues

Appendix J

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	169	150	212	260	1553	62	1978
v/c Ratio	0.40	0.51	0.90	0.69	0.88	0.43	0.40	0.68
Control Delay	59.7	35.0	104.1	60.6	78.4	5.4	27.1	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.7	35.0	104.1	60.6	78.4	5.4	27.1	22.0
Queue Length 50th (m)	11.9	24.1	40.2	49.6	61.7	20.3	9.5	141.0
Queue Length 95th (m)	24.8	46.6	#75.3	76.2	m#97.1	44.2	23.9	157.8
Internal Link Dist (m)		99.2		1187.3		464.2		152.1
Turn Bay Length (m)			15.0		126.0		75.0	
Base Capacity (vph)	143	370	191	353	305	3640	156	2925
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.46	0.79	0.60	0.85	0.43	0.40	0.68

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	304	168	35	83	59	237	1940	323	1712
v/c Ratio	0.10	0.81	0.45	0.42	0.22	0.17	0.75	0.76	0.87	0.62
Control Delay	44.3	70.6	25.0	62.7	46.9	10.9	43.5	30.7	61.7	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	70.6	25.0	62.7	46.9	10.9	43.5	30.7	61.7	23.5
Queue Length 50th (m)	5.7	80.7	17.6	8.5	19.4	0.0	39.2	155.7	80.3	87.4
Queue Length 95th (m)	13.3	108.3	37.8	19.5	32.6	11.4	66.2	195.1	m#114.5	108.8
Internal Link Dist (m)		197.7			123.8			371.2		464.2
Turn Bay Length (m)	32.0		30.0	50.0		60.0	170.0		78.0	
Base Capacity (vph)	311	461	435	104	466	426	409	2562	418	2763
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.66	0.39	0.34	0.18	0.14	0.58	0.76	0.77	0.62

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	165	120	166	153	139	98	2178	162	1590	245
v/c Ratio	0.82	0.36	0.53	0.72	0.46	0.62	0.71	0.78	0.45	0.20
Control Delay	84.4	51.7	39.1	71.7	44.4	42.4	22.5	57.0	9.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.4	51.7	39.1	71.7	44.4	42.4	22.5	57.0	9.2	1.7
Queue Length 50th (m)	44.7	29.7	28.1	40.5	28.0	16.1	144.1	28.0	59.0	1.0
Queue Length 95th (m)	65.1	44.0	46.7	59.2	44.4	#56.5	212.2	53.4	89.7	10.7
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	289	474	426	306	423	158	3049	263	3569	1203
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.25	0.39	0.50	0.33	0.62	0.71	0.62	0.45	0.20

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	34	485	9	479	59	111	157	223
v/c Ratio	0.10	0.60	0.03	0.60	0.19	0.21	0.41	0.41
Control Delay	7.1	11.4	6.6	11.4	13.1	10.4	15.7	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	11.4	6.6	11.4	13.1	10.4	15.7	10.9
Queue Length 50th (m)	1.0	18.0	0.3	17.6	2.5	3.7	7.2	6.7
Queue Length 95th (m)	4.8	45.3	2.0	44.5	10.2	13.8	22.7	22.7
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)	30.0		30.0		43.0		27.0	
Base Capacity (vph)	783	1798	597	1765	937	1577	1163	1499
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.27	0.02	0.27	0.06	0.07	0.13	0.15

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	203	383	73	205	206	1968	111	1168	69
v/c Ratio	0.95	0.90	1.04	0.48	0.62	0.66	0.60	0.39	0.07
Control Delay	103.7	69.9	172.0	47.4	21.1	9.8	30.8	15.0	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.7	69.9	172.0	47.4	21.1	9.8	30.8	15.0	2.7
Queue Length 50th (m)	55.8	92.0	~21.7	45.6	11.3	49.1	9.7	58.7	0.0
Queue Length 95th (m)	#105.2	#148.6	#54.5	70.6	m33.7	58.4	29.1	68.3	6.0
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	213	427	70	427	330	2964	219	3025	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.90	1.04	0.48	0.62	0.66	0.51	0.39	0.07

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	94	60	475	180	459	241	2034	31	1472	44
v/c Ratio	0.72	0.13	1.07	0.41	0.78	1.71	0.72	0.23	0.54	0.05
Control Delay	78.9	42.4	103.0	37.7	50.5	374.9	26.6	17.6	13.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.9	42.4	103.0	37.7	50.5	374.9	26.6	17.6	13.7	0.2
Queue Length 50th (m)	24.0	13.1	~126.9	36.5	108.2	~99.7	158.8	2.5	62.5	0.0
Queue Length 95th (m)	#53.0	25.4	#194.5	56.1	150.6	#117.9	180.4	m5.6	m67.3	m0.0
Internal Link Dist (m)		197.7			123.8		371.2		464.2	
Turn Bay Length (m)	32.0		30.0	30.0		170.0		78.0		130.0
Base Capacity (vph)	131	466	445	440	590	141	2814	181	2718	953
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.13	1.07	0.41	0.78	1.71	0.72	0.17	0.54	0.05

Intersection Summary

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

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	183	104	114	74	227	195	2569	100	1591	96
v/c Ratio	0.97	0.25	0.27	0.26	0.54	0.72	0.86	0.61	0.56	0.11
Control Delay	110.3	43.8	7.9	44.3	40.1	33.0	29.5	41.0	22.7	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.3	43.8	7.9	44.3	40.1	33.0	29.5	41.0	22.7	8.1
Queue Length 50th (m)	50.3	23.7	0.0	16.9	42.8	19.5	210.6	11.5	104.1	4.3
Queue Length 95th (m)	#81.6	36.7	14.2	28.6	63.6	#55.9	#300.8	31.9	136.0	14.8
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	247	551	522	378	530	289	2978	197	2825	897
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.19	0.22	0.20	0.43	0.67	0.86	0.51	0.56	0.11

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	469	19	360	64	121	71	100
v/c Ratio	0.15	0.57	0.05	0.44	0.19	0.25	0.22	0.21
Control Delay	5.9	9.2	5.2	6.8	12.2	11.4	12.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	9.2	5.2	6.8	12.2	11.4	12.6	9.3
Queue Length 50th (m)	1.7	13.6	0.4	8.4	2.4	4.2	2.7	2.5
Queue Length 95th (m)	6.1	33.2	2.4	22.0	9.8	14.8	10.7	11.3
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)	30.0		30.0		43.0		27.0	
Base Capacity (vph)	1044	1844	847	1786	1213	1716	1173	1650
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.25	0.02	0.20	0.05	0.07	0.06	0.06

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	171	150	178	260	1583	46	1993
v/c Ratio	0.32	0.51	0.90	0.57	0.84	0.43	0.31	0.70
Control Delay	53.7	33.2	103.0	50.8	73.9	3.4	23.0	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	33.2	103.0	50.8	73.9	3.4	23.0	22.9
Queue Length 50th (m)	11.9	23.9	40.8	38.4	61.8	12.7	6.4	137.7
Queue Length 95th (m)	23.3	44.6	#67.8	59.2	m#110.5	27.8	16.6	154.0
Internal Link Dist (m)		99.2		1187.3		464.2		152.1
Turn Bay Length (m)			15.0		126.0		75.0	
Base Capacity (vph)	199	415	217	397	311	3646	147	2853
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.41	0.69	0.45	0.84	0.43	0.31	0.70

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	25	307	168	92	96	116	237	1953	339	1712
v/c Ratio	0.10	0.78	0.43	0.82	0.30	0.32	0.77	0.81	0.82	0.63
Control Delay	39.9	65.5	21.6	104.0	53.1	10.4	47.8	35.1	53.3	29.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	65.5	21.6	104.0	53.1	10.4	47.8	35.1	53.3	29.5
Queue Length 50th (m)	5.5	81.2	15.5	25.8	24.5	0.0	41.1	167.0	81.8	104.8
Queue Length 95th (m)	12.1	104.1	33.7	#48.3	38.5	15.9	70.3	#225.6	#123.5	125.1
Internal Link Dist (m)		197.7			124.6			371.2		464.2
Turn Bay Length (m)	32.0		30.0	50.0		60.0	170.0		78.0	
Base Capacity (vph)	263	592	538	163	466	470	347	2413	418	2710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.52	0.31	0.56	0.21	0.25	0.68	0.81	0.81	0.63

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	178	121	178	153	144	149	2178	162	1590	291
v/c Ratio	0.82	0.54	0.53	0.65	0.71	0.58	0.75	0.71	0.55	0.29
Control Delay	77.9	65.8	12.9	62.1	67.6	19.5	25.6	48.2	20.2	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.9	65.8	12.9	62.1	67.6	19.5	25.6	48.2	20.2	7.6
Queue Length 50th (m)	43.3	32.0	0.0	36.6	32.5	11.5	157.9	27.1	93.8	13.8
Queue Length 95th (m)	62.1	49.8	20.3	54.0	53.0	30.1	218.5	51.4	136.3	37.2
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	218	419	478	235	366	323	2896	248	2887	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.29	0.37	0.65	0.39	0.46	0.75	0.65	0.55	0.29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	514	9	595	62	111	157	232
v/c Ratio	0.12	0.57	0.03	0.67	0.22	0.22	0.44	0.46
Control Delay	7.1	10.4	6.2	12.3	16.5	12.9	19.4	13.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	7.1	10.4	6.2	12.4	16.5	12.9	19.4	13.7
Queue Length 50th (m)	1.1	20.5	0.3	25.2	3.2	4.5	8.6	8.5
Queue Length 95th (m)	5.1	50.8	2.0	62.4	13.0	16.8	27.7	29.1
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)	30.0		30.0		43.0		27.0	
Base Capacity (vph)	607	1778	570	1759	785	1336	982	1274
Starvation Cap Reductn	0	0	0	293	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.29	0.02	0.41	0.08	0.08	0.16	0.18

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	203	385	73	169	206	1977	82	1182	69
v/c Ratio	0.83	0.90	1.07	0.40	0.63	0.66	0.48	0.39	0.07
Control Delay	79.0	70.6	181.6	42.8	19.3	5.1	19.9	15.1	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.0	70.6	181.6	42.8	19.3	5.1	19.9	15.1	2.7
Queue Length 50th (m)	53.9	92.8	~22.3	34.7	7.9	31.5	6.5	59.7	0.0
Queue Length 95th (m)	#96.4	#150.5	#55.0	56.5	m19.6	34.5	17.7	69.2	6.0
Internal Link Dist (m)		99.2		1187.3		464.2		152.1	
Turn Bay Length (m)			15.0		126.0		75.0		45.0
Base Capacity (vph)	244	427	68	427	326	3013	220	3025	948
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.90	1.07	0.40	0.63	0.66	0.37	0.39	0.07

Intersection Summary

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

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	94	64	475	236	271	257	241	2047	47	1472	44
v/c Ratio	0.43	0.17	0.92	0.47	0.41	0.42	0.85	0.78	0.34	0.78	0.06
Control Delay	53.5	45.0	49.1	34.9	36.0	19.9	61.4	32.5	29.4	30.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	45.0	49.1	34.9	36.0	19.9	61.4	32.5	29.4	30.6	0.3
Queue Length 50th (m)	22.6	14.5	64.5	46.1	55.3	28.6	48.0	178.1	4.3	142.8	0.0
Queue Length 95th (m)	38.7	26.4	#115.9	64.2	75.2	49.2	#103.4	209.8	m15.8	90.4	m0.0
Internal Link Dist (m)		197.7			123.8			371.2		464.2	
Turn Bay Length (m)	32.0		30.0	60.0		60.0	170.0		78.0		130.0
Base Capacity (vph)	275	473	581	501	761	698	282	2638	142	1885	716
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.14	0.82	0.47	0.36	0.37	0.85	0.78	0.33	0.78	0.06

Intersection Summary

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

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

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	105	125	74	232	247	2569	100	1591	143
v/c Ratio	0.90	0.22	0.26	0.38	0.79	0.78	0.90	0.62	0.64	0.17
Control Delay	83.1	41.2	7.3	57.3	64.4	45.0	33.5	43.6	30.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.1	41.2	7.3	57.3	64.4	45.0	33.5	43.6	30.2	6.2
Queue Length 50th (m)	44.7	23.2	0.0	18.7	51.0	41.3	225.6	11.1	121.1	2.6
Queue Length 95th (m)	#73.7	36.0	14.3	32.2	75.2	74.2	#296.9	#39.2	157.0	16.4
Internal Link Dist (m)		167.9			140.2		718.6		284.6	
Turn Bay Length (m)	31.0		35.0	45.0		120.0		112.0		50.0
Base Capacity (vph)	218	605	570	285	409	347	2847	161	2468	824
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.17	0.22	0.26	0.57	0.71	0.90	0.62	0.64	0.17

Intersection Summary

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	497	19	470	66	121	71	109
v/c Ratio	0.18	0.58	0.05	0.55	0.21	0.26	0.23	0.24
Control Delay	6.2	9.2	5.1	8.5	13.1	12.2	13.4	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	9.2	5.1	8.5	13.1	12.2	13.4	9.7
Queue Length 50th (m)	1.7	14.7	0.4	12.8	2.5	4.3	2.8	2.7
Queue Length 95th (m)	6.5	35.7	2.5	32.0	10.7	15.7	11.4	12.5
Internal Link Dist (m)		552.8		167.9		418.3		255.1
Turn Bay Length (m)	30.0		30.0		43.0		27.0	
Base Capacity (vph)	852	1844	798	1804	1154	1644	1124	1567
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.27	0.02	0.26	0.06	0.07	0.06	0.07

Intersection Summary

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 90 BG.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 7/25/2017 9:10:16 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2031 Background															
1 - Homelands Dr - N	1.0	2.3	7.75	0.51	A	7.27	A	54 % [1 - Homelands Dr - N]	0.3	1.4	4.29	0.24	A	7.59	A	27 % [3 - Speakman Dr - S]
2 - Sheridan Park Dr - E	1.1	1.9	7.17	0.51	A				0.5	2.2	6.01	0.33	A			
3 - Speakman Dr - S	0.5	2.3	6.65	0.33	A				1.4	3.4	11.00	0.59	B			
4 - Sheridan Park Dr - W	0.0	0.5	6.20	0.02	A				0.1	0.5	4.12	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

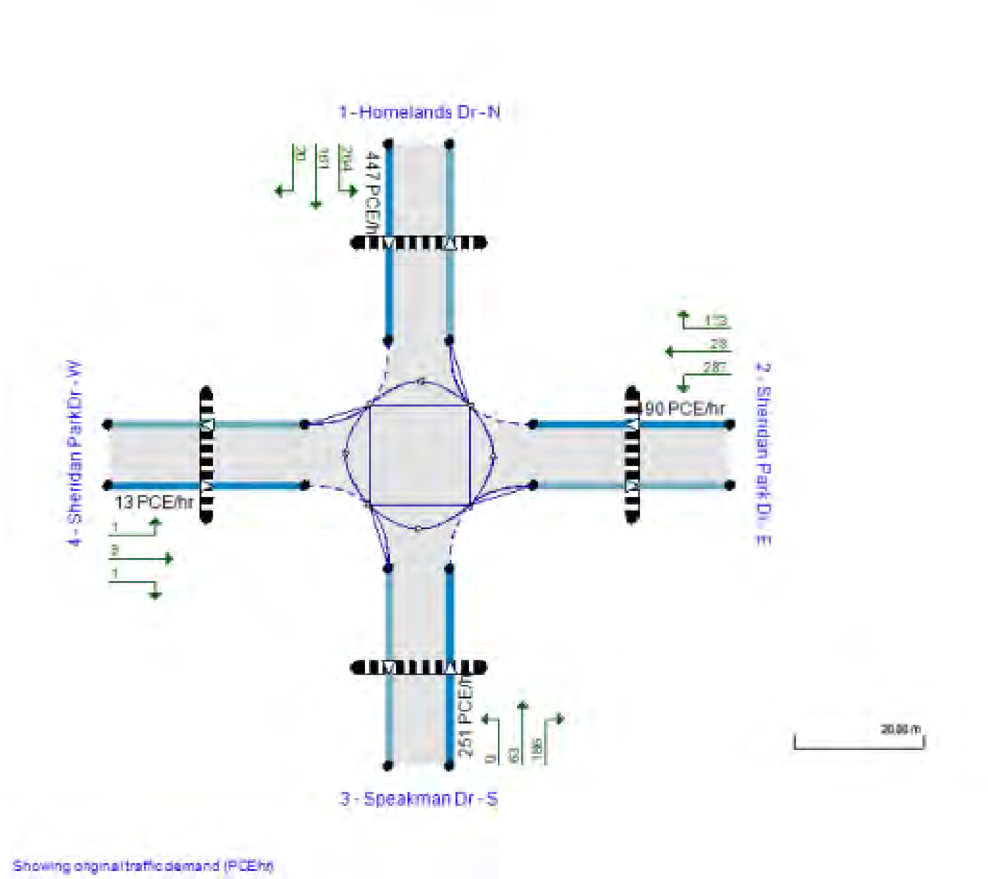
File summary

File Description

Title	Sheridan Park Drive 90 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



Showing original traffic demand (PCE/hr)

The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2031 Background	AM	ONE HOUR	08:00	09:30	15	✓
2031 Background	PM	ONE HOUR	16:00	17:30	15	✓

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.0.0.4211 []
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Filename: 039474_Roundabout_Analysis 90 With Ext.j9
Path: \\monty\Shared Work Areas\039474 - Sheridan\traffic\Analysis\Arcady
Report generation date: 1/9/2018 11:50:17 AM

Summary of intersection performance

	AM								PM							
	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity	Queue (PCE)	95% Queue (PCE)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS	Network Residual Capacity
	Single Lane Roundabout - 2031 With Extension															
1 - East End - 1 - Homelands Dr - N	1.1	2.8	8.98	0.53	A	7.93	A	13 % [2 - West End - 4 - Sheridan Park Dr - W]	0.4	1.0	4.84	0.26	A	7.25	A	29 % [1 - East End - 3 - Speakman Dr - S]
1 - East End - 2 - Sheridan Park Dr - E	1.3	1.5	7.77	0.56	A				0.6	2.7	5.92	0.37	A			
1 - East End - 3 - Speakman Dr - S	0.5	2.1	6.81	0.33	A				1.2	3.4	10.50	0.55	B			
1 - East End - 4 - Sheridan Park Dr - W	0.1	0.5	6.18	0.07	A				0.1	0.5	4.21	0.10	A			
2 - West End - 2 - Sheridan Park Dr - E	0.1	0.5	3.93	0.13	A	8.40	A		0.2	0.5	5.61	0.17	A	6.49	A	
2 - West End - 3 - Speakman Dr - S	0.2	0.5	3.82	0.16	A				1.5	1.8	7.80	0.59	A			
2 - West End - 4 - Sheridan Park Dr - W	2.7	7.8	9.86	0.73	A				0.1	0.5	1.74	0.07	A			

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

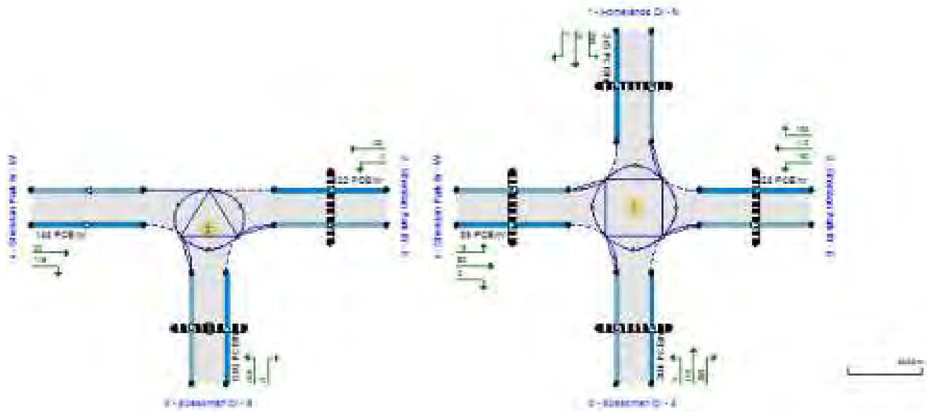
File summary

File Description

Title	Sheridan Park Drive With Extension 90 percent Capacity
Location	Mississauga
Site number	
Date	7/25/2017
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Analyst	RJBURNSIDE"jlester
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCE	PCE	perHour	s	-Min	perMin



Showing original traffic demand (PCE/h)

The intersection diagram reflects the last run of Intersections.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	V/C Ratio Threshold	Average Delay threshold (s)	Queue threshold (PCE)
5.75	✓		✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2031 With Extension	AM	ONE HOUR	08:00	09:30	15	✓
2031 With Extension	PM	ONE HOUR	16:00	17:30	15	✓

Burnside

[The Difference is our People]

Appendix B

Safety Performance Report

Appendix B

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Memorandum

Date: January 18, 2018 (Updated)
To: David Argue, PTOE, P. Eng., RJ Burnside
From: Owen Karanja, BA /Timothy Oketch, Ph.D., P. Eng.
Project Number: 21-12030
Subject: Sheridan Park Drive EA Study – Safety Performance Assessment

Distribution To: City of Mississauga

1. Scope

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The EA Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The EA Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act.*

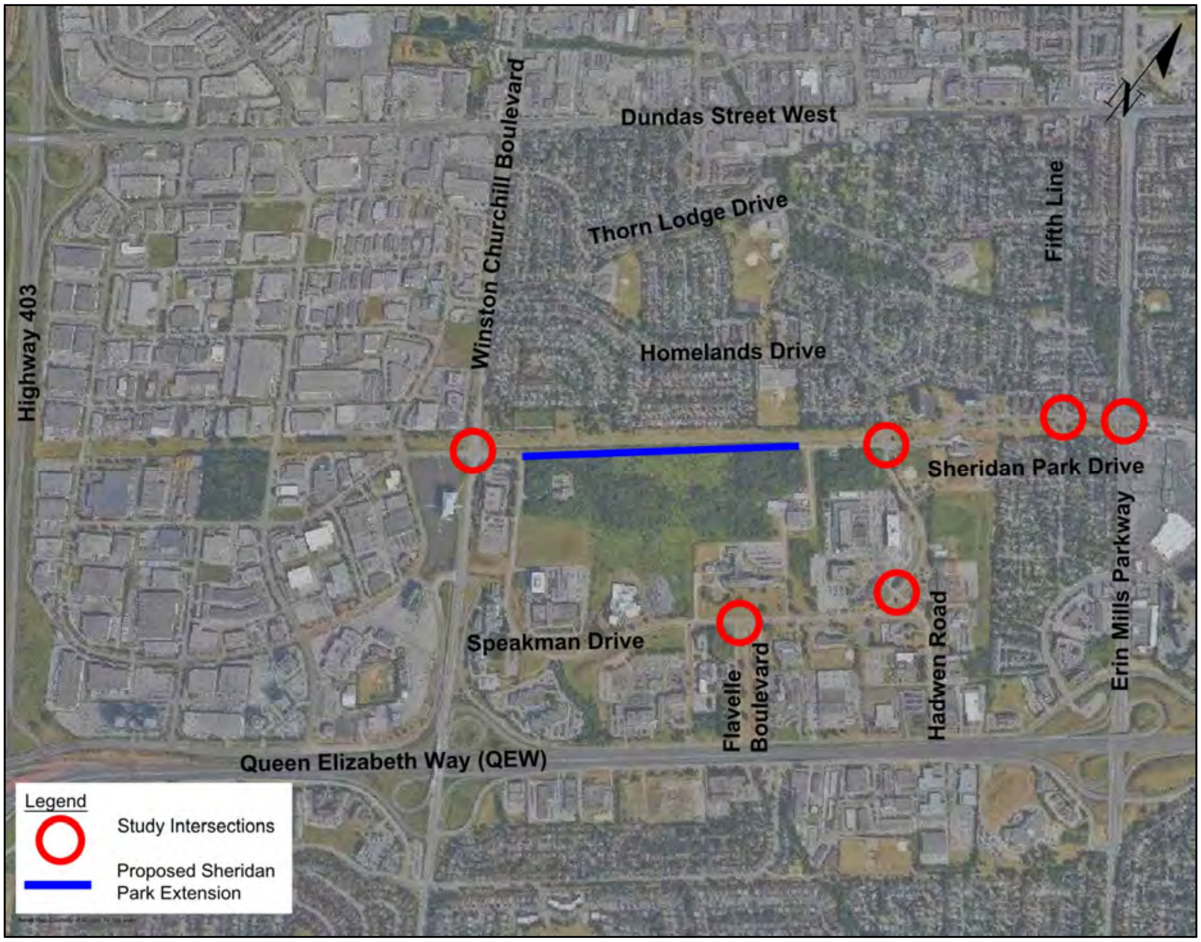
As part of the EA Study, TIMCON has completed a *Sheridan Park Drive Extension Safety Performance Study* to identify whether the proposed Sheridan Park Drive extension will impact transportation safety within the Study Area and determine if any potential mitigation measures are required. This assessment examined both existing and future conditions with the recommended improvements.

1.1 Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The study area intersections for the transportation safety analysis are shown in **Figure 1**. The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Figure 1: Study Area Intersections

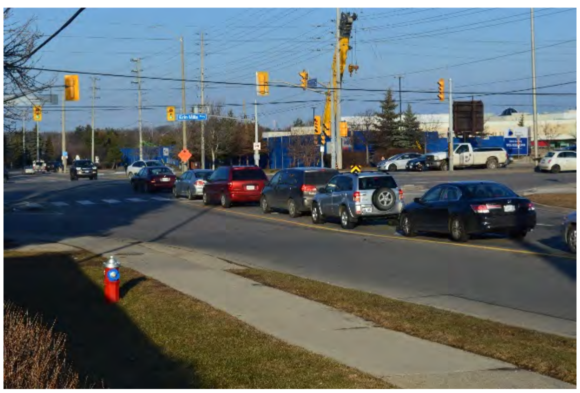


2. Existing Conditions

2.1 Field Review

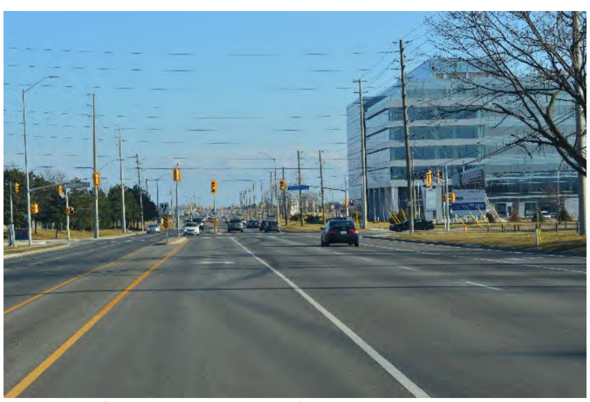
A field review was undertaken on February 23, 2017 and included observations at the Study Area intersections along Sheridan Park Drive. Preliminary review of the collisions data showed that the highest collisions occurred on Erin Mill Parkway / Sheridan Park Drive and Winston Churchill Blvd/ Sheridan Park Drive intersections. Consequently, emphasis was placed on those intersections during the field review. It was observed that reconstruction of Speakman Drive was underway resulting on one-way traffic operations on Speakman Drive between Flavelle Blvd and Sheridan Park Drive, just east of Winston Churchill Blvd. Table 1 show photos of general conditions at the Study Area intersections.

Table 1: Selected Photos of Site Issues

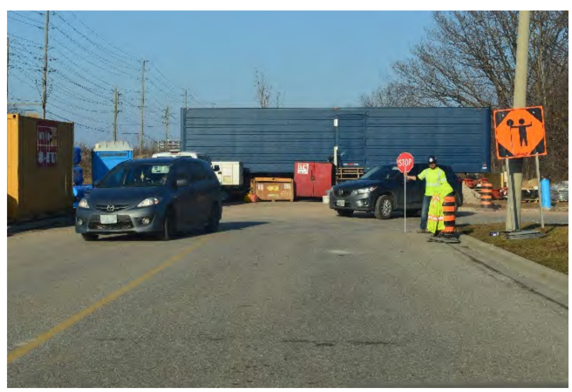


Substantial queues on EB approach at the Sheridan Park Dr / Erin Mill Parkway intersection extending back to Fifth Line intersection

Sheridan Park Drive/Speakman Drive intersection – Allway Stop sign with chevrons



Winston Churchill Blvd is a four-lane arterial with a posted speed 60km/h. There is a gentle slope SB towards the Sheridan/ Plymouth intersection



One-way traffic operations on Speakman Drive between Flavelle Blvd and Sheridan Park Drive, just east of Winston Churchill Blvd

2.2 Traffic Data

Traffic volume data was provided by the City of Mississauga and Burnside. They included turning movement counts undertaken at several intersections within the Study Area. The turning movement count volumes were available for six or eight-hour durations. The data was reviewed and summarized for peak hours and six-hour (6) volumes for consistency at all the intersections. Peak hour and six-hour (6) traffic volumes at the various intersection approaches within the Study Area are shown in **Figure 2** and **Figure 3** respectively.

Figure 2: Peak Hour Traffic Volumes at Study Area Intersections

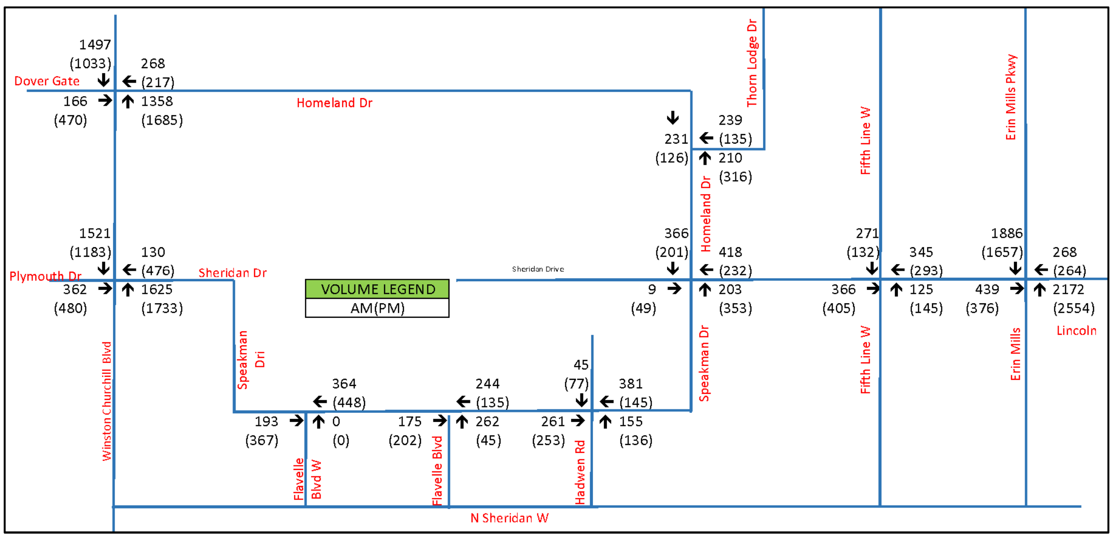
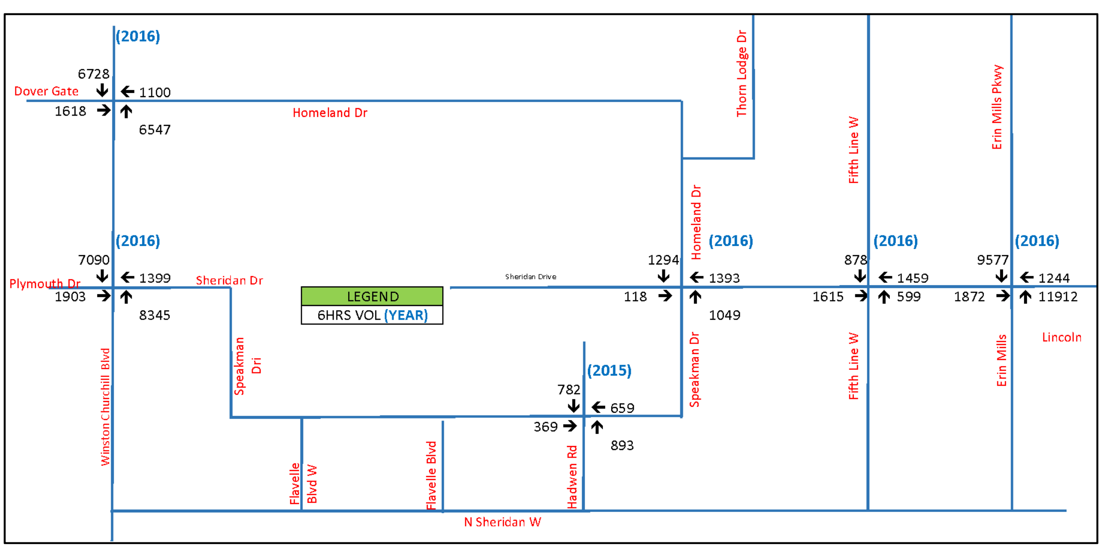


Figure 2 indicates relatively higher volumes during the weekday PM peak hour. The highest approach volume was 2,554 vehicles per hour on the northbound approach at the Erin Mills Pkwy and Sheridan Park Dr intersection.

Figure 3: **Six (6) Hour Traffic Volumes at Study Area Intersections**



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2.3 Traffic Signal Operations

Traffic signal phasing and timings were obtained from the City and confirmed at the site. The information is summarized in **Table 2** below.

Table 2: Collision Patterns at Intersections within the Study Area

Intersection	AM- Phasing	PM- Phasing	Comments
Erin Mill Pkwy/ Sheridan Park Dr	SBL – 20s SB/NB – 97/77s WB/EB – 43s Cycle time: 140s	NBL/SBL – 18/15s NB/SB – 74/77s WB/EB – 48s Cycle time: 140s	NBL not provided during PM
Winston Churchill Blvd/Sheridan Park Dr	SBL – 14s SB/NB – 99/85s WB/EB- 41/41s Cycle time 140	SBL – 13s SB/NB – 88/75s WBL – 11s WB/EB- 52/41s Cycle time: 140s	

3. Collisions Analysis

3.1 Overview

Collision analysis was undertaken for intersections within the Study Area limits. Collision data was obtained from the City of Mississauga for the five-year period from 2010 to 2014. The analysis considered the collision severity, type of impact and the environmental conditions. **Table 3** shows the overall annual trends classified according to severity, surface condition and lighting condition.

Table 3: General Collision Characteristics at the Study Area Intersections

Year	Severity			Surface Condition		Lighting Condition		
	Fatal	Injury	PDO	Wet	Dry	Daylight	Dark	Total
2010	0	5	19	5	19	16	8	24
2011	0	2	21	5	18	18	5	23
2012	0	4	28	9	23	26	6	32
2013	0	6	19	4	21	20	5	25
2014	0	0	17	3	14	13	4	17
Total	**0**	**17**	**104**	**26**	**95**	**93**	**28**	**121**

There was a total of 121 collisions recorded in the Study Area, all of which were non-fatal. The collisions ranged from 17 in 2014 to 32 in 2012. Property damage collisions accounted for 85% of those. Injury collisions accounted for approximately 15%. Most collisions occurred during dry surface during daylight conditions. As such, wet conditions or darkness did not appear to be of any significance in the collisions experience.

The collision pattern at each intersection is summarized in **Table 4**. The highest number of collisions occurred at the Erin Mills Parkway and Sheridan Park Drive Intersection which experienced 74 (60%) of the total collisions. Winston Churchill Blvd / Sheridan Park Drive Intersection which had comparable traffic volumes, had only 31 collisions.

Table 4: Collision Patterns at Intersections

Intersection	Fatal	Injury	Property Damage	Total	6 Hr Total Volume
Erin Mill Pkwy/ Sheridan Park Dr	0	11	63	74	24,605
Fifth Line W/ Sheridan Park Dr	0	3	6	9	4,551
Homeland Dr/Speakman @ Sheridan Dr	0	0	2	2	3,854
Hadwen Rd/ Speakman Dr	0	0	2	2	2,703
Speakman Dr/ Flavelle Blvd	0	0	3	3	Not available
Winston Churchill Blvd/Sheridan Park Dr	0	3	28	31	18,737
Total	**0**	**17**	**104**	**121**	

Further analysis involved examining initial collision impact at each intersection as shown in **Table 5**. Most of the collisions were rear end, which contributed 43 % of the total collisions analysed. Angle and turning collisions were also common at the intersections together accounting for 41%.

Table 5: Intersection Collision by Initial Impact

Intersection	Type of collision						
	Single Vehicle	Angle	Rear End	Side Swipe	Turning	Other	Total
Erin Mills Pkwy/ Sheridan Park Dr	3	12	30	8	20	1	74
Winston Churchill Blvd/Sheridan Park Dr	3	5	16	2	4	1	31
Fifth Line W/ Sheridan Park Dr	2	3	3	0	1	0	9
Homeland Dr/Sheridan Dr/ Speakman Dr	0	0	2	0	0	0	2
Hadwen Rd/ Speakman Dr	0	1	0	0	1	0	2
Speakman Dr/ Flavelle Blvd	0	0	1	0	2	0	3
Total	**8**	**21**	**52**	**10**	**28**	**2**	**121**

The collisions were also analyzed by the time of day of occurrence. The time periods considered were 6 to 10am for the AM peak, 10 am to 3 pm for the off-peak period; 3 pm to 7 pm for the PM peak and finally 7 pm to 6 am for night time periods respectively. Table 6 shows the pattern obtained.

Table 6: Intersection Collision by Time of Day

Intersection	AM Peak	Off-Peak	PM Peak	Night	TOTAL
	6-10am	10 am-3 pm	3-7pm	7pm-6am	
Erin Mills / Sheridan Park Dr	15	21	20	18	74
Winston Churchill/ Sheridan Park Dr	6	6	14	5	31
Fifth Line W/ Sheridan Park Dr	4	2	3	0	9
Homeland Dr/Sheridan Dr/ Speakman Dr	1	1	0	0	2
Hadwen Rd/ Speakman Dr	0	1	1	0	2
Speakman Dr/ Flavelle Blvd	0	2	0	1	3
Total	**26**	**33**	**38**	**24**	**121**

At most intersections, the collisions appeared spread across all times during the day; therefore, making it not possible to associate any pattern with a specific time period. However, at the Winston Churchill Blvd and Sheridan Park Drive Intersection, almost 50% of all collisions occurred during the PM peak period which may point to traffic volume patterns at that time or signal timing issues at the intersection. This is explored further in Section 3.2 below.

3.2 Detailed Safety Analysis

3.2.1 Winston Churchill /Sheridan Parkway Intersection

Over the analysis period, 31 collisions were recorded at the Winston Churchill Blvd and Sheridan Park Drive intersection. Almost 90% of the collisions (28) at the intersection were property damage with the rest (3) resulting in injury. Review of the patterns showed that rear end collisions accounted for over 50% of all the collisions. Collisions diagram for this intersection is presented in Figure 4.

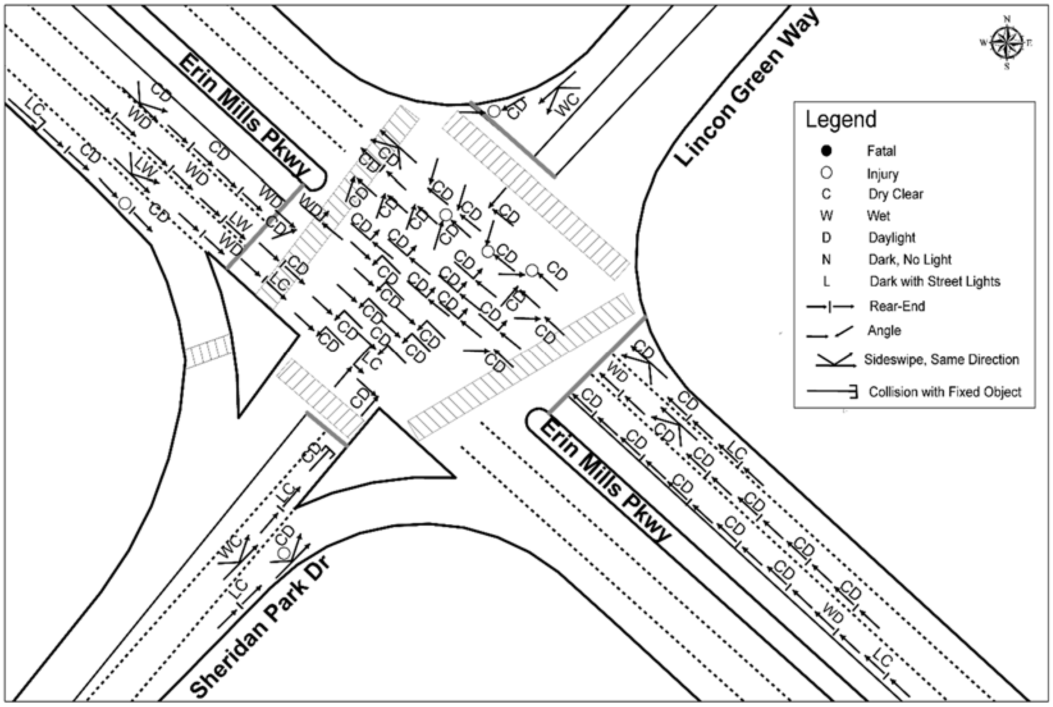
Figure 4: Sheridan Park Drive and Winston Churchill Blvd Intersection Collision Pattern

The figure shows that while several collisions occur within the intersection area, the majority occur on the southbound approach. Most of the collisions on that approach occur during the PM peak hour with the common manoeuvre being vehicles slowing down to stop. A review of traffic operations (provided in a separate report) shows that the intersection operates well at that time with the SB approach at Level of Service B. Noting that the approach slopes downwards towards the intersection, the collisions could be attributed to speeding, and inability of drivers to stop safely once the signal turns red.

3.2.2 Erin Mills Parkway /Sheridan Park Drive Intersection

The highest number of collisions was recorded at the Erin Mills Parkway/Sheridan Park Drive intersection during the analysis period. The intersection also had the highest traffic volumes of over 24,000 vehicles in the busiest six hours. A total of 74 collisions were recorded with the majority (85%) being property damage only. No fatal collisions were recorded anywhere in the Study Area. Collisions diagram for this intersection is shown in Figure 5.

Figure 5: Sheridan Park Drive and Erin Mills Pkwy Intersection Collision Pattern



Majority of the collisions (43%) occurred at the intersection area and were either turning or angle collisions. That was closely followed by rear end collisions that accounted for 41%. A greater percentage of the rear end collisions occurred on the northbound approach.

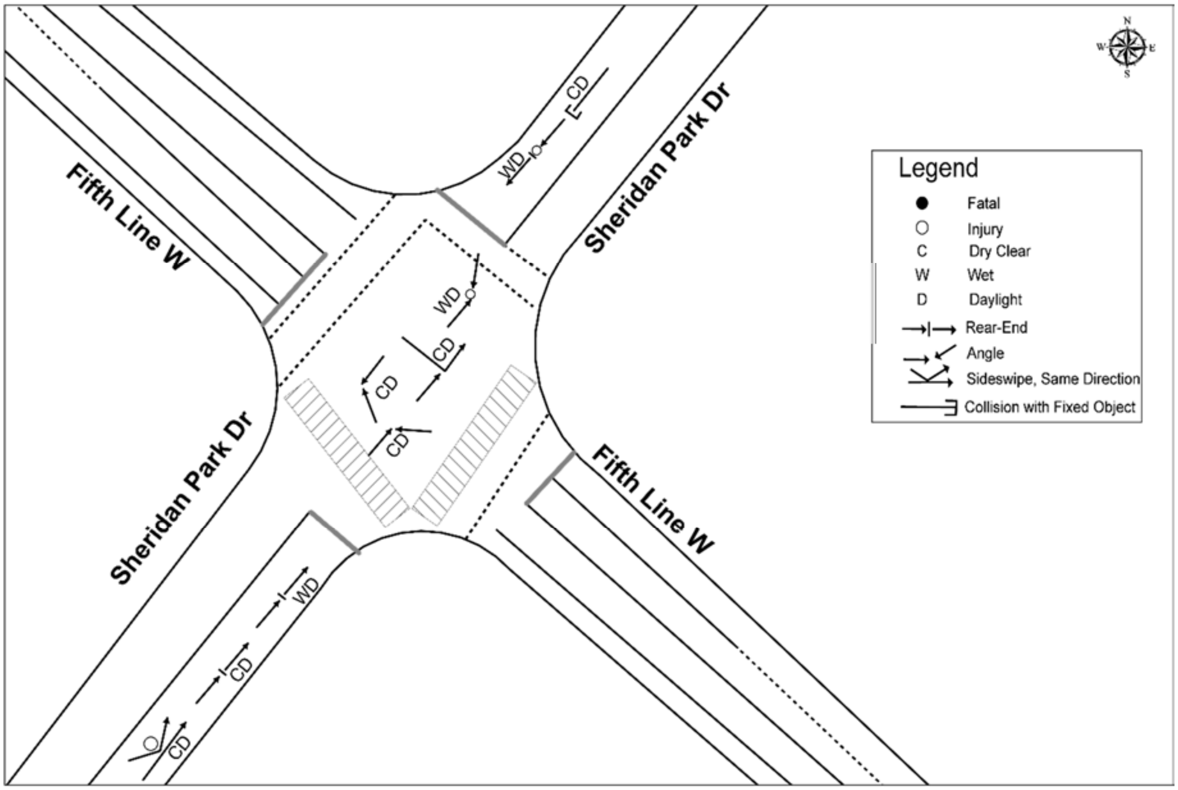
Operations at this intersection were reported to be fair at LOS C, but the east-west movements operated poorly at Level of Service E or F during both AM and PM peak hours. The poor operations are attributed to lower capacity on the approaches. That situation results in long delays for motorists who may often be tempted to enter the intersection even when the green signal has ended. As noted previously, queues on the eastbound approach are long and occasionally extend to Fifth Line West and Sheridan Park Drive Intersection. Coupled with that, there is a downward slope on the approach, thereby requiring greater effort to decelerate and stop when the signal is changing.

These factors could explain the high number of angle or turning collisions with east west traffic. Such a situation could be mitigated through measures that enhance capacities on those approaches such as the provision of protected left turn phasing or widening to accommodate more lanes.

3.2.3 Fifth Line /Sheridan Parkway Intersection

A total of nine collisions were recorded at this intersection over the five-year period. The collision diagram is shown in **Figure 6**. It is noteworthy to mention that three rear end collisions were on the EB approach. Because of the extensive queueing on the EB approach of the downstream intersection (Erin Mills Parkway), there is a high likelihood that the long queue played a contributory role in those rear end collisions.

Figure 6: Fifth Line W and Sheridan Park Dr Intersection Collision Pattern



3.2.4 Other Intersections

Collisions at the other Study Area intersections were few and did not warrant detailed considerations.

3.3 Potential for Safety Improvement (PSI)

Assessment for Potential for Safety Improvement was undertaken based on the calibrated City of Mississauga Models. The analysis was undertaken for the Erin Mills/Sheridan Park and the Winston Churchill /Sheridan Parkway intersections that experienced the highest number of collisions. The PSI models are based on the Empirical Bayes framework that aims at estimating long term safety performance of intersections and considers factors impacting road safety and how safety measures can reduce accident frequency and severity. The provided models for the City of Mississauga are included in the Appendix.

The PSI of an intersection is the difference between the long term expected safety performances and its predicted safety performance also including the societal cost of collision. The PSI of an intersection is comprised of both the PSI for the severe and PDO collisions. Only positive PSI value are used for consideration. Usually if the PSI is negative for a roadway element, it should be assigned a value of zero since the negative sign means that the intersection experiences fewer collisions than is expected.

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3.3.1 Comparison of Predicted and Average Collisions

Predicted number of collisions were estimated using the Equation 1 below:

$$E(Y) = \boldsymbol{\alpha} \times \boldsymbol{F_{tot}^{b}} \times \{\frac{F\ min}{F\ tot}\}^{c} \qquad \textbf{\textit{EQ 1}}$$

Where,

E(Y) is the predicted number of collisions:
F_{maj} is the entering AADT on the major approach
F_{min} is the entering AADT on the minor approach
F_{tot} is the total entering volume of an intersection which is equal to F_{maj} + F_{min}
α , b, c are the model parameters estimated through the Full Bayes approaches.

The predicted annual collisions were then compared with actual average number of collisions obtained by dividing the observed number of collisions with the five-year analysis period at the two intersections as shown in Table 7.

Table 7: Expected Collisions

Intersection	Severity	AADT Major	AADT Minor	lnα	α	b	c	Predicted Collisions	Avg. Actual Collisions
Winston Churchill /Sheridan Park	Severe	31,700	6,800	-12.0015	6.135E-06	1.2137	0.480	**0.9649**	**0.60**
	PDO	31700	6,800	-12.0953	5.5857E-06	1.3955	0.566	**5.2516**	**5.60**
Erin Mill Pkwy/ Sheridan Park Dr	Severe	42,600	7,000	-12.0015	6.135E-06	1.2137	0.490	**1.1757**	**2.20**
	PDO	42,600	7,000	-12.0953	5.5857E-06	1.3955	0.566	**6.5877**	**12.60**

The results indicate that the Winston Churchill intersection is experiencing generally average number of collisions, the collisions frequency at the Erin Mills Pkwy intersections is much higher than expected. In fact, the intersection experienced approximately twice as much as the predicted number of collisions over the five-year period considered.

3.3.2 Estimation of Potential for Safety Improvement

The Potential for Safety Improvement is calculated for specific collision severity level:

i. Fatal and Injury (F&I)
ii. Property Damage Only (PDO)

In the Mississauga model, the number of factor collisions has a weighting factor of 135.5 while the number of injury collisions has a factor of 3.3. A weighting factor for economic and societal costs, the Relative Safety Index (RSI), is used to substitute the societal costs of collisions and is calculated thus:

$$\text{RSI} = \frac{135.5 \times Number\ of\ fatal\ Collisions + 3.3 \times Number\ of\ Injury\ Collisions}{Total\ Number\ of\ fatal\ and\ Injury\ Collisions} \qquad \textbf{\textit{EQ 2}}$$

The RSI value for an intersection is therefore assessed based on the respective numbered of recorded fatal and injury collisions. **Table 8** below shows the RSI values from the equation above for the two intersections considered.

Table 8: Relative Safety Index

Traffic Control Type/ Number of Legs	Intersection	Fatal	Injury	PDO	RSI
Signalized-4 Legged	Erin Mill Pkwy/ Sheridan Park Dr	0	11	63	3.3
Signalized-4 Legged	Winston Churchill Blvd/Sheridan Park Dr	0	3	28	3.3

Then the Potential for Safety Improvement is calculated as for each severity level and final factor obtained by summing up the various factors thus:

$$PSI_{F\&I} = (m_{F\&I} - E\{m\}_{F\&I}) - (RSI) \quad \textbf{\textit{EQ 3}}$$

$$PSI_{PDO} = = (m_{PDO} - E\{m\}_{PDO}) \quad \textbf{\textit{EQ 4}}$$

$$PSI_{ALL} = PSI_{F\&I} + PSI_{PDO} \quad \textbf{\textit{EQ 5}}$$

Where,

m = the long term number of collision s expected to occur at the location per year,

$E\{m\}$= the number of collisions predicted to occur as an average per year.

The finally obtained PSI as well as selected intermediate model parameters are shown in **Table 9**. Negative results indicate the intersection experiences less than the expected collisions, and hence are assigned a value of zero (0.0).

Table 9: Potential for Safety Improvement

Model Parameters	Winston Churchill		Erin Mills	
	F&I Collisions	PDO Collisions	F&I Collisions	PDO Collisions
E{m}	0.9649	5.2516	1.1757	6.5877
m	0.7082	5.5725	1.9367	12.2151
m-E{m}	-0.2567	0.3208	0.7611	5.6275
RSI	3.3000	1.0000	3.3000	1.0000
PSI	-0.8471	0.3208	2.5115	5.6275
PSI (All)	-0.5262 (0.0)		8.1390	

The results provide PSI values of zero (0.0) and 8.1 for the Winston Churchill Blvd and Erin Mills Parkway intersections respectively. The PSI results indicate that there are benefits in undertaking safety improvements at the Erin Mills Parkway/Sheridan Park Drive intersection. However, those benefits may not accrue at the Winston Churchill Blvd and Sheridan Park Drive Intersection.

4. Future Conditions Review

Review of the safety performance under future conditions was undertaken following the design of improvements along the Sheridan Park Drive. It is recognized that safety performance will change in the future due to normal traffic growth and more so as a result of any recommended improvements on the road. This section reviews the changes in safety performance that will arise due to those factors in the future.

4.1 Review of Future Transportation Conditions

R.J Burnside & Associates Limited undertook future transportation analysis as documented in the *Sheridan Park Drive Extension Transportation Report,* that included assessment of future traffic demands and applying them to develop suitable improvements within the Study Area. The report assessed future traffic volumes on the basis of patterns developed from EMME outputs provided by the City of Mississauga and observed turning movement volume patterns at intersections. It was found that traffic growth at intersections would generally range from 0.5% to 3.5% per year up to future horizon years considered of 2021 and 2031.

The report recommended various improvements on the road network to address existing and projected traffic operational concerns. **Table 10** lists some of the proposed improvements from the traffic operations analysis of the Study Area.

Table 10:Summary of the Future improvements

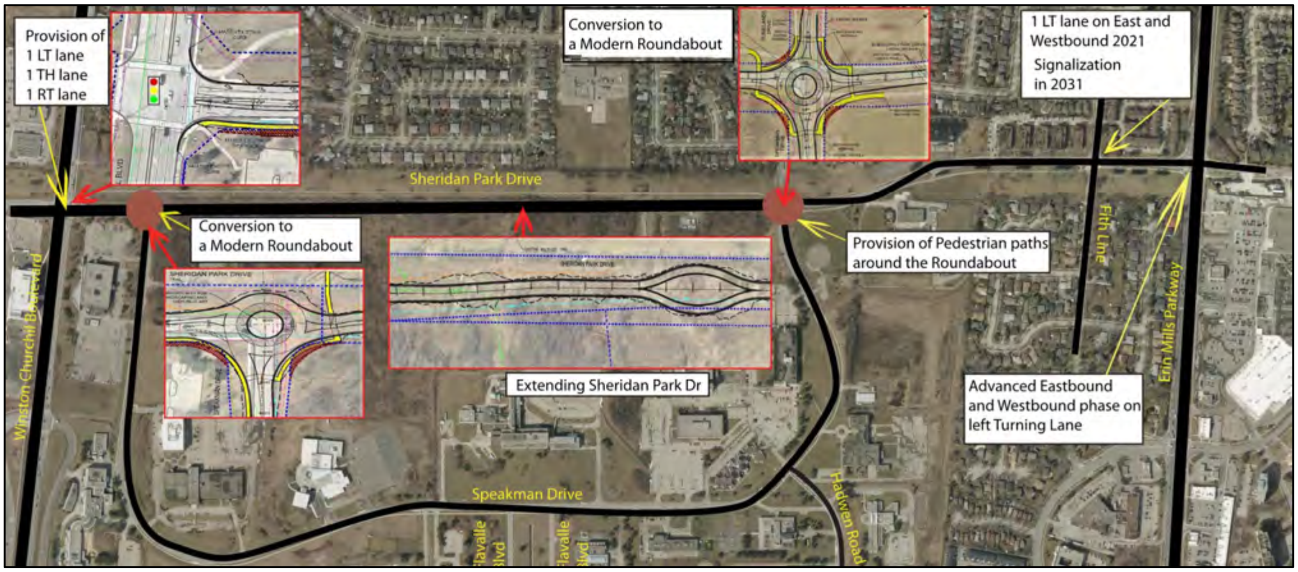
2021 Improvements	2031 Improvements
Conversion of the Sheridan Park Drive/Homeland cross Intersection to a roundabout	Signalization of the Fifth Line/Sheridan Park Drive intersection
Introduction of Eastbound and Westbound LT lanes of Fifth Line W/ Sheridan Park Drive	Winston Churchill Blvd 3 Lanes per Direction[1]
Introduction of sidewalks and crossing areas	
Introduction of Westbound RT lane on Winston Churchill Blvd/Sheridan Park Drive	
Introduction of a roundabout at Sheridan Park Drive / Speakman Drive (west leg)	

Most of the improvements will be required by 2021 and will include construction of the central section of Sheridan Park Drive into a two-lane cross section to provide a through roadway from Winston Churchill Boulevard to Erin Mills Parkway. In addition, several modifications are proposed on individual intersections that will include conversion from stop controlled intersections to roundabouts and widening to accommodate through movement or turning lanes. The improvements are illustrated schematically in **Figure 7**.

[1] *Improvements done with EMME Model and did not include any other roadway improvement.*

The proposed improvements will impact safety performance in the future and hence the need to undertake assessment to quantify those impacts.

Figure 7: Proposed Measures



4.2 General Impacts of Measures

4.2.1 Intersections Improvements

A summary of the proposed improvements and expected safety benefits is shown in **Table 11**.

Table 11: Summary of Proposed Improvements and Expected Safety Benefits

Intersection	Improvement	Expected Benefits
Erin Mill Pkwy/ Sheridan Park Dr	• Advanced Eastbound and Westbound phase on the LT lane	• Reduced conflicts
Fifth Line W/ Sheridan Park Dr	• Introduction LT in East and Westbound Direction 2021 • Signalizing the intersection prior to 2031 [2]	• Reduced conflicts
Homeland Dr/ Speakman @ Sheridan Dr	• Conversion of the intersection to roundabout.	• Improved traffic circulation • Reduced number of conflict points • Improved pedestrian safety
Hadwen Rd/ Speakman Dr	N/A	
Speakman Dr/ Flavelle Blvd	N/A	
Winston Churchill Blvd/Sheridan Park Dr	• Widening of the Sheridan approach from 2 to 3 lanes with 1 LT ,1 TH and 1 RT. • Signalization of the intersection	• Reduced conflicts with opposing traffic • Channelization of traffic • Improved pedestrian safety
Sheridan Park Drive/ Speakman Drive (West Leg)	• Conversion to a roundabout	• Improved traffic circulation • Reduced number of conflict points

[2] *Without Sheridan park Drive Extension, Signalization by 2021 with Sheridan Park Drive Extension.*

4.2.2 Impacts of Conversions to Modern Roundabouts

4.2.2.1 Homelands Dr/Speakman @ Sheridan Dr

The intersections as currently existing is designed as a 2 way stop control and is characterised by rear end and angle collisions by the vehicles approaching from the Sheridan Park Drive east leg. This may be attributed to sudden changes in speed as vehicles approach the intersection and inadequate turning space for the left turn movement. The conversion of the intersection to a modern roundabout will change the conflict points from crossing conflicts to merging conflicts. The roundabout is expected to reduce travel speeds and thereby reduce the likelihood of a rear end collision.

Potential Benefits of a roundabout

1. One-way travel -The traffic at the roundabout circles in one direction ruling out the possibility of a head on collision and significantly reducing the angle collisions.
2. Low travel speeds- Roundabouts have fewer severe collisions because of the low speeds and drivers must yield before entering the roundabout.
3. Roundabouts keep the traffic flow smooth thus vehicles can move into and out of an intersection faster and therefore less congestion.
4. Pedestrians experience fewer conflict points compared to the cross intersections.

Disadvantages of the roundabout

1. Drivers yield when approaching the intersection, this create a confusion for the pedestrians since the traffic does not come to a full stop.
2. The crosswalk locations are further out from the intersection about 6 metres or behind the yield point. This creates confusion since pedestrians must adjust to these roundabout operations.

4.2.2.2 Sheridan Park Drive/Speakman Drive (West Leg)

The conversion of the intersection to a roundabout will result in similar benefits on safety as discussed above on the Sheridan Park Drive and Homelands Drive. Additionally, the roundabout is expected to provide efficient operation for traffic from the new Sheridan Park extension and cater well for the various modes of transportation. This is expected to improve the overall safety experience within the entire Study Area and eliminate traffic infiltration and truck traffic on Homeland Drive neighbourhood.

4.2.3 Impacts of the Other improvements

4.2.3.1 Winston Churchill Blvd/Sheridan Park Dr

The design has proposed widening of the Sheridan Park Dr eastbound approach from 2 to 3 lanes (LT, TH, RT). This improvement will significantly impact on the traffic operations at the intersection. The right turn and the left turn lanes separate traffic movements at the intersection.

Benefit of provision of the turning lanes

1. They provide a safe place for turning drivers to wait for a gap in the opposing traffic therefore reducing the likelihood of angle collisions.
2. They improve the intersection capacity.
3. There is significant improvement on traffic flow within the intersection as traffic is channelized into definite paths as they approach the intersection.

4.3 Crash Modification Factors (CMF)

CMF's quantify the change in expected average crash frequency at a site resulting from implementation of a certain countermeasures. The CMF approach adopted from *Highway Safety Manual Vol. 3* was applied at three intersections where modifications are recommended in the future. An extract from the Manual showing the relevant CMF for the considered improvements is included in **Appendix 3. Table 12** tabulates a summary of the existing and future expected crashes at each intersection following implementation of the various improvements.

As an example, at the Winston Churchill/Sheridan Park intersection, the improvement is expected to result in a CMF of 0.73 that translate to reduced future crashes from existing 0.96 to anywhere between 0.63 to 0.78. This corresponds to 19% to 35% reduction in crashes. The range indicates the lower bound and upper bound limits for 95th percentile confidence on the factors and expected reductions.

Table 12: Summary of Expected Crashes

Intersection	Treatment	CMF	Existing Crashes/ year	Future Crashes /year	% Decrease
Winston Churchill Blvd/Sheridan Park Dr	Provide a Right Turn lane on one major road approaches	0.73	0.96	0.63 to 0.78	19% - 35%
Homeland Dr/ Speakman @ Sheridan Dr	Convert Intersection to modern roundabout	0.61	0.33	0.13 to 0.27	19% - 59%
Fifth Line W/ Sheridan Park Dr	Provide a Left Turn lane on both major road approaches	0.53	0.26	0.11 to 0.16	39% - 55%

The results indicate that the improvements will result in percentage crash reduction of between 19% to 35% at the Winston Churchill Blvd/Sheridan Park Drive intersection where a LT lane and one through lane are proposed, while at the Homeland/Sheridan Park Drive intersection, conversion to a roundabout will decrease collisions by between 19% – 59%.

It should be noted that these changes assume that all factors would remain relatively the same at the intersections. With increased volumes, higher collision rates are expected. It is estimated that without improvements, collision rates could escalate by 5 to 10% by 2021 as a result of traffic volume increases as per the assessed growth rates.

5. Conclusions and Recommendations

The analysis in this memorandum points to higher than normal collisions at the Erin Mills Parkway/Sheridan Park Drive intersection. The collision patterns point predominantly to poor operations on the intersection East-West movement that do not have protected left turn signals. These operations results in long queues that may in turn impact the safety at the Fifth Line/Sheridan Park Drive Intersection.

While the collision frequency at the Winston Churchill / Sheridan Park Drive / Plymouth Drive intersection was generally as expected, there was a disproportionate number on the southbound approach.

Under future conditions, the assessment indicates that the proposed measures will result in positive safety impacts with reduced number of collisions at the intersections where changes are planned.

It is recommended that the designed improvements be implemented as they would result in improved safety performance within the Study Area.

APPENDICES

Appendix 1:

Potential for safety Improvement (PSI) Model & Procedure

Collision Prediction Model for the City of Mississauga

Group	Type	Ln(α)	*b*	*c*	*k*	Pearson Chi-Square/Df	
Signalized 4-leg	**Severe**	-12.0015	1.2137	0.4897	0.4918	0.979	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
Signalized 3-leg	**Severe**	-6.7111	0.606	0.3382	1.1451	0.9893	$E(Y) = \alpha \times F_{maj}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
2-way stop control 4-leg	**Severe**	-12.2183	1.2155	0.5337	0.4256	0.9456	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
2-way stop control 3-leg	**Severe**	-13.3843	1.3362	0.6523	0.297	1.0087	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
Signalized 4-leg	**PDO**	-12.0953	1.3955	0.5655	0.4439	0.9299	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
Signalized 3-leg	**PDO**	-7.1172	0.8422	0.4217	0.7491	0.9348	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
2-way stop control 4-leg	**PDO**	-9.5475	1.048	0.2517	0.6055	1.0618	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$
2-way stop control 3-leg	PDO	-11.1226	1.3123	0.7337	0.7693	1.0404	$E(Y) = \alpha \times F_{tot}^{b} \times \left(\frac{F_{min}}{F_{tot}}\right)^{c}$

E(Y) is the predicted number of collisions;
F_{maj} is the entering AADT on the major approaches;
F_{min} is the entering AADT on the minor approaches;
F_{tot} is the total entering volume of an intersection which is equal to $F_{maj} + F_{min}$;
α, b, and c are the model parameters estimated through the Full Bayes approach.

WEIGHTING FACTOR		
Fatal	Injury	PDO
135.5	3.3	1

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Potential for safety Improvement (PSI) Model & Procedures

The formulae used are follows:

$$m = w_1 \times x + w_2 \times \mathrm{E}\{m\} \quad \textbf{EQ 1}$$

Where w_1 and w_2 are the weighting factors that can be estimated by:

$$w_1 = \frac{\mathrm{E}\{m\}}{(\frac{1}{k})+(\mathrm{n}\times\mathrm{E}\{m\})} \quad \textbf{EQ 2}$$

$$w_2 = \frac{(\frac{1}{k})}{(\frac{1}{k})+(\mathrm{n}\times\mathrm{E}\{m\})} \quad \textbf{EQ 3}$$

Where,

m = the long term number of collision s expected to occur at the location per year,

$\mathrm{E}\{m\}$= the number of collisions predicted to occur as an average per year.

X = Observed number of collisions at a specific location per years,
n= number of years for which the collisions counts are available
k= the over –dispersion parameter that describe the relationship between E $\{m\}$ and VAR $\{m\}$ as previously described.

The PSI of an intersection is the difference between the long term expected safety performances and its predicted safety performance also including the societal cost of collision.

Therefore the PSI is calculated by:

$$\mathrm{PSI}_{\mathrm{TOTAL}} = \mathrm{PSI}_{severe} + \mathrm{PSI}_{\mathrm{PDO}} \quad \textbf{EQ 4}$$

Where,

$$\mathrm{PSI}_{severe} = (m_{severe} - \mathrm{E}\{m\}_{severe}) \times (\text{Societal Cost of Fatal and Injury Collisions})$$

$$\mathrm{PSI}_{\mathrm{PDO}} = = (m_{PDO} - \mathrm{E}\{m\}_{PDO}) \times (\text{Societal Cost of PDO})$$

In light of this study, the estimated weighting factors for the fatal, injury and PDO collisions was 135:3.3:1. The weighting factor is used to substitute the societal costs of collisions.
Then:

$$\mathrm{PSI}_{F+1} = (m_{severe} - \mathrm{E}\{m\}_{severe}) \times (\text{weighted factor of fatal and Injury Collisions})$$

$$\mathrm{PSI}_{\mathrm{PDO}} = = (m_{PDO} - \mathrm{E}\{m\}_{PDO})$$

Because the SPF $_{severe}$ is used in this study, the economic weighted factor, or relative safety index (RSI), must be derived for severe collisions. The RSI for intersections is estimated by,

$$\text{RSI} = \frac{135.5 \times Number\ of\ fatal\ Collisions + 3.3 \times Number\ of\ Injury\ Collisions}{Total\ Number\ of\ fatal\ and\ Injury\ Collisions} \qquad \textbf{EQ 5}$$

For this study, RSI value for intersection are acquired based on the respective numbered of recorded fatal and injury collisions for intersections in the Region. The table below shows the RSI values from the equation above.

Take together the following equation are used in this study to estimate the PSI for the intersection.

$$\text{PSI}_{F+1} = (m_{severe} - \text{E}\{m\}_{severe}) - (\text{RSI}) \qquad \textbf{EQ 6}$$

$$\text{PSI}_{\text{PDO}} = = (m_{PDO} - \text{E}\{m\}_{PDO}) \qquad \textbf{EQ 7}$$

$$\text{PSI}_{\text{ALL}} = \text{PSI}_{severe} + \text{PSI}_{\text{PDO}} \qquad \textbf{EQ 8}$$

Only positive PSI value are used for consideration. Usually if the PSI is negative for a roadway element, it should be assigned a value of zero since the negative sign means that the intersection experiences fewer collisions than is expected.

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Appendix 2:

Estimation of Future Collision Rates due to Traffic Volume Increase

Table A2-1: Severe Crash Projections

Severe Collisions									
Intersection	**AADT Major 2016**	**AADT Minor 2016**	**% Growth 2021**	**AADT Major 2021**	**AADT Minor 2021**	**EB-adjusted Collisions 2016**	**Actual Avg. Annual Collisions**	**EB-Adjusted Predicted Collisions 2021**	**% Increase**
Erin Mill Pkwy/ Sheridan Park Dr	42600	7000	1.5	43676	7541	1.18	2.2	1.25	6%
Fifth Line W/ Sheridan Park Dr	7680	4220	0.5	8274	4546	0.26	0.6	0.28	9%
Homeland Dr/Speakman @ Sheridan Dr	7850	5700	1.0	8457	5844	0.33	0.0	0.34	5%
Hadwen Rd/ Speakman Dr	5530	3590	1.0	5670	3681	0.24	0.0	0.25	3%
Speakman Dr/ Flavelle Blvd	5410	3700	1.0	5547	3889	0.54	0.0	0.57	6%
WinstonChurchill Blvd/Sheridan Park Dr	31700	6800	2.0	32500	8076	0.96	0.6	1.09	13%

Table A2-2: Property Damage Only Projections

PDO Collisions									
Intersection	**AADT Major 2016**	**AADT Minor 2016**	**% Growth 2021**	**AADT Major 2021**	**AADT Minor 2021**	**EB-Adjusted Collisions 2016**	**Actual Avg. Annual Collisions**	**EB-Adjusted Predicted Collisions 2021**	**% Increase**
Erin Mill Pkwy/ Sheridan Park Dr	42600	7000	1.5	43676	7541	6.59	12.6	7.06	7%
Fifth Line W/ Sheridan Park Dr	7680	4220	0.5	8274	4546	1.51	1.2	1.68	11%
Homeland Dr/Speakman @ Sheridan Dr	7850	5700	1.0	8457	5844	1.05	0.4	1.11	5%
Hadwen Rd/ Speakman Dr	5530	3590	1.0	5670	3681	1.11	0.4	1.15	4%
Speakman Dr/ Flavelle Blvd	5410	3700	1.0	5547	3889	1.20	0.6	1.27	6%
WinstonChurchill Blvd/Sheridan Park Dr	31700	6800	2.0	32500	8076	5.25	0.6	6.05	15%

TIMCON

Appendix 3: Collision Modification Factors

Roundabout Conversion CMF

Table 14-4. Potential Crash Effects of Converting a Stop-Controlled Intersections into a Modern Roundabout (29)

Treatment	Setting (Intersection Type)	Traffic Volume	Crash Type (Severity)	CMF	Std. Error
Convert intersection with minor-road stop control to modern roundabout	All settings (One or two lanes)	Unspecified	All types (All severities)	**0.56**	**0.05**
			All types (Injury)	**0.18**	**0.04**
	Rural (One lane)		All types (All severities)	**0.29**	**0.04**
			All types (Injury)	**0.13**	**0.04**
	Urban (One or two lanes)		All types (All severities)	**0.71**	**0.1**
			All types (Injury)	**0.19**	**0.1**
	Urban (One lane)		All types (All severities)	**0.61**	**0.1**
			All types (Injury)	**0.22**	**0.1**
	Urban (Two lanes)		All types (All severities)	*0.88*	*0.2*
	Suburban (One or two lanes)		All types (All severities)	**0.68**	**0.08**
			All types (Injury)	**0.29**	**0.1**
	Suburban (One lane)		All types (All severities)	**0.22**	**0.07**
			All types (Injury)	**0.22**	**0.1**
	Suburban (Two lanes)		All types (All severities)	**0.81**	**0.1**
			All types (Injury)	**0.32**	**0.1**
Convert all-way, stop-controlled intersection to roundabout	All settings (One or two lanes)		All types (All severities)	*1.03**	*0.2*

Base Condition: Stop-controlled intersection.

TIMCON

LT on both Major Road Conversion CMF

Table 14-12. Potential Crash Effects of Providing a Left-Turn Lane on Two Approaches to Four-Leg Intersections (16)

Treatment	Setting (Intersection Type)	Traffic Volume AADT (veh/day)	Crash Type (Severity)	CMF	Std. Error
Provide a left-turn lane on both major-road approaches	Rural (Four-leg, minor-road stop-controlled intersection)	Major road 1,500 to 32,400, minor road 50 to 11,800	All types (All severities)	**0.52**	**0.04**
			All types (Injury)	**0.42**	**0.04**
	Urban (Four-leg, minor-road stop-controlled intersection)	Major road 1,500 to 40,600, minor road 200 to 8,000	All types (All severities)	**0.53**	**0.04**
			All types (Injury)	**0.50**	**0.06**
	Rural (Four-leg signalized intersection)	Unspecified	All types (All severities)	0.67	N/A°
	Urban (Four-leg Signalized intersection)	Major road 7,200 to 55,100, minor road 550 to 2,600	All types (All severities)	**0.81**	**0.1**
			All types (Injury)	**0.83**	**0.02**
	Urban (Four-leg newly signalized[a] intersection)	Major road 4,600 to 40,300, minor road 100 to 13,700	All types (All severities)	**0.58**	**0.04**
			All types (Injury)	**0.52**	**0.07**

Base Condition: A four-leg intersection without a left-turn lane

LT on one Major Road Conversion CMF

Table 14-11. Potential Crash Effects of Providing a Left-Turn Lane on One Approach to Four-Leg Intersections (16)

Treatment	Setting (Intersection Type)	Traffic Volume AADT (veh/day)	Crash Type (Severity)	CMF	Std. Error
Provide a left-turn lane on one major-road approach	Rural (Four-leg, minor-road stop-controlled intersection)	Major road 1,600 to 32,400, minor road 50 to 11,800	All types (All severities)	**0.72**	**0.03**
			All types (Injury)	**0.65**	**0.04**
	Urban (Four-leg, minor-road stop-controlled intersection)	Major road 1,500 to 40,600, minor road 200 to 8,000	All types (All severities)	**0.73**	**0.04**
			All types (Injury)	**0.71**	**0.05**
	Rural (Four-leg signalized intersection)	Unspecified	All types (All severities)	0.82	N/A°
	Urban (Four-leg signalized intersection)	Major road 7,200 to 55,100, minor road 550 to 2,600	All types (All severities)	**0.90***	**0.1**
			All types (Injury)	**0.91**	**0.02**
	Urban (Four-leg newly signalized intersection)	Major road 4,600 to 40,300, minor road 100 to 13,700	All types (All severities)	**0.76**	**0.03**
			All types (Injury)	**0.72**	**0.06**

Base Condition: A four-leg intersection without left-turn lanes.

[The Difference is our People]

Appendix C

Natural Environment Report

Appendix C

Sheridan Park Drive Extension
Municipal Class EA

Natural Environment Report

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON L5N 8R9 CANADA

November 2017
300039474.0000

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R.J. Burnside & Associates Limited

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Executive Summary

As part of the Sheridan Park Drive Extension Environmental Assessment (EA) study, this report has been prepared to document the assessment of the natural environment within the Study Area that may be affected, directly or indirectly, by the proposed extension.

Detailed field surveys were undertaken to characterize terrestrial and aquatic habitats within 120 m of the proposed road extension (the Study Area). Field investigations included the delineation of vegetation communities, breeding bird surveys, the identification of bat maternity and roosting habitat, and an aquatic habitat classification and fish presence survey.

Lands within the Study Area Vicinity, defined as lands within 500 m of the proposed road extension, were also evaluated based on a desktop review of background reports, aerial photography, natural heritage databases, and agency consultation. The major findings of this study are divided into vegetation communities, significant natural heritage features, Species at Risk, and aquatic habitats.

Vegetation Communities

Vegetation communities were characterized using the Ecological Land Classification system at the ecosite level for the Study Area using protocols outlined in Lee *et al*. (1998). Three vegetation community types were identified in the Study Area, split between eight distinct vegetation community polygons. The communities identified were:

- Fresh-Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest (FOD9-1 / FOD9-4);
- Cultural Thicket (CUT); and
- Cultural Meadow (CUM).

Significant Natural Heritage Features

Significant Woodland was identified within the Study Area and confirmed during field studies to extend into the City owned right-of-way (ROW) based on the size criteria, as described in Section 5.1.3. The extent of the Significant Woodland within the ROW is 0.44 ha. The definition of Significant Woodland was taken from the City of Mississauga Official Plan, which was guided by the Provincial Policy Statement.

There were no significant wetlands, valleylands, or areas of natural and scientific interest (ANSI) identified during this study.

Ten candidate and two confirmed Significant Wildlife Habitats, as defined by the Ministry of Natural Resources and Forestry, were identified in the Study Area:

- Candidate Waterfowl Stopover and Staging Areas (Terrestrial);
- Candidate Raptor Wintering Area;
- Candidate Bat Maternity Colonies;
- Candidate Reptile Hibernaculum;
- Candidate Monarch Butterfly Stopover Areas;
- Candidate Landbird Migratory Stopover Areas;
- Candidate Old Growth Forest;
- Candidate Amphibian Breeding Habitat (Woodland);
- Candidate Shrub / Early Successional Bird Breeding Habitat;
- Confirmed Special Concern and Rare Wildlife Species;
  - Eastern Wood-pewee;
  - Wood Thrush;
  - Monarch; and
- Candidate Amphibian Movement Corridors.

Additionally, two candidate Significant Wildlife Habitats, as defined by the Region of Peel, were identified in the Study Area:

- Candidate Migratory Land Bird Stopover (Successional, Natural); and
- Candidate Foraging Areas with Abundant Mass.

Several considerations were made when determining anticipated impacts to Significant Wildlife Habitats (SWH) identified within the Study Area. The areas of encroachment anticipated from proposed road developments are relatively small edge habitat zones which have been heavily degraded by anthropogenic pressures and the encroachment of invasive species. These edge habitats have been assessed as having low ecological integrity and value. As such, the removal of these areas is not anticipated to represent a significant detrimental impact on the ecological functionality of any SWH that may be present in the adjacent Study Area.

Species at Risk

No Species at Risk (SAR) were identified during site specific field studies conducted as part of the EA. Candidate habitat exists on the Study Area for Eastern Meadowlark (Threatened), Little Brown Myotis (Endangered), Northern Myotis (Endangered), Tri-colored Bat (Endangered), and Butternut (Endangered). In the Study Area Vicinity there is also potential habitat for Barn Swallow (Threatened) and Chimney Swift (Threatened).

The most effective way to minimize impacts to these candidate habitats is to reduce the footprint of road works as much as possible. In the event that tree removal will be required, trees to be removed must be assessed on a case-by-case basis to determine whether they may be suitable as Bat Maternity Habitat (BMH). If a BMH tree must be removed, permitting may be required from the MNRF to remove SAR habitat and compensatory offsetting may be required.

Although no Butternut trees were identified in the areas predicted to be impacted by the road, trees to be removed should be confirmed to the species level during the detailed design phase of the project to avoid the incidental removal of Butternut. No impacts to candidate habitat for Eastern Meadowlark are anticipated.

Aquatic Habitat

The aquatic environment in the Study Area comprised of two watercourses and three headwater features of Sheridan Creek. All watercourses flow generally from northwest to southeast through the Study Area.

Watercourse 1

Watercourse 1 was assessed as likely intermittent. The segment of this watercourse within the Study Area features significant riparian vegetation that would provide shade and contribute to potential habitat to resident fish. Streambanks were identified as slightly unstable; undercutting was observed along limited sections of the banks. Small amounts of Watercress were observed along the eastern bank of the channel, which can be a potential indication of groundwater contribution.

Watercourse 2

Watercourse 2 was located southwest of Watercourse 1 and originated upstream of the paved trail. This watercourse likely receives its water from overland sheet flow contributed by surrounding lands. Downstream of the paved trail, the watercourse becomes ponded by a footpath, which indicated a barrier to potential fish migration. This watercourse was assessed as appearing to be incapable of providing direct fish habitat; it was noted, however, that this watercourse does likely contribute to water quality and quantity to Sheridan Creek during the spring freshet and in periods of extended precipitation.

Fish Habitat

No fish were observed during the site visit and subject aquatic features appear to provide little to no potential to support direct fish habitat. Fish populations have also been identified as being likely limited in the upstream reaches of Sheridan Creek and its tributaries. These factors, intermittent or ephemeral flows, low water quantity, in-stream barriers, and potentially degraded water quality contribute to the conclusion that there is likely no direct fish habitat within the Study Area. No records of aquatic SAR were identified as potentially inhabiting the watercourse within the Study Area itself, or within the Sheridan Creek Watershed.

Conclusions

The footprint of the proposed road extension alignment was selected in an effort to both avoid and minimize the potential for adverse effects to the natural heritage features and functions associated with the Study Area. The shoulder grading on the planned right-of-way for Sheridan Drive has been modified with the intention of mitigating area disturbance and removal of habitat adjacent to the proposed road extension.

The proposed extension will require minor intrusion into adjacent Candidate and Confirmed SWH, edge removals of some trees and vegetation, and encroachment into identified Headwater Drainage Areas. However, direct and indirect impacts as a result of the proposed extension is expected to have no net impact overall to the existing natural environment. Additionally, the proposed road extension is not anticipated to impact the form and function of vegetation, wildlife habitat and headwater drainage features. Direct and indirect impacts on the natural environment located outside of the proposed road right-of-way can be managed through appropriate mitigation measures and monitoring activities, as detailed in this Report.

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In the preparation of the various instruments of service contained herein, R.J. Burnside & Associates Limited was required to use and rely upon various sources of information (including but not limited to: reports, data, drawings, observations) produced by parties other than R.J. Burnside & Associates Limited. For its part R.J. Burnside & Associates Limited has proceeded based on the belief that the third party/parties in question produced this documentation using accepted industry standards and best practices and that all information was therefore accurate, correct and free of errors at the time of consultation. As such, the comments, recommendations and materials presented in this instrument of service reflect our best judgment in light of the information available at the time of preparation. R.J. Burnside & Associates Limited, its employees, affiliates and subcontractors accept no liability for inaccuracies or errors in the instruments of service provided to the client, arising from deficiencies in the aforementioned third party materials and documents.

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Glossary of Terms and Acronyms

ANSI:	Significant Areas of Natural and Scientific Interest
BMH:	Bat Maternity Habitat
Burnside:	R.J. Burnside & Associates Limited
COSEWIC:	Committee on the Status of Endangered Wildlife in Canada
COSSARO:	Committee on the Status of Species at Risk in Ontario
CRA Fishery:	Commercial, Recreational, or Aboriginal Fishery
CVC:	Credit Valley Conservation Authority
DBH:	Diameter at Breast Height
DFO:	Fisheries and Oceans Canada
ECCC:	Environment and Climate Change Canada
ELC:	Ecological Land Classification
ESA	*Endangered Species Act*
LIO:	Land Information Ontario
NHIC:	Natural Heritage Information Centre
NHRM:	Natural Heritage Reference Manual
NHS:	Natural Heritage System
MMAH:	Ministry of Municipal Affairs and Housing
MNRF:	Ministry of Natural Resources and Forestry
MBCA:	*Migratory Birds Convention Act*
MBR:	Migratory Birds Regulations
MOECC:	Ministry of the Environment and Climate Change
MOP:	City of Mississauga Official Plan
OBBA:	Ontario Breeding Bird Atlas
ORAA:	Ontario Reptile and Amphibian Atlas
OPSS:	Ontario Provincial Standard Specifications
ORAA:	Ontario Reptile and Amphibian Atlas
PPS:	Provincial Policy Statement 2014 - the statement of the government's policies on land use planning.
RPOP:	Region of Peel Official Plan
SAR:	Species at Risk
SARA:	Federal *Species at Risk Act*
SARO:	Species at Risk in Ontario List
SCC:	Species of Conservation Concern
SWH:	Significant Wildlife Habitat
SWHTG:	Significant Wildlife Habitat Technical Guide

1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighborhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act.*

As part of the EA Study, Burnside has completed a Natural Environment Report (NER) to identify the potential impacts and constraints that may arise as a result of proposed developments within the Study Area and Vicinity and any potential mitigation measures.

1.1 Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive / Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail and the Sheridan Homelands residential neighborhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Development in the City of Mississauga's Official Plan (MOP) (City of Mississauga, 2017). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved multi-use trail through the utility corridor from Winston Churchill Boulevard to Homelands Drive / Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Figure 1: Study Area

For the purposes of this Report, the Study Area is defined as the area within approximately 120 m of the proposed road extension. Lands within the Study Area Vicinity, defined as lands within approximately 500 m of the proposed road extension, were also evaluated based on a desktop review of background reports, aerial photography, natural heritage databases, and agency consultation.

1.2 Study Purpose

The purpose of this study is to assess the natural environment within the Study Area and Study Area Vicinity that may be affected, directly or indirectly, by the proposed road extension. Provincial and local significance of natural features will be evaluated, as well an assessment on the presence of species and habitats protected by Ontario legislature and guiding documentation.

1.3 Study Organization

This study discusses pertinent legislature and other documentation, assessment of background information and natural site history, methodology of data collection, analysis of results, and interpretation of implications from a natural environment perspective. The logical flow of these concepts follows the general steps as outlined below:

- Identification of Planning and Environmental Policy Considerations;
- Background Records Review;
- Site Investigation:
  - Methodologies;
  - Results;
  - Analyses;
- Identification of Features of Provincial Significance ; and
- Identification of Features of Local Significance.

2.0 Planning and Environmental Policy Considerations

The following policies, Acts and regulations apply to features present in the Study Area and Study Area Vicinity.

2.1 *Federal Fisheries Act*, 1985

The *Fisheries Act*, *1985* is administered by Fisheries and Oceans Canada (DFO) (DFO, 1985). On June 29, 2012, amendments to the Federal *Fisheries Act* were approved. The changes are focused on protecting the productivity of commercial, recreational and Aboriginal fisheries (CRA fishery). On November 25, 2013, amended fish and fish habitat and pollution prevention provisions came into effect. The federal government is now focusing protection rules on significant threats to the fisheries and the habitat that supports them, while setting clear standards and guidelines for routine projects. The amended *Fisheries Act* requires that any development project avoid causing serious harm to fish unless authorized by DFO. This applies to any works being undertaken in or near waterbodies that support fish that are part of, or that support a CRA fishery.

Any waterbody or watercourse that could be potentially impacted that contains fish during any time of the year, and/or contributes to a CRA fishery as described in the

Fisheries Act is protected. Documented waterbodies and watercourses that are part of, or contribute to a CRA fishery are discussed herein and shown on accompanying Figures. *Fisheries Act* compliance is required as part of the proposed works.

2.2 *Species at Risk Act*, 2002

As per the Species at Risk Public Registry, the Act is a key federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity (Government of Canada 2017).

The purposes of the Act are to prevent Canadian indigenous species, subspecies, and distinct populations from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and encourage the management of other species to prevent them from becoming at risk.

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

To ensure the protection of Species at Risk, SARA contains prohibitions that make it an offence to:

- Kill, harm, harass, capture, or take an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated;
- Possess, collect, buy, sell or trade an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated; and
- Damage or destroy the residence (e.g. nest or den) of one or more individuals of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated, if a recovery strategy has recommended the reintroduction of that extirpated species.

These prohibitions apply on all federal lands in a province and all federal lands in a territory under the authority of the Minister of the Environment or the Parks Canada Agency (Government of Canada 2017).

2.3 *Migratory Birds Convention Act*, 1994

The *Migratory Birds Convention Act, 1994* (MBCA) and the Migratory Bird Regulations (MBR) are federal legislative requirements that are binding on members of the public and all levels of government, including federal and provincial governments (ECCC, 1994; ECCC, 2013). The legislation protects certain species[1], controls the harvest of others, and prohibits commercial sale of all species.

One key responsibility under the MBCA is described in Section 6 of the associated MBR:

> *"Subject to subsection 5(9), no person shall disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, or have in his possession a live migratory bird, or a carcass, skin, nest or egg of a migratory bird except under authority of a permit therefor."*

The "incidental take" of migratory birds and the disturbance, destruction or taking of the nest of a migratory bird is prohibited. "Incidental take" is the killing or harming of migratory birds due to actions, such as economic development, which are not primarily focused on taking migratory birds.

No permit can be issued for the incidental take of migratory birds or their nest or eggs as a result of economic activities. These prohibitions apply throughout the year. Environment Canada and the Canadian Wildlife Service have compiled nesting calendars that show the variation in nesting intensity, by habitat type and nesting zone, within broad geographical areas distributed across Canada. While this does not mean nesting birds will not nest outside of these periods, the calendars can be used to greatly reduce the risk of encountering a nest. Environment Canada advises avoidance as the best approach.

2.4 Provincial Policy Statement, 2014

The Provincial Policy Statement (PPS) provides general policies on land use patterns, resources, and public health and safety that guide development across Ontario (MMAH, 2014). The PPS, dated 2005, was updated in 2014 and includes some changes to the policies for Natural Heritage, Wetlands and Water. This report will address Section 2.1 of the PPS (Natural Heritage).

Eight types of natural heritage features are identified in Sections 2.1.4 and 2.1.5 of the PPS where development and site alteration are not permitted unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions:

1. *Significant Wetlands in Ecoregions 5E, 6E and 7E;*

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[1] *Bird species not regulated under the Act include: Rock Dove, American Crow, Brown-headed Cowbird, Common Grackle, House Sparrow, Red-winged Blackbird, and European Starling. In addition, raptors are not regulated under the MBCA. However, they are protected under provincial legislation which restricts and regulates the taking or possession of eggs and nests. Furthermore, if the species identified is protected under Ontario's ESA or the federal SARA, additional restrictions may apply.*

2. *Significant Coastal Wetlands;*
3. *Significant Wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;*
4. *Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);*
5. *Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and St. Mary's River);*
6. *Significant Wildlife Habitat (SWH);*
7. *Significant Areas of Natural and Scientific Interest (ANSIs); and*
8. *Coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).*

Sections 2.1.6, 2.1.7, and 2.1.8 identify three additional development and site alteration prohibitions and exemptions, as follows:

1. *Fish habitat except in accordance with provincial and federal requirements;*
2. *Habitat of endangered species and threatened species, except in accordance with provincial and federal requirements; and*
3. *On adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5 and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*

The presence, or potential presence, of these features as well as the policy and planning implications of these features for development are discussed in detail in this Report.

2.5 Provincial *Endangered Species Act*, 2007

The *Endangered Species Act, 2007* (ESA) provides protection for Species at Risk (SAR) and their habitat (MNRF, 2007). The ESA is administered by the Ministry of Natural Resources and Forestry (MNRF) and provides policies for the protection of extirpated, endangered and threatened species, as well as species of special concern. These four categories of species form the Species at Risk in Ontario (SARO) List, which are classified by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is also responsible for maintaining criteria for assessing and classifying SAR (MNRF, 2017b).

The ESA helps protect species (Section 9) and their habitat (Section 10). Section 9(1)(a) of the ESA (2007) states "*no person shall kill, harm, harass, capture or take a living member of a species that is listed on the SARO list as extirpated, endangered or threatened*". Section 10(1) (a) of the ESA, 2007 states "*no person shall damage or destroy the habitat of a species that is listed on the SARO list as an endangered or threatened species*".

The ESA includes a general habitat regulation as well as species-specific habitat regulations. Species uplisted to endangered or threatened automatically receive general habitat protection under the ESA. The province is then required to prepare a species recovery strategy and establish a habitat regulation according to requirements of the ESA.

The SARO List is constantly being updated. It is therefore the proponent's responsibility to practice due diligence in order to ensure that the ESA and its regulations are not violated.

2.6 Credit Valley Conservation Authority

Portions of the subject lands are located within the Credit Valley Conservation Authority (CVC) Regulation limit (CVC, 2017). CVC administers Ontario Regulation (O. Reg.) 160/06, *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses* (MNRF, 2013). Through this regulation, CVC has the ability to:

- Prohibit, regulate or require the permission of the authority for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream or watercourse, or for changing or interfering in any way with a wetland; and
- Prohibit, regulate or require the permission of the authority for development, if in the opinion of the authority, the control of flooding, erosion, dynamic beaches or pollution or the conservation of land may be affected by the development.

The proposed development would require a permit application under O. Reg. 160/06. CVC will assess the application in order to determine if the proposed works will be affected by the above, in accordance with their programs and policies.

2.7 Region of Peel Official Plan

The Region of Peel Official Plan (RPOP), adopted in 1996 and consolidated December 2016, defines and guides the implementation of land use policies for all communities within the Region of Peel (Region of Peel, 2016). It incorporates the GGH, the Oak Ridges Moraine, and the Niagara Escarpment into its Greenlands System; the system's overarching philosophy is to protect natural areas through maintaining linkages, where ecologically appropriate, into a network of natural core areas and corridors.

The Greenlands System is divided into Core Areas, Natural Areas and Corridors, and Potential Natural Areas and Corridors. Core Areas are identified landscapes that contain ecological features, forms and/or functions that represent uninterrupted natural system and the highest potential for biodiversity (Region of Peel, 2016). Natural Areas and Corridors are lands identified as containing important ecological features, forms and/or functions that can also support the integrity of the Greenlands System within the

Region. Potential Natural Areas and Corridors are similar to Natural Areas and Corridors though their status and significance within the Greenlands System may require additional study and evaluation.

2.8 City of Mississauga Official Plan

The City of Mississauga Official Plan (MOP) consolidation of March, 2017 is the guiding document for development and growth within the City (City of Mississauga, 2017). It reflects Mississauga's strategic goals:

- Lead and encourage environmentally responsible approaches;
- Conserve, enhance and connect natural environments; and
- Promote a green culture.

The MOP incorporates aspects of the PPS, the Greenbelt Plan, and the RPOP into its policies. From an environmental perspective, the plan incorporates significant natural and hazard areas into its Greenland system. Development is restricted in Greenland space to protect people and property from damage, as well as to provide protection, enhancement, and restoration of the Natural Heritage System (City of Mississauga, 2017).

2.9 The City of Mississauga Urban Forest Management Plan

The Natural Heritage and Urban Forest Strategy, along with the Urban Forest Management Plan (UFMP) 2014-2033 (January 2014), guides the management of Mississauga's Natural Heritage System and Urban Forest to ensure they are protected, enhanced, restored and expanded for future generations . The UFMP was completed in 2014 as the City's response to the challenges facing the City's Urban Forest. A key part of the UFMP is to monitor the status of the urban forest through analysis of the urban canopy.

General Objectives of the UFMP include the following to provide integrated direction and a holistic approach to managing parks and natural areas within the urban setting of the City through the establishment of city-wide plans for both public and private forested lands:

- *Increase … awareness of the value and need to protect enhance, expand and restore the Natural Heritage System (NHS) and the Urban Forest (UF).*
- *Expand the NHS and the UF by pursuing opportunities through the development application process, infilling and redevelopment of public and private lands, and public acquisition.*
- *Build on existing, and develop new, public and private sector partnerships to help pursue and implement the vision and targets for the NHS and UF.*

- *Undertake regular monitoring of the NHS and UF to evaluate performance and identify trends or changes that may require a shift in management approaches or practices.*

Implementation, guidance documents and plans will feed back into the MOP.

3.0 Background Records Review

3.1 Methodology

The background records review took into account the proposed development envelope and surrounding lands. The total project area was determined to be approximately 37 ha. The Study Area encompassed an approximate radius of 120 m from the proposed road works, while the Study Area Vicinity encompassed all natural areas within 500 m of the proposed road extension (Figure 1). All lands within the Study Area were studied as part of the high level desktop review to identify significant natural heritage features located within the Study Area and Study Area Vicinity that have the potential to be impacted by the proposed works. Some background sources provided a broader scope of search area that extended up to 10 km from the Study Area (i.e., Ontario Breeding Bird Atlas, Ontario Reptile and Amphibian Atlas).

An aquatic assessment was also required based on the proximity of the potential works to several watercourses and potential fish habitat, as well as the implications of O. Reg. 160/06, *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation,* administered by CVC (MNRF, 2013). A comprehensive desktop review of background information was completed to compile and review existing information of the local aquatic environment available for the Study Area and Vicinity.

Information acquired through this desktop assessment was used to help guide field studies and evaluate the significance of on-site observations. Information was reviewed from the data sources identified in Table 3.1. In addition to background documents, relevant agencies were also contacted to provide additional records as identified in Table 3.2. The results of the background review are contained in Appendix A.

Table 3.1: Background Review Data Sources

Database	Website / Source
Species, Habitat Natural Area Records	
Natural Heritage Information Centre (NHIC) Natural Heritage Viewer NHIC 1x1 km^2 Squares 17PJ0819, 17PJ0719.	http://www.gisapplication.lrc.gov.on.ca/mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US
Land Information Ontario (LIO)	Geographic Information Systems (GIS)
MNRF Interactive Map of SAR by County/Region	http://www.ontario.ca/environment-and-energy/find-species-risk-your-area
Ontario Breeding Bird Atlas (OBBA 2001-2005) OBBA 10x10 km^2 Square 17PJ01	http://www.birdsontario.org/atlas/datasummaries.jsp?lang=en
Conservation Authority/Fisheries and Oceans Canada (DFO) Aquatic Species at Risk mapping	http://www.conservation-ontario.on.ca/projects/DFO.html
Ontario Reptile and Amphibian Atlas (ORAA) ORAA 10x10 km^2 Square 17PJ01	http://www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php
Publications	
Sheridan Creek Watershed Study and Impact Monitoring Characterization Report	http://www.creditvalleyca.ca/wp-content/uploads/2015/05/Sheridan-Watershed-March-2011_Phase1.pdf
Credit River Fisheries Management Plan	http://www.creditvalleyca.ca/watershed-science/our-watershed/credit-river-fisheries-management-plan/
Credit Valley Source Protection Area Assessment Report	www.ctcswp.ca/the-science/credit-valley-spa-assessment-report/

Database	Website / Source
Landscape Imagery	
Natural Resources Canada National Air Photo Library	http://www.nrcan.gc.ca/earth-sciences/geomatics/satellite-imagery-air-photos/9265
Ministry of Agriculture, Food, and Rural Affairs Mapping (2015)	http://www.omafra.gov.on.ca/english/landuse/gis/portal.htm
CA Regulations	
Credit Valley Conservation Authority (CVC)	http://www.creditvalleyca.ca/regmap-files/CVC_ScreeningTool_20160111_final.html
Official Plans	
Region of Peel Official Plan (RPOP)	https://www.peelregion.ca/planning/officialplan/
City of Mississauga Official Plan (MOP)	http://www.mississauga.ca/portal/residents/mississaugaofficialplan

Table 3.2: Agencies Contacted for Site-specific Records

Agency	Contact
Ministry of Natural Resources and Forestry (MNRF), Aurora District	Mr. Bohdan Kowalyk District Planner (Acting) 50 Bloomington Rd Aurora ON L4G 0L8
Credit Valley Conservation Authority	Mr. Iftekhar Ahmad Planning Technician 1255 Old Derry Road Mississauga ON L5N 6R4

Records of agency correspondence are found in Appendix B.

3.2 Summary of the Background Records Review

3.2.1 Identification of Regulated Natural Areas

3.2.1.1 Credit Valley Conservation Authority Regulated Areas

Portions of the Study Area are located within the CVC Regulation Limits (CVC, 2017). A southeastern running drainage swale at the southwestern limit of Sheridan Park Drive (#1), several headwater drainage features in the central portion of the project area (#2), and a small lowland area in the southwestern end of the Study Area (#3) have all been identified as falling within CVC regulations, as numbered on Figure 2. The headwater drainage features at #1 are discussed in Sections 4.3.5 and 5.1.7. The lowland areas at #3 appear to be the current location of a commercial building (2855 Speakman Drive). The proposed road extension is not anticipated to impact this area.

3.2.1.2 Region of Peel Official Plan Regulated Areas

The RPOP designates the headwater drainage features, watercourses (tributaries of Sheridan Creek) and surrounding lowlands as being part of the regional Greenlands System (Region of Peel, 2016). Development and site alterations within the Region's Core Greenland Areas are permitted; the prohibitions placed on development in these areas do not apply to essential infrastructure that is authorized under an environmental assessment process.

Datum: North American 1983
Coord. System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Central Meridian: 81°0'0.00"W
False Easting: 500,000m | False Northing: 0m
Rotation: -51.2 | Scale Factor: 0.99960

True North

0 100 200 300 400
Metres

StudyArea
Sheridan Park Drive Right-of-Way
CVC Generic Regulation Limit

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
Data Source: CVC Regulation Mapping

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CITY OF MISSISSAUGA

Figure Title
SHERIDAN PARK DRIVE EXTENSION
CVC REGULATION LIMIT

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HN	PD	2017/09/06	2
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3.2.1.3 City of Mississauga Official Plan Regulated Areas

Most of the natural areas adjacent to the proposed extension of Sheridan Park Drive are included in the City of Mississauga's Greenland system (City of Mississauga, 2017). Developments within Greenland areas of the City of Mississauga are restricted. According to Section 19.18.5 of the MOP, the following applies when evaluating development adjacent to Greenland areas:

> *Development adjacent to Greenland areas is subject to the delineation of natural hazards, natural areas, buffers and setbacks by the City in consultation with the appropriate conservation authority.*

The planning and development of any extensions to Sheridan Park Drive adjacent to Greenland areas will require consultation with City officials and CVC biologists during the detailed design phase of the project.

3.2.2 Identification of Provincially Significant Natural Features

Provincially significant natural features are natural areas that have been identified by the PPS or the MNRF as being valuable. Some of these areas are determined by established ranking systems, and others are determined by the wildlife they support. Section 5.0 details the provincially significant natural features that were identified through the review of existing records and field data analysis carried out for the Study Area and Study Area Vicinity.

Significant wetlands and Areas of Natural and Scientific Interest (ANSI) are identified through the MNRF and reflected on municipal official plans, while significant valleylands are identified by the local conservation authority. Significant Wildlife Habitat (SWH) is to be assessed using the Significant Wildlife Habitat Criteria Schedules (SWHCS) (MNRF, 2015).

3.2.3 Identification of Provincially Significant Species

Species of Conservation Concern

The term "Species of Conservation Concern" (SCC) is defined under the Natural Heritage Reference Manual (NHRM) as follows:

- Species that are rare or are substantially declining, or have a high percentage of their global population in Ontario;
- Special concern species identified on the SARO List that were formally referred to as "vulnerable" in the Significant Wildlife Habitat Technical Guide (SWHTG; MNR, 2000); and/or
- Species identified as nationally endangered or threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which are not protected in regulation under Ontario's ESA (MNRF, 2005).

The definition for SCC excludes habitats of endangered and threatened species covered under the PPS (MMAH, 2014), specifically, Policy 2.1.3(a). These are discussed separately in Section 5.1.5 of this Report.

Species at Risk

Species designated as endangered are defined under the PPS as “a species that is listed or categorized as an ‘endangered species’ on the MNRF’s official Species at Risk list, as updated and amended from time to time” (MMAH, 2014).

Species designated as threatened are defined under the PPS (MMAH, 2014) as “a species that is listed or categorized as a ‘threatened species’ on the MNRF’s official Species at Risk list, as updated and amended from time to time”.

According to the NHRM (MNR, 2005), the definition of “significant” as it pertains to the habitat of endangered or threatened species has two basic characteristics that habitat must exhibit to meet the definition. The habitat must be:

- Necessary for the maintenance, survival and/or recovery of naturally occurring or reintroduced populations; and
- Occupied or habitually occupied by the species during all or any part(s) of its life cycle.

The potential for habitat of rare and endangered species can be assessed using sighting records as found in sources such as the Natural Heritage Information Centre (NHIC), Ontario Bird Breeding Atlas (OBBA), Ontario Reptile and Amphibian Atlas (ORAA), as well as through communication with MNRF area biologists familiar with the lands around the project area.

Summary

Species that are listed as SCC or SAR that were recorded from Burnside’s background records review and field studies are discussed in Sections 4.0 and 5.0 and included in the detailed Screening Table in Appendix A. The results of the background review of features and species that may be present in the Study Area and Study Area Vicinity were guided by field investigations that were conducted in spring and summer of 2017 and are discussed in Section 4.0 of this Report.

3.2.4 Aquatic Environment Background Review

The Study Area is located in the upper section of the Sheridan Creek drainage basin within the Lake Ontario Shoreline West Subwatershed within the Credit River Watershed. The Sheridan Creek drainage basin is a relatively highly urbanized watershed whose watercourses are generally highly influenced for anthropogenic purposes, most notably storm water management infrastructure. General hydrologic symptoms of this influence are hardened and straightened channels, poor water quality, rapid stream flow response to rain/precipitation events, and low quality fish habitat.

The northernmost / upper section of the mainstem of Sheridan Creek originates from a small network of naturalized headwater drainage features and residential storm water management infrastructure, generally flowing southeast through a mix of industrial, commercial, and residential land uses prior to flowing into Lake Ontario via the Rattray Marsh. Reviewed background material from the Sheridan Creek Watershed Study and Impact Monitoring Characterization Report (Aquafor Beech Ltd., 2011) indicated that there are a small number of headwater channels remaining in the Sheridan Creek watershed, which has limited the supply of sediment to the reaches in the upstream portion of the watershed and has resulted in bank erosion and down-cutting within these reaches. Most watercourse reaches downstream of Speakman Drive have been straightened, confined, and hardened in some way. The confinement of these channels within narrow corridors with limited sediment supply from upstream reaches has resulted in down-cutting and increased separation of the channel and its floodplain. In addition to the direct modifications of the channel during development of the watershed, the urbanization of the watershed has also changed the character of the flow in the channel.

The Approved Updated Credit Valley Source Protection Area Assessment Report (2015) indicated that the water quality in the lower more urbanized section of Sheridan Creek, upstream of the Rattray Marsh, contains elevated concentrations above the respective regulatory standards for chlorine, aluminum, and E.coli. However, the upper section is generally not as impacted as the downstream sections.

The Sheridan Creek Watershed Study and Impact Monitoring Characterization Report (Aquafor Beech Ltd., 2011) also identified that potential fish habitat exists in the Rattray Marsh, Sheridan Creek, and its tributaries. The average Index of Biological Integrity calculated for Sheridan Creek was 0.87/5, a poor health rating typical of an urban stream. The report discusses several other aspects of physical habitat conditions in the Sheridan Creek subwatershed relevant to the Study Area, including:

- Zero-order swales have been hardened or piped to prevent flooding and erosion;
- Good shade provided by a treed corridor, although limited in-stream woody cover is present within the mainstem of Sheridan Creek;
- Substrates of the mainstem of Sheridan Creek, as well as downstream in Rattray Marsh appear ideal for fish habitat; and
- Instream barriers are the primary factor in limiting upstream movement of fish, with no fish being found upstream of Clarkson Road.

4.0 Characterization of Existing Natural Environment

4.1 Physiography and Topography (Desktop)

The Study Area is located within the broad, low-lying area known as the Iroquois Plain physiographic region of southern Ontario. This physiographic region was formed by the lacustrine deposits of the historic Lake Iroquois, a waterbody that existed in the late Pleistocene Era. The Iroquois Plain extends around the western portion of Lake Ontario, from the Niagara River to the Trent River (Chapman and Putnam, 1984). As could be anticipated, conditions along this extensive region vary greatly depending on the location. The historic Lake Iroquois shorelines include bars, beaches, boulder and cliff pavements (Chapman and Putnam, 1984), while old sand and gravel bars are considered to be good aquifers and sources of aggregate material. The physiography in the vicinity of the Study Area is characterized by shale plains and is located north and west of two historic beaches and a shore cliff formed by Lake Iroquois. The reviewed surficial geology mapping in the region of the Study Area indicates that the Study Area is underlain by glaciolacustrine deposits of clay to silt till and Paleozoic bedrock (Ontario Geological Survey, 2010). Ministry of Environment and Climate Change (MOECC) water well records in the area of the Study Area indicate that the Site is generally underlain by till and shale formations (red or grey in colour), the latter of which typically contained the water table.

4.2 Natural Heritage Features and Functions Methodology

The purpose of the site investigations was to verify information collected through the background records review, further characterize known features and identify any additional features not previously recorded. The site investigations included:

- Classification of vegetation communities using the Ecological Land Classification (ELC) for Southern Ontario protocol (Lee et al., 1998);
- Avifauna surveys;
- Amphibian breeding call surveys;
- An assessment of aquatic habitat (including a fish presence survey); and
- A review of cultural (originating from, or maintained by, anthropogenic influences and culturally based disturbances) features with the potential to provide significant habitats.

The survey methodologies used are summarized and described below.

4.2.1 Vegetation Communities and Species Inventory

Vegetation communities were characterized using methodologies as presented by Lee *et al*. (1998) in the Ecological Land Classification (ELC) System for Ontario (First Approximation). During these studies, information on the plant species encountered at the Study Area was also compiled into a plant inventory. Field surveys were conducted on June 7, 2017. The timing of this survey was based on provincially accepted guidelines and the timing of the 2017 spring leaf out. The start of June date was intended to capture both spring ephemerals and the longer-living dominant plant species cover in the vegetation communities. This system involves gathering data on topography, soil moisture regime and effective texture, as well as density and composition of plant species. These data are then used to arrive at specific ecosites that best represent each distinct ecological unit.

4.2.2 Avifauna

Breeding bird surveys were completed for this project on June 1 and 13, 2017 by an Avian Biologist. Breeding bird surveys were completed following the general principles outlined in the *Ontario Breeding Bird Atlas (OBBA) Guide for Participants* (OBBA, 2001), tailored to the needs of this project. The survey methodology is summarized below and in Table 4.1.

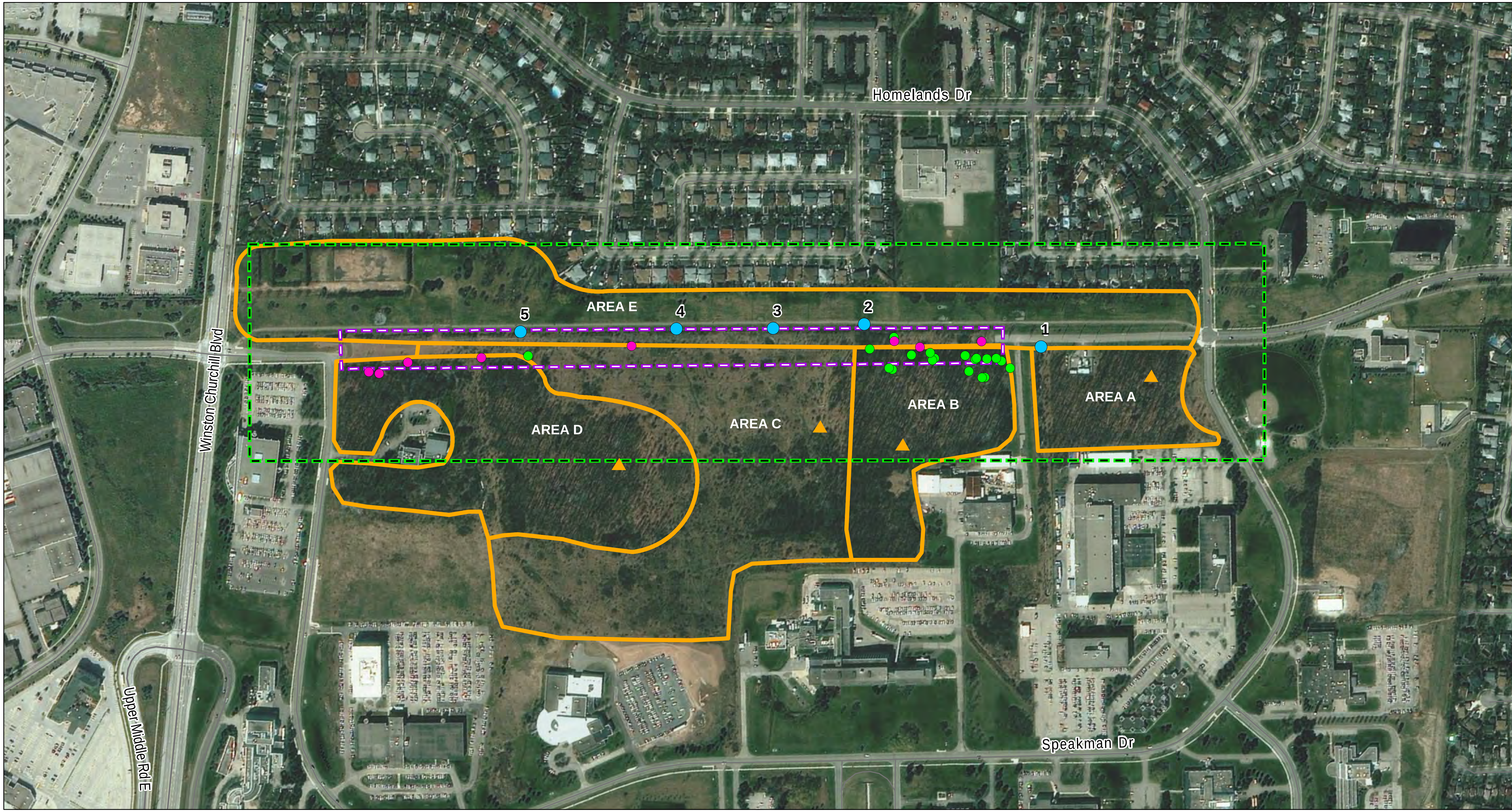
- Surveys were conducted between June 1 and June 13, 2017, which falls within the peak breeding window for the majority of bird species in Southern Ontario;
- The OBBA Guide states that breeding bird surveys conform to the following weather conditions requirements: counts should not be done if it is raining, there is thick fog, or if winds are greater than 19 km per hour (i.e., >3 on the Beaufort scale); Generally, weather conditions were conducive for auditory and visual surveys, with winds less than 19 km per hour, and no precipitation;
- Surveys within the Study Area were conducted by walking transects through each of the vegetation habitats present (refer to Figure 3); and
- All birds observed and heard were recorded, including level of breeding evidence (refer to Section 4.3.2 and Appendix C).

Table 4.1: Summary of Breeding Bird Surveys Conducted by Burnside Staff

June 1, 2017	**Breeding Bird Survey #1**
Time (24 h): 0610-0845	Air Temp (°C): 10-13
Sky Code[1]: 0	Wind Scale[2]: 1-3
June 13, 2017	**Breeding Bird Survey #2**
Time (24 h): 0625-0900	Air Temp (°C): 23
Sky Code[1]: 2	Wind Scale[2]: 0

[1] NAAMP / Beaufort Sky Codes: 0=clear (no cloud cover); 1=partly cloudy (scattered or broken) or variable; 2=cloudy or overcast; 3=sandstorm, dust storm or blowing snow; 4=fog, smoke, thick dust, or haze; 5=drizzle or light rain; 6=rain; 7=snow or snow / rain mix; 8=showers; 9=thunderstorms.

[2] Beaufort Wind Scale: 0=calm, smoke rises vertically (0-2 km/hr); 1=light air movement, smoke drifts (3-5 km/h); 2=slight breeze, wind felt on face; leaves rustle (6-11 km/h); 3=gentle breeze, leaves & twigs in constant motion (12-19 km/h); 4=moderate breeze, small branches moving, raises dust & loose paper (20-30 km/h); 5=fresh breeze, small trees begin to sway (31-39 km/h); 6=strong breeze, large branches in motion (40-50 km/h).



Datum: North American 1983	
Coord. System: NAD 1983 UTM Zone 17N	
Projection: Transverse Mercator	
Central Meridian: 81°0'0.00"W	
False Easting: 500,000m	False Northing: 0m
Rotation: -51.2	Scale Factor: 0.99960

True North

0 100 200 300 400

Metres

Candidate Bat Maternity Habitat Tree (Leaf-On)

Candidate Bat Maternity Habitat Tree (Leaf-Off)

Amphibian Monitoring Location

EAWP Location

Sheridan Park Drive Right-of-Way

Breeding Bird Survey Location

Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BURNSIDE

Client

CITY OF MISSISSAUGA

Figure Title

SHERIDAN PARK DRIVE EXTENSION

ECOLOGICAL SURVEYS

Drawn	Checked	Date	Figure No.
HN	PD	2017/09/06	3
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File Path: E:\Project\300\039474 (Sheridan Park Drive)\Map\039474 Ecological Surveys.mxd Print Date: 2017/09/06 Time: 02:07 PM

4.2.3 Herpetofauna

A review of aerial photographs and mapping identified the potential presence of several small wetted features including two watercourses as well as the potential for localized seasonal ponding within the Study Area. When weather permitted, amphibian breeding call surveys were conducted throughout the Study Area during the first two weeks of April, May, and June, 2016, respectively to determine the presence of breeding amphibians within 120 m of the Study Area. Refer to Figure 3 for survey locations.

Survey protocols were based on the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (BSC, 2009). Surveys for frog and toad species are conducted three times per year during the peak breeding times for individual species. The survey guidelines divide the province of Ontario into three main regions (south, central and north). As a general rule, sites located in southern Ontario would typically be surveyed earlier each month compared to sites located further north in central or northern Ontario (i.e., first survey between April 1-15) due to the earlier onset of breeding in southern Ontario. According to the definition provided in the handbook, the Study Area is located in central Ontario (between the 43rd and 47th parallels); therefore, surveys were conducted over the first two weeks of each respective month.

Surveys were completed during appropriate weather conditions in order to maximize calling activity and provide the best chance of call capture (Table 4.2). Night temperatures for the April survey were above 5°C, above 10°C for the May survey, and above 17°C for the June survey. Due to the relatively loud background noise from the surrounding urban environment, survey lengths were extended to 10 minutes per station.

Table 4.2: Details of Amphibian Breeding Call Surveys Conducted by Burnside Staff

April 11, 2017	**Amphibian Breeding Call Survey #1**
Time (24h): 20:30	Air Temp (°C): 6
Sky Code[1]: 1	Wind Scale[2]: 2
May 16, 2017	**Amphibian Breeding Call Survey #2**
Time (24h):20:55	Air Temp (°C): 13
Sky Code[1]: 1	Wind Scale[2]: 2
June 13, 2017	**Amphibian Breeding Call Survey #3**
Time (24h): 21:30	Air Temp (°C): 21
Sky Code[1]: 1	Wind Scale[2]: 1

[1] NAAMP / Beaufort Sky Codes: 0=clear (no cloud cover); 1=partly cloudy (scattered or broken) or variable; 2=cloudy or overcast; 3=sandstorm, dust storm or blowing snow; 4=fog, smoke, thick dust, or haze; 5=drizzle or light rain; 6=rain; 7=snow or snow / rain mix; 8=showers; 9=thunderstorms.

[2] Beaufort Wind Scale: 0=calm, smoke rises vertically (0-2 km/hr); 1=light air movement, smoke drifts (3-5 km/h); 2=slight breeze, wind felt on face; leaves rustle (6-11 km/h); 3=gentle breeze, leaves & twigs in constant motion (12-19 km/h); 4=moderate breeze, small branches moving, raises dust & loose paper (20-30 km/h); 5=fresh breeze, small trees begin to sway (31-39 km/h); 6=strong breeze, large branches in motion (40-50 km/h).

Three call level codes are used for amphibians (Code 1, Code 2, and Code 3). Table 4.3 below shows the descriptions for each of these codes (taken from BSC, 2009). The results of the amphibian breeding call surveys are provided in Section 4.3.3 of this Report.

Table 4.3: Amphibian Breeding Call Level Codes

Call Code	Code Description
1	Calls not simultaneous, number of individuals can be accurately counted.
2	Some calls simultaneous, number of individuals can be reliably estimated.
3	Full chorus, calls continuous and overlapping, number of individuals cannot be reliably estimated.

4.2.4 Bats

In April 2017, MNRF Guelph District released the *Survey Protocol for Species at Risk Bats within Treed Habitats* for three of Ontario's four Endangered bat species (Little Brown Myotis – *Myotis lucifugus*; Northern Myotis – *Myotis septontrionalis*; Tri-colored Bat – *Perimyotis subflavus*) (MNRF, 2017c). These three species, along with Eastern Small-footed Myotis (*Myotis leibii*) were designated as Endangered on SARA in 2014 after observations of dramatic population declines of these species throughout eastern North America (ECCC, 2015).

The protocol is separated into two sub-protocols, a "leaf-off" and a "leaf-on" survey which each target different species.

Leaf-off Survey

Leaf-off surveys of treed habitat for maternity / roosting colonies focus on Little Brown Myotis and Northern Myotis. These species roost in tree cavities or under loose bark. Leaf-off surveys were completed on April 11, 2017.

The initial step of the protocol is identifying treed areas that are facing potential disturbance, to be confirmed during field reconnaissance. With small areas (under 10 ha), a comprehensive walk-through of an area is conducted to look for snag trees, as opposed to larger sites where sub-samples and snag density surveys are more appropriate.

The quality of roosting habitat is dependent on 10 factors, which can be used to determine which snag trees from a survey are most suitable as bat maternity habitat. These factors are listed below in order of descending importance:

1. Tallest snag trees;
2. Snag exhibits cavities or crevices often originating as cracks, scars, knot holes or woodpecker cavities;

3. Snag has the largest diameter breast height (DBH) (>25 cm);
4. Snag is within the highest density of other snags;
5. Snag has the highest amount of loose, peeling bark (naturally occurring / due to decay);
6. Cavity or crevice is high on the tree (>10 m) or is chimney-like with a low entrance;
7. Tree is a species known to be rot-resistant (such as Black Cherry, Black Locust);
8. Tree species typically provides good cavity habitat (e.g., White Pine, Maple, Aspen, Ash, Oak);
9. Snag is located within an area where the canopy is more open; and
10. Snag exhibits early stages of decay (Decay Class 1-3).

With these factors in mind, we surveyed all treed habitat within the study area for traits that indicate potential BMH for Little Brown and Northern Myotis. We recorded for each candidate tree: species, DBH, canopy height class, approximate height, cavity type, the presence of other nearby snags, and decay class. These trees were each recorded with a GPS waypoint and photo records. Identified BMH tree listings can be found in Appendix E.

Leaf-on Survey

Tri-colored Bat show strong preference to roosting in the foliage of oak and maple trees, especially those that feature dead or dying clusters of leaves. This survey protocol targets these genera specifically. The following trees were documented:

- Oaks ≥ 10 cm DBH;
- Maples ≥ 10 cm DBH **IF** the tree includes dead or dying leaf clusters; and
- Maples ≥ 25 cm DBH.

Areas with oak and maple trees were identified during the leaf-off phase of the BMH survey protocol. As such, survey efforts focused on the mixed and deciduous forest communities.

The protocol for bat habitat surveys was determined through consultation with MNRF. Records of agency correspondence are found in Appendix B.

4.2.5 Aquatic Habitat Assessment

A site investigation was undertaken to verify the findings of the background information review and to identify additional features. Off-site property access constrained some observations; however, where sightlines allowed, watercourses were assessed both on-site and downstream of the Sheridan Drive corridor. Planned site investigations included walking surveys throughout the corridor to visually observe and assess the watercourses. Information was collected using a combination of the Ministry of Transportation (MTO) / DFO / MNRF Fisheries Protocol (2009), and the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA, 2013). Burnside conducted a site visit on April 11, 2017 to verify and assess the existing conditions of the watercourses and drainage features within the Study Area.

4.2.6 Incidental Wildlife Sightings

Incidental wildlife sightings were limited to the Study Area and were documented during all field investigations in order to provide a general characterization of the habitat functions of the Study Area. Incidental observations were those recorded during targeted surveys for other aquatic or terrestrial investigations. Examples include tracks, carcasses, live sightings, etc. A list of incidental wildlife observations are noted below in Section 4.3.6 of this Report.

4.2.7 Anthropogenic Features

A review of background sources revealed that a number of SCC or SAR that are known to utilize anthropogenic features may be present in the Study Area or vicinity. These include Barn Swallow (*Hirundo rustica*), Chimney Swift (*Chaetura pelagica*), and bat species. Any man-made features which could provide a habitat function and may require targeted surveys were identified. This included an assessment of whether any uncapped chimneys, buildings with open roof / trusses, barn structures, rock piles or rock fences extending into the ground, and landfill spoil piles are present in the Study Area.

The presence of anthropogenic features in the Study Area is discussed in Section 4.3.7 of this Report.

4.3 Findings of the Site Investigations

4.3.1 Vegetation Communities and Species Inventory

The natural areas southeast of the proposed Sheridan Drive extension were assessed using the First Approximations ELC system (Lee *et al.* 1998). The system resulted in eight ecosites in three ecosite types, as described below:

4.3.1.1 FOD9-1/FOD9-4 – Fresh-Moist Oak-Sugar Maple Deciduous Forest/Fresh-Moist Shagbark Hickory Deciduous Forest

FOD9 ecosites are characterized by tree cover greater than 60% of predominantly deciduous species. Red Oak (*Quercus rubra*), White Oak (*Quercus alba*), Bur Oak (*Quercus macrocarpa*), Sugar Maple (*Acer saccharum*) Red Maple (*Acer rubrum*), Shagbark Hickory (*Carya ovata*) and Bitternut Hickory (*Cary cordiformis*) can dominate separately or in variable mixtures within these ecosites. Ontario's FOD9 forests are characterized by hydrophilic and hydro-tolerant species (Trilliums, Violets, Jack-in-the-pulpit, Wild Geranium, Marsh Fern, Sensitive Fern, Spotted Jewelweed, etc.) and are considered to represent an interface between upland and swamp plant communities.

Four FOD9-1 / FOD9-4 ecosites were identified on the Study Area and represent all of the forest communities along the corridor (polygons #1, #2, #4, and #6 on Figure 4. The species composition in these ecosites was found to be consistent with the Lee *et al*. (1998) definition of FOD9; Canopy dominance varied between Sugar Maple, Red Oak, and Shagbark Hickory, with Wild Geranium, Jewelweed, Jack-in-the-Pulpit, Enchanter's Nightshade, Fly Honeysuckle, Virginia Creeper, and Choke Cherry common in understory and groundcover layers. Species lists for each ecosite can be found in Appendix D. Specific notes for each FOD9-1 / FOD9-4 ecosite are provided below.

FOD9-1 / FOD9-4 Polygon #1

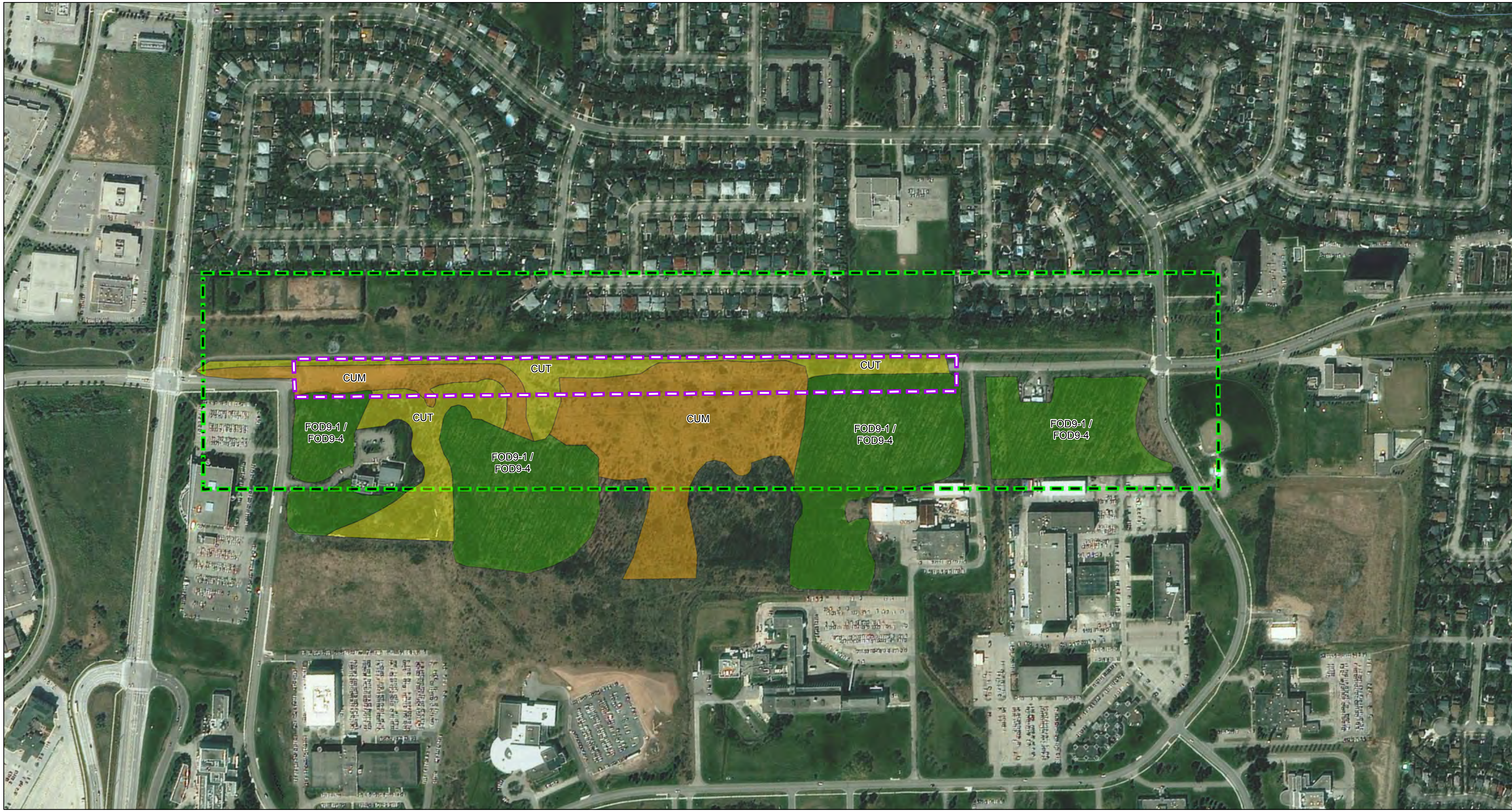
This forest featured canopy and sub-canopy, both dominated by Sugar Maple, with Shagbark Hickory approaching co-dominance in the sub-canopy layer. Red Oak and Shagbark Hickory were also common constituents of the canopy layer, while Ironwood (*Ostraya virginiana*) was the most common understory tree species. A robust edge of European Buckthorn (*Rhamnus cathartica*) was prevalent around the entire forest, but thinned out substantially in the understory. Choke Cherry and Gray Dogwood dominated the thin shrub layer, though small-scale areas dominated with Virginia creeper were not uncommon.

Soil sampling indicated that this area is underlain with imperfectly draining silty clay, resulting in a moist soil moisture regime. Mottles were identified at 35 cm or less in all samples.

Disturbance was readily apparent to this area. The presence of invasive species (European Buckthorn and Garlic Mustard – *Alliaria petiolata* being the most prevalent), compacted walking trails and litter indicated that these areas commonly see recreational usage.

FOD9-1 / FOD9-4 Polygon #2

This site was similar to polygon #1, but with Shagbark Hickory edging out Sugar Maple to be the most dominant canopy species. These two species shared co-dominance of the sub-canopy. Buckthorn and American Beech (*Fagus grandifolia*) were the most common woody understory species. It also featured a dense shrub margin composed of European Buckthorn and *Crataegus sp*. A small drainage swale inclusion was also identified on the southern edge of the ecosite. This area was dominated by Green Ash (*Fraxinus pennsylvanica*), European Buckthorn, and Kentucky Bluegrass (*Poa pratensis*), along with a large volume of invasive *Phragmites australis*.



Datum: North American 1983
Coord. System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Central Meridian: 81°0'0.00"W
False Easting: 500,000m | False Northing: 0m
Rotation: -51.2 | Scale Factor: 0.99960

N

True North

0 100 200 300 400

Metres

Vegetation Community Classification

CUM - Cultural Meadow

CUT - Cultural Thicket

FOD9-1 / FOD9-4 - Fresh Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest

Sheridan Park Drive Right-of-Way

Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BURNSIDE

Client

CITY OF MISSISSAUGA

Figure Title

SHERIDAN PARK DRIVE EXTENSION

ECOLOGICAL LAND CLASSIFICATION

Drawn	Checked	Date	Figure No.
HN	PD	2017/09/06	4
Scale		Project No.	
H 1:5,000		300039474	

File Path: E:\Project\300\039474 (Sheridan Park Drive)\Map\039474 ELC (Tabloid).mxd Print Date: 2017/09/06 Time: 02:10 PM

Soil samples at this ecosite were almost identical to polygon #1, and revealed the same imperfectly-draining silty clay and a moist soil moisture regime. Areas of this ecosite were inundated as well, presumably from the recent spring freshet.

Disturbance was also similar to that in polygon #1, though more pronounced. Invasive species such as Garlic Mustard and Wild Buckwheat (*Fallopia convulvus*) were found throughout the forest interior. Bare-earth walking trails threaded through much of this ecosite, while litter and refuse were common in much higher volumes and included larger items such as shopping carts and broken chairs. Some areas had trees defaced with graffiti. Several recently-used fire pits were also found in this ecosite, as well as one wide area with charred leaves indicating a previous small-scale uncontrolled burn.

FOD9-1 / FOD9-4 Polygon #4

The ecosite at polygon #4 featured a Red Oak-dominated canopy and subcanopy, with Shagbark Hickory, Sugar Maple, Ironwood, and Basswood (*Tilia americana*) being other common canopy species. Hawthorn species and European Buckthorn were the most common shrub-layer constituents, though Gray Dogwood and Choke Cherry were relatively common as well.

Soil sampling indicated similar findings here as in previous wooded areas; clay loam with mottles at approximately 30 cm yielded an imperfectly-drained moist soil regime. There were fewer areas of inundation present, but similar hydrophytic plant species were present here as in previous forested areas (Jewelweed, Jack-in-the-pulpit).

Disturbance in this forest was less obvious than in polygons #1 and #2. Fewer walking trails were present here, and those that were seemed less commonly utilized. Less refuse was found here as well.

FOD9-1 / FOD9-4 Polygon #6

From a woody-species perspective, this ecosite was functionally similar to the others surveyed in the study area. Red Oak dominated the upper canopy, while Ironwood was the dominant sub-canopy species. Sugar Maple and Green Ash were also common, with Beech and Trembling Aspen (*Populus tremuloides*) being found occasionally.

This forest ecosite appeared to be the driest of the four present within the Study Area. It lacked some of the moisture tolerant groundcover that the other forest communities had such as Jewelweed. However, soil sampling indicated a clay loam effective texture with mottling at 28 cm. The ecosite at polygon #6 therefore exhibited imperfect drainage resulting in a moist soil moisture regime, which is functionally identical to the other three forest ecosites from a soil hydrology perspective.

This area showed the fewest signs of disturbance out of the forest ecosites. Some minor litter was found, but no trail system was identified here. This may be partially due to the fact that this ecosite is fenced on the northwestern edge.

CUM1 – Mineral Cultural Meadow Ecosite

Cultural meadows are anthropogenically influenced ecosites dominated by herbaceous plant species with low cover of woody species (<25% tree cover, <25% shrub cover). Two CUM1 ecosites were identified within the study area (polygons #3, and #7 as shown on Figure 4). These areas were similar in terms of plant species composition and soil composition. Species lists for these ecosites can be found in Appendix D.

CUM1 Polygons #3 and #7

The cultural meadow within the Study Area included a large open area dominated by graminoid species. It was bisected by a shrubby thicket, but soil and plant species composition were consistent throughout. The most common woody species were European Buckthorn and Gray Dogwood. Groves of Black Locust (*Robinia pseudocacacia*) bordered much of the southeastern extent of this polygon. Ground cover was dominated with Kentucky Bluegrass, though Smooth Brome, American Vetch, *Solidago sp.*, Yarrow, and Common Speedwell were also abundant.

Soil in this area was similar to samples taken in the surrounding forest communities. The area was found to be underlain with clay loam soils, resulting in an imperfectly draining moist soil moisture regime. The soil regime at polygon #3 indicates a broad homogeneity of soil composition and moisture regime across the entire study area. Plants tolerant to wetter conditions were most abundant within the headwater drainage areas and included Red-osier Dogwood, Green Ash, and *Carex* species, though they and others (Amur Maple, Silver Maple, Grey Dogwood) can be found sporadically through the entire ecosite.

Evidence of disturbance was commonplace. Walking and biking trails were present here, as were copious amounts of litter and dumping. Invasive species were also encountered frequently, including Teasel, Dandelion, Canada Thistle, Bull Thistle, Common Plantain, and Rhubarb.

CUT1 – Mineral Cultural Thicket Ecosite

Cultural thickets have low cover of tree species (<25%) and high cover of shrub species (<25%) underlain by mineral soil. Cultural ecosites are defined as having conditions and substrate types resulting from, or maintained by, cultural or anthropogenic-based disturbances. Given the immediate adjacency of deciduous forest to CUT1 ecosites in the Study Area, it is assumed that CUT1 units are the result of tree-clearing and the introduction of invasive shrubs such as European Buckthorn.

Two CUT1 polygons were identified within the project area (polygons #5 and #8).

CUT1 #5

The ecosite at polygon #5 was a European Buckthorn-dominated thicket. Tree cover was found to account for less than 5% of total canopy cover, with White Oak, Red Oak, and Green Ash being the most common species encountered. European Buckthorn was the most dominant tall shrub species, growing dense enough in some areas to restrict the underlying ground cover to little more than bare earth, detritus, and wind-blown litter. Areas that included a low shrub layer were dominated by Gray Dogwood, Blackberry, and Virginia Creeper.

Soils here were similar in composition and moisture regime to the surrounding areas. Fine-grained silty clay indicated imperfect drainage, and mottles encountered at under 30 cm indicated a soil moisture regime of moist.

One well-used trail was evident here, as well as further evidence of fire pits and dumping. Large tarps encountered also suggested evidence of previous (or current) occupation by squatters. Exotic plant species were commonplace here as well, and included Garlic Mustard, Canada Thistle, Dandelion, Tall Tumble Mustard (*Sisymbrium altissimum*), Common Buckwheat, and Teasel.

CUT1 #8

The ecosite at polygon #8 represents a cultural hedgerow that extends along the entire southeastern border of the existing municipal walking trail that connects Sheridan Park Drive to Plymouth Drive. Trees here were mostly isolated, and no continuous canopy was identified. Buckthorn and Gray Dogwood are the most common shrub species here, though numerous escaped horticultural species were noted along the entire hedgerow.

No soil samples were taken along this hedgerow, but it was assumed that underlying soils likely consistent with those identified in other areas of the Study Area (fine silty clay or clay loam, imperfect drainage, and a moist soil moisture regime).

This area had the highest levels of human disturbance of any ecosite on the Study Area. It was degraded by trails, dumping, and invasive species. Likely due to illegal dumping of yard waste, a large diversity of horticultural shrub and herbaceous species were evident throughout the entire ecosite.

4.3.2 Avifauna

At total of 29 summer resident bird species exhibiting some level of breeding evidence were observed in the Study Area during the breeding bird surveys conducted in 2017. A complete list of species observed, along with the highest recorded breeding evidence, is found in Appendix C of this Report.

Four other species were observed in the Study Area during the breeding bird surveys but no breeding evidence (i.e., suitable breeding habitat or breeding behavior) was recorded in the Study Area limits: Ring-billed Gull (*Larus delawarensis*), Rock Pigeon (*Columba livia*), Canada Goose (*Branta canadensis*), and Barn Swallow. All four of these were flyover observations only. The single Barn Swallow was observed aerial foraging over the Study Area. Some of the anthropogenic features in vicinity to the Study Area may offer suitable nesting habitat for this species in the form of overhangs and eves of buildings. Burnside did not have access to these buildings to search for potential nests. Barn Swallow is an aerial insectivore, and forages over open areas of the landscape where insects are abundant (i.e., open water, wetlands, fields).

According to MNRF's Significant Wildlife Habitat Technical Guide (MNRF, 2000), some species require large areas of suitable habitat for long term population survival. Fragmentation of essential habitats can result in overall declines in populations. Two "area-sensitive" bird species, as defined by the MNRF, were observed in the Study Area during the breeding bird surveys: White-breasted Nuthatch (*Sitta carolinensis*) and Sharp-shinned Hawk (*Accipiter striatus*). White-breasted Nuthatch is most abundant in woodland habitats where natural cavities in hardwood trees are greater than 30 cm DBH are present. They typically require at least 10 ha of continuous forest, although are often found in smaller habitat patches in parts of Southern Ontario where forests have been highly fragmented due to agricultural practices and urban development (Cadman *et al*. 2007). Sharp-shinned Hawk is most abundant in dense mixed or deciduous forests, requiring at least 4 ha of dense canopy closure for nesting; forests that are greater than 30 ha are preferred. It uses open areas like forest edges and forest clearings for hunting (2000). This species was observed being mobbed by American Crow (*Corvus brachyrhynchos*) in the vicinity of a possible nest site for the crows. Given the small size of the woodland habitats present in the Study Area, it is likely that the Study Area is being used for foraging, but that breeding habitat is present outside the Study Area limits.

Two bird species listed as either provincially and/or federally significant were observed in the Study Area during the breeding bird surveys: Eastern Wood-pewee (*Contopus virens*) (Special Concern) and Barn Swallow (Threatened). Suitable nesting habitat is present for Eastern Wood-pewee in the FOD9-1 / FOD9-4 ecosites of the Study Area (Figure 4).

As mentioned above, Barn Swallow was observed foraging over the Study Area, but suitable nesting habitat is not present in the Study Area. Based on a background review of the Study Area, other avian SAR may be present in the vicinity of the Study Area but were not observed during field investigations. A Screening Table for SAR for the Study Area is included in Appendix A of this Report.

4.3.3 Herpetofauna

Amphibian Breeding Call Survey

The amphibian survey was conducted at five sites along the paved walking trail. Site A was located the furthest east, on Sheridan Park Drive. The remaining four sites (B, C, D and E) were arranged northeast to southwest along the paved walking trail through the Study Area. The location coordinates (UTM Zone 17T) are listed in Table 4.4 and the locations are shown on Figure 3.

The first amphibian survey was conducted on April 11, 2017. A rain event occurred the day before and some rainfall occurred in the afternoon the day of the survey. Night temperatures were relatively cold leading up to the survey, but were above the required temperature of 5°C the night of the first amphibian breeding call survey with relatively little wind. Burnside staff visited the five noted amphibian monitoring stations and no amphibians were heard calling at any location.

The second amphibian survey was conducted on May 16, 2017. No precipitation occurred during the survey; however a small amount of precipitation was noted earlier in the day. The air temperature at the time of the second amphibian survey was 13°C with some wind noted. Burnside conducted the survey at the five amphibian monitoring stations and no amphibians were heard calling at any of the locations.

The third amphibian survey was conducted from on June 13, 2017. No precipitation occurred during the survey although a relatively minor rain event was noted earlier in the day. The air temperature at the time of the third amphibian survey was 21°C with very light wind. Burnside staff again visited the five amphibian monitoring stations and no amphibians were heard calling at any location.

Table 4.4: Amphibian Breeding Call Survey Summary (UTM Zone 17T)

Station ID	Easting	Northing	Calls Heard at Any Time
A	607985	4819795	No
B	607819	4819635	No
C	607749	4819540	No
D	607671	4819442	No
E	607548	4819282	No

No amphibians were heard calling during any of the monitoring events and no significant amphibian breeding habitat was identified within the Study Area.

4.3.4 Bats

Leaf-off surveys for BMH identified 19 candidate habitat trees for Northern Myotis and Little Brown Myotis, and leaf-on surveys found 8 suitable habitat trees for Tri-colored Bat within the corridor of anticipated road impacts. Locations of identified trees can be found on Figure 3. Roost selection in bat species involves more than just individual trees. BMH trees identified during surveys can be found in Appendix E. At the stand scale, selection may be a function of canopy gaps, local snag density, tree density, proximity of water for invertebrate forage, etc. (ECCC, 2015). On the landscape scale, forest age and composition are factored into roost selection as well.

The Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*), published by Environment and Climate Change Canada, provides guidelines that are to be followed when assessing potential impacts to bat / myotis individuals and habitats (ECCC, 2015). One of the focal points of the strategy is to ensure that sufficient suitable habitat exists and persists to support these species.

Summer roosting habitat is an essential life-cycle component for these species. Roosts provide shelter from the elements, aid in thermoregulation, allow congregation for social interaction, and reduce the risk of predation (ECCC, 2015). The spread of WNS has increased the relative significance of habitat loss across North America. Because roost selection is difficult to predict with accuracy, any snag trees within forest habitat should be considered significant. All reasonable measures should be taken to avoid impacts to identified snag trees, and appropriate mitigation measures should be taken in the event that potential BMH are removed.

Ontario's fourth Endangered bat species, the Eastern Small-footed Myotis, is the rarest bat in the province. Elsewhere in its range, the Eastern Small-footed Myotis is known to make summer roosts in open, rocky habitats as well as occasionally in anthropogenic structures. Its presence along the Sheridan Park Drive corridor is not anticipated.

4.3.5 Aquatic Habitat

Within the Study Area there are two watercourses (herein referred to as Watercourse 1 and 2, respectively) and three headwater drainage features (herein referred to as HDF 1, HDF 2, and HDF 3, respectively) that are all considered to be tributaries to Sheridan Creek. All watercourses and headwater drainage features generally flow from northwest to southeast through the Study Area. Watercourse 1 and 2 were evaluated as per the Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat (MTO, 2009), while the HDF's were evaluated as per the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA, 2013).

4.3.5.1 Watercourse 1

Watercourse 1 flows from a subterranean storm water management network that discharges through a grated concrete storm water management (SWM) outlet, approximately 1.2 m in diameter. The culvert was outfitted with a debris cage at its outlet that was slightly obstructed with refuse and debris. The land use surrounding this watercourse consists of industrial, residential and parklands. The watercourse was observed to be slowly flowing southeast (<0.04 m/s) through a linear man-made channelized drain that was slightly incised and displayed evidence of bed and bank degradation. The watercourse appeared to primarily convey the flow of local municipal storm water drainage, as well as the surface runoff of nearby low-lying areas that drain towards the channel and a likely small input of localized shallow groundwater. Due to the nature and age of the storm water infrastructure, it is likely that the storm water network also conveys the flow of a local groundwater input that has leaked into the system. Watercourse 1 is likely intermittent during periods of low precipitation.

Watercourse 1 features significant riparian vegetation that provides shade and contributes to potential habitat for resident fish. The riparian vegetation community primarily consisted of shrubs and trees including red osier dogwood and Manitoba maple. Some of the riparian vegetation roots were observed to be exposed and along the channel supporting the stream bank. Streambanks were identified as slightly unstable, with undercutting being located along limited sections of the watercourse. Algae was present throughout the entire watercourse, which is typical of storm water influenced watercourses due to water quality. A minor amount of watercress was observed along the eastern bank of the watercourse indicating the potential presence of a groundwater contribution to the watercourse.

The watercourse morphology within the observable length was primarily comprised of a flat with the exception of a small riffled section. Water depth was limited at the time of the investigation and no potential fish refuge habitat was observed within the observable length of the reach. Substrate in Watercourse 1 was comprised of cobble, gravel, and sand with some shale bedrock exposed along the banks of the watercourse. Overall, Watercourse 1 appeared considerably impacted by the upstream urban environment and is likely only capable of providing marginal fish habitat to tolerant species (i.e.,brook stickleback).

4.3.5.2 Watercourse 2

Watercourse 2 is located southwest of Watercourse 1, and originates upstream of the paved trail way within a shallow basin that is surrounded by manicured lawn. The watercourse likely obtains its water from overland sheet flow from the surrounding lands, as well as a potential shallow groundwater input. The watercourse within this section was not flowing at the time of the site visit but is connected downstream through a small corrugated steel pipe culvert beneath the paved trail way. Downstream of the trail, the watercourse becomes ponded by a footpath that is aligned in an east-west direction. The footpath has formed a barrier to potential fish migration as it disconnects the upstream and downstream reaches of this watercourse within the Study Area. The gradient in the area of the upstream basin and ponded area is relatively flat, but becomes steeper downstream. This downstream reach was characterized as a relatively deep, naturalized channel that meanders through the woodlot.

At the time of the site visit this reach was observed to be flowing interstitially and contained small, intermittent pooled areas with a maximum depth of 0.08 m. Based on these observations, the watercourse is likely ephemeral or intermittent in nature and did not appear to be viable fish habitat. Overall, the upstream reaches of Watercourse 2 appeared to be impacted by anthropogenic activities, and due to the minimal amount of water within the watercourse downstream of the ponded area, appeared incapable of providing direct fish habitat. However, the watercourse does potentially contribute to water quantity and water quality of the downstream reaches of Sheridan Creek during the spring freshet and periods of extended precipitation.

4.3.5.2.1 Headwater Drainage Feature 1

HDF 1 appears to originate towards the southern extent of the Study Area from a relatively broad and shallow depression consisting of wetland-type vegetation (i.e., cattails). This feature is located within a meadow and scrubland with very little mature vegetation. Some watercress was observed at the source of the feature indicating a likely groundwater contribution. At the time of the site visit the depression contained standing water and was not observed to be flowing, however a gently-sloped drainage swale could be discerned, providing an outlet downstream during storm events and the spring freshet. The swale was observed to be conveying interstitial flow downstream of the depression. No channel or a respective bed and banks were present, and the entire swale was vegetated with species of grasses and forbs. This feature was classified as ephemeral in nature and is not capable of providing direct fish habitat. However, during the spring freshet and storm events, it is possible that this feature contributes a minimal amount of water quantity and quality downstream, to reaches of Sheridan Creek which may provide direct fish habitat.

4.3.5.2.2 Headwater Drainage Feature 2

Similar to HDF 1, HDF 2 originates from a shallow depression near the southern extent of the Study Area. Its origin is located approximately 4 m south of the paved trail way within a very shallow-graded scrubland and meadow valley that contained some woody vegetation as well as grasses and forbs. Some watercress was observed at the source of the feature indicating a potential groundwater input. This feature drains through a very broad, shallow swale that is gently graded. Further downstream, the swale becomes significantly more pronounced with the flow path becoming easily discernible. This deeper, conspicuous swale is likely a remnant feature, formed by previous upstream drainage occurring prior to the construction of the residential development located north of the Study Area.

At the time of the site visit, the feature was not observed to be flowing within the pooled depression, but was observed to be slowly flowing interstitially downstream. This feature was identified as being ephemeral in nature and likely flows slightly more substantially during the initial spring freshet and periods of extensive precipitation. The entirety of the observable feature was vegetated and does not convey enough water quantity to possibly support direct fish habitat. However, during the spring freshet and storm events, it is possible that this feature contributes a minimal amount of water quantity and quality downstream, to reaches of Sheridan Creek which may provide direct fish habitat.

4.3.5.2.3 Headwater Drainage Feature 3

HDF 3 is a smaller feature than the other HDFs but also originates from a shallow depression near the southern extent of the Study Area. Similar to the other HDFs, the feature is characterized as a broad, shallow swale downstream of the standing water. HDF 3 is surrounded by a mix of thicket and meadow and the entirety of the swale was vegetated with grasses and some forbs.

At the time of the site visit, the feature was not observed to be flowing within the pooled depression, but was observed to be slowly flowing interstitially downstream between intermittent pockets of standing water. This feature was identified as being ephemeral in nature and likely flows slightly more substantially during the initial spring freshet and periods of extensive precipitation. Similar to the other HDFs, the entirety of the observable feature likely does not convey enough water quantity to potentially support direct fish habitat. However, during the spring freshet and storm events, it is possible that this feature contributes a minimal amount of water quantity and quality downstream, to reaches of Sheridan Creek which may provide direct fish habitat.

Fish Habitat

As mentioned above, the Sheridan Creek Watershed Study and Impact Monitoring Characterization Report (Aquafor Beech Ltd., 2011) noted that no fish are found within the mainstem of Sheridan Creek upstream of the Clarkson Road GO Station, nor are any found in the middle and upper portions of the watershed. However, fish species identified in MNRF Aquatic Area Resource mapping as potentially inhabiting Sheridan Creek and Rattray Marsh, downstream of Clarkson Road are shown below in Table 4.5.

Table 4.5: Fish species found in Sheridan Creek and Rattray Marsh, downstream of Clarkson Road

Common Name	Scientific Name	Provincial S-Rank	Preferred Thermal Regime
Common shiner	*Notropis cornutus*	S-5	Cool
Longnose dace	*Rhinichthys cataractae*	S-5	Cool
White sucker	*Catostomus commersoni*	S-5	Cool
Fathead minnow	*Pimephales promelas*	S-5	Warm
Creek chub	*Semotilus atromaculatus*	S-5	Cool
Blacknose dace	*Rhinichthys atratulus*	S-5	Cool
Common carp	*Cyprinus carpio*	SNA	Warm
Gizzard shad	*Dorosoma cepedianum*	S-4	Cool

Common Name	Scientific Name	Provincial S-Rank	Preferred Thermal Regime
Lake chub	*Couesius plumbeus*	S-5	Cold
Round goby	*Apollonia melanostomus*	SNA	Cool
Emerald shiner	*Notropus atherinoides*	S-5	Cool

There were no fish observed during the site visit and the subject aquatic features appeared to provide little to no potential to support direct fish habitat. The watercourses and headwater drainage features potentially transport allocthonous materials, such as sediment, detritus and insects, to downstream reaches of Sheridan Creek that contain fish. Field observations within the Study Area concur with the Sheridan Creek Subwatershed Report in that fish populations are likely limited within upstream reaches of Sheridan Creek and its tributaries (Aquafor Beech Ltd., 2011). Intermittent or ephemeral flows, low water quantity, in-stream barriers, and potential poor water quality all likely contribute to the lack of direct fish habitat within the Study Area.

No fish SAR were identified as potentially inhabiting the watercourses within the Study Area itself, or within the Sheridan Creek subwatershed.

4.3.6 Incidental Wildlife Sightings

Several incidental observations of mammals, reptiles, and insects were documented during the field investigations. According to the MNRFs provincial ranks (i.e., S1 to S5) that are used to set protection priorities for rare species and natural communities, none of these species are listed as provincially and/or federally significant and are listed as ‘secure’ in Southern Ontario (in other words, they are ranked as S5, which is defined by the MNRF as species that are common, widespread and abundant in the province), with the exception of Monarch (*Danaus plexippus*) which is ranked as S2N/S2B (“Imperiled Non-breeding” population/”Apparently Secure Breeding” population). These sightings included: Eastern Cottontail (*Sylvilagus floridanus*), Eastern Garter Snake (*Thamnophis sirtalis sirtalis*) and Eastern Gray Squirrel (*Sciurus carolinensis*).

4.3.7 Anthropogenic Features

A search for cultural / man-made habitat features was limited to the Study Area. A barbed-wire fence and fence posts ran parallel to the asphalt path, presumably to keep pedestrians on the manicured side of the area. This area is also coincident with a hydro-corridor and regularly-spaced hydro poles. The poles and fence posts would likely provide perching habitat for raptors.

Three commercial buildings and associated driveway / parking areas were also identified. These buildings were respectively located adjacent to polygons #1, #2, and #6 on Figure 4. No access was obtained to determine potential for wildlife to utilize the anthropogenic features on these commercial areas.

5.0 Identification of Provincially Significant Features

Provincially significant natural features include those listed in the PPS (2014), NHRM (MNRF, 2005), SWHTG (MNRF, 2000) and SWH Criteria Schedules (MNRF, 2015). The findings of the site investigation were cross-referenced with criteria provided in these documents in order to identify the presence or potential presence of Provincially Significant natural features.

5.1.1 Provincially Significant Wetlands

The PPS (MMAH, 2014) Section 6.0 defines significant wetlands as "an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time."

No PSW were identified within the Study Area or on any adjacent lands from NHIC records. There are three headwater drainage features and tributaries located central to the natural portions of the Study Area. These areas were not identified as wetlands during ELC surveys. It should be noted that soil samples in the Study Area were consistently found to indicate imperfectly drained, moist regime substrates. These fine-grained soils would be retentive in rainy conditions and during the spring freshet; there is a high probability of ephemeral flooding across all-natural areas surveyed during the spring freshet and storm events. Seasonally flooded areas, not exhibiting wetland plant growth are not eligible to be evaluated as PSW under the PPS and have therefore not been discussed within this document as wetland features. However, it is noted that these features may have both hydrologic and biological functions within the local environment.

A constructed linear drainage swale was also identified on the south-western edge of polygon #1 (see Figure 4). This swale did have the presence of obligate wetland species such as Narrow-leaved Cattail (*Typha angustifolia*). This system was determined to be a constructed SWM feature, and as such has no potential to be evaluated as a PSW.

5.1.2 Significant Valleylands

Criteria for evaluating Significant Valleylands are defined in the Natural Heritage Reference Manual (MNRF, 2005). No Significant Valleyland features have been identified in this area from MNRF or CVC mapping.

It was determined based on aerial photo interpretation and background information, and confirmed during site visits, that no valleylands are present within the Study Area.

5.1.3 Significant Woodlands

Criteria for Significant Woodlands are determined by the local municipality. The PPS (MMAH, 2014) guides municipalities on the development of these criteria. According to the PPS, Significant Woodlands are defined as:

> *"an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history."*

The MOP defines Significant Woodlands as any woodlands, excluding cultural savannahs, greater than or equal to four hectares (City of Mississauga, 2017), as follows:

Significant woodlands *are those that meet one or more of the following criteria:*

- *Woodlands, excluding cultural savannahs, greater than or equal to four hectares;*
- *Woodlands, excluding cultural woodlands and cultural savannahs, greater than or equal to two hectares and less than four hectares;*
- *Any woodland greater than 0.5 hectares that:*
    - *Supports old growth trees (greater than or equal to 100 years old);*
    - *Supports a significant linkage function as determined through an Environmental Impact Study approved by the City in consultation with the appropriate conservation authority;*
    - *Is located within 100 m of another Significant Natural Area supporting a significant ecological relationship between the two features;*
    - *Is located within 30 m of a watercourse or significant wetland; or*
    - *Supports significant species or communities.*

The Region of Peel incorporates a number of significant woodland criteria into their OP, including the Oak Ridges Moraine Conservation Plan, the Niagara Escarpment Plan, the Greenbelt Plan and The Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study (North-South Environmental, Dougan and Associates and Sorensen Gravely Lowes, June 2009). The guidance documents indicate that a number of criteria are recommended to determine the significance of a woodland feature, including:

- Size;
- Location (above or below the Niagara Escarpment);
- Linkages;
- Proximity to other significant features;
- Proximity to watercourse, surface water feature or wetland; and
- Support of SAR, rare species or specified forest communities.

Significant Woodland was identified within the Study Area (MOP) and confirmed during field studies to extend into the City owned right-of-way (ROW), including in the Deciduous Forested area (FOD) (Figure 4) based on the size criteria, as described below. According to this definition, the FOD9-1 / FOD9-4 polygon #2 (~4.5 ha) meets the definition of Significant Woodlands (see Figure 4). The extent of the Significant Woodland within the ROW is 0.44 hectares. In addition, forested areas on and adjacent to the ROW have been calculated to cover approximately 11 hectares, in total, and include both FOD and wooded features (unclassified by ELC[2]).

The EA process is tasked with identifying the best development alternative with respect to growth, infrastructure development, and the environment. It is anticipated that any impacts to the forest at polygon #2 will be minor. City biologists should be notified of the possibility that proposed road extension may result in a small decrease in area of this Significant Woodland area.

5.1.4 Significant Areas of Natural and Scientific Interest

The PPS (MMAH, 2014), Section 6.0 defines areas of natural and scientific interest (ANSIs) as:

> *"areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education."*

According to the NHRM (MNRF, 2005), provincially significant ANSI's include some of the most significant and best examples of these features in the province, and only include ANSIs identified as provincially significant.

No ANSI's were identified through the background information review for the Study Area or Study Area Vicinity.

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[2] Areas outside of the landowner holdings for which permission to enter had not been granted and therefore, fieldwork was not completed in these areas.

5.1.5 Significant Wildlife Habitat

Determination of SWH is broadly categorized and described in the NHRM (MNRF, 2005). Additionally, the SWHTG (MNRF, 2000) and SWH Criteria Schedule for Ecoregion 7E (MNRF, 2015) are additional supplemental documents intended to assist in identifying SWH. The four categories of SWH are identified as:

1. Habitats of seasonal concentrations of animals;
2. Rare vegetation communities or specialized habitat for wildlife;
3. Habitat of Species of Conservation Concern; and
4. Animal movement corridors.

Appendix F includes a screening of the various categories of SWH both for the Study Area and Study Area Vicinity based on background records review, the findings of the field investigations in 2017, agency records, and aerial photo interpretation.

Table 5.1 summarizes Confirmed and Candidate SWH in the Study Area. It also lists Candidate SWH assessed as having moderate or high potential to be present in the Study Area Vicinity.

Table 5.1: Confirmed and Candidate SWH in the Study Area and Study Area Vicinity

Study Area (within 120 m of proposed project area)	Study Area Vicinity (within 500 m of proposed project area)
Seasonal Concentration Areas of Animals	
• Candidate Waterfowl Stopover and Staging Areas (Terrestrial) • Candidate Raptor Wintering Area • Candidate Bat Maternity Colonies • Candidate Reptile Hibernaculum • Candidate Monarch Butterfly Stopover Areas • Candidate Landbird Migratory Stopover Areas	• Candidate Waterfowl Stopover and Staging Areas (Terrestrial) • Candidate Raptor Wintering Area • Candidate Bat Maternity Colonies • Candidate Reptile Hibernaculum • Candidate Monarch Butterfly Stopover Areas • Candidate Landbird Migratory Stopover Areas
Rare Vegetation Communities or Specialized Habitat for Wildlife	
• Candidate Old Growth Forest • Candidate Amphibian Breeding Habitat (Woodland)	• Candidate Old Growth Forest • Candidate Amphibian Breeding Habitat (Woodland)
Habitat of Species of Conservation Concern	
• Candidate Shrub / Early Successional Bird Breeding Habitat	• Candidate Shrub / Early Successional Bird Breeding Habitat

Study Area (within 120 m of proposed project area)	Study Area Vicinity (within 500 m of proposed project area)
• Confirmed Special Concern and Rare Wildlife Species - Eastern Wood-pewee - Monarch	• Confirmed Special Concern and Rare Wildlife Species - Eastern Wood-pewee - Monarch
Animal Movement Corridors	
• Candidate Amphibian Movement Corridors	• Candidate Amphibian Movement Corridors

In addition, CVC has provided mapping for candidate SWH based on the *Peel-Caledon Significant Woodlands and Significant Wildlife Habitat Study* (North-South Environmental Inc. *et al.*, 2009). City mapping showed the presence of three candidate SWH in the Study Area Vicinity (Migratory Land Bird Stopover Successional, Migratory Land Bird Stopover Natural, Foraging Areas with Abundant Mast) (see Figure 5). These SWH will also be discussed in Section 5.1.5.2.

5.1.5.1 Confirmed Significant Wildlife Habitat in the Study Area and Vicinity

Two SWH were confirmed within the Study Area, both considered Habitat for Species of Conservation Concern. These SWH are described below.

Confirmed Special Concern and Rare Wildlife Species

Monarch

The open areas of the Study Area were noted as confirmed habitat for Monarch butterflies. Monarch is listed as Special Concern under the ESA and was confirmed present in the Study Area during field investigations in June 2017. Adults were observed feeding on wildflowers. Milkweed is present in the cultural meadow communities of the Study Area; therefore, the Study Area is also suitable for supporting the larval stage of this species.

Eastern Wood-pewee

As noted in Section 4.3.2, Eastern Wood-pewee was identified during breeding bird surveys. Eastern Wood-pewee is listed as Special Concern in the ESA (MNRF, 2007). This species is common in mature deciduous forests as well as on forest edges.

Implications

Under the PPS (MMAH, 2014), Section 2.1 states that “development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.”

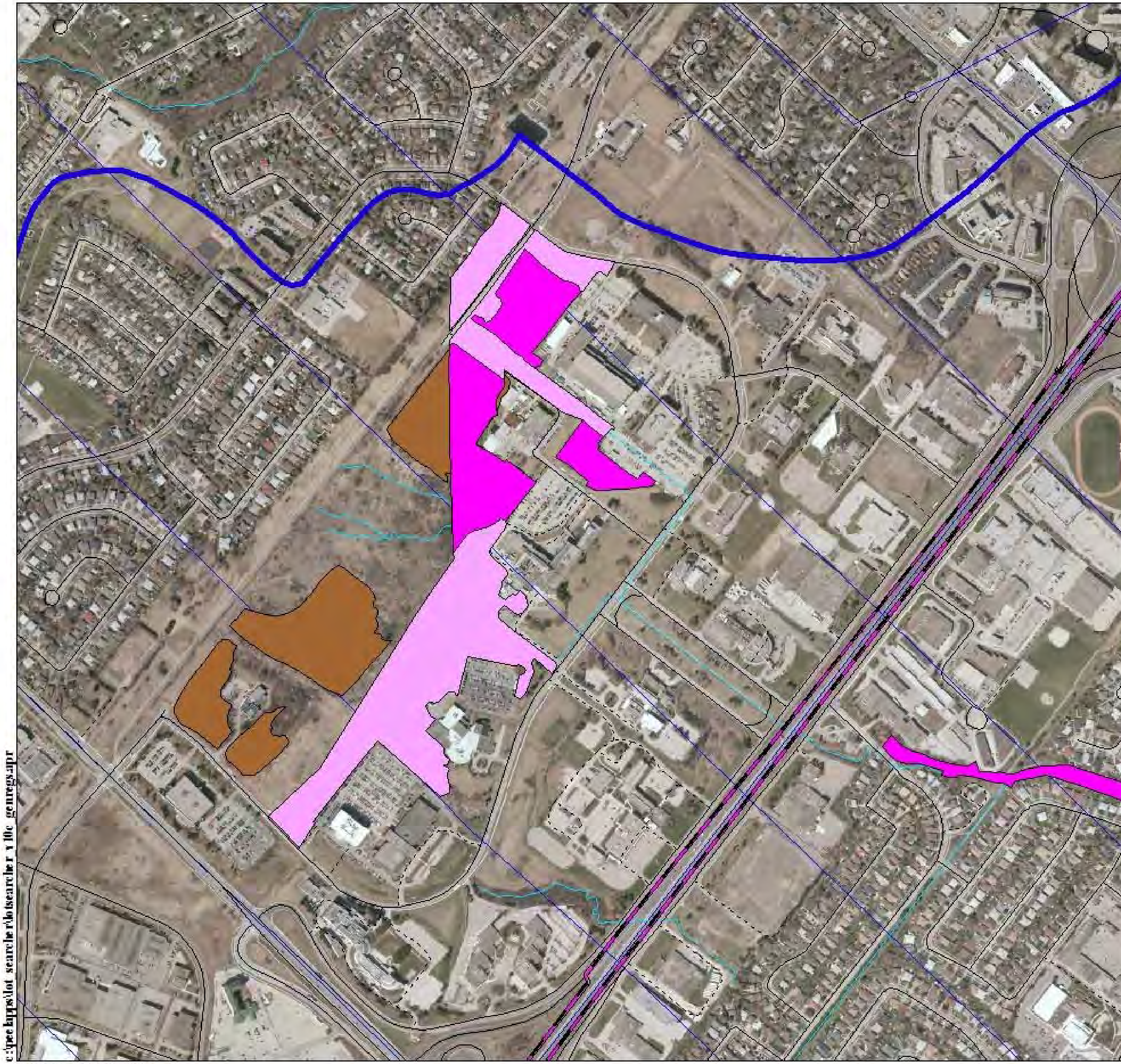
Under the ESA, species listed as special concern are not afforded species or habitat protection. However, according to the MNRF, species listed as special concern are "not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats." Nesting migratory birds are afforded protection under the federal *Migratory Birds Convention Act*, 1994 (ECCC, 1994).

CREDIT VALLEY CONSERVATION

SWH

Figure No. 5

Sheridan Business Park



Migratory Land Bird Stopover Successional
Migratory Land Bird Stopover Natural
Foraging Area with Abundant Mast
Transportation Network
Abandoned railroad
Accessway
Existing railroad
Highway
Street
Lot Annotation
Rivers and Streams

0 100 200 300 Meters

1 / 10000

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Printed on: 24 AUG 2017

5.1.5.2 Candidate Significant Wildlife Habitat in the Study Area and Vicinity

5.1.5.2.1 Provincial Criteria Schedule

Unless stated otherwise, potential impacts to candidate SWH habitat from road construction are not expected to result in a measurable impact to the natural heritage features or their functions either within the Study Area or the Study Area Vicinity. The majority of the ecosites identified will not be impacted by the proposed roadway; areas to be impacted are mostly within the heavily disturbed outer edge of the cultural thicket at polygon #8 adjacent to the existing pathway (see Figure 4).

Seasonal Concentration Areas of Animals

Candidate Waterfowl Stopover and Staging Areas (Terrestrial)

Terrestrial waterfowl stopover and staging areas (WSSA-T) are important habitat for migrating waterfowl. Any combination of cultural meadow or cultural thicket that includes evidence of annual spring flooding from melt water or run-off has the potential to serve as WSSA-T. The complex of Ecosites #3, #5, #7, and #8 (see Figure 4) combined with the imperfectly draining soil encountered across the Study Area and Vicinity indicates a high likelihood that these areas exhibit seasonal flooding in the spring, and serve as potential WSSA-T as a result.

Candidate Raptor Wintering Area

Wintering raptors require a mix of open and forested ecosites to allow for roosting, foraging, and nesting habitat. Candidate Raptor Wintering Areas (RWA) are combinations of forest and cultural upland at least 20 ha in size. The combination of FOD polygons (#2, #4, and #6) adjacent to CUT and CUM polygons (#3, #5, #7, and #8) on Figure 4 indicates that this complex does represent candidate RWA.

Candidate Bat Maternity Colonies

Any forested ecosite in Ontario has the potential to contain suitable habitat for Bat Maternity Colonies (BMC). There are eight species of bat in the province, four of which are Endangered. Habitats of Endangered species are protected from harm by the ESA, but all bat habitat is protected as SWH by the PPS (MMAH, 2014). BMC are typically older, larger deciduous trees that have cavities, crevices, sloughing bark, cracks, or other openings that bats can use as shelter from the elements and from predators. Bats use these micro-habitats to congregate and to raise their young. Potential exists for BMH in all of the FOD9-1 / FOD9-4 ecosites identified in the Study Area and Vicinity (see Figure 4).

Candidate Reptile Hibernaculum

Any habitats, other than those that are very wet, may be suitable as Reptile Hibernacula. Snake hibernation occurs below the frost line in burrows, rock crevices, and other natural or naturalized areas. There exists potential for Reptile Hibernacula at any natural area in the Study Area and Vicinity.

Candidate Migratory Butterfly Stopover Areas

Migratory Butterfly Stopover Areas (MBSA) require a mix of field and forest ecosites and are only located within 5 km of Lake Erie and Lake Ontario. The Study Area and Vicinity is approximately 5 km from Lake Ontario and features a mosaic of CUM, CUT, and FOD ecosites. Additionally, nectar plants, including Milkweed, the larval foodplant for Monarch, is present in the CUM ecosites. Therefore, the Study Area may be used as a migratory butterfly stopover area.

Candidate Landbird Migratory Stopover Areas

Similar to MBSA, Landbird Migratory Stopover Areas (LMSA) can only be considered SWH if found within 5 km of Lake Erie or Lake Ontario. LMSA are woodlot or treed swamp complexes greater than 5 ha, though if treed areas are rare on the landscape scale (as is the case in downtown Mississauga), woodlot fragments of 2-5 ha may be considered. The most valuable sites will have a mix of habitats including forest, grassland, and wetland complexes.

The Study Area and Vicinity features four small forested ecosites that may be candidate LMSA, given the site is approximately 5 km from Lake Ontario.

Rare Vegetation Communities

Candidate Old Growth Forest

Old Growth Forest (OGF) habitats are characterized as having heavy mortality by overstorey trees, resulting in canopy gaps which allow sunlight to reach the forest floor. The result is a complex, multi-layered canopy and abundance of downed woody material and standing snags. Any treed ecosite could be considered an OGFt. Confirmation requires the dominant tree species in a forest to be greater than 140 years old. Trees were not cored to determine age, so no data on forest maturity is available to confirm whether or not the stands in the Study Area and Vicinity would be considered OGF. However the conditions in the forested communities within the Study Area do not indicate the presence of OGF characteristics or functions.

Specialized Habitats of Wildlife

Candidate Amphibian Breeding Habitat (Woodland)

All ecosites associated with forest or treed-swamp communities have the potential to support Woodland Amphibian Breeding Habitats (ABH-W). The criteria for candidate ABH-W is the presence of wetlands, ponds or vernal pools greater than 500 m^2 within or adjacent to woodland. The fact that the soil on the Study Area was found to be fine-grained, imperfectly draining substrate gives high likelihood that sections of these ecosites experience vernal pooling in the spring. However, during breeding amphibian surveys, no species were documented within the Study Area and 2017 conditions includes elevated rainfall for this area.

Habitats of Species of Conservation Concern

Candidate Shrub / Early Successional Bird Breeding Habitat

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E (SWHCS) defines Confirmed Shrub / Early Successional Bird Breeding Habitat as being large field areas succeeding to shrub and thicket (MNRF, 2015). Candidate habitat will be cultural thicket, cultural savannah, or cultural woodlot ecosites of greater than 10 ha in size. The polygons identified at CUM were approaching 25% cover in shrub, so it is assumed that the open areas within the Study Area and Vicinity represent areas in the process of succeeding to shrub thicket. Confirmation of this SWH requires the nesting or breeding evidence of one listed indicator species and at least two common species. Breeding evidence was observed for one indicator species (Brown Thrasher) and one common species (Willow Flycatcher).

5.1.5.2.2 Region of Peel Criteria Schedule

Migratory Land Bird Stopover (Successional; Natural)

CVC mapping indicated the presence of Migratory Land Bird Stopover (MLBS-SN) areas along the southern edge of the Study Area and Vicinity (see Figure 5). The natural areas in the Study Area and Vicinity meet the guidelines as MLBS-SN as they are within 5 km of Lake Ontario and either in a river or creek valley or within 500 m of a river valley. The headwater drainage features and nearby Sheridan Creek would allow these areas to meet the Peel-Caledon definition of MLBS-SN.

It should be noted that some areas designated as MLBS-SN on Figure 5 are not natural areas. There is a manicured corridor between polygons #1 and #2 as seen on Figure 4 which would not qualify as a natural area. The same can be said for the SWH area north of Sheridan Park Drive. These areas are maintained and have little ecological value to migrating land birds.

No impacts are anticipated on the region-defined MLBS-SN, as none of the areas identified are located within the proposed Sheridan Park Drive extension right-of-way.

Foraging Area with Abundant Mass

Peel-Caledon SWH definitions list all FOD9 ecosites as potential Foraging Area with Abundant Mass (FAAM). These are forests that produce high-quality forage of nuts, acorns, and fruit-bearing shrubs. The regional definition agrees with findings from ELC surveys. It is assumed that polygons #1 and #2 on Figure 4 would also be considered both a MLBS-SN and a FAAM on figures provided by the CVC.

Minor impacts to the FOD9 forests are anticipated along the edges adjacent to the proposed roadway alignment. As discussed in Section 4.3.1, the edge habitats of these forests are heavily degraded through dumping and the establishment of invasive species such as European Buckthorn. These removals are not expected to have significant impacts on the overall functionality or integrity of these habitats.

5.1.6 Habitat of Endangered and Threatened Species

Burnside's background review and correspondence with MNRF area biologists revealed the potential for SAR in the Study Area and Vicinity. All findings can be found in the SCC and SAR screening table in Appendix A of this report. Table 5.2 summarizes confirmed and candidate habitat for endangered and threatened species in the Study Area and Vicinity.

Table 5.2: Confirmed and Candidate Habitat for Endangered and Threatened Species in Study Area and Vicinity

	Study Area (within 120 m of proposed project area)	Study Area Vicinity (within 500 m of proposed project area)
Confirmed Habitat Present	None	None
Candidate Habitat Present	• Little Brown Myotis (END) • Northern Myotis (END) • Tri-colored Bat (END) • Eastern Meadowlark (THR) • Butternut (END)	• Little Brown Myotis (END) • Northern Myotis (END) • Tri-colored Bat (END) • Barn Swallow (THR) • Eastern Meadowlark (THR) • Chimney Swift (THR) • Butternut (END)

5.1.6.1 Confirmed Habitat for Endangered or Threatened Species in the Study Area

No species designated as Endangered or Threatened were confirmed to be utilizing the Study Area as habitat during 2017 field investigations. One Threatened species (Barn Swallow) was observed foraging over the Study Area. Suitable nesting habitat for Barn Swallow is not present in the Study Area. As described in Section 4.3.2, habitat for Barn Swallow is not regulated under the ESA 2007; however, foraging habitat is included as Category 3 under the General Habitat Description for the Barn Swallow (MNRF, 2016). Habitat under Category 3 is defined as “the area between 5 m and 200 m of the nest.” Category 3 habitat has the highest tolerance to disturbance.

5.1.6.2 Candidate Habitat for Endangered or Threatened Species in the Study Area

Little Brown Myotis, Northern Myotis and Tri-colored Bat

As discussed in Section 4.3.4, Candidate Bat Maternity Habitat (BMH) for three bat species (Little Brown Myotis, Northern Myotis, and Tri-colored Bat) may be present within the Study Area. These species are listed as Endangered under the ESA (MNRF, 2007) and the federal *Species at Risk Act* (ECCC, 2002).

All three species receive general habitat protection under the ESA as per subsection 9(1) and 10(1). All FOD9 communities located in the Study Area include trees that have suitable cavities for bat maternity and roosting habitats (Figure 4). Isolated trees outside of forest communities may offer marginal habitat for bat roosting, but are not considered in the MNRF Bat Maternity Habitat Methodology used to guide survey efforts in this study (MNRF, 2017c).

The locations of identified BMH trees can be found on Figure 3. In order to avoid direct impacts to these species and their habitat, direct removal of trees within forested ecosites should be avoided. If avoidance is not possible, the MNRF may grant permits or other authorizations for activities that would otherwise not be allowed, with conditions that are aimed at protecting and recovering SAR. These are dealt with on a case-by-case basis.

Eastern Meadowlark

Eastern Meadowlark is listed as Threatened under the ESA (MNRF, 2007). Candidate habitat for Eastern Meadowlark includes grassy pastures, meadows, and hay fields. Bobolink is also closely associated with these vegetative features; however, it should be noted that suitable habitat for Bobolink is not present in the Study Area or Vicinity. Bobolink have a low tolerance to shrub encroachment and the presence of patches of bare ground. They are also sensitive to vegetation structure and composition and are positively associated with high grass-to-forb ratios (McCracken *et al.* 2013). The Study Area and Vicinity lack the suitable nesting conditions to support this species.

No breeding evidence for Eastern Meadowlark was identified during breeding bird surveys, though the large Cultural Meadow ecosite at polygon #3 may be considered marginal habitat (Figure 4). Eastern Meadowlark receives general habitat protection under the ESA. Ecological functionality of the open areas that would provide habitat for these species are not anticipated to be impacted by proposed roadway installation.

Butternut

Butternut (*Juglans cinerea*) is a medium-sized tree of the walnut family. The species is listed as Endangered in the ESA (MNRF, 2007) due to the introduction and proliferation of a microscopic fungus (*Sirococcus clavigignenti-juglandacearum*). This fungus is the causative agent of a fatal disease known as Butternut canker.

Butternut will grow in moist, fertile soils of lower slopes, riverbanks, and floodplains, although they are also known to occur on dry, rocky limestone soils. They are most commonly found as constituents in deciduous forests associated with Basswood, Sugar Maple, Red Oak, White Oak, Beech, and Black Cherry.

Records of Butternut exist in the Project Area and Vicinity. The identified FOD9 forest communities would meet the habitat requirements of these species (Figure 4). Only a narrow band of disturbance is anticipated on ecosites directly adjacent to the proposed road extension right-of-way. A tree inventory was completed for these areas where tree removal is anticipated, and no Butternut individuals were identified. In the event that a Butternut is identified on site, the MNRF should be notified of its presence and location immediately.

5.1.6.3 Habitat for Endangered or Threatened Species in the Study Area Vicinity

Two SAR were identified as being potentially present in the Study Area Vicinity but not within the Study Area itself. These species are Barn Swallow (THR) and Chimney Swift (THR).

Barn Swallow

Barn Swallow is an aerial insectivore, and is frequently observed foraging over open areas of the landscape where insects are abundant. This species will typically build mud nests on ledges or landings on or in barns, bridges, buildings or other anthropogenic structures. Barn Swallows are gregarious, and will often nest in small colonies with other insectivores.

While no nesting habitat for this species was found to be present within the Study Area, foraging presence indicates that it is likely that suitable nesting habitat exists in the Study Area Vicinity.

Chimney Swift

Chimney Swifts are aerial insectivores that most commonly nest in anthropogenic structures like uncapped chimneys, though historically they have nested / roosted in deciduous and coniferous wet forests with a well-developed, dense shrub layer. This species is listed as Threatened under the ESA (MNRF, 2007) and has been recorded as present within the Study Area Vicinity.

While no breeding habitat exists within the Study Area, there may be anthropogenic structures suitable for nesting habitat within the Study Area Vicinity.

5.1.7 Aquatic Habitat

The Toronto and Region Conservation Authority (TRCA) has produced a guide for the evaluation, classification and management of HDFs (TRCA, 2013). This guide is used to provide direction for assessing and managing features that are not clearly covered by policy and legislation as being important eco-hydrological features, but may contribute to the overall health of a watershed. When considering alteration regarding a headwater drainage feature, consideration must be made for its functions and attributes. The framework from the TRCA guide was used in the assessment and evaluation of the subject headwater tributaries to Sheridan Creek.

The three HDFs located on site were all classified as having limited hydrologic functions as they provide ephemeral flow or water storage functions during, and for a short-time after, spring freshet and large rain events. They are usually dry or surface-damp by mid-May. There was no substrate found in the three HDFs, as well as little or no channel formation within the Study Area itself.

Each respective HDF were assessed as having Riparian Classification B, Valued Functions. The riparian corridor (0-30 m on either side of a HDF) at the three HDFs consisted of mostly meadows with some scrubland within the riparian zone. There were no forests or thickets present within the accessible riparian corridor of the three HDFs.

The assessment of the fish and fish habitat classification determined that there are contributing functions present within each of the respective HDFs as they could potentially flow to a downstream watercourse (Sheridan Creek) which contains direct fish habitat. No fish were identified within any of the three HDFs and they do not provide any suitable habitat for feeding, cover, refuge or migration.

The assessment of the terrestrial habitat classification determined that there are limited functions present within the subject HDFs. The three HDFs were classified as swales with standing water present at the time of field visit (April 11, 2017), and they did not function as a link to any features upstream and downstream that could be used by higher mobility species (turtles, frogs, etc.).

Following the above described evaluation of the HDFs, the management recommendation as described in Table 8 in the "Evaluation, Classification and Management of Headwater Drainage Features Guidelines" (TRCA, 2013) for each of the respective HDFs is "mitigation". Examples of mitigation measures that could be completed as part of the development in order to mitigate potential impacts to the HDFs include: replicating or enhancing functions through lot level conveyance measures, such as well vegetated swales that mimic online wet vegetation pockets, connected to the natural heritage system through existing feature functions as feasible, and/or Low Impact Development (LID) stormwater options (TRCA, 2013).

Table 5.3: Headwater Drainage Feature Classification Assessment

<table>
<tr><th colspan="7">Headwater Drainage Feature Classification Assessment</th></tr>
<tr><th>Watercourse ID</th><th>Hydrology Classification</th><th>Riparian Classification</th><th>Fish and Fish Habitat Classification</th><th>Terrestrial Habitat Classification</th><th>Management Recommendation</th><th>Mitigation Examples</th></tr>
<tr><td>HDF 1</td><td>C – Contributing Functions – Ephemeral</td><td>B – Valued Functions</td><td>C – Contributing Functions – Potentially transports allocthonous materials (insects, detritus, water quantity) to downstream reaches potentially containing fish</td><td>Limited Function</td><td>Mitigation</td><td rowspan="3">Replicate or enhance functions through lot level conveyance measures, such as well-vegetated swales to mimic online wet vegetation pockets, connected to the natural heritage system through existing feature functions as feasible, and/or Low Impact Development (LID) stormwater options</td></tr>
<tr><td>HDF 2</td><td>C – Contributing Functions – Ephemeral</td><td>B – Valued Functions</td><td>C – Contributing Functions – Potentially transports allocthonous materials (insects, detritus, water quantity) to downstream reaches potentially containing fish</td><td>Limited Function</td><td>Mitigation</td></tr>
<tr><td>HDF 3</td><td>C – Contributing Functions – Ephemeral</td><td>B – Valued Functions</td><td>C – Contributing Functions – Potentially transports allocthonous materials (insects, detritus, water quantity) to downstream reaches potentially containing fish</td><td>Limited Function</td><td>Mitigation</td></tr>
</table>

6.0 Impact Assessment and Mitigation

Detailed field surveys were undertaken to characterize terrestrial and aquatic habitats within 120 m of the proposed expansion of Sheridan Park Drive (the Study Area) to verify information collected through background records review, to further characterize known features, and to identify any additional features not previously recorded. Field investigations included delineation of vegetation communities through the use of Ecological Land Classification (ELC), tree inventory, breeding bird surveys, bat maternity habitat surveys, anuran call count surveys, aquatic habitat classification, and fish presence surveying. These surveys included targeted Species at Risk (SAR), surveys for Tri-colored Bat, Northern Myotis, and Little Brown Myotis, Bat Maternity Habitat (BMH), as well as breeding evidence surveys for Eastern Wood-pewee.

Lands within the Study Area Vicinity (within 500 m of proposed road extension works) were also evaluated based on a desktop review of background reports, aerial photography, natural heritage databases, and agency consultation.

Based on the results of these studies, the footprint of the proposed road extension alignment was selected in an effort to both avoid and minimize the potential for adverse effects to the natural heritage features and functions associated with the Study Area. The shoulder grading on the planned right-of-way for Sheridan Drive has been modified with the intention of mitigating area disturbance and removal of habitat adjacent to the proposed road extension.

The following is a summary of Provincially Significant Features present in the Study Area where direct or indirect impacts are anticipated given the construction, operations, and/or maintenance of the preliminary Conceptual Design.

6.1 Direct Impacts

Direct impacts to Significant Wildlife Habitat and to candidate SAR habitat during the construction, operations, or maintenance phase of the project include:

- Removal of snag trees suitable as BMH on the edge of forests directly adjacent to proposed road extension;
- Removal of Significant Wildlife Habitat (SWH) including;
    - Candidate Waterfowl Stopover and Staging Areas (Terrestrial);
    - Candidate Raptor Wintering Areas;
    - Candidate Bat Maternity Colonies (Non-SAR);
    - Candidate Reptile Hibernacula;
    - Candidate Foraging Areas with Abundant Mass (Peel-Caledon);
    - Candidate Old Growth Forest;

- Confirmed Special Concern and Rare Wildlife Species;
  - Eastern Wood-pewee (Special Concern);
  - Monarch (Special Concern); and
- Encroachment into identified Headwater Drainage Areas.

6.2 Indirect Impacts

Indirect impacts to Significant Wildlife Habitat and to candidate SAR habitat during the construction, operations, or maintenance phase of the project must also be considered.

- Degradation in quality of Significant Wildlife Habitat (SWH) including;
  - Candidate Monarch Butterfly Stopover Areas;
  - Candidate Land Bird Migratory Stopover Areas (Provincial);
  - Candidate Land Bird Migratory Stopover Areas (Peel-Caledon);
  - Candidate Amphibian Breeding Habitat (Woodland);
  - Candidate Amphibian Movement Corridors; and
- Contamination of watercourses potentially containing fish downstream of on-site watercourses and Headwater Drainage Features from road works, utilization, and maintenance.

Impacts from road usage and maintenance have the potential to adversely affect natural features and their ecological functions in the Study Area. Impacts with farther-reaching implications include noise and vibration disturbance, surface-water runoff, increased siltation, contaminants from road presence (road salts, volatile organic compounds (VOCs), etc.), and light pollution.

In summary, both the direct and indirect impacts will have no net impact overall to the existing natural environment. The proposed road extension is not anticipated to impact the form and function of vegetation, wildlife habitat and headwater drainage features.

Impacts and mitigations are discussed with more detail in Table 6.1.

Table 6.1: Impact and Management Measures

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Surface and Ground Water	Surface Water	Potential for erosion and sedimentation impacts.	The City is required to comply with the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40 with respect to the quality of water discharging into natural receivers. The footprint of disturbed areas shall be minimized to the extent possible. For example, vegetated buffers shall be left in place adjacent to natural vegetation features (forested areas) to the maximum extent possible. A Soil Management Plan (SMP) will be prepared by a Qualified Professional as defined in O.Reg. 160/06 for managing soil materials on-site (includes excavation, location of stockpiles, reuse and off-site disposal). An Erosion and Sediment Control (ESC) Plan will be developed during detailed design in consultation with CVC and will conform to industry best management practices and recognized standard specifications such as Ontario Provincial Standards Specification (OPSS). Any in-water work will be conducted in isolation of flowing water. All work zones will be clearly marked on detailed design drawings and the ESC Plan to indicate that no work should occur outside the work zone. ESC measures shall be installed and maintained during the construction phase and until all areas of the construction site have been stabilized. ESC measures shall be inspected daily to confirm they are functioning and maintained as required. If ESC measures are not functioning properly, no further work in the affected areas will occur until the sediment and/or erosion problem is resolved. All disturbed areas of the construction site will be stabilized and re-vegetated as soon as conditions allow. Wet weather restrictions shall be applied during site preparation and excavation. Any construction works within CVC regulated areas will require a permit under O. Reg. 160/06.	A qualified Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC are being followed. A qualified Environmental Inspector shall inspect, suggest and confirm the repair of ESC measures as needed.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Surface and Ground Water	N/A	Potential for localized surface water or groundwater impacts as a result of spills, discharge or dumping of materials, fluids and other wastes during construction of proposed road extension and associated surface water facilities (e.g., swales).	Refueling and maintenance of construction equipment should occur within designated areas only. Any hazardous materials used for construction will be handled in accordance to appropriate regulations. A Construction Emergency Response and Communications Plan shall be developed and followed throughout the construction phase (including spill response plans). The Contractor shall develop spill prevention and contingency plans for the construction of new landfill cells and general site preparation for proposed road extension. Personnel shall be trained in how to apply the plans and the plans shall be reviewed to strengthen their effectiveness and continuous improvement. Spills or depositions into watercourses shall be immediately contained and cleaned up in accordance with provincial regulatory requirements and the contingency plan. A hydrocarbon spill response kit will be on site at all times during the work. Spills will be reported to the Ontario Spills Action Centre at 1-800-268-6060.	A qualified Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC are followed. Workers shall report any instances of spills to their supervisors.	No net effects anticipated.
Surface and Groundwater	Headwater feature	Change in water balance to seasonally flooded or wet habitat within natural vegetation communities affecting groundwater recharge functions.	Incorporation of Low Impact Development (LID) to direct surface water flow to grassed swales, bioretention gardens and infiltration galleries in close proximity to the natural heritage features (refer to CVC Grey to Green Road Retrofits). LID elements should be designed to preserve local predevelopment water balance as they reduce runoff volume through the processes of infiltration and evapotranspiration and improve stormwater quality through a variety of physical and biological treatment processes.	Monitoring of vegetation communities for changes in plant species composition and soil moisture regime.	No net effects anticipated
Natural Environment	Vegetation	Direct effects of construction activities will include the limited clearing and loss of both herbaceous and woody vegetation. Indirect effects include the increase to edge habitats, which includes a number of potential effects, such as wind throw and sunscald, introduction of invasive plant and wildlife species which may outcompete or predate native species, change in soil moisture regime and	Construction hoarding should be installed prior to commencement of construction activities to both prevent the unnecessary encroachment / disturbance by humans and machinery into vegetation communities and to prevent wildlife from entering the construction areas. Hoarding should be installed and inspected prior to any land disturbance. Hoarding should be installed at the dripline of any trees to be preserved. Construction activity should be outside of the dripline of any trees that are to remain.	Fencing shall be inspected regularly to ensure damage is repaired in a timely manner and that additional risk to wildlife is minimized. Hoarding site visit required.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
		water availability to plants and plant communities, increases in light penetration (pollution) and noise, soil compaction, equipment and pedestrian “traffic”, equipment laydown and spills.	Plant species loss should be minimized, where possible, and compensatory planting plans established in areas of the Study Area when no clearing activities are proposed, referencing CVC’s Plant Selection Guidelines for the existing soil and vegetation communities. Potential for establishing pollinator species of plants should also be included when establishing a formal planting plan. The inclusion of bio swales, infiltration galleries or other features to promote localized surface water infiltration to maintain the existing water balance should be included as part of the detailed design and landscape plan for the road extension.		
Natural Environment	Wildlife and Wildlife Habitat (General) – Breeding Birds	Potential for disturbance or destruction of migratory breeding birds and their habitat by the landfill expansion (prohibitions under the *Migratory Bird Convention Act*, *1994*).	To reduce the risk of contravening the *Migratory Birds Convention Act, 1994*, timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from April 1st to August 31st for most species (regardless of the calendar year); Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the ESA, 2007, cannot be destroyed at any time of the year. The destruction of inactive nests for some species may also be prohibited. If a nesting migratory bird (or SAR protected under ESA, 2007) is identified within or adjacent to the construction site (or during operations and maintenance activities) and the activities are such that continuing works in that area would result in a contravention of the *Migratory Birds Convention Act, 1994* or ESA, 2007, all activities will stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures with the City. Should SAR be identified, all activities will stop and MNRF will be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the Town, the MNRF and/or Environment Canada.	An Avian Biologist may be required on-site as needed should a nesting migratory bird (or SAR protected under ESA, 2007) be identified within or adjacent to the construction site. The Avian Biologist may be required to confirm the presence and identification of an active nest and/or breeding bird prior to contacting MNRF for further advice.	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
Natural Environment	Wildlife and Wildlife Habitat (General)	Temporary displacement of, and disturbance to, wildlife and wildlife habitat during the construction phase (i.e., vegetation removals, noise, light trespass), including SAR. Development in these habitats may limit wildlife movement and reduce useable habitat. Wildlife habitat may be removed as a result of the proposed activities. • Removal of Significant Wildlife Habitat (SWH) including; - Candidate Waterfowl Stopover and Staging Areas (Terrestrial); - Candidate Raptor Wintering Areas; - Candidate Bat Maternity Colonies (Non-SAR); - Candidate Reptile Hibernacula; - Candidate Foraging Areas with Abundant Mass (Peel-Caledon); - Candidate Old Growth Forest; - Confirmed Special Concern and Rare Wildlife Species; ▪ Eastern Wood-pewee (Special Concern); and, ▪ Monarch (Special Concern).	In the event that an animal is encountered during construction and does not move from the construction zone, the Contract Administrator will be notified. If the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location will temporarily stop and the MNRF shall be contacted for direction; If temporary construction hoarding is used at a location, it shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning. The excluded area should be searched immediately following fencing installation for any wildlife (including SAR) that may have become trapped. Any wildlife should be safely relocated, or permitted to escape, to a suitable habitat. All works should stop immediately and MNRF contacted should a SAR be encountered within a construction or operational area to ensure compliance with the ESA. Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between wintering and summer habitats).		No net effects anticipated.
Natural Environment	Woodlands	Removal of snag trees suitable as Bat Maternity Habitat (BMH) on the edge of forests directly adjacent to proposed road extension. a) Potential for direct environmental effects to woodland habitat (FOD9-1 / FOD9-4) during clearing and construction activities for the proposed road extension. b) Potential for indirect environmental effects to adjacent woodland features. Potential	a) Note: A permit under the ESA may be required before any work can occur in Regulated habitat at any time during the year – as such, mitigation measures outlined below will be refined during the permitting process, including details of construction hoarding, timing of works, etc. Removal of candidate BMH trees will require appropriate compensation during the appropriate timing windows, including the installation of bat house(s) to compensate for loss of habitat. The recommended approach from MNRF includes proactive	a) A Biologist shall be on-site during construction works in the event that wildlife is trapped within the construction zone and requires removal and relocation to land outside of the construction zone. They may also be required on-site as needed should a species that is protected under the ESA, 2007 be identified within or adjacent	No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
		indirect effects may include noise disturbance as a result of construction and/or operations and maintenance activities. Noise disturbance may impact breeding success of avian species, including SCC (Wood Thrush, Eastern Wood-pewee), whose habitat is considered SWH.	establishment of alternate bat habitat features within the Study Area to avoid the requirement for permitting under the ESA. - Prior to construction works commencing, installation of construction hoarding is recommended along the perimeter of the limit of construction which includes all areas required for excavation and spoil stockpile, vehicle and worker access and material laydown in order to prevent any wildlife from attempting to access the construction zone during construction works – specifically, fencing shall be installed at the beginning of April or earlier. - If designated areas are created during construction for the stockpiling of materials, especially fill, soil and gravel, the Contractor shall install temporary construction hoarding around the perimeter of these areas to prevent any reptile species from entering the area and attempting to nest (reptiles are attracted to these materials for nesting). - Any wildlife should be safely relocated, or permitted to escape, to a suitable habitat no more than 200 m away from the work zone. Wildlife shall be released no more than 200 m away from the work zone in a similar ecosystem type. - In the event that SAR are found within the construction zone all activities will stop and mitigation options shall be discussed with the Town, whereby an MNRF SAR Biologist may be contacted for advice as these animals are protected under ESA 2007. - Educational material shall be provided by a Biologist to construction personnel prior to commencement of construction works to assist personnel in identifying SAR species, should they be encountered. These materials shall also include protocols to be followed to prevent contravention of the ESA 2007, should any SAR be encountered. - All works should stop immediately and MNRF contacted should a SAR be encountered within a construction or operation area to ensure compliance with the ESA; - In the event that SAR are found within the construction zone all activities will stop and mitigation options shall be discussed with the Town, whereby an MNRF SAR Biologist may be	to the construction site. The Biologist may be required to confirm the presence and identification of a particular species prior to contacting the MNRF for further advice. a) Fencing should be monitored on a regular basis to ensure there is no damage that may result in a decrease in function or opportunities for injury or death to wildlife species. b) An Avian Biologist may be required on-site as needed should a nesting migratory bird (or SAR protected under ESA, 2007) be identified within or adjacent to the construction site. b) The Avian Biologist may be required to confirm the presence and identification of an active nest and/or breeding bird prior to contacting MNRF for further advice.	

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			contacted for advice as these animals are protected under ESA 2007. - SAR identification training shall be provided by a Biologist to construction personnel prior to commencement of construction works to assist personnel in identifying SAR species, should they be encountered. Educational materials shall also include protocols to be followed to prevent contravention of the ESA 2007, should any SAR be encountered. All construction personnel will be trained on how to identify and deal with SAR encountered during work. a) A mitigation plan will be designed and implemented to compensate for the temporary removal of vegetation and provide enhancement of the existing features. b) To reduce the risk of disturbing breeding birds (and contravening the *Migratory Bird Convention Act, 1994*), timing constraints shall be applied to avoid vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period - broadly from end of March to end of August for most species (regardless of the calendar year) (see Breeding Birds for more detail).		
Natural Environment	Cultural Thicket-Cultural Meadow	Potential for direct environmental effects (i.e., habitat removal) to cultural thicket and cultural meadow which composes most of the proposed road extension footprint area. This feature is candidate SWH for raptor wintering area and shrub/ early successional bird breeding habitat, and is confirmed habitat for breeding birds generally. a) Candidate raptor wintering area: Modification to, or removal of, vegetation structure or drainage patterns in fields or forests supporting a winter roost may make it unattractive.	a) Prior to construction, surveys should be conducted by an Avian Biologist in winter to determine if the site is significant habitat for raptors. If this is not possible due to project time constraints, habitat shall be considered “candidate” habitat. Consultation with MNRF is required prior to construction to determine what mitigation measures are appropriate to avoid potential negative effects. d) To reduce the risk of disturbing breeding birds (and contravening the *Migratory Bird Convention Act, 1994*), timing constraints shall be applied to avoid vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period - broadly from end of March to end of August for most species (regardless of the calendar year) (see Breeding Birds for more detail).		No net effects anticipated.

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
		c) Shrub / early successional bird breeding habitat: permanent removal of candidate habitat reduces overall size of available habitat for bird species that depend on this type of vegetation structure for food, cover and nesting. A reduction in overall size will also reduce the ecological function in the remaining habitat due to fragmentation. d) Potential for indirect environmental effects may include noise disturbance as a result of construction and/or operations and maintenance activities. Noise disturbance may impact nesting success of bird species nesting in this habitat.			
Natural Environment	Fish Habitat	Potential indirect impacts to downstream fish habitat from water quality and quantity impairments (sediment loading; fuels and lubricants from machinery) as a result of construction works (earthworks-based activities).	SMP and ESC Plans shall be developed as noted above. Wet weather restrictions shall be applied during site preparation and excavation. Work will be avoided near watercourses and headwater drainage features during periods of excessive precipitation and/or excessive snow melt. Compliance with the *Ontario Water Resources Act, 1990* shall be maintained with respect to the quality of water discharging into natural receivers. Sediment and erosion control measures (such as silt fence barriers, etc.) shall be installed and maintained during the work phase and until the site has been stabilized. Control measures shall be inspected daily to ensure they are functioning and are maintained as required. If control measures are not functioning properly, no further work shall occur until the problem is resolved. All temporary ESC measures shall be installed in accordance with recognized provincial standards. Extra silt fence / turbidity curtain shall be stored on-site, should additional sediment control be required. Any stockpiled material shall be stored and stabilized away from the surface water features. All materials and equipment used for the purpose of site preparation and road construction shall be operated	An Environmental Inspector shall regularly monitor construction activities to confirm the requirements outlined in the SMP and ESC plans are followed. Workers shall report any instances of spills or impacts to surface water features.	No net effects anticipated

Environmental Component	Environmental Sub-Component	Potential Environmental Effects	Impact Management Measures (including Mitigation Measures)	Recommended Monitoring Activities	Net Effects
			and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) from entering the water. ESC plans and a spill response plan shall be developed and shall include, but not be limited to, the details described above. CVC shall be consulted during detailed design with regard to potential works within or in close proximity flood regulated areas, as appropriate.		

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Appendix A

Background Records Search and Screening Table

BURNSIDE

Appendix A: Screening Table - Background Review of Species at Risk and Species of Conservation Concern Potentially Present in the Study Area

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
BIRDS									
Bank Swallow (Source: OBBA)	*Riparia riparia*	S4B	THR	THR	-	-	In Ontario, Bank Swallows typically nest in exposed earthen banks created by erosion along watercourses and lakeshores. It has also adapted to nesting in sand and gravel pits, along roadsides, and in stockpiles of soil and other materials. The largest populations are supported by the shorelines of the lower Great Lakes, and they can be found throughout southern Ontario in the Carolinian and Lake Simcoe-Rideau regions.[5]	No nesting habitat confirmed present in the Study Area. Potential for foraging habitat over open areas of the Study Area based on observations of other aerial insectivores, such as Barn Swallow.	No.
Barn Swallow (Source: OBBA, MNRF)	*Hirundo rustica*	S4B	THR	THR	-	-	Barn Swallows usually build mud nests on ledges of walls in or outside of a barn or other man-mad structures, including building and bridges. Natural nesting locations include caves and cliffs, but they are now rarely used. They often nest in small colonies in areas often associated with other insectivores. They are most abundant south of the Canadian Shield, within agricultural lands in the Carolinian and Lake Simcoe-Rideau regions.[5]	No nesting habitat confirmed present in the Study Area. Confirmed foraging habitat over open areas of the Study Area.	Yes. Foraging only.
Bobolink (Source: MNRF, OBBA)	*Dolichonyx oryzivorus*	S4B	THR	THR	-	-	Bobolinks generally prefer open grasslands and hay fields for nesting, typically featuring relatively tall vegetation. Sometimes uses large fields of winter wheat and rye in southwestern Ontario. Sensitive to vegetation structure and composition. They are positively associated with high grass-to-forb ratios, and moderate litter depth. They tolerate wetter portions of fields compared to Eastern Meadowlark and are more likely to nest closer to field centers rather than field margins. They have a lower tolerance to presence of patches of bare ground, and appear to prefer larger fields than Eastern Meadowlark.[5, 7]	No nesting habitat confirmed present in the Study Area.	No.
Chimney Swift (Source: MNRF, OBBA)	*Chaetura pelagica*	S4B,S4N	THR	THR	THR	1	Chimney Swifts have historically nested/roosted in deciduous and coniferous, typically wet, forest types, with a well-developed, dense shrub layer. Currently, most are found in anthropogenic structures, most commonly in uncapped chimneys.[5]	No nesting or roosting habitat confirmed present in the Study Area. Potential for foraging habitat over open areas of the Study Area based on observations of other aerial	No.

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
								insectivores, such as Barn Swallow.	
Common Nighthawk (Source: OBBA)	*Chordeiles minor*	S4B	SC	THR	THR	1	Nests in open habitats, forests and urban areas. They prefer rock outcrops, alvars, sand barrens, bogs, fens, and openings created by clear-cuts and burns. In southern Ontario, they can be found in grasslands, agricultural fields, gravel pits, prairies, alvars and at airports. In urban areas, they nests mostly on flat, graveled roofs but occasionally on railways or railway ROWs and pedestrian pathways.[5]	No nesting habitat confirmed present in the Study Area. Potential for foraging habitat over open areas of the Study Area based on observations of other aerial insectivores, such as Barn Swallow.	No.
Eastern Meadowlark (Source: MNRF, OBBA)	*Sturnella magna*	S4B	THR	THR	-	-	Generally prefers grassy pastures, meadows and hay fields. Prefers moderately tall grass with abundant litter cover, a high proportion of grass cover, moderate forb density, low proportions of shrub and woody vegetation cover, and low percent of bare ground. Prefers to nest in drier sites and frequently nests around field margins.[5,7]	No nesting habitat confirmed present in the Study Area.	No.
Eastern Whip-poor-will (Source: OBBA)	*Caprimlugus vociferus*	S4B	THR	THR	THR	1	Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred. In Ontario, its preferred habitats include rock or sand barrens with scattered trees, savannahs, old burns in state of early forest succession, and open conifer plantations.[5]	No nesting habitat confirmed present in the Study Area.	No.
Eastern Wood-pewee (Source: OBBA)	*Contopus virens*	S4B	SC	SC	-	-	Prefers open space near the nest in the form of forest edges, clearings, roadways, and water. They do not require large areas of woods, but occurs less frequently in woodlots surrounded by development than in those without.[5]	Confirmed nesting habitat in the wooded portions of the Study Area.	Yes.
Grasshopper Sparrow (Source: OBBA)	*Ammodramus savannarum*	S4B	SC	SC	-	-	Prefers drier, sparsely vegetated grasslands, particularly rough or unimproved pastures, at least 30 ha in size. Such grasslands support varying amounts of forb and shrub growth. It will occasionally also use cultivated hayfields and cereal crops. The species is found across Southern Ontario, mostly south of the Canadian Shield, with small, isolated populations north to Sault Ste. Marie and in western Rainy River District near Lake of the Woods.[5]	No nesting habitat confirmed present in the Study Area.	No.
Henslow's Sparrow (Source: NHIC)	*Ammodramus henslowii*	SHB	END	END	END	1	Commonly found in the grasslands of eastern Minnesota south to Kansas and east to central New York. In Canada, it is restricted to southern Ontario. They tend to nest in large, open, usually moist to	No nesting habitat confirmed present in the Study Area.	No.

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
							wet, flat fields with a high graminoid to ford/shrub ratio. Vegetation must be dense and over 30 cm in height. In Ontario, it has nested in regenerating old fields, lightly used pastures, hayfields, wet meadows and sedge marshes. It has low breeding site fidelity, and fidelity is generally greater in large grasslands supporting larger colonies. This species is very rare in the province, and detected on average at only one or two sites per year in Ontario.[5]		
Wood Thrush (Source: OBBA)	*Hylocichla mustelina*	S4B	SC	THR	-	-	The Wood Thrush occurs throughout the Great Lakes-St. Lawrence Forest. In Ontario, it inhabits woodlands ranging from small (3 ha) and isolated to large and contiguous. The presence of tall trees and a thick understory are usually prerequisites for site occupancy. Most abundant in the Lake Simcoe-Rideau and Carolinian regions.[5]	No nesting habitat confirmed present in the Study Area. Marginal habitat exists in the wooded portions of the Study Area; however, these wooded habitats lack the thick understory that they prefer. These wooded habitats are also fragmented and small in size, making them less than ideal habitat.	No.
FISH									
Redside Dace (Source: NHIC)	*Clinostomus elongatus*	S2	END	END	SC	3	Redside Dace can be found in pools and in slow-moving areas of streams and headwaters with gravelly bottoms. Populated streams generally have overhanging grasses and shrubs. Spawning occurs in shallower, gravel bottom areas that are popular spawning areas for other minnow species. The northern extent of the population includes the Lake Superior drainage area and north end of Lake Huron in Ontario, specifically tributaries of western Lake Ontario, the Holland river (Lake Simcoe drainage), and Irvine Creek (Lake Erie drainage).[6, 8]	No suitable habitat identified on the Study Area or Vicinity. Marginal habitat may exist downstream of headwater drainage features closer to Sheridan Creek.	No.

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
INSECTS									
Monarch (Source: MNRF)	*Danaus plexisppus*	S2N,S4B	SC	END	SC	1	Monarchs can be found in areas that Milkweed (*Asclepius sp.*) and other wildflowers are present. This includes open spaces (fields), abandoned farmland, and roadsides. Pin-sized green eggs are laid on the underside of various Milkweed species, which are the primary food source of the Monarch caterpillar. Overwintering occurs along the California coast, and the Oyamel Fir Forest in central Mexico.[8]	Confirmed present in the Study Area. Adults were observed foraging on wildlflowers. Milkweed is also present, which is suitable for supporting the larval stage of this species.	Yes.
MAMMALS									
Little Brown Myotis (Source: MNRF)	*Myotis lucifugus*	S4	END	END	END	1	Overwintering habitat: Generally underground openings, including caves, abandoned mines, wells, and tunnels, but at some sites only specific sections of the site will be used for hibernation. Roosting habitat: Uses buildings and other anthropogenic structures (e.g., bat boxes, bridges, and barns) to roost (particularly for maternity roosting), but it will also use cavities of canopy trees, foliage, tree bark, crevices on cliffs, and other structures. Females show a strong tendency to roost in large-diameter trees, although roost properties may vary significantly throughout the summer. Roosting areas are generally used annually and individual natural roost sites can be used for upwards of 10 years. Little Brown Myotis are particularly loyal to anthropogenic structures and sites may be used for 50 years or more. They also exhibit strong within-year site fidelity to anthropogenic structures. Males roost individually or in small groups and periodically switch roosts.[10]	Candidate Bat Maternity Habitat (BMH) trees were identified within forested ecosites. No individuals were observed. Removal of Candidate BMH is to be avoided if at all possible.	No.
Northern Myotis (Source: MNRF)	*Myotis septentrionalis*	S3	END	END	END	1	Overwintering habitat: Generally underground openings, including caves, abandoned mines, wells, and tunnels, but at some sites only specific sections of the site will be used for hibernation. Roosting habitat: roost singly or in small groups and favour tree roosts (under raised bark and in tree cavities and crevices), but they can also be found in	Candidate Bat Maternity Habitat (BMH) trees were identified within forested ecosites. No individuals were observed. Removal of Candidate BMH is to be avoided if at all possible.	No.

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
							anthropogenic structures (e.g., under shingles). maternity roosts are strongly associated with forest cover, streams, and tree characteristics (e.g., species, height, diameter, age, and decay). Females prefer to roost in tall, large diameter trees in early- to mid-stages of decay. Males generally roost alone under raised bark or within cavities of trees in mid-stages of decay.[10]		
Tri-colored Bat (Source: MNRF)	*Pipistrellus subflavus*	S3?	END	END	END	1	Overwintering habitat: Generally underground openings, including caves, abandoned mines, wells, and tunnels, but at some sites only specific sections of the site will be used for hibernation. They often select the deepest part of caves or mines where temperature is the least variable, have strong humidity level preferences, and use warmer walls than other species. Roosting habitat: Most roost sites are found within forested habitats, where this species also forages. Tri-colored Bats may roost in clumps of dead foliage and lichens. Females roost alone or in small colonies. In more anthropogenically modified landscapes, maternity roosts may be barns or similar human-made structures. Males roost individually.[10]	Candidate Bat Maternity Habitat (BMH) trees were identified within forested ecosites. No individuals were observed. Removal of Candidate BMH is to be avoided if at all possible.	No.
PLANTS									
Butternut (Source: MNRF)	*Juglans cinerea*	S2?	END	END	END	1	Butternut grows best in rich, moist and well-drained soils or limestone gravel sites. They are less commonly found in dry, rocky and sterile soils. They generally grow alone or in small groups in deciduous forests that are commonly comprised of Linden, Black Cherry, Beed, Black Walnut, Elm, Hemlock, Hickory, Oak, Red Maple, Sugar Maple, Yellow Poplar, White Ash and Yellow Birch. In Ontario, they can be found throughout the southwest, and north towards the Bruce Peninsula, and south of the Canadian Shield.[6,8]	Suitable habitat exists within the Study Area to support this species. Tree removal areas were catalogued extensively and no individuals were identified.	No
REPTILES & AMPHIBIANS									
Blanding's Turtle (Source: ORRA)	*Emydonidea blandingii*	S3	THR	THR	THR	1	The Blanding's Turtle is a semi-aquatic species. Although it spends most of its time in aquatic	No habitat confirmed present in the Study Area. The Study Area	No.

BURNSIDE

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
							habitats, it has seasonal movement patterns which allow it to meet different biological or behavioural needs, including use of terrestrial habitats during the active season. Habitat use varies as a function of the different activities undertaken by individuals to complete their life cycle. Blanding's Turtles use aquatic habitats for overwintering, mating, foraging, thermoregulation, summer inactivity, and movement. They often favour relatively eutrophic environments, with shallow water (less than 2 m deep), soft organic substrate, and abundant submergent, floating, and emergent vegetation. They can occur in a variety of wetland habitats (e.g., marshes, ponds, swamps, bogs, fens, coastal wetlands), slow flowing rivers and creeks, pools, lakes, bays, sloughs, marshy meadows, and artificial channels. Blanding's Turtles have been shown to select all wetland types over lotic environments and have also shown a preference for ponds and marshes when available.[11]	lacks suitable aquatic habitats for this species.	
Eastern Musk Turtle (Source: NHIC)	*Sternotherus odoratus*	S3	SC	SC	THR	1	The Eastern Musk Turtle is a highly aquatic species that undertakes only limited overland travel because it moves slowly on land and is prone to rapid dehydration. Eastern Musk Turtles commonly inhabit stagnant or slow-moving shallow wetlands that are connected to larger permanent waterbodies or shallow bays of lakes and rivers. In Canada, Eastern Musk Turtles have been found in different types of water bodies, such as lakes, ponds, marshes, rivers, and streams. Nevertheless, the species has been described as a habitat specialist since it seems to require water with abundant emergent, floating, and submerged aquatic vegetation that provides surface cover, which may be important for foraging, adult and juvenile refuge, and thermoregulation. They are often found in areas with a soft substrate such as sand or organic mud where they can readily bury themselves, and also areas with gravel bottoms.[12]	No habitat confirmed present in the Study Area. The Study Area lacks suitable aquatic habitats for this species.	No.
Northern Map Turtle (Source: ORAA)	*Graptemys geographica*	S3	SC	SC	SC	1	The Northern Map Turtle relies primarily on aquatic habitat, and makes limited use of terrestrial habitat for nesting and basking. In the northern portion of their range, Northern Map Turtles typically inhabit well oxygenated bodies of water such as small to	No habitat confirmed present in the Study Area. The Study Area lacks suitable aquatic habitats for this species.	No.

Common Name **(Source)	Scientific Name	Provincial S-RANK[1]	Provincial SARO Status[2]	COSEWIC[3]	Federal SARA Status[3]	Federal SARA Schedule[4]	Habitat Description	Habitat Present in Study Area?	Species Observed In Study Area During Field Surveys?
							major rivers with slow to moderate flows, and lakes. Within lake habitats, the species tends to utilize areas with undeveloped shorelines or marshy habitats. In lakes occurring on the Canadian Shield, Northern Map Turtle utilizes rocky open shorelines and shoals, rock islands and substrates as well as muck substrate. Within river habitats, the species tends to inhabit areas where moderate flow and turbidity are maintained. In most rivers, Northern Map Turtles tend to avoid areas where the water is less transparent. During the active season (April to October), individuals prefer shallow waters and generally avoid waters greater than 2.5 m deep. The Northern Map Turtle requires suitable basking sites, such as partially submerged rocks and logs and exposed banks that are adjacent to deep water. They favour natural shoreline environments and have home ranges primarily in shallow waters near shore. [13]		
Snapping Turtle (Source: ORAA)	*Chelydra serpentina*	S3	SC	SC	SC	1	Although Snapping Turtles occupy a wide variety of habitats, the preferred habitat for this species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often found in ponds, marshes, swamps, peat bogs, shallow bays, river and lake edges, and slow-moving streams. Although individual turtles may persist in developed areas (e.g., golf course ponds, irrigation canals) and environments with heavily polluted water (e.g., some port areas), it is unlikely that local populations will persist in such habitats, since environmental contamination is known to severely compromise reproductive success. [14]	No habitat confirmed present in the Study Area. The Study Area lacks suitable aquatic habitats for this species.	No.

** Sources: Natural Heritage Information Centre (NHIC) database searched on April 12, 2017 and August 21, 2017 for square 17PJ0719 and 17PJ0819; Correspondence with MNRF Aurora District, (Received May 29, 2017); Ontario Reptile and Amphibian Atlas (ORAA) for Square 17PJ01, searched online on May 5, 2017; Ontario Breeding Bird Atlas (OBBA) 2001-2005 database for Square 17PJ01 searched online on April 12, 2017.

[1]S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://explorer.natureserve.org/nsranks.htm)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 — Secure - Common, widespread, and abundant in the province.
SNR — Unranked - Province conservation status not yet assessed.
SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers
B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.
N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.
M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

[2]SARO *Endangered Species Act, 2007*

(provincial status from http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3)
The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

[3]SARA (Federal *Species at Risk Act*) Status and Schedule (includes COSEWIC Status)
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.
Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (END) - A wildlife species facing imminent extirpation or extinction.
Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

[4]SARA Schedule

Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

Sources:

[5] Cadman, M.D., et al. (eds). 2007. Atlas of the Breeding Birds of Ontario, 2001-2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto, xxii + 706 pp.
[6] Species at Risk Public Registry(http://www.sararegistry.gc.ca)
[7] McCracken, J.D. et al. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario .Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario, viii + 88 pp.
[8] MNRF SARO List Species Descriptions (http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_CSSR_SARO_LST_EN.html)
[9] Humphrey, C. 2017. Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources and Forestry, Peterborough, Ontario, vii + 76 pp.
[10] Environment Canada. 2015. Recovery Strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. ix + 110 pp.
[11] Environment Canada. 2016. Recovery Strategy for the Blanding's Turtle (*Emydoidea blandingii*), Great Lakes / St. Lawrence population, in Canada [Proposed]. Species at Risk Act Recovery Strategy Series. Environment Canada, Ottawa. vii + 49 pp.
[12] Environment Canada. 2016. Recovery Strategy for the Eastern Musk Turtle (*Sternotherus odoratus*) in Canada [Proposed]. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. viii + 58 pp.
[13] Environment Canada. 2016. Management Plan for the Northern Map Turtle (*Graptemys geographica*) in Canada [Proposed]. Species at Risk Act Management Plan Series. Environment Canada, Ottawa. iv + 45 pp.
[14] Environment and Climate Change Canada. 2016. Management Plan for the Snapping Turtle (*Chelydra serpentina*) in Canada [Proposed]. Species at Risk Act Management Plan Series. Environment and Climate Change Canada, Ottawa. iv + 39 p.

Burnside
[The Difference is our People]

Appendix B

Record of Agency Correspondence

Ministry of
Natural Resources
and Forestry
Aurora District Office
50 Bloomington Road
Aurora, Ontario L4G 0L8

Ministère des
Richesses naturelles
et des Forets

Telephone: (905) 713-7400
Facsimile: (905) 713-7361

Ontario

May 29, 2017

Sarah Robbins
R.J, Burnside & Associates Limited
128 Wellington Street West, Suite 301
Barrie, ON L4N 8J6
705-797-4254
Sarah.Robbins@rjburnside.com

Re: Sheridan Park Drive EA, Mississauga

Dear Sarah Robbins,

In your email of April 18, 2017 you requested information regarding the above location.

Species at risk recorded in the vicinity include Butternut (endangered), Barn Swallow (threatened), Bobolink (threatened), Chimney Swift (threatened), and Eastern Meadowlark (threatened). There is potential for endangered bats (i.e., Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat) in cavities or leaf clusters.

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. Appropriate inventory work is needed depending on the undertakings proposed. Approval from MNRF may be required if work you are proposing could cause harm to any species that receive protection under the *Endangered Species Act 2007*.

Species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific sensitive information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact ESA.aurora@ontario.ca or Bohdan.Kowalyk@Ontario.ca.

Sincerely,

B. Kowalyk

Bohdan Kowalyk, R.P.F.
Aurora District, Ontario Ministry of Natural Resources and Forestry

CVC | CREDIT VALLEY CONSERVATION

TRANSPORTATION & WORKS DEPT.
RECEIVED
June 5, 2017

May 31, 2017

Dana Glofcheskie, P.Eng
Project Manager
City of Mississauga
201 City Centre Drive, Suite 800
Mississauga, ON L5B 2T4

Re: City of Mississauga–Notice of Study Commencement/Stakeholder Advisory Committee Meeting No.1
Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension
CVC File No.: EA 17/001

CVC staff offer the following preliminary/initial comments with respect to the above noted project:

It is the understanding of CVC staff that the City of Mississauga is undertaking a Schedule B Municipal Class Environmental Assessment (EA) with the purpose of exploring the opportunity to connect the east and west sections of Sheridan Park Drive to maximize access to Sheridan Park, create options for alternative routes and improve road network connectivity.

Site Characteristics:
The proposed works are located within the Sheridan Creek watershed. The location of the proposed works does fall within an area located in close proximity to a watercourse and its associated floodplain.

Permit Approval Requirements:
In accordance with Ontario Regulation 160/06 (our Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation), a permit would be required from the CVC prior to commencement of the works involving development, interference with a wetland and/or alterations to a watercourse.

Fish Habitat and Fisheries and Oceans Canada (DFO):
Please note that CVC's agreement with the DFO establishes a streamlined approach to addressing issues pertaining to the Federal Fisheries Act. CVC staff, in consultation with the DFO staff, is responsible for co-coordinating the review of proposed works that may potentially result in the harmful alteration, disruption or destruction (HADD) of fish habitat. Please be advised that in stream works where the HADD of fish habitat requires compensation; authorization from DFO is required pursuant to Section 35(2) of the Federal Fisheries Act.

General comments:

1. The proposed natural environment evaluation criteria focus heavily on impacts to existing natural features and wildlife. CVC suggests these are expanded to include other higher level objectives such as the preservation and enhancement of a functional natural heritage system and urban forest, and protecting/enhancing/restoring/improving natural connections.

CVC recommends that the city of Mississauga's Natural Heritage and Urban Forest Strategy also be consulted when developing objectives and goals for the EA.

2. As per the intent of CVC's guiding policies, the proposal is to demonstrate, to the satisfaction of CVC, that an ecological gain is achieved. As such, the EA must outline the proposed rehabilitation, restoration, or habitat improvements for existing disturbed and adjacent natural heritage areas.

3. CVC encourages options which pursue the following objectives in order to avoid impacts, and maintain/enhance ecological functions:
   - Retention and enhancement of natural features and habitat (avoidance of natural heritage features is the preferred approach to mitigation)
   - Fish habitat protection and enhancement
   - Mitigation measures for roadways adjacent to natural areas – lighting, landscaping, noise attenuation, debris management, etc.
   - Incorporation of wildlife friendly plantings, in particular for migrant and breeding birds since this area is known to be within significant areas for migratory birds.

4. Please note that CVC is no longer administering the *Fisheries Act* on behalf of Fisheries and Oceans Canada (DFO). As a result, it is up to the proponent to ensure that the DFO requirements under the self-assessment process are addressed.

5. Depending on the nature of the preferred option, it is anticipated that restoration and enhancement plans will be required for both watercourses at the detailed design stage. The EA should address the restoration/enhancement potential of the property, and include at minimum the recommended/required measures to demonstrate an ecological gain for the proposal. The restoration/enhancement plans must be prepared by a qualified professional such as an ecologist or landscape architect.

6. Depending on the nature of the preferred option, if watercourse interference is pursued, detailed isolation and dewatering arrangements must be provided to the satisfaction of CVC.

Detailed comments:

7. In order to ensure that the proposed supporting environmental studies are sufficient and in keeping with accepted ecological protocols, a terms of reference/statement of work detailing the studies should be provided and reviewed by CVC and the City. The comments below provide some preliminary direction on which to base this TOR/statement of work. CVC would be happy to meet and discuss further details of study design.

8. CVC is supportive of the proposed terrestrial ecology assessment components, namely: bat habitat surveys, frog call surveys, tree inventory, breeding bird surveys, and ecological land classification (ELC). Please note that supplementary surveys may be required based on the results of the initial surveys; for

example, bat acoustic surveys if suitable mat habitat and maternity roost trees are identified; or targeted nests searches for species at risk bids or birds that may indicate the presence of significant wildlife habitat.

9. The proposed tree inventory should document all trees <10cm DBH within the limit of disturbance in order to help inform avoidance/mitigation/restoration opportunities.

10. Vegetation inventory/ELC: the optimal period is between end of May and September. Protocol to follow is the ELC system for Southern Ontario. A full vegetation list should be provided on a polygon basis. Species rarity is to be based on the following sources: Vascular Plant Flora of the Region of Peel & the Credit River Watershed. (2001) (Kaiser, 2001 and amendments), City of Mississauga local rarity ranks, S-Ranks using the NHIC species lists and Species at Risk in Ontario list. Rare, at risk or otherwise significant species will be required to be georeferenced. Please consult the NHIC, MNRF and the City of Mississauga Natural Areas Survey for any already documented rare and uncommon species within the natural areas in the study area; these should be an additional focus of the vegetation inventory work.

11. The breeding bird survey must be done in accordance with the Forest Bird Monitoring Program, 2002 (CWS) or the Marsh Monitoring Program (CWS and Bird Studies Canada). That is, two surveys must be conducted at least 10 days apart between late May and July 5th. The surveys must be conducted in either the early morning and/or early evening depending on habitat and potential species present, as per the protocols. These surveys should be designed to ensure that the *full habitat patch* is sampled in order to base recommendations and conclusions on the feature and its function. CVC notes that much of the forest and meadow habitat within the study area extends beyond the study area and should be included in the survey.

12. Amphibian surveys – Sampling is to follow Bird Studies Canada Great Lakes Marsh Monitoring Program protocol, with 3 separate spring/early summer seasonal survey timing windows. Since this is in a very urbanized area with much noise, point counts should be extended to a minimum of 6 minutes from the typical 3 minutes.
13. Bat habitat surveys should follow the protocol for species at risk bats within tree habitats (Ministry of Natural Resources and Forestry, April 2017). CVC notes that much of the forest habitat within the study area extends beyond the study area and should be included in the survey.

14. Depending on the nature of the aquatic habitat within the study area a Headwater Drainage Feature assessment may also be required to determine appropriate management recommendations. Please refer to the following document: Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC & TRCA, January 2014).

15. An evaluation of significant wildlife habitat must be undertaken in order to address impacts to candidate or confirmed habitat within or adjacent to the study area. The assessment should be based both on the Ministry of Natural Resources Ecoregion criteria for 7E (2015), and the Region of Peel -Town of Caledon Significant Woodland and Wildlife Habitat technical guide (2009). Please assess referencing applicable current literature. Previous work in this vicinity has indicated the potential for the following types of significant wildlife habitat (others may also exist) which must be specifically addressed:

- Raptor wintering habitat
- Land bird Migratory Stopover Areas
- Migratory Butterfly Stopover Area
- Habitat for Species of Special Concern

16. It is anticipated that a staking of natural features (woodland, wetland) will be required in the future.

17. Preliminary screening of this project indicates that species at risk are known for the area. The proponent should contact the local district MNRF office (Aurora) to request a species at risk screening for his/her project in order to identify any concerns related to species at risk and associated habitat. Inquiries can be directed to: Esa.aurora@ontario.ca

Given CVC's interest staff would like to be kept informed of future meetings and proceedings through the Environmental Assessment process. Please forward any information or reports when available to ensure that this Authority's policy and program interest are reflected in the planning and design components for this project.

Should you have any further questions please contact the undersigned at (905) 670-1615 extension 236.

Regards,

Ken Thajer
Regulations Officer

cc: David Argue, P.Eng., PTOE
Consultant Project Manager
R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga, ON L5N 8R9

Mark Heaton, Ministry of Natural Resources (by e-mail)

Jamie Ferguson, City of Mississauga (by e-mail)

Shae Richter

From: Kowalyk, Bohdan (MNRF) <bohdan.kowalyk@ontario.ca>
Sent: Thursday, June 01, 2017 11:47 AM
To: Peter DeCarvalho
Cc: Nicholle Smith
Subject: RE: Bat Protocol Discussion

Hello,

It may be easiest if you provide your findings and I will respond with my own interpretations to them and any specific questions by email.

Regards,

Bohdan Kowalyk, R.P.F.
Aurora District
Ontario Ministry of Natural Resources and Forestry
50 Bloomington Road, Aurora, Ontario L4G 0L8
Phone: 905-713-7387; Email: Bohdan.Kowalyk@Ontario.ca

From: Peter DeCarvalho [mailto:Peter.DeCarvalho@rjburnside.com]
Sent: June-01-17 10:54 AM
To: Kowalyk, Bohdan (MNRF)
Cc: Nicholle Smith
Subject: Bat Protocol Discussion

Dear Mr. Kowalyk,

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Thanks very much for your time,

Peter

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Ave. West, Unit 20

Peter De Carvalho, EIT
B.Sc. (Bio), B.Eng. (Env)
Terrestrial Ecologist/Engineering Assistant

Guelph ON N1H 1C4
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www.rjburnside.com

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Cc: mark.heaton@ontario.ca; Nicholle Smith
Subject: RE: Bat Protocol Discussion
Attachments: 039474_Sheridan Park EA Bat Memo Final.pdf

Mr. Kowalyk,

Please see attached our Bat Maternity Habitat findings and interpretations for the proposed road extension at Sheridan Park Drive in Mississauga.

All the best,

Peter

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R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Memorandum

Date:	June 8, 2017	**Project No.:**	300039474.0000
Project Name:	Sheridan Park Drive Extension, Mississauga		
Client Name:	City of Mississauga		
To:	MNRF – Aurora District		
From:	Peter DeCarvalho		

R.J. Burnside and Associates Limited (Burnside) has been retained by the City of Mississauga to complete an Environmental Assessment relating to the proposed extension of Sheridan Park Drive in Mississauga connecting the northeast and southwest segments of the road (Figure 1). Proposed development includes joining Sheridan Park Drive between Speakman Drive and Winston Churchill Boulevard. Some of the areas proposed for expansion are treed forest / woodlot communities which have potential to provide Bat Maternity Habitat (BMH) for three of the four Endangered bat species in Ontario regulated under the *Endangered Species Act* (2007).

Terrestrial ecologists have completed leaf-off surveys for BMH in forest / woodlot areas within the project study area that have potential to be impacted by proposed expansion. We are currently seeking guidance from the Ministry of Natural Resources and Forestry (MNRF) regarding our current findings as well as the appropriate next steps given the specifics of this project. The surveys followed leaf-off protocol from the MNRF Guelph District Survey Protocol for Species at Risk within Treed Habitats (Little Brown Myotis, Northern Myotis and Tri-colored Bat) dated April 2017, as outlined below.

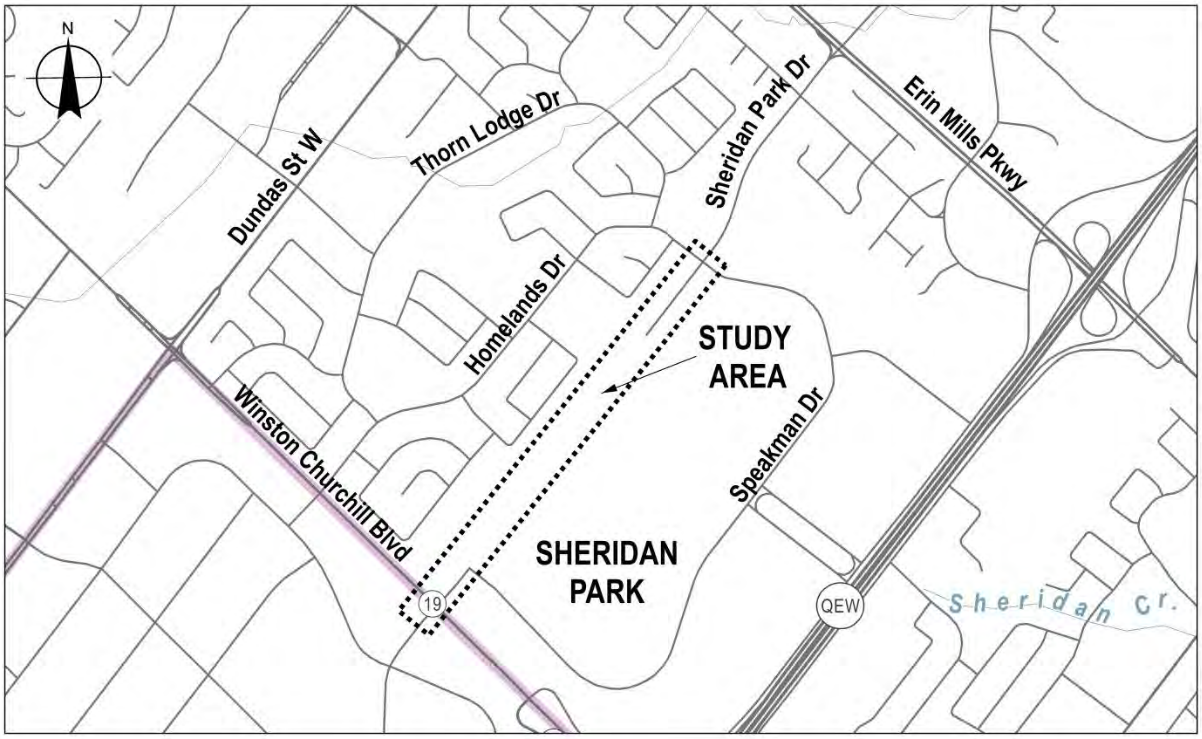

Figure 1: Project Area for Sheridan Park Drive Extension, Mississauga.

Methodology

Leaf-off surveys of treed habitat for maternity / roosting colonies focus on Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis serpentrionalis*). These species prefer to roost in tree cavities or under loose bark.

The initial step of the MNRF protocol is to conduct a site reconnaissance in treed areas that may be disturbed as a result of the proposed works and identify any candidate BMH. With small areas (under 10 ha), a comprehensive walkthrough of an ecosite is conducted to look for snag trees, as opposed to larger sites where sub-samples and snag density surveys are more appropriate. As each ecosite potentially impacted by these developments were under 10 ha, walkthrough surveys were completed. The areas surveyed for BMH were the natural areas adjacent to and within the right-of-way for Sheridan Park Drive (Figure 2).

According to the protocol, there are 10 criteria for evaluating the suitability of a snag for BMH. These criteria are listed below in order of importance:

1. Tallest snag trees;
2. Snag exhibits cavities or crevices often originating as cracks, scars, knot holes or woodpecker cavities;
3. Snag has the largest diameter breast height (DBH) (>25 cm);
4. Snag is within the highest density of other snags;

5. Snag has the highest amount of loose, peeling bark (naturally occurring / due to decay);
6. Cavity or crevice is high on the tree (>10 m) or is chimney-like with a low entrance.
7. Tree is a species known to be rot-resistant (such as Black Cherry, Black Locust);
8. Tree species typically provides good cavity habitat (e.g. White Pine, Maple, Aspen, Ash, Oak);
9. Snag is located within an area where the canopy is more open; and,
10. Snag exhibits early stages of decay (Decay Class 1-3).

With these factors in mind, we surveyed all treed areas that fell within the Sheridan Park Drive right-of-way that may potentially fall within proposed development envelopes for traits that indicate potential BMH. We recorded for each candidate tree: species, DBH, canopy height class, approximate height, cavity type, the presence of other nearby snags, and decay class. Each tree was recorded with a GPS waypoint and photo records.

Areas surveyed along the right-of-way include edge habitat of the western woodlot (Fresh Sugar Maple Deciduous Forest) and the Eastern woodlot (Moist Ash Lowland Deciduous Forest transitioning to Dry-Fresh Oak-Hardwood Deciduous Forest), as well as the north-central Cultural Thicket / Cultural Meadow, as outlined in cross-hatch on Figure 2.

Data

Bat maternity surveys were conducted for Sheridan Park Drive on April 11th. The results are presented below in Tables 1 and 2.

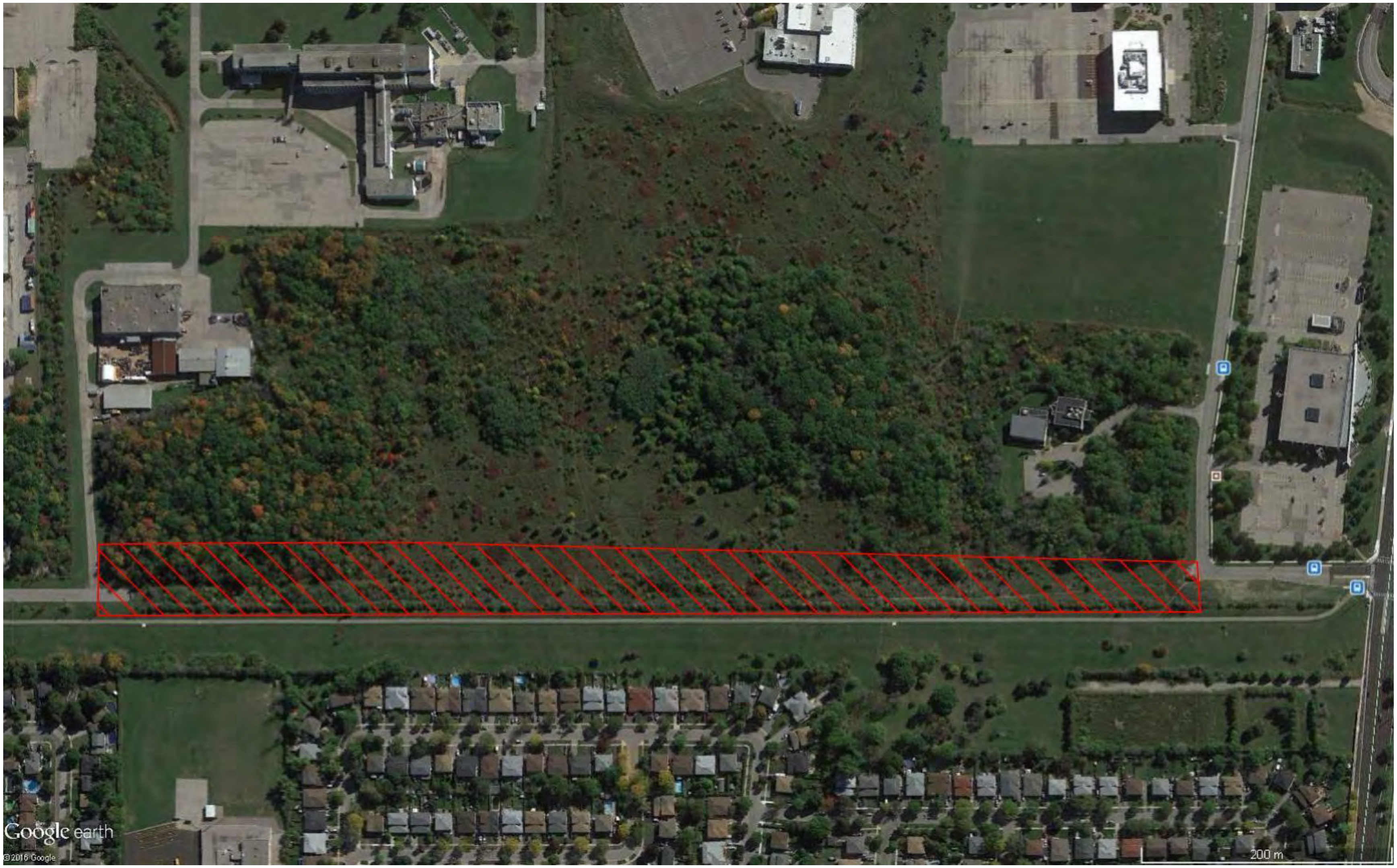

Figure 2: Sheridan Park Drive right-of-way. Area surveyed for Bat Maternity Habitat outlined / hatched in red.

Table 1: Northeastern FOD Community

Tree Species ID	DBH (cm)	Approximate Height (m)	Cavity Type	Cavity Heights (m)	Decay Class
American Elm	36	15	Peeling Bark	4	5
White Ash	74.5	28	Peeling Bark/Knothole	10+	3
Red Maple	45	20	Long fissures	8+	2
Sugar Maple	44	27	Cavity	15	1
Sugar Maple	46	25	Large cavity in upper branches	12	1
Red Maple	52.5	28	Small cavity	14	1
Red Oak	55	18	Large Crack/Cavity	8	1
Deciduous (Dead)	53	12	Decaying Standing Trunk	4 to 10	5
Beech	26	15	Hollow areas of trunk	6, 10+	2
Beech	17.5	12	Hollow areas of trunk	6, 8	4
White Ash	36.5	25	Cracked bark	6	1
Sugar Maple	70	27	Hollow areas of trunk	1	1
Deciduous (Dead)	56.5	12	Dead standing trunk with cavities	6, 10	6
White Ash	62	25	Dead standing trunk with loose bark	8, 15	4
White Ash	41	23	Loose bark	6,10	1
Beech	33	7	Large cavities	3, 5	3
Red Pine	53	25	Knot hole	2, 3.5, 6	1
Sugar Maple	43	16	Cavity, loose bark	6 to 15	3

Table 2: Southwestern FOD Community

Tree Species ID	DBH (cm)	Approximate Height (m)	Cavity Type	Cavity Heights (m)	Decay Class
Green Ash	21	14	Loose Bark	4	1

Analysis

The greatest abundance of cavity trees was identified in the northeastern FOD community. A total of 18 snag trees were identified in these two areas. All but one of these trees was greater than 25 cm DBH, and all but one was greater than 10 m in height. Of these trees, 11 featured snags, crevices, or loose bark at heights of 10 m or greater. A high density of Shagbark Hickory (*Carya ovata*) was also identified in the surveyed right-of-way in this woodlot. With its namesake shaggy bark, mature individuals of this species will also potentially serve as bat maternity habitat, even if they are not strictly considered snag trees.

The edge woodlot to the southwest was an immature stand of Green Ash (*Fraxinus pennsylvanica*) with little potential for cavity trees. One individual was observed in this region, an ash with regions of shedding bark low on the trunk (4 m). It should be noted that beyond the property-line for this area, mature hardwood deciduous appeared to dominate, and would likely have potential for BMH as well.

No snag trees were identified in the open meadow / thicket region of the right-of-way.

It is our opinion that the combination of identified cavity trees and the perceived density of Shagbark Hickory within the northeastern deciduous woodlot indicates that this area possesses characteristics indicative of Bat Maternity Habitat.

Next Steps

The results of our leaf-off survey strongly suggest that the northeastern forest edge that falls within the right-of-way should be considered candidate Bat Maternity Habitat. The early-successional Green Ash thicket that borders the mature hardwood forest to the southwest, conversely, did not possess any indication that it would meet the Significant Wildlife Habitat definition of BMH.

It is proposed that, in lieu of additional surveys, a conservative approach to bat habitat potential and significance is applied to the Sheridan Park site. This approach would recommend that the northeastern forest be treated as candidate BMH moving forward, subject to any approvals or mitigations that this designation would require given the proposed works. Mitigation to potential impacts to protected habitats could potentially include avoiding tree removal by modifying placement of the road corridor or compensatory tree plantings/bat-box installations to compensate for lost habitat.

Conclusion

It is our opinion that the information gathered through leaf-off surveys as prescribed by the MNRF Guelph District Bat Maternity Habitat Protocol (2017) is conclusive in demonstrating that the mature northeastern forest that falls within the Sheridan Park Drive right-of-way should be considered candidate Bat Maternity Habitat. Additionally, it has been indicated through analyzing these data that, in absence of large, mature trees (>10 DBH) the early-successional Green Ash thicket that occupies the right-of-way on the southwestern edge does not meet the habitat requirements of Little Brown and Northern Myotis or Tri-colored Bat.

It is our intent to proceed with the environmental impact study for this corridor extension assuming that the project area to the north does contain candidate BMH, and that, in doing so, we accept the requirements and processes that working with candidate SAR habitat will entail.

PD:sr

039474_Sheridan Park EA Bat Memo Final
6/8/2017 3:10 PM

Shae Richter

From: Kowalyk, Bohdan (MNRF) <bohdan.kowalyk@ontario.ca>
Sent: Thursday, June 08, 2017 4:45 PM
To: Peter DeCarvalho
Cc: Heaton, Mark (MNRF); Nicholle Smith
Subject: RE: Bat Protocol Discussion

Hello,

The interpretation seems reasonable. It appears that south is towards the top of the photomap (which should have a north arrow). For further assessment, please provide the actual area (in square metres) of forest habitat that would be affected.

Bohdan Kowalyk, R.P.F.
Aurora District
Ontario Ministry of Natural Resources and Forestry
50 Bloomington Road, Aurora, Ontario L4G 0L8
Phone: 905-713-7387; Email: Bohdan.Kowalyk@Ontario.ca

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Appendix C

Breeding Bird Summary Table and Field Datasheets

Burnside

Breeding Bird Survey Summary Table – June 1, 2017 and June 13, 2017

Surveys Conducted by: Hannah Maciver

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]	Provincial MNRF Area Sensitive Species[5]	Total Number Recorded in Study Area	Highest Recorded Breeding Evidence in Study Area[6]	Comments
Alder Flycatcher	*Empidonax alnorum*	S5B						1	S	
American Crow	*Corvus brachyrhynchos*	S5B						3	FY	
American Goldfinch	*Carduelis tristis*	S5B						15	D	
American Robin	*Turdus migratorius*	S5B						22	CF	
Baltimore Oriole	*Icterus galbula*	S4B						2	T	
Barn Swallow	*Hirundo rustica*	S4B	THR	THR	No Status	No Schedule		1	X	Flyover
Black-capped Chickadee	*Poecile atricapillus*	S5						9	T	
Blue Jay	*Cyanocitta cristata*	S5						4	S	
Brown Thrasher	*Toxostoma rufum*	S4B						4	T	
Brown-headed Cowbird	*Molothrus ater*	S4B						13	T	
Canada Goose	*Branta canadensis*	S5						35	X	Flyover
Cedar Waxwing	*Bombycilla cedrorum*	S5B						5	T	
Common Grackle	*Quiscalus quiscula*	S5B						7	CF	
Downy Woodpecker	*Picoides pubescens*	S5						1	S	
Eastern Phoebe	*Sayornis phoebe*	S5B						1	S	
Eastern Wood-pewee	*Contopus virens*	S4B	SC	SC				4	T	

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]	Provincial MNRF Area Sensitive Species[5]	Total Number Recorded in Study Area	Highest Recorded Breeding Evidence in Study Area[6]	Comments
European Starling	*Sturnus vulgaris*	SNA						15	FY	
Gray Catbird	*Dumetella carolinensis*	S4B						4	T	
Great Crested Flycatcher	*Myiarchus crinitus*	S4B						3	T	
House Sparrow	*Passer domesticus*	SNA						5	P	
Mourning Dove	*Zenaida macroura*	S5						6	T	
Northern Cardinal	*Cardinalis cardinalis*	S5						10	A	
Northern Flicker	*Colaptes auratus*	S4B						3	S	
Red-bellied Woodpecker	*Melanerpes carolinus*	S4						1	S	
Red-eyed Vireo	*Vireo olivaceus*	S5B						4	T	
Red-winged Blackbird	*Agelaius phoeniceus*	S4						16	CF	
Ring-billed Gull	*Larus delawarensis*	S5B,S4N						8	X	Flyover
Rock Pigeon	*Columba livia*	SNA						2	X	Flyover
Sharp-shinned Hawk	*Accipiter striatus*	S5					Yes	1	H	
Song Sparrow	*Melospiza melodia*	S5B						10	FY	
White-breasted Nuthatch	*Sitta carolinensis*	S5					Yes	1	S	
Willow Flycatcher	*Empidonax traillii*	S5B						3	A	
Yellow Warbler	*Dendroica petechia*	S5B						6	P	

[1]S-Ranks (provincial)
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://explorer.natureserve.org/nsranks.htm)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 — Secure - Common, widespread, and abundant in the province.
SNR — Unranked - Province conservation status not yet assessed.
SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers
B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.
N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.
M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

[2]SARO *Endangered Species Act, 2007*
(provincial status from http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3)
The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

[3]SARA (Federal *Species at Risk Act*) Status and Schedule (includes COSEWIC Status)
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.
Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (END) - A wildlife species facing imminent extirpation or extinction.
Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

[4]SARA Schedule
Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

[5]Source: Ontario Ministry of Natural Resources. 2000. *Significant Wildlife Habitat Technical Guide* & Appendices.

[6]Ontario Breeding Bird Atlas - Breeding Evidence Codes

Observed	
X	Species observed in its breeding season (no breeding evidence).

Possible	
H	Species observed in its breeding season in suitable nesting habitat.
S	Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

Probable	
P	Pair observed in suitable nesting habitat in nesting season.
T	Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D	Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V	Visiting probable nest site
A	Agitated behaviour or anxiety calls of an adult.
B	Brood Patch on adult female or cloacal protuberance on adult male.
N	Nest-building or excavation of nest hole.

Confirmed	
DD	Distraction display or injury feigning.
NU	Used nest or egg shells found (occupied or laid within the period of the survey).
FY	Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE	Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS	Adult carrying fecal sac.
CF	Adult carrying food for young.
NE	Nest containing eggs.
NY	Nest with young seen or heard.

BURNSIDE

Breeding Bird Evidence Field Form	Project Name / #: Sheridan Park Drive EA - 300039474

Visit #1 **Date:** June 1, 2017	**Start Time (24 hr):** 0610	**End Time:** 0845	**Temperature °C:** Start: 10°C	**Sky Code**[1]: 0 End: 13°C	**Wind**[2]: 1-3
Observer Name(s): Hannah Maciver			**Precipitation:** None		
Visit #2 **Date:** June 13, 2017	**Start Time:** 0625	**End Time:** 0900	**Temperature °C:** Start: 23°C	**Sky Code**[1]: 2 End: 23°C Humid	**Wind**[2]: 0
Observer Name(s): Hannah Maciver			**Precipitation:** None		

NOTES: Some traffic noise disturbance from roads in vicinity to Study Area
On second visit, lawn crew cutting around woodlot immediately prior to surveying this area.

HABITAT UNIT REFERENCE

Woodlot - Area A
Mainly deciduous

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carying fecal sac.
CF Adult carying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

Other Observations (e.g., wildlife)

June 1, 2017 - American Crow mobbing Sharp-shinned Hawk, indicating possible AMCR nest in woodlot. Very vocal during visit.

June 13, 2017 - Fledged AMCR in direct vicinity to this woodlot during visit, indicating that AMCR nest very probable.

Species Observed[3]: Visit #1	Breeding Evidence	Tally Visit #1	Species Observed[3]: Visit #2	Breeding Evidence	Tally Visit #2
REVI	S	1	REVI	P	2
RBWO	S	1	-	-	-
AMCR	A	2	AMCR	FY	3
NOCA	S	1	-	-	-
SSHA	H	1	-	-	-
BLJA	S	1	-	-	-
GCFL	S	1	GCFL	S	1
WBNU	S	1	-	-	-
			NOFL	S	1
			HOSP	H	1
			EAWP	S	1
			AMRO	FY	2
			MODO	S	1

Species[3]	Highest Evidence Recorded	Highest Number Recorded
REVI	P	2
RBWO	S	1
AMCR	FY	3
NOCA	S	1
SSHA	H	1
BLJA	S	1
GCFL	T	1
WBNU	S	1
NOFL	S	1
HOSP	H	1
EAWP	S	1
AMRO	FY	2
MODO	S	1

BURNSIDE

Breeding Bird Evidence Field Form

Project Name / #: Sheridan Park Drive EA - 300039474

Visit #1
Date: June 1, 2017 **Start Time (24 hr):** 0610 **End Time:** 0845
Temperature °C: Start: 10°C End: 13°C
Sky Code[1]: 0 **Wind[2]:** 1-3
Observer Name(s): Hannah Maciver
Precipitation: None

Visit #2
Date: June 13, 2017 **Start Time:** 0625 **End Time:** 0900
Temperature °C: Start: 23°C End: 23°C Humid
Sky Code[1]: 2 **Wind[2]:** 0
Observer Name(s): Hannah Maciver
Precipitation: None

NOTES: Some traffic noise disturbance from roads in vicinity to Study Area

HABITAT UNIT REFERENCE

Woodlot - Area B
Central portion of this woodlot heavily disturbed by human usage - fire pit, graffiti on tree trunks, very compact bare soil, garbage, tree damage, etc.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carying fecal sac.
CF Adult carying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

Other Observations (e.g., wildlife)

Species Observed[3]: Visit #1	Breeding Evidence	Tally Visit #1	Species Observed[3]: Visit #2	Breeding Evidence	Tally Visit #2
COGR	S	1	-	-	-
AMRO	NU	1	AMRO	CF	6
AMGO	H	2	AMGO	S	1
SOSP	S	1	SOSP	S	1
GRCA	S	1	GRCA	S	1
EAWP	S	1	EAWP	S	1
			GCFL	S	1
			BCCH	S	1
			NOCA	S	1
			REVI	S	1

Species[3]	Highest Evidence Recorded	Highest Number Recorded
COGR	S	1
AMRO	CF	6
AMGO	S	2
SOSP	T	1
GRCA	T	1
EAWP	T	1
GCFL	S	1
BCCH	S	1
NOCA	S	1
REVI	S	1

BURNSIDE

Breeding Bird Evidence Field Form

Project Name / #: Sheridan Park Drive EA - 300039474

Visit #1		**Temperature °C:**	**Sky Code**[1]: 0 / **Wind**[2]: 1-3
Date: June 1, 2017	**Start Time (24 hr):** 0610 **End Time:** 0845	Start: 10°C	End: 13°C
Observer Name(s): Hannah Maciver		**Precipitation:** None	
Visit #2		**Temperature °C:**	**Sky Code**[1]: 2 / **Wind**[2]: 0
Date: June 13, 2017	**Start Time:** 0625 **End Time:** 0900	Start: 23°C	End: 23°C Humid
Observer Name(s): Hannah Maciver		**Precipitation:** None	

NOTES: Some traffic noise disturbance from roads in vicinity to Study Area

HABITAT UNIT REFERENCE

Area C - Shrub Thicket/Meadow Community
Very compact, clay soils
Area disturbed by anthropogenic uses such as bike trails, illegal dumping, natural gas pipeline, etc.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carying fecal sac.
CF Adult carying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

Other Observations (e.g., wildlife)

Species Observed[3]: Visit #1	Breeding Evidence	Tally Visit #1	Species Observed[3]: Visit #2	Breeding Evidence	Tally Visit #2
BRTH	S	4	BRTH	S	3
RWBL	P	7	RWBL	CF	10
YWAR	P	3	YWAR	P	5
SOSP	S	5	SOSP	FY	6
NOCA	P	4	-	-	-
EAPH	S	1	-	-	-
AMGO	P	5	AMGO	D	8
WIFL	S	3	WIFL	A	3
CEDW	S	2	CEDW	S	5
BHCO	S	5	BHCO	S	9
GRCA	S	3	GRCA	S	2
RBGU	X	2	RBGU	X	5
HOSP	P	2	-	-	-
AMRO	H	1	AMRO	FY	5
COGR	S	4	COGR	CF	4
CAGO	X	35	-	-	-
BARS	X	1	-	-	-
BCCH	S	2	-	-	-
			GCFL	S	1
			EAWP	S	1
			BLJA	S	2
			MODO	S	1
			EUST	S	2
			ROPI	X	2
			ALFL	S	1
			BAOR	S	1
			DOWO	S	1

Species[3]	Highest Evidence Recorded	Highest Number Recorded
BRTH	T	4
RWBL	CF	10
YWAR	P	5
SOSP	FY	6
NOCA	P	4
EAPH	S	1
AMGO	D	8
WIFL	A	3
CEDW	T	5
BHCO	T	9
GRCA	T	3
RBGU	X	5
HOSP	P	2
AMRO	FY	5
COGR	CF	4
CAGO	X	35
BARS	X	1
BCCH	S	2
GCFL	S	1
EAWP	S	1
BLJA	S	2
MODO	S	1
EUST	S	2
ROPI	X	2
ALFL	S	1
BAOR	S	1
DOWO	S	1

BURNSIDE

Breeding Bird Evidence Field Form	Project Name / #: Sheridan Park Drive EA - 300039474

Visit #1			Temperature °C:	Sky Code[1]: 0	Wind[2]: 1-3
Date: June 1, 2017	Start Time (24 hr): 0610	End Time: 0845	Start: 10°C	End: 13°C	
Observer Name(s): Hannah Maciver			Precipitation: None		
Visit #2			Temperature °C:	Sky Code[1]: 2	Wind[2]: 0
Date: June 13, 2017	Start Time: 0625	End Time: 0900	Start: 23°C	End: 23°C Humid	
Observer Name(s): Hannah Maciver			Precipitation: None		

NOTES: Some traffic noise disturbance from roads in vicinity to Study Area

HABITAT UNIT REFERENCE

Woodlot - Area D
Disturbed by human usage (bike trails, garbage, temporary shelters); surrounded by border of raspberry, hawthorn, etc.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carying fecal sac.
CF Adult carying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

Other Observations (e.g., wildlife)

Species Observed[3]: Visit #1	Breeding Evidence	Tally Visit #1	Species Observed[3]: Visit #2	Breeding Evidence	Tally Visit #2
EAWP	S	1	EAWP	S	1
BAOR	S	1	BAOR	S	1
REVI	S	1	REVI	S	1
NOCA	S	1	NOCA	A	1
EUST	S	4	EUST	S	2
BCCH	S	5	BCCH	S	2
			NOFL	H	1

Species[3]	Highest Evidence Recorded	Highest Number Recorded
EAWP	T	1
BAOR	T	1
REVI	T	1
NOCA	A	1
EUST	T	4
BCCH	T	5
NOFL	H	1

BURNSIDE

Breeding Bird Evidence Field Form

Project Name / #: Sheridan Park Drive EA - 300039474

Visit #1
Date: June 1, 2017 **Start Time (24 hr):** 0610 **End Time:** 0845
Temperature °C: Start: 10°C End: 13°C
Sky Code[1]: 0 **Wind[2]:** 1-3
Observer Name(s): Hannah Maciver
Precipitation: None

Visit #2
Date: June 13, 2017 **Start Time:** 0625 **End Time:** 0900
Temperature °C: Start: 23°C End: 23°C Humid
Sky Code[1]: 2 **Wind[2]:** 0
Observer Name(s): Hannah Maciver
Precipitation: None

NOTES: Some traffic noise disturbance from roads in vicinity to Study Area
Lawn crew out during second visit; grass recently cut.

HABITAT UNIT REFERENCE

Area E

Open Areas - turfgrass (maintained) and landscaped trees/shrubs along paved multi-use trail.

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.
S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.
T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.
D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult.
B Brood Patch on adult female or cloacal protuberance on adult male.
N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.
NU Used nest or egg shells found (occupied or laid within the period of the survey).
FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.
AE Adult leaving or entering nest sites in circumstances indicating occupied nest.
FS Adult carying fecal sac.
CF Adult carying food for young.
NE Nest containing eggs.
NY Nest with young seen or heard.

Other Observations (e.g., wildlife)

Eastern Cottontail
Black/Grey Squirrel
Monarch

Species Observed[3]: Visit #1	Breeding Evidence	Tally Visit #1	Species Observed[3]: Visit #2	Breeding Evidence	Tally Visit #2
AMRO	S	9	AMRO	FY	3
NOFL	H	1	-	-	-
HOSP	S	2	-	-	-
MODO	S	2	MODO	S	4
SOSP	S	3	SOSP	S	1
EUST	FY	9	-	-	-
BHCO	S	4	-	-	-
AMGO	S	5	AMGO	S	3
YWAR	S	1	-	-	-
BLJA	H	1	-	-	-
NOCA	S	3	NOCA	S	3
RWBL	P	6	-	-	-
RBGU	X	3	-	-	-
COGR	P	2	-	-	-
			BCCH	S	1

Species[3]	Highest Evidence Recorded	Highest Number Recorded
AMRO	FY	9
NOFL	H	1
HOSP	S	2
MODO	T	4
SOSP	T	3
EUST	FY	9
BHCO	S	4
AMGO	T	5
YWAR	S	1
BLJA	H	1
NOCA	T	3
RWBL	P	6
RBGU	X	3
COGR	P	2
BCCH	S	1

1NAAMP/ Beaufort Sky Codes
0 = clear (no cloud cover)
1 = partly cloudy (scattered or broken) or variable
2 = cloudy or overcast
3 = sandstorm, duststorm or blowing snow
4 = fog, smoke, thick dust, or haze
5 = drizzle or light rain
6 = rain
7 = snow or snow/rain mix
8 = showers
9 = thunderstorms
2 Beaufort Wind Scale
0 = Calm, smoke rises vertically (0-2km/hr)
1 = Light air movement, smoke drifts (3-5)
2 = Slight breeze, wind felt on face; leaves rustle (6-11)
3 = Gentle breeze, leaves & twigs in constant motion (12-19)
4 = Moderate breeze, small branches moving, raises dust & loose paper (20-30)
5 = Fresh breeze, small trees begin to sway (31-39)
6 = Strong breeze, large branches in motion (40-50)

4 Habitat Codes Used in OBBA 2001-2005

(found online at: http://www.bsc-eoc.org/dataentry/codes.jsp?ts=1430836464891)

3Species Codes (4-Letter Codes Used in OBBA 2001-2005

SNGO	Snow Goose	AMBI	American Bittern	SESA	Semipalmated Sandpiper	CHSW	Chimney Swift	RCKI	Ruby-crowned Kinglet	WIWA	Wilson's Warbler
ROGO	Ross's Goose	LEBI	Least Bittern	LESA	Least Sandpiper	RTHU	Ruby-throated Hummingbird	BGGN	Blue-gray Gnatcatcher	CAWA	Canada Warbler
BRAN	Brant	GBHE	Great Blue Heron	WRSA	White-rumped Sandpiper	RUHU	Rufous Hummingbird	NOWH	Northern Wheatear	YBCH	Yellow-breasted Chat
CACG	Cackling Goose	GREG	Great Egret	BASA	Baird's Sandpiper	BEKI	Belted Kingfisher	EABL	Eastern Bluebird	EATO	Eastern Towhee
CAGO	Canada Goose	SNEG	Snowy Egret	PESA	Pectoral Sandpiper	RHWO	Red-headed Woodpecker	MOBL	Mountain Bluebird	ATSP	American Tree Sparrow
MUSW	Mute Swan	TRHE	Tricolored Heron	PUSA	Purple Sandpiper	RBWO	Red-bellied Woodpecker	VEER	Veery	CHSP	Chipping Sparrow
TRUS	Trumpeter Swan	CAEG	Cattle Egret	DUNL	Dunlin	YBSA	Yellow-bellied Sapsucker	GCTH	Gray-cheeked Thrush	CCSP	Clay-colored Sparrow
TUSW	Tundra Swan	GRHE	Green Heron	STSA	Stilt Sandpiper	DOWO	Downy Woodpecker	SWTH	Swainson's Thrush	FISP	Field Sparrow
WODU	Wood Duck	BCNH	Black-crowned Night-Heron	BBSA	Buff-breasted Sandpiper	HAWO	Hairy Woodpecker	HETH	Hermit Thrush	VESP	Vesper Sparrow
GADW	Gadwall	YCNH	Yellow-crowned Night-Heron	SBDO	Short-billed Dowitcher	TTWO	Three-toed Woodpecker	WOTH	Wood Thrush	LASP	Lark Sparrow
AMWI	American Wigeon	GLIB	Glossy Ibis	COSN	Common Snipe	BBWO	Black-backed Woodpecker	AMRO	American Robin	SAVS	Savannah Sparrow
ABDU	American Black Duck	BLVU	Black Vulture	AMWO	American Woodcock	NOFL	Northern Flicker	GRCA	Gray Catbird	GRSP	Grasshopper Sparrow
MALL	Mallard	TUVU	Turkey Vulture	WIPH	Wilson's Phalarope	PIWO	Pileated Woodpecker	NOMO	Northern Mockingbird	HESP	Henslow's Sparrow
MBDH	American Black Duck x Mallard (hybrid)	OSPR	Osprey	RNPH	Red-necked Phalarope	OSFL	Olive-sided Flycatcher	SATH	Sage Thrasher	LCSP	Le Conte's Sparrow
BWTE	Blue-winged Teal	BAEA	Bald Eagle	BOGU	Bonaparte's Gull	EAWP	Eastern Wood-Pewee	BRTH	Brown Thrasher	NSTS	Nelson's Sparrow
CITE	Cinnamon Teal	NOHA	Northern Harrier	BHGU	Black-headed Gull	YBFL	Yellow-bellied Flycatcher	EUST	European Starling	FOSP	Fox Sparrow
NSHO	Northern Shoveler	SSHA	Sharp-shinned Hawk	LIGU	Little Gull	ACFL	Acadian Flycatcher	AMPI	American Pipit	SOSP	Song Sparrow
NOPI	Northern Pintail	COHA	Cooper's Hawk	LAGU	Laughing Gull	ALFL	Alder Flycatcher	SPPI	Sprague's Pipit	LISP	Lincoln's Sparrow
GWTE	Green-winged Teal	NOGO	Northern Goshawk	FRGU	Franklin's Gull	WIFL	Willow Flycatcher	BOWA	Bohemian Waxwing	SWSP	Swamp Sparrow
CANV	Canvasback	HRSH	Harris's Hawk	RBGU	Ring-billed Gull	LEFL	Least Flycatcher	CEDW	Cedar Waxwing	WTSP	White-throated Sparrow
REDH	Redhead	RSHA	Red-shouldered Hawk	CAGU	California Gull	EAPH	Eastern Phoebe	BWWA	Blue-winged Warbler	HASP	Harris's Sparrow
RNDU	Ring-necked Duck	BWHA	Broad-winged Hawk	HERG	Herring Gull	GCFL	Great Crested Flycatcher	GWWA	Golden-winged Warbler	WCSP	White-crowned Sparrow
GRSC	Greater Scaup	RTHA	Red-tailed Hawk	ICGU	Iceland Gull	WEKI	Western Kingbird	BGWW	Blue-winged/Golden-winged Warbler	DEJU	Dark-eyed Junco
LESC	Lesser Scaup	FEHA	Ferruginous Hawk	LBBG	Lesser Black-backed Gull	EAKI	Eastern Kingbird	LAWA	Lawrence's Warbler (hybrid)	MCLO	McCown's Longspur
KIEI	King Eider	RLHA	Rough-legged Hawk	GLGU	Glaucous Gull	FTFL	Fork-tailed Flycatcher	BRWA	Brewster's Warbler (hybrid)	LALO	Lapland Longspur
COEI	Common Eider	GOEA	Golden Eagle	GBBG	Great Black-backed Gull	LOSH	Loggerhead Shrike	TEWA	Tennessee Warbler	SMLO	Smith's Longspur
SUSC	Surf Scoter	AMKE	American Kestrel	CATE	Caspian Tern	NSHR	Northern Shrike	OCWA	Orange-crowned Warbler	SNBU	Snow Bunting
WWSC	White-winged Scoter	MERL	Merlin	BLTE	Black Tern	WEVI	White-eyed Vireo	NAWA	Nashville Warbler	SUTA	Summer Tanager
BLSC	Black Scoter	PEFA	Peregrine Falcon	COTE	Common Tern	YTVI	Yellow-throated Vireo	NOPA	Northern Parula	SCTA	Scarlet Tanager
LTDU	Long-tailed Duck	YERA	Yellow Rail	ARTE	Arctic Tern	BHVI	Blue-headed Vireo	YWAR	Yellow Warbler	WETA	Western Tanager
BUFF	Bufflehead	KIRA	King Rail	FOTE	Forster's Tern	WAVI	Warbling Vireo	CSWA	Chestnut-sided Warbler	NOCA	Northern Cardinal
COGO	Common Goldeneye	VIRA	Virginia Rail	PAJA	Parasitic Jaeger	PHVI	Philadelphia Vireo	MAWA	Magnolia Warbler	RBGR	Rose-breasted Grosbeak
BAGO	Barrow's Goldeneye	SORA	Sora	LTJA	Long-tailed Jaeger	REVI	Red-eyed Vireo	CMWA	Cape May Warbler	BLGR	Blue Grosbeak
HOME	Hooded Merganser	PUGA	Purple Gallinule	BLGU	Black Guillemot	GRAJ	Gray Jay	BTBW	Black-throated Blue Warbler	INBU	Indigo Bunting
COME	Common Merganser	COMO	Common Gallinule	ECDO	Eurasian Collared-Dove	BLJA	Blue Jay	YRWA	Yellow-rumped Warbler	DICK	Dickcissel
RBME	Red-breasted Merganser	AMCO	American Coot	WWDO	White-winged Dove	BBMA	Black-billed Magpie	BTNW	Black-throated Green Warbler	BOBO	Bobolink
RUDU	Ruddy Duck	MOOT	moorhen/coot sp.	MODO	Mourning Dove	AMCR	American Crow	BLBW	Blackburnian Warbler	RWBL	Red-winged Blackbird
GRPA	Gray Partridge	SACR	Sandhill Crane	BUDG	Budgerigar	CORA	Common Raven	YTWA	Yellow-throated Warbler	EAME	Eastern Meadowlark
RIPH	Ring-necked Pheasant	BBPL	Black-bellied Plover	YBCU	Yellow-billed Cuckoo	HOLA	Horned Lark	PIWA	Pine Warbler	WEME	Western Meadowlark
SIPH	Silver Pheasant	AMGP	American Golden-Plover	CUCK	Black/Yellow-billed Cuckoo	PUMA	Purple Martin	KIWA	Kirtland's Warbler	YHBL	Yellow-headed Blackbird
RUGR	Ruffed Grouse	SEPL	Semipalmated Plover	BBCU	Black-billed Cuckoo	TRES	Tree Swallow	PRAW	Prairie Warbler	RUBL	Rusty Blackbird
SPGR	Spruce Grouse	PIPL	Piping Plover	BNOW	Barn Owl	NRWS	Northern Rough-winged Swallow	PAWA	Palm Warbler	BRBL	Brewer's Blackbird
WIPT	Willow Ptarmigan	KILL	Killdeer	EASO	Eastern Screech-Owl	BANS	Bank Swallow	BBWA	Bay-breasted Warbler	COGR	Common Grackle
STGR	Sharp-tailed Grouse	RODO	Rock Pigeon	GHOW	Great Horned Owl	CLSW	Cliff Swallow	BLPW	Blackpoll Warbler	BHCO	Brown-headed Cowbird
GPCH	Greater Prairie-Chicken	BNST	Black-necked Stilt	SNOW	Snowy Owl	BARS	Barn Swallow	CERW	Cerulean Warbler	OROR	Orchard Oriole
WITU	Wild Turkey	AMAV	American Avocet	NHOW	Northern Hawk Owl	BCCH	Black-capped Chickadee	BAWW	Black-and-white Warbler	BAOR	Baltimore Oriole
HELG	Helmeted Guineafowl	SPSA	Spotted Sandpiper	BUOW	Burrowing Owl	BOCH	Boreal Chickadee	AMRE	American Redstart	PIGR	Pine Grosbeak
NOBO	Northern Bobwhite	SOSA	Solitary Sandpiper	BDOW	Barred Owl	TUTI	Tufted Titmouse	PROW	Prothonotary Warbler	PUFI	Purple Finch
RTLO	Red-throated Loon	GRYE	Greater Yellowlegs	GGOW	Great Gray Owl	RBNU	Red-breasted Nuthatch	WEWA	Worm-eating Warbler	HOFI	House Finch
PALO	Pacific Loon	WILL	Willet	LEOW	Long-eared Owl	WBNU	White-breasted Nuthatch	SWWA	Swainson's Warbler	RECR	Red Crossbill
COLO	Common Loon	LEYE	Lesser Yellowlegs	SEOW	Short-eared Owl	BRCR	Brown Creeper	OVEN	Ovenbird	WWCR	White-winged Crossbill
PBGR	Pied-billed Grebe	UPSA	Upland Sandpiper	BOOW	Boreal Owl	CARW	Carolina Wren	NOWA	Northern Waterthrush	CORE	Common Redpoll
HOGR	Horned Grebe	WHIM	Whimbrel	NSWO	Northern Saw-whet Owl	BEWR	Bewick's Wren	LOWA	Louisiana Waterthrush	HORE	Hoary Redpoll
RNGR	Red-necked Grebe	HUGO	Hudsonian Godwit	CONI	Common Nighthawk	HOWR	House Wren	KEWA	Kentucky Warbler	PISI	Pine Siskin
EAGR	Eared Grebe	MAGO	Marbled Godwit	COPO	Common Poorwill	WIWR	Winter Wren	CONW	Connecticut Warbler	AMGO	American Goldfinch
ASTK	American Swallow-tailed Kite	RUTU	Ruddy Turnstone	CWWI	Chuck-will's-widow	SEWR	Sedge Wren	MOWA	Mourning Warbler	EVGR	Evening Grosbeak
AWPE	American White Pelican	REKN	Red Knot	WPWI	Whip-poor-will	MAWR	Marsh Wren	COYE	Common Yellowthroat	HOSP	House Sparrow
DCCO	Double-crested Cormorant	SAND	Sanderling	EWPW	Eastern Whip-poor-will	GCKI	Golden-crowned Kinglet	HOWA	Hooded Warbler		

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[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Vegetation Species Lists for ELC Ecosites

Ecological Land Classification Vegetation Inventory Summary Tables – June 7, 2017

Surveys Conducted by: Peter De Carvalho

ELC Polygon # 1

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
American Basswood	*Tilia Americana*	S5	-	-	-	-
Ironwood	*Ostrya virginiana*	S5	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
Shagbark Hickory	*Carya ovata*	S5	-	-	-	-
Red Pine	*Pinus resinosa*	S5	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
White Oak	*Quercus alba*	S5	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Fly Honeysuckle	*Lonicera canadensis*	S5	-	-	-	-
Prickly Gooseberry	*Ribes cynosbati*	S5	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Enchanter's Nightshade	*Circaea canadensis*	S5	-	-	-	-
Jack in the Pulpit	*Arisaema triphyllum*	S5	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
False Solomon's Seal	*Maianthemum racemosum*	S5	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Spotted Jewelweed	*Impatiens capensis*	S5	-	-	-	-
Herb Robert	*Geranium robertanum*	S5	-	-	-	-
Wild Geranium	*Geranium maculatum*	S5	-	-	-	-
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Solidago sp.	*Solidago sp.*	S?	-	-	-	-
A sedge	*Carex c.f. rosea*	S5	-	-	-	-
A cinquefoil	*Potentilla c.f. simplex*	S5	-	-	-	-

ELC Polygon # 2

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
American Basswood	*Tilia Americana*	S5	-	-	-	-
American Beech	*Fagus grandifolia*	S4	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
Shagbark Hickory	*Carya ovata*	S5	-	-	-	-
Red Pine	*Pinus resinosa*	S5	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
White Oak	*Quercus alba*	S5	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Bitternut Hickory	*Carya cordiformis*	S5	-	-	-	-
Wild Apple	*Malus pumila*	SNA	-	-	-	-
Red Maple	*Acer rubrum*	S5	-	-	-	-
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Fly Honeysuckle	*Lonicera canadensis*	S5	-	-	-	-
Prickly Gooseberry	*Ribes cynosbati*	S5	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Enchanter’s Nightshade	*Circaea canadensis*	S5	-	-	-	-
Jack in the Pulpit	*Arisaema triphyllum*	S5	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
False Solomon’s Seal	*Maianthemum racemosum*	S5	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Spotted Jewelweed	*Impatiens capensis*	S5	-	-	-	-
Herb Robert	*Geranium robertanum*	S5	-	-	-	-
Wild Geranium	*Geranium maculatum*	S5	-	-	-	-
Poison Ivy	*Toxicodendron radicans*	S5	-	-	-	-
May-apple	*Podophyllum peltatum*	S5	-	-	-	-
A sedge	*Carex c.f. rosea*	S5	-	-	-	-
White Trillium	*Trillium grandiflorum*	S5	-	-	-	-
Wild Buckwheat	*Fagopyrum esculentum*	SNA	-	-	-	-

ELC Polygon #2* (Drainage Swale)

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Green Ash	*Fraxinus pennsylvanica*	S4	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
Shagbark Hickory	*Carya ovata*	S5	-	-	-	-
Little-leaf Linden	*Tilia cordata*	SNA	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Trembling Aspen	*Populus tremuloides*	S5	-	-	-	-
An apple	*Malus c.f. coronaria*	S4	-	-	-	-
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Red-osier Dogwood	*Cornus stolonifera*	S5	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Common Blackberry	*Rubus allegheniensis*	S5	-	-	-	-
Russian Olive	*Elaegnus angustifolia*	SNA	-	-	-	-
European Euonymus	*Euonymus eruopaeus*	SNA	-	-	-	-
Ground Juniper	*Juniperus communis*	S5	-	-	-	-
A willow	*Salix sp.*	S?	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Enchanter's Nightshade	*Circaea canadensis*	S5	-	-	-	-
Smooth Brome	*Bromus inermis*	SNA	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
Ox-eye Daisy	*Leucanthemum vulgare*	SNA	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Wild Strawberry	*Fragaria virginiana*	S5	-	-	-	-
Kentucky Bluegrass	*Poa pratensis*	S5	-	-	-	-
Canada Thistle	*Cirsium arvense*	SNA	-	-	-	-
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Solidago sp.	*Solidago sp.*	S?	-	-	-	-
Poison Ivy	*Toxicodendron radicans*	S5	-	-	-	-
Bull Thistle	*Cirsium vulgare*	SNA	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
Common Mullein	*Verbascum Thapsus*	SNA	-	-	-	-
Yarrow	*Achillea millefolium*	SNA	-	-	-	-
American Vetch	*Vicia americana*	S5	-	-	-	-
Narrow-leaved Cattail	*Typha augustifolia*	SNA	-	-	-	-
Teasel	*Dipsacus sylvestris*	SNA	-	-	-	-
Common Milkweed	*Asclepias syriaca*	S5	-	-	-	-
Wild Carrot	*Daucus carota*	SNA	-	-	-	-

ELC Polygon #3, 7

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Green Ash	*Fraxinus pennsylvanica*	S4	-	-	-	-
Black Locust	*Robinia pseudoacacia*	SNA	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Silver Maple	*Acer saccharinum*	S5	-	-	-	-
Morrow's Honeysuckle	*Lonicera morrowii*	SNA	-	-	-	-
Downy Arrowwood	*Viburnum rafinesquianum*	S5	-	-	-	-
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Red-osier Dogwood	*Cornus stolonifera*	S5	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Amur Maple	*Acer ginnala*	SNA	-	-	-	-
Ninebark	*Physocarpus opulifolius*	S5	-	-	-	-
Serviceberry	*Amelanchier sp.*	S?	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Virginia Rose	*Rosa virginiana*	SU	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Common Blackberry	*Rubus allegheniensis*	S5	-	-	-	-
Smooth Brome	*Bromus inermis*	SNA	-	-	-	-
Ox-eye Daisy	*Leucanthemum vulgare*	SNA	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Woodland Strawberry	*Fragaria vesca*	S5	-	-	-	-
Kentucky Bluegrass	*Poa pratensis*	S5	-	-	-	-
Canada Thistle	*Cirsium arvense*	SNA	-	-	-	-
Solidago sp.	*Solidago sp.*	S?	-	-	-	-
Bull Thistle	*Cirsium vulgare*	SNA	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
Yarrow	*Achillea millefolium*	SNA	-	-	-	-
American Vetch	*Vicia americana*	S5	-	-	-	-
Teasel	*Dipsacus sylvestris*	SNA	-	-	-	-
Orchard Grass	*Dactylis glomerata*	SNA	-	-	-	-
Common Plantain	*Plantago major*	S5	-	-	-	-
A Hawkweed	*Pilosella c.f. aurantiaca*	SNA	-	-	-	-
Black Mustard	*Brassica nigra*	SNA	-	-	-	-
An Avens	*Geum c.f. aleppicum*	S5	-	-	-	-
A St. John's-wort	*Hypericum sp.*	S?	-	-	-	-
A Sedge	*Carex c.f. tenera*	S5	-	-	-	-
Common Cinquefoil	*Potentilla simplex*	S5	-	-	-	-

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Pennycress	*Thlaspi arvense*	SNA	-	-	-	-
Tall Buttercup	*Ranunculus acris*	SNA	-	-	-	-
Red Clover	*Trifolium pretense*	SNA	-	-	-	-
A Sedge	*Carex sp.*	S?	-	-	-	-
Timothy	*Pleum pretense*	SNA	-	-	-	-
Grass-leaved Starwort	*Stellaria graminea*	SNA	-	-	-	-
Common Speedwell	*Veronica officinalis*	SNA	-	-	-	-
Curly Dock	*Rumex crispus*	SNA	-	-	-	-

BURNSIDE

ELC Polygon #4

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Trees						
American Basswood	*Tilia Americana*	S5	-	-	-	-
Ironwood	*Ostrya virginiana*	S5	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
Shagbark Hickory	*Carya ovata*	S5	-	-	-	-
Red Pine	*Pinus resinosa*	S5	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Shrubs						
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Fly Honeysuckle	*Lonicera canadensis*	S5	-	-	-	-
Common Blackberry	*Rubus allegheniensis*	S5	-	-	-	-
Virginia Rose	*Rosa virginiana*	SU	-	-	-	-
Herbs						
Enchanter's Nightshade	*Circaea canadensis*	S5	-	-	-	-
Jack in the Pulpit	*Arisaema triphyllum*	S5	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
Spotted Jewelweed	*Impatiens capensis*	S5	-	-	-	-
Herb Robert	*Geranium robertanum*	S5	-	-	-	-
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
An avens	*Geum c.f. macrophyllum*	S5	-	-	-	-
May-apple	*Podophyllum peltatum*	S5	-	-	-	-
Black Mustard	*Brassica nigra*	SNA	-	-	-	-
White Trillium	*Trillium grandiflorum*	S5	-	-	-	-
Woodland Strawberry	*Fragaria vesca*	S5	-	-	-	-

ELC Polygon #5

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Trees						
Green Ash	*Fraxinus pennsylvanica*	S4	-	-	-	-
Sugar Maple	*Acer saccharum*	S5	-	-	-	-
Shagbark Hickory	*Carya ovata*	S5	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
White Oak	*Quercus alba*	S5	-	-	-	-
Shrubs						
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Riverbank Grape	*Vitis riparia*	S5	-	-	-	-
Virginia Rose	*Rosa virginiana*	SU	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Common Blackberry	*Rubus allegheniensis*	S5	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Russian Olive	*Elaegnus angustifolia*	SNA	-	-	-	-
Fly Honeysuckle	*Lonicera canadensis*	S5	-	-	-	-
Herbs						
Enchanter’s Nightshade	*Circaea canadensis*	S5	-	-	-	-
Smooth Brome	*Bromus inermis*	SNA	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
Ox-eye Daisy	*Leucanthemum vulgare*	SNA	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Woodland Strawberry	*Fragaria vesca*	S5	-	-	-	-
Kentucky Bluegrass	*Poa pratensis*	S5	-	-	-	-
Canada Thistle	*Cirsium arvense*	SNA	-	-	-	-
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Poison Ivy	*Toxicodendron radicans*	S5	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
Yarrow	*Achillea millefolium*	SNA	-	-	-	-
American Vetch	*Vicia americana*	S5	-	-	-	-
Teasel	*Dipsacus sylvestris*	SNA	-	-	-	-
Common Milkweed	*Asclepias syriaca*	S5	-	-	-	-
Wild Carrot	*Daucus carota*	SNA	-	-	-	-
Black Mustard	*Brassica nigra*	SNA	-	-	-	-
An Avens	*Geum c.f. aleppicum*	S5	-	-	-	-
A St. John’s-wort	*Hypericum sp.*	S?	-	-	-	-
Common Cinquefoil	*Potentilla simplex*	S5	-	-	-	-
Pennycress	*Thlaspi arvense*	SNA	-	-	-	-
Wild Buckwheat	*Fagopyrum esculentum*	SNA	-	-	-	-

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Tall Tumble Mustard	*Sisymbrium altissimum*	SNA	-	-	-	-

ELC Polygon #6

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Trees						
Green Ash	*Fraxinus pennsylvanica*	S4	-	-	-	-
American Beech	*Fagus grandifolia*	S4	-	-	-	-
Ironwood	*Ostrya virginiana*	S5	-	-	-	-
Trembling Aspen	*Populus tremuloides*	S5	-	-	-	-
Red Maple	*Pinus resinosa*	S5	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
Shrubs						
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
Riverbank Grape	*Vitis riparia*	S5	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Virginia Rose	*Rosa virginiana*	SU	-	-	-	-
Herbs						
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Teasel	*Dipsacus sylvestris*	SNA	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
Enchanter's Nightshade	*Circaea canadensis*	S5	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Herb Robert	*Geranium robertanum*	S5	-	-	-	-
Poison Ivy	*Toxicodendron radicans*	S5	-	-	-	-

ELC Polygon #8

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Trees						
Green Ash	*Fraxinus pennsylvanica*	S4	-	-	-	-
White Ash	*Fraxinus americana*	S4	-	-	-	-
Wild Apple	*Malus pumila*	SNA	-	-	-	-
Red Oak	*Quercus rubra*	S5	-	-	-	-
American Elm	*Ulmus americana*	S5	-	-	-	-
Shrubs						
Gray Dogwood	*Cornus racemosa*	S5	-	-	-	-
Choke Cherry	*Prunus virginiana*	S5	-	-	-	-
Red-osier Dogwood	*Cornus stolonifera*	S5	-	-	-	-
Buckthorn sp.	*Rhamnus c.f. cathartica*	SNA	-	-	-	-
English Hawthorn	*Crataegus monogyna*	SNA	-	-	-	-
Serviceberry	*Amelanchier sp.*	S?	-	-	-	-
Virginia Rose	*Rosa virginiana*	SU	-	-	-	-
Virginia Creeper	*Parthenocissus quinquefolia*	S4?	-	-	-	-
Russian Olive	*Elaegnus angustifolia*	SNA	-	-	-	-
Hawthorn sp.	*Crataegus sp.*	S?	-	-	-	-
Tartarian Honeysuckle	*Lonicera tatarica*	SNA	-	-	-	-
Fly Honeysuckle	*Lonicera canadensis*	S5	-	-	-	-
Herbs						
Smooth Brome	*Bromus inermis*	SNA	-	-	-	-
Garlic Mustard	*Alliaria petiolata*	SNA	-	-	-	-
Ox-eye Daisy	*Leucanthemum vulgare*	SNA	-	-	-	-
Common Dandelion	*Taraxacum officinale*	SNA	-	-	-	-
Wild Strawberry	*Fragaria virginiana*	S5	-	-	-	-
Woodland Strawberry	*Fragaria vesca*	S5	-	-	-	-
Kentucky Bluegrass	*Poa pratensis*	S5	-	-	-	-
Canada Thistle	*Cirsium arvense*	SNA	-	-	-	-
Aster sp.	*Symphotrichum sp.*	S?	-	-	-	-
Solidago sp.	*Solidago sp.*	S?	-	-	-	-
Poison Ivy	*Toxicodendron radicans*	S5	-	-	-	-
Bull Thistle	*Cirsium vulgare*	SNA	-	-	-	-
Rhubarb	*Rheum rhabarbarum*	SNA	-	-	-	-
American Vetch	*Vicia americana*	S5	-	-	-	-
Teasel	*Dipsacus sylvestris*	SNA	-	-	-	-
Common Milkweed	*Asclepias syriaca*	S5	-	-	-	-
Wild Carrot	*Daucus carota*	SNA	-	-	-	-
Orchard Grass	*Dactylis glomerata*	SNA	-	-	-	-
A Hawkweed	*Pilosella c.f. aurantiaca*	SNA	-	-	-	-

Common Name	Scientific Name	Provincial SRANK[1]	Provincial SARO (Endangered Species Act, 2007)[2]	Federal COSEWIC[3]	Federal SARA (Species At Risk Act)[3]	Federal SARA Schedule[4]
Black Mustard	*Brassica nigra*	SNA	-	-	-	-
A St. John's-wort	*Hypericum sp.*	S?	-	-	-	-
Common Cinquefoil	*Potentilla simplex*	S5	-	-	-	-
Red Clover	*Trifolium pretense*	SNA	-	-	-	-
Grass-leaved Starwort	*Stellaria graminea*	SNA	-	-	-	-
Curly Dock	*Rumex crispus*	SNA	-	-	-	-
Wild Buckwheat	*Fagopyrum esculentum*	SNA	-	-	-	-
Dame's Rocket	*Hesperis matronalis*	SNA	-	-	-	-
Black Medick	*Medicago lupulina*	SNA	-	-	-	-
Common Shepherd's Purse	*Capsella bursa-pastoris*	SNA	-	-	-	-
Horticultural Lily	*Crinum sp.*	SNA	-	-	-	-
Butter-and-eggs	*Linaria vulgaris*	SNA	-	-	-	-
Prickly Lettuce	*Lactuca serriola*	SNA	-	-	-	-
Horseradish	*Armoracia rusticana*	SNA	-	-	-	-
Common Comfrey	*Symphytum officinale*	SNA	-	-	-	-

[1]**S-Ranks (provincial)**
Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario (Please refer to: http://explorer.natureserve.org/nsranks.htm)

SX — Presumed Extirpated - Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH — Possibly Extirpated (Historical) - Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20–40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1 — Critically Imperiled - Critically imperiled in the province or state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 — Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 — Secure - Common, widespread, and abundant in the province.
SNR — Unranked - Province conservation status not yet assessed.
SU — Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA — Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# — Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
S#? – Inexact or Uncertain - Denotes inexact or uncertain numeric rank.

Breeding Status Qualifiers
B – Breeding Conservation status refers to the breeding population of the species in the nation or state/province.
N – Nonbreeding Conservation status refers to the non-breeding population of the species in the province.
M – Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.

[2]**SARO *Endangered Species Act, 2007***
(provincial status from http://www.ontario.ca/environment-and-energy/how-species-risk-are-listed#section-3)
The provincial review process is implemented by the MNRF's Committee on the Status of Species at Risk in Ontario (COSSARO).

Extinct - A species that no longer exists anywhere.
Extirpated (EXT) - Lives somewhere in the world, and at one time lived in the wild in Ontario, but no longer lives in the wild in Ontario.
Endangered (END) - Lives in the wild in Ontario but is facing imminent extinction or extirpation.
Threatened (THR) - Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
Special concern (SC) - Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.
Not at Risk (NAR) - A species that has been evaluated and found to be not at risk.
Data Deficient (DD) - A species for which there is insufficient information for a provincial status recommendation.

[3]**SARA (Federal *Species at Risk Act*) Status and Schedule (includes COSEWIC Status)**
The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

Extinct - A wildlife species that no longer exists.
Extirpated (EXT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (END) - A wildlife species facing imminent extirpation or extinction.
Threatened (THR) - A wildlife species that is likely to become an endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD) - A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

[4]SARA Schedule
Schedule 1: is the official list of species that are classified as extirpated, endangered, threatened, and of special concern.
Schedule 2: species listed in Schedule 2 are species that had been designated as endangered or threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.
Schedule 3: species listed in Schedule 3 are species that had been designated as special concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk

ELC Community Summary Sheet	Polygon #	1

Project #:________ **Project Name:** Sheridan Drive Ext **Surveyor(s):** PD **Date:** June 7/2017

Polygon Description

Community Series:	Ecosite: FOD	Vegetation Type: Moist deciduous forest
System: Terrestrial / Wetland / Aquatic	**Topographic Feature:** Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	**Dominant Plant Form:** Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed
Cover: Open / Shrub / Treed	**History:** Natural / Cultural	**Community Class:** Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis	
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor	
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet	
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Silty Clay	
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** Sample 1 M - 35 cm / G - — cm, **Sample 2** M - 30 cm / G - — cm	
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m	**Depth to Bedrock:** @ m At surface / <1m / >1m

	Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	25	60%	Sugar Maple
2	Subcanopy	12	50%	Sugar Maple / BNH
3	Understorey	6	30%	"
4	Groundlayer	<1	50%	V. Creeper, ENS

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	A	O	R
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

G. mustard / invasives along walking paths (dri)

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Crows

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet

Polygon #

Plant List Trees	Layer / Abundance 1	2	3	4
Basswood				O
Ironwood	C			
Sugar Maple	C		O	C
SBH	O	O	O	O
R. Pine	O			
R. Oak	C			
W. Oak	O			
Am. elm	O		O	

Shrubs	1	2	3	4
Grey Dogwood			C	
Choke Cherry		C		
Hawthorn Sp		O		
Buckthorn Sp		O		
Honeysuckle (Fly)		O		
Gooseberry (Prickly)		O		
V. Creeper		R	O	C

Plant List Groundlayer	Layer / Abundance 1	2	3	4
ENS			C	
~~Joe Pye weed~~ JPW		O		
Garlic Mustard		O	C	
False Solomons			C	
Dandelion			O	
Jewelweed			C	
Herb Robert			O	
Wild Geranium			O	
Aster Sp		O	O	
Solidago Sp		O	O	
Carex cf. rosea			R	
Potentilla Sp			U	

TSTM

ELC Community Summary Sheet	Polygon #	2

Project #: ______ **Project Name:** Sheridan Drive Ext **Surveyor(s):** ______ **Date:** ______

Polygon Description

Community Series:	Ecosite:	Vegetation Type: Drainage Swale

System:	Topographic Feature:	Dominant Plant Form:
Terrestrial / Wetland / Aquatic	Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed

Cover:	History:	Community Class:
Open / Shrub / Treed	Natural / Cultural	Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		Basal Area (m2/ha):	Soil Drainage: V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor
Standing Snags: Rare / Occasional / Abundant / Dominant			Soil Moisture Regime: Dry / Fresh / Moist / Wet
Deadfall Logs: Rare / Occasional / Abundant / Dominant			Effective Soil Texture:
Health L / M / H	Sensitivity L / M / H	Botanical Quality L / M / H	Depth to Mottles / Gley Sample 1 M - cm / G - cm, Sample 2 M - cm / G - cm
Slope: None / Gentle / Moderate / Steep Simple / Complex			Depth to G. Water: @ m At surface / <1m / >1m; Depth to Bedrock: @ m At surface / <1m / >1m

	Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	10	15%	G. Ash
2	Subcanopy	6	60%	Buckthorn
3	Understorey	4	30%	
4	Groundlayer	1	70%	Grasses / Asters

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O	—	—
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Some cutting, [illegible]
[illegible]

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

Drainage ditch (overgrown)
Likely [illegible]

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet

Polygon #

Plant List **Trees**	1	2	3	4
G. Ash	C			
S. Maple		O		
SBH			O	
Little-leaf Linden	R			
Am Elm			O	R
T. Aspen	R			
Apple (crab??)		R		
Juniper	R			R

Shrubs	1	2	3	4
Buckthorn	C	C		
Choke Cherry			O	
Russian Olive		O	R	
Salix Sp.			O	
Euonymus europaeus			O	
RO Dogwood			O	
Black [illegible]			O	
Grey Dogwood			C	

Plant List **Groundlayer**	1	2	3	4
Solidago sp.			C	
Smooth Brome			C	
Dandelion			C	
Ox-eye Daisy				O
Wild Strawberry				R
Poison Ivy				O
Poa pratensis				A
Canada Thistle			O	
Bull Thistle			R	
Rhubarb			O	
Common Mullein			R	
Yarrow			C	
Am Vetch			C	
[illegible]		U		
G. Mustard			C	
[illegible]				C
[illegible]				
Common Milkweed			C	
V. Creeper			O	
W. Carrot			O	
Aster sp.			O	

ELC Community Summary Sheet

Polygon # 2

Project #: ______ **Project Name:** Sheridan Drive **Surveyor(s):** PD **Date:** June 7, 2012

Polygon Description

Community Series:	Ecosite:	Vegetation Type:
	FOD	Moist deciduous Forest

System:	Topographic Feature:	Dominant Plant Form:
Terrestrial Wetland Aquatic	Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed

Cover:	History:	Community Class:
Open Shrub Treed	Natural Cultural	Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			**Soil Analysis**
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Silty Clay
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** **Sample 1** M - 20 cm / G - cm, **Sample 2** M - 25 cm / G - cm
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m — **Depth to Bedrock:** @ m At surface / <1m / >1m

g <0.3
Very Moist

Vegetation Layer		Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	25	40%	SBH
2	Subcanopy	15	50%	SBH / S. Maple
3	Understorey	6-8	50%	Buckthorn / Beech
4	Groundlayer	>0.5	30%	G. Mustard

Height Codes – (1) >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – (0) None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O	O	R
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Invasives Firepits
Foot paths Dumping
Cutting Graffiti

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet	Polygon #	

Plant List	Layer / Abundance			
Trees	1	2	3	4
Beech	O	O	C	C
S. Maple	C	C	C	O
SBH	C	O	O	O
R. Pine	O			
Am. Elm		O	O	O
Wild Apple			R	
R. Oak	C		O	O
R. Maple	O		O	
W. Oak	C			
Basswood			O	O
Bitternut Hickory		R		

Shrubs	1	2	3	4
Buckthorn sp.		O	C	C
Fly Honeysuckle			O	O
Prickly Gooseberry			O	
Choke Cherry			O	
S. Maple			O	O
G. dogwood				O
Hawthorn sp.		O	O	
V. Creeper				

Plant List	Layer / Abundance			
Groundlayer	1	2	3	4
FNS			C	
Wild Geranium				O
G. mustard			C	
Poison Ivy				C
V. Creeper			O	O
Mayapple			O	
~~Tall thimbleweed~~ JJTP				O
[illegible]				C
False Solomon				O
Carex sp.				O
[illegible]				O
White trillium				R
wild [illegible]				R

ELC Community Summary Sheet	Polygon #	3

Project #: ____ **Project Name:** Stender **Surveyor(s):** RD **Date:** Jan 7

Polygon Description

Community Series:	Ecosite: CUM	Vegetation Type: graminoid open field
System: Terrestrial / Wetland / Aquatic	**Topographic Feature:** Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	**Dominant Plant Form:** Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed
Cover: Open / Shrub / Treed	**History:** Natural / Cultural	**Community Class:** Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Clay Loam
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** Sample 1 M - cm / G - cm, Sample 2 M - cm / G - cm
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m; **Depth to Bedrock:** @ m At surface / <1m / >1m

	Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	6	10%	Buckthorn
2	Subcanopy	2	15%	Grey dogwood
3	Understorey	|		
4	Groundlayer	71	50%	Poa Pratensis

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	O	–	–	–
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Invasives, Dumping, Walking/Biking paths

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet

Polygon #

Plant List	Layer / Abundance			
Trees	1	2	3	4
Green Ash	O		O	O
Black Locust	O	O		
Sugar Maple				R
American Elm	R	R		
Silver maple	R			

Shrubs	1	2	3	4
Virginia Rose			O	
Virginia Creeper			O	
Red dogwood		R	O	
Morrow's Honeysuckle		O		
Hawthorn Sp		O		
Buckthorn Sp	O	O	O	O
Grey dogwood		O	C	C
Amur maple	O	R	R	
Choke cherry		O		
Ninebark			R	
Amelanchier Sp.			R	
Downy Arrowwood			R	

Plant List	Layer / Abundance			
Groundlayer	1	2	3	4
Poa Pratensis			C	
American Vetch			C	
Orchard Grass			O	
Common Plantain				C
Hawkweed sp.			O	
Dandelion				C
Yarrow				C
Smooth Brome	C			
Solidago sp		C		
Black Mustard			O	
Geum c.f. aleppicum			C	
St. John's Wort		O	C	
Canada Thistle			C	
Rhubarb	O			
Bull Thistle		R		
Carex c.f. tenera				O
Oxeye Daisey		O		
Woodland Strawberry				O
Teasel			C	
Common Blackberry				O
Common cinqfoil				O
Penny cress				O
Tall buttercup			O	
Red Clover				O
Carex sp.				O
Timothy			O	
Lesser Stitchwort				O
Common speedwell				C
Curled Dock				R

ELC Community Summary Sheet	Polygon #	4

Project #: ______ **Project Name:** Sheridan **Surveyor(s):** PD **Date:** June 7

Polygon Description

Community Series:	Ecosite: FOD	Vegetation Type: Moist deciduous forest
System: Terrestrial / Wetland / Aquatic	**Topographic Feature:** Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	**Dominant Plant Form:** Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed
Cover: Open / Shrub / Treed	**History:** Natural / Cultural	**Community Class:** Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis	
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor	
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet	
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Clay Loam	
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** **Sample 1** M - 30 cm / G - cm, **Sample 2** M - cm / G - cm	
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m	**Depth to Bedrock:** @ m At surface / <1m / >1m

	Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	25	50	R oak
2	Subcanopy	15	50	R. oak
3	Understorey	6	40	Hawthorn
4	Groundlayer	<1	30	Buckthorn

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O	D	R
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Invasive species
Trails
Dumping

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet

Polygon #

Plant List	Layer / Abundance			
Trees	1	2	3	4
Red Oak	D	C		
Shagbark Hickory		O	O	
Basswood	O			
American Elm			O	
Sugar Maple			O	
Ironwood		O		
Red Pine		R		

Plant List	Layer / Abundance			
Shrubs	1	2	3	4
Hawthorn	O	C	O	
Buckthorn	O	O	C	C
Fly Honeysuckle			O	
Choke Cherry		O		O
Blackberry			O	
Grey Dogwood		O	O	C
Virginia Rose				O

Plant List	Layer / Abundance			
Groundlayer	1	2	3	4
Aster sp		C		
Black Mustard		O		
Wood Strawberry				O
Enchanters Nightshade				C
#Shagbark Hickory (sapling)			O	O
Herb Robert			O	
Mayapple			O	
Garlic Mustard				C
White trillium				O
Geum c.f. macrophyllum			O	
Rhubarb			R	
~~Joe~~ Pye Weed JIN?			O	
Jewelweed				O

ELC Community Summary Sheet

Polygon # 5

Project #: ______ **Project Name:** Sheridan **Surveyor(s):** PD **Date:** June 7

Polygon Description

Community Series:	Ecosite:	Vegetation Type:
	CUT-1	Shrub thicket

System:	Topographic Feature:	Dominant Plant Form:
~~Terrestrial~~ / Wetland / Aquatic	Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed

Cover:	History:	Community Class:
Open / ~~Shrub~~ / Treed	Natural / ~~Cultural~~	Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Silty Clay
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** Sample 1 M - 20cm / G - cm, Sample 2 M - cm / G - cm
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m; **Depth to Bedrock:** @ m At surface / <1m / >1m

Vegetation Layer		Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	20	5%	W. oak
2	Subcanopy	8	50%	Buckthorn
3	Understorey	5	20%	Grey dogwood / Green ash / buckthorn
4	Groundlayer	<0.5	50%	Poa pratensis / Garlic Mustard / Poison I...

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O		
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Invasives trail dumping

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet	**Polygon #**	5

Plant List	Layer / Abundance			
Trees	1	2	3	4
Red Oak	O	O	O	
White Oak	O		O	
Shagbark Hickory				O
Green Ash	O	O	C	
Sugar maple	R			

Shrubs	1	2	3	4
Buckthorn	C	C		
Grey dogwood		C	C	
American vetch				C
Blackberry			O	
Hawthorn		O		
Russian Olive		O		
Honeysuckle (? sp)		O	O	
Virginia Rose			O	O
Virginia creeper				C
Wild Grape				O

Plant List	Layer / Abundance			
Groundlayer	1	2	3	4
Aster sp.			C	
Smooth Brome			O	
Woodland Strawberry			C	
Yarrow				O
St John's wort			O	
Teasel				C
Crowfoot (common)				O
Wild Carrot				C
Geum c.f. aleppicum			O	
Black Mustard			O	
Poa pratensis				C
Enchanter's nightshade				O
Common Buckwheat				O
Penny cress				O
Ox-eye daisy			C	
Poison Ivy		I		C
Dandelion				C
Common Milkweed				R
Rhubarb				R
Tall tumble Mustard	R			
Garlic Mustard			C	C
Canada thistle		C	C	

ELC Community Summary Sheet

ELC Community Summary Sheet	Polygon #	6

Project #: ______ Project Name: Slendon Surveyor(s): PD Date: June 7

Polygon Description

Community Series:	Ecosite: FOD	Vegetation Type: Moist deciduous forest
System: Terrestrial / Wetland / Aquatic	**Topographic Feature:** Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	**Dominant Plant Form:** Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed
Cover: Open / Shrub / Treed	**History:** Natural / Cultural	**Community Class:** Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Clay loam
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** Sample 1 M - 26 cm / G - cm, Sample 2 M - cm / G - cm
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m; **Depth to Bedrock:** @ m At surface / <1m / >1m

	Vegetation Layer	Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	28	20%	R. Oak
2	Subcanopy	20	50%	Ironwood
3	Understorey	10-8	60%	Buckthorn
4	Groundlayer	<0.5	20%	Buckthorn

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O	R	R
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Dumping, Exotics, Cutting

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet

Polygon #

Plant List — Trees	Layer / Abundance 1	2	3	4
Green Ash		C		O
Red Oak	C	C		
Trembling Aspen	O			O
Ironwood	C	C	O	O
Red maple	R			
Beech		O		

Shrubs	1	2	3	4
Buckthorn	C	C	C	C
Hawthorn	O	C	O	
Grey dogwood			O	C
Choke cherry		O		O
Virginia Rose			O	
Wild grape				O
Virginia creeper				O

Plant List — Groundlayer	Layer / Abundance 1	2	3	4
Aster sp				C
Teasel				O
[illegible]			O	
Green Ash	O		O	
Garlic mustard			O	
Enchanter's Night Shade				O
Poison Ivy				O
Herb Robert				O
Dandelion				C

Hedgerow

ELC Community Summary Sheet	Polygon #	8#

Project #:_______ **Project Name:** Sheridan Park **Surveyor(s):** PD **Date:** June 7, 2017

Polygon Description

Community Series:	**Ecosite:** CUT-1	**Vegetation Type:** Shrub thicket hedgerow
System: Terrestrial / Wetland / Aquatic	**Topographic Feature:** Lacustrine / Riverine / Bottomland / Terrace / Valley Slope / Tableland / Rolling Upland / Cliff / Talus / Crevice / Cave / Alvar / Rockland / Beach / Bar / Sand Dune / Bluff	**Dominant Plant Form:** Plankton / Submerged / Floating-leaved / Graminoid / Forb / Lichen / Bryophyte / Deciduous / Coniferous / Mixed
Cover: Open / Shrub / Treed	**History:** Natural / Cultural	**Community Class:** Beach-Bar / Sand Dune / Bluff / Cliff / Talus / Alvar / Rock Barren / Crevice-Cave / Sand Barren / Tallgrass Prairie – Savannah & Woodland / Forest / Cultural / Swamp / Bog / Marsh / Open Water / Shallow Water

Stand Description			Soil Analysis	
Community Age: Pioneer / Young / Mid-Aged / Mature / Old Growth		**Basal Area (m2/ha):**	**Soil Drainage:** V. Rapid / Rapid / Well / Moderately Well / Imperfect / Poor / V. Poor	
Standing Snags: Rare / Occasional / Abundant / Dominant			**Soil Moisture Regime:** Dry / Fresh / Moist / Wet	
Deadfall Logs: Rare / Occasional / Abundant / Dominant			**Effective Soil Texture:** Silty Clay (assumed)	
Health L / M / H	**Sensitivity** L / M / H	**Botanical Quality** L / M / H	**Depth to Mottles / Gley** Sample 1 M - cm / G - cm, Sample 2 M - cm / G - cm	
Slope: None / Gentle / Moderate / Steep Simple / Complex			**Depth to G. Water:** @ m At surface / <1m / >1m	**Depth to Bedrock:** @ m At surface / <1m / >1m

Vegetation Layer		Height	Cover	Dominant Sp. Per Vegetation Layer
1	Canopy	8	30%	Buckthorn
2	Subcanopy	4	50%	Buckthorn
3	Understorey	2	30%	Grey Dogwood
4	Groundlayer	<1	40%	Garlic mustard / [illegible]

Height Codes – **(1)** >20m, **(2)** 10-20m, **(3)** 2-10m, **(4)** 1-2m, **(5)** 0.5-1m, **(6)** 0.2-0.5m, **(7)** <0.2m
Cover Codes – **(0)** None, **(1)** 1-10%, **(2)** 10-25%, **(3)** 25-60%, **(4)** >60%

Size Class Analysis (Rare / Occasional / Abundant / Dominant)	A	O	R	-
	< 10cm DBH	10 – 24cm DBH	25 – 50cm DBH	> 50cm DBH

Evidence of Disturbance:
Tree cutting, exotic species, trails, dumping, noise, predation

Dumping Trail
Invasive /escaped hort [illegible]

Wildlife / Habitat Observations:
Birds, mammals, calls, observed, dens, nests

Comments:

Garden work dumping evident.
Likely source of abundant escaped hort sp.

				Community Name	Code		% of Community
Inclusion		Complex					
Inclusion		Complex					
Inclusion		Complex					

ELC Community Summary Sheet	**Polygon #**	

Plant List	**Layer / Abundance**			
Trees	**1**	**2**	**3**	**4**
W. Ash	R	R		
G Ash	R			O
R oak	R			
Wild apple	R			
A Plum				R

Shrubs	**1**	**2**	**3**	**4**
Buckthorn Sp.	C	C	C	C
Hawthorn Sp.		O	O	
[illegible]	O			
[illegible] dogwood	C			
V. rose			C	
Choke cherry	C			
Honeysuckle ([illegible])		R		
Red Currant			C	
Russian Olive	R			
V. Creeper				C
Amelanchier Sp.				
English Hawthorn		R		

Plant List	**Layer / Abundance**			
Groundlayer	**1**	**2**	**3**	**4**
Poa Pratensis				A
Dandelion				C
Aster Sp.				C
Smooth brome				C
Tartarian Honeysuckle		O		
Vicia cracca				C
hawkweed sp				O
Common Cinquefoil				O
Poison Ivy			C	O C
Teasel				O
Orchard grass			O	
wild carrot			C	
Red Clover				O
St. Johns Wort			O	
Garlic Mustard				C
Black Mustard			O	
Dame's Rocket		O		
Black Medick				O
Lesser Stitchwort				O
Shepherd's Purse			O	
Solidago Sp.		C		
Ox eye daisy			C	
Cirsium Sp.				O
Canada thistle		O	O	
Rhubarb			O	
Curley dock			R	
Wild Strawberry				O
Woodland Strawberry				O
Fly Honeysuckle			O	
Butter and Eggs			O	
Prickly Lettuce			O	
Common milkweed				R
Horse radish			R	
Common Comfrey			O	
Buckwheat				O
Bull thistle			O	
Horticultural Rose				R

BURNSIDE

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Appendix E

Bat Maternity Habitat Tree List

Bat Maternity Colony Summary Tables – April 11, June 7, 2017

Surveys Conducted by: Peter De Carvalho

Leaf-off (Northern Myotis/Little Brown Myotis) BMH Trees

Tree Species	DBH (cm)	Cavity Type	Cavity Height (m)	UTM E (NAD83)	UTM N (NAD83)
American Elm	36	36	4	607982	4819747
White Ash	74.5	74.5	10+	607968	4819744
Red Maple	45	45	8+	607961	4819741
Sugar Maple	44	44	15	607971	4819714
Sugar Maple	46	46	12	607969	4819711
Red Maple	52.5	52.5	14	607945	4819719
Red Oak	55	55	8	607933	4819712
Deciduous (Dead)	53	53	4 to 10	607952	4819703
Beech	26	26	6, 10+	607911	4819679
Beech	17.5	17.5	6, 8	607911	4819675
White Ash	36.5	36.5	6	607889	4819658
Sugar Maple	70	70	1	607857	4819655
Deciduous (Dead)	56.5	56.5	6, 10	607888	4819627
White Ash	62	62	8, 15	607884	4819625
White Ash	41	41	6,10	607849	4819621
Beech	33	33	3, 5	607954	4819731
Red Pine	53	53	2, 3.5, 6	607945	4819721
Sugar Maple	43	43	6 to 15	607902	4819679
White Ash	21	21	4	607579	4819271

Leaf-on (Tri-colored Bat) BMH Trees

Tree Species	DBH (cm)	UTM E (NAD83)	UTM N (NAD83)
Sugar Maple	12	607932	4819740
Bur Oak	81	607888	4819673
Bur Oak	68	607861	4819652
Norway Maple	12	607653	4819383
Red Oak	68	607543	4819222
Red Oak	48	607488	4819144
White Oak	71	607476	4819106
Red Oak	74	607466	4819097

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Appendix F

Significant Wildlife Habitat Screening Table for Ecoregion 7E

BURNSIDE

300039474 Sheridan Park Drive Extension Environmental Assessment
Appendix F: Significant Wildlife Habitat Screening within the On-site Study Area and Study Area Vicinity – Ecoregion 7E Criteria (2015)

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Seasonal Concentration Areas of Animals						
Waterfowl Stopover and Staging Areas (Terrestrial) **Rationale**: Habitat important to migrating waterfowl.	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. - Fields with seasonal flooding and waste grains in the Long Point, Rondeau, Lk. St. Clair, Grand Bend, and Pt. Pelee areas may be important to Tundra Swan	Fields with sheet water during Spring (mid-March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects: • Any mixed species aggregations of 100 or more individuals required. • The flooded field ecosite habitat plus a 100-300 m radius area, dependant on local site conditions and adjacent land use is the significant wildlife habitat. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHMiST Index #7 provides development effects and mitigation measures.	Moderate potential CUM1 and CUT1 ecosites observed in Study Area. Imperfectly drained mineral substrate likely results in spring flooding.	Moderate potential CUM1 and CUT1 ecosites extend southwest from the Study Area.
Waterfowl Stopover and Staging Areas (Aquatic) **Rationale:** Important for local and migrant waterfowl populations during the spring or fall migration or both	Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal	MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an	Studies carried out and verified presence of: • Aggregations of 100 or more of listed species for 7 days, results in >700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH. • The combined area of the ELC ecosites and a 100 m radius area is	No potential No marshes or swamps are present. Stormwater features onsite do not qualify. The narrow strip of riparian vegetation doesn not provide suitable conditions.	No to low potential Surrounding areas are mostly residential subdivisions or commercial complexes.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
periods combined. Sites identified are usually only one of a few in the eco-district.	Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	SWD5 SWD6 SWD7	abundant food supply (mostly aquatic invertebrates and vegetation in shallow water)	the SWH. • Wetland area and shorelines associated with sites identified within the SWHTG Appendix K are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHMiST Index #7 provides development effects and mitigation measures.		
Shorebird Migratory Stopover Area __Rationale__: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	• Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. • Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. • Sewage treatment ponds and storm water ponds do not qualify as a SWH.	Studies confirming: • Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period). • Whimbrel stop briefly (<24 hrs) during spring migration, any site with >100 Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100 m radius area. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWH MiST Index #8 provides development effects and mitigation	No potential No marshes or swamps are present. Stormwater features onsite do not qualify. The narrow strip of riparian vegetation doesn not provide suitable conditions.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	**Habitat Criteria**	**Defining Criteria**		
	Dunlin			measures.		
Raptor Wintering Area **Rationale:** Sites used by multiple species, a high number of individuals and used annually are most significant	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **Special Concern:** Short-eared Owl Bald Eagle	Hawks/Owls: Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. Bald Eagle: Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	• The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. • Raptor wintering sites (hawk/owl) need to be > 20 ha with a combination of forest and upland Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands. • Field area of the habitat is to be wind swept with limited snow depth or accumulation. • Eagle sites have open water, large trees and snags available for roosting	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; One or more Bald Eagles or; At least 10 individuals and two of the listed hawk/owl species. • To be significant a site must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds. • The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects." • SWHMiST Index #10 and #11 provides development effects and mitigation measures.	Moderate to high potential A complex of forest and upland ecosites was identified within the Study Area and Vicinity that meets the minimum size criteria for this SWH.	Moderate to high potential A complex of forest and upland ecosites was identified within the Study Area and Vicinity that meets the minimum size criteria for this SWH.
Bat Hibernacula **Rationale:** Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	• Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. • Active mine sites should not be considered as SWH • The locations of bat hibernacula are relatively poorly known.	• All sites with confirmed hibernating bats are SWH. • The habitat area includes a 200 m radius around the entrance of the hibernaculum for most development types and 1000 m for wind farms. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Bats and Bat Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #1 provides development effects and mitigation measures.	No potential	No potential

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Bat Maternity Colonies **Rationale:** Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	• Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). • Maternity roosts are not found in caves and mines in Ontario. • Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25 cm dbh) wildlife trees. • Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 or class 1 or 2. • Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred.	• Maternity Colonies with confirmed use by; – >10 Big Brown Bats – >5 Adult Female Silver- haired Bats • The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies. • Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #12 provides development effects and mitigation measures.	Moderate to high potential Forest ecosites were identified along the natural corridor south and west of proposed developments. Mature deciduous trees were identified as having qualities that indicate suitable bat maternity habitat.	Moderate to high potential Forest ecosites extend south and west from the Study Area radius. It is assumed from air-photo interpretation that these forests are similar in age and composition to those identified through ELC.
Turtle Wintering Areas **Rationale:** Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle **Special Concern:** Northern Map Turtle Snapping Turtle	Snapping and Midland Painted Turtles; ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle; Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	• For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. • Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH.	• Presence of 5 over-wintering Midland Painted Turtles is significant. • One or more Northern Map • Turtle or Snapping Turtle over-wintering within a wetland is significant. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
				turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May). • Congregation of turtles is more common where wintering areas are limited and therefore significant • SWHMiST Index #28 provides development effects and mitigation measures for turtle wintering habitat.		
Reptile Hibernaculum **Rationale**: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	**Snakes**: Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **Special Concern**: Milksnake Eastern Ribbonsnake	For all snakes, habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations or congregations of snakes on sunny warm days in the spring or fall is a good indicator.	• For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. • Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line. • Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock groundcover.	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (e.g., foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct) • <u>Note</u>: If there are Special Concern Species present, then site is SWH. • <u>Note</u>: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e., strong hibernation site fidelity). Other critical life processes (e.g., mating) often take place in close proximity to hibernacula. The feature in which the hibernacula is located plus a 30 m radius area is the SWH. • SWHMiST Index #13 provides development effects and mitigation measures for snake hibernacula.	Moderate to high potential No soil samples reached the water table, which indicates that animal burrows in the area would not be inundated. Disused or abandoned burrows below the frost line would make suitable hibernacula. One Eastern Garter Snake was observed during field studies.	Moderate to high potential
Colonially - Nesting	Cliff Swallow	Eroding banks,	• Any site or areas with	Studies confirming:	No potential	Low potential

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Bird Breeding Habitat (Bank and Cliff) **Rationale:** Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario.	Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	sandy hills, borrow pits, steep slopes, and sand piles. Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation.	• Presence of 1 or more nesting sites with 8 or more cliff swallow pairs and/or rough- winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50 m radius habitat area from the peripheral nests. • Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST Index #4 provides development effects and mitigation measures.	Natural features providing exposed bank habitat are not present in the Study Area.	There is no indication from aerial imagery that naturally-occurring exposed banks exist in natural areas within the Study Area Vicinity.
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs) **Rationale:** Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Great Blue Heron Black-crowned Night - Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree.	Studies confirming: • Presence of 5 or more active nests of Great Blue Heron or other listed species. • The habitat extends from the edge of the colony and a minimum 300 m radius or extent of the Forest Ecosite containing the colony or any island <15.0 ha with a colony is the SWH. • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells. • SWHMiST Index #5 provides development effects and mitigation measures.	No potential These ecosites are not present.	Low potential Based on aerial photo interpretation and ELC site reconnaissance, it does not appear that these ecosites are present in the Study Area Vicinity.
Colonially - Nesting Bird Breeding Habitat (Ground) **Rationale:** Colonies	Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map).	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern.	No potential Study Area is not on a rocky island or peninsula within a lake or large river.	No potential Study Area Vicinity is not on a rocky island or peninsula within a lake or large river.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
are important to local bird population, typically sites are only known colony in area and are used annually.	Caspian Tern Brewer's Blackbird	Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM, CUT CUS	• Brewers Blackbird colonies are found loosely on the ground in low bushes in close proximity to streams and irrigation ditches within farmlands.	• Presence of 5 or more pairs for Brewer's Blackbird. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant. • The edge of the colony and a minimum 150 m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0 ha with a colony is the SWH. • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #6 provides development effects and mitigation measures.		
Migratory Butterfly Stopover Areas **<u>Rationale:</u>** Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each land class: <u>Field</u>: CUM CUT CUS <u>Forest</u>: FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat. • Staging areas usually provide protection from the elements	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct). MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day, significant variation can occur between years and multiple years of sampling should occur. • Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. • MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.	Moderate potential The site has an appropriate mix of cultural field, cultural thicket, and forest ecosites, and adult Monarch were observed feeding on Milkweed flowers. The habitat areas, however, did feature prominent indications of human disturbance and degradation.	Moderate to high potential It is possible that the natural ecosites to the south and west of the Study Area have been less disturbed by human use than areas closer to the pedestrian walking trails.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
			and are often spits of land or areas with the shortest distance to cross the Great Lakes.	• SWHMiST Index #16 provides development effects and mitigation measures.		
Landbird Migratory Stopover Areas **Rationale:** Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >5 ha in size and within 5 km of Lake Ontario. • If multiple woodlands are located along the shoreline, woodland fragments 2-5 ha can be considered for this habitat. • Sites have a variety of habitats; forest, grassland and wetland complexes. • The largest sites are more significant • Woodlots and forest fragments are important habitats to migrating birds, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH.	Studies confirm: • Use of the habitat by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Mar to May) and fall (Aug to Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #9 provides development effects and mitigation measures.	Moderate potential One FOD forest ecosite was located in the Study Area that meets the minimum size criteria for this SWH.	Moderate potential The forest ecosite identified as potential for this SWH extends into the Study Area Vicinity.
Deer Winter Congregation Areas **Rationale:** Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions.	White-tailed Deer	All Forested Ecosites with these ELC Community Series: FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots > 100 ha in size or if large woodlots are rare in a planning area, woodlots > 50 ha. • Deer movement during winter in the southern areas of Ecoregion 7E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. • Large woodlots > 100 ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha.	Studies confirm: • Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF. • Use of the woodlot by white- tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF. • Studies should be completed during winter (Jan/Feb) when >20 cm of snow is on the ground using aerial survey techniques, ground or road surveys. or a pellet count deer	No potential No deer wintering areas identified by the MNRF.	No potential No deer wintering areas identified by the MNRF.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
				density survey. • SWHMiST Index #2 provides development effects and mitigation measures.		
Rare Vegetation Communities						
Cliffs and Talus Slopes **Rationale:** Cliffs and Talus Slopes are extremely rare habitats in Ontario.		Any ELC Ecosite within Community Series: TAO, CLO, TAS, CLS, TAT, CLT	A Cliff is vertical to near vertical bedrock >3 m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	• Most cliff and talus slopes occur along the Niagara Escarpment • Confirm any ELC Vegetation Type for Cliffs or Talus Slopes. • SWHMiST Index #21 provides development effects and mitigation measures.	No potential Ecosite not present.	No potential Ecosite not present.
Sand Barren **Rationale:** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry		ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	A sand barren area >0.5 ha in size. Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered, but less than 60%	• Confirm any ELC Vegetation Type for Sand Barrens • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #20 provides development effects and mitigation measures.	No potential Ecosite not present.	No potential Ecosite not present.
Alvar **Rationale:** Alvars are extremely rare habitats in Ecoregion 7E.		ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2	An Alvar site > 0.5 ha in size. Alvar is particularly rare in Ecoregion 7E where the An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex,	• Field studies that identify four of the five Alvar Indicator Species at a Candidate Alvar site is Significant. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses.	No potential Ecosite not present.	No potential Ecosite not present.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
		Five Alvar Indicator Species: *Carex crawei* *Panicum philadelphicum* *Eleocharis compressa* *Scutellaria parvula* *Trichostema brachiatum* These indicator species are very specific to Alvars within Ecoregion 6E.	with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.	• SWHMiST Index #17 provides development effects and mitigation measures.		
Old Growth Forest **Rationale:** Due to historic logging Practices and land clearance for agriculture, old growth forest is rare in Ecoregion 7E		Forest Community Series: FOD FOC FOM SWD SWC SWM	Woodland area is >0.5 ha. Old Growth forests are characterized by heavy mortality or turnover of over- storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Field Studies will determine: • If dominant trees species of the are >140 years old, then the area containing these trees is Significant Wildlife Habitat. • The forested area containing the old growth characteristics will have experienced no recognizable forestry activities (cut stumps will not be present). • The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. • Determine ELC vegetation types for the forest forest area containing the old growth characteristics. • SWHMiST Index #23 provides development effects and mitigation measures.	Moderate potential Old growth forest is rare in Ecoregion 7E. Because the area threshold for this SWH is so small (>0.5 ha), any mature forest stand in this Ecoregion has the potential to be considered SWH.	Moderate potential Old growth forest is rare in Ecoregion 7E. Because the area threshold for this SWH is so small (>0.5 ha), any mature forest stand in this Ecoregion has the potential to be considered SWH.
Savannah **Rationale:** Savannahs are extremely		TPS1 TPS2 TPW1 TPW2 CUS2	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	Field studies confirm one or more of the Savannah indicator species listed in Appendix N should be present. Note: Savannah plant spp. list from Ecoregion 7E should be used.	No potential Ecosite not present.	No potential Ecosite not present.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
rare habitats in Ontario.			A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie Shoreline, in Brantfor and in the Toronto area (North of Lake Ontario.	• Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #18 provides development effects and mitigation measures.		
Tallgrass Prairie **Rationale:** Tallgrass Prairies are extremely rare habitats in Ontario.		TPO1 TPO2	No minimum size to site. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. In Ecoregion 7E, known tallgrass prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie Shoreline, in Brantfor and in the Toronto area (North of Lake Ontario.	Field studies confirm one or more of the Prairie indicator species listed in Appendix N should be present. Note: Prairie plant spp. list from Ecoregion 7E should be used. • Area of the ELC Ecosite is the SWH. • Site must not be dominated by exotic or introduced species (<50% vegetative cover are exotic sp.). • SWHMiST Index #19 provides development effects and mitigation measures.	No potential Ecosite not present.	No potential Ecosite not present.
Other Rare Vegetation Communities **Rationale:** Plant communities		Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite Code	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in Appendix M The OMNRF/NHIC will have up to	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG.	No potential	No potential MNRF did not identify any additional rare vegetation communities.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
that often contain rare species which depend on the habitat for survival.		that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	date listing for rare vegetation communities. Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	• Area of the ELC Vegetation Type polygon is the SWH. • SWHMiST Index #37 provides development effects and mitigation measures.		
Specialized Habitat for Wildlife						
Waterfowl Nesting Area **Rationale:** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (> 0.5 ha) and any small wetlands (0.5 ha) within 120 m or a cluster of 3 or more small (< 0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur. • Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40 cm dbh) in woodlands for cavity nest sites.	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards, or; • Presence of 10 or more nesting pairs for listed species including Mallards. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHMiST Index #25 provides development effects and mitigation measures.	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.
Bald Eagle and Osprey Nesting,	Osprey	ELC Forest Community Series:	Nest are associated with lakes, ponds, river or wetlands along	Studies confirm the use of these nests by:	No potential	Low potential

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Foraging and Perching Habitat **Rationale:** Nest sites are fairly uncommon in Eco-region 7E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	**Special Concern** Bald Eagle	FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	forested shorelines, islands, or on structures over water. • Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. • Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	• One or more active Osprey or Bald Eagle nests in an area. • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH, maintaining undisturbed shorelines with large trees within this area is important. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. cvi, ccvii Area of the habitat from 400-800 m is dependent on site lines from the nest to the development and inclusion of perching and foraging habitat. • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for >3 years or suspected of not being used for >5 years before being considered not significant. • Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWHMiST Index #26 provides development effects and mitigation measures.	The small watercourses identified in the Study Area were found to contain no fish, and displayed limited to no capacity for supporting fish populations.	There is some potential for this SWH downstream of the Study Area. The adjoining reaches of Sheridan Creek, however, were determined to not contain fish at the time of the Subwatershed Study completion.
Woodland Raptor Nesting Habitat	Northern Goshawk Cooper's Hawk	May be found in all forested ELC Ecosites.	All natural or conifer plantation woodland/forest stands >30ha	Studies confirm: • Presence of 1 or more active nests	No potential	No potential

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Rationale: Nests sites for these species are rarely identified; these area sensitive habitats and are often used annually by these species.	Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May also be found in SWC, SWM, SWD and CUP3	with >4 ha of interior habitat. Interior habitat determined with a 200 m buffer • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	from species list is considered significant cxlviii. • Red-shouldered Hawk and Northern Goshawk – A 400 m radius around the nest or 28 ha area of habitat is the SWH. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) • Barred Owl – A 200m radius around the nest is the SWH • Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is the SWH. • Sharp-Shinned Hawk – A 50 m radius around the nest is the SWH. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHMiST Index #27 provides development effects and mitigation measures.	No forests exist within the Study Area that meet the size criteria for this SWH.	No forests exist within the Study Area Vicinity that meet the size criteria for this SWH.
Turtle Nesting Areas **Rationale:** These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle Special Concern Species: Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100 m) or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle- nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles. • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. • Travel routes from wetland to	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
			provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWH MiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.		
Seeps and Springs **Rationale:** Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat. • SWHMiST Index #30 provides development effects and mitigation measures	No potential Though headwater drainage features (seeps) were identified within the Study Area, these were in open CUM1 and CUT 1 areas.	Low potential No headwater features were identified in forested ecosites, but it is possible that forested areas not assessed in the Study Area Vicinity do contain headwater drainage features that may indicate seeps.
Amphibian Breeding Habitat (Woodland). **Rationale:** These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest	• Presence of a wetland, pond or woodland pool (including vernal pools) >500 m^2 (about 25 m diameter) ccvii within or adjacent (within 120 m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) lxxi or 2 or more of the listed frog species with Call Level Codes of 3. • A combination of observational study and call count surveys cviii will be required during the spring	High potential FOD ecosites observed in Study Area. Imperfectly drained mineral substrate likely results in spring flooding/vernal pooling.	High potential FOD ecosites extend southwest from the Study Area.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
populations		distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	water in most years until mid-July are more likely to be used as breeding habitat.	(March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230 m radius of woodland area. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMiST Index #14 provides development effects and mitigation measures.		
Amphibian Breeding Habitat (Wetlands) **Rationale:** Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands.	• Wetlands >500 m^2 (about 25 m diameter), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation.	Studies confirm: • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3 or; Wetland with confirmed breeding Bullfrogs are significant. • The ELC ecosite wetland area and the shoreline are the SWH. • A combination of observational study and call count surveys cviii will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
				Schedule. • SWHMiST Index #15 provides development effects and mitigation measures.		
Woodland Area-Sensitive Bird Breeding Habitat **<u>Rationale</u>:** Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren Pileated Woodpecker **Special Concern:** Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. • Interior forest habitat is at least 200 m from forest edge habitat.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. • Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH. • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #34 provides development effects and mitigation measures.	No potential No forests exist within the Study Area that meet the size criteria for this SWH.	No potential No forests exist within the Study Area Vicinity that meet the size criteria for this SWH.
Habitat for Species of Conservation Concern (not including Endangered or Threatened Species)						
Marsh Breeding Bird Habitat **<u>Rationale:</u>** Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
				and Bird Habitats: Guidelines for Wind Power Projects". • SWHMiST Index #35 provides development effects and mitigation measures.		

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Open Country Bird Breeding Habitat **Rationale:** This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	CUM1 CUM2	• Large grassland areas (includes natural and cultural fields and meadows) >30 ha. • Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years). • Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. • The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species. • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects" • SWHMiST cxlix Index #32 provides development effects and mitigation measures.	No potential No open country ecosites exist within the Study Area that meet the size criteria for this SWH.	No potential No open country ecosites exist within the Study Area Vicinity that meet the size criteria for this SWH.
Shrub/Early Successional Bird Breeding Habitat **Rationale:**	**Indicator Spp:** Brown Thrasher Clay-coloured Sparrow	CUT1 CUT2 CUS1 CUS2 CUW1	• Large field areas succeeding to shrub and thicket habitats >10ha in size. • Shrub land or early	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.	Low to moderate potential CUT areas and high-shrub (20% to less than 25% cover) CUM areas complex within the	Low to moderate potential CUT areas and high-shrub (20% to less than 25% cover) CUM areas complex within the

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records cxcix.	**Common Spp.** Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years). • Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species. • Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.	• A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”. • SWHMiST cxlix Index #33 provides development effects and mitigation measures.	Study Area and Vicinity to meet the size criteria for this SWH. Breeding evidence for Brown Thrasher was observed during surveys.	Study Area and Vicinity to meet the size criteria for this SWH.
Terrestrial Crayfish **<u>Rationale:</u>** Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. ccii	Chimney or Digger Crayfish (*Fallicambarus fodiens*) Devil Crayfish or Meadow Crayfish (*Cambarus Diogenes*) -	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh or swamp ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed.	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or moist terrestrial sites. • Area of ELC ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. • Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult. • SWHMiST Index #36 provides development effects and mitigation measures.	No potential Wetland ecosites were not identified within the Study Area.	Low potential Surrounding areas are mostly residential subdivisions or commercial complexes. It is possible that wetland conditions suitable for this SWH exist to the south and west of the Study Area, though air photo interpretation did not indicate any wetland areas in that direction.
Special Concern and	All Special Concern and Provincially Rare (S1-S3, SH)	All plant and animal element occurrences	When an element occurrence is identified within a 1 or 10 km	Studies Confirm: • Assessment/inventory of the site for	Confirmed	High potential

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Rare Wildlife Species **Rationale:** These species are quite rare or have experienced significant population declines in Ontario.	plant and animal species. Lists of these species are tracked by the Natural Heritage Information Centre (NHIC).	(EO) within a 1 or 10 km grid. Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites.	the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. • The area of the habitat to the finest ELC scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g., specific nesting habitat or foraging habitat. • SWHMiST cxlix Index #37 provides development effects and mitigation measures.	Monarch (SC) was observed during field investigations utilizing Common Milkweed within the open country areas. Eastern Wood-pewee (SC) was also identified with breeding evidence during breeding bird surveys.	Suitable habitat for Monarch and Eastern Wood-pewee as identified in the Study Area extend south and west into the Study Area Vicinity and beyond.
Animal Movement Corridors						
Amphibian Movement Corridors **Rationale:** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat – Wetland) of this Schedule.	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant • Corridors should have at least 15m of vegetation on both sides of waterwaycxlix or be up to 200m widecxlix of woodland habitat and with gaps <20m. • Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat	Low potential The intermittent nature of identified watercourses, as well as the lack of interconnectivity between the Study Area and surrounding natural environments indicates limited potential as an Animal Movement Corridor.	Low potential The intermittent nature of identified watercourses, as well as the lack of interconnectivity between the Study Area Vicinity and surrounding natural environments indicates limited potential as an Animal Movement Corridor.

Habitat	Wildlife Species	Candidate SWH		Confirmed SWH	Potential Presence in the On-site Study Area	Potential Presence in the Study Area Vicinity (500 m radius from On-site Study Area)
		ELC Ecosite Codes	**Habitat Criteria**	**Defining Criteria**		
				• SWHMiST Index #40 provides development effects and mitigation measures		

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Appendix D

Tree Inventory and Preservation Report

Appendix D

Sheridan Park Drive Extension Municipal Class Environmental Assessment

Tree Inventory and Preservation Report

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON L5N 8R9 CANADA

January 19, 2018
3000379474.0000

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Record of Revisions

Revision	Date	Description
0	December 12, 2017	Draft Submission to the City of Mississauga
1	January 19, 2018	Final Submission to the City of Mississauga

R.J. Burnside & Associates Limited

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Appendices

Disclaimer

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act.*

As part of the EA Study, Burnside has completed an arborist report to map and assess trees within or immediately adjacent the proposed road alignment that may be impacted by construction of the road extension. The Tree Preservation Plan illustrates the trees in the context of the proposed design with recommendations on preservation. Mitigation guidelines to optimize tree retention through the implementation of measures such as tree protection fence are provided in the report, and illustrated on Plan C: Tree Preservation Plan.

2.0 Study Area

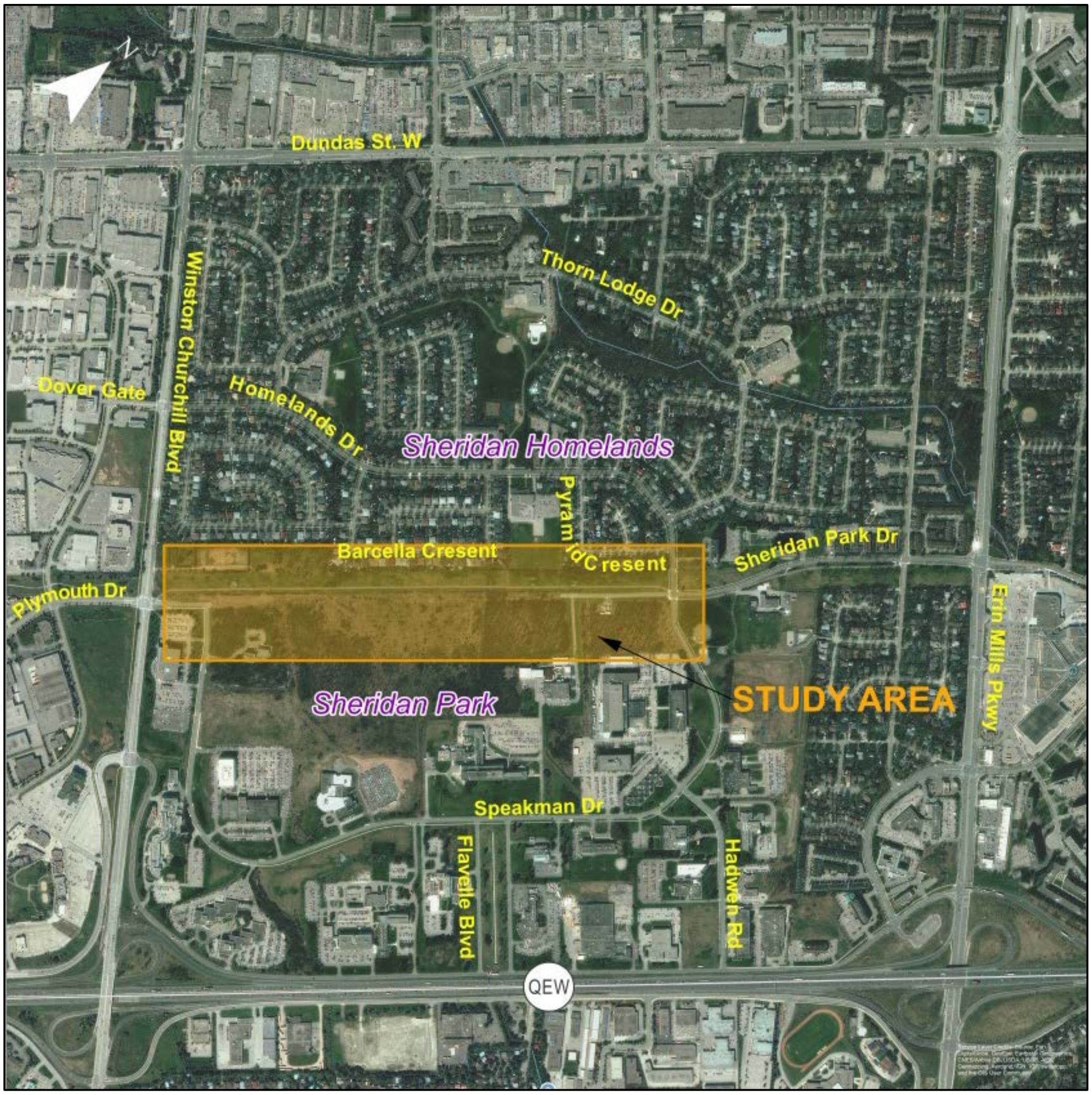
The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on the figure below. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved MUT through the utility corridor from Winston Churchill Boulevard to Homelands Drive/Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Study Area



3.0 Methodology

A site meeting was completed with Sarah Piett, Natural Heritage Coordinator (City of Mississauga) on April 26, 2017. A site walk was carried out and the approach to the tree assessment was approved at that time.

Trees included in the assessment are:

- Trees 10 cm Diameter at Breast Height (DBH) and greater within the existing unopened road allowance; and
- Trees 10 cm DBH and greater with canopies that extend into the anticipated impact area.

The methodology used to assess the trees is provided in Appendix A. The following data were collected for each tree included in the study:

- Species;
- DBH (cm);
- Crown reserve (m);
- Condition (Good, Fair, Poor, or Dead); and
- Additional comments (to supplement condition or location notes, as needed).

Trees within the proposed road extension area were tagged during the assessment. Trees located offsite and within existing roadside areas (i.e. in manicured turf boulevard areas) were not tagged.

Trees are illustrated on Plan C (provided at the end of this Report) with their crown reserves and the proposed development design (including the proposed grading limits). Generally, trees with 25% or greater of their crown reserve conflicting with the proposed construction zone were recommended for removal.

Preservation recommendations (i.e., preserve or remove) are provided in separate columns in the data based on the existing condition and proposed development impacts.

A final recommendation, either preserve or remove is provided in the data based on the condition and development preservation recommendations. A tree is recommended for preservation if it has been assigned a fair or good condition rating and can incorporated into the proposed design. A tree is recommended for removal if it has been assigned a poor condition rating and/or will be significantly impacted by, or is conflict with the proposed design.

Assessment data is provided in Appendix B and locations and crown reserves of the assessed trees, with the preliminary road design plan prepared by Burnside are provided on Plan C: Tree Preservation Plan.

Limitations of this tree assessment are provided in Appendix C.

4.0 Findings

The proposed location of the road extension is dominated by early successional immature trees; mainly Green Ash (*Fraxinus pennsylvanica*). Mature woodlots are found at the east and west limits of the unopened road right-of-way and are dominated by Bur Oak (*Quercus macrocarpa*), Bitternut Hickory (*Carya cordiformis*) and Sugar Maple (*Acer saccharum*). Shrub thicket and meadow vegetation is found between the woodlots.

An additional woodlot is found at the southwest corner of Homelands Drive / Speakman Drive and Sheridan Park Drive. Manicured turf grass with open grown trees characterizes the remainder the existing boulevards.

Additional details of the natural heritage features are included in the Natural Environment Report (provided under separate cover).

4.1 Description of Proposed Construction

Preliminary road design plans have been created to accommodate a single lane for each direction of travel with two horizontal deflection medians for speed management. Two roundabouts are also included in the preliminary design: 1) At the west limit of the Study Area where Sheridan Park Drive currently terminates and connects to Speakman Drive, and 2) At the east limit of the Study Area where Sheridan Park Drive connects with Homelands Drive / Speakman Drive.

4.2 Impacts to Trees

A total of 191 trees were included in the assessment. The final preservation recommendations of the trees are as follows:

- 77 trees recommended for preservation; and
- 114 trees recommended for removal.

The majority of the trees are Green Ash (92 of the 191 trees), and 71 of these species require removal. There is concern about the long term survivability of Green Ash throughout most of Ontario due to Emerald Ash Borer (EAB). EAB damage, most obviously manifesting as severe crown dieback, was encountered on a small number of the trees. It is anticipated that more trees will have EAB impacts or early signs of feeding if trees were extensively reviewed. The second most common tree was Black Locust (*Robinia pseudoacacia*), at 34 of the total trees, is an introduced species that may aggressively colonize disturbed and early successional areas.

5.0 Guidelines to the Protection of Trees and Adjacent Natural Features during Construction

Delineation of the work zone is necessary to prevent impacts to root zones of trees adjacent to the proposed construction. Storage of equipment, materials and vehicles, dumping of waste materials, and grade filling or lowering beyond the identified limits may result in short or long term impacts to trees. The following measures are recommended to reduce impacts to these adjacent trees:

1. Clearly delineate the extent of vegetation removal for the vegetation clearing and grubbing contractor. All vegetation must be cut in a way that it stays within the work zone.

2. Install all tree protection and erosion and sediment control (ESC) measures prior to site disturbance.

3. Install tree protection hoarding based on City standard (provided in Appendix D) in locations shown on Plan C: Tree Preservation Plan. The work zone adjacent to the woodlots at the east and west limits of the unopened right-of-way are recommended to receive this enhanced treatment.

4. Inspection of tree protection measures by the site supervisor or environmental inspector to be coordinated with review of ESC measures throughout the construction period. All damaged, sagging or deficient measures must be fixed immediately.

5. An arborist should review all trees adjacent to the work zone and prior to opening the road for use by the general public. Branches and trunks damaged during the construction period that may cause damage or injury must be mitigated.

6.0 Compensation and Mitigation Guidelines

Compensation and mitigation plantings are identified in the Streetscape Plan (provided under separate cover) and will be implemented as follows:

- New trees will be planted along the roadside as streetscaping with trees installed 12 metres on centre in conformity with the Transportation Association of Canada;
- Shrubs planted where the new road interfaces with the two woodlots; and
- Shrubs installed within the meadow area in the central portion of the Study Area.

Based on the existing species and vegetation community attributes of the area, a replacement value of 2:1 trees were determined to be appropriate as part of the proposed project. The total number of replacement trees will be confirmed during the detailed design phase of the Project. Replacement trees will be planted to the extent possible within the City-owned right-of-way of the road extension corridor. The City will explore opportunities to plant the remainder of the replacement trees as a suitable off-site location as necessary. A possible method of determining the number of replacement trees required is to use the Trunk Formula Method of the International Society of Arboriculture (ISA). The ISA formula takes into consideration a variety of factors to determine the value of a tree, including size, age, species, health, and location. It is not possible to recreate the forest edge immediately, but the goal is to both replace and improve the habitat features by providing site specific restoration recommendations to ensure no net loss of forest within the Study Area.

7.0 Summary

Tree preservation and removal has been identified in this Tree Inventory and Preservation Report. Measures to ensure protection of the trees prior to and during the construction period are detailed to minimize impacts to preserved trees.

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Appendix A

Tree Study Methodology

Tree Studies: Methodology

The list provided below represents all data that may be collected in the analysis of trees. Methodology descriptions should be reviewed with the column headings provided in the data. The columns represent the scope and extent of the tree assessment carried out.

Tree #: This number may be assigned by the tree assessor or predetermined by the surveyor or client. The number corresponds with the tree tag affixed to the tree, if tree tagging is part of the study's scope.

Species Name: Botanical name of the species.

Common Name: Commonly used English name.

DBH (cm): Diameter at Breast Height measured using DBH tape or tree caliper.

Crown Reserve (m): Average measurement of the diameter or width of the dripline (extent of branches from the trunk). Generally the trunk is trunk is the midpoint of this measurement. It is represented on the drawing(s) as a circle. This measurement may not be used in the subject jurisdiction.

TPZ (m): Tree protection zone required based on the required setback from the trunk, as designated by the agency (e.g. municipality). The TPZ is calculated by doubling the setback and including the trunk diameter to create a diameter of circle of protection around the tree.

HT (m): Estimated height from the base to the top of the tree.

Condition (G, F, P, D): A qualitative score of the combination of biological health and structural condition assigned as Good, Fair, Poor or Dead.

Preserve or Remove Reason: Reasons for recommended preservation or removal assigned in the tree study. Reasons for recommended removal may result from:

- Existing condition (critical deficiency such as severe crown dieback)
- Anticipated impacts of the proposed development (i.e., tree location is in conflict with construction element)
- Both existing condition and anticipated impacts

A checkmark is provided in the appropriate column.

Description of Reason: Rationale for the assignment of preservation or removal rationale based on analysis of collected data and proposed development.

Transplant Potential (G,F,P): Assignment of qualitative measure of reestablishment success of a tree when removed from its existing location and moved to another or removed and stored for replanting following construction. An assignment of Good, Fair or Poor is assigned based on a species' ability to reestablish, condition of the tree, new growing conditions, etc.

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Appendix B

Tree Assessment Data sheet

Tree Number	Scientific Name	Common Name	DBH	Crown Reserve	Condition	Preservation Recommendation (Condition)	Preservation Recommendation (Development)	Preservation Recommendation (Final)	Comments
1	*Carya ovata*	Shagbark Hickory	40	12	Good	Preserve	Preserve	Preserve	
2	*Sorbus aucuparia*	European Mountain-ash	16	5	Good	Preserve	Preserve	Preserve	Moderate lean to the north
3	*Fraxinus pennsylvanica*	Green Ash	18,16	8	Fair	Preserve	Preserve	Preserve	
4	*Fraxinus pennsylvanica*	Green Ash	11	2	Good	Preserve	Remove	Remove	
5	*Acer saccharum*	Sugar Maple	12	4	Good	Preserve	Remove	Remove	Severe one-sided crown to the east
6	*Fraxinus pennsylvanica*	Green Ash	35	8	Good	Preserve	Remove	Remove	
7	*Pinus strobus*	White Pine	51	6	Fair	Preserve	Preserve	Preserve	Decayed cavity in trunk
8	*Fraxinus pennsylvanica*	Green Ash	17	4	Fair	Preserve	Preserve	Preserve	
9	*Fraxinus pennsylvanica*	Green Ash	16	6	Good	Preserve	Preserve	Preserve	
10	*Fraxinus pennsylvanica*	Green Ash	15	3	Good	Preserve	Remove	Remove	
11	*Malus sp.*	Apple	16,12,11	6	Fair	Preserve	Remove	Remove	
12	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Remove	Remove	
13	*Fraxinus pennsylvanica*	Green Ash	28	7	Good	Preserve	Remove	Remove	
14	*Malus sp.*	Apple	6-12	6	Fair	Preserve	Preserve	Preserve	Multiple stems
15	*Fraxinus pennsylvanica*	Green Ash	11	2	Fair	Preserve	Remove	Remove	
16	*Malus sp.*	Apple	9,10,12,14	6	Fair	Preserve	Remove	Remove	
17	*Malus sp.*	Apple	12	2	Fair	Preserve	Remove	Remove	
18	*Fraxinus pennsylvanica*	Green Ash	8,10,11	3	Fair	Preserve	Preserve	Preserve	
19	*Fraxinus pennsylvanica*	Green Ash	14	4	Fair	Preserve	Preserve	Preserve	
20	*Fraxinus pennsylvanica*	Green Ash	14,14	6	Good	Preserve	Preserve	Preserve	
21	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Preserve	Preserve	
22	*Fraxinus pennsylvanica*	Green Ash	13,12	3	Good	Preserve	Remove	Remove	
23	*Fraxinus pennsylvanica*	Green Ash	15	6	Fair	Preserve	Remove	Remove	
24	*Fraxinus pennsylvanica*	Green Ash	12	2	Fair	Preserve	Remove	Remove	
25	*Fraxinus pennsylvanica*	Green Ash	11	2	Fair	Preserve	Remove	Remove	
26	*Fraxinus pennsylvanica*	Green Ash	12	2	Fair	Preserve	Remove	Remove	
27	*Fraxinus pennsylvanica*	Green Ash	8,11	3	Fair	Preserve	Remove	Remove	
28	*Quercus macrocarpa*	Bur Oak	81	14	Good	Preserve	Preserve	Preserve	
29	*Fraxinus pennsylvanica*	Green Ash	12	3	Fair	Preserve	Preserve	Preserve	Trunk forks into 2 at 0.5m
30	*Malus sp.*	Apple	12	7	Fair	Preserve	Remove	Remove	
31	*Fraxinus pennsylvanica*	Green Ash	24	8	Fair	Preserve	Preserve	Preserve	
32	*Malus sp.*	Apple	11	3	Good	Preserve	Remove	Remove	
33	*Malus sp.*	Apple	12	4	Good	Preserve	Preserve	Preserve	
34	*Fraxinus pennsylvanica*	Green Ash	50	10	Fair	Preserve	Remove	Remove	
35	*Quercus macrocarpa*	Bur Oak	68	10	Fair	Preserve	Remove	Remove	Major hollow in trunk
36	*Malus sp.*	Apple	8,14	8	Fair	Preserve	Preserve	Preserve	
37	*Carya ovata*	Shagbark Hickory	38	8	Good	Preserve	Remove	Remove	
38	*Fraxinus pennsylvanica*	Green Ash	12,14	4	Good	Preserve	Remove	Remove	
39	*Fraxinus pennsylvanica*	Green Ash	12,14	3	Good	Preserve	Remove	Remove	
40	*Fraxinus pennsylvanica*	Green Ash	14,14,16	5	Fair	Preserve	Preserve	Preserve	
41	*Fraxinus pennsylvanica*	Green Ash	11	2	Fair	Preserve	Remove	Remove	Multiple basal sprouts

Tree Number	Scientific Name	Common Name	DBH	Crown Reserve	Condition	Preservation Recommendation (Condition)	Preservation Recommendation (Development)	Preservation Recommendation (Final)	Comments
42	*Fraxinus pennsylvanica*	Green Ash	12	4	Fair	Preserve	Preserve	Preserve	
43	*Fraxinus pennsylvanica*	Green Ash	31	8	Good	Preserve	Remove	Remove	
44	*Fraxinus pennsylvanica*	Green Ash	16	4	Fair	Preserve	Remove	Remove	
45	*Fraxinus pennsylvanica*	Green Ash	11	3	Fair	Preserve	Remove	Remove	Edge of pool
46	*Fraxinus pennsylvanica*	Green Ash	15	4	Good	Preserve	Remove	Remove	Edge of pool
47	*Fraxinus pennsylvanica*	Green Ash	14,15	7	Fair	Preserve	Remove	Remove	
48	*Fraxinus pennsylvanica*	Green Ash	12,16	4	Good	Preserve	Remove	Remove	Edge of pool
49	*Fraxinus pennsylvanica*	Green Ash	12	4	Good	Preserve	Remove	Remove	Edge of pool
50	*Fraxinus pennsylvanica*	Green Ash	14,14	4	Fair	Preserve	Remove	Remove	Edge of pool
51	*Fraxinus pennsylvanica*	Green Ash	12	3	Fair	Preserve	Remove	Remove	Within pool
52	*Fraxinus pennsylvanica*	Green Ash	10	2	Fair	Preserve	Remove	Remove	Within pool
53	*Fraxinus pennsylvanica*	Green Ash	8,8,10	3	Fair	Preserve	Remove	Remove	Within pool
54	*Fraxinus pennsylvanica*	Green Ash	15	3	Fair	Preserve	Remove	Remove	Within pool
55	*Fraxinus pennsylvanica*	Green Ash	11	3	Good	Preserve	Remove	Remove	
56	*Fraxinus pennsylvanica*	Green Ash	12	4	Good	Preserve	Preserve	Preserve	Edge of pool
57	*Fraxinus pennsylvanica*	Green Ash	42	12	Fair	Preserve	Remove	Remove	
58	*Fraxinus pennsylvanica*	Green Ash	13,13	4	Fair	Preserve	Remove	Remove	
59	*Fraxinus pennsylvanica*	Green Ash	38	8	Fair	Preserve	Remove	Remove	Edge of pool
60	*Fraxinus pennsylvanica*	Green Ash	26	5	Fair	Preserve	Remove	Remove	
61	*Malus sp.*	Apple	6,8,10	4	Fair	Preserve	Preserve	Preserve	
62	*Carya ovata*	Shagbark Hickory	29	5	Good	Preserve	Preserve	Preserve	
63	*Fraxinus pennsylvanica*	Green Ash	12	3	Fair	Preserve	Remove	Remove	
64	*Carya ovata*	Shagbark Hickory	18	5	Good	Preserve	Preserve	Preserve	
65	*Fraxinus pennsylvanica*	Green Ash	5,11	2	Good	Preserve	Remove	Remove	
66	*Fraxinus pennsylvanica*	Green Ash	12,13	4	Fair	Preserve	Remove	Remove	
67	*Fraxinus pennsylvanica*	Green Ash	13	3	Good	Preserve	Preserve	Preserve	
68	*Fraxinus pennsylvanica*	Green Ash	11	2	Fair	Preserve	Remove	Remove	
69	*Fraxinus pennsylvanica*	Green Ash	11	2	Fair	Preserve	Remove	Remove	
70	*Fraxinus pennsylvanica*	Green Ash	8,11	2	Good	Preserve	Remove	Remove	
71	*Fraxinus pennsylvanica*	Green Ash	8,11	3	Fair	Preserve	Remove	Remove	
72	*Fraxinus pennsylvanica*	Green Ash	10,12	4	Good	Preserve	Remove	Remove	
73	*Fraxinus pennsylvanica*	Green Ash	13	3	Good	Preserve	Remove	Remove	
74	*Fraxinus pennsylvanica*	Green Ash	5-10	4	Fair	Preserve	Remove	Remove	
75	*Fraxinus pennsylvanica*	Green Ash	15	4	Fair	Preserve	Remove	Remove	
76	*Fraxinus pennsylvanica*	Green Ash	16	6	Good	Preserve	Remove	Remove	
77	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Remove	Remove	
78	*Pyrus communis*	Common Pear	8,14	5	Fair	Preserve	Remove	Remove	
79	*Fraxinus pennsylvanica*	Green Ash	8,10,12,13	4	Fair	Preserve	Remove	Remove	
80	*Fraxinus pennsylvanica*	Green Ash	11	3	Fair	Preserve	Remove	Remove	
81	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Remove	Remove	
82	*Fraxinus pennsylvanica*	Green Ash	6,11	3	Fair	Preserve	Preserve	Preserve	

Tree Number	Scientific Name	Common Name	DBH	Crown Reserve	Condition	Preservation Recommendation (Condition)	Preservation Recommendation (Development)	Preservation Recommendation (Final)	Comments
83	*Fraxinus pennsylvanica*	Green Ash	1	1	Fair	Preserve	Preserve	Preserve	
84	*Fraxinus pennsylvanica*	Green Ash	15	5	Good	Preserve	Remove	Remove	
85	*Fraxinus pennsylvanica*	Green Ash	13	3	Good	Preserve	Remove	Remove	
86	*Fraxinus pennsylvanica*	Green Ash	12,14,15	4	Fair	Preserve	Remove	Remove	
87	*Robinia pseudoacacia*	Black Locust	12	3	Fair	Preserve	Preserve	Preserve	
88	*Robinia pseudoacacia*	Black Locust	12	3	Good	Preserve	Remove	Remove	
89	*Robinia pseudoacacia*	Black Locust	14	4	Good	Preserve	Remove	Remove	
90	*Robinia pseudoacacia*	Black Locust	11	3	Good	Preserve	Remove	Remove	
91	*Robinia pseudoacacia*	Black Locust	14	4	Good	Preserve	Remove	Remove	
92	*Robinia pseudoacacia*	Black Locust	12	3	Fair	Preserve	Preserve	Preserve	
93	*Robinia pseudoacacia*	Black Locust	10	2	Fair	Preserve	Preserve	Preserve	
94	*Robinia pseudoacacia*	Black Locust	14	3	Fair	Preserve	Preserve	Preserve	
95	*Robinia pseudoacacia*	Black Locust	11	2	Fair	Preserve	Preserve	Preserve	
96	*Robinia pseudoacacia*	Black Locust	12	3	Fair	Preserve	Preserve	Preserve	
97	*Robinia pseudoacacia*	Black Locust	11	3	Fair	Preserve	Remove	Remove	
98	*Robinia pseudoacacia*	Black Locust	11	2	Fair	Preserve	Preserve	Preserve	
99	*Robinia pseudoacacia*	Black Locust	34	6	Fair	Preserve	Remove	Remove	
100	*Robinia pseudoacacia*	Black Locust	11	3	Fair	Preserve	Remove	Remove	
101	*Robinia pseudoacacia*	Black Locust	15	3	Fair	Preserve	Preserve	Preserve	
102	*Robinia pseudoacacia*	Black Locust	11	2	Fair	Preserve	Remove	Remove	
103	*Robinia pseudoacacia*	Black Locust	12	3	Fair	Preserve	Preserve	Preserve	
104	*Robinia pseudoacacia*	Black Locust	16	3	Fair	Preserve	Remove	Remove	
105	*Robinia pseudoacacia*	Black Locust	11	2	Fair	Preserve	Preserve	Preserve	
106	*Robinia pseudoacacia*	Black Locust	13	2	Good	Preserve	Preserve	Preserve	
107	*Robinia pseudoacacia*	Black Locust	10	2	Good	Preserve	Preserve	Preserve	
108	*Robinia pseudoacacia*	Black Locust	14	3	Good	Preserve	Preserve	Preserve	
109	*Robinia pseudoacacia*	Black Locust	10	3	Good	Preserve	Preserve	Preserve	
110	*Robinia pseudoacacia*	Black Locust	13	4	Good	Preserve	Preserve	Preserve	
111	*Robinia pseudoacacia*	Black Locust	12	5	Good	Preserve	Preserve	Preserve	
112	*Robinia pseudoacacia*	Black Locust	11	2	Good	Preserve	Preserve	Preserve	
113	*Robinia pseudoacacia*	Black Locust	10	2	Good	Preserve	Preserve	Preserve	
114	*Robinia pseudoacacia*	Black Locust	12,15	4	Good	Preserve	Remove	Remove	
115	*Robinia pseudoacacia*	Black Locust	16	4	Good	Preserve	Remove	Remove	
116	*Robinia pseudoacacia*	Black Locust	12	3	Good	Preserve	Remove	Remove	
117	*Robinia pseudoacacia*	Black Locust	10	3	Good	Preserve	Remove	Remove	
118	*Robinia pseudoacacia*	Black Locust	12	2	Good	Preserve	Remove	Remove	
119	*Robinia pseudoacacia*	Black Locust	14	3	Good	Preserve	Remove	Remove	
120	*Robinia pseudoacacia*	Black Locust	14	3	Fair	Preserve	Remove	Remove	Severe trunk wound
121	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Remove	Remove	
122	*Malus sp.*	Apple	12,14,16	7	Good	Preserve	Remove	Remove	
123	*Acer platanoides*	Norway Maple	12	4	Good	Preserve	Remove	Remove	

Tree Number	Scientific Name	Common Name	DBH	Crown Reserve	Condition	Preservation Recommendation (Condition)	Preservation Recommendation (Development)	Preservation Recommendation (Final)	Comments
124	*Fraxinus pennsylvanica*	Green Ash	11	3	Fair	Preserve	Remove	Remove	
125	*Fraxinus pennsylvanica*	Green Ash	12	2	Poor	Remove	Remove	Remove	
126	*Fraxinus pennsylvanica*	Green Ash	8,11,12	3	Poor	Remove	Remove	Remove	
127	*Fraxinus pennsylvanica*	Green Ash	11,12	3	Fair	Preserve	Remove	Remove	
128	*Fraxinus pennsylvanica*	Green Ash	10	3	Fair	Preserve	Remove	Remove	
129	*Fraxinus pennsylvanica*	Green Ash	12	3	Fair	Preserve	Remove	Remove	
130	*Fraxinus pennsylvanica*	Green Ash	14	3	Good	Preserve	Remove	Remove	
131	*Fraxinus pennsylvanica*	Green Ash	13	3	Fair	Preserve	Remove	Remove	
132	*Fraxinus pennsylvanica*	Green Ash	12	3	Fair	Preserve	Remove	Remove	
133	*Fraxinus pennsylvanica*	Green Ash	8,12,13,14	5	Fair	Preserve	Remove	Remove	
134	*Fraxinus pennsylvanica*	Green Ash	12,14	3	Fair	Preserve	Remove	Remove	
135	*Fraxinus pennsylvanica*	Green Ash	8,8,10,12	4	Fair	Preserve	Preserve	Preserve	
136	*Fraxinus pennsylvanica*	Green Ash	8,12	3	Good	Preserve	Preserve	Preserve	
137	*Elaeagnus angustifolia*	Russian-olive	22	10	Fair	Preserve	Remove	Remove	
138	*Fraxinus pennsylvanica*	Green Ash	14,16	10	Fair	Preserve	Remove	Remove	
139	*Fraxinus pennsylvanica*	Green Ash	11	3	Good	Preserve	Remove	Remove	
140	*Fraxinus pennsylvanica*	Green Ash	12,13	4	Good	Preserve	Preserve	Preserve	
141	*Fraxinus pennsylvanica*	Green Ash	14	3	Good	Preserve	Preserve	Preserve	
142	*Fraxinus pennsylvanica*	Green Ash	12	3	Good	Preserve	Remove	Remove	
143	*Fraxinus pennsylvanica*	Green Ash	14	3	Good	Preserve	Remove	Remove	
144	*Quercus rubra*	Red Oak	68	18	Good	Preserve	Preserve	Preserve	
145	*Ulmus pumila*	Siberian Elm	16	6	Good	Preserve	Remove	Remove	
146	*Fraxinus pennsylvanica*	Green Ash	16	5	Fair	Preserve	Preserve	Preserve	
147	*Fraxinus pennsylvanica*	Green Ash	12	2	Fair	Preserve	Remove	Remove	
148	*Quercus rubra*	Red Oak	48	14	Good	Preserve	Preserve	Preserve	
149	*Pyrus communis*	Common Pear	14	4	Fair	Preserve	Remove	Remove	
150	*Quercus alba*	White Oak	71	18	Good	Preserve	Preserve	Preserve	
151	*Quercus rubra*	Red Oak	74	18	Good	Preserve	Preserve	Preserve	
152	*Ulmus americana*	White Elm	28	16	Good	Preserve	Remove	Remove	
1000	*Malus sp.*	Apple	5,5,7,10,16	8	Poor	Remove	Preserve	Preserve	In hydro corridor
1001	*Fraxinus americana*	White Ash	25	6	Fair	Preserve	Preserve	Preserve	Moderate EAB impacts
1002	*Fraxinus americana*	White Ash	8,8,10,14,16	10	Poor	Remove	Preserve	Preserve	Dead
1004	*Gleditsia triacanthos var. inernis*	Honey-locust	22,23	11	Good	Preserve	Remove	Remove	Trunk forks into 2 at 0.5m
1005	*Acer campestre*	Field Maple	10,14,14,16,18,28	10	Fair	Preserve	Remove	Remove	
1006	*Acer saccharinum*	Silver Maple	24	7	Good	Preserve	Remove	Remove	Minor epicormic growth
1007	*Acer saccharinum*	Silver Maple	21	7	Good	Preserve	Preserve	Preserve	
1008	*Malus sp.*	Apple	19,26,28	12	Fair	Preserve	Remove	Remove	
1009	*Fraxinus pennsylvanica*	Green Ash	12,14	6	Poor	Remove	Remove	Remove	Severe crown dieback, severe EAB impacts
1010	*Malus coronaria*	Crabapple	14,14,16,16	12	Fair	Preserve	Remove	Remove	Minor past pruning
1011	*Morus alba*	White Mulberry	16,18	10	Good	Preserve	Remove	Remove	
1012	*Fraxinus pennsylvanica*	Green Ash	10,14	6	Fair	Preserve	Remove	Remove	Moderate EAB impacts

Tree Number	Scientific Name	Common Name	DBH	Crown Reserve	Condition	Preservation Recommendation (Condition)	Preservation Recommendation (Development)	Preservation Recommendation (Final)	Comments
1013	*Fraxinus pennsylvanica*	Green Ash	15	6	Poor	Remove	Preserve	Remove	Severe crown dieback, severe EAB impacts
1014	*Juniperus spp.*	Juniper sp	12	3	Good	Preserve	Preserve	Preserve	
1015	*Quercus rubra*	Red Oak	14	5	Good	Preserve	Remove	Remove	
1016	*Quercus rubra*	Red Oak	27	12	Good	Preserve	Remove	Remove	
1017	*Quercus rubra*	Red Oak	38	16	Good	Preserve	Remove	Remove	
1018	*Quercus rubra*	Red Oak	33	10	Good	Preserve	Remove	Remove	
1019	*Pinus strobus*	White Pine	3	1	Good	Preserve	Preserve	Preserve	Recently planted
1020	*Pinus strobus*	White Pine	3	1	Good	Preserve	Preserve	Preserve	Recently planted
1021	*Pinus nigra*	Austrian Pine	35	10	Good	Preserve	Preserve	Preserve	
1022	*Tilia cordata*	Littleleaf Linden	23,25,47	10	Fair	Preserve	Preserve	Preserve	
1023	*Acer saccharinum*	Silver Maple	6	2	Good	Preserve	Preserve	Preserve	
1024	*Acer rubrum*	Red Maple	5,6,6,9,10	5	Fair	Preserve	Preserve	Preserve	
1025	*Pinus nigra*	Austrian Pine	42	8	Good	Preserve	Remove	Remove	
1026	*Pinus nigra*	Austrian Pine	26	7	Fair	Preserve	Preserve	Preserve	
1027	*Tilia cordata*	Littleleaf Linden	15,21,24,29	11	Fair	Preserve	Preserve	Preserve	
1028	*Pinus nigra*	Austrian Pine	45	11	Fair	Preserve	Preserve	Preserve	Minor crown dieback
1029	*Acer saccharinum*	Silver Maple	5,8,10,14	5	Fair	Preserve	Preserve	Preserve	Severe callused wound, 2 basal wounds
1030	*Tilia cordata*	Littleleaf Linden	25,50	13	Fair	Preserve	Preserve	Preserve	Minor past pruning
1031	*Tilia cordata*	Littleleaf Linden	13,21,26,31	13	Good	Preserve	Preserve	Preserve	Minor past pruning
1032	*Pinus nigra*	Austrian Pine	38	7	Good	Preserve	Preserve	Preserve	Minor past pruning
1033	*Pinus nigra*	Austrian Pine	29	7	Good	Preserve	Preserve	Preserve	Minor past pruning
1034	*Pinus nigra*	Austrian Pine	33	9	Fair	Preserve	Preserve	Preserve	Severe past pruning
1035	*Prunus virginiana 'Schubert'*	Schubert Chokecherry	19	5	Fair	Preserve	Preserve	Preserve	Moderate past pruning
1036	*Populus balsamifera*	Balsam Poplar	27	5	Fair	Preserve	Preserve	Preserve	Moderate crown dieback, minor past pruning
1037	*Pinus nigra*	Austrian Pine	30	6	Good	Preserve	Preserve	Preserve	Minor past pruning
1038	*Pinus nigra*	Austrian Pine	33	5	Fair	Preserve	Preserve	Preserve	Minor crown dieback, minor past pruning
1039	*Sorbus aucuparia*	European Mountain-ash	8	1	Good	Preserve	Preserve	Preserve	

Totals

Preserve	185	78	77
Remove	6	113	114
Total	191	191	191

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Appendix C

Limitation of Tree Studies

Tree Studies: Limitations

This report, drawings and data (i.e., qualitative and quantitative measurements) are intended to inform the recipient and reviewer(s) of the report of the tree(s) condition at the time of the assessment. The assessment may be limited by the following constraints:

1. Access – tree is located offsite, or the onsite location is not reasonably accessed.
2. Weather – accumulated snow around the base or in branch attachments may obscure defects.
3. Season – biotic indications (e.g., foliage chlorosis or fungal fruiting bodies) are only obvious for a portion of the year.
4. Visual obstructions – Elements such as other trees' canopies can prevent the view of the entire tree.

The study is completed from the ground using a DBH tape or tree caliper. Non-invasive tools such as binoculars and a sounding hammer may be used to provide additional information about defects and characteristics. Excavation of the rootzone and other intensive analyses have not been completed unless stated.

It must be understood that trees may not manifest signs or symptoms (e.g., dieback) of some impacts (e.g., root compaction) immediately and so recent changes to the tree or its growing conditions prior to the assessment may not be apparent to the assessor. Also, changes to the tree condition resulting from damage, weather, infestations, defects, soil, decay, light, moisture, exposure, etc. may occur after the assessment.

No tree is without some level of risk, where a tree may fail and strike a target. Mitigation options, if provided, will not eliminate risk but are prescribed treatments to reduce risk based on the measured and assessed factors at the time of assessment, subject to site and assessment constraints.

Identification of the ownership of assessed trees (i.e., on-site or off-site) made in the report is based on the legal survey. The assessor of trees uses the point location of the tree provided on the survey and the limits of property to assign ownership in the report and associated materials.

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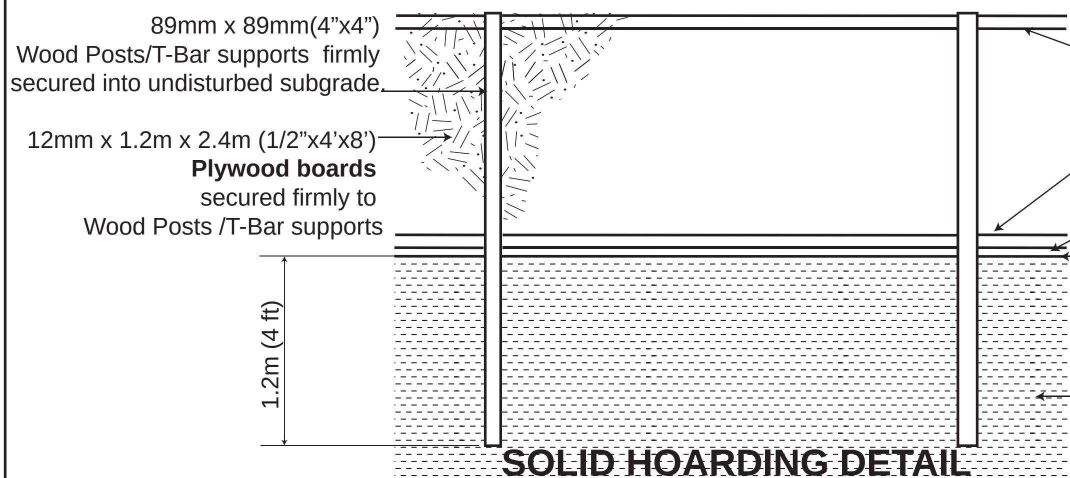
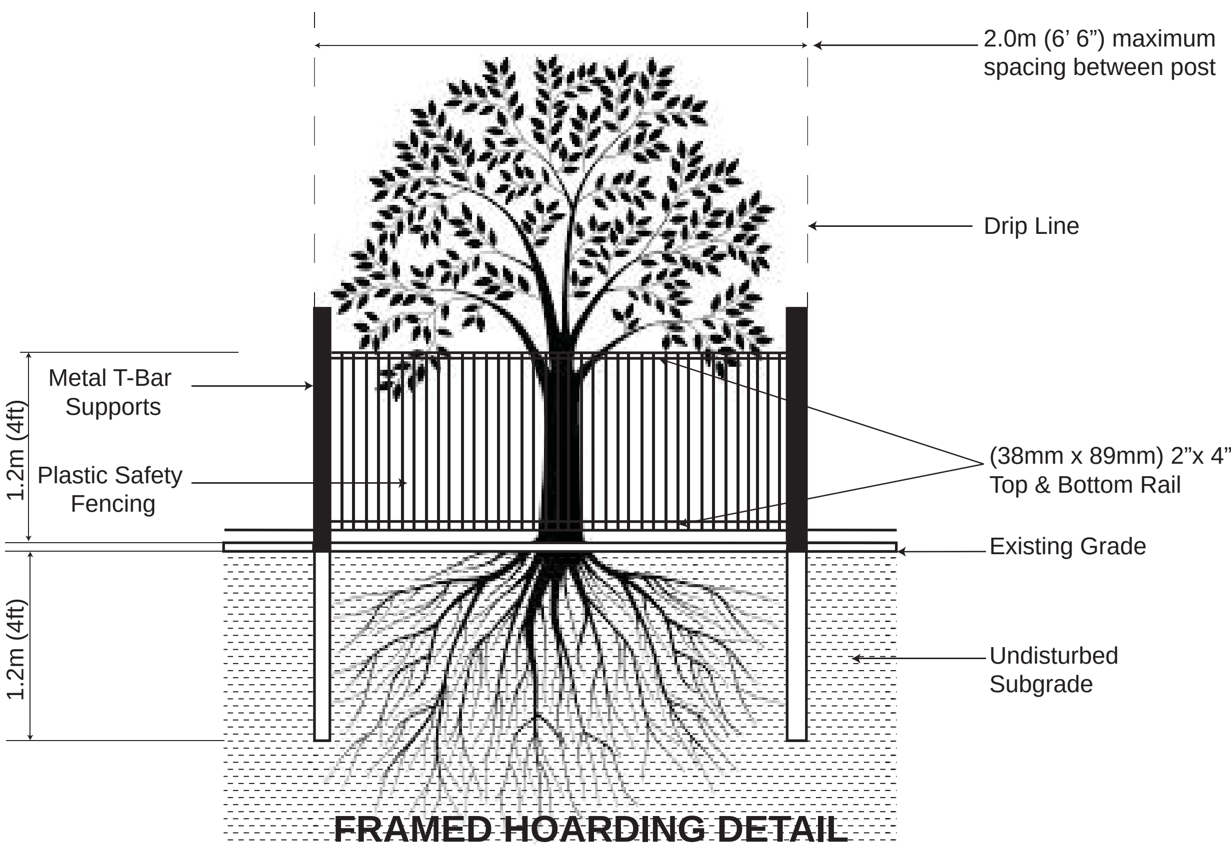
Appendix D

Hoarding Detail

Appendix D



SOLID HOARDING DETAIL



FRAMED HOARDING DETAIL

NOTES:

1. Hoarding details to be determined following initial site inspection.
2. Private tree hoarding to be approved by Development & Design ;
   City tree hoarding to be approved by Community Services Dept.
3. Hoarding must be supplied, installed and maintained by the applicant throughout all phases of construction.
   Inspection must be conducted by the Development and Design Division prior to removing any/all private hoarding.
4. Do not allow water to collect and pond behind or within hoarding.
5. **T-bar supports are acceptable alternative to 4x4 posts. U-shaped metal supports will not be accepted.**
6. **Plywood** must be utilized for ‘solid’ hoarding. OSB/Chipboard will not be accepted for solid hoarding. Plywood sheets must be installed on “construction” side of frame.
7. Applicant is responsible to ensure utility locates are completed within city boulevard prior to installing framed hoarding.

TREE PRESERVATION HOARDING

MISSISSAUGA

SCALE : N.T.S DATE : June 2017

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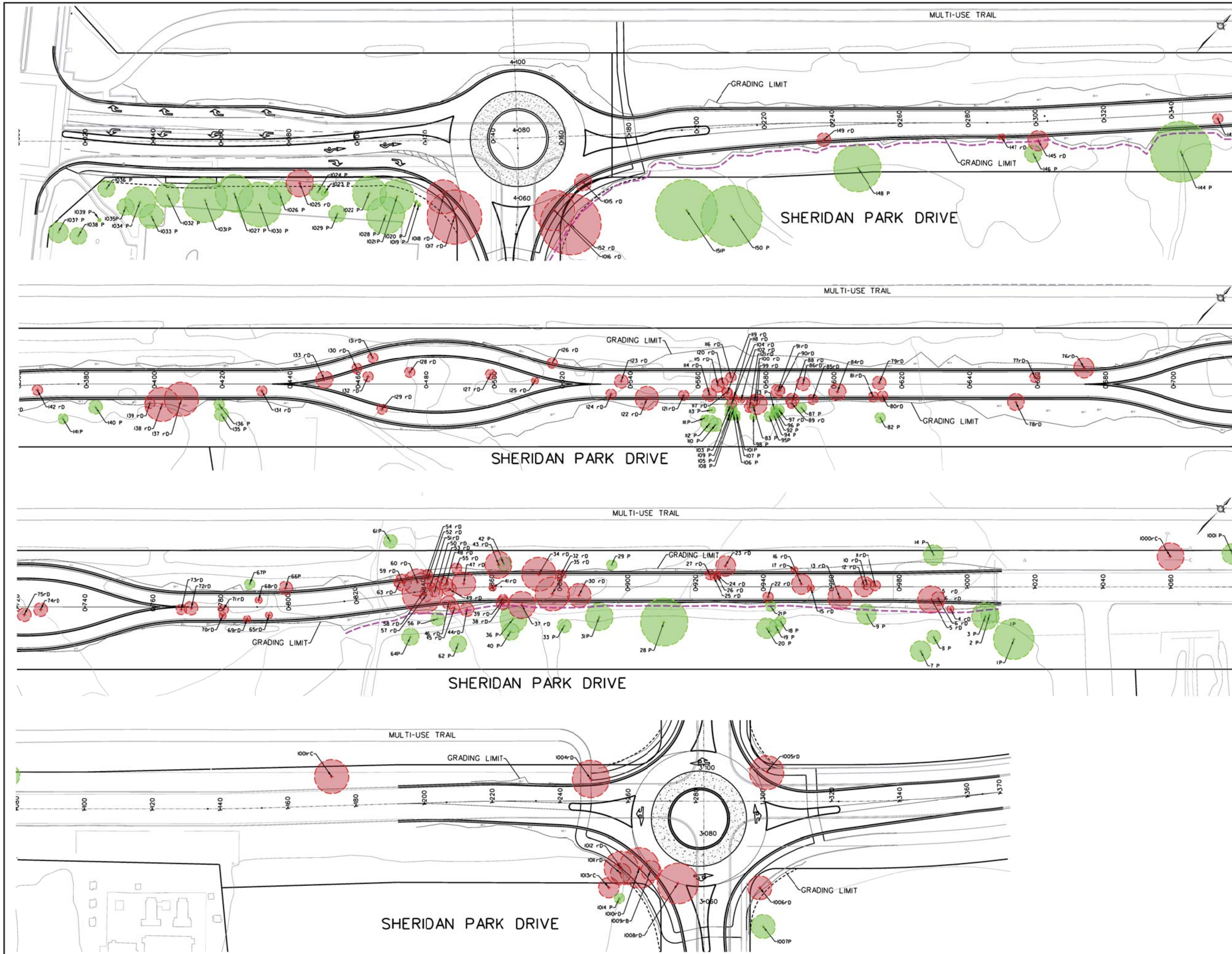
Plan C

Tree Preservation Plan



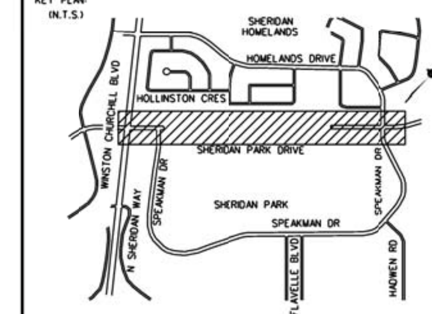
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN:
(N.T.S.)



LEGEND:

3 P — EXISTING TREE RECOMMENDED FOR PRESERVATION

1013 rC — EXISTING TREE RECOMMENDED FOR REMOVAL (DUE TO CONDITION)

76 rD — EXISTING TREE RECOMENDED FOR REMOVAL (DUE TO DEVELOPMENT)

1009 rB — EXISTING TREE RECOMMENDED FOR REMOVAL (DUE TO BOTH, CONDITION AND DEVELOPMENT)

RECOMMENDED LOCATION OF TREE PRESERVATION HOARDING (AS PER MISSISSAUGA DETAIL)

DESIGN BY	APPROVED BY
C.E.T.	
DEPARTMENTAL APPROVAL SILVIO CESARIO P.ENG.	

BURNSIDE
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web www.rjburnside.com
RJB Project No. 300039474

MISSISSAUGA

PRODUCED FOR - T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION

TREE PRESERVATION PLAN

STA 0+000 TO STA 1+370

SCALE 1:500	AREA	PROJECT No.
DRAWN BY L.R.	CHECKED BY D.A.	PLAN No. C
DATE DECEMBER 2017	SHEET 1 OF 1	

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Appendix E

Socio-Economic Assessment

Appendix E

R.J. Burnside & Associates Limited 6990 Creditview Road, Unit 2 Mississauga ON L5N 8R9 CANADA
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November 16, 2017

Via: Email

Dana Glofcheskie, P.Eng
Transportation Project Engineer
City of Mississauga
300 City Centre Drive
Mississauga ON L5B 3C1

Dear Mrs. Glofcheskie:

Re: Sheridan Park Drive Extension Environmental Assessment
Socio- Economic Assessment
Project No.: 300039474.000

1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighborhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.

As part of the EA Study, Burnside has completed a social and economic assessment of the Study Area to characterize the local economy and social environment. A review of municipal planning documents, relevant policy, land use plans and available data have been used to determine the character of the local Study Area and vicinity.

Potential impacts to the social and economic conditions of the Study Area have been assessed in relation to several criteria in Section 6.0, for each of the alternative solutions determined through the EA process.

2.0 Methodology

The relevant policy and data reviewed includes:

- Provincial Policy Statement (2014);
- Growth Plan for the Greater Golden Horseshoe (2017);
- Region of Peel Official Plan (2014);
- City of Mississauga Strategic Plan (2008);
- City of Mississauga Official Plan (2010);
- Sheridan Park Corporate Centre Land Use Plan (Urban Strategies Inc., 2014);
- Statistics Canada Census Data;
- Mississauga Employment Land Review Study (Hemson Consulting Ltd. 2008);
- City of Mississauga Economic Development Strategy (2010);
- City of Mississauga Natural Areas Survey (2016 Update); and
- An Action Plan for Innovation in Mississauga (2011).

The EA involves the assessment of several alternative solutions to the project, including:

Alternative 1: Do Nothing

Do nothing, do not make any changes / improvements to road network. Do not extend Sheridan Park Drive.

Alternative 2: Limit / Manage Growth

Limit growth in surrounding areas.

Alternative 3: Extend Roadway (Sheridan Park Drive)

Extend Sheridan Park Drive through unopened portion of the Sheridan Park Drive right of way.

Alternative 4: Provide Alternative Routes for Existing or Anticipated Traffic

Make improvements to adjacent roads to enable existing and future anticipated traffic to use alternative routes.

The alternatives listed above are measured against impacts to or opportunity to improve the following socio-economic criteria:

- Adjacent Land Uses;
- Recreation;
- Aesthetics and Visual Impacts;
- Considerations of Streetscape Design;
- Development Activity;
- Land Use Policies;
- Quality of Life;
- Property Development;
- Entrances;
- Construction;

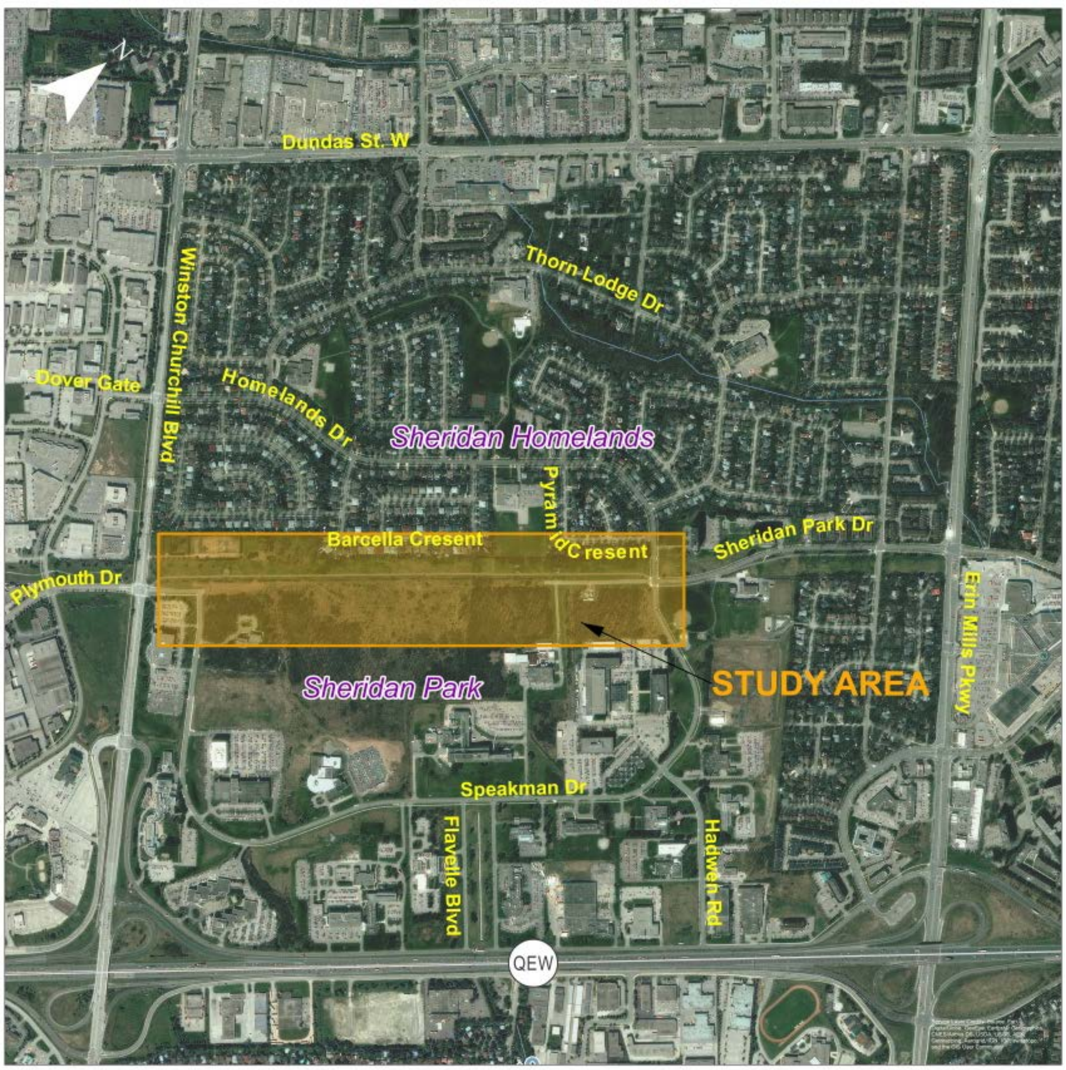
- Neighborhood Traffic Infiltration;
- Residential (excluding impacts to property worth);
- Impacts to business;
- Place-making Opportunities; and
- Cycling and Pedestrian Environment.

3.0 The Study Area

3.1 Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive / Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owner right-of-way (ROW), which runs through the centre part of the Study Area.

Figure 1: Study Area



3.2 Land Use

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail, and the Sheridan Homelands residential neighborhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of the park is occupied by private industries and businesses, which include in their landholdings, natural areas on the north side of the corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved multi-use trail through the utility corridor from Winston Churchill Boulevard to Homelands Drive / Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

4.0 Existing Conditions

4.1 Economic Conditions

The 2016 census was completed for several Mississauga neighborhoods. The Mississauga City neighborhood (census subdivision) includes the Sheridan Park Corporate Centre, Sheridan Homelands neighborhood and the Study Area. According to the 2016 census published by Statistics Canada in 2016, the enumerated population of Mississauga (City) was 721,599, which represents a change of 1.1% from 2011. This compares to the provincial average of 4.6% and the national average of 5.0%. The land area of Mississauga (City) is 292.43 km^2 and the population density was 2,467.6 people/km^2. In 2016, there were 240,913 private dwellings occupied in Mississauga (City), which represent a change of 2.7% from 2011. The population of Mississauga is expected to increase to 878,000 by 2041 (currently 766,000). The population in Sheridan Homelands fell by 1.1% from 2011 to 2016. Employment fell by 12%, but is expected to increase again by the next census.

Within the Study Area, over 2,700 scientists, technicians, engineers and support staff are currently employed in Sheridan Park Corporate Centre (which is classified as a regionally significant center of business). As identified by the City of Mississauga, the key existing economic clusters within the City include life sciences and CIT (community, information and technology), both of which are represented in Sheridan Park. These sectors are poised to experience continued growth into the future, as Mississauga becomes a growing hub for these industries. The relevant policies have poised Sheridan Park Corporate Centre as a major area for economic growth within the city and regionally.

4.2 Social Conditions

The Sheridan Homelands neighborhood consists of over 2,000 households, bounded to the north by Dundas Street, to the east by Erin Mills Parkway, to the south by the utility corridor, and to the west by Winston Churchill Boulevard. This area has a vibrant community lead by the

Sheridan Homelands Ratepayers' Association (SHORA). SHORA works to cultivate a strong sense of community with various events, community meetings, membership, and a neighborhood newsletter.

The multi-use trail in the area is actively used by many community residents as an area for leisure, recreation and enjoyment of the natural green space. The neighborhood is serviced by several recreational facilities, parks as well as a local school (Homelands Jr. Public School), which is directly adjacent to the utility corridor to the north of the proposed roadway extension.

5.0 Relevant Policy

5.1 Provincial Policy Statement

The 2014 Provincial Policy Statement (PPS) is the complimentary policy document to the *Planning Act*, issued under Section 3 of the *Planning Act*. The PPS is more than a set of individual policies. It is to be read in its entirety and the relevant policies are to be applied to each project. The language of each policy, including the Implementation and Interpretation policies, assists the City in understanding how the policies are to be implemented.

The PPS states that municipal projects should be directed to existing settlement areas, create stronger and improved communities, and have little to no impact on the natural features of the area. In general projects should have consideration for future needs to ensure the benefits of the project are far-reaching. Please note there is no implied priority in the order in which the policies appear.

Section 1.6 of the PPS contains specific guidance on Infrastructure and Public Service Facilities:

> *"1.6.1 Infrastructure and public services facilities shall be provided in a coordinated, efficient and cost-effective manner that considers impacts from climate changes while accommodating projected needs.*
>
> *Planning for infrastructure and public service facilities shall be coordinated and integrated with land use planning so that they are:*
>
> a) *Financially viable over their life cycle, which may be demonstrated through asset management planning; and*
>
> b) *Available to meet current and projected needs.*
>
> *1.6.3 Before consideration is given to developing new infrastructure and public service facilities:*
>
> a) *The use of existing infrastructure and public service facilities should be optimized; and*
>
> b) *Opportunities for adaptive re-use should be considered, wherever feasible.*"

There are many more policies that are relevant to the assessment of the project, particularly 1.1.1 c., 1.1.3.4, 1.6.7.1, 1.6.8.4, 1.7.1.6 and the Natural Heritage and Water policies in Section 2.

As such, improvements made to public infrastructure, including the potential extension of Sheridan Park Drive are consistent with the PPS.

5.2 Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (2017) is a Provincial Plan that directs how regional growth in the GGH is to be managed up to 2041. The plan carries policies forward from the Provincial Policy Statement (PPS), working to reduce development sprawl and providing direction in where intensification should take place. There are several provisions within the policy that are relevant to the Sheridan Park Drive extension. Section 3.2.2. of the Growth Plan outlines the general provisions of Transportation for the Greater Golden Horseshoe (GGH). According to this policy, the transportation system within the GGH will be planned and managed to:

a) *"Provide connectivity among transportation modes for moving people and moving goods;*

b) *Offer a balance of transportation choices that reduces reliance upon the automobile and promotes transit and active transportation."*

Section 4 of the Growth Plan details the protection of natural features within the GGH. Within the Natural Heritage System:

iii. "the removal of other natural features, not identified as key natural heritage features and key hydrologic features is avoided, where possible. Such features should be incorporated into the planning and design of the proposed use wherever possible"

Climate change is also addressed in Section 4 of the Growth Plan. According to the growth plan, in planning to reduce greenhouse gas emissions and address the impacts of climate change, municipalities are encouraged to:

a) "develop strategies to reduce greenhouse gas emissions and improve resilience through the identification of vulnerabilities to climate change, land use planning, planning for *infrastructure* including transit and energy, *green infrastructure*, and *low impact development*, and the conservation objectives in policy 4.2.9.1"

5.3 Regional Official Plan

With the major theme of sustainability and smart growth, the Region of Peel Official Plan (ROP) reinforces the policies of the PPS and the Growth Plan, allocating growth targets to municipalities. While providing direction for local OP's, the ROP focuses on policies affecting regional systems and services. Mississauga is located within the Region's urban system and Sheridan Park is designated as an employment area.

5.4 Mississauga Strategic Plan

The Mississauga Strategic Plan identifies five Strategic Pillars for Change, intended to provide guidance towards the creation of a city for the 21st century.

The most relevant include to this study include:

- Increasing transportation capacity by creating additional links in street networks and active mobility choices;
- Creation of complete streets with inclusive cross-sections and an urban form that supports walking and active modes of transportation;
- Develop walkable, connected communities;
- Build and maintain infrastructure;
- Maintain a safe city;
- Attract innovative businesses;
- Meet employment needs; and
- Conserve, enhance and connect natural environments by minimizing impacts to existing natural heritage features and introducing low impact development features and plantings to increase biodiversity.

The Sheridan Park Drive project works to balance all of these objectives within the project area.

5.5 Mississauga Official Plan

Mississauga OP (MOP) provides a policy framework to protect, enhance, restore and expand the Natural Areas System, protect the health of the natural environment and the climate, to direct growth to where it will benefit the urban form, support a strong public transportation system, and address the long term sustainability of the City.

Central to the framework of the MOP, is a protection of the natural environment, detailed in Chapter 6 of the plan. Mississauga will protect, enhance, expand and restore the natural heritage system, protect life and property from natural and human made hazards and ensure land use compatibility.

As a key element to the consolidated MOP the City adopted a new approach to land use planning in Mississauga, one that blends transportation, land use, and urban design objectives. Key to the delivery of this new approach is the MOP’s section on building a multi-modal city by:

- Developing and promoting an efficient and safe transportation system for all users;
- Promoting a transportation network that connects nodes with a range of transportation modes;
- Implementing a viable, active transportation network for cyclists and pedestrians;
- Encouraging the application of transportation demand management techniques;
- Developing a seamless network of mobility hubs; and
- Providing an alternative route for goods movement in the business park.

MOP defines the role of arterials as principal transportation corridors for high volumes of people and goods. Major collectors in neighbourhoods, like Sheridan Park Drive (proposed), will be designed to accommodate moderate volumes of traffic and encourage active transportation, by minimizing conflicts with the various uses of active transportation. Mississauga supports opportunities for multi-modal uses where feasible.

Within the MOP, Sheridan Park will provide for employment uses and densities similar to major nodes (less density than downtown, but more than elsewhere). MOP Land Use Map (Schedule 10) designates most of Sheridan Park as Business Employment, which generally permits a wide range of commercial or industrial uses.

MOP recognizes the strong role of life sciences, communication and information technology industries in the City. Section 10.1.5 states that the City will provide a large range of employment opportunities, including diversified employment uses, the City will:

- Strive to increase office employment;
- Encourage the establishment of knowledge based industries and support their growth; and
- Support smaller, more innovative industries and their growth.

5.6 Sheridan Park Land Use Master Plan

In 2014, the City completed the Draft Sheridan Park Master Land Use Plan, a study to review existing conditions of the area and recommend amendments to the land use designations and zoning regulations within Sheridan Park. Future land use amendments would facilitate multiple businesses and increased accessory uses in Sheridan Park, while maintaining the unique campus feel of the area for nearby residents. The renewed focus of Sheridan Park is on pilot plants, innovation and science and technology; however, future land uses also include offices, daycare, utility and open spaces. Schools are permitted on a site specific basis; however are not the preferred use of the land.

The existing zoning in Sheridan Park is primarily E2-5, which permits science and technology buildings and office uses. One of the zoning exceptions in Sheridan Park is E2-101, which permits a range of more diverse commercial and employment uses including hotels at the eastern end of Sheridan Park.

The Draft Land Use Master Plan is directed by Amendment No. 40 to the Mississauga Official Plan. The purpose of the amendment is to update the Sheridan Park Corporate Centre character area policies to reflect the Draft Land Use Master Plan. The changes include:

- Changes to the ‘Business Employment’ designation to allow a broader range of uses.
- Changes to Greenland mapping to reflect the presence of significant natural areas and natural hazard lands associated with Sheridan Creek.

The amended polices of allow a broader range of uses to encourage re development to occur in Sheridan Park.

5.7 Other Relevant Policies / Studies

Mississauga Economic Development Strategy 'Building on Success'

The intent of the 'Building on Success' (2010) report was to analyze the opportunity to create a culture of innovation in Mississauga. The Economic Development Strategy recommends actions to improve the overall market position of Sheridan Park, and has been identified as a potential site for an incubation center, as a mentoring and support system for select sector sub-group start-ups and small and medium enterprises.

Employment Land Review Study

The Employment Land Review Study (2008) was prepared by Hemson Consulting Ltd. The study states that nearly all of Mississauga's supply of employment land is developed, with much of the existing vacant land consisting of relatively small parcels. Based on this, protecting existing employment lands is crucial, and only a small number of conversions to other uses under the Official Plan are recommended. Land conversion in Sheridan Park is not recommended, the area is an important area of developable land in the city for employment purposes.

Municipal Comprehensive Review of Employment Lands

The report, completed in 2015, focuses on the developable employment lands that Mississauga currently holds and are needed to meet development and employment goals for future growth. The report recommends that the existing corporate centers in the city, including the Sheridan Park Corporate Centre, be subject to protection from conversion to incompatible land uses, with respect to remaining land supply.

An Action Plan for Innovation in Mississauga

The report, created in 2011, focused on the role that human capital can play in driving the City's strategic and economic objectives. Recommendations were made to update the current model of Sheridan Park, to employ a cluster strategy to create more linkages with researchers at nearby universities and federal laboratories and amongst fellow firms. The park could also benefit from strategies used to position the park as a private sector-led accelerator for the growth of small technology firms within Mississauga and regionally.

6.0 Criteria and Potential Impacts

The socio economic criteria have been selected to represent important features that represent the existing conditions of the economic and social context of the Study Area. These features are also present in the policies described above, as important indicators of the social and economic setting of the area, and of importance for the City of Mississauga. The criteria are assessed according to each alternative considered under the EA process. The alternatives are considered for their potential of effect or impact to the criteria.

Table 1: Evaluation of Potential Effects on the Socio-Economic Environment

Socio Economic Criteria	Alternative 1: Do Nothing	Alternative 2: Limit / Manage Growth	Alternative 3: Extend Roadway	Alternative 4: Provide Alternatives Routes for Traffic
Adjacent Land Use	No impacts to existing adjacent land use. Not extending the roadway will not improve road connectivity within the Study Area as the business park develops in the future.	Limiting growth would allow the natural areas within the business park to remain undisturbed. However, employment lands within the city would remain undeveloped. Limiting growth does not support the policy currently in place (i.e., does not fulfill Official Plan, Strategic Plan, etc.	The extended roadway will result in some impacts to the natural area south of the multi-use trail (MUT), these impacts will be mitigated as much as possible. The existing MUT will not be impacted. The extension will complement the planned future growth of the business park, by creating extended network connectivity and potentially alleviating traffic within the adjacent residential neighbourhood.	No impacts to existing adjacent land use, but there could be impacts to existing roads as an example, based on the traffic analysis completed, Homelands Drive could experience more traffic if Speakman Drive were widened to four lanes since this does not provide an alternate route for the residential community.
Recreation	No impacts to the existing MUT in the Study Area for recreational and leisure use.	Residents will be able to continue to use the existing MUT.	Residents will be able to continue to use the existing MUT for recreation and leisure. Increased roadway connectivity and alternate routes for recreational and commuter cyclists.	No impacts to the existing MUT.
Aesthetics and Visual Impacts	No impacts to visual landscape and aesthetic of the Study Area.	The visual landscape and aesthetic of the Study Area will not be	Views of utility corridor / green space will not change as a result of the	The visual landscape and aesthetic of the Study Area will not be

Socio Economic Criteria	Alternative 1: Do Nothing	Alternative 2: Limit / Manage Growth	Alternative 3: Extend Roadway	Alternative 4: Provide Alternatives Routes for Traffic
		impacted.	road extension.	impacted.
Streetscape Design	No changes to the existing conditions.	No changes to the existing conditions.	Extension of the roadway will include the inclusion of roundabouts, medians and increased opportunities for plantings and landscaping.	May lessen streetscape opportunities if roadways are widened, resulting in narrower boulevards. No changes
Development Activity	No impacts to existing conditions.	Does not support the policy currently in place (ie. Does not fulfill Official Plan, Strategic Plan).	The extension of the roadway is compatible with the future land use and zoning permissions of the business park. The extension will create increased roadway connectivity and improved access routes for local traffic.	The improvements of adjacent roads will not have a direct impact on increasing access routes for traffic as the business park develops and intensifies.
Quality of Life (Health and Safety)	No negative impacts or changes to existing quality of life.	No negative impacts to quality of life.	The inclusion of speed management features and roundabouts will increase safety for local residents and employees. The extension of the roadway will not create any long term impacts to air quality; dust from construction will be temporary and mitigated. The future predicted noise levels at the closest sensitive receptors were found to	No changes to existing quality of life.

Socio Economic Criteria	Alternative 1: Do Nothing	Alternative 2: Limit / Manage Growth	Alternative 3: Extend Roadway	Alternative 4: Provide Alternatives Routes for Traffic
			be no more than 1 dBA greater than the existing noise levels. Therefore, the extension has negligible impact on the noise levels in the neighbourhood.	
Property Development	No impact on property development in the Study Area.	No impacts to property development in the Study Area.	The extension of the roadway supports the diversification of land use and zoning of the business park by creating increased roadway connectivity and improving access routes for local traffic.	No impacts to property development in the Study Area.
Network Access (e.g., providing alternate routes)	No additional network access provided. Road improvements in the area not related to this project may still occur.	No additional network access provided. Road improvements in the area not related to this project may still occur.	The extension of the roadway may alleviate the traffic within the adjacent Homelands neighbourhood.	No additional network access provided. Road improvements in the area not related to this project may still occur.
Construction	No construction will take place.	No construction will take place.	Construction will be necessary for the creation of the extended roadway. Mitigation measures will be put in place to limit disturbance to residents, and construction will only be completed over one season.	Construction will be necessary to improve and/or widen existing roads.
Residential	No impacts to existing residential properties in the Study Area other	No impact to existing residential properties in the Study Area.	The extension will not impact residential properties in the Study	The improvement and widening of adjacent roads may impact

Socio Economic Criteria	Alternative 1: Do Nothing	Alternative 2: Limit / Manage Growth	Alternative 3: Extend Roadway	Alternative 4: Provide Alternatives Routes for Traffic
	than some roads may experience increase in traffic volumes due to City-wide growth.		Area.	existing properties, to extend existing right of ways on adjacent roads, additional property may be required to widen roads.
Impacts to Business	As Sheridan Park continues to develop, and businesses diversify, economic activity may be impacted though a lack of roadway connectivity.	No impacts to existing buisnesses.	The roadway extension will not negatively impact existing businesses, the increased connectivity of the road network will aid in servicing the expanding Sheridan business Park and future development in the area.	Improvements to adjacent roads will aid in providing increased roadway connectivity for the diversifying business within Sheridan Park corporate Centre.
Place-making Opportunities	No place making opportunities will be present within the Study Area.	No immediate place making opportunities will be present within the Study Area if development is limited.	The roadway extension will allow for greater place making opportunities with increased plantings, and potential spaces for public art.	No place making opportunities will be present within the Study Area.
Pedestrian and Cycling Environment	No impacts to the existing cycling and pedestrian environment. Residents will continue to have access to the existing MUT for walking or cycling.	No impacts to the existing cycling and pedestrian environment. Residents will continue to have access to the existing MUT for walking or cycling.	Pedestrians will not be impacted by the extension of the roadway. Cyclists will be able to use the roadway extension as an alternate route.	The repair and improvement of adjacent roads may create more opportunities for pedestrians and cyclists.

7.0 Conclusion

The Sheridan Park Corporate Centre represents a vibrant and growing area in the City of Mississauga. The City has developed a policy framework that will further strengthen the importance of the Corporate Centre within the local economy, and as an important feature within the Sheridan neighborhood.

The extension of Sheridan Park Drive represents the most beneficial alternative for the social and economic future of the Study Area. The extension of Sheridan Park Drive is supported by provincial, regional and city-level policies. The extension will support existing land uses and the potential future development while providing the opportunity for place making within the study area. Economically, the future growth of the corporate center will be well served by the extension of the roadway, providing alternative routes and greater roadway network connectivity in the area as the park diversifies its services and businesses grow within the area.

Yours truly,

R.J. Burnside & Associates Limited

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Environmental Planner
ML:sr/js

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Appendix F

Appendix F

Stage 1 Archaeological Assessment Report

STAGE 1 ARCHAEOLOGICAL ASSESSMENT
SHERIDAN PARK DRIVE EXTENSION
PART OF LOTS 32-35, CONCESSION 1 SOUTH OF DUNDAS STREET
(FORMER TOWNSHIP OF TORONTO, COUNTY OF PEEL)
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL, ONTARIO

ORIGINAL REPORT

Prepared for:

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Archaeological Licence #P1066 (Lytle)
Ministry of Tourism, Culture and Sport PIF# P1066-0034-2017
ASI File: 16EA-226

24 July 2017

ASI Archaeological & Cultural Heritage Services
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Stage 1 Archaeological Assessment
Sheridan Park Drive Extension
Part of Lots 32-35, Concession 1 South of Dundas Street
(Former Township of Toronto, County of Peel)
City of Mississauga
Regional Municipality of Peel, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc. was contracted by R.J. Burnside & Associates Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Sheridan Park Drive Extension Municipal Class Environmental Assessment. The project involves the potential extension of Sheridan Park Drive between the west leg to east leg of Speakman Drive, along with their intersections and approaches, in the City of Mississauga.

The Stage 1 background study determined that no previously registered archaeological sites are located within one kilometre of the Study Area, however four sites are within two kilometres of the Study Area. The property inspection determined that the Study Area exhibits archaeological potential and will require Stage 2 assessment, prior to development.

In light of these results, the following recommendations are made:

1. The Study Area exhibits archaeological potential. These lands require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any proposed impacts to the property

2. Parts of the Study Area require test pit survey according to professional judgement to confirm disturbance;

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance. These lands do not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner / Director* *Environmental Assessment Division*
Project Coordinator:	Sarah Jagelewski, Hon. BA (R405) *Archaeologist / Assistant Manager* *Environmental Assessment Division*
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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by R.J. Burnside & Associates Limited to conduct a Stage 1 Archaeological Assessment (Background Research and Property Inspection) as part of the Sheridan Park Drive Extension Municipal Class Environmental Assessment (MCEA). The project involves the potential extension of Sheridan Park Drive between the west leg to east leg of Speakman Drive, along with their intersections and approaches, in the City of Mississauga (Figure 1).

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2009) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Tourism, Culture and Sport (MTCS).

In the S & G, Section 1, the objectives of a Stage 1 archaeological assessment are discussed as follows:

- To provide information about the history, current land conditions, geography, and previous archaeological fieldwork of the Study Area;
- To evaluate in detail the archaeological potential of the Study Area that can be used, if necessary, to support recommendations for Stage 2 archaeological assessment for all or parts of the Study Area; and,
- To recommend appropriate strategies for Stage 2 archaeological assessment, if necessary.

This report describes the Stage 1 archaeological assessment that was conducted for this project and is organized as follows: Section 1.0 summarizes the background study which provides the historical and archaeological contexts for the project Study Area; Section 2.0 addresses the field methods used for the property inspection to document the general environment, current land use history and conditions of the Study Area; Section 3.0 analyses the characteristics of the project Study Area and evaluates their archaeological potential; Section 4.0 provides recommendations; and the remaining sections contain other report information that is required by the S & G, e.g., advice on compliance with legislation, works cited, mapping and photo-documentation.

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association *Municipal Class Environmental Assessment* (2000 as amended in 2007, 2011 and 2015) document.

Authorization to carry out the activities necessary for the completion of the Stage 1 archaeological assessment was granted by R.J. Burnside & Associates Limited on May 4, 2017.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the

Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988) and populations now occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990, 2009; Brown 1995:13).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. Exchange and interaction networks broaden at this time (Spence et al. 1990:136, 138) and by approximately 2,000 BP, evidence exists for macro-band camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). It is also during this period that maize was first introduced into southern Ontario, though it would have only supplemented people’s diet (Birch and Williamson 2013:13–15). Bands likely retreated to interior camps during the winter. It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From approximately 1,000 BP until approximately 300 BP, lifeways became more similar to that described in early historical documents. During the Early Iroquoian phase (AD 1000-1300), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990:317). By the second quarter of the first millennium BP, during the Middle Iroquoian phase (AD 1300-1450), this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al. 1990:343). In the Late Iroquoian phase (AD 1450-1649) this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed. By AD 1600, the communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries.

In the 1640s, the traditional enmity between the Haudenosaunee[1] and the Huron-Wendat (and their Algonkian allies such as the Nippissing and Odawa) led to the dispersal of the Huron-Wendat. After the dispersal, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario, including Teiaiagon, near the mouth of the Humber River; and Ganestiquiagon, near the mouth of the Rouge River. Their locations near the mouths of the Humber and Rouge Rivers, two branches of the Toronto Carrying Place, strategically linked these settlements with the upper Great Lakes through Lake Simcoe. The west branch of the Carrying Place followed the Humber River valley northward over the drainage divide, skirting the west end of the Oak Ridges Moraine, to the East Branch of the Holland River. Another trail followed the Don River watershed.

When the Senecas established Teiaiagon at the mouth of the Humber, they were in command of the traffic across the peninsula to Lake Simcoe and the Georgian Bay. Later, Mississauga and earliest European presence along the north shore, was therefore also largely defined by the area's strategic importance for accessing and controlling long established economic networks. Prior to the arrival of the Seneca, these economic networks would have been used by indigenous groups for thousands of years. While the trail played an important part during the fur trade, people would also travel the trail in order to exploit the resources available to them across south-central Ontario, including the various spawning runs, such as the salmon coming up from Lake Ontario or herring or lake trout in Lake Simcoe.

Due, in large part, to increased military pressure from the French upon their homelands south of Lake Ontario, the Haudenosaunee abandoned their north shore frontier settlements by the late 1680s, although they did not relinquish their interest in the resources of the area, as they continued to claim the north shore as part of their traditional hunting territory. The territory was immediately occupied or re-occupied by Anishinaabek groups, including the Mississauga, Ojibwa (or Chippewa) and Odawa, who, in the early seventeenth century, occupied the vast area extending from the east shore of Georgian Bay, and the north shore of Lake Huron, to the northeast shore of Lake Superior and into the upper peninsula of Michigan. Individual bands were politically autonomous and numbered several hundred people. Nevertheless, they shared common cultural traditions and relations with one another and the land. These groups were highly mobile, with a subsistence economy based on hunting, fishing, gathering of wild plants, and garden farming. Their movement southward also brought them into conflict with the Haudenosaunee.

Peace was achieved between the Haudenosaunee and the Anishinaabek Nations in August of 1701 when representatives of more than twenty Anishinaabek Nations assembled in Montreal to participate in peace negotiations (Johnston 2004:10). During these negotiations captives were exchanged and the Iroquois and Anishinaabek agreed to live together in peace. Peace between these nations was confirmed again at council held at Lake Superior when the Iroquois delivered a wampum belt to the Anishinaabek Nations.

In 1763, following the fall of Quebec, New France was transferred to British control at the Treaty of Paris. The British government began to pursue major land purchases to the north of Lake Ontario in the early nineteenth century, the Crown acknowledged the Mississaugas as the owners of the lands between Georgian Bay and Lake Simcoe and entered into negotiations for additional tracts of land as the need arose to facilitate European settlement.

[1] The Haudenosaunee are also known as the New York Iroquois or Five Nations Iroquois and after 1722 Six Nations Iroquois. They were a confederation of five distinct but related Iroquoian–speaking groups - the Seneca, Onondaga, Cayuga, Oneida, and Mohawk. Each lived in individual territories in what is now known as the Finger Lakes district of Upper New York. In 1722 the Tuscarora joined the confederacy.

In 1805, the Mississaugas were granted one mile (approximately 1.6 km) on either side of the Credit River, Twelve Mile Creek and Sixteen Mile Creek. In 1818, the majority of the Mississauga Tract was acquired by the Crown excluding the lands tracts flanking the Credit River, Twelve Mile Creek and Sixteen Mile Creek. In 1820, the remainder of Mississauga land was surrendered except approximately 81 hectares (ha) along the Credit River (Heritage Mississauga 2012:18). In 1825-26 the Credit Indian Village was established as an agricultural community and Methodist mission near present day Port Credit (Heritage Mississauga 2009a; Mississaugas of the New Credit First Nation 2014). By 1840 the village was under significant pressure from Euro-Canadian settlement that plans begun to relocate the settlement. In 1847 the Credit Mississaugas were made a land offer by the Six Nations Council to relocate at the Grand River. In 1847, 266 Mississaugas settled at New Credit, approximately 23 km southwest of Brantford. In 1848 a mission of the Methodist Church was established there by Rev. William Ryerson (Woodland Indian Cultural Education Centre 1985). Although the majority of the former Mississagua Tract had been surrendered from the Mississauga by 1856 (Gould 1981), this does not exclude the likelihood that the Mississauga continued to utilise the landscape at large during travel (Ambrose 1982) and for resource extraction.

The eighteenth century saw the ethnogenesis in Ontario of the Métis, when Métis people began to identify as a separate group, rather than as extensions of their typically maternal First Nations and paternal European ancestry (Métis National Council n.d.). Living in both Euro-Canadian and Indigenous societies, the Métis acted as agents and subagents in the fur trade but also as surveyors and interpreters. Métis populations were predominantly located north and west of Lake Superior, however, communities were located throughout Ontario (MNC n.d.; Stone and Chaput 1978:607,608). During the early nineteenth century, many Métis families moved towards locales around southern Lake Huron and Georgian Bay, including Kincardine, Owen Sound, Penetanguishene, and Parry Sound (MNC n.d.). By the mid-twentieth century, Indigenous communities, including the Métis, began to advance their rights within Ontario and across Canada, and in 1982, the Métis were federally recognized as one of the distinct Indigenous peoples in Canada. Recent decisions by the Supreme Court of Canada (Supreme Court of Canada 2003, 2016) have reaffirmed that Métis people have full rights as one of the Indigenous people of Canada under subsection 91(24) of the Constitution Act, 1867.

1.2.2 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the Study Area is located in the Former Toronto Township, County of Peel, on part of Lots 32-35, Concession 1 South of Dundas Street (SDS).

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (Archaeological Services Inc. 2006).

In 1788, the County of Peel was part of the extensive district known as the "Nassau District." After the province of Quebec was divided into Upper and Lower Canada in 1792, the Nassau District became known as Home District. The same year, Upper Canada was subdivided into nineteen counties by its first Lieutenant Governor, Colonel John Graves Simcoe, and by 1852, the Home District was replaced by the Counties of York, Ontario and Peel.

After Simcoe established York as the capital of Upper Canada he commissioned the Queen's Rangers to build the Dundas Highway (also known as the Governor's Road) running west to Ancaster and east toward Kingston, hooking up with Kingston Road. This important transportation corridor was intended to provide an overland military route between Lake Ontario, Lake St. Clair, and Lake Huron. The road (later known as Dundas Street now Highway 5) was intended to serve a dual purpose – to support settlement in Upper Canada and as a deterrent to expansionist American interests. Work on the Governor's Road began in 1793, but progress was slow. Once the colonial government had purchased new lands adjacent to it, Dundas Street did facilitate settlement in southern Ontario.

Along the lakeshore, the pre-existing trail was widened and improved as a public road by 1798, but bridges were lacking. By 1826, a regular stagecoach service ran between York and Niagara. The Toronto Road Company purchased the Lakeshore Road in 1850, turning it into a toll road.

Toronto Township

The Township of Toronto was originally surveyed in 1806 by Mr. Wilmot, Deputy Surveyor. The first settler in this Township, and also the County of Peel, was Colonel Thomas Ingersoll. The whole population of the Township in 1808 consisted of seven families, scattered along Dundas Street. The number of inhabitants gradually increased until the war broke out in 1812, which gave considerable check to its progress. When the war was over, the Township's growth revived and the rear part of the Township was surveyed and called the "New Survey". The greater part of the New Survey was granted to a colony of Irish settlers from New York City, who suffered persecution during the war.

The Credit River runs through the western portion of the Township, and proved to be a great source of wealth to its inhabitants, as it was not only a good watering stream, but there were endless mill privileges along the entire length of the river.

In 1855, the Hamilton and Toronto Railway completed its lakeshore line. In 1871, the railway was amalgamated with the Great Western Railway, which in turn, was amalgamated in 1882, with the Grand Trunk Railway, and then in 1923, with Canadian National Railway (Andreae 1997:126–127). Several villages of varying sizes had developed by the end of the nineteenth century, including Streetsville, Meadowvale, Churchville, and Malton. A number of crossroad communities also began to grow by the end of the nineteenth century. These included Britannia, Derry, Frasers Corners, Palestine, Mt Charles, and Grahamsville.

Erindale

The village of Erindale was established in 1822 after Thomas Racey constructed a sawmill on the Credit River, just south of Dundas Street. By 1824, a village site was laid out, first called Toronto, Credit, Springfield, Springfield-on-the-Credit, and finally Erindale in the early 1900s (Heritage Mississauga 2009b). The village was a stopping place for stagecoach travelers between Dundas and York (now Hamilton and Toronto), along Dundas Street. Early settlers included Emerson Taylor, who operated the Royal Exchange Hotel; John McGill, the first flour miller; Dr. Beaumont Dixie, an early physician, Duncan Turpel, a blacksmith, notary and stagecoach operator; John Barker, the postmaster and storekeeper; and Edwin Turner and Christopher Boyes, who were prominent merchants; and General Peter Adamson, who held early Anglican church services in his home until St. Peter's Anglican Church was built in 1826. This was the only Anglican Church west of Toronto, later rebuilt in 1887, and still stands today. The village saw a period of decline when it was bypassed by the Great Western Railway, despite the Credit Valley Railway station being built in 1879. In the early 1900s Erindale was the centre of a large hydroelectric project which brought growth in the village until a devastating fire in 1919. Erindale amalgamated with other villages in Toronto Township in 1968 to form the Town of Mississauga. The town became the City of Mississauga in 1974 (Heritage Mississauga 2009b).

Sheridan

The village of Sheridan was originally named Hammondsville, after William Ranson Hammond, who emigrated from Pennsylvania in the 1820s and opened a store, giving the name Hammondsville to the intersection of what is now Winston Churchill Boulevard and the Q.E.W (Mair 2009). Lt. Colonel Peter Adamson of the 7lst Highland Regiment, or "General Adamson" came to Canada in 1821 and bought land west of the Credit and south of Dundas Street he built "Toronto House", a one-storey stone mansion – later his brother, Dr. Joseph Adamson, settled on the Middle Road near Sheridan (Richardon 1956). Other early settlers included the Adamson, Clark, Devlin, Greeniaus, Hammond, Henriod, Lawrence, Long, McCleary, Oliphant, Oughtred, Pollard, Robertson, Shain and Tindell families. When the first post office was built for the hamlet in 1857 the name of the village was changed to Sheridan, and the post office functioned until 1956, almost a century later, when it was removed during construction for South Service Road (Mair 2009). The first church in Sheridan was a small frame church built in 1837 on Ferris Lawrence's property, which welcomed all denominations, and was also used as a school and community hall, until in 1867 half an acre of land was donated by Ferris Lawrence for a new church, the Sheridan United Church (Mair 2009). The old school and church was used as a Temperance Hall from 1837 into the 1890s, with multiple uses until 1976 when the building was moved to the Ontario Agricultural Museum. In 1877, Sheridan had a population of 100, but by 1907 the population had dropped to 50. Sheridan was also home to Thomas Wainwright's tannery, Erastus Hill's chair factory, Stephen Oughtred's blacksmith shop, which would have been located on the northwest corner of Winston Churchill and Upper Middle Road and George Long's shoemaker's shop at the northeast corner of the same intersection (Mair 2009).

1.2.3 Historical Map Review

The 1806 Patent Plan of Toronto Township South (Surveyor General 1806), the 1859 Map of the County of Peel (Tremaine 1859), and the 1877 Illustrated Historical Atlas of the County of Peel, Toronto Township South page (Walker and Miles 1877), were examined to determine the presence of historic features within the Study Area during the nineteenth century (Figures 2-4).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

The 1806 patent plant illustrates that Lot 32 was owned by John Utter Jr., Lot 33 by Peter Covenhoven, Lot 34 by Asa Patrick, and Lot 35 by Charles Cameron.

Table 1: Nineteenth-century property owner(s) and historical features(s)

		1859		*1887*	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
1 SDS	32	General Adamson	None	Charles Mitchel	House, orchard
	33 N	C & T Boyes	House (2), Conover's Brewery	Sam. Conover Chas Johnson	House (3), orchard House, orchard
	S	General Adamson	None	Charles Mitchel	None
	34 N	Donald Cameron	Waggon Shop	Donald Cameron, N.R. W.A.	House, orchard House
	S	G & T Boyes Jas Adamson	None None	Chas Johnson John Skinner	None None
	35 N	Charles Cameron	House	Albert E. Cameron	House (2), orchard
	S	Jas. Adamson	Sheridan Post Office, Long's Boot & Shoe Store, House (2)	Jas. Adamson, N.R.	House (5)

According to the maps, no structures were located within or adjacent to the Study Area. Both maps illustrate that Lots 32-35 were separated into north and south parcels, with the village of Sheridan south of the Study Area, including a footwear shop and post office, at the crossroads of what is now Winston Churchill Boulevard and Q.E.W. The 1859 map illustrates a wagon shop and a brewery along Dundas Street north of the Study Area.

1.2.4 Twentieth-Century Mapping Review

The 1909 National Topographic Series Brampton Sheet and the 1954 aerial photograph of Port Credit were examined to determine the extent and nature of development and land uses within the Study Area (Figures 5 and 6). The 1909 map illustrates the Study Area northeast of what is now Winston Churchill Boulevard, however no structures were within the Study Area. In 1954, an informal road appears to be located within the Study Area running northeast from Winston Churchill Boulevard surrounded by agricultural fields.

A review of available Google satellite imagery, since 2004, shows that the Study Area has remained within an undeveloped corridor between residential subdivisions and Sheridan Science and Technology Park in the City of Mississauga near the Town of Port Credit. A multi-use trail (MUT) was constructed within the Study Area in 2009.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land uses and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MTCS through “Ontario’s Past Portal”; published and unpublished documentary sources; and the files of ASI.

1.3.1 Current Land Use and Field Conditions

A Stage 1 property inspection was conducted on May 12, 2017 that noted the Study Area is within an undeveloped corridor southeast of residential subdivisions and northwest of Sheridan Science and Technology Park in the City of Mississauga. A MUT connects Speakman Drive and Winston Churchill Boulevard within a utility corridor.

1.3.2 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

Water has been identified as the major determinant of site selection and the presence of potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings. Resource areas, including; food or medicinal plants (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The Study Area is located on shale plains within the Iroquois Plain physiographic region of Southern Ontario, a lowland region bordering Lake Ontario. This region is characteristically flat, and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, a body of water that existed during the late Pleistocene. This region extends from the Trent River, around the western part of Lake Ontario, to the Niagara River, spanning a distance of 300 km (Chapman and Putnam 1984:190). The old shorelines of Lake Iroquois include cliffs, bars, beaches and boulder pavements. The old sandbars in this region are good aquifers that supply water to farms and villages. The gravel bars are quarried for road and building material, while the clays of the old lake bed have been used for the manufacture of bricks (Chapman and Putnam 1984:196). The Study Area is north and west of two ancient beaches and a shorecliff formed by Lake Iroquois (Figure 7).

Figure 8 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by glaciolacustrine deposits of clay to silt-textured till and Paleozoic bedrock (Ontario Geological Survey 2010). Soils in the Study Area consist of Bottom Land, an alluvial soil, and Trafalgar clay, a grey-brown podzolic, both with imperfect drainage (Figure 9).

The Study Area is within the Sheridan Creek and Loyalist Creek subwatersheds, within the Credit River watershed. Sheridan Creek is a long, narrow, urbanized watershed located on the west side of the City of Mississauga which drains an area of approximately 1,035 hectares into Rattray Marsh on Lake Ontario (Aquafor Beech Ltd. 2011). Increased development of the Sheridan Creek watershed in the twentieth century led to major modifications to the Sheridan Creek watercourse. Loyalist Creek is a small tributary of the Credit River, originating near Winston Churchill Boulevard and Dundas Street West, draining into the Credit River east of Mississauga Road near Blythe Road (Credit Valley Conservation 2009b).

The Credit River watershed drains an area of approximately 860 square kilometres from its headwaters in Orangeville, Erin, and Mono, passing through part of the Niagara Escarpment and the Oak Ridges Moraine, and draining into Lake Ontario at the town of Port Credit (Credit Valley Conservation 2009a). The river was named "*Mis.sin.ni.he*" or "*Mazinigae-zeebi*" by the Mississaugas, and surveyor Augustus Jones believed this signified "the trusting creek", or could also be translated as "to write or give and make credit", while the French name used when the river was first mapped in 1757 was "*Riviere au Credit*". These names refer to the fur trading period, when the French, British, and Indigenous traders would meet along this river (Jameson 1838:73–74; Smith 1987:255–257; Rayburn 1997:84; Scott 1997:182; Gibson 2002:177; Robb et al. 2003:6). The Credit River was historically considered to be one of the best potential power sources for milling in all of southern Ontario, which led to the development of early of saw and grist mill industries, and later textile mills, distilleries, bottling plants, and hydro-electric plants spawned communities throughout the river valley, typically close to the Niagara Escarpment (Town of Caledon 2009:7.1).

1.3.3 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AjGv*.

According to the OASD, no previously registered archaeological sites are located within one kilometre of the Study Area, however four sites are within two kilometres of the Study Area (Ministry of Tourism, Culture and Sport 2016).

According to the background research, no previous reports detail fieldwork within 50 m of the Study Area.

2.0 FIELD METHODS: PROPERTY INSPECTION

A Stage 1 property inspection must adhere to the S & G, Section 1.2, Standards 1-6, which are discussed below. The entire property and its periphery must be inspected. The inspection may be either systematic or random. Coverage must be sufficient to identify the presence or absence of any features of archaeological potential. The inspection must be conducted when weather conditions permit good visibility of land features. Natural landforms and watercourses are to be confirmed if previously identified. Additional features such as elevated topography, relic water channels, glacial shorelines, well-drained soils within heavy soils and slightly elevated areas within low and wet areas should be identified and documented, if present. Features affecting assessment strategies should be identified and documented such as woodlots, bogs or other permanently wet areas, areas of steeper grade than indicated on topographic mapping, areas of overgrown vegetation, areas of heavy soil, and recent land disturbance such as grading, fill deposits and vegetation clearing. The inspection should also identify and document structures and built features that will affect assessment strategies, such as heritage structures or landscapes, cairns, monuments or plaques, and cemeteries.

The Stage 1 archaeological assessment property inspection was conducted under the field direction of Peter Carruthers (P163) of ASI, on May 12, 2017, in order to gain first-hand knowledge of the geography, topography, and current conditions and to evaluate and map archaeological potential of the Study Area. It was a visual inspection only and did not include excavation or collection of archaeological resources. Fieldwork was only conducted when weather conditions were deemed suitable, per S&G Section 2. Previously identified features of archaeological potential were examined; additional features of archaeological potential not visible on mapping were identified and documented as well as any features that will affect assessment strategies. Field observations are compiled onto the existing conditions of the Study Area in Section 7.0 (Figure 10) and associated photographic plates are presented in Section 8.0 (Plates 1-16).

3.0 ANALYSIS AND CONCLUSIONS

The historical and archaeological contexts have been analyzed to help determine the archaeological potential of the Study Area. These data are presented below in Section 3.1. Results of the analysis of the Study Area property inspection are presented in Section 3.2.

3.1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meet the following criteria indicative of archaeological potential:

- Water sources: primary, secondary, or past water source (Credit River, Sheridan Creek, Loyalist Creek);
- Early historic transportation routes (Winston Churchill Boulevard., Dundas Street, Fifth Line West); and
- Proximity to early settlements (farmsteads, villages of Erindale, Sheridan)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The City of Mississauga Heritage Register was consulted and no properties within the Study Area are Listed or Designated under the Ontario Heritage Act.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

3.2 Analysis of Property Inspection Results

The property inspection determined that parts of the Study Area exhibits archaeological potential (Plates 2, 4, 9-14, 16; Figure 10: areas highlighted in green). These areas will require Stage 2 archaeological assessment by test pit survey at five metre intervals, prior to any development. According to the S & G Section 2.1.2, test pit survey is required on terrain where ploughing is not viable, such as wooded areas, properties where existing landscaping or infrastructure would be damaged, overgrown farmland with heavy brush or rocky pasture, and narrow linear corridors up to 10 metres wide.

Parts of the Study Area require test pit survey according to professional judgement to confirm disturbance in accordance with the S & G Section 2.1.8 Standard 2 (Plates 1 and 3; Figure 10: areas highlighted in turquoise).

The remainder of the Study Area has been subjected to deep soil disturbance events associated with the construction of the existing ROWs, MUT, and buried utilities, and according to the S & G Section 1.3.2 do not retain archaeological potential (Plates 1, 3-8, 15; Figure 10: areas highlighted in yellow). These areas do not require further survey.

3.3 Conclusions

The Stage 1 background study determined that no previously registered archaeological sites are located within one kilometre of the Study Area, however four sites are within two kilometres of the Study Area. The property inspection determined that the Study Area exhibits archaeological potential and will require Stage 2 assessment, prior to development.

4.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. The Study Area exhibits archaeological potential. These lands require Stage 2 archaeological assessment by test pit survey at five metre intervals prior to any proposed impacts to the property

2. Parts of the Study Area require test pit survey according to professional judgement to confirm disturbance;

3. The remainder of the Study Area does not retain archaeological potential on account of deep and extensive land disturbance. These lands do not require further archaeological assessment; and,

4. Should the proposed work extend beyond the current Study Area, further Stage 1 archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.

5.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act,* RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act,* R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

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7.0 MAPS

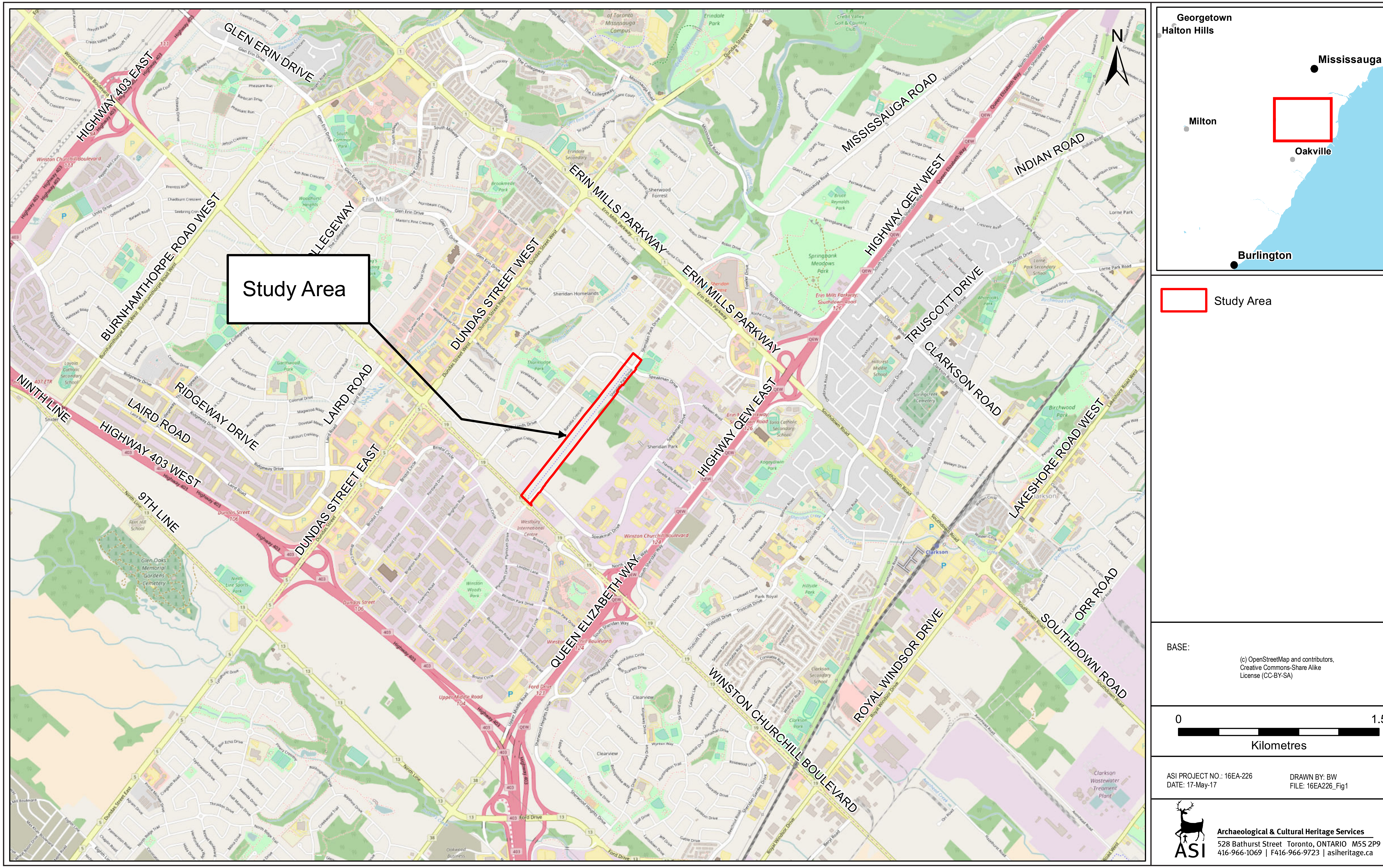

Figure 1: Sheridan Park Drive Extension - Location of the Study Area

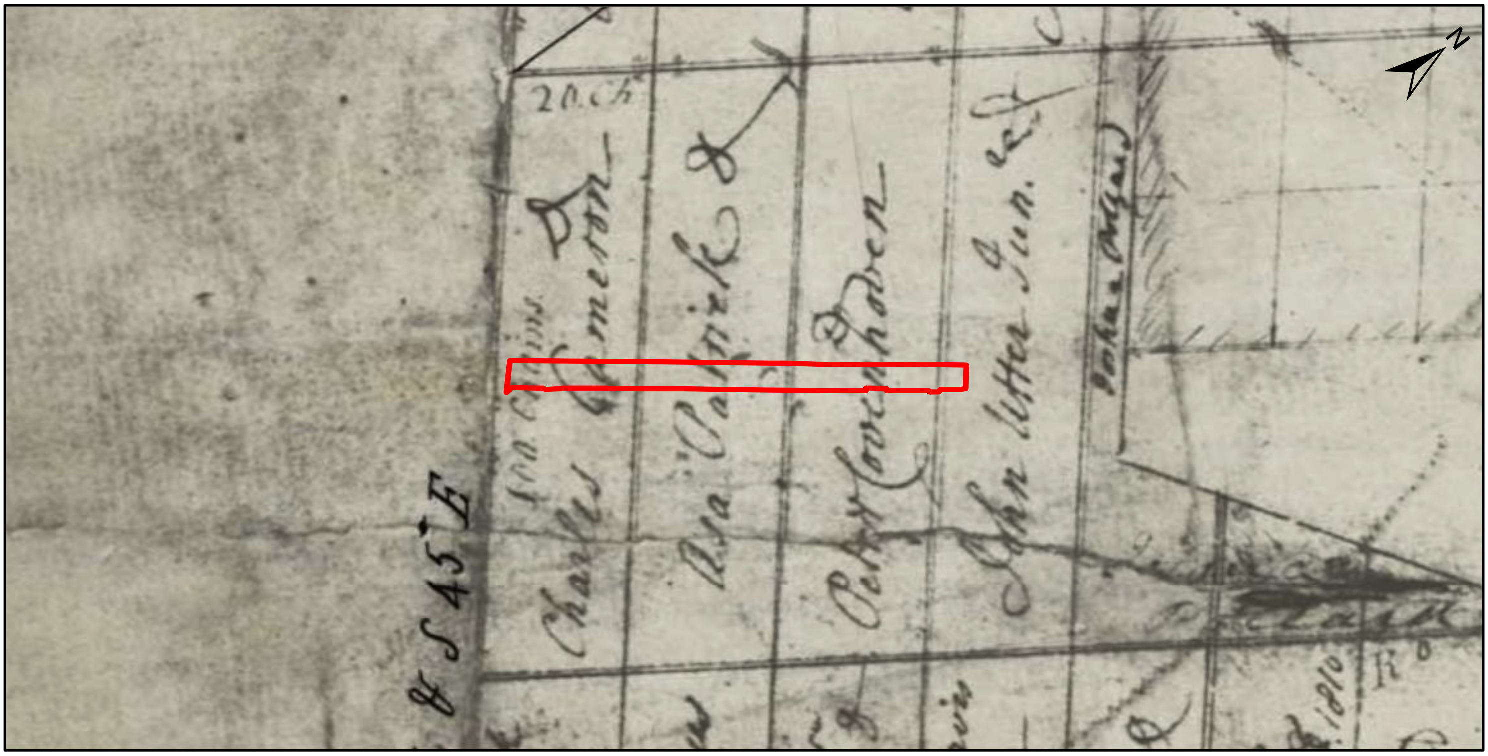

Figure 2: Sheridan Park Drive Extension Study Area (Approximate Location) Overlaid on the 1806 Patent Plan of Toronto Township South

Figure 3: Sheridan Park Drive Extension Study Area (Approximate Location) Overlaid on the 1859 Map of the County of Peel

ASI
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528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 | F416-966-9723 | asiheritage.ca

Study Area

0 800
Metres

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DATE: 17-May-17
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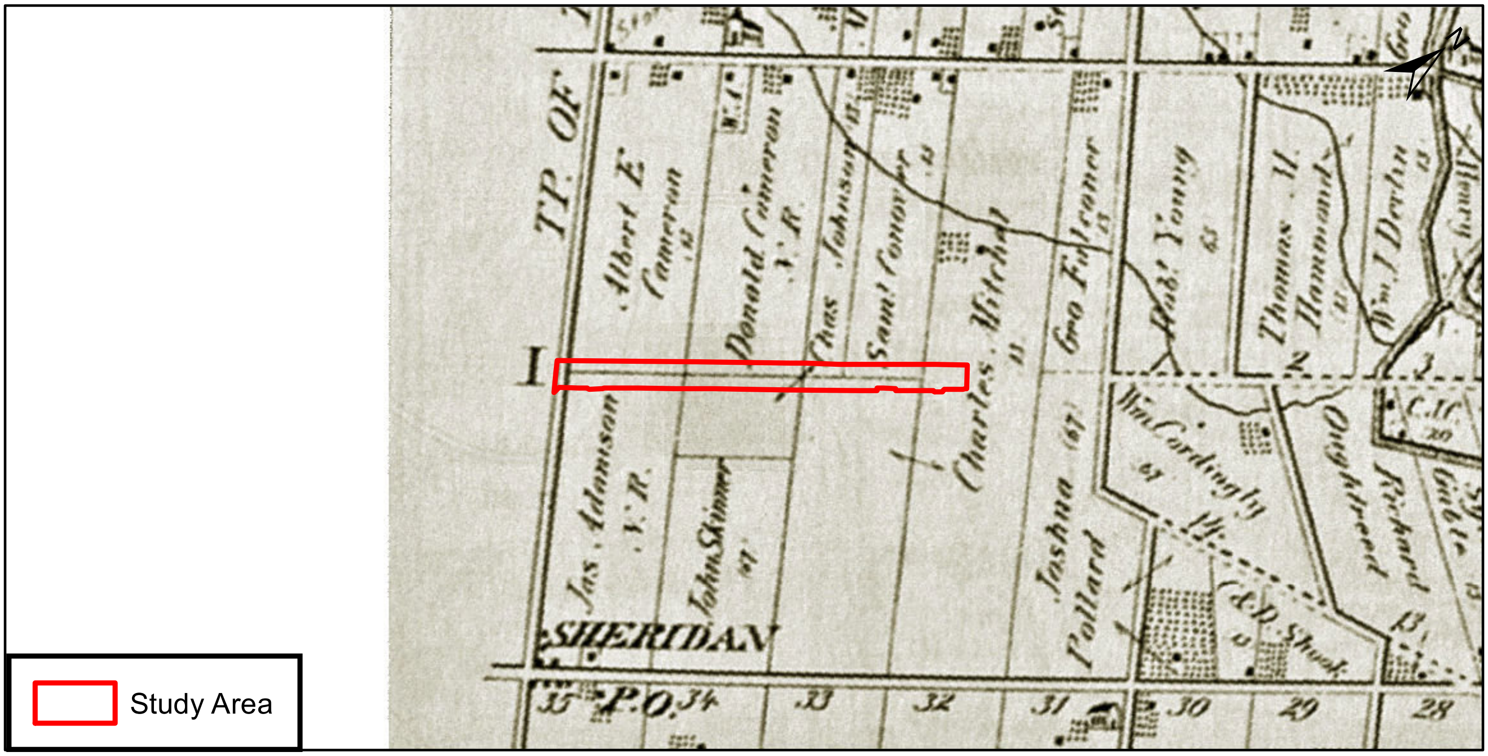

Figure 4: Sheridan Park Drive Extension Study Area (Approximate Location) Overlaid on the 1877 Illustrated Historical Atlas of the Township of Toronto

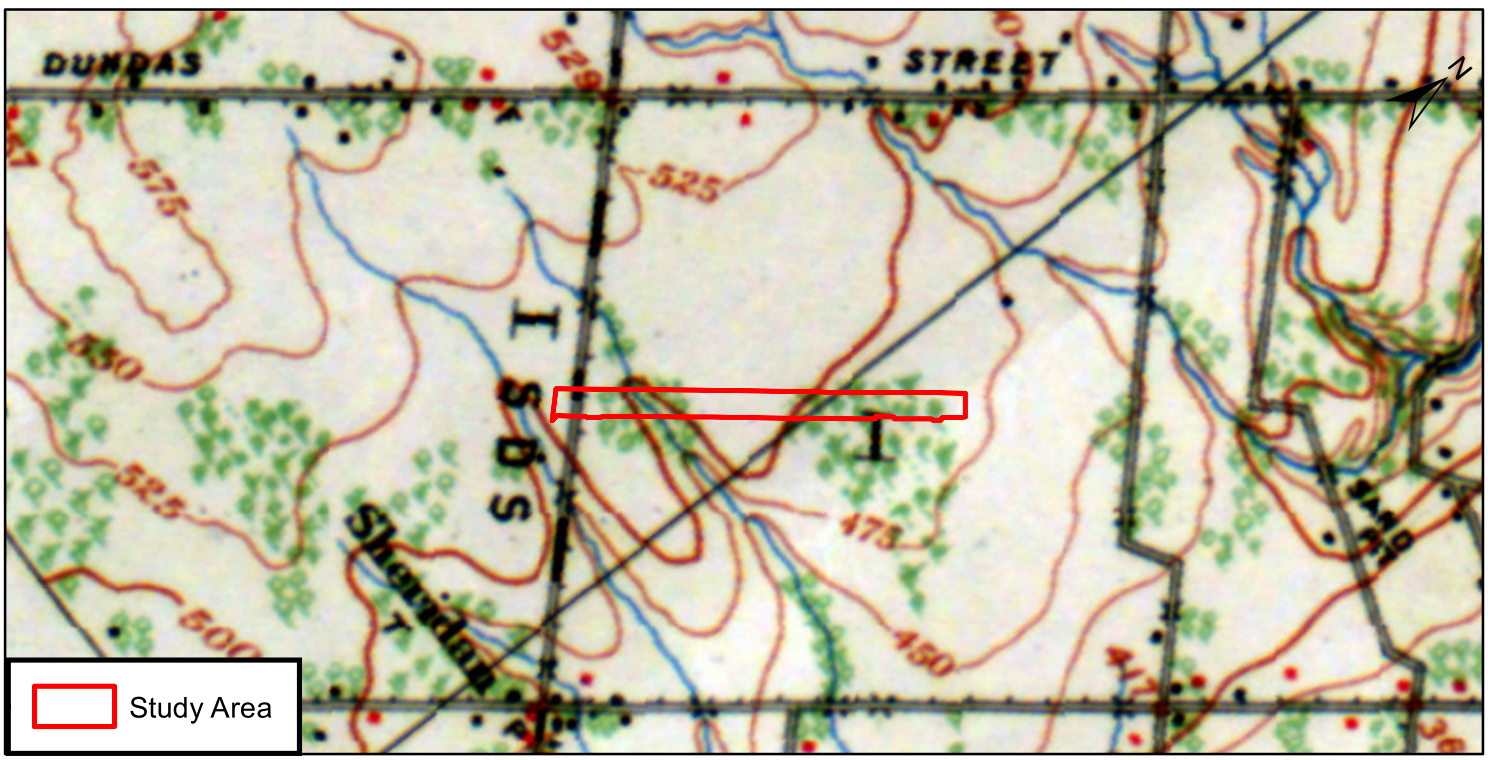

Figure 5: Sheridan Park Drive Extension Study Area (Approximate Location) Overlaid on the 1909 National Topographic Series Brampton Sheet

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Study Area

0 800
Metres

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Figure 6: Sheridan Park Drive Extension Study Area (Approximate Location) Overlaid on the 1954 Aerial Photograph of Mississauga

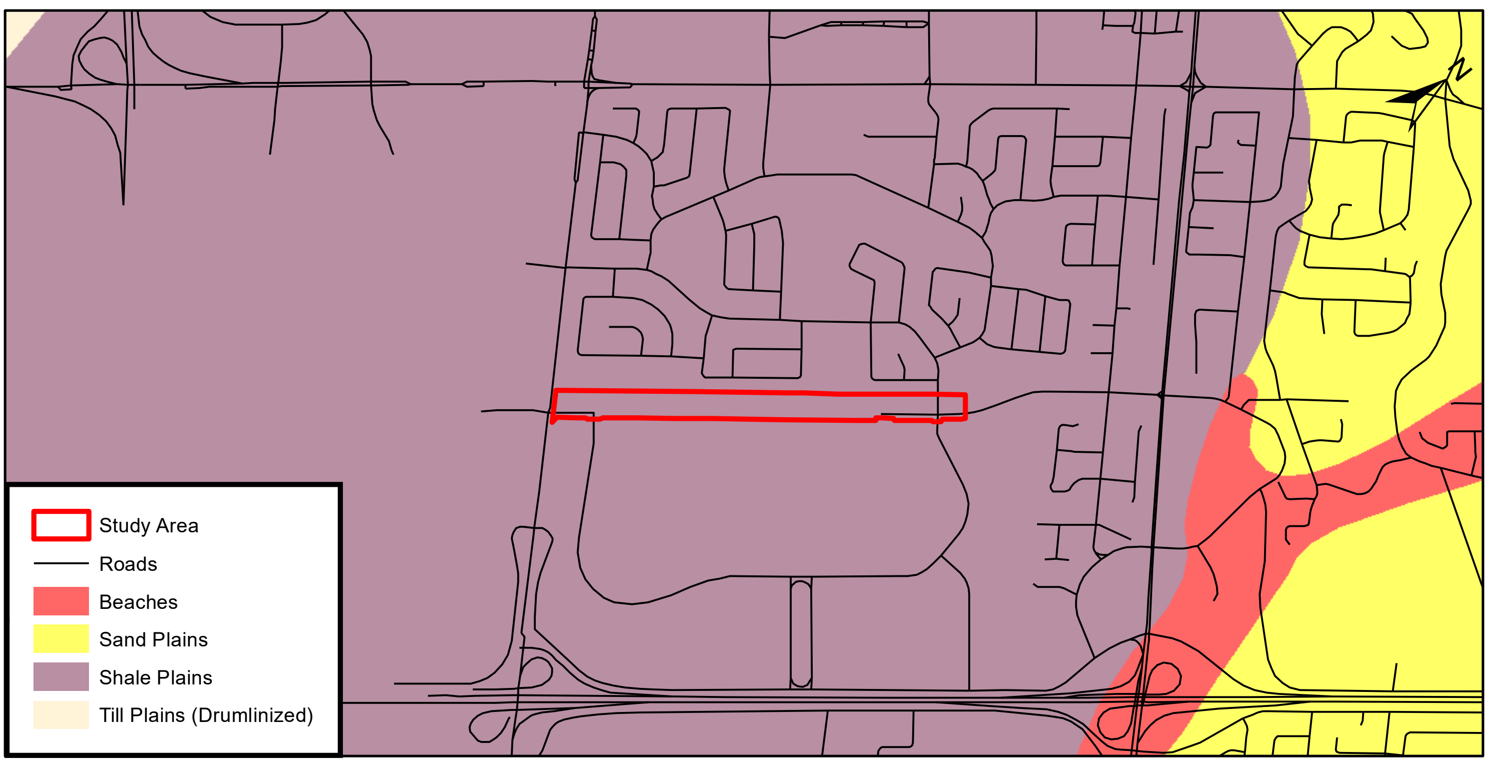

Figure 7: Sheridan Park Drive Extension Study Area - Physiographic Landforms

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Study Area

0 800
Metres

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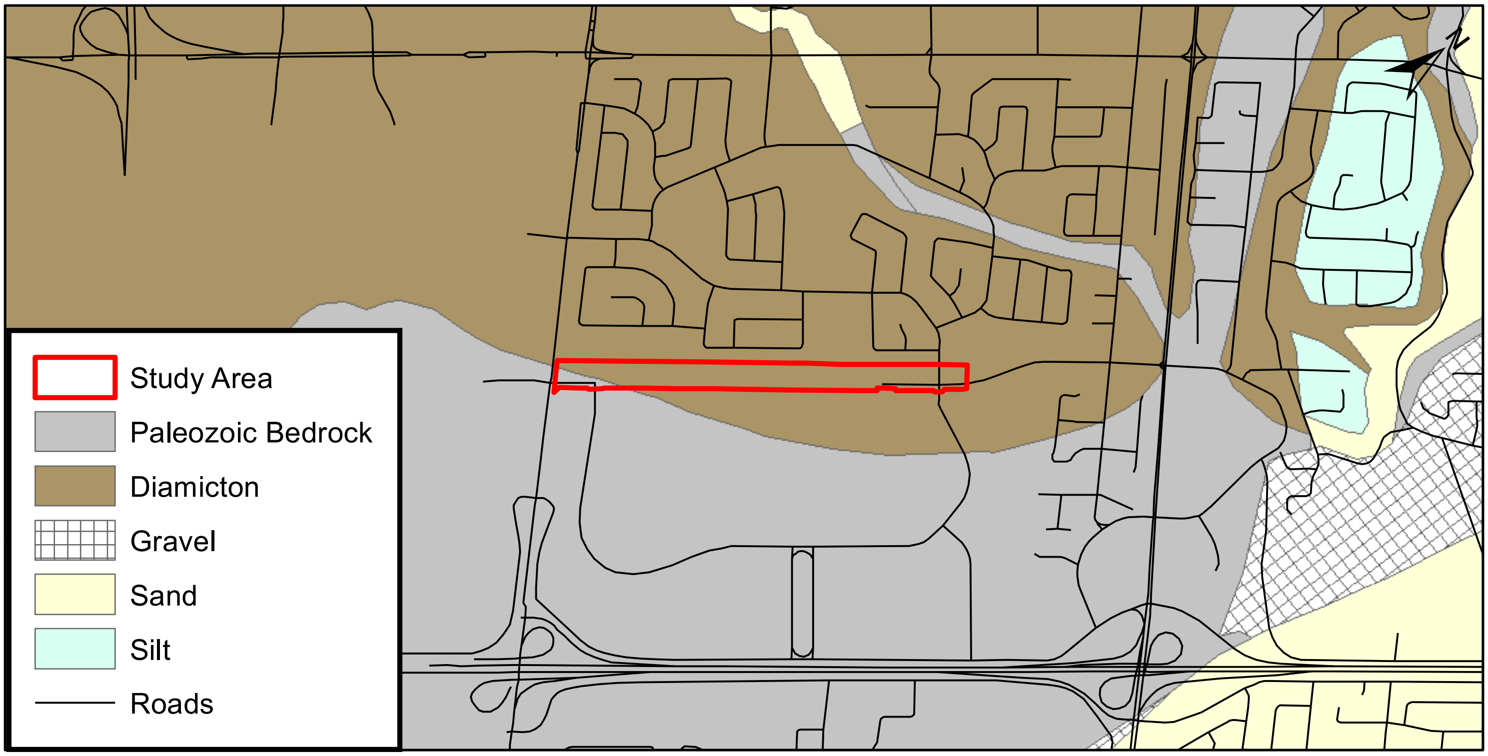

Figure 8: Sheridan Park Drive Extension Study Area - Surficial Geology

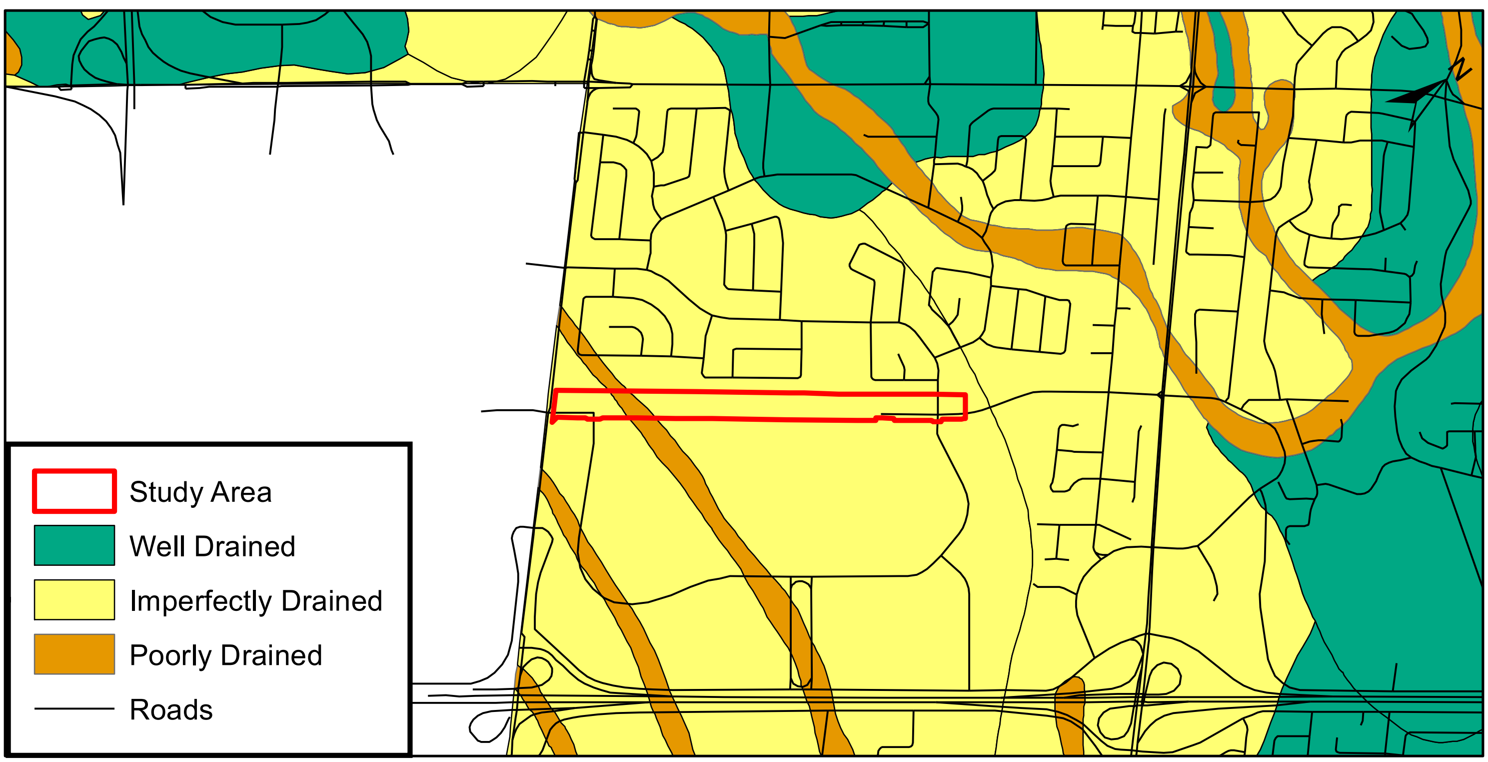

Figure 9: Sheridan Park Drive Extension Study Area - Soil Drainage

ASI Archaeological & Cultural Heritage Services 528 Bathurst Street Toronto, ONTARIO M5S 2P9 416-966-1069 | F416-966-9723 | asiheritage.ca	Study Area		0 800 Metres ASI PROJECT NO.: 16EA-226 DRAWN BY: BW DATE: 17-May-17 FILE: 16EA226_Fig8_9

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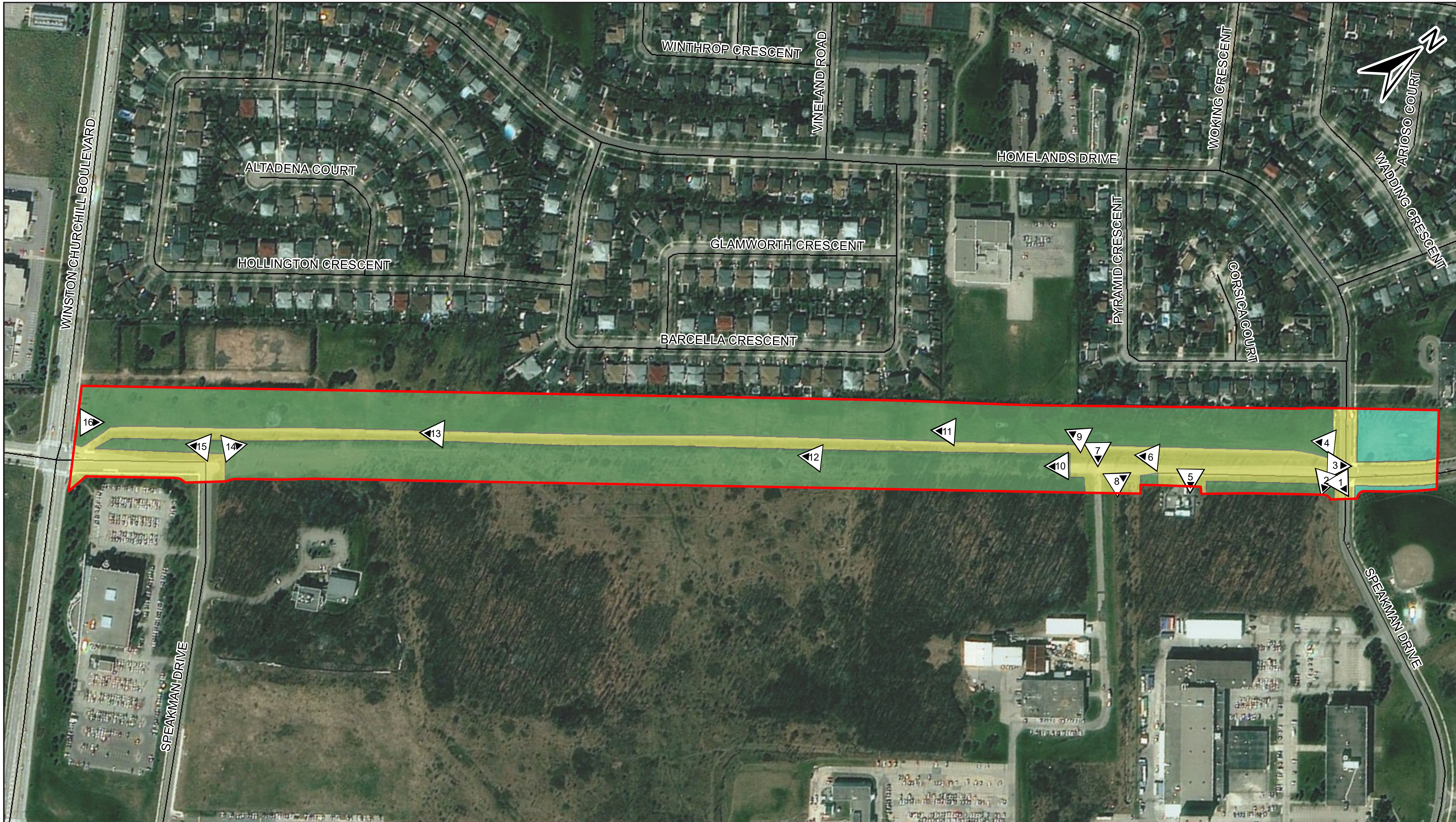

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Study
Photo Plate
Disturbed - No Stage 2 Required
Archaeological Potential - Requires Stage 2 Judgemental Test Pit Survey
Archaeological Potential - Requires Stage 2 Test Pit Survey
Roads

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 150
Metres

ASI PROJECT NO.: 16EA-226
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Figure 10: Sheridan Park Drive Extension - Results of the Property Inspection

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8.0 IMAGES

Plate 1: Southeast view of Speakman Dr. at Sheridan Park Dr.; Area in baseball outfield east of the disturbed ROW requires Stage 2 judgemental test pit survey to confirm disturbance

Plate 2: South view at Speakman and Sheridan; Area beyond disturbed ROW exhibits potential, requires Stage 2 test pit survey

Plate 3: Northeast view of Sheridan Park Dr. at Homelands Dr.; Area beyond disturbed ROWs requires Stage 2 judgemental test pit survey to confirm disturbance

Plate 4: Southwest view of Sheridan Park Drive; Areas northeast of the MUT retains potential, requires Stage 2 test pit survey

Plate 5: Southeast view of transformer facility on Sheridan Park Dr; Area is disturbed, no potential

Plate 6: Southwest view of Sheridan Park Dr terminus; Area is disturbed, no potential

Plate 7: Southeast view of access road into Sheridan Science and Technology Park; Area is within the disturbed ROW, no Stage 2 required

Plate 8: North view of channelized creek under Sheridan Park Dr.; Area is disturbed ROW, no Stage 2 required

Plate 9: West view of the Study Area; Area retains potential, requires Stage 2 test pit survey

Plate 10: West view of the Study Area; Areas around sewer maintenance cover exhibit potential, require Stage 2 test pit survey

Plate 11: Southwest view of the Study Area; Area beyond MUT retains potential, requires Stage 2 test pit survey

Plate 12: Southwest view of the Study Area; Area retains potential, requires Stage 2 test pit survey

Plate 13: Southwest view of the Study Area; Areas beyond MUT retain potential, require Stage 2 test pit survey

Plate 14: Northeast view of the Study Area; Area retains potential, requires Stage 2 test pit survey

Plate 15: Southwest view of the Study Area; Berm between MUT and Sheridan Park Dr. to Winston Churchill Blvd. is disturbed, no potential

Plate 16: Northeast view of Study Area from Winston Churchill Blvd.; Area northwest of MUT retains potential, requires Stage 2 test pit survey

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix G

Stage 2 Archaeological Assessment Report

Stage 2 Archaeological Assessment
Sheridan Park Drive Extension
Part of Lots 32-35, Concession 1 South of Dundas Street
Former Township of Toronto, County of Peel
City of Mississauga, Regional Municipality of Peel, Ontario

ORIGINAL REPORT

Prepared for:

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, ON, N1H 1C4

Archaeological Licence #P1066 (Lytle)
Ministry of Tourism, Culture and Sport PIF# P1066-0057-2017
ASI File: 17EA-128

08 December 2017

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Stage 2 Archaeological Assessment
Sheridan Park Drive Extension
Part Lots 32-35, Concession 1 South of Dundas Street,
Former Township of Toronto, County of Peel
City of Mississauga, Regional Municipality of Peel, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc. (ASI) was contracted by R.J. Burnside and Associates Limited to conduct a Stage 2 Archaeological Assessment (Property Assessment) for the Sheridan Park Drive Extension Municipal Class Environmental Assessment (EA), Schedule B, located in Lots 32-35 Concession 1 South of Dundas Street, in the City of Mississauga, Regional Municipality of Peel, Ontario. This project involves the potential extension of Sheridan Park Drive between the west leg and the east leg of Speakman Drive, along with their intersections and approaches.

A Stage 1 Archaeological Assessment was previously completed to assess the archaeological potential of the study area for this project. ASI completed this assessment in May 2017 and the results were summarized in a report submitted to the Ministry of Tourism, Culture and Sport (MTCS). The Stage 1 determined that the study area exhibits archaeological potential and recommended Stage 2 archaeological assessment prior to development.

The Stage 2 property assessment was conducted by ASI on 09 and 20 October 2017, in accordance with the *Ontario Heritage Act* and the *Standards and Guidelines for Consultant Archaeologists* (S & G). The total size of the Stage 2 study area is approximately 3.2 ha. Test pit survey at 5 m and 10 m intervals was completed on all lands with archaeological potential, where appropriate, in the study area. No archaeological resources were identified during the course of the Stage 2 assessment.

In light of the above results, ASI makes the following recommendations:

1. The study area for the proposed Sheridan Park Drive Extension has been fully documented and no further archaeological assessment is required on these lands; and,

2. Should the proposed work extend beyond the current study area, further archaeological assessment must be conducted to determine the archaeological potential of the surrounding lands.

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc (P094) *Partner / Director, Environmental Assessment Division*
Project Manager:	Sarah Jagelewski, BA (Hon) (R405) *Archaeologist / Assistant Manager - Environmental Assessment Division*
Project Director (Licencee):	Jes Lytle, MSc (P1066) *Archaeologist / Project Manager - Environmental Assessment Division*
Field Director:	Alanna Martini, BA (R1088)
Field Archaeologists	Meagan Butt, MA Ben Mahar, BA Emily Meikle, MMSt
Report Preparation:	Michael Brand, PhD (P160) *Archaeologist / Technical Writer - Environmental Assessment Division*
Graphics:	Blake Williams, MLitt (P383) *Archaeologist / Geomatics Specialist - Operations Division*
Report Reviewers:	Sarah Jagelewski Lisa Merritt

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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by R.J. Burnside and Associates Limited to conduct a Stage 2 Archaeological Assessment (Property Assessment) for the Sheridan Park Drive Extension Municipal Class Environmental Assessment (EA), Schedule B, located in part of Lots 32-35, Concession 1 South of Dundas Street, in the City of Mississauga, Regional Municipality of Peel (Figure 1). This project involves the potential extension of Sheridan Park Drive between the west leg and east leg of Speakman Drive, along with their intersections and approaches, covering an area of approximately 3.2 ha.

Following the *Standards and Guidelines for Consultant Archaeologists* (S & G), the objectives are this report are:

- To provide information about the geography, history, previous archaeological fieldwork and current land condition of the study area (Stage 1 background study);
- To document all archaeological resources in the study area;
- To determine whether the study area contains archaeological resources with cultural heritage value or interest (CHVI) that would require further assessment; and,
- To recommend appropriate Stage 3 archaeological assessment strategies for any archaeological sites identified.

This report addresses these objectives in terms of the Project as follows: Section 1.0 first identifies the development context for the Project, then summarizes the historical and archaeological context represented by the Stage 1 background study and property inspection that was previously conducted; Section 2.0 first outlines the field methods employed to conduct the Stage 2 fieldwork, then summarizes the survey results; Section 3.0 documents any archaeological resources that were recovered; Section 4.0 provides an analysis of the background research and the fieldwork completed; Section 5.0 presents recommendation for the next assessment steps; and the remaining sections contain other report information that is required by the S & G, which is administered by the Ministry of Tourism, Culture and Sport (MTCS), such as advice on compliance with legislation, references cited, photo-documentation and mapping.

1.1 Development Context

All activities carried out during this assessment have been undertaken as required by the *Environmental Assessment Act*, RSO (1990) and regulations made under the Act, and are therefore subject to all associated legislation. Specifically, this project is being conducted under the Municipal Class EA process, Schedule B. In addition, all activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (MTC 2005), and the S & G. This assessment was conducted under the senior project management of Lisa Merritt (P094), and project direction of Jes Lytle (P1066), both of ASI.

The Stage 2 is being conducted to satisfy recommendations made in the Stage 1 archaeological assessment that was undertaken by ASI in 2017, under the Municipal Class EA process.

Authorization to carry out the activities necessary for the completion of this Stage 2 assessment, including permission to access the study area was granted to ASI by R.J. Burnside and Associates Limited on 22 September 2017.

1.2 Historical Context

The purpose of this section, according to the S & G*,* Section 7.5.7, Standard 1, is to describe the past and present land use, the settlement history and any other relevant historical information gathered through the previous Stage 1 background research and supplement where necessary. First, a summary is presented of the current understanding of the Indigenous land use of the study area. This is followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous History

The background research (ASI 2017) determined that the study area has been occupied by Indigenous peoples for millennia. The study area is within the Credit River watershed, which has a well-documented ancestral Huron-Wendat settlement sequence. In the 1640s, the traditional enmity between the Haudenosaunee[1] and the Huron-Wendat led to the dispersal of the Huron-Wendat. The study area was subsequently utilized by the Haudenosaunee, who established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. The Haudenosaunee abandoned their north shore settlements by the late 1680s, although they did not relinquish their interest in the resources of the area. The territory was immediately occupied or re-occupied by Anishinaabek groups, including the Mississauga, Ojibwa (or Chippewa) and Odawa. The British government began to pursue major land purchases to the north of Lake Ontario in the early nineteenth century. The Crown acknowledged the Mississaugas as the owners of the lands between Georgian Bay and Lake Simcoe and entered into negotiations tracts of land to facilitate European settlement.

1.2.2 Euro-Canadian Settlement History

The detailed background information on the history of Euro-Canadian settlement in the region around the study area presented in the Stage 1 report (ASI 2017) is summarized below.

Historically, the study area is located in part of Lots 32-35, Concession 1 South of Dundas Street, in the Former Township of Toronto, County of Peel. In 1788, the County of Peel was part of the Nassau District, which became known as the Home District in 1792. By 1852, the Home District was replaced by the Counties of York, Ontario and Peel. The population of Toronto Township in 1808 consisted of seven families, scattered along Dundas Street. This important transportation corridor was intended to provide an overland military route between Lake Ontario, Lake St. Clair, and Lake Huron. The road (originally named the Governor's Road) was intended to serve a dual purpose – to support settlement in Upper Canada and as a deterrent to expansionist American interests.

---

[1] The Haudenosaunee are also known as the New York Iroquois or Five Nations Iroquois and after 1722 Six Nations Iroquois. They were a confederation of five distinct but related Iroquoian–speaking groups - the Seneca, Onondaga, Cayuga, Oneida, and Mohawk. Each lived in individual territories in what is now known as the Finger Lakes district of Upper New York. In 1722 the Tuscarora joined the confederacy.

The study area is situated in proximity to the village of Sheridan, which was located approximately 2 km south of Dundas Street on Winston Churchill Boulevard. The village of Sheridan was originally named Hammondsville, after William Ranson Hammond, who emigrated from Pennsylvania in the 1820s and opened a store near the intersection of what is now Winston Churchill Boulevard and the Q.E.W (Mair 2009). The village reached its peak population, of 100 people, in 1877; by 1907 the population had dropped to 50 persons. Sheridan amalgamated with other villages in Toronto Township in 1968 to form the Town of Mississauga, which became the City of Mississauga in 1974 (Heritage Mississauga 2009).

The Stage 1 assessment (ASI 2017) consulted the 1806 Patent Plan of Toronto Township South (Surveyor General 1806), the 1859 Map of the County of Peel (Tremaine 1859), and the 1877 Illustrated Historical Atlas of the County of Peel, Toronto Township South (Walker and Miles 1877), to determine the presence of historic features within the study area during the nineteenth century. According to these maps, no structures were located within, or adjacent to the study area in Lots 32-35.

1.3 Archaeological Context

1.3.1 Previous Archaeological Research

According to the Ontario Archaeological Sites Database (OASD), which is maintained by the MTCS, there are no previously registered archaeological sites located within 1 km of the study area (MTCS 2017).

1.3.2 Current Land Use and Field Conditions

The study area, approximately 3.2 ha in size, is situated on the east side of Winston Churchill Boulevard, approximately 1 km south of Dundas Street, in the City of Mississauga. The study area consists of portions of the existing Sheridan Park Drive roadway on the east and west sides, separated by approximately 850 m of City owned right-of-way (ROW) consisting of cultural meadow, cultural thicket and deciduous forest communities. A number of small tributaries of Sheridan Creek run through the east end of the study area. To the north the study area is immediately bordered by a paved multi-use trail, beyond which is dense residential development. The study area is bordered by commercial and residential developments in the east and west. To the south the study areas is immediately bordered by naturalized private lands consisting of cultural meadow and deciduous forest communities, followed by commercial development.

The Stage 2 property survey was conducted under the field direction of Alanna Martini (R1088) on 09 and 20 October 2017 in accordance with the *Ontario Heritage Act* and the S & G, Section 2.1.

1.3.3 Physiography

The study area is situated within the Iroquois Plain physiographic region of southern Ontario, a lowland region bordering Lake Ontario. This region is characteristically flat, and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, a body of water that existed during the late Pleistocene. The region extends from the Trent River, around the western part of Lake Ontario, to the Niagara River, spanning a distance of 300 km (Chapman and Putnam 1984:190). The old shorelines of Lake Iroquois include cliffs, bars, beaches and boulder pavements. The old sandbars in this region are good aquifers that supply water to farms and villages. A relic shorecliff runs along the east side of Erin Mills Parkway, passing approximately 1 km east of the study area , then curves to the west, running approximately 1.8 km south of the study area.

Surficial geology mapping demonstrates that the study area is underlain by glaciolacustrine deposits of clay to silt-textured till and Paleozoic bedrock (Ontario Geological Survey 2010). Soils in the study area consist primarily of imperfectly drained Trafalgar clay, a grey-brown podzolic, and poorly drained Bottom Land, an alluvial soil associated with stream courses (Hoffman and Richards 1953:61,63).

The study area is within the Sheridan Creek and Loyalist Creek sub-watersheds, within the Credit River watershed. Sheridan Creek is a long, narrow, urbanized watershed located on the west side of the City of Mississauga that drains an area of approximately 1,035 hectares into Rattray Marsh on Lake Ontario (Aquafor Beech Ltd. 2011). Increased development of the Sheridan Creek watershed in the twentieth century led to major modifications to the Sheridan Creek watercourse. Loyalist Creek is a small tributary of the Credit River, originating near Winston Churchill Boulevard and Dundas Street West, draining into the Credit River east of Mississauga Road near Blythe Road (Credit Valley Conservation 2009).

2.0 FIELD METHODS

The Stage 2 Archaeological Assessment for the Sheridan Park Drive Extension was conducted on 09 and 20 October 2017 under the field direction of Alanna Martini (R1088) in accordance with the S & G Section 2. During all periods of field assessment, weather and lighting conditions permitted good visibility and were in accordance with the S & G*,* Section 2.1, Standard 3. Photographs of all field conditions were taken (Plates 1-26), and the location and direction of each photograph is mapped (Figures 3-6).

The Stage 2 study area is approximately 3.2 ha and consists of portions of the existing Sheridan Park Drive roadway on the east and west sides and the proposed road extension area (to proposed grading limit) within the City owned ROW. Approximately 38% (1.23 ha) of the study area was previously assessed as disturbed (Figures 3 and 6) in ASI's Stage 1 Archaeological Assessment report (ASI 2017).

The remainder of the study area was assessed as having archaeological potential (62 %, 1.98 ha) and was subject to Stage 2 test pit survey. According to Section 2.1.2, Standard 2 of the S & G, any undisturbed areas requiring test pit survey within 300 m of any feature of archaeological potential must be subject to systematic assessment at 5 m intervals. Approximately 3% (0.09 ha) of the study area was found to contain intact soil deposits and therefore subject to test pit survey at five metre intervals (Figure 5). Lands containing intact soil profiles consist of a small section approximately in the middle of the study area. Undisturbed stratigraphy within the study area is characterized by 25-35 cm of brownish black (10YR 3/2) moderately compact, clay-loam topsoil overlying yellowish brown (10YR 5/8) clay subsoil (Plate 1). Some of the test pits in this area included gravel and pockets of grey clay (Plate 2), suggesting that the area had experienced some disturbance.

The Stage 2 property survey found that remaining 59 % (1.89 ha) of the study area consisted of disturbed lands that were subject to judgmental test pit survey at 10 m intervals to confirm the extent of disturbance (Figures 3-6; Plates 3-26), in accordance with Section 2.1.8, Standard 2 of the S & G. In the eastern end of the study area disturbed profiles consisted of dense gravel with coarse sand, overlying clay with gravel and cobbles (Plate 26). A dense stone layer at approximately 40 cm below surface precluded further excavation. Stratigraphic profiles in the remaining disturbed portions of the study area consist of 100+ cm of magenta coloured clay, with gravel, cobbles and pockets of grey clay (Plate 16).

All test pits were excavated following the S & G Section 2.1.2, Standards 4-9. All test pits were excavated stratigraphically by hand to a minimum of 30 cm in diameter. All test pits were excavated into the first five centimetres of subsoil where viable and examined for stratigraphy, cultural features and evidence of fill. Test pit fill was screened through six millimetre mesh to facilitate artifact recovery. Afterwards, all test pits were backfilled and their locations were recorded on field maps. Any factors that precluded the excavation of test pits (e.g. excessive slope, drainage, exposed bedrock, previous disturbance) were noted, and the areas were mapped and photographed.

3.0 RECORD OF FINDS

No artifacts with cultural heritage value were recovered during the Stage 2 Archaeological Assessment of the Sheridan Park Drive Extension study area.

3.1 Documentary and Material Record

The documentation related to this archaeological assessment will be curated by ASI until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the MTCS, and any other legitimate interest groups.

Table 1 provides an inventory and location of the documentary and material record for the project in accordance with the S & G, Sections 6.7 and 7.8.2.3.

Table 1: Inventory of Documentary and Material Record

Document/Material	Location	Comments
Written Field Notes, Annotated Field Maps, GPS Logs, etc.	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON, M5S 2P9	Field notes hard copy, GPS data (digital)
Field Photography (Digital)	As above	Stored on ASI network servers and/or CD-ROM
Research/Analysis/Reporting Materials (Various Formats)	As above	Hard copy and/or digital files stored on ASI network servers and/or CD-ROM

4.0 ANALYSIS AND CONCLUSIONS

A Stage 2 Archaeological Assessment was conducted as part of the proposed Sheridan Park Drive Extension environmental assessment, following recommendations made in the Stage 1 report previously completed by ASI in 2017.

The Stage 2 property survey was conducted by means of test pit survey at 5 m and 10 m intervals. No archaeological resources were identified during the course of the Stage 2 assessment.

5.0 RECOMMENDATIONS

In light of the above results, ASI makes the following recommendations:

1. The study area for the proposed Sheridan Park Drive Extension has been fully documented and no further archaeological assessment is required on these lands; and,

2. Should the proposed work extend beyond the current study area, further archaeological assessment must be conducted to determine the archaeological potential of the surrounding lands.

Notwithstanding the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Cultural Programs Unit of the MTCS should be immediately notified.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

In addition, the following advice on compliance is provided:

- This report is submitted to the Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the MTCS, a letter will be issued by the Ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development;

- It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological field work on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*;

- Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with sec. 48 (1) of the *Ontario Heritage Act*;

- The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33, requires that any person discovering or having knowledge of a burial site shall immediately notify the police or coroner. It is recommended that the Registrar of Cemeteries at the Ministry of Consumer Services is also immediately notified.

7.0 REFERENCES CITED

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2017 Stage 1 Archaeological Assessment Sheridan Park Drive Extension Part of Lots 32-35, Concession 1 South of Dundas Street (Former Township of Toronto, County of Peel) City of Mississauga, Regional Municipality of Peel, Ontario. [PIF P1066-0034-2017) Report on file, Ontario Ministry of Culture, Tourism and Sport, Toronto.

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8.0 MAPPING

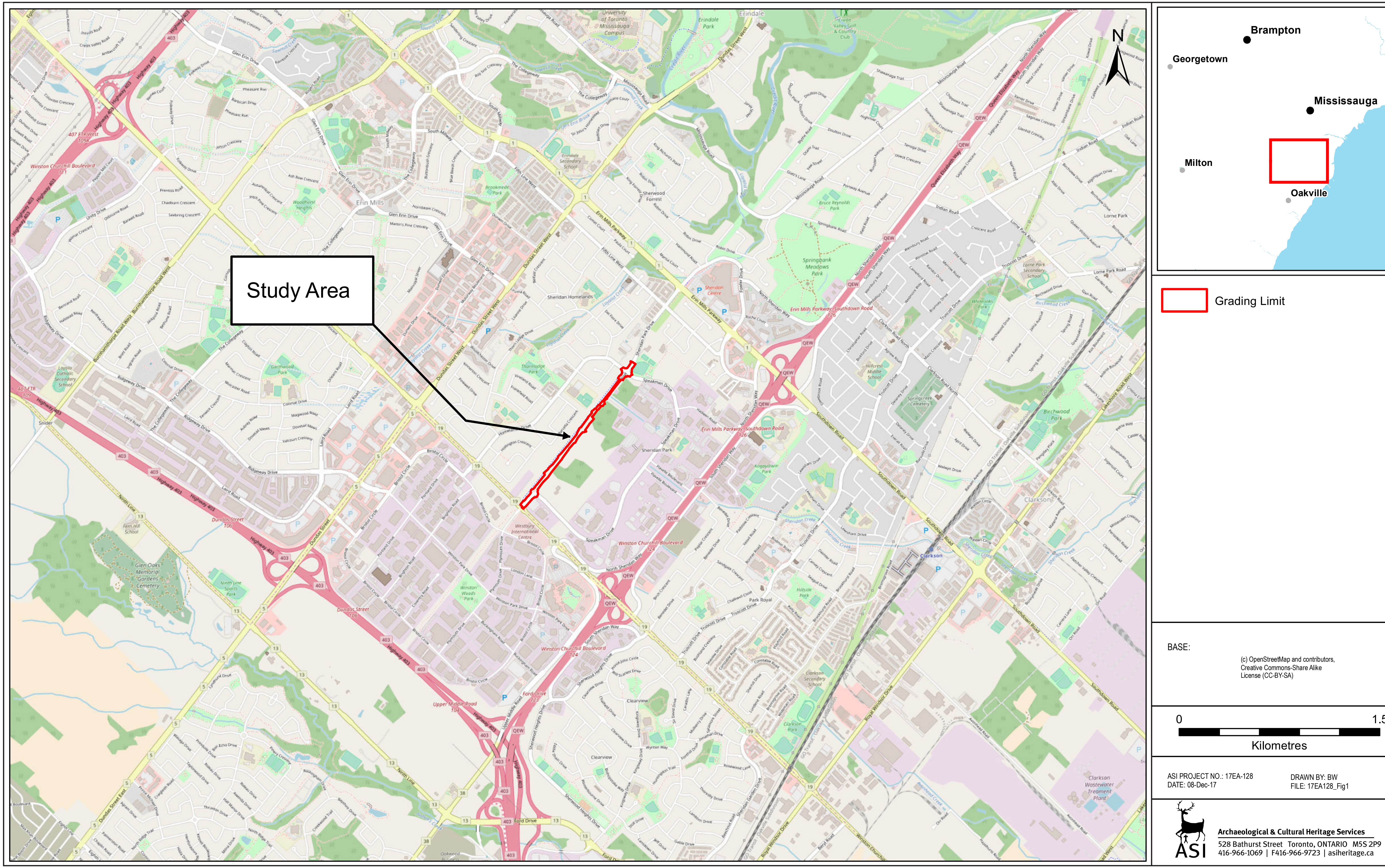
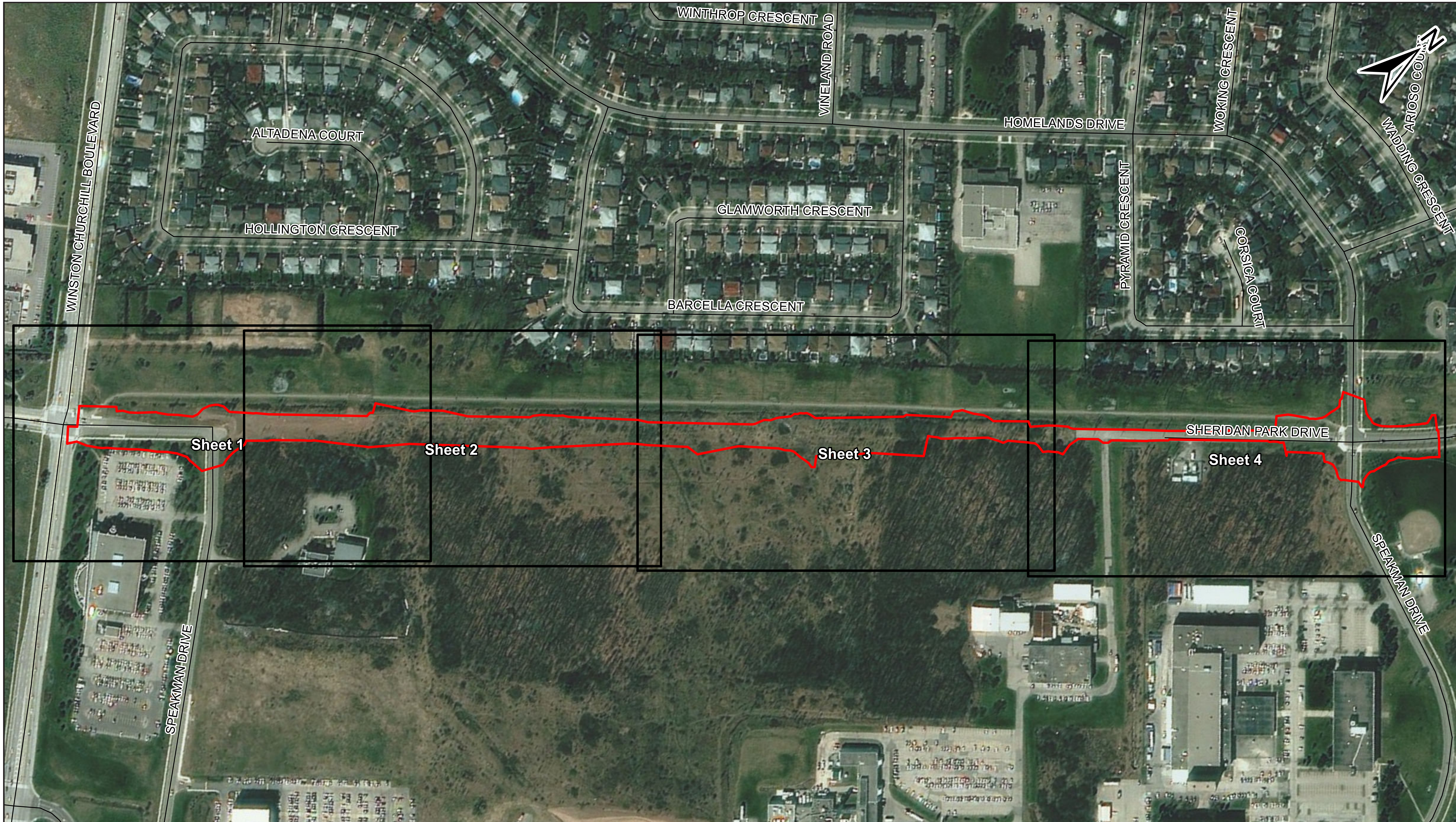


Figure 1: Sheridan Park Drive Extension Study Area Location



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ASI

Grading Limit — Roads

BASE:

Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Metres

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Figure 2: Sheridan Park Drive Extension Study Area Property Survey Key Map.

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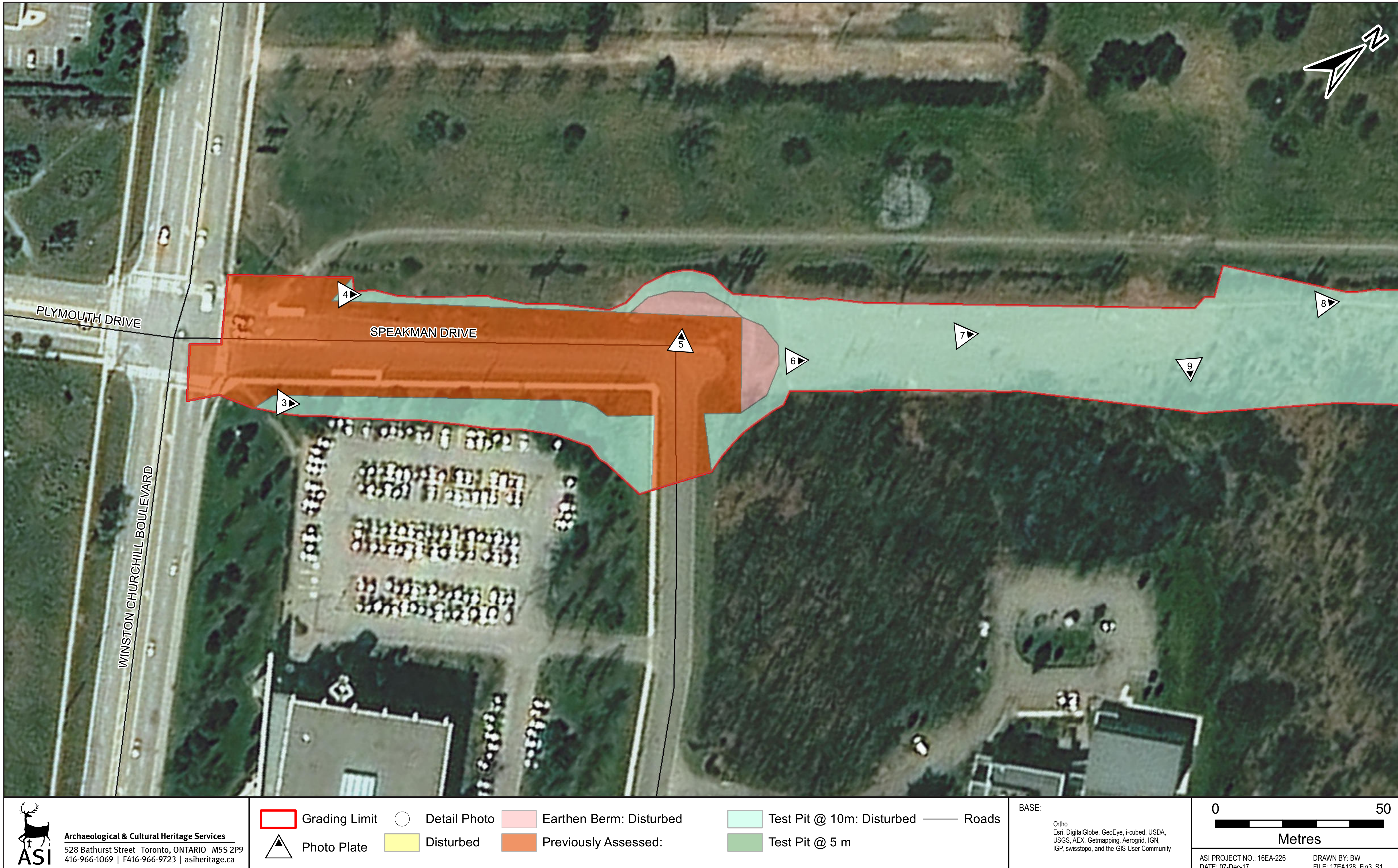

Figure 3: Sheridan Park Drive Extension Study Area Property Survey Results - Sheet 1.

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Grading Limit
Photo Plate
Detail Photo
Disturbed
Earthen Berm: Disturbed
Previously Assessed:
Test Pit @ 10m: Disturbed
Test Pit @ 5 m
Roads

BASE:

Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Figure 4: Sheridan Park Drive Extension Study Area Property Survey Results - Sheet 2.

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Figure 5: Sheridan Park Drive Extension Study Area Property Survey Results - Sheet 3.

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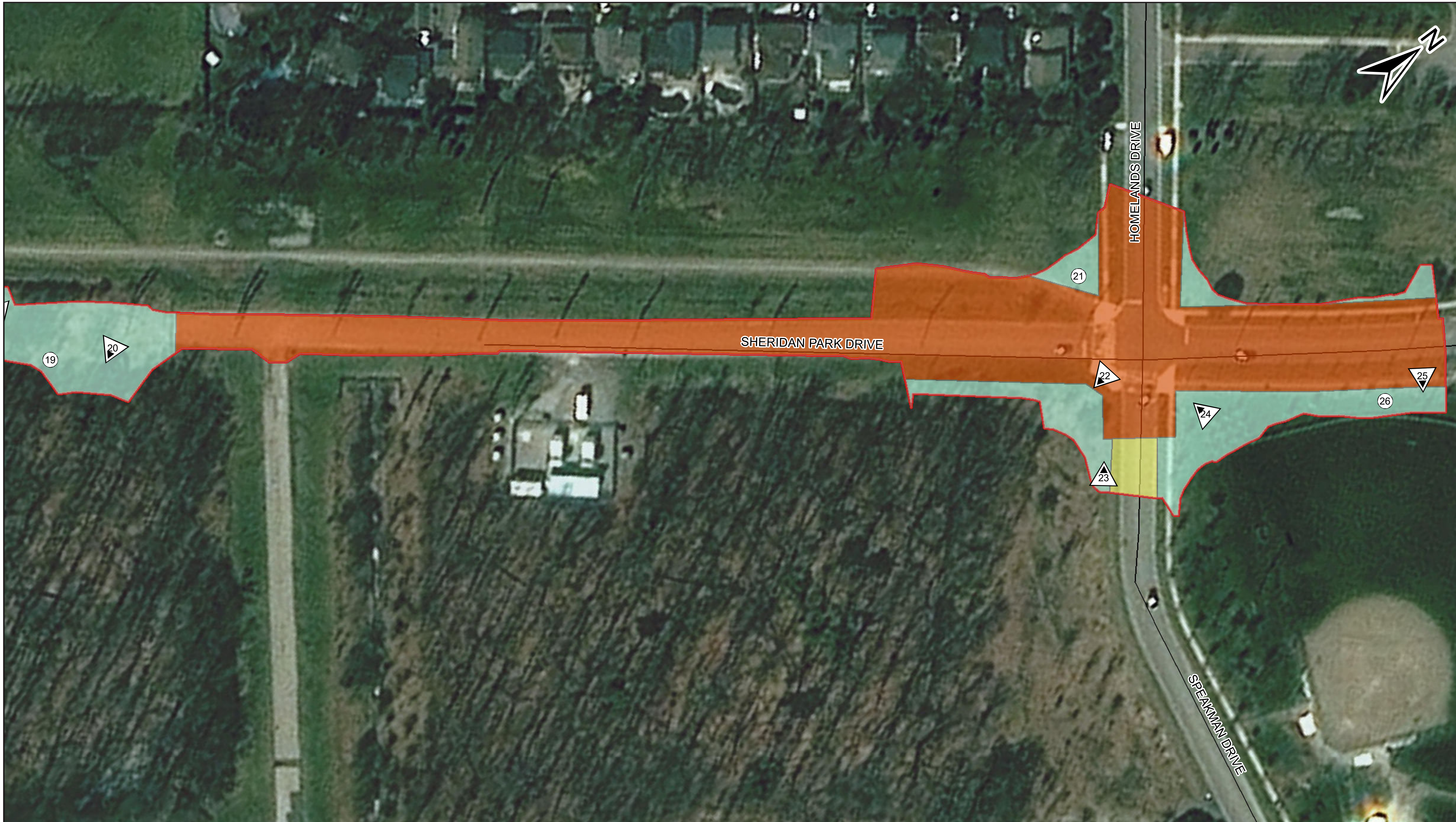

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Grading Limit
Detail Photo
Earthen Berm: Disturbed
Test Pit @ 10m: Disturbed
Roads
Photo Plate
Disturbed
Previously Assessed:
Test Pit @ 5 m

BASE:
Ortho
Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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Figure 6: Sheridan Park Drive Extension Study Area Property Survey Results - Sheet 4.

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9.0 IMAGES

Fieldwork Plates:

Plate 1: Detailed photo of intact test pit profile in portion of study area test pitted at a 5 m interval.

Plate 2: Detailed photo of test pit profile showing grey clay inclusions in portion of study area test pitted at a 5 m interval.

Plate 3: View NE showing test pitting at 10 m interval on the south side of Sheridan Park Drive, west side of study area.

Plate 4: View NE showing test pitting at 10 m interval on the north side of Sheridan Park Drive, west side of study area.

Plate 5: View NW showing utility access cover and earthen berm on the north side of Sheridan Park Drive, west side of study area.

Plate 6: View NE at test pit survey at 10 m intervals, immediately east of the earthen berm at the end of the existing Sheridan Park Drive, at the west leg of Speakman Drive.

Plate 7: View NE showing route of buried natural gas pipeline through study area.

Plate 8: View NE at test pit survey at 10 m intervals in the northern portion of the study area.

Plate 9: View SE at lands in the western portion of the study area subject to test pit survey at 10 m intervals.

Plate 10: View NW at lands in the western portion of the study area subject to test pit survey at 10 m intervals.

Plate 11: View SE at utility access cover in the western portion of the study area.

Plate 12: View East at lands in the central portion of the study area subject to test pit survey at 10 m intervals.

Plate 13: View SW at lands in the central portion of the study area subject to test pit survey at 10 m intervals.

Plate 14: View East at test pit survey at 10 m intervals in the central portion of the study area.

Plate 15: Detailed photo of disturbed test pit profile in central portion of study area.

Plate 16: Detailed photo of disturbed test pit, showing magenta and grey clays.

Plate 17: View SW showing partially exposed pipes in the central portion of the study area.

Plate 18: View SE utility access covers in the eastern portion of the study area.

Plate 19: Detailed photo of disturbed test pit in the eastern portion of the study area.

Plate 20: View S at surface debris and test pitting at a 10 m interval in the eastern portion of the study area.

Plate 21: Detailed photo of disturbed test pit near the intersection of Sheridan Park Drive and Homelands Drive.

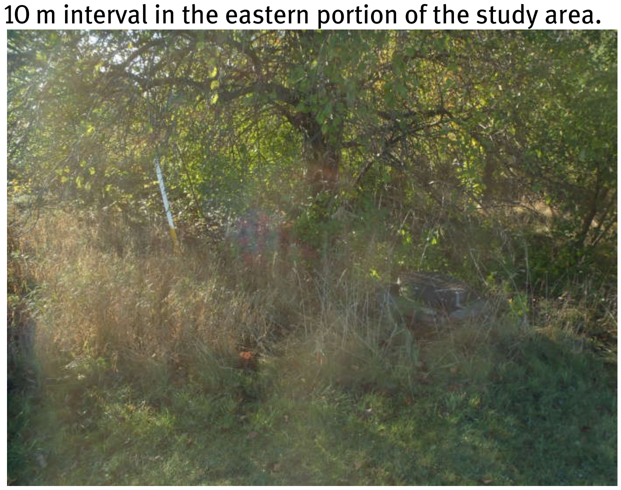

Plate 22: View S at buried gas pipeline and utility access cover at the intersection of Sheridan Park Drive and the east leg of Speakman Drive.


Plate 23: View NW at lands subject to test pit survey at 10 m intervals at the south side of the intersection of Sheridan Park Drive and the east leg of Speakman Drive.


Plate 24: View W at disturbance due to buried utilities at the east side of the intersection of Sheridan Park Drive and the east leg of Speakman Drive.

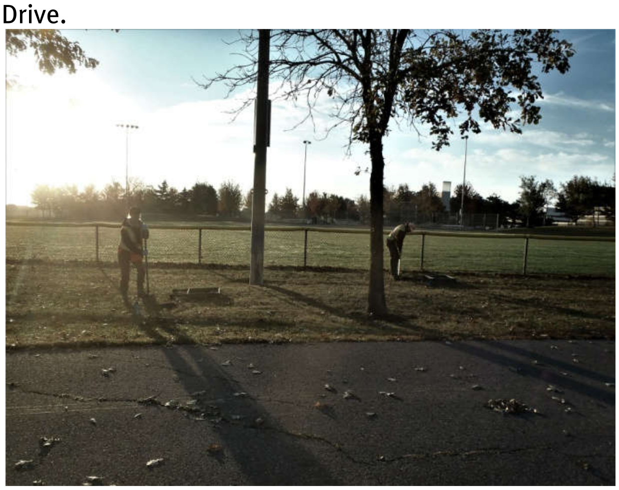
Plate 25: View SE at lands subject to test pit survey at 10 m intervals south of Sheridan Park Drive east of the intersection with Speakman Drive.


Plate 26: Detailed photo of disturbed test pit south of Sheridan Park Drive east of the intersection with Speakman Drive.

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Appendix H

Cultural Heritage Resource Assessment Report

CULTURAL HERITAGE RESOURCE ASSESSMENT:
BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES

EXISTING CONDITIONS AND IMPACT ASSESSMENT

SHERIDAN PARK DRIVE EXTENSION
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

CITY OF MISSISSAUGA,
REGIONAL MUNICIPALITY OF PEEL, ONTARIO

Prepared for:

R.J. Burnside &Associates Limited
292 Speedvale Avenue West
Guelph, ON, N1H 1C4

ASI File: 16EA-227

June 2017 (Revised July 2017)

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CULTURAL HERITAGE RESOURCE ASSESSMENT:
BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPES

EXISTING CONDITIONS AND IMPACT ASSESSMENT

SHERIDAN PARK DRIVE EXTENSION
CLASS ENVIRONMENTAL ASSESSMENT

CITY OF MISSISSAUGA,
REGIONAL MUNICIPALITY OF PEEL, ONTARIO

EXECUTIVE SUMMARY

ASI was contracted by R.J. Burnside & Associates Limited to conduct a Cultural Heritage Resource Assessment as part of the Sheridan Park Drive Extension Municipal Class Environmental Assessment. The project involves the potential extension of Sheridan Park Drive between the east leg and west leg of Speakman Drive, along with their intersections and approaches, in the City of Mississauga. The Sheridan Park Drive Extension study area includes a multi-use trail (MUT) through a utility corridor and is generally bounded by residential development to the north, and the Sheridan Park Corporate Centre to the south.

The results of background historical research and a review of secondary source material, including historical mapping, revealed a study area with a rural land use history dating back to the early-nineteenth century. A review of available heritage inventories revealed that there is one previously identified cultural heritage resource within and/or adjacent to the study area. No additional resources of cultural heritage interest were identified during the field review. Based on the results of background data collection and field review, the following recommendations have been developed:

1. Construction activities and staging should be suitably planned and undertaken to avoid impacts to identified cultural heritage resources.

2. Should future work require an expansion of the study area then a qualified heritage consultant should be contacted in order to confirm the impacts of the proposed work on potential heritage resources.

PROJECT PERSONNEL

Senior Project Manager:	Annie Veilleux, MA, CAHP *Cultural Heritage Specialist | Manager* *Cultural Heritage Division*
Project Manager:	John Sleath, MA *Archaeologist / Cultural Heritage Assistant* *Cultural Heritage Division*
Project Coordinator:	Sarah Jagelewski, BA (Hon) *Archaeologist | Assistant Manager* *Environmental Assessment Division*
Report Preparation:	John Sleath
Graphics Preparation:	Blake Williams, MLitt *Archaeologist | Geomatics Specialist* *Operations Division*
Report Reviewer:	Annie Veilleux

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1.0 INTRODUCTION

ASI was contracted by R.J. Burnside & Associates Limited to conduct a Cultural Heritage Resource Assessment as part of the Sheridan Park Drive Extension Municipal Class Environmental Assessment. The project involves the potential extension of Sheridan Park Drive between the east leg and west leg of Speakman Drive, along with their intersections and approaches, in the City of Mississauga. The Sheridan Park Drive Extension study areaincludes a multi-use trail (MUT) through a utility corridor and is generally bounded by residential development to the north, and the Sheridan Park Corporate Centre to the south (Figure 1).

The purpose of this report is to present an inventory of cultural heritage resources, identify existing conditions of the Sheridan Park Drive study area, identify impacts to cultural heritage resources, and propose appropriate mitigation measures. This research was conducted by John Sleath, Cultural Heritage Assistant, under the senior project management of Annie Veilleux, Manager of the Cultural Heritage Division, both of ASI.

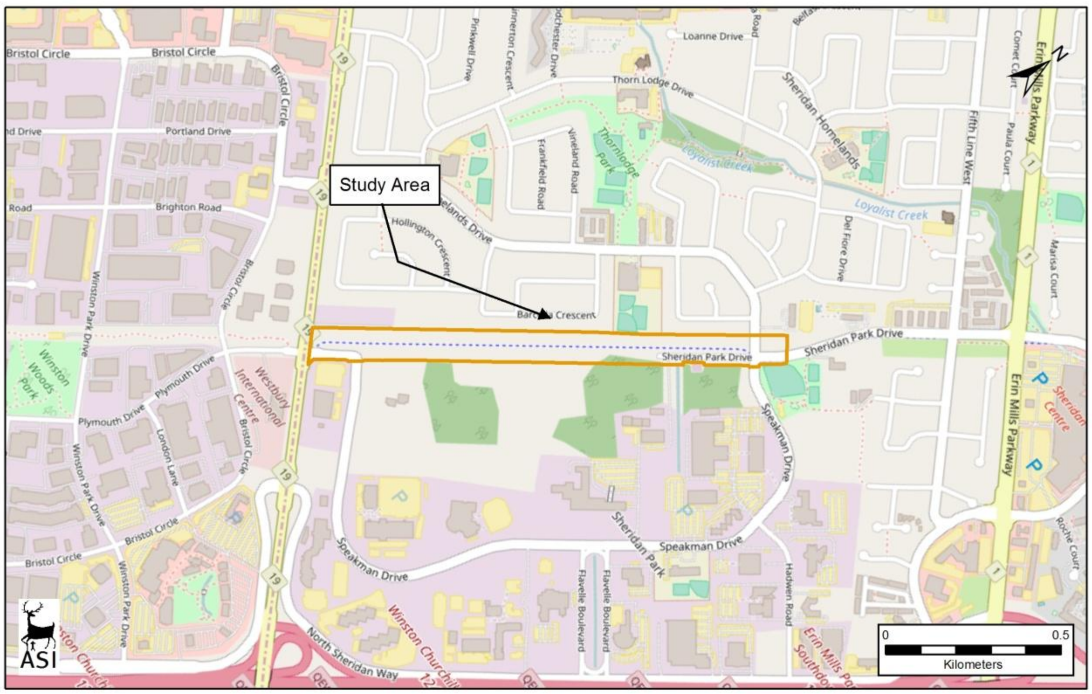

Figure 1: Location of the study area

Base Map:©OpenStreetMap and contributors
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2.0 BUILT HERITAGE RESOURCE AND CULTURAL HERITAGE LANDSCAPE ASSESSMENT CONTEXT

2.1 Legislation and Policy Context

This cultural heritage assessment considers cultural heritage resources in the context of improvements to specified areas, pursuant to the *Environmental Assessment Act*. This assessment addresses above ground cultural heritage resources over 40 years old. Use of a 40 year old threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources (Ministry of Transportation 2006; Ministry of Transportation 2007; Ontario Realty Corporation 2007). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly younger than 40 years old, this does not preclude the resource from retaining heritage value.

For the purposes of this assessment, the term cultural heritage resources was used to describe both cultural heritage landscapes and built heritage resources. A cultural landscape is perceived as a collection of individual built heritage resources and other related features that together form farm complexes, roadscapes and nucleated settlements. Built heritage resources are typically individual buildings or structures that may be associated with a variety of human activities, such as historical settlement and patterns of architectural development.

The analysis throughout the study process addresses cultural heritage resources under various pieces of legislation and their supporting guidelines. Under the *Environmental Assessment Act* (1990) environment is defined in Subsection 1(c) to include:

- cultural conditions that influence the life of man or a community, and;
- any building, structure, machine, or other device or thing made by man.

The Ministry of Tourism, Culture and Sport is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of the heritage of Ontario and has published two guidelines to assist in assessing cultural heritage resources as part of an environmental assessment: *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (1992), and *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (1981). Accordingly, both guidelines have been utilized in this assessment process.

The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (Section 1.0) states the following:

> When speaking of man-made heritage we are concerned with the works of man and the effects of his activities in the environment rather than with movable human artifacts or those environments that are natural and completely undisturbed by man.

In addition, environment may be interpreted to include the combination and interrelationships of human artifacts with all other aspects of the physical environment, as well as with the social, economic and cultural conditions that influence the life of the people and communities in Ontario. The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* distinguish between two basic ways of visually experiencing this heritage in the environment, namely as cultural heritage landscapes and as cultural features.

Within this document, cultural heritage landscapes are defined as the following (Section 1.0):

> The use and physical appearance of the land as we see it now is a result of man's activities over time in modifying pristine landscapes for his own purposes. A cultural landscape is perceived as a collection of individual man-made features into a whole. Urban cultural landscapes are sometimes given special names such as townscapes or streetscapes that describe various scales of perception from the general scene to the particular view. Cultural landscapes in the countryside are viewed in or adjacent to natural undisturbed landscapes, or waterscapes, and include such land uses as agriculture, mining, forestry, recreation, and transportation. Like urban cultural landscapes, they too may be perceived at various scales: as a large area of homogeneous character; or as an intermediate sized area of homogeneous character or a collection of settings such as a group of farms; or as a discrete example of specific landscape character such as a single farm, or an individual village or hamlet.

A cultural feature is defined as the following (Section 1.0):

> …an individual part of a cultural landscape that may be focused upon as part of a broader scene, or viewed independently. The term refers to any man-made or modified object in or on the land or underwater, such as buildings of various types, street furniture, engineering works, plantings and landscaping, archaeological sites, or a collection of such objects seen as a group because of close physical or social relationships.

The Minister of Tourism, Culture, and Sport has also published *Standards and Guidelines for Conservation of Provincial Heritage Properties* (April 2010; Standards and Guidelines hereafter). These Standards and Guidelines apply to properties the Government of Ontario owns or controls that have cultural heritage value or interest. They are mandatory for ministries and prescribed public bodies and have the authority of a Management Board or Cabinet directive. Prescribed public bodies include:

- Agricultural Research Institute of Ontario
- Hydro One Inc.
- Liquor Control Board of Ontario
- McMichael Canadian Art Collection
- Metrolinx
- The Niagara Parks Commission.
- Ontario Heritage Trust
- Ontario Infrastructure Projects Corporation
- Ontario Lottery and Gaming Corporation
- Ontario Power Generation Inc.
- Ontario Realty Corporation
- Royal Botanical Gardens
- Toronto Area Transit Operating Authority
- St. Lawrence Parks Commission

The Standards and Guidelines provide a series of definitions considered during the course of the assessment:

A provincial heritage property is defined as the following (14):

> Provincial heritage property means real property, including buildings and structures on the property, that has cultural heritage value or interest and that is owned by the Crown in right of Ontario or by a prescribed public body; or that is occupied by a ministry or a prescribed public body if the terms of the occupancy agreement are such that the ministry or public body is entitled to make the alterations to the property that may be required under these heritage standards and guidelines.

A provincial heritage property of provincial significance is defined as the following (14):

> Provincial heritage property that has been evaluated using the criteria found in Ontario Heritage Act O.Reg. 10/06 and has been found to have cultural heritage value or interest of provincial significance.

A built heritage resource is defined as the following (13):

> …one or more significant buildings (including fixtures or equipment located in or forming part of a building), structures, earthworks, monuments, installations, or remains associated with architectural, cultural, social, political, economic, or military history and identified as being important to a community. For the purposes of these Standards and Guidelines, "structures" does not include roadways in the provincial highway network and in-use electrical or telecommunications transmission towers.

A cultural heritage landscape is defined as the following (13):

> … a defined geographical area that human activity has modified and that has cultural heritage value. Such an area involves one or more groupings of individual heritage features, such as structures, spaces, archaeological sites, and natural elements, which together form a significant type of heritage form distinct from that of its constituent elements or parts. Heritage conservation districts designated under the Ontario Heritage Act, villages, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trails, and industrial complexes of cultural heritage value are some examples.

Additionally, the *Planning Act* (1990) and related *Provincial Policy Statement* (*PPS*), which was updated in 2014, make a number of provisions relating to heritage conservation. One of the general purposes of the *Planning Act* is to integrate matters of provincial interest in provincial and municipal planning decisions. In order to inform all those involved in planning activities of the scope of these matters of provincial interest, Section 2 of the *Planning Act* provides an extensive listing. These matters of provincial interest shall be regarded when certain authorities, including the council of a municipality, carry out their responsibilities under the *Act*. One of these provincial interests is directly concerned with:

> 2.(d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest

Part 4.7 of the *PPS* states that:

> The official plan is the most important vehicle for implementation of this Provincial Policy Statement. Comprehensive, integrated and long-term planning is best achieved through official plans.

> Official plans shall identify provincial interests and set out appropriate land use designations and policies. To determine the significance of some natural heritage features and other resources, evaluation may be required.
>
> Official plans should also coordinate cross-boundary matters to complement the actions of other planning authorities and promote mutually beneficial solutions. Official plans shall provide clear, reasonable and attainable policies to protect provincial interests and direct development to suitable areas.
>
> In order to protect provincial interests, planning authorities shall keep their official plans up-to-date with this Provincial Policy Statement. The policies of this Provincial Policy Statement continue to apply after adoption and approval of an official plan.

Those policies of particular relevance for the conservation of heritage features are contained in Section 2- Wise Use and Management of Resources, wherein Subsection 2.6 - Cultural Heritage and Archaeological Resources, makes the following provisions:

> 2.6.1 Significant built heritage resources and significant cultural heritage landscapes shall be conserved.

A number of definitions that have specific meanings for use in a policy context accompany the policy statement. These definitions include built heritage resources and cultural heritage landscapes.

A *built heritage resource* is defined as: “a building, structure, monument, installation or any manufactured remnant that contributes to a property’s cultural heritage value or interest as identified by a community, including an Aboriginal community” (PPS 2014).

A *cultural heritage landscape* is defined as “a defined geographical area that may have been modified by human activity and is identified as having cultural heritage value or interest by a community, including an Aboriginal community. The area may involve features such as structures, spaces, archaeological sites or natural elements that are valued together for their interrelationship, meaning or association” (PPS 2014). Examples may include, but are not limited to farmscapes, historic settlements, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trailways, and industrial complexes of cultural heritage value.

In addition, significance is also more generally defined. It is assigned a specific meaning according to the subject matter or policy context, such as wetlands or ecologically important areas. With regard to cultural heritage and archaeology resources, resources of significance are those that are valued for the important contribution they make to our understanding of the history of a place, an event, or a people (*PPS* 2014).

Criteria for determining significance for the resources are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used. While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation (*PPS* 2014).

Accordingly, the foregoing guidelines and relevant policy statement were used to guide the scope and methodology of the cultural heritage assessment.

2.2 City of Mississauga Municipal Heritage Policies

The City of Mississauga's Official Plan (2012) sets out a number of policies with regard to cultural heritage resources. Policies that are relevant to this study are included below:

> 7.4.1.1 The heritage policies are based on two principles:
> a. heritage planning will be an integral part of the planning process; and,
> b. cultural heritage resources of significant value will be identified, protected, and preserved.
>
> 7.4.1.2 Mississauga will discourage the demolition, destruction or inappropriate alteration or reuse of cultural heritage resources.
>
> 7.4.1.3 Mississauga will require development to maintain locations and settings for cultural heritage resources that are compatible with and enhance the character of the cultural heritage resource.
>
> 7.4.1.10 Applications for development involving cultural heritage resources will be required to include a *Heritage Impact Statement* prepared to the satisfaction of the City and other appropriate authorities having jurisdiction.
>
> 7.4.1.12 The proponent of any construction, development, or property alteration that might adversely affect a listed or designated cultural heritage resource or which is proposed adjacent to a cultural heritage resource will be required to submit a *Heritage Impact Statement*, prepared by the City and other appropriate authorities having jurisdiction.
>
> 7.4.1.13 Cultural heritage resources must be maintained in situ and in a manner that prevents deterioration and protects the heritage qualities of the resource.
>
> 7.4.1.17 Public works will be undertaken in a way that minimizes detrimental impacts on cultural heritage resources.
>
> 7.4.1.18 Mississauga recognizes the Credit River and Etobicoke Creek valleys as heritage corridors with both prehistoric and historical significance.
>
> 7.4.2.2 Prior to the demolition or alteration of a cultural heritage resource, documentation will be required of the property to the satisfaction of the City, and any appropriate advisory committee. This documentation may be in the form of a *Heritage Impact Statement*.
>
> 7.4.3.3 Applications for development within a Heritage Conservation District will be required to include a *Heritage Impact Statement* and Heritage Permit, prepared to the satisfaction of the City and the appropriate authorities having jurisdiction.

The Sheridan Research Park, which is located on the south side of the study area, is also governed by special policy under the Draft Sheridan Park Land Use Master Plan (City of Mississauga 2014). Policies relevant to this study include:

ASI

2.1.7 Other Relevant Policies

Cultural Landscape Inventory (2005)

> While not officially designated a heritage site, Sheridan Park is identified in the Inventory as an important feature in the City's Cultural Landscape. Sheridan Park is considered significant for its scenic and distinct visual quality and the site's landscape design, type of use and technological interest. Many of the Park's buildings are considered significant for their consistent scale of built features and unique architecture associated with the "planned research park" movement, including the nationally recognized Xerox building.

Natural Areas Survey (1996, 2012 Update)

> The Sheridan Park site contains designated Natural Areas SP1 and SP3, as well as a Special Management Area, in the north of the site, due to their location at the headwaters of Sheridan Creek, as well as prominent physiographic features, including watercourse basins, drainage divides and forested areas. Natural Area SP3, identified as an Area of Natural and Scientific Interest (ANSI) by the Province and a Core Area within the Regional Greenlands System, was classified as a 'Significant Natural Site'

2.3 Data Collection

In the course of the cultural heritage assessment, all potentially affected cultural heritage resources are subject to inventory. Short form names are usually applied to each resource type, (e.g. barn, residence). Generally, when conducting a preliminary identification of cultural heritage resources, three stages of research and data collection are undertaken to appropriately establish the potential for and existence of cultural heritage resources in a particular geographic area.

Background historical research, which includes consultation of primary and secondary source research and historical mapping, is undertaken to identify early settlement patterns and broad agents or themes of change in a study area. This stage in the data collection process enables the researcher to determine the presence of sensitive heritage areas that correspond to nineteenth and twentieth-century settlement and development patterns. To augment data collected during this stage of the research process, federal, provincial, and municipal databases and/or agencies are consulted to obtain information about specific properties that have been previously identified and/or designated as retaining cultural heritage value. Typically, resources identified during these stages of the research process are reflective of particular architectural styles, associated with an important person, place, or event, and contribute to the contextual facets of a particular place, neighbourhood, or intersection.

A field review is then undertaken to confirm the location and condition of previously identified cultural heritage resources. The field review is also used to identify cultural heritage resources that have not been previously identified on federal, provincial, or municipal databases.

Several investigative criteria are utilised during the field review to appropriately identify new cultural heritage resources. These investigative criteria are derived from provincial guidelines, definitions, and past experience. During the course of the environmental assessment, a built structure or landscape is identified as a cultural heritage resource if it is considered to be 40 years or older, and if the resource satisfies at least one of the following criteria:

Design/Physical Value:

- It is a rare, unique, representative or early example of a style, type, expression, material or construction method.
- It displays a high degree of craftsmanship or artistic merit.
- It demonstrates a high degree of technical or scientific achievement.
- The site and/or structure retains original stylistic features and has not been irreversibly altered so as to destroy its integrity.
- It demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.

Historical/Associative Value:

- It has a direct association with a theme, event, belief, person, activity, organization, or institution that is significant to: the City of Mississauga; the Province of Ontario; or Canada.
- It yields, or has the potential to yield, information that contributes to an understanding of the history of the: the City of Mississauga; the Province of Ontario; or Canada.
- It demonstrates or reflects the work or ideas of an architect, artist builder, designer, or theorist who is significant to: the City of Mississauga; the Province of Ontario; or Canada.
- It represents or demonstrates a theme or pattern in Ontario's history.
- It demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage.
- It has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use.
- It has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province.

Contextual Value:

- It is important in defining, maintaining, or supporting the character of an area.
- It is physically, functionally, visually, or historically linked to its surroundings.
- It is a landmark.
- It illustrates a significant phase in the development of the community or a major change or turning point in the community's history.
- The landscape contains a structure other than a building (fencing, culvert, public art, statue, etc.) that is associated with the history or daily life of that area or region.
- There is evidence of previous historic and/or existing agricultural practices (e.g. terracing, deforestation, complex water canalization, apple orchards, vineyards, etc.)
- It is of aesthetic, visual or contextual important to the province.

If a resource meets one of these criteria it will be identified as a cultural heritage resource and is subject to further research where appropriate and when feasible. Typically, detailed archival research, permission to enter lands containing heritage resources, and consultation is required to determine the specific heritage significance of the identified cultural heritage resource.

When identifying cultural heritage landscapes, the following categories are typically utilized for the purposes of the classification during the field review:

Farm complexes:	comprise two or more buildings, one of which must be a farmhouse or barn, and may include a tree-lined drive, tree windbreaks, fences, domestic gardens and small orchards.
Roadscapes:	generally two-lanes in width with absence of shoulders or narrow shoulders only, ditches, tree lines, bridges, culverts and other associated features.
Waterscapes:	waterway features that contribute to the overall character of the cultural heritage landscape, usually in relation to their influence on historic development and settlement patterns.
Railscapes:	active or inactive railway lines or railway rights of way and associated features.
Historical settlements:	groupings of two or more structures with a commonly applied name.
Streetscapes:	generally consists of a paved road found in a more urban setting, and may include a series of houses that would have been built in the same time period.
Historical agricultural landscapes:	generally comprises a historically rooted settlement and farming pattern that reflects a recognizable arrangement of fields within a lot and may have associated agricultural outbuildings, structures, and vegetative elements such as tree rows.
Cemeteries:	land used for the burial of human remains.

Results of the desktop data collection and field review are contained in Sections 4.0, while Sections 5.0 and 6.0 contain conclusions and recommendations with respect to potential impacts of the undertaking on identified cultural heritage resources. Cultural heritage resource location mapping is provided in Section 7.0.

3.0 BUILT HERITAGE RESOURCE AND CULTURAL HERITAGE LANDSCAPE ASSESSMENT

This section provides a brief summary of historical research and a description of identified above ground cultural heritage resources that may be affected by the proposed undertaking.

3.1 Background Historical Summary

A review of available primary and secondary source material was undertaken to produce a contextual overview of the study area, including a general description of physiography, Indigenous land use, and Euro-Canadian settlement

3.1.1 Physiography

The study area is situated within the Iroquois Plain physiographic region of southern Ontario (Chapman and Putnam 1984).

The Iroquois Plain physiographic region of Southern Ontario is a lowland region bordering Lake Ontario. This region is characteristically flat, and formed by lacustrine deposits laid down by the inundation of Lake Iroquois, a body of water that existed during the late Pleistocene. This region extends from the Trent River, around the western part of Lake Ontario, to the Niagara River, spanning a distance of 300 km (Chapman and Putnam 1984:190). The old shorelines of Lake Iroquois include cliffs, bars, beaches and boulder pavements. The old sandbars in this region are good aquifers that supply water to farms and villages. The gravel bars are quarried for road and building material, while the clays of the old lake bed have been used for the manufacture of bricks (Chapman and Putnam 1984:196).

3.1.2 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier, approximately 13,500 before present (BP) (Ferris 2013: 13). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988), and populations now occupied less extensive territories (Ellis and Deller 1990: 62-63).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines were then submerged. This period produces the earliest evidence of heavy wood working tools and is indicative of greater investment of labour in felling trees for fuel, to build shelter, or to produce tools, and is ultimately indicative of prolonged seasonal residency at sites. By approximately 8,000 BP, evidence exists for polished stone implements and worked native copper. The source for the latter from the north shore of Lake Superior is evidence of extensive exchange networks. Early evidence exists at this time for the creation of communal cemeteries and ceremonial funerary customs. This evidence is significant for the establishment of band territories. These communal places indicate shared meaning across the community and are reflective of a people's cosmology (Brown 1995: 13; Holloway and Hubbard 2001: 74; Parker Pearson 1999: 141). Between approximately 4,500-3,000 BP, there is evidence for construction of fishing weirs. These structures indicate not only the group sharing of resources, but also the organization of communal labour (Ellis *et al.* 1990; Ellis *et al.* 2009).

Between 3,000-2,500 BP, populations continued with residential mobility harvesting of seasonally available resources, including spawning fish. Exchange and interaction networks broaden at this time (Spence *et al.* 1990: 136, 138) and by approximately 2,000 BP, evidence exists for macro-band camps, focusing on the seasonal harvesting of resources (Spence *et al.* 1990: 155, 164). It is also during this period that maize was first introduced into southern Ontario, though it would have only supplemented people's diet (Birch and Williamson 2013: 13-15). Bands likely retreated to interior camps during the winter.

From approximately 1,000 BP until approximately 300 BP, lifeways became more similar to those described in early historical documents. Populations in the study area would have been Iroquoian speaking though full expression of Iroquoian culture is not recognised archaeologically until the fourteenth century. During the Early Iroquoian phase (1000-1300), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990: 317). By the second quarter of the first millennium BP, during the Middle Iroquoian phase (1300-1450), this episodic community disintegration was no longer practised, and populations now communally occupied sites throughout the year (Dodd *et al.* 1990: 343). In the Late Iroquoian phase (1450-1649), this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the Aboriginal Nations was developed, as described historically by the French and English explorers who first visited southern Ontario.

By AD 1600, the Five Nations Iroquois, in particular the Seneca, were the principle group using the central north shore of Lake Ontario, in particular for hunting, fishing, and for participation in the fur trade. By AD 1649, the Seneca mainly took over control of the region (Heidenreich 1990: 489; Ramsden 1990). Compared to settlements of the New York Iroquois, the "Iroquois du Nord" occupation of the landscape was less intensive. Only seven villages are identified by the early historic cartographers on the north shore of Lake Ontario, and they are documented as considerably smaller than those in New York State. The populations were agriculturalists, growing maize, pumpkins and squash. These settlements also played the important alternate role of serving as stopovers and bases for New York Iroquois travelling to the north shore of Lake Ontario for the annual beaver hunt (Konrad 1974).

Beginning in the mid-late seventeenth century, the Mississaugas began to replace the Seneca as the controlling Aboriginal group along the north shore of Lake Ontario since the Five Nations Iroquois confederacy had overstretched their territory between the 1650s and 1670s (Williamson 2008). The Five Nations Iroquois could not hold the region and agreed to form an alliance with the Mississauga peoples and share hunting territories with them. The Mississaugas traded with both the British and the French in order to have wider access to European materials at better prices, and they acted as trade intermediaries between the British and tribes in the north.

The eighteenth century saw the ethnogenesis in Ontario of the Métis. Métis people are of mixed First Nations and French ancestry, but also mixed Scottish and Irish ancestry as well. The Métis played a significant role in the economy and socio-political history of the Great Lakes during this time. Living in both Euro-Canadian and Aboriginal societies, the Métis acted as agents and subagents in the fur trade but also as surveyors and interpreters. Métis populations were predominantly located north and west of Lake Superior, however Métis populations lived throughout Ontario (Métis Nation of Canada [MNC] n.d.; Stone and Chaput 1978:607,608).

By 1805, the lands from Burlington Bay to the Etobicoke River north of Eglinton Avenue were known as the "Mississague Tract" (Boulton 1805: 48; Heritage Mississauga 2012: 18; Smith 2002). In 1806, the lands south of Eglinton Avenue from Etobicoke Creek to Burlington Bay, excluding the Brant Tract and reserves along the Twelve Mile Creek, the Sixteen Mile Creek and the Credit River were purchased by the Crown from the Mississaugas as part of the "Head of the Lake Treaty" (Aboriginal Affairs and Northern Development Canada [AANDC] 2013b). In 1818, the lands of the Mississauga Tract north of Eglinton Avenue were purchased by the crown from the Mississaugas of the Twelve Mile Creek, the Sixteen Mile Creek and the Credit River as part of the "Ajetance Treaty" (AANDC 2013a). In 1820, the remainder of Mississauga land was surrendered except approximately 81 ha along the Credit River (Heritage Mississauga 2012: 18). In 1825-26, the Credit Indian Village was established as an agricultural community and Methodist mission near present day Port Credit (Heritage Mississauga 2009a; MNCFN n.d.). By 1840, the village was under significant pressure from Euro-Canadian settlement so that plans were formulated to relocate the settlement. In 1847, the Credit Mississaugas were made a land offer by the Six Nations Council to relocate at the Grand River. In 1847, 266 Mississaugas settled at New Credit, approximately 23 km southwest of Brantford. The majority of the former Mississague Tract had been ceded from the Mississauga by 1856 (Gould 1981).

3.1.3 Historical Euro-Canadian Land Use: Township Survey and Settlement

Historically, the study area is located in the Former Township of Toronto, County of Peel in part of Lots 33-35, Concession 1 SDS. In 1788, the County of Peel was part of the extensive district known as the "Nassau District". Later called the "Home District", its administrative centre was located in Newark, now called Niagara. After the province of Quebec was divided into Upper and Lower Canada in 1792, the Province was separated into nineteen counties, and by 1852, the entire institution of districts was abolished and the late Home Districts were represented by the Counties of York, Ontario and Peel. Shortly after, the County of Ontario became a separate county, and the question of separation became popular in Peel. A vote for independence was taken in 1866, and in 1867 the village of Brampton was chosen as the capital of the new county (Armstrong 1985; Pope 1877).

Township of Toronto

At the conclusion of the American War of Independence (1774-1783), the British were forced to recognize the emergence of a new political frontier, one that had to be maintained by a strong military presence. In addition, a number of British loyalists travelled north and crossed the border in order to remain in British territory. Many of them were given land grants by the Crown in exchange for loyal service. These new developments ultimately led to the purchase of Mississauga land by the Crown in 1787 (although boundary disputes were not resolved until the signing of a treaty in 1805). The subject property is located within these "New Survey" lands which were surveyed in 1806.

In 1788, the County of Peel was part of the extensive district known as the "Nassau District." After the province of Quebec was divided into Upper and Lower Canada in 1792, the Nassau District became known as the Home District. The same year, Upper Canada was subdivided into nineteen counties by its first Lieutenant Governor, Colonel John Graves Simcoe, and by 1852, the Home District was replaced by the Counties of York, Ontario and Peel. Shortly after, the County of Ontario became a separate county, and the question of separation became popular in Peel. A vote for independence was taken in 1866, and in 1867, the village of Brampton was chosen as the capital of the new county.

The first transportation routes to be established followed early Aboriginal trails, both along the lakeshore and adjacent to various creeks and rivers. Local roads were initially cleared by the grantees of adjacent land as part of their settlement duties although the many rivers and creeks posed a challenge to the gridded road system, and nineteenth-century maps detail the many jags and detours necessary to avoid bad crossing points.

After Simcoe established York as the capital of Upper Canada he commissioned the Queen's Rangers to build the Dundas Highway (also known as the Governor's Road) running west to Ancaster and east toward Kingston, hooking up with Kingston Road. This important transportation corridor was intended to provide an overland military route between Lake Ontario, Lake St. Clair, and Lake Huron. The road (later known as Dundas Street now Highway 5) was intended to serve a dual purpose – to support settlement in Upper Canada, and as a deterrent to expansionist American interests. Work on the Governor's Road began in 1793, but the rocky and heavily treed landscape made progress slow and the route was still barely passable when Simcoe returned to England in 1796. Eventually, Dundas Street served the purpose of supporting settlement in southern Ontario once the colonial government had purchased new lands adjacent to it.

Along the lakeshore, the pre-existing trail was widened and improved as a public road by 1798, but there was no bridge across the Humber River at that time (a ferry operated between 1802 and 1815). Lakeshore Road opened through Etobicoke in 1804, was planked in 1820, and by 1826, a regular stagecoach service ran between York and Niagara. The Toronto Road Company purchased the Lakeshore Road in 1850, turning it into a toll road.

The Hamilton and Toronto Railway was formed in 1852, and in 1855, completed its lake shore route across the south end of Lot 11. In 1871, the railway was amalgamated with the Great Western Railway, which in turn, was amalgamated in 1882, with the Grand Trunk Railway. The Grand Trunk Railway was amalgamated in 1923, with Canadian National Railway (Andrea 1997: 126-127).

Village of Erindale

The village of Erindale was established in 1822 after Thomas Racey constructed a sawmill on the Credit River, just south of Dundas Street. By 1824, a village site was laid out, first called Toronto, Credit, Springfield, Springfield-on-the-Credit, and finally Erindale in the early 1900s (Heritage Mississauga 2009b). The village was a stopping place for stagecoach travelers between Dundas and York (now Hamilton and Toronto), along Dundas Street. Early settlers included Emerson Taylor, who operated the Royal Exchange Hotel; John McGill, the first flour miller; Dr. Beaumont Dixie, an early physician, Duncan Turpel, a blacksmith, notary and stagecoach operator; John Barker, the postmaster and storekeeper; and Edwin Turner and Christopher Boyes, who were prominent merchants; and General Peter Adamson, who held early Anglican church services in his home until St. Peter's Anglican Church was built in 1826. This was the only Anglican Church west of Toronto, later rebuilt in 1887, and still stands today. The village saw a period of decline when it was bypassed by the Great Western Railway, despite the Credit Valley Railway station being built in 1879. In the early 1900s Erindale was the centre of a large hydroelectric project which brought growth in the village until a devastating fire in 1919. Erindale amalgamated with other villages in Toronto Township in 1968 to form the Town of Mississauga. The town became the City of Mississauga in 1974 (Heritage Mississauga 2009b).

Village of Sheridan

The village of Sheridan was originally named Hammondsville, after William Ranson Hammond, who emigrated from Pennsylvania in the 1820s and opened a store, giving the name Hammondsville to the intersection of what is now Winston Churchill Boulevard and the Q.E.W (Mair 2009). Lt. Colonel Peter Adamson of the 7lst Highland Regiment, or "General Adamson" came to Canada in 1821 and bought land west of the Credit and south of Dundas Street where he built "Toronto House", a one-storey stone mansion. His brother, Dr. Joseph Adamson, settled on the Middle Road near Sheridan (Richardon 1956).

Other early settlers included the Adamson, Clark, Devlin, Greeniaus, Hammond, Henriod, Lawrence, Long, McCleary, Oliphant, Oughtred, Pollard, Robertson, Shain, and Tindell families. When the first post office was built for the hamlet in 1857 the name of the village was changed to Sheridan, and the post office functioned until 1956, almost a century later, when it was removed during construction for South Service Road (Mair 2009). The first church in Sheridan was a small frame church built in 1837 on Ferris Lawrence's property, which welcomed all denominations, and was also used as a school and community hall. In 1867 half an acre of land was donated by Ferris Lawrence for a new church, the Sheridan United Church (Mair 2009). The old school and church was used as a Temperance Hall from 1837 into the 1890s, with multiple uses until 1976 when the building was moved to the Ontario Agricultural Museum. In 1877, Sheridan had a population of 100, but by 1907 the population had dropped to 50. Sheridan was also home to Thomas Wainwright's tannery, Erastus Hill's chair factory, Stephen Oughtred's blacksmith shop, which would have been located on the northwest corner of Winston Churchill and Upper Middle Road, and George Long's shoemaker's shop at the northeast corner of the same intersection (Mair 2009).

*3.1.4 **Review of Historical Mapping***

The 1806 *Patent Plan of Toronto Township South* (Surveyor General 1806), the 1859 *Map of the County of Peel* (Tremaine 1859), and the 1877 *Illustrated Historical Atlas of the County of Peel*, Toronto Township South page (Walker and Miles 1877), were examined to determine the presence of historic features within the study area during the nineteenth century (Figures 2-4).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

Historically, the study area is located in the former Township of Toronto, Peel County. The 1806 patent plan illustrates that Lot 32 was owned by John Utter Jr., Lot 33 by Peter Covenhoven, Lot 34 by Asa Patrick, and Lot 35 by Charles Cameron. Details of historic property owners and historic features in the study area in the mid and late-nineteenth-century are listed in Table 1.

Table 1: Sheridan Park Drive Study Area – Nineteenth-century property owner(s) and historical features(s)

		1859 Tremaine's Map		1887 Illustrated Historical Atlas	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
1 SDS	32	General Adamson	None	Charles Mitchel	House, orchard

33 N	C & T Boyes	House (2), Conover's Brewery	Sam. Conover Chas Johnson	House (3), orchard House, orchard
S	General Adamson	None	Charles Mitchel	None
34 N	Donald Cameron	Waggon Shop	Donald Cameron, N.R. W.A.	House, orchard House
S	G & T Boyes Jas Adamson	None None	Chas Johnson John Skinner	None None
35 N	Charles Cameron	House	Albert E. Cameron	House (2), orchard
S	Jas. Adamson	Sheridan Post Office, Long's Boot & Shoe Store, House (2)	Jas. Adamson, N.R.	House (5)

According to the 1859 *Map of the County of Peel* (Tremaine 1859), and the 1877 *Illustrated Historical Atlas of the County of Peel*, Toronto Township South page (Walker and Miles 1877), no structures were located within or adjacent to the study area. Both maps illustrate that Lots 32-35 were separated into north and south parcels, with the village of Sheridan south of the study area, including a footwear shop and post office, at the crossroads of what is now Winston Churchill Boulevard and the Q.E.W. The 1859 map illustrates a wagon shop and a brewery along Dundas Street north of the study area.

In addition to nineteenth-century mapping, historical topographic mapping and aerial photographs from the twentieth century were examined. This report presents maps and aerial photographs from 1909, 1954, and 1994. These do not represent the full range of maps consulted for the purpose of this study but were judged to cover the full range of land uses that occurred in the area during this period.

The 1909 topographic map demonstrates that relatively little development occurred in and around the study area in the late nineteenth century (Figure 5). Modern day Winston Churchill Boulevard and Erin Mills Parkway are depicted to the west and east, respectively. A watercourse oriented east-west is depicted in the western portion of the study area. The Village of Sheridan is depicted to the south at the on Winston Churchill Boulevard. Sheridan appears to have experienced modest growth from earlier mapping, and was the site of a telephone office.

The 1954 aerial photo demonstrates that the study area continued to feature rural, agricultural lands and large woodlots in the mid-twentieth century (Figure 6). Notable changes in the study area include the depiction of modern-day Sheridan Park Drive within the study area, oriented in a northeast-southwest direction along the proposed alignment of the present undertaking. All other roadways are illustrated in their extant alignment.

The 1994 topographical map confirms the study area underwent significant commercial/industrial development in the second half of the twentieth century. Sheridan Park is depicted in its extant location, as is Winston Churchill Boulevard to the west, the QEW to the south, and Erin Mills Parkway to the east. An electric power transmission line is shown to follow the alignment of the study area. The residential neighbourhood of Sheridan Homelands to the immediate north of the study area, and Homelands Senior Public School is also depicted. Large wooded areas continue to occupy the area immediately south of the study area, in the northern portion of Sheridan Park.

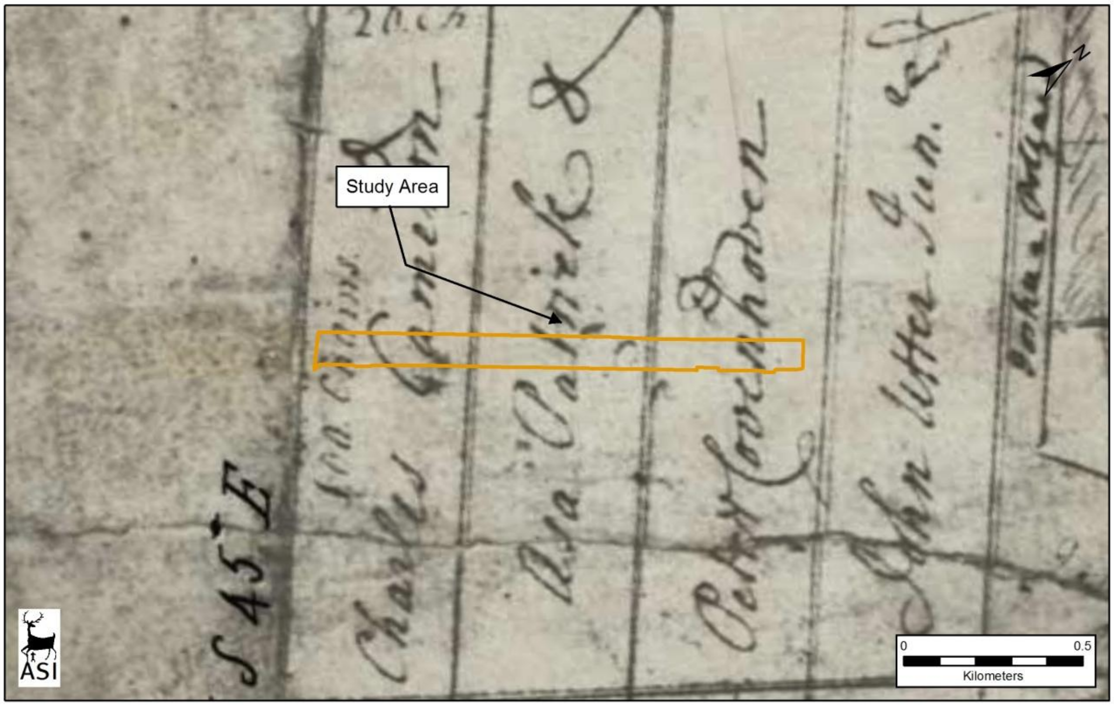

Figure 2: The study area overlaid on the 1806 *Patent Plan of Toronto Township South*.
Base Map: Surveyor General 1806

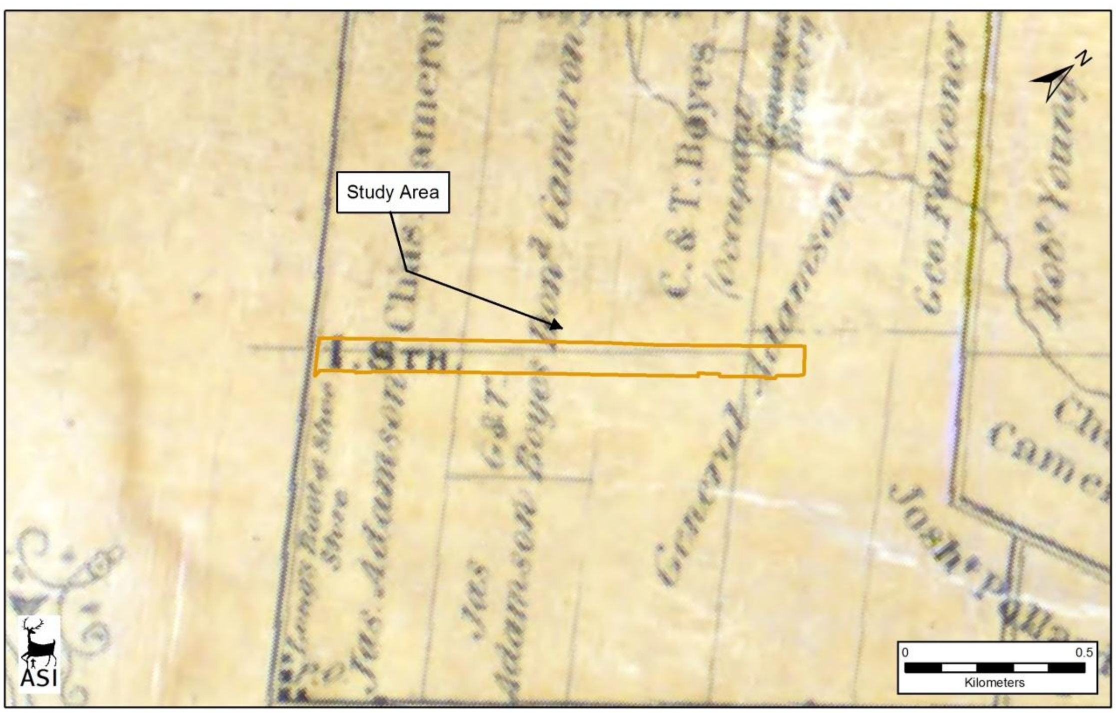

Figure 3: The study area overlaid on the 1859 Tremaine map.
Base Map: Tremaine 1859

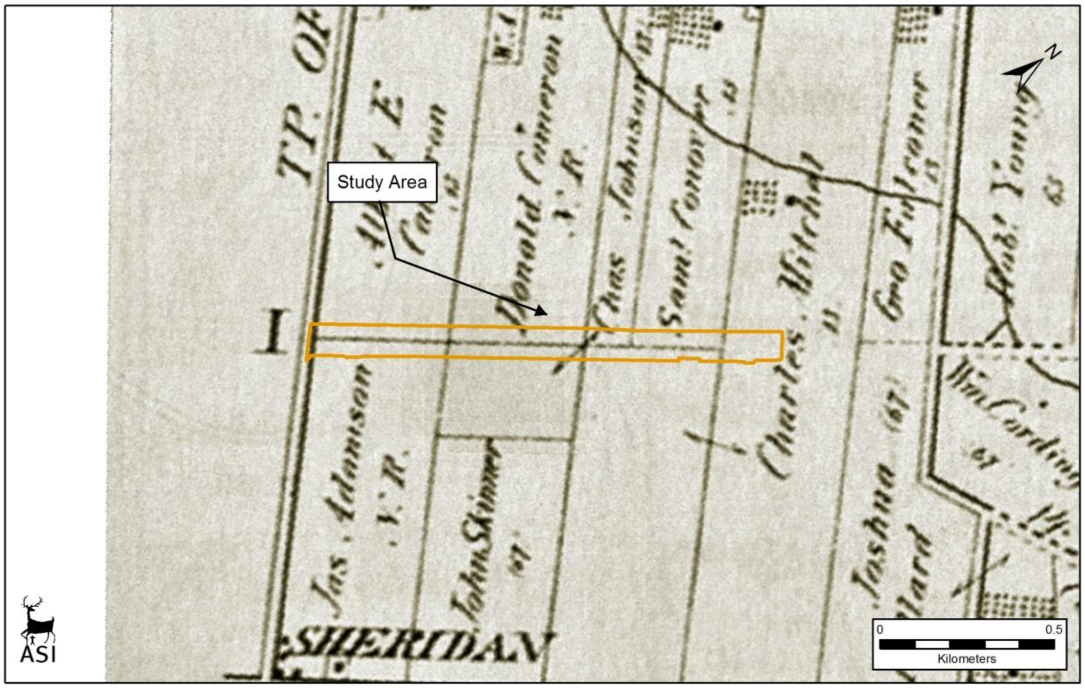

Figure 4: The study area overlaid on the 1877 *Illustrated Historical Atlas*.
Base Map: Walker and Miles 1877

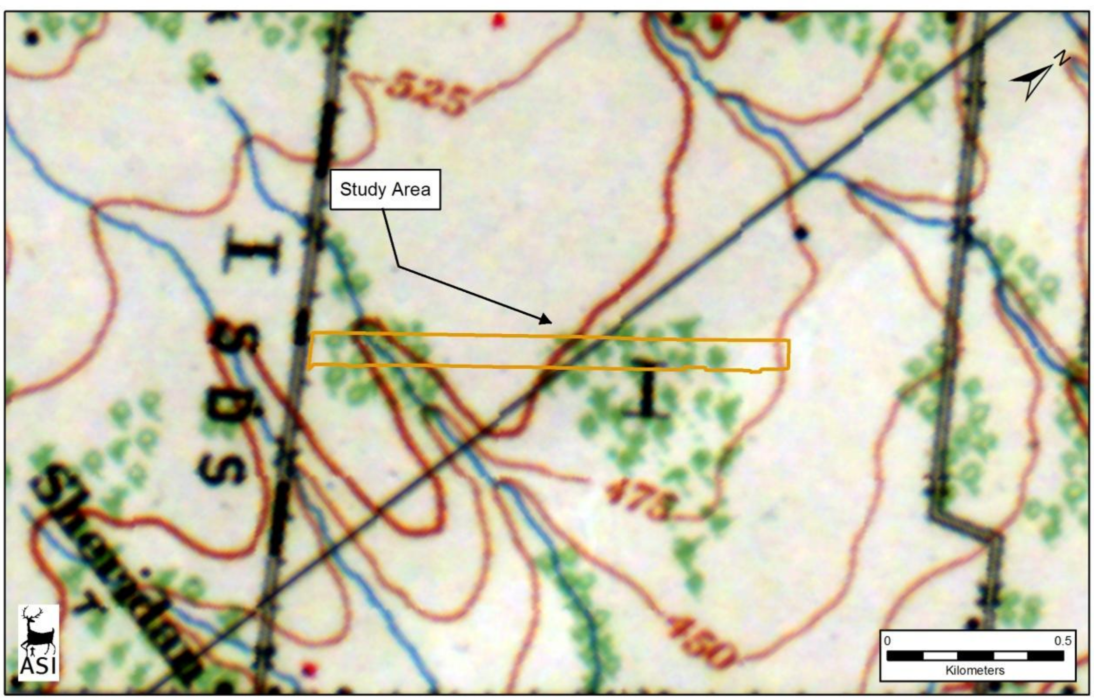

Figure 5: The study area overlaid on the 1909 NTS map.
Base Map: NTS Sheet 35 (Brampton)(Department of Militia and Defense 1909)

Figure 6: The study area overlaid on the 1954 aerial photograph.
Base Map: Hunting Survey Corporation 1954

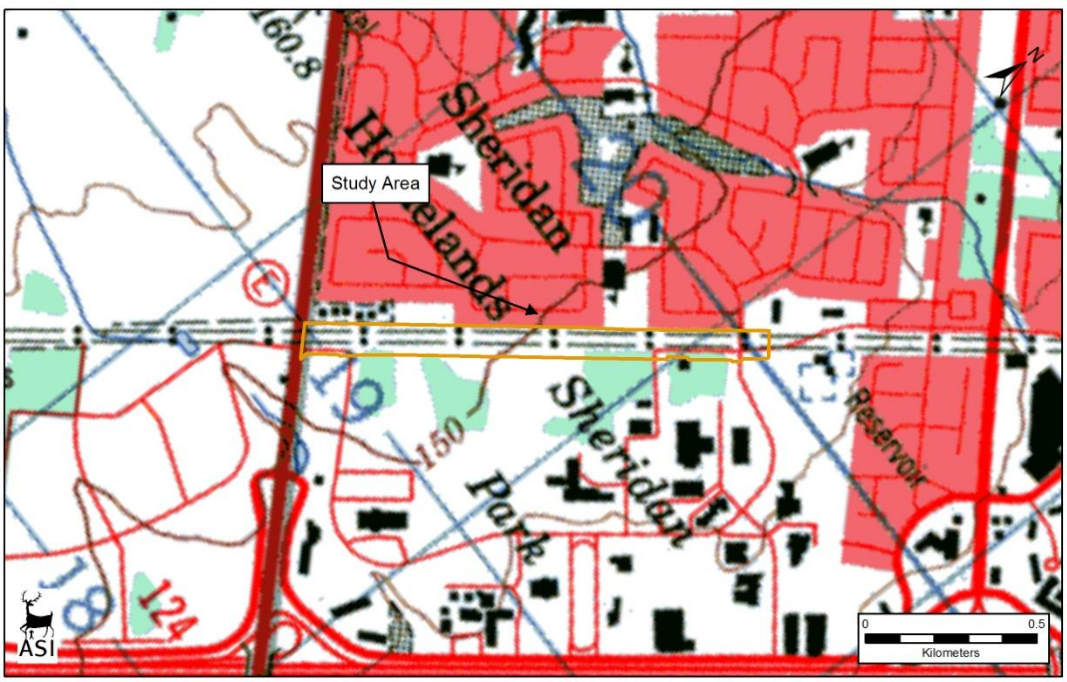

Figure 7: The study area overlaid on the 1994 NTS map.
Base Map: NTS Sheet 30/M-12 (Brampton) (Department of Energy, Mines and Resources 1994)

3.2 Existing Conditions

3.2.1 Review of Existing Heritage Inventories

In order to make an identification of existing cultural heritage resources within the study area, a number of resources were consulted (MTCS 2016). They include:

- The City of Mississauga's list of *Designated Properties* and *Cultural Landscape Inventory* which provides an inventory of cultural heritage resources that are designated under Part IV and Part V of the *Ontario Heritage Act* and an inventory of listed properties that are of cultural heritage value or interest to the city[1]; and,
- The City of Mississauga's *Cultural Heritage Landscape Inventory*[2]*;*
- The inventory of Ontario Heritage Trust easements[3];
- The Ontario Heritage Trust's *Ontario Heritage Plaque Guide*, an online, searchable database of Ontario Heritage Plaques[4];
- *Ontario's Historical Plaques* website[5];
- Inventory of known cemeteries/burial sites in the Ontario Ministry of Government and Consumer Services and the Ontario Geneaological Society's online databases[6].
- Parks Canada's *Canada's Historic Places* website: available online, the searchable register provides information on historic places recognized for their heritage value at the local, provincial, territorial, and national levels[7];
- Parks Canada's *Directory of Federal Heritage Designations*, a searchable on-line database that identifies National Historic Sites, National Historic Events, National Historic People, Heritage Railway Stations, Federal Heritage Buildings, and Heritage Lighthouses[8];
- Canadian Heritage River System. The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage[9].
- United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites[10]

In addition, the following stakeholders were contacted to gather information on potential cultural heritage resources, active and inactive cemeteries, and areas of identified Indigenous interest within and/or adjacent to the study area:

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[1] Reviewed 9 May, 2017 (http://www.mississauga.ca/portal/discover/heritage)
[2] Reviewed 9 May, 2017 (http://www5.mississauga.ca/pdfs/Cultural_Landscape_Inventory_Jan05.pdf)
[3] Reviewed 9 May, 2017 (http://www.heritagetrust.on.ca/en/index.php/property-types/easement-properties)
[4] Reviewed 9 May, 2017 (http://www.heritagetrust.on.ca/Resources-and-Learning/Online-Plaque-Guide.aspx)
[5] Reviewed 9 May, 2017 (www.ontarioplaques.com)
[6] Reviewed 9 May, 2017 (http://vitacollections.ca/ogscollections/2818487/data?grd=3186 and https://www.consumerbeware.mgs.gov.on.ca/esearch/cemeterySearch.do?eformsId=0)
[7] Reviewed 9 May, 2017 (http://www.historicplaces.ca/en/pages/about-apropos.aspx)
[8] Reviewed 9 May, 2017 (http://www.pc.gc.ca/apps/dfhd/search-recherche_eng.aspx)
[9] Reviewed 9 May, 2017 (http://chrs.ca/the-rivers/)
[10] Reviewed 9 May, 2017 (http://whc.unesco.org/en/list/)

- Paula Wubbenhorst, Senior Heritage Coordinator, City of Mississauga (email communication 10 May, 1 and 2 June 2017). Email correspondence confirmed that the southern portion of the study area is previously identified as a cultural landscape with each structure individually listed in the City of Mississauga's list of *Designated Properties* and *Cultural Landscape Inventory*.
- The Ministry of Tourism, Culture and Sport (email communication 9 May, 2017). Email correspondence confirmed that there are no additional previously identified heritage resources or concerns regarding the study area[11].

Based on the review of available municipal, provincial, and federal data, there is one previously identified resource within and/or adjacent to the Sheridan Park Drive Extension study area. This resource is the Sheridan Research Park, identified as a cultural landscape by the City of Mississauga (City of Mississauga 2005).

3.2.2 Sheridan Park Drive Study Area– Field Review

A field review of the study area was undertaken by John Sleath of ASI, on 29 May, 2017 to document the existing conditions of the study area. The field review was preceded by a review of available, current and historic, aerial photographs and maps (including online sources such as Bing and Google maps). These large-scale maps were reviewed for any potential cultural heritage resources which may be extant in the study area. The existing conditions of the study area are described below. Identified cultural heritage resources are discussed in Section 3.2.3 and are mapped in Section 8.0 of this report.

The Sheridan Park Drive Extension study area is centered on the MUT and utility corridor between the terminus of existing Sheridan Park Drive in the east to Winston Churchill Boulevard in the west. The study area is oriented in a generally northeast-southwest direction, however, for the sake of clarity, it will be described as an east-west route as part of this report. The study area is generally located in a mixed residential/commercial area, bounded by residences to the north, and undeveloped woodlots associated with the Sheridan Park Corporate Centre to the south. The location and orientation of photographic plates (Plates 1-12) are provided in Figure 8.

The western portion of the study area begins at the intersection of Sheridan Park Drive and Winston Churchill Boulevard, which is a total of six lanes in width at this point, including dedicated left and right hand turning lanes for southbound traffic. Winston Churchill Boulevard features paved sidewalks on the east and west sides that are separated from live traffic by grass boulevards. Sheridan Park Drive extends approximately 130 metres east of Winston Churchill Boulevard, and terminates at a dead end before the intersection with Speakman Drive.

The south side of the study area encroaches on the Sheridan Park Corporate Centre Landuse Master Plan area (December 2014). This master plan area is bounded by Winston Churchill Boulevard to the west, the Queen Elizabeth Way (QEW) to the south, Erin Mills Parkway to the east, and the property line that composes the southern limit of the study area to the north (Appendix A).

The study area generally follows the MUT, with wide landscaped grasslands on both the north and south side. A hydro transmission corridor is located to the south of the MUT, with a small transfer station or transformer located to the east outside of the study area. South of the hydro transmission line is a large, undeveloped woodlot associated with the Sheridan Park Corporate Centre. The immediate north of the

[11] Contacted 9 May, 2017 at registrar@ontario.ca.

study area features a school along the eastern portion, houses fronting on Barcella Crescent and Hollington Crescent near the center, and an abandoned and overgrown residential lot (associated with 2335 Winston Churchill Boulevard) along the west portion fronting on Winston Churchill Boulevard.

Plate 1: The eastern portion of the study area, looking northwest across Sheridan Park Drive.

Plate 2: MUT in the east portion of the study area, with baseball diamond at left, looking west.

Plate 3: Intersection of Sheridan Park Drive and Speakman/Homelands Drive, looking west.

Plate 4: MUT with Sheridan Park Drive at left, and grass boulevard at right, looking west.

Plate 5: Study corridor with wooded area south of Sheridan Park Drive at far left, and residences at far right, looking west.

Plate 6: Electrical transformer station on the south of Sheridan Park Drive, looking southeast.

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Plate 7: Termination of Sheridan Park Drive at the east portion of the study area, looking southwest.

Plate 8: Residences on Pyramid Crescent, north of the eastern portion of the study area, looking north.

Plate 9: West portion of the study area, looking northwest towards Winston Churchill Boulevard.

Plate 10: Intersection of Winston Churchill Boulevard and Speakman Drive, looking north.

Plate 11: Western portion of the study area, looking east from Winston Churchill Boulevard.

Plate 12: Western portion of the study area to the south of the MUT, looking east.

3.2.3 Sheridan Park Drive Study Area– Identified Cultural Heritage Resources

Based on the results of the background research and field review, one cultural heritage resource (CHR) was identified within and/or adjacent to the Sheridan Park Drive Extension study area (see Figure 8). The cultural heritage resource is a cultural heritage landscape (CHL) (Table 2). A detailed inventory of this cultural heritage resource within the study area and contributing properties is presented in Section 7.0 and mapping of this feature is provided in Section 8.0 of this report.

Table 2: Summary of built heritage resources (BHR) and cultural heritage landscapes (CHL) in the study area

Feature	Location	Type	Recognition
CHL 1	2305-2800 Sheridan Park Drive Sheridan Research Park	Commercial/ Industrial Complex	Properties individually listed by the City of Mississauga, Sheridan Research Park Cultural Landscape Inventory (City of Mississauga 2014a), Draft Sheridan Park Land Use Master Plan (City of Mississauga 2014b).

3.3 Screening for Potential Impacts

To assess the potential impacts of the undertaking, identified cultural heritage resources are considered against a range of possible impacts as outlined in the document entitled *Screening for Impacts to Built Heritage and Cultural Heritage Landscapes* (MTC November 2010) which include:

- Destruction, removal or relocation of any, or part of any, significant heritage attribute or feature (III.1).
- Alteration which means a change in any manner and includes restoration, renovation, repair or disturbance (III.2).
- Shadows created that alter the appearance of a heritage attribute or change the exposure or visibility of a natural feature or plantings, such as a garden (III.3).
- Isolation of a heritage attribute from its surrounding environment, context, or a significant relationship (III.4).
- Direct or indirect obstruction of significant views or vistas from, within, or to a built or natural heritage feature (III.5).
- A change in land use such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces (III.6).
- Soil disturbance such as a change in grade, or an alteration of the drainage pattern, or excavation, etc (III.7)

A number of additional factors are also considered when evaluating potential impacts on identified cultural heritage resources. These are outlined in a document set out by the Ministry of Culture and Communications (now Ministry of Tourism, Culture and Sport) and the Ministry of the Environment entitled *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (October 1992) and include:

- Magnitude: the amount of physical alteration or destruction which can be expected;
- Severity: the irreversibility or reversibility of an impact;
- Duration: the length of time an adverse impact persists;
- Frequency: the number of times an impact can be expected;

- Range: the spatial distribution, widespread or site specific, of an adverse impact; and
- Diversity: the number of different kinds of activities to affect a heritage resource.

For the purposes of evaluating potential impacts of development and site alteration, MTC (2010) defines "adjacent" as: "contiguous properties as well as properties that are separated from a heritage property by narrow strip of land used as a public or private road, highway, street, lane, trail, right-of-way, walkway, green space, park, and/or easement or as otherwise defined in the municipal official plan."

Where any above-ground cultural heritage resources are identified, which may be affected by direct or indirect impacts, appropriate mitigation measures should be developed. This may include completing a heritage impact assessment or documentation report, or employing suitable measures such as landscaping, buffering or other forms of mitigation, where appropriate. In this regard, provincial guidelines should be consulted for advice and further heritage assessment work should be undertaken as necessary.

3.3.1 Potential Impacts of the Proposed Undertaking

The proposed undertaking for the Sheridan Park Drive Extension study area consists of grading and excavating activities and the construction of a 35 metre wide roadway to connect the eastern leg of Sheridan Park Drive to the west of Homelands/Speakman Drive with the western leg east of Winston Churchill Boulevard.

Figure 8 shows the study area in relation to identified cultural heritage resources. Table 3 lists potential impacts to identified cultural heritage resources.

Table 3: Potential Impacts of the Proposed Undertaking

Resource	Potential Impact(s)
CHL 1	• The proposed undertaking will result in the encroachment on the Sheridan Research Park Cultural Landscape and removal of trees and vegetation along the northern edge of the resource. This wooded area is not identified as contributing to the heritage value of the cultural landscape, rather, the heritage value lies in industrial research structures themselves and their immediate landscaped environs. The proposed tree removals and related impacts are considered to be minimal, as the proposed study area limits terminate far to the north of any structure or feature of identified heritage value in the Sheridan Research Park. These impacts would be minimal in severity, and would not impact views to or from the Sheridan Research Park.

No significant impacts to the one identified cultural heritage resource are identified resulting from the proposed undertaking. While portions of this impacted area are also considered Significant Natural Areas in the Draft Sheridan Park Land Use Master Plan (City of Mississauga 2014b), these impacts will not negatively affect the identified cultural heritage value of the heritage resource.

4.0 CONCLUSIONS

The results of background historic research and a review of secondary source material, including historical mapping, revealed a study area with a rural land use history dating back to the early nineteenth century. A review of federal registers and municipal and provincial inventories revealed that there is one previously identified feature of cultural heritage value adjacent to the Sheridan Park Drive Extension EA study area.

Key Findings

- A field review of the study area confirmed that there is one cultural heritage resource consisting one cultural heritage landscape (CHLs) within and immediately adjacent to the study area.

- The identified cultural heritage resource includes a mid-late-twentieth-century industrial research park (CHL 1).

- The identified cultural heritage resource is historically, architecturally, and contextually associated with mid-late-twentieth-century industrial land use patterns in the City of Mississauga.

- No significant impacts to the one identified cultural heritage resource are anticipated as a result of the proposed undertaking.

5.0 RECOMMENDATIONS

The background research, data collection, and field review conducted for the study area determined that one cultural heritage resource is located within the Sheridan Park Drive Extension Drive Class EA study area. No significant impacts to the one identified cultural heritage resource are identified resulting from the proposed undertaking. Based on the results of the assessment, the following recommendations have been developed:

1. Construction activities and staging should be suitably planned and undertaken to avoid impacts to identified cultural heritage resources.

2. Should future work require an expansion of the study area then a qualified heritage consultant should be contacted in order to confirm the impacts of the proposed work on potential heritage resources.

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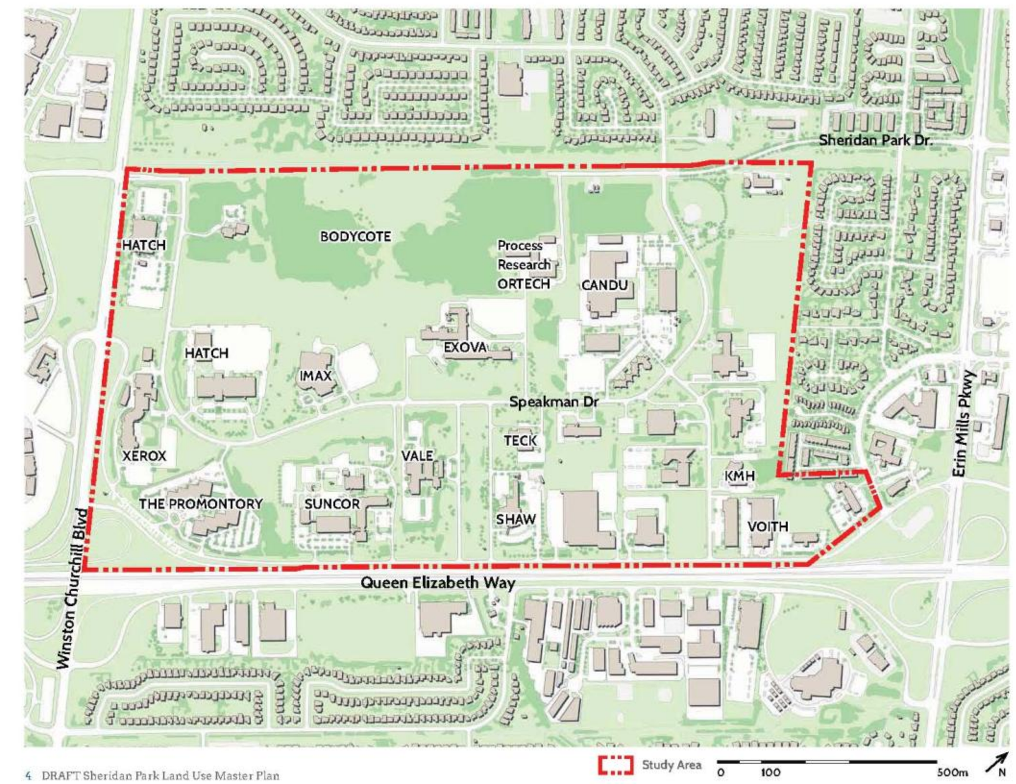
7.0 CULTURAL HERITAGE RESOURCE INVENTORY

Table 4: Inventory of Cultural heritage resources (CHR) in the study area

Resource	Type	Address/Location	Recognition	Description	Photos
CHL 1	Commercial/industrial complex	2305-2800 Sheridan Park Drive	Properties individually listed by the City of Mississauga, Sheridan Research Park Cultural Landscape Inventory (City of Mississauga 2014a), Draft Sheridan Park Land Use Master Plan (City of Mississauga 2014b).	Historical: -Construction began in the late 1960s under the Sheridan Park Association. - A hotel and the award-winning Xerox structure were constructed in the 1980s, with further development continuing development by Hatch Mott-Macdonald and Imax in the 1990s. Design: -Constructed as a planned industrial research park, the Sheridan Research Park (also known as the Sheridan Park Corporate Centre) contains a number of large corporate offices and research facilities that incorporate unique built forms with an emphasis on landscaping and the visual form to foster a productive and enjoyable working environment. -In addition to the corporate research and office facilities, the Sheridan Research Park features two hotels and an elementary school (City of Mississauga 2014b) Context: - Bound by the QEW to the south, Winston Churchill Boulevard to the west, the Sheridan Park Multiuse trail to the north, and Erin Mills Parkway to the east. -Area forms a unique mid-late-twentieth-century industrial and research employment area that served as a prototype for the industrial research park movement in Canada.	 Map of Sheridan Research Park (CHL 1) (City of Mississauga 2014b:4)

8.0 CULTURAL HERITAGE RESOURCE MAPPING

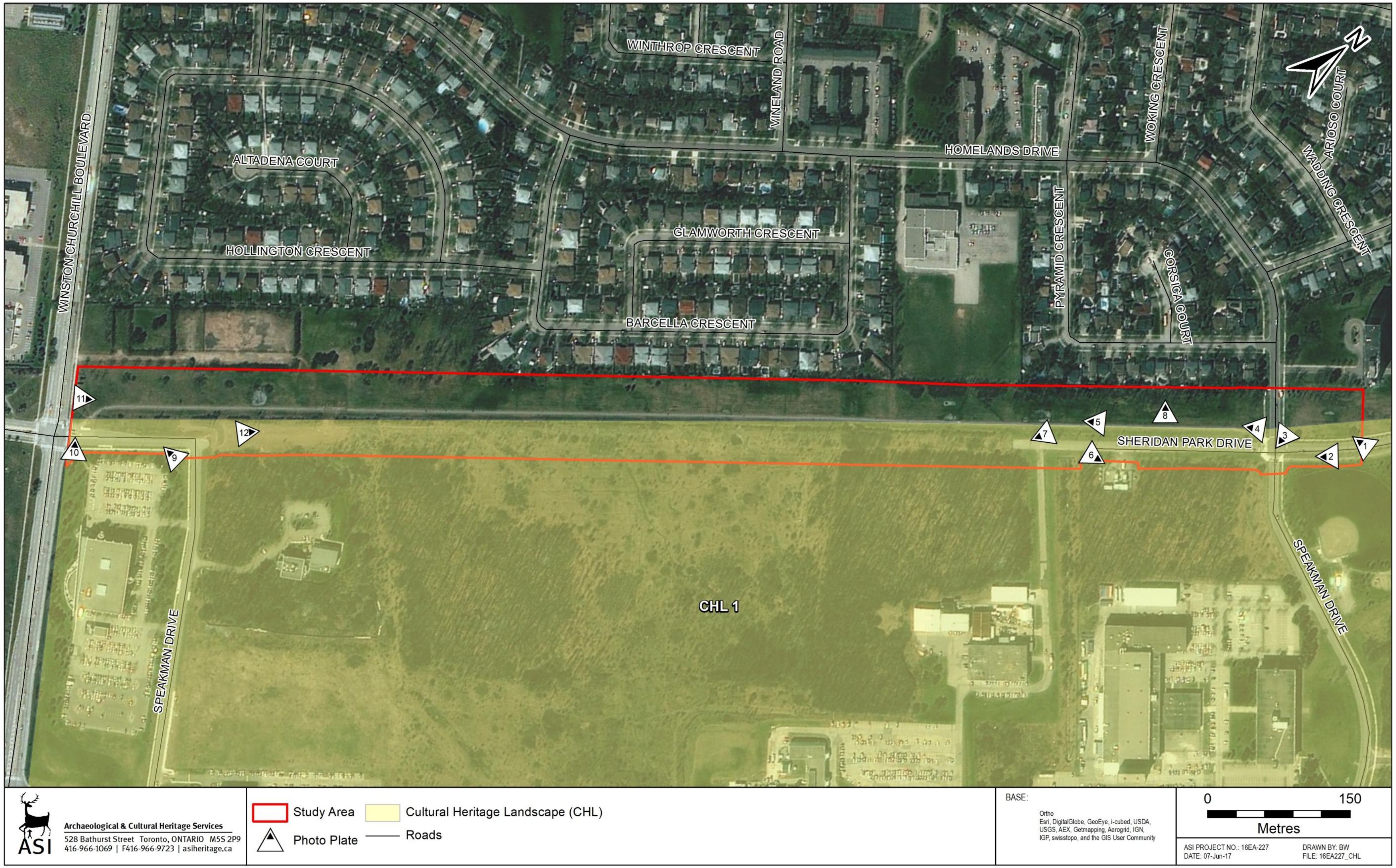


Figure 8: Location of Cultural Heritage Resources and Photographic Plates in the Sheridan Park Drive Extension Study Area

[THE DIFFERENCE IS OUR PEOPLE]

Appendix I

Air Quality Impact Assessment Report

Appendix I

Sheridan Park Drive Extension
Municipal Class Environmental Assessment
Air Quality Impact Assessment Report

City of Mississauga

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Mississauga ON   L5N 8R9 CANADA

October 26, 2017
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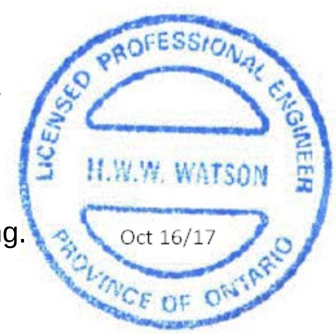

Executive Summary

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. This Air Quality Impact Assessment (AQIA) was completed as part of the EA Study in order to understand the impacts of the proposed road extension on local air quality.

Based on the forecasted 2031 traffic volumes, future predicted air quality levels with and without a road extension were compared to the existing air quality levels to understand the impact of a potential road extension on local air quality. Typical contaminants from automobile exhaust were evaluated including Particulate Matter ($PM_{2.5}$ and PM_{10}), Total Suspended Particulates (TSP), Nitrogen Oxides (NO_x), Carbon Monoxide (CO), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde.

Air quality modelling was performed for above contaminants for present day, and two future scenarios. The present day results show the current (2017) impact of the local roads. The Future No Build scenario predicts emissions due to traffic in the vicinity of the Study Area for the future (2031) without the proposed road extension. The Future Build scenario predicts future (2031) emissions with the proposed road extension. The impacts were assessed on 0.5 hour, 1 hour, 8 hour, 24 hour and annual basis. Modelled impacts for the local roads were added to the background measurements recorded by the Ministry of Environment and Climate Change (MOECC) for all three scenarios in order to understand the total cumulative effects of the proposed road extension on local air quality.

The future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) were all below the MOECC criteria with the exception of benzene, which already exceeds the criteria based on background air quality.

The Air Quality Assessment shows that change in concentration of benzene at any location in the Study Area is negligible. The variability in the National Air Pollution Surveillance (NAPS) background measurements (standard deviation of 0.22 $\mu g/m^3$) is much higher than the predicted change in impact (0.0003 $\mu g/m^3$ worst case impact). The background benzene concentration is continuing to fall as shown in Figure 19 of the Air Quality in Ontario 2015 Report. As a result, based on the analysis, there is no expectation that the benzene concentration will increase because of the project.

It should be noted that the elevated benzene levels detected are not isolated to the Sheridan Park area, but observed all over the Province. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level.

Local reductions have a limited effect as a result reducing benzene concentrations requires a provincial solution. According to Air Quality in Ontario 2015 Report published by the MOECC, over the 10 year period from 2005 to 2014, benzene concentrations have decreased 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial / commercial operations emitting benzene in the vicinity of the project area.

Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the city.

A potential Greenhouse Gas emission effect from the proposed road extension was determined to be insignificant on a regional scale. The total annual emissions are expected to be well below 1% of the provincial levels. Similarly, the local impact is negligible.

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Glossary of Terms and Acronyms

AAQC	Ambient Air Quality Criteria
AADT	Annual Average Daily Traffic
AQIA	Air Quality Impact Assessment
AQIA Guidance	City of Mississauga Air Quality Impact Assessment Guidance for Schedule C Road Improvements Class EAs
CAL3QHCR	Air Dispersion Model for Predicting Air Quality Impacts Near Roadways
City	City of Mississauga
BMP	Best Management Practices
Burnside	R.J. Burnside & Associates Limited
CAAQS	Canadian Ambient Air Quality Standards
CAC	Criteria Air Contaminant
City	City of Mississauga
CO	Carbon Monoxide
CO_2e	Carbon Dioxide equivalent
ECCC	Environmental and Climate Change Canada
EA	Environmental Assessment
GHG	Greenhouse Gas
MOECC	Ministry of the Environment and Climate Change
MOP	City of Mississauga Official Plan
MOVES	Motor Vehicle Emission Simulator
MTO	Ministry of Transportation
MTO Guide	Ministry of Transportation "Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects" (2012)
NAAQO	National Ambient Air Quality Objective
NAPS	National Air Pollution Surveillance
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
O_3	Ozone
OTAQ	Office of Transportation and Air Quality
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter < 2.5 µm in diameter
PM_{10}	Particulate Matter < 10 µm in diameter
RAMMET	Meteorological Data Preprocessor
ROW	Right-of-Way
SO_2	Sulphur Dioxide
TTA	Transportation and Traffic Analysis
TSP	Total Suspended Particulate Matter
US EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The EA Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighborhood and business area, create options for alternative routes and improve multi-modal network connectivity. The EA Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.

As part of the EA Study, Burnside has completed an Air Quality Impact Assessment (AQIA) to identify whether the change in traffic as a result of the Sheridan Park Drive extension will significantly change air quality within the Study Area and vicinity.

1.1 Study Area

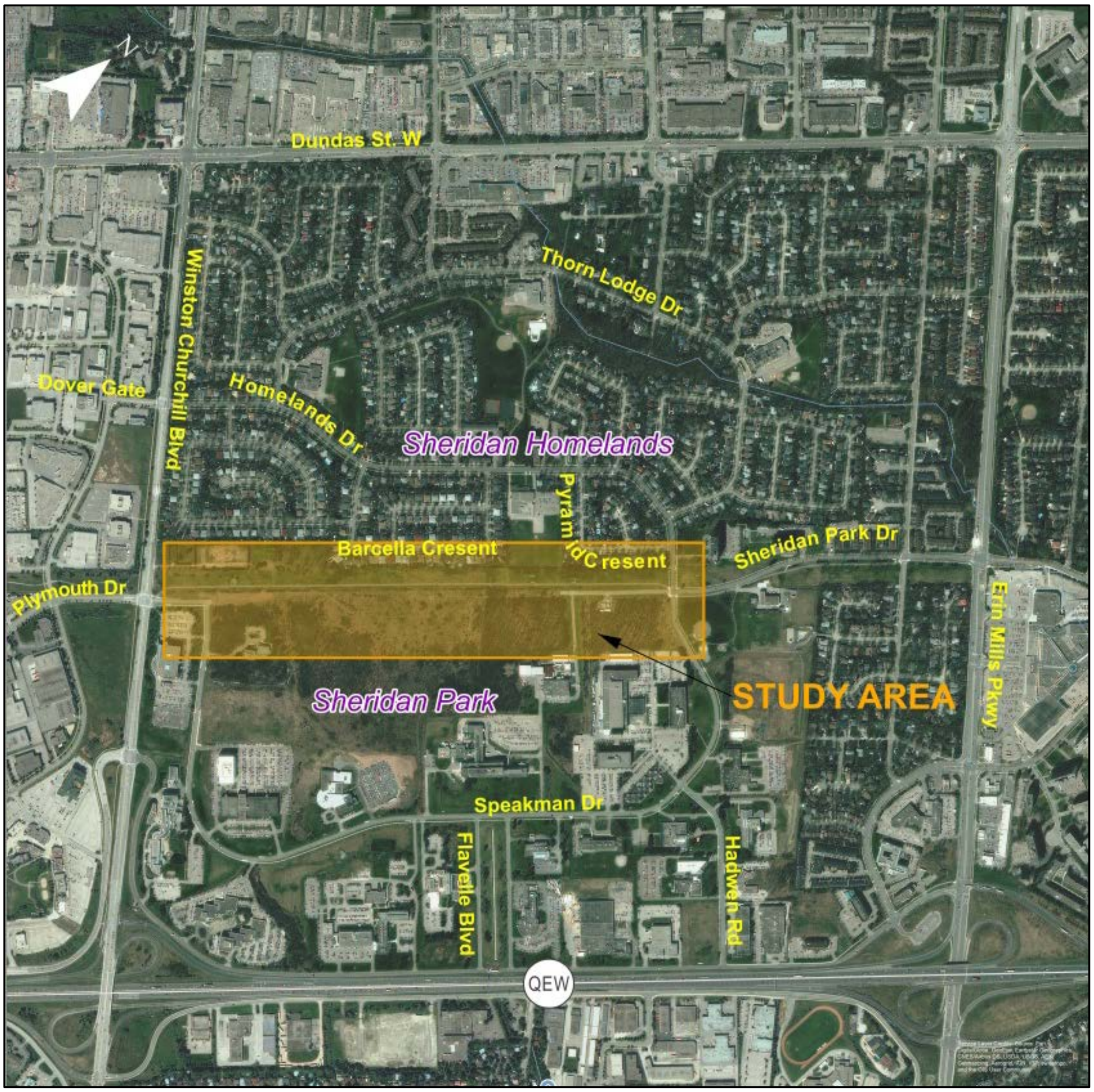
The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail, and the Sheridan Homelands residential neighbourhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of the Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of the corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved multi-use trail through the utility corridor from Winston Churchill Boulevard to Homelands Drive/Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Figure 1: Study Area



1.2 Sensitive Receptors

The air quality effects due to the proposed Sheridan Park Drive extension were predicted at selected sensitive receptors. Sensitive receptors are described by the Ministry of Transportation (MTO) in their Guide “Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects” (MTO Guide) (MTO, 2012) as:

- Residences.
- Hospitals.
- Retirement homes.
- Childcare centres.
- Similar institutional buildings (like schools).

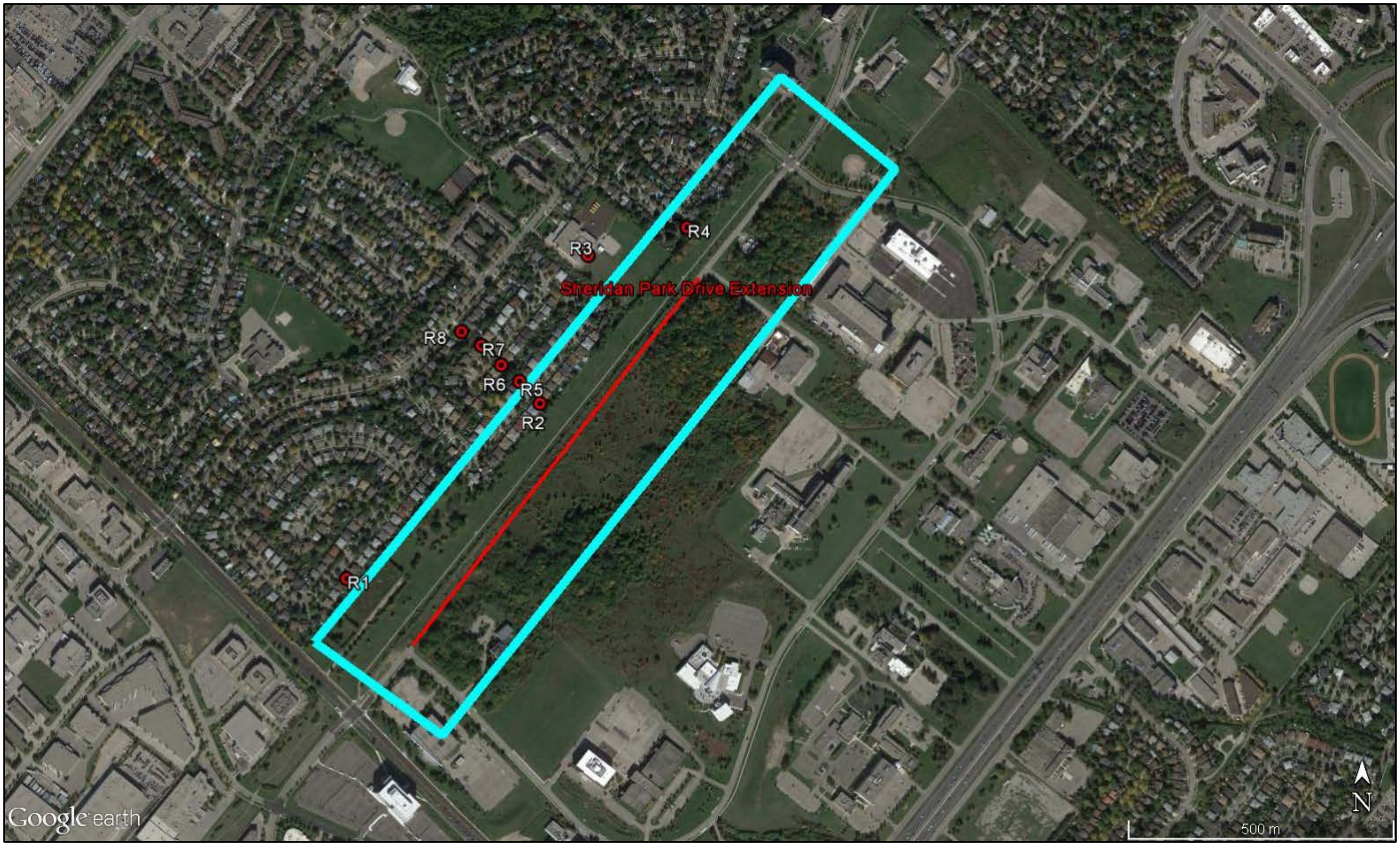
There are residences to the north of the Study Area, which are part of the Sheridan Homelands neighbourhood. In addition, Homelands Sr. Public School is located within this neighbourhood. Three residential properties and the school were selected as representative sensitive receptors within the Study Area. In addition, four residential properties were selected at varying setbacks from the proposed road extension to illustrate the change in ground level air quality concentration at varying distances. All sensitive receptor locations are summarized in Table 1 and shown in Figure 2.

Table 1: Sensitive Receptor Locations

ID	Address	Easting	Northing	Receptor Description
R1	2644 Hollington Crescent	607308	4819204	2 story house
R2	2494 Barcella Crescent	607657	4819529	2 story house
R3	2420 Homelands Drive	607741	4819801	Homelands Sr. Public School
R4	2356 Pyramid Crescent	607922	4819855	2 story house
R5	2493 Barcella Crescent	607619	4819568	2 story house
R6	2498 Glamworth Crescent	607585	4819598	2 story house
R7	2495 Glamworth Crescent	607549	4819633	2 story house
R8	2500 Homelands Drive	607511	4819658	1 story house

Receptors R1, R2, and R4 were selected to represent the closest group of receptors in the Study Area. Receptors R5 through R8 were selected northwest of R2 with increased separation distance from the Study Area in order to show the change in concentration level with the distance. Homeland Senior Public School was selected as a sensitive receptor R3.

Figure 2: Sensitive Receptors



1.3 Potential Pollutants

Transportation related contaminants are emitted due to fuel combustion, brake wear, tire wear, and road dust. According to City of Mississauga publication Air Quality Impact Assessment Guidance for Schedule C Road Improvements Class EAs (AQIA Guidance), the key pollutants released from transportation sources include Criteria Air Contaminants (CACs) and Volatile Organic Compounds (VOCs):

- Carbon Monoxide (CO).
- Nitrogen Oxides (NO_x).
- Total Suspended Particulate Matter (TSP).
- Particulate Matter 10 μm or less in diameter (PM_{10}).
- Particulate Matter 2.5 μm or less in diameter ($PM_{2.5}$).
- Selected VOCs (benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein).

CACs are the common pollutants found in ambient air associated with environmental effects such as smog and acid rain, and cause a variety of health effects. They include particulate matter (PM), sulphur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), and ozone (O_3). CACs come from a variety of sources and are mainly the products of fossil fuel combustion and industrial processes.

VOCs are compounds that have a high vapour pressure and can easily evaporate into the air. They occur naturally and are also produced by human activities such as cleaning, painting, etc. They are common indoors, where concentrations are typically higher than outdoors.

1.4 Greenhouse Gas

Greenhouse Gases (GHGs) contribute to climate change by trapping heat within the earth's atmosphere. The major gases include carbon dioxide, methane, and nitrous oxide although there are many other gases that behave in a similar way. Burning of fossil fuels is the major source of GHGs.

A GHG impact assessment on a regional scale was completed as part of this AQIA. Total annual emissions were based on the annual vehicle kilometres travelled within the Study Area for the reference year 2031. Annual emissions were compared to the total provincial emissions due to transportation sector to estimate the magnitude of the effect of the Sheridan Park Drive extension. Provincial emissions were taken from the most recent Environment Canada National Inventory Report on Greenhouse Gases (Environment Canada, 2017) for the 2015 calendar year.

2.0 Existing Ambient Air Quality Conditions

2.1 Climate

The ambient air monitoring station in Oakville was used to assess the climate in the vicinity of the Study Area. The Study Area is located within the City of Mississauga close to the border with the Town of Oakville. Both Oakville and Mississauga have a humid continental climate characterized with warm and humid summers and cool winters. Local climate conditions were obtained from Environment and Climate Change Canada's (ECCC) Oakville Southeast Water Pollution Control Plant (WPCP) meteorological station (station ID 615N745, Latitude 43°29'00.000" N, Longitude 79°38'00.000" W). According to the Canadian Climate Normals (calendar years 1981 to 2010) for this station, the mean annual temperature is estimated at 8.1°C. The warmest month of the year is July with an average temperature of 20.9°C and the coldest month is January with an average temperature of -4.7°C. The Oakville Southeast WPCP meteorological station recorded a total average annual precipitation (snow and rain) of 801 mm, 726 mm of which was rain. Precipitation is distributed throughout the year, with most of the rain occurring between April and November. The maximum mean monthly rainfall is 78.3 mm and occurs in August. Climate Normals for the Oakville Southeast WPCP station are summarized in Table 2.

Table 2: Oakville Southeast WPCP Meteorological Station Climate Normals (1981-2010)

Meteorological Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Average Temperature (°C)	-4.7	-3.9	0.1	6.4	12.3	17.7	20.9	20.1	15.6	9.3	4	-1.3	8.1
Daily Maximum Temperature (°C)	-0.4	0.6	4.7	11.3	17.9	23.2	26.3	25.2	20.9	14.3	8.3	2.8	12.9
Daily Minimum Temperature (°C)	-8.9	-8.3	-4.5	1.5	6.8	12.1	15.4	15	10.2	4.3	-0.2	-5.5	3.2
Rainfall (mm)	31.5	30.7	37.2	63.1	73.9	71	75.8	78.3	73.5	70	76.8	43.9	726
Snowfall (cm)	28.3	16.1	17.2	2.1	0	0	0	0	0	0	2.5	14.9	81
Precipitation (mm)	59.8	46.7	54.4	65.2	73.9	71	75.8	78.3	73.5	70	79.3	58.8	807

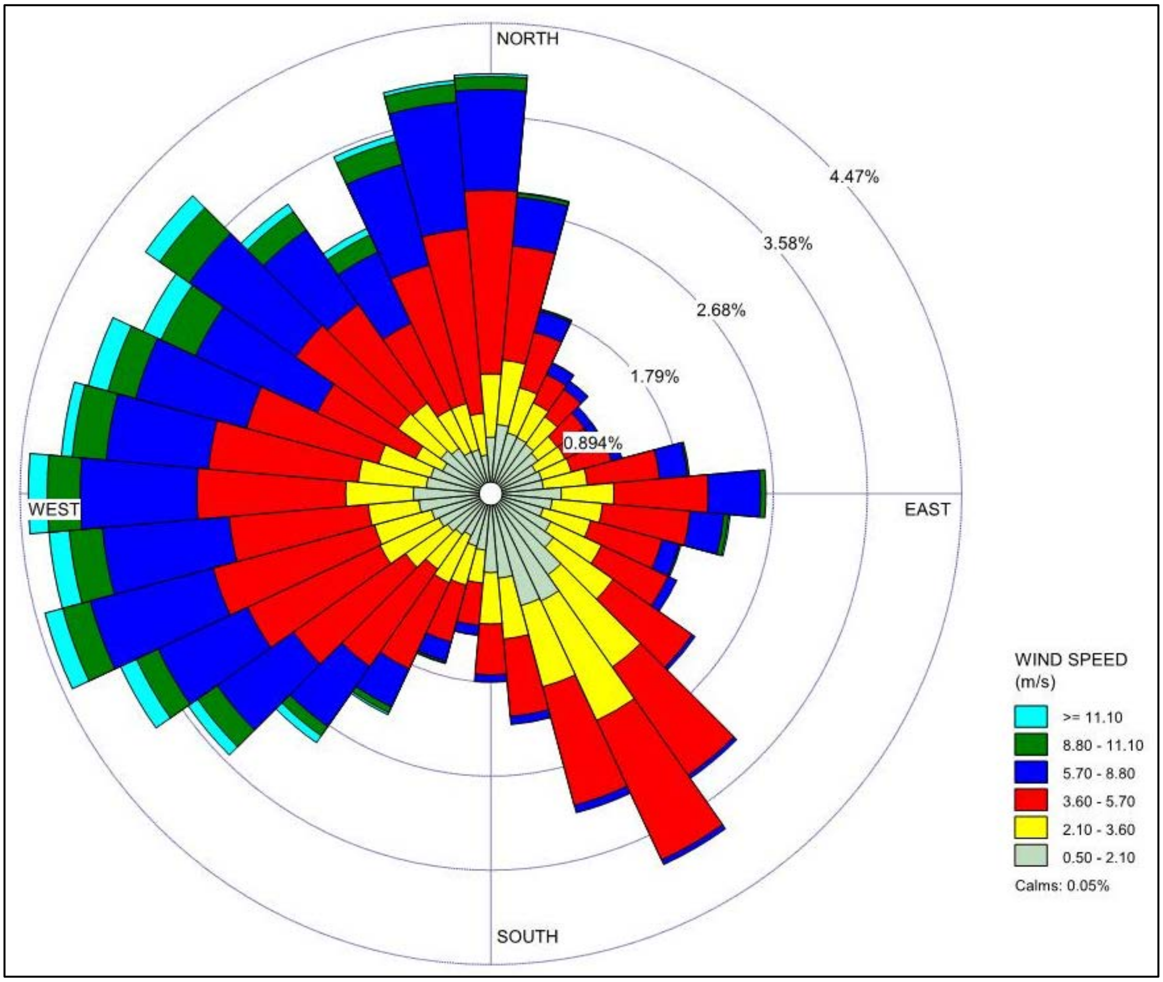
Station Climate ID: 615N745; Latitude: 43°29'00.000" N, Longitude: 79°38'00.000" W.
Elevation: 86.9 m

Source:http://climate.weather.gc.ca/climate_normals/results_1981_2010_e.html?searchType=stnName&txtStationName=OAKVILLE+SOUTHEAST+WPCP&searchMethod=contains&txtCentralLatMin=0&txtCentralLatSec=0&txtCentralLongMin=0&txtCentralLongSec=0&stnID=4846&dispBack=1

The MOECC provided the meteorological data set (station ID 61587) used in this AQIA. This data set covers the 2012 to 2016 calendar years. Based on the provided data, the average wind speed at the station is 4.45 m/s. The dominant wind directions are west and north. A wind rose depicting the relative frequency of wind directions including wind speeds is provided in Figure 3. The meteorological data set was used in the dispersion model (CAL3QHCR) to predict the concentration levels at various places.

The dispersion model starts with the emissions based on traffic and then predicts how those contaminants will be moved by the wind.

Figure 3: Wind Rose



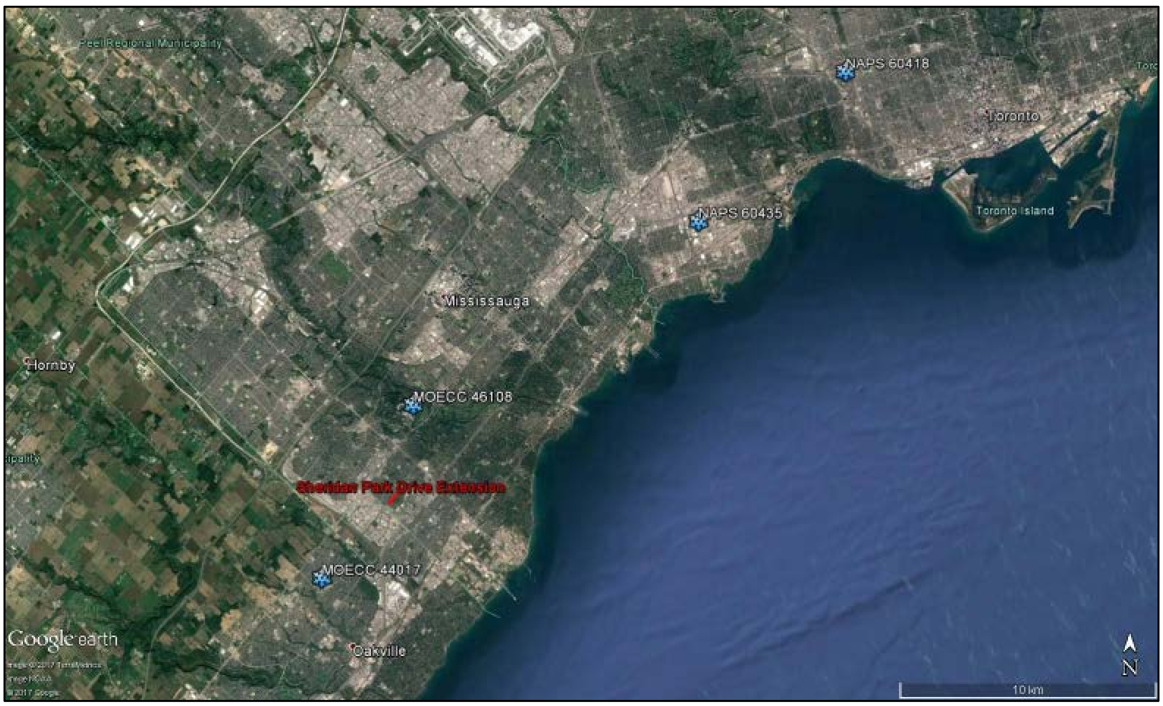
2.2 Air Quality

The MOECC and National Air Pollution Surveillance (NAPS) stations in close proximity to the Study Area were reviewed to ensure the most representative background concentration would be selected. Not all contaminant concentrations are available at every station; therefore, a total of three stations were selected to fully characterize the background concentrations in the vicinity of the Study Area. One MOECC station was selected to represent $PM_{2.5}$, NO_x, and CO. Two NAPS stations were selected to represent background concentrations for 1,3-butadiene, benzene, acetaldehyde, acrolein, and formaldehyde. The stations and the most recent five available data years are summarized in Table 3. The locations of the selected stations are shown in Figure 4.

Table 3: Ambient Monitoring Stations Summary

Contaminant	Station ID	Station Location	Year
$PM_{2.5}$	MOECC 46108	3359 Mississauga Rd. N., U of T Mississauga	2011-2015
NO_x	MOECC 46108	3359 Mississauga Rd. N., U of T Mississauga	2011-2015
CO	MOECC 44017	Eighth Line/Glenashton Drive, Halton Res	2001-2004
1,3-Butadiene	NAPS 60435	Toronto 461 Kipling Avenue	2011-2015
Benzene	NAPS 60435	Toronto 461 Kipling Avenue	2011-2015
Acetaldehyde	NAPS 60418	Toronto Perth/Ruskin (Junction Triangle)	2001-2005
Acrolein	NAPS 60418	Toronto Perth/Ruskin (Junction Triangle)	2001-2005
Formaldehyde	NAPS 60418	Toronto Perth/Ruskin (Junction Triangle)	2001-2005

Figure 4: MOECC and NAPS Air Quality Stations



The Study Area is in close proximity to two MOECC ambient monitoring stations – Oakville (4.2 km) and Mississauga (2.4 km). $PM_{2.5}$ and NO_x background concentrations were taken from the nearest Mississauga station. CO concentrations were available at Oakville station only and were limited to 2001-2004 calendar years. Summary of background concentrations 90th percentile[1], maximum and average values for all contaminants is provided in Table 4.

[1] 90th percentile of monitoring data is typically considered a conservative estimate of background air quality. 90th percentile is the level below which 90% of all the observed values occur.

Table 4: Background Data Summary

Contaminant	CAS#	Averaging period	90th Percentile	Max	Average
$PM_{2.5}$	-	24hr	14.17	39.50	7.43
		Annual	n/a	8.64	7.42
PM_{10}	-	24hr	26.33	73.15	13.76
TSP	-	24hr	47.22	131.67	24.76
		Annual	n/a	28.82	24.74
NO_x	11104-93-1	1hr	47.25	477.75	22.73
		24hr	40.91	175.51	22.71
		Annual	n/a	25.65	22.72
CO	630-08-0	1hr	935	3,865	611
		8hr	908	1,459	611
1,3-Butadiene	106-99-0	24hr	0.07	0.21	0.04
		Annual	n/a	0.049	0.045
Benzene	71-43-2	24hr	0.80	1.40	0.51
		Annual	n/a	0.57	0.52
Acetaldehyde	75-07-0	0.5hr	n/a	n/a	n/a
		24hr	3.30	5.58	1.95
Acrolein	107-02-8	1hr	n/a	n/a	n/a
		24hr	0.20	1.17	0.12
Formaldehyde	50-00-0	24hr	6.48	11.24	3.66

Notes:
- Acrolein concentrations are provided on a daily basis so hourly values cannot be determined.
- 5 annual values are insufficient to calculate an annual 90th percentile value so the maximum value was used.
- PM_{10} concentrations based on $PM_{2.5}/PM_{10}$ ratio of 0.54 (Lall, 2004).
- TSP concentrations based on $PM_{2.5}$/TSP ratio of 0.30 (Lall, 2004).

Fine particulate matter is associated with major health effects compared to larger particles. Due to their small size, they can penetrate deep into lungs. MOECC monitoring stations record only background concentrations of $PM_{2.5}$. Since PM_{10} and TSP background concentrations were not available, values were calculated based on monitored $PM_{2.5}$ concentrations. Mean ratios of $PM_{2.5}/PM_{10}=0.54\pm0.14$, and $PM_{2.5}/TSP=0.30\pm0.11$ derived by Lall, et al (2004) were used to calculate 90^{th} percentile, maximum and average concentrations of PM_{10} and TSP. This method is used throughout the province to predict PM_{10} and TSP concentrations when the only measured values are for $PM_{2.5}$. The MOECC considers this method to be acceptably accurate.

2.3 Air Quality Assessment Criteria

Ontario regulates contaminants released into the environment in order to limit and even reduce concentrations of harmful substances in the atmosphere and to protect the environment and human health. As a part of this regulation, the MOECC has developed a number of sources of criteria as described below.

Ambient air criteria for contaminants associated with road traffic emissions were taken from Ontario's Ambient Air Quality Criteria (AAQC) developed by the MOECC and is summarized in Table 5. According to the MOECC "an AAQC is a desirable concentration of a contaminant in air, based on protection against adverse effects on health or the environment". The Canadian Ambient Air Quality Standards (CAAQS) coming into effect in 2020 were used for $PM_{2.5}$. The Canadian National Ambient Air Quality Objectives (NAAQO) for maximum desired level was used as an annual nitrogen dioxides criterion.

Table 5: Representative Contaminants and Air Quality Criteria

Contaminant	CAS#	Averaging Period	AAQC[1] ($\mu g/m^3$)	CAAQS[2] ($\mu g/m^3$)	NAAQO[3] ($\mu g/m^3$)	Limiting Effect
CO	630-08-0	1hr	36,200			Heath
		8hr	15,700			Heath
NO_x	10102-44-0	1hr	400			Heath
		24hr	200			Heath
		Annual			60	Heath
$PM_{2.5}$	-	24hr	30	27		
		Annual		8.8		
PM_{10}	-	24hr	50			
TSP	-	24hr	120			Visibility
		Annual	60			Visibility
1-3 Butadiene	106-99-0	24hr	10			Health
		Annual	2			Health
Acetaldehyde	75-07-0	0.5hr	500			Health
		24hr	500			Health
Acrolein	107-02-8	1hr	4.5			Health
		24hr	0.4			Heath
Benzene	71-43-2	24hr	2.3			Heath
		Annual	0.45			Heath
Formaldehyde	50-00-0	24hr	65			Heath

Notes:

[1] Ontario's Ambient Air Quality Criteria

[2] Canadian Ambient Air Quality Standards

[3] Canadian National Ambient Air Quality Objective

NO_x is the sum of nitrogen dioxide (NO_2) and nitric oxide (NO). Emissions of NO_x consist mainly of NO; however, NO is converted to NO_2 in the ambient air. NO_2 has an adverse effect at much lower concentrations than NO according to Ontario's Ambient Air Quality Criteria publication. Therefore, the AAQC is based on the NO_2 concentration. As a conservative assumption for this assessment, it was assumed that all NO is converted to NO_2.

3.0 Local Air Quality Assessment

Transportation is one of the largest sources of air pollution in Canada according to Environment and Climate Change Canada (ECCC).

The exhaust from the vehicles due to fuel combustion contains a number of pollutants that might be harmful to human health and the environment. The main contaminants include particulate matter, nitrogen oxides, and carbon monoxide. However, there are many more contaminants associated with transportation. The magnitude of the emissions and the predicted change of those emission ns due to proposed road extension were also evaluated in this AQIA.

3.1 Methodology

Following the MTO Guide, two scenarios were assessed for Sheridan Park Drive extension, namely the Future No Build and Future Build scenarios. Those scenarios assess the future impact without the extension and future impact with the extension. The AQIA Guidance requires the assessment of the Current and Future Build scenarios. These three scenarios are referred to as "Current", "Future Build" and "Future No Build". The future date used in the assessment is 2031. The scenarios use the following information:

- Current (2017) Scenario:
  - Existing traffic volumes
  - Existing roads
- Future No Build (2031) Scenario:
  - Projected 2031 traffic volumes on all roads around the Study Area if the extension is not built
  - Existing roads
- Future Build (2031) Scenario:
  - Projected 2031 traffic volumes on all roads around the Study Area if the extension is built
  - Existing roads
  - Sheridan Park Drive extension

Ground level contaminant concentrations were predicted for all contaminants of interest for the three scenarios. Predicted values were added to the existing background ambient concentrations. The resulting cumulative concentrations were compared to the applicable criteria and the magnitude of the impact of the proposed road extension was determined.

For the future 2031 scenarios, background concentrations were assumed to remain the same. Based on data collected at the MOECC ambient monitoring stations, concentrations of the key pollutants such as NO_x, CO, $PM_{2.5}$, and some VOCs such as benzene decreased over the last 10 years between 11% and 62% (MOECC, 2017). Assuming this trend will continue in the future, using current background values for the future scenario is a conservative approach.

3.2 Emission Factors

Transportation related emissions are associated with fuel combustion, brake wear, tire wear, as well as re-suspended road dust.

Emission factors for fuel combustion, brake wear and tire wear were estimated using Motor Vehicle Emission Simulator (MOVES) developed by the United States Environmental Protection Agency (US EPA) Office of Transportation and Air Quality (OTAQ). This emission modeling system estimates emissions for mobile sources covering a broad range of pollutants and conditions including the variety of vehicles (cars vs. trucks), ambient temperature, and vehicle speed. The summary of emission factors is provided in Appendix A. Weighted emission factors were derived based on the speed limit and vehicle type distribution for each road segment.

MOVES does not provide an emission factor for TSP. An exhaust emission factor for PM_{10} was used for TSP as, according to the US EPA, based on emissions test results, more than 97% of tailpipe particulate matter is PM_{10} or less.

Particulate emissions due to re-suspended road dust were estimated using the latest US EPA methodology for paved roads (US EPA, 2011). As a result, the total emission factors for particulate matter were a sum of tail pipe and road dust emission factors.

3.3 Traffic

Traffic volumes were provided for the morning (AM) and evening (PM) rush hours as well as annual average daily traffic (AADT). Based on the change between existing and future forecasted traffic volumes on the roads closest to the proposed extension, it was determined that AM rush hour traffic was expected to increase more than PM rush hour traffic. Due to the higher expected traffic volume increase, the AM rush hour represents the worst case scenario and was selected as a basis for this assessment.

The percentage of heavy vehicles was derived from the hourly vehicle counts on all surrounding roads. It was assumed that this percentage will remain the same in the future scenarios.

There are two intersections controlled by traffic lights within the Study Area – Winston Churchill Blvd. / Homelands Dr. and Winston Churchill Blvd. / Sheridan Park Dr. Existing signal timings for both intersections were utilized.

3.4 Air Dispersion Modelling

Dispersion modelling to determine maximum pollutant concentration was completed in accordance with the MTO Guide. The modelled impacts of contaminant emissions are assessed as 1-hour, 8-hour, 24-hour, and annual concentrations to match the appropriate criteria.

The appropriate model to assess the maximum impact is the US EPA CAL3QHCR model. The CAL3QHCR model estimates ground level air pollutant concentrations near roads from both moving and idling vehicles.

A site-specific meteorological data set was provided by the MOECC for use with this AQIA. The CAL3QHCR ready meteorological data set covers the dates from January 1, 2012 to December 31, 2016.

The hourly data includes many factors, which affect the dispersion of air contaminants including wind speed, wind direction, temperature, mixing height and stability category.

As explained in Section 1.2, eight sensitive receptors were selected for this assessment. The first four sensitive receptors (R1-R4) where selected into order to assess the impact to air quality along the length of the Study Area while the last four sensitive receptors (R5-R8) were selected in order show the change in air quality impact as the distance to the proposed road extension increases.

The model is developed to incorporate the area road network and associated characteristics such as road width, traffic volume, travel speed, etc. In addition, the model assumes idling during the red phase of the signal cycle.

3.5 Modelling Results

The impact of the proposed Sheridan Park Drive extension was assessed based on the predicted ground level concentrations at the selected sensitive receptors within the Study Area as shown in Figure 2 and existing background concentrations as monitored at MOECC and NAPS stations.

Predicted future ground level concentrations at the most impacted receptors are summarized for each contaminant and averaging period in Table 6 through Table 8. Detailed results are provided in Appendix C. The most impacted receptor is the receptor with the highest predicted ground level concentration. This appears to be either R1 or R8 depending on the contaminant. Both receptors are the ones nearest to the existing roads. R1 is the closest receptor to Winston Churchill Boulevard and is the most impacted by Winston Churchill Boulevard. R8 is the nearest receptor to Homelands Drive and the major impact on air quality at this receptor is due to proximity to Homelands Drive.

The results are presented by contaminant and include background concentration (90^{th} percentile), predicted concentration at the most impacted receptor and cumulative concentrations (background plus predicted concentration). The predicted and cumulative concentrations are compared against applicable criteria.

Table 6: Maximum Predicted Concentrations – Current Scenario

Contaminant	Averaging Period	Criteria (µg/m³)	Background Concentration (µg/m³)	Most Impacted Receptor	Current Predicted Concentration (µg/m³)	Current Predicted % of Criteria	Current Cumulative Concentration (µg/m³)	Current Cumulative % of criteria
CO	1hr	36,200	934.80	R1	36.98	0.10%	971.78	2.7%
	8hr	15,700	907.73	R1	28.61	0.18%	936.34	6.0%
NO_x	1hr	400	47.25	R8	9.04	2.26%	56.29	14.1%
	24hr	200	40.91	R1	3.74	1.87%	44.65	22.3%
	Annual	60	25.65	R1	1.32	2.19%	26.96	44.9%
$PM_{2.5}$	24hr	27	14.17	R8	0.76	2.80%	14.92	55.3%
	Annual	8.8	8.64	R8	0.30	3.40%	8.94	101.6%
PM_{10}	24hr	50	26.23	R8	2.74	5.48%	28.97	57.9%
TSP	24hr	120	47.22	R8	13.90	11.58%	61.12	50.9%
	Annual	60	28.82	R8	5.38	8.96%	34.19	57.0%
1,3-Butadiene	24hr	10	0.07	R1	0.0018	0.02%	0.08	0.8%
	Annual	2	0.05	R8	0.0008	0.04%	0.05	2.5%
Acetaldehyde	0.5hr	500	3.30	R8	0.028	0.01%	3.32	0.7%
	24hr	500	3.30	R1	0.011	0.00%	3.31	0.7%
Acrolein	1hr	4.5	0.20	R8	0.0038	0.08%	0.21	4.6%
	24hr	0.4	0.20	R8	0.0012	0.30%	0.21	51.4%
Benzene	24hr	2.3	0.80	R1	0.014	0.62%	0.81	35.4%
	Annual	0.45	0.57	R1	0.005	1.09%	0.58	128.1%
Formaldehyde	24hr	65	6.48	R1	0.018	0.03%	6.50	10.0%

Notes:
- 90th percentile used as background concentrations for 1-hr, 8-hr, and 24-hr averaging periods.
- Maximum annual values use as background concentrations for annual averaging periods.
- 24-hour 90th percentile used as background concentrations for acrolein 1-hour and acetaldehyde 0.5-hr averaging periods because measured data is only reported for the 24 hour period.

Table 7: Maximum Predicted Concentrations – Future No Build Scenario

Contaminant	Averaging Period	Criteria (µg/m³)	Background Concentration (µg/m³)	Most Impacted Receptor	Build Predicted Concentration (µg/m³)	Future No Build Predicted % of Criteria	Future No Build Cumulative Concentration (µg/m³)	Future No Build Cumulative % of criteria
CO	1hr	36,200	934.80	R1	51.63	0.14%	986.43	2.7%
	8hr	15,700	907.73	R1	37.96	0.24%	945.69	6.0%
NO_x	1hr	400	47.25	R8	11.82	2.95%	59.07	14.8%
	24hr	200	40.91	R1	4.91	2.46%	45.82	22.9%
	Annual	60	25.65	R1	1.71	2.84%	27.35	45.6%
$PM_{2.5}$	24hr	27	14.17	R8	1.01	3.74%	15.18	56.2%
	Annual	8.8	8.64	R8	0.40	4.52%	9.04	102.8%
PM_{10}	24hr	50	26.23	R8	3.67	7.33%	29.90	59.8%
TSP	24hr	120	47.22	R8	18.61	15.51%	65.83	54.9%
	Annual	60	28.82	R8	7.16	11.94%	35.98	60.0%
1,3-Butadiene	24hr	10	0.07	R1	0.0024	0.02%	0.08	0.8%
	Annual	2	0.05	R8	0.0010	0.05%	0.05	2.5%
Acetaldehyde	0.5hr	500	3.30	R8	0.036	0.01%	3.33	0.7%
	24hr	500	3.30	R1	0.014	0.00%	3.31	0.7%
Acrolein	1hr	4.5	0.20	R8	0.0050	0.11%	0.21	4.6%
	24hr	0.4	0.20	R8	0.0016	0.40%	0.21	51.5%
Benzene	24hr	2.3	0.80	R1	0.019	0.82%	0.82	35.6%
	Annual	0.45	0.57	R1	0.006	1.42%	0.58	128.4%
Formaldehyde	24hr	65	6.48	R1	0.024	0.04%	6.51	10.0%

Notes:
- 90th percentile used as background concentrations for 1-hr, 8-hr, and 24-hr averaging periods.
- Maximum annual values use as background concentrations for annual averaging periods.
- 24-hour 90th percentile used as background concentrations for acrolein 1-hour and acetaldehyde 0.5-hr averaging periods because measured data is only reported for the 24 hour period.

Table 8: Maximum Predicted Concentrations – Future Build Scenario

Contaminant	Averaging Period	Criteria (µg/m^3)	Background Concentration (µg/m^3)	Most Impacted Receptor	Future Build Predicted Concentration (mg/m3)	Future Build Predicted % of Criteria	Future Build Cumulative Concentration (mg/m3)	Future Build Cumulative % of criteria
CO	1hr	36,200	934.80	R1	53.94	0.15%	988.74	2.7%
	8hr	15,700	907.73	R1	39.33	0.25%	947.06	6.0%
NO_x	1hr	400	47.25	R1	10.70	2.68%	57.95	14.5%
	24hr	200	40.91	R1	5.15	2.57%	46.05	23.0%
	Annual	60	25.65	R1	1.75	2.91%	27.40	45.7%
$PM_{2.5}$	24hr	27	14.17	R8	0.81	2.99%	14.97	55.5%
	Annual	8.8	8.64	R8	0.33	3.76%	8.98	102.0%
PM_{10}	24hr	50	26.23	R8	2.92	5.84%	29.15	58.3%
TSP	24hr	120	47.22	R8	14.81	12.34%	62.03	51.7%
	Annual	60	28.82	R8	5.93	9.88%	34.74	57.9%
1,3-Butadiene	24hr	10	0.07	R1	0.0026	0.03%	0.08	0.8%
	Annual	2	0.05	R1	0.0008	0.04%	0.05	2.5%
Acetaldehyde	0.5hr	500	3.30	R8	0.031	0.01%	3.33	0.7%
	24hr	500	3.30	R1	0.015	0.00%	3.31	0.7%
Acrolein	1hr	4.5	0.20	R8	0.0041	0.09%	0.21	4.6%
	24hr	0.4	0.20	R1	0.0013	0.33%	0.21	51.4%
Benzene	24hr	2.3	0.80	R1	0.020	0.86%	0.82	35.6%
	Annual	0.45	0.57	R1	0.007	1.47%	0.58	128.5%
Formaldehyde	24hr	65	6.48	R1	0.025	0.04%	6.51	10.0%

Notes:
- 90th percentile used as background concentrations for 1-hr, 8-hr, and 24-hr averaging periods.
- Maximum annual values use as background concentrations for annual averaging periods.
- 24-hour 90th percentile used as background concentrations for acrolein 1-hour and acetaldehyde 0.5-hr averaging periods because measured data is only reported for the 24 hour period.

Table 6 shows the maximum impact of the current traffic on the various receptors including the amount contributed by the roads and background levels. Table 7 shows the same information for the future scenario assuming that the extension is not built (Future No Build). Table 8 shows the same information for the future scenario assuming that the extension is built (Future Build).

Table 6 through Table 8 show that the contribution from all the roads in the area including the proposed extension is relatively small compared to the background values.

The cumulative concentrations predicted within the Study Area for all contaminants are well below their applicable criteria with two exceptions as shown in Table 6 ($PM_{2.5}$, annual and benzene, annual).

The annual $PM_{2.5}$ concentration is predicted to be slightly above the criteria. However, the annual concentration of $PM_{2.5}$ in the ambient air quality is at 98% of the criterion. Since the prediction of annual $PM_{2.5}$ concentration is a result of adding the maximum background value to the maximum modelled value, the contribution of $PM_{2.5}$

contaminants due the current traffic and the traffic based on the Future No Build and Future Build Scenario is a much smaller portion of the cumulative concentration. The $PM_{2.5}$ annual concentration is slightly above the criterion for the Current[2], Future No Build[3], and Future Build[4] scenarios at R7 and R8. The exceedance is the highest for the Future No Build scenario at R7 and R8. The concentrations for this contaminant are predicted to be below criteria for all other receptors for all scenarios as shown in Table C 7, Table C 8, and Table C 9 in Appendix C.

According to Air Quality in Ontario 2015 Report (MOECC, 2017), fine particulate matter decreased 25% from 2006 to 2015. Considering the general trend in Ontario, average annual background concentrations and the very small contribution due to the roads within the Study Area it is reasonable to expect that cumulative $PM_{2.5}$ concentrations will be below their annual criteria within the Study Area in the future.

Similar to $PM_{2.5}$, annual benzene concentrations exceed the annual criteria. However, in this case the annual concentration of benzene in the ambient air quality exceeds the criterion. The contribution of benzene concentrations due to the current traffic and the traffic based on the Future No Build and Future Build Scenarios is a much smaller portion of the cumulative concentration and the difference between the Future No Build and Future Build Scenarios is negligible.

The elevated background benzene concentration is not isolated to the Sheridan Park area, but observed across the Province of Ontario. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level. Local reductions have a limited effect as a result reducing benzene concentrations requires a provincial solution. According to Air Quality in Ontario 2015 Report (MOECC, 2015), over the 10-year period from 2005 to 2014, benzene concentrations have decreased by 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial/commercial operations emitting benzene in the vicinity of the Study Area.

Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the City.

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[2] Appendix C, Table C 7 R1=100.0 %, R7 = 100.0 %, and R8 = 101.6 %,
[3] Appendix C, Table C 8 R1=100.6 %, R7 = 100.5 %, and R8 = 102.8 %,
[4] Appendix C, Table C 9 R1=100.6 %, R7 = 100.3 %, and R8 = 102.0 %,

3.6 Air Quality during Construction Phase

Road construction generally consists of excavation of soil, import and compaction of materials, and paving. Therefore, air emissions associated with the construction of road infrastructure are typically limited to the following:

- Fugitive dust emissions due to soil excavation and filling activities.
- Fugitive dust emissions due to the stockpiling of soil and other friable construction materials.
- Fugitive dust emissions due to the transport of friable fill materials via dump trucks.
- Emissions resulting from the combustion engines of construction equipment.

The Best Management Practices (BMP) would help to mitigate potential air quality effects associated with the construction of this road extension, including but not limited to the following:

- Dust suppression measures (e.g., application of water wherever appropriate, or the use of approved non-chloride chemical dust suppressants, where the application of water is not suitable) as needed to control fugitive dust emissions in accordance with the Cheminfo Services Inc. March 2005 publication “Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities”.
- Stockpiling of soil and other friable materials in locations that are less exposed to wind (e.g., protected from the wind by suitable barriers or wind fences/screens).
- Use of dump trucks with retractable covers for the transport of friable fill materials.
- Washing of equipment and use of mud mats where practical at construction site exits to limit the migration of soil and dust off-site.
- Use of erosion and sedimentation control measures such as silt fence and erosion control blankets to address areas with temporary unstabilized soil.
- Ensuring that all construction vehicles, machinery, and equipment are equipped with current emission controls, and in a state of good repair.

The potential air quality effects associated with the construction stage of Sheridan Park Drive extension are expected to be temporary and localized to the areas adjacent the corridor. Effects are to be reduced to the extent possible through implementation of construction Best Management Practices.

4.0 Regional Air Quality Assessment

The assessment of emission impacts associated with the proposed extension of Sheridan Park Drive on a regional scale was based on the annual GHG emissions. Annual emissions were calculated using emission factors summarized in Table 9.

Table 9: Emission Factors for Energy Mobile Combustion Sources

Vehicles	Emission Factors (g/L fuel)		
	CO_2	CH_4	N_2O
Gasoline	2,316	0.33	0.28
Diesel	2,690	0.10	0.15

Source:
National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada. Part 2 Table A6-12: Emission Factors for Energy Mobile Combustion Sources.

Typical vehicle fuel consumption was taken from the Summary Report of Canadian Vehicle Survey (Natural Resources Canada, 2009). Auto manufacturers are continuously looking for ways to improve their vehicle fuel efficiency; therefore, the actual emissions for both current and future scenarios are expected to be even lower than the calculated 2009 fuel consumption. An average light vehicle (gasoline) was assumed to consume 10.7 L/100 km. An average truck (diesel) was assumed to consume 28.9 L/100 km. Based on AADT and length of segment of each road within the Study Area; total kilometers travelled were estimated to calculate GHG emissions. Annual expected GHG emissions for existing and future conditions are summarized in Table 10. Annual concentrations for all GHGs including total CO_2 equivalent, are estimated to be well below 0.1% of the provincial GHG levels associated with road transportation sector. Therefore, the impact of the proposed road extension on GHG emissions is negligible.

Table 10: Annual GHG Emissions within the Study Area

Contaminant	CO_2	CH_4	N_2O	Total CO_2e
Current Scenario (t/yr)	4,559	0.6	0.5	4,728
Future Scenario No Build (t/yr)	5,672	0.8	0.6	5,883
Increase from Current to Future No Build (t/yr)	1,114	0.2	0.1	1,156
Future Scenario Build (t/yr)	5,226	0.7	0.6	5,420
Increase from Current to Future Build (t/yr)	668	0.1	0.1	693
Increase from No Build to Build2 (t/yr)	(446)	-0.1	-0.1	(463)
Total Provincial1 (t/yr)	47,300,000	3000.0	3000.0	48,300,000
Current Scenario (%)	0.010%	0.020%	0.017%	<0.01%
Future No Build Scenario (%)	0.012%	0.025%	0.021%	0.012%
Future Build Scenario (%)	0.011%	0.023%	0.020%	0.011%

[1] National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada. Part 3, Table A11-13: 2015 GHG Emissions Summary for Ontario.
2 Negative values indicate that the Build Scenario produces fewer emissions than the No Build Scenario.

Detailed GHG calculations for both scenarios are provided in Appendix D.

5.0 Conclusions

The results of the dispersion modelling show that the future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) were all below the MOECC criteria with the exception of benzene, which already exceeds the criteria based on background air quality.

The Air Quality Impact Assessment shows that change in concentration of benzene at any location in the Study Area is negligible.

The results also show that there is a negligible difference in future predicted air quality levels at sensitive receptor locations with or without the Sheridan Park Drive road extension.

The selected sensitive receptors were chosen to represent all the receptors in the vicinity of the Study Area. All other receptors are expected to experience the same or smaller impact due to the proposed road extension.

Potential air quality effects associated with the construction stage is expected to be temporary and localized to the surrounding area. Emissions associated with construction are typically limited to fugitive dust emissions and emissions associated with mobile equipment. During the construction period, people living next to the construction sites might experience elevated dust concentrations.

It is recommended to monitor dust levels during construction stage and apply mitigation measures, such as water application, if needed to reduce the effect on surrounding residences.

6.0 References

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Appendix A

Traffic Volumes

Table A 1: Current and Future Traffic Volumes

Road Description				Current Scenario			Future No Build Scenario			Future Build Scenario		
Road	Posted Speed (km/h)	Percent Cars (%)	Percent Large Vehicles (%)	AM Peak Hour (vph)	PM Peak Hour (vph)	Daily Traffic (vpd)	AM Peak Hour (vph)	PM Peak Hour (vph)	Daily Traffic (vpd)	AM Peak Hour (vph)	PM Peak Hour (vph)	Daily Traffic (vpd)
Winston Churchill Blvd. N of Homelands Dr.	60	97	3	2,623	2,575	24,000	3,250	3,200	32,250	3,300	3,240	32,700
Winston Churchill Blvd.	60	97	3	2,831	2,949	28,900	3,570	3,700	36,350	3,640	3,760	37,000
Winston Churchill Blvd. S of Sheridan Park Dr.	60	97	3	2,604	3,366	29,850	3,750	4,230	39,900	3,800	4,290	40,450
Homelands Dr. W.	50	94	6	454	605	5,300	530	690	6,100	460	580	5,200
Homelands Dr.	40	94	6	454	605	5,300	530	690	6,100	460	580	5,200
Homelands Dr. E	50	94	6	335	294	3,100	450	340	3,950	350	260	3,050
Sheridan Park Dr. W	50	99	1	785	562	6,700	1,050	730	8,900	1,200	880	2,200
Sheridan Park Dr. Extension	50	99	1	0	0	0	0	0	0	209	208	2,050
Sheridan Park Dr. EW	50	99	1	47	53	500	59	64	600	0[1]	0[1]	0[1]
Sheridan Park Dr. EE	50	96	4	785	639	7,100	950	780	8,650	1,040	860	9,500
Speakman Dr. W	50	99	1	785	562	6,700	1,050	730	8,900	1,050	880	2,200
Speakman Dr. E	50	99	1	590	441	4,650	700	530	6,150	650	490	5,700

[1] *Sheridan Park Dr. EW is considered part of Sheridan Park Dr. Extension in this scenario*

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Appendix B

Emission Factors

Table B 1: Emission Factors for Free Flow Links

Road	Weighted Emission Factors (g/VMT)									
	CO	NOx	PM2.5	PM10	TSP	1-3 Butadiene	Acetaldehyde	Acrolein	Benzene	Formaldehyde
Winston Churchill Blvd. N of Homelands Dr.	1.95	0.41	0.017	0.019	0.019	0.00024	0.0011	0.00013	0.0015	0.0019
Winston Churchill Blvd.	1.95	0.41	0.017	0.019	0.019	0.00024	0.0011	0.00013	0.0015	0.0019
Winston Churchill Blvd. S of Sheridan Park Dr.	1.95	0.41	0.017	0.019	0.019	0.00024	0.0011	0.00013	0.0015	0.0019
Homelands Dr. W.	2.13	0.58	0.023	0.026	0.026	0.00030	0.0018	0.00025	0.0018	0.0035
Homelands Dr.	2.27	0.63	0.025	0.027	0.027	0.00035	0.0021	0.00029	0.0020	0.0040
Homelands Dr. E	2.13	0.58	0.023	0.026	0.026	0.00030	0.0018	0.00025	0.0018	0.0032
Sheridan Park Dr. W	2.15	0.34	0.015	0.017	0.017	0.00024	0.0008	0.00007	0.0016	0.0013
Sheridan Park Dr. extension	2.15	0.34	0.015	0.017	0.017	0.00024	0.00081	0.00007	0.0016	0.0013
Sheridan Park Dr. EW	2.15	0.34	0.015	0.017	0.017	0.00024	0.0008	0.00007	0.0016	0.0013
Sheridan Park Dr. EE	2.14	0.49	0.020	0.022	0.022	0.00028	0.0014	0.00018	0.0017	0.0029
Speakman Dr. W	2.15	0.34	0.015	0.017	0.017	0.00024	0.0008	0.00007	0.0016	0.0013
Speakman Dr. E	2.15	0.34	0.015	0.017	0.017	0.00024	0.0008	0.00007	0.0016	0.0013

Table B 2: Emission Factors for Queue Links

Road	Weighted Emission Factors (g/VMT)									
	CO	NOx	PM2.5	PM10	TSP	1-3 Butadiene	Acetaldehyde	Acrolein	Benzene	Formaldehyde
Winston Churchill Blvd. N of Homelands Dr.	8.253	1.636	0.083	0.092	0.092	0.002	0.009	0.001	0.010	0.016
Winston Churchill Blvd. S of Homelands Dr.	8.253	1.636	0.083	0.092	0.092	0.002	0.009	0.001	0.010	0.016
Winston Churchill Blvd. N of Sheridan Park Dr.	8.253	1.636	0.083	0.092	0.092	0.002	0.009	0.001	0.010	0.016
Winston Churchill Blvd. S of Sheridan Park Dr.	8.253	1.636	0.083	0.092	0.092	0.002	0.009	0.001	0.010	0.016
Homelands Dr. W.	8.360	2.698	0.121	0.133	0.133	0.002	0.014	0.002	0.011	0.029
Sheridan Park Dr. W	8.182	0.928	0.058	0.065	0.065	0.002	0.006	0.001	0.009	0.008

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Appendix C

Modelling Results

Appendix C

Table C 1: Predicted CO Ground Level Concentrations - Current Scenario

Receptor ID	1-hr					8-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	934.8	37.0	971.8	36,200	2.7%	907.7	28.6	936.3	15,700	6.0%
R2	934.8	20.3	955.1	36,200	2.6%	907.7	16.8	924.5	15,700	5.9%
R3	934.8	22.5	957.3	36,200	2.6%	907.7	12.8	920.5	15,700	5.9%
R4	934.8	17.6	952.4	36,200	2.6%	907.7	8.3	916.0	15,700	5.8%
R5	934.8	20.5	955.3	36,200	2.6%	907.7	17.4	925.2	15,700	5.9%
R6	934.8	21.9	956.7	36,200	2.6%	907.7	18.2	926.0	15,700	5.9%
R7	934.8	26.6	961.4	36,200	2.7%	907.7	19.7	927.4	15,700	5.9%
R8	934.8	36.3	971.1	36,200	2.7%	907.7	24.7	932.5	15,700	5.9%

Table C 2: Predicted CO Ground Level Concentrations - Future No Build Scenario

Receptor ID	1-hr					8-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	934.8	51.6	986.4	36,200	2.7%	907.7	38.0	945.7	15,700	6.0%
R2	934.8	28.2	963.0	36,200	2.7%	907.7	22.1	929.8	15,700	5.9%
R3	934.8	28.7	963.5	36,200	2.7%	907.7	16.6	924.4	15,700	5.9%
R4	934.8	22.6	957.4	36,200	2.6%	907.7	10.4	918.1	15,700	5.8%
R5	934.8	28.4	963.2	36,200	2.7%	907.7	23.0	930.8	15,700	5.9%
R6	934.8	28.6	963.4	36,200	2.7%	907.7	24.1	931.8	15,700	5.9%
R7	934.8	34.2	969.0	36,200	2.7%	907.7	25.9	933.6	15,700	5.9%
R8	934.8	47.3	982.1	36,200	2.7%	907.7	32.6	940.3	15,700	6.0%

Table C 3: Predicted CO Ground Level Concentrations - Future Build Scenario

Receptor ID	1-hr					8-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	934.8	53.9	988.7	36,200	2.7%	907.7	39.3	947.1	15,700	6.0%
R2	934.8	32.4	967.2	36,200	2.7%	907.7	24.1	931.8	15,700	5.9%
R3	934.8	27.5	962.3	36,200	2.7%	907.7	17.3	925.1	15,700	5.9%
R4	934.8	27.3	962.1	36,200	2.7%	907.7	13.0	920.7	15,700	5.9%
R5	934.8	31.5	966.3	36,200	2.7%	907.7	24.1	931.8	15,700	5.9%
R6	934.8	31.1	965.9	36,200	2.7%	907.7	24.5	932.2	15,700	5.9%
R7	934.8	31.0	965.8	36,200	2.7%	907.7	25.5	933.3	15,700	5.9%
R8	934.8	41.2	976.0	36,200	2.7%	907.7	29.8	937.5	15,700	6.0%

Table C 4: Predicted NOx Ground Level Concentrations - Current Scenario

Receptor ID	1-hr					24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.3	7.5	54.7	400	13.7%	40.9	3.7	44.6	200	22.3%	25.6	1.3	27.0	60	44.9%
R2	47.3	4.2	51.5	400	12.9%	40.9	1.4	42.3	200	21.2%	25.6	0.4	26.1	60	43.5%
R3	47.3	5.3	52.5	400	13.1%	40.9	1.4	42.3	200	21.2%	25.6	0.6	26.2	60	43.7%
R4	47.3	4.0	51.3	400	12.8%	40.9	1.1	42.1	200	21.0%	25.6	0.4	26.1	60	43.4%
R5	47.3	4.5	51.8	400	12.9%	40.9	1.5	42.4	200	21.2%	25.6	0.5	26.1	60	43.6%
R6	47.3	5.1	52.3	400	13.1%	40.9	1.6	42.6	200	21.3%	25.6	0.6	26.2	60	43.7%
R7	47.3	6.4	53.6	400	13.4%	40.9	1.9	42.8	200	21.4%	25.6	0.7	26.3	60	43.9%
R8	47.3	9.0	56.3	400	14.1%	40.9	2.6	43.5	200	21.8%	25.6	1.1	26.8	60	44.6%

Table C 5: Predicted NOx Ground Level Concentrations - Future No Build Scenario

Receptor ID	1-hr					24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.3	10.3	57.6	400	14.4%	40.9	4.9	45.8	200	22.9%	25.6	1.7	27.4	60	45.6%
R2	47.3	5.5	52.8	400	13.2%	40.9	1.8	42.8	200	21.4%	25.6	0.6	26.2	60	43.7%
R3	47.3	6.8	54.0	400	13.5%	40.9	1.8	42.7	200	21.3%	25.6	0.7	26.3	60	43.9%
R4	47.3	5.1	52.4	400	13.1%	40.9	1.4	42.3	200	21.2%	25.6	0.5	26.1	60	43.6%
R5	47.3	5.7	53.0	400	13.2%	40.9	2.0	42.9	200	21.4%	25.6	0.6	26.3	60	43.8%
R6	47.3	6.5	53.8	400	13.4%	40.9	2.1	43.1	200	21.5%	25.6	0.7	26.4	60	43.9%
R7	47.3	8.2	55.5	400	13.9%	40.9	2.5	43.4	200	21.7%	25.6	0.9	26.5	60	44.2%
R8	47.3	11.8	59.1	400	14.8%	40.9	3.5	44.4	200	22.2%	25.6	1.5	27.1	60	45.2%

Table C 6: Predicted NOx Ground Level Concentrations - Future Build Scenario

Receptor ID	1-hr					24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.3	10.6	57.9	400	14.5%	40.9	4.9	45.8	200	22.9%	25.6	1.7	27.3	60	45.5%
R2	47.3	5.6	52.9	400	13.2%	40.9	1.9	42.8	200	21.4%	25.6	0.6	26.2	60	43.7%
R3	47.3	6.2	53.4	400	13.4%	40.9	1.7	42.6	200	21.3%	25.6	0.6	26.3	60	43.8%
R4	47.3	4.8	52.1	400	13.0%	40.9	1.5	42.4	200	21.2%	25.6	0.5	26.2	60	43.6%
R5	47.3	5.5	52.8	400	13.2%	40.9	1.9	42.8	200	21.4%	25.6	0.6	26.3	60	43.8%
R6	47.3	6.0	53.2	400	13.3%	40.9	2.0	42.9	200	21.5%	25.6	0.7	26.3	60	43.8%
R7	47.3	7.3	54.6	400	13.6%	40.9	2.3	43.2	200	21.6%	25.6	0.8	26.4	60	44.1%
R8	47.3	10.1	57.4	400	14.3%	40.9	3.0	43.9	200	22.0%	25.6	1.2	26.9	60	44.8%

Table C 7: Predicted PM2.5 Ground Level Concentrations - Current Scenario

Receptor ID	1-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	14.2	0.4	14.6	27	54.1%	8.6	0.2	8.8	8.8	100.0%
R2	14.2	0.2	14.4	27	53.3%	8.6	0.1	8.7	8.8	99.1%
R3	14.2	0.2	14.4	27	53.3%	8.6	0.1	8.7	8.8	99.2%
R4	14.2	0.2	14.3	27	53.1%	8.6	0.1	8.7	8.8	99.0%
R5	14.2	0.2	14.4	27	53.4%	8.6	0.1	8.7	8.8	99.2%
R6	14.2	0.3	14.5	27	53.6%	8.6	0.1	8.8	8.8	99.4%
R7	14.2	0.4	14.6	27	54.0%	8.6	0.2	8.8	8.8	100.0%
R8	14.2	0.8	14.9	27	55.3%	8.6	0.3	8.9	8.8	101.6%

Table C 8: Predicted PM2.5 Ground Level Concentrations - Future No Build Scenario

Receptor ID	1-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	14.2	0.6	14.7	27	54.6%	8.6	0.2	8.8	8.8	100.6%
R2	14.2	0.3	14.4	27	53.5%	8.6	0.1	8.7	8.8	99.3%
R3	14.2	0.3	14.4	27	53.5%	8.6	0.1	8.7	8.8	99.4%
R4	14.2	0.2	14.4	27	53.3%	8.6	0.1	8.7	8.8	99.1%
R5	14.2	0.3	14.5	27	53.7%	8.6	0.1	8.8	8.8	99.5%
R6	14.2	0.4	14.6	27	53.9%	8.6	0.1	8.8	8.8	99.8%
R7	14.2	0.6	14.7	27	54.5%	8.6	0.2	8.8	8.8	100.5%
R8	14.2	1.0	15.2	27	56.2%	8.6	0.4	9.0	8.8	102.8%

Table C 9: Predicted PM2.5 Ground Level Concentrations - Future Build Scenario

Receptor ID	1-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	14.2	0.6	14.7	27	54.6%	8.6	0.2	8.9	8.8	100.6%
R2	14.2	0.4	14.5	27	53.8%	8.6	0.1	8.8	8.8	99.6%
R3	14.2	0.3	14.5	27	53.7%	8.6	0.1	8.8	8.8	99.5%
R4	14.2	0.3	14.5	27	53.7%	8.6	0.1	8.8	8.8	99.5%
R5	14.2	0.3	14.5	27	53.7%	8.6	0.1	8.8	8.8	99.6%
R6	14.2	0.4	14.5	27	53.8%	8.6	0.1	8.8	8.8	99.8%
R7	14.2	0.5	14.6	27	54.2%	8.6	0.2	8.8	8.8	100.3%
R8	14.2	0.8	15.0	27	55.5%	8.6	0.3	9.0	8.8	102.0%

Table C 10: Predicted PM10 Ground Level Concentrations - Current Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	26.2	1.3	27.5	50	55.0%
R2	26.2	0.7	26.9	50	53.9%
R3	26.2	0.7	27.0	50	53.9%
R4	26.2	0.7	26.9	50	53.8%
R5	26.2	0.8	27.1	50	54.2%
R6	26.2	1.1	27.3	50	54.6%
R7	26.2	1.5	27.7	50	55.4%
R8	26.2	2.7	29.0	50	57.9%

Table C 11: Predicted PM10 Ground Level Concentrations - Future No Build Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	26.2	1.7	27.9	50	55.8%
R2	26.2	0.9	27.1	50	54.3%
R3	26.2	0.9	27.2	50	54.3%
R4	26.2	0.8	27.0	50	54.0%
R5	26.2	1.1	27.3	50	54.7%
R6	26.2	1.4	27.6	50	55.3%
R7	26.2	1.9	28.2	50	56.3%
R8	26.2	3.7	29.9	50	59.8%

Table C 12: Predicted PM10 Ground Level Concentrations - Future Build Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	26.2	1.7	27.9	50	55.9%
R2	26.2	1.2	27.4	50	54.8%
R3	26.2	1.1	27.3	50	54.6%
R4	26.2	1.2	27.4	50	54.8%
R5	26.2	1.1	27.3	50	54.7%
R6	26.2	1.2	27.4	50	54.9%
R7	26.2	1.6	27.8	50	55.7%
R8	26.2	2.9	29.2	50	58.3%

Table C 13: Predicted TSP Ground Level Concentrations - Current Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.2	5.9	53.1	120	44.2%	28.8	2.2	31.0	60	51.7%
R2	47.2	3.4	50.6	120	42.2%	28.8	1.2	30.0	60	50.0%
R3	47.2	3.6	50.8	120	42.3%	28.8	1.3	30.1	60	50.2%
R4	47.2	3.0	50.3	120	41.9%	28.8	1.0	29.8	60	49.7%
R5	47.2	4.2	51.4	120	42.9%	28.8	1.4	30.2	60	50.4%
R6	47.2	5.3	52.5	120	43.8%	28.8	1.8	30.6	60	51.0%
R7	47.2	7.3	54.5	120	45.4%	28.8	2.6	31.5	60	52.4%
R8	47.2	13.9	61.1	120	50.9%	28.8	5.4	34.2	60	57.0%

Table C 14: Predicted TSP Ground Level Concentrations - Future No Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.2	7.8	55.0	120	45.8%	28.8	2.9	31.7	60	52.8%
R2	47.2	4.4	51.6	120	43.0%	28.8	1.5	30.3	60	50.5%
R3	47.2	4.6	51.8	120	43.2%	28.8	1.6	30.4	60	50.7%
R4	47.2	3.8	51.0	120	42.5%	28.8	1.3	30.1	60	50.1%
R5	47.2	5.6	52.8	120	44.0%	28.8	1.8	30.7	60	51.1%
R6	47.2	7.1	54.3	120	45.2%	28.8	2.3	31.1	60	51.9%
R7	47.2	9.8	57.0	120	47.5%	28.8	3.5	32.3	60	53.8%
R8	47.2	18.6	65.8	120	54.9%	28.8	7.2	36.0	60	60.0%

Table C 15: Predicted TSP Ground Level Concentrations - Future Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	47.2	7.9	55.1	120	45.9%	28.8	3.0	31.8	60	53.0%
R2	47.2	5.7	52.9	120	44.1%	28.8	1.9	30.8	60	51.3%
R3	47.2	5.3	52.5	120	43.8%	28.8	1.7	30.6	60	50.9%
R4	47.2	5.9	53.1	120	44.2%	28.8	1.8	30.6	60	51.0%
R5	47.2	5.4	52.7	120	43.9%	28.8	2.0	30.8	60	51.3%
R6	47.2	5.9	53.1	120	44.2%	28.8	2.3	31.1	60	51.8%
R7	47.2	8.0	55.2	120	46.0%	28.8	3.1	31.9	60	53.2%
R8	47.2	14.8	62.0	120	51.7%	28.8	5.9	34.7	60	57.9%

Table C 16: Predicted 1,3-Butadiene Ground Level Concentrations - Current Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.074	0.002	0.076	10	0.8%	0.049	0.001	0.049	2	2.5%
R2	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.4%
R3	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R4	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.4%
R5	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.4%
R6	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R7	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R8	0.074	0.002	0.076	10	0.8%	0.049	0.001	0.050	2	2.5%

Table C 17: Predicted 1,3-Butadiene Ground Level Concentrations - Future No Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.074	0.002	0.076	10	0.8%	0.049	0.001	0.050	2	2.5%
R2	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R3	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R4	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.4%
R5	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R6	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R7	0.074	0.001	0.075	10	0.8%	0.049	0.001	0.049	2	2.5%
R8	0.074	0.002	0.076	10	0.8%	0.049	0.001	0.050	2	2.5%

Table C 18: Predicted 1,3-Butadiene Ground Level Concentrations - Future Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.074	0.003	0.077	10	0.8%	0.049	0.001	0.050	2	2.5%
R2	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R3	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R4	0.074	0.001	0.075	10	0.7%	0.049	0.000	0.049	2	2.5%
R5	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R6	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R7	0.074	0.001	0.075	10	0.8%	0.049	0.000	0.049	2	2.5%
R8	0.074	0.002	0.076	10	0.8%	0.049	0.001	0.050	2	2.5%

Table C 19: Predicted Acetaldehyde Ground Level Concentrations - Current Scenario

Receptor ID	0.5-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	3.30	0.02	3.32	500	0.7%	3.30	0.01	3.31	500	0.7%
R2	3.30	0.01	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R3	3.30	0.02	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R4	3.30	0.01	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R5	3.30	0.01	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R6	3.30	0.02	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R7	3.30	0.02	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%
R8	3.30	0.03	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%

Table C 20: Predicted Acetaldehyde Ground Level Concentrations - Future No Build Scenario

Receptor ID	0.5-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	3.30	0.03	3.33	500	0.7%	3.30	0.01	3.31	500	0.7%
R2	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R3	3.30	0.02	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%
R4	3.30	0.02	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R5	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R6	3.30	0.02	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%
R7	3.30	0.03	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%
R8	3.30	0.04	3.33	500	0.7%	3.30	0.01	3.31	500	0.7%

Table C 21: Predicted Acetaldehyde Ground Level Concentrations - Future Build Scenario

Receptor ID	0.5-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	3.30	0.03	3.33	500	0.7%	3.30	0.01	3.31	500	0.7%
R2	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R3	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R4	3.30	0.01	3.31	500	0.7%	3.30	0.00	3.30	500	0.7%
R5	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R6	3.30	0.02	3.31	500	0.7%	3.30	0.01	3.30	500	0.7%
R7	3.30	0.02	3.32	500	0.7%	3.30	0.01	3.30	500	0.7%
R8	3.30	0.03	3.33	500	0.7%	3.30	0.01	3.31	500	0.7%

Table C 22: Predicted Acrolein Ground Level Concentrations - Current Scenario

Receptor ID	1-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.3%
R2	0.204	0.001	0.205	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R3	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R4	0.204	0.001	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R5	0.204	0.001	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R6	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R7	0.204	0.002	0.207	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R8	0.204	0.004	0.208	4.50	4.6%	0.204	0.001	0.205	0.40	51.4%

Table C 23: Predicted Acrolein Ground Level Concentrations - Future No Build Scenario

Receptor ID	1-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	0.204	0.003	0.207	4.50	4.6%	0.204	0.001	0.206	0.40	51.4%
R2	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R3	0.204	0.002	0.207	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R4	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R5	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R6	0.204	0.002	0.207	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R7	0.204	0.003	0.207	4.50	4.6%	0.204	0.001	0.205	0.40	51.3%
R8	0.204	0.005	0.209	4.50	4.6%	0.204	0.002	0.206	0.40	51.5%

Table C 24: Predicted Acrolein Ground Level Concentrations - Future Build Scenario

Receptor ID	1-hr					24-hr				
	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria	Background 90th percentile, μg/m^3	Maximum Concentration, μg/m^3	Maximum Concentration plus Background, μg/m^3	Criteria, μg/m^3	% of Criteria
R1	0.204	0.003	0.207	4.50	4.6%	0.204	0.001	0.206	0.40	51.4%
R2	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R3	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R4	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R5	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R6	0.204	0.002	0.206	4.50	4.6%	0.204	0.001	0.205	0.40	51.2%
R7	0.204	0.003	0.207	4.50	4.6%	0.204	0.001	0.205	0.40	51.3%
R8	0.204	0.004	0.208	4.50	4.6%	0.204	0.001	0.206	0.40	51.4%

Table C 25: Predicted Benzene Ground Level Concentrations - Current Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.799	0.014	0.814	2.3	35.4%	0.572	0.005	0.577	0.45	128.1%
R2	0.799	0.005	0.804	2.3	35.0%	0.572	0.002	0.573	0.45	127.4%
R3	0.799	0.005	0.804	2.3	35.0%	0.572	0.002	0.573	0.45	127.4%
R4	0.799	0.004	0.803	2.3	34.9%	0.572	0.001	0.573	0.45	127.3%
R5	0.799	0.005	0.805	2.3	35.0%	0.572	0.002	0.573	0.45	127.4%
R6	0.799	0.006	0.805	2.3	35.0%	0.572	0.002	0.574	0.45	127.4%
R7	0.799	0.007	0.806	2.3	35.0%	0.572	0.002	0.574	0.45	127.5%
R8	0.799	0.009	0.808	2.3	35.1%	0.572	0.004	0.575	0.45	127.8%

Table C 26: Predicted Benzene Ground Level Concentrations - Future No Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.799	0.019	0.818	2.3	35.6%	0.572	0.006	0.578	0.45	128.4%
R2	0.799	0.007	0.806	2.3	35.0%	0.572	0.002	0.574	0.45	127.5%
R3	0.799	0.006	0.805	2.3	35.0%	0.572	0.002	0.574	0.45	127.5%
R4	0.799	0.005	0.804	2.3	35.0%	0.572	0.002	0.573	0.45	127.4%
R5	0.799	0.007	0.806	2.3	35.1%	0.572	0.002	0.574	0.45	127.5%
R6	0.799	0.008	0.807	2.3	35.1%	0.572	0.002	0.574	0.45	127.6%
R7	0.799	0.009	0.808	2.3	35.1%	0.572	0.003	0.575	0.45	127.7%
R8	0.799	0.012	0.811	2.3	35.3%	0.572	0.005	0.576	0.45	128.1%

Table C 27: Predicted Benzene Ground Level Concentrations - Future Build Scenario

Receptor ID	24-hr					Annual				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	0.799	0.020	0.819	2.3	35.6%	0.572	0.007	0.578	0.45	128.5%
R2	0.799	0.008	0.807	2.3	35.1%	0.572	0.002	0.574	0.45	127.5%
R3	0.799	0.007	0.806	2.3	35.0%	0.572	0.002	0.574	0.45	127.5%
R4	0.799	0.006	0.805	2.3	35.0%	0.572	0.002	0.574	0.45	127.5%
R5	0.799	0.008	0.807	2.3	35.1%	0.572	0.002	0.574	0.45	127.5%
R6	0.799	0.008	0.807	2.3	35.1%	0.572	0.003	0.574	0.45	127.6%
R7	0.799	0.009	0.808	2.3	35.1%	0.572	0.003	0.575	0.45	127.7%
R8	0.799	0.011	0.810	2.3	35.2%	0.572	0.004	0.576	0.45	128.0%

Table C 28: Predicted Formaldehyde Ground Level Concentrations - Current Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	6.48	0.02	6.50	65	10.0%
R2	6.48	0.01	6.49	65	10.0%
R3	6.48	0.01	6.49	65	10.0%
R4	6.48	0.01	6.49	65	10.0%
R5	6.48	0.01	6.49	65	10.0%
R6	6.48	0.01	6.49	65	10.0%
R7	6.48	0.01	6.49	65	10.0%
R8	6.48	0.01	6.50	65	10.0%

Table C 29: Predicted Formaldehyde Ground Level Concentrations - Future No Build Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	6.48	0.02	6.51	65	10.0%
R2	6.48	0.01	6.49	65	10.0%
R3	6.48	0.01	6.49	65	10.0%
R4	6.48	0.01	6.49	65	10.0%
R5	6.48	0.01	6.49	65	10.0%
R6	6.48	0.01	6.49	65	10.0%
R7	6.48	0.01	6.49	65	10.0%
R8	6.48	0.02	6.50	65	10.0%

Table C 30: Predicted Formaldehyde Ground Level Concentrations - Future Build Scenario

Receptor ID	24-hr				
	Background 90th percentile, $\mu g/m^3$	Maximum Concentration, $\mu g/m^3$	Maximum Concentration plus Background, $\mu g/m^3$	Criteria, $\mu g/m^3$	% of Criteria
R1	6.48	0.02	6.51	65	10.0%
R2	6.48	0.01	6.49	65	10.0%
R3	6.48	0.01	6.49	65	10.0%
R4	6.48	0.01	6.49	65	10.0%
R5	6.48	0.01	6.49	65	10.0%
R6	6.48	0.01	6.49	65	10.0%
R7	6.48	0.01	6.49	65	10.0%
R8	6.48	0.02	6.50	65	10.0%

Table C 31: Project Impact Due to Predicted Ground Level Concentrations (Future No Build vs Future Build Scenarios)

Contaminant	CO		NOx			PM2.5		PM10	TSP	
Receptor ID	1hr	8hr	1hr	24hr	Annual	24hr	Annual	24hr	24hr	Annual
R1	0.2%	0.1%	0.5%	-0.1%	-0.1%	0.1%	0.1%	0.1%	0.2%	0.3%
R2	0.4%	0.2%	0.2%	0.1%	0.1%	0.5%	0.3%	0.9%	2.5%	1.4%
R3	-0.1%	0.1%	-1.1%	-0.1%	-0.1%	0.3%	0.1%	0.5%	1.3%	0.4%
R4	0.5%	0.3%	-0.6%	0.2%	0.1%	0.8%	0.3%	1.5%	4.1%	1.8%
R5	0.3%	0.1%	-0.4%	-0.1%	-0.1%	0.1%	0.1%	0.0%	-0.2%	0.5%
R6	0.3%	0.0%	-1.0%	-0.3%	-0.2%	-0.2%	0.0%	-0.7%	-2.2%	-0.2%
R7	-0.3%	0.0%	-1.6%	-0.6%	-0.4%	-0.6%	-0.2%	-1.2%	-3.1%	-1.2%
R8	-0.6%	-0.3%	-2.9%	-1.0%	-0.9%	-1.3%	-0.7%	-2.5%	-5.8%	-3.4%

(continued)

Contaminant	1,3-Butadiene		Acetaldehyde		Acrolein		Benzene		Formaldehyde
Receptor ID	24hr	Annual	0.5hr	24hr	1hr	24hr	24hr	Annual	24hr
R1	0.26%	0.00%	0.03%	0.02%	0.05%	0.00%	0.12%	0.03%	0.02%
R2	0.27%	0.00%	0.03%	0.01%	-0.03%	0.00%	0.14%	0.05%	0.01%
R3	0.00%	0.00%	-0.06%	0.00%	-0.15%	0.00%	0.04%	0.00%	0.00%
R4	0.00%	0.41%	-0.03%	0.01%	0.03%	0.00%	0.14%	0.05%	0.01%
R5	0.27%	0.00%	-0.02%	0.00%	-0.11%	0.00%	0.05%	0.02%	0.00%
R6	0.00%	0.00%	-0.05%	-0.01%	-0.15%	0.00%	0.02%	0.02%	0.00%
R7	0.00%	-0.41%	-0.08%	-0.01%	-0.24%	-0.05%	-0.02%	-0.02%	-0.01%
R8	-0.53%	-0.40%	-0.16%	-0.03%	-0.42%	-0.15%	-0.11%	-0.10%	-0.03%

BURNSIDE

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Appendix D

GHG Impact

Appendix D

Table D 1: Annual GHG Emissions - Current Scenario

Road Segment	Daily Traffic (vpd)	Percent Cars (%)	Percent Large Vehicles (%)	Segment Length, m	CO_2, tonnes/yr	CH_4, tonnes/yr	N_2O, tonnes/yr
Winston Churchill Blvd. N of Homelands Dr.	24,000	97	3	370	855	0.12	0.10
Winston Churchill Blvd.	28,900	97	3	480	1,335	0.18	0.15
Winston Churchill Blvd. S of Sheridan Park Dr.	29,850	97	3	330	948	0.13	0.11
Homelands Dr. W.	5,300	94	6	445	241	0.03	0.03
Homelands Dr.	5,300	94	6	300	162	0.02	0.02
Homelands Dr. E	3,100	94	6	750	237	0.03	0.03
Sheridan Park Dr. W	6,700	99	1	150	93	0.01	0.01
Sheridan Park Dr. extension							
Sheridan Park Dr. EW	500	99	1	245	11	0.00	0.00
Sheridan Park Dr. EE	7,100	96	4	390	272	0.04	0.03
Speakman Dr. W	6,700	99	1	445	275	0.04	0.03
Speakman Dr. E	4,650	99	1	300	129	0.02	0.02
				Total	**4,559**	**0.6**	**0.5**

Table D 2: Annual GHG Emissions - Future Build (2031) Scenario

Road	Daily Traffic (vpd)	Percent Cars (%)	Percent Large Vehicles (%)	Segment Length, m	CO_2, tonnes/yr	CH_4, tonnes/yr	N_2O, tonnes/yr
Winston Churchill Blvd. N of Homelands Dr.	32,700	97	3	370	1,165	0.16	0.13
Winston Churchill Blvd.	37,000	97	3	371	1,321	0.18	0.15
Winston Churchill Blvd. S of Sheridan Park Dr.	40,450	97	3	372	1,448	0.20	0.16
Homelands Dr. W.	5,200	94	6	373	198	0.03	0.02
Homelands Dr.	5,200	94	6	374	198	0.03	0.02
Homelands Dr. E	3,050	94	6	375	117	0.01	0.01
Sheridan Park Dr. W	2,200	99	1	376	76	0.01	0.01
Sheridan Park Dr. extension	2,050	99	1	377	71	0.01	0.01
Sheridan Park Dr. EW							
Sheridan Park Dr. EE	9,500	96	4	379	354	0.05	0.04
Speakman Dr. W	2,200	99	1	380	77	0.01	0.01
Speakman Dr. E	5,700	99	1	381	201	0.03	0.02
				Total	**5,226**	**0.7**	**0.6**

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Appendix J

Noise Impact Assessment Report

Sheridan Park Drive Extension Municipal Class Environmental Assessment Noise Impact Assessment Report

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON   L5N 8R9 CANADA

October 25, 2017
300039474.0000

Distribution List

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Record of Revisions

Revision	Date	Description
0	September 7, 2017	Draft Submission to the City
1	September 25, 2017	2nd Draft Submission to the City
2	October 25, 2017	3rd Draft Submission to the City

R.J. Burnside & Associates Limited

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Executive Summary

As part of the Sheridan Park Drive Extension Environmental Assessment (EA), a noise study was undertaken to determine noise impacts as a result of the proposed Sheridan Park Drive extension. The noise study followed the Ontario Ministry of Transportation's (MTO) Environmental Guide for Noise (MTO Noise Guide) (MTO, 2006) and the City of Mississauga Policy 09-03-03, Noise Attenuation Barriers on Major Roadways (City Noise Policy) (CoM, March 2015).

Noise levels are predicted in decibels in the A-weighted dBA scale, which best approximates the human perception of sound over a specified time period. An increase of 2 to 3 decibels in noise levels is considered to be just perceivable to the average person. It should be noted that a 3 dBA increase in noise equates to a doubling of traffic volumes.

Based on the MTO Noise Guide, where an existing roadway is proposed to be modified / widened adjacent to a Noise Sensitive Area (NSA) or a new road is proposed, MTO requires that the future noise levels without the proposed improvements be compared to the future noise level with the proposed improvements. The assessment is done at the outdoor living area (typically backyards) of each NSA. The provision of noise mitigation is to be investigated should the future noise level with the proposed improvements result in a greater than 5 dBA increase over the future noise level without the proposed improvements. If noise mitigation is provided, the objective is a minimum 5 dBA reduction. Mitigation will attempt to achieve levels as close to, or lower than, the objective level.

For the purpose of the noise analysis carried out for this Class EA study, the City Noise Policy state "Noise barriers may be constructed by the City in conjunction with a road widening project if no noise attenuation barriers exist, and the proposed additional lanes of traffic are found to adversely affect the daytime noise level beyond the established criteria (the noise level must be greater than 60 dBA (Leq daytime). (Leq means "equivalent sound level" and daytime means 7:00 AM to 11 PM. Leq daytime means daytime average.)

The STAMSON 5.0 computer modelling program, which is approved for use in Ontario by the MTO, was used to assess existing and future noise levels on Sheridan Park Drive. This program is used to predict noise levels generated from the road at the outdoor living areas (typically backyards) of NSA's.

The Sheridan Homelands neighbourhood to the north of the Study Area is considered an NSA. The outdoor living areas of three residential houses adjacent to the utility corridor as well as the Homelands Senior Public School yard were selected as representative

Points of Reception (PORs) for the purposes of assessing future noise levels within the NSA.

The future sound levels at the four PORs were predicted based on the traffic forecast for 2031 calendar year for three scenarios: Current, Future No Build, and Future Build. Future No Build scenario represents conditions in the future without proposed road extension; while Future Build scenario includes proposed road extension in the future.

Based on the Future Build Scenario, the future sound level is reduced at two of the PORs (POR2 and POR4) because the traffic that currently drives on the closest road will be reduced if the extension is built. For instance, at POR4 during the day, the traffic on Homelands Drive will be 6,100 vehicles per day without the extension but only 5,200 vehicles per day if the extension is built.

Based on the noise analysis, the difference between the projected future noise levels with and without the Sheridan Park Drive extension was determined to be less than 1 dBA. Therefore the extension has negligible impact on the noise levels in the neighbourhood and the consideration of noise mitigation is not warranted based on the Provincial guidelines and City Noise Policy.

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Glossary of Terms and Acronyms

AADT	Annual Average Daily Traffic
Burnside	R.J. Burnside & Associates Limited
City Noise Policy	City of Mississauga Policy 09-03-03, Noise Attenuation Barriers on Major Roadways, March 2015
EA	Environmental Assessment
MOECC	Ontario Ministry of the Environment and Climate Change
MTO	Ontario Ministry of Transportation
MTO Noise Guide	Ontario Ministry of Transportation Environmental Guide for Noise, October 2006
OLA	Outdoor Living Area
POR	Point of Reception

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The EA Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighborhood and business area, create options for alternative routes and improve multi-modal network connectivity. The EA Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.

As part of the EA Study, Burnside has completed a Noise Impact Assessment to identify whether the proposed Sheridan Park Drive extension will change noise levels within the Study Area and determine if any potential mitigation measures are required.

2.0 Study Area

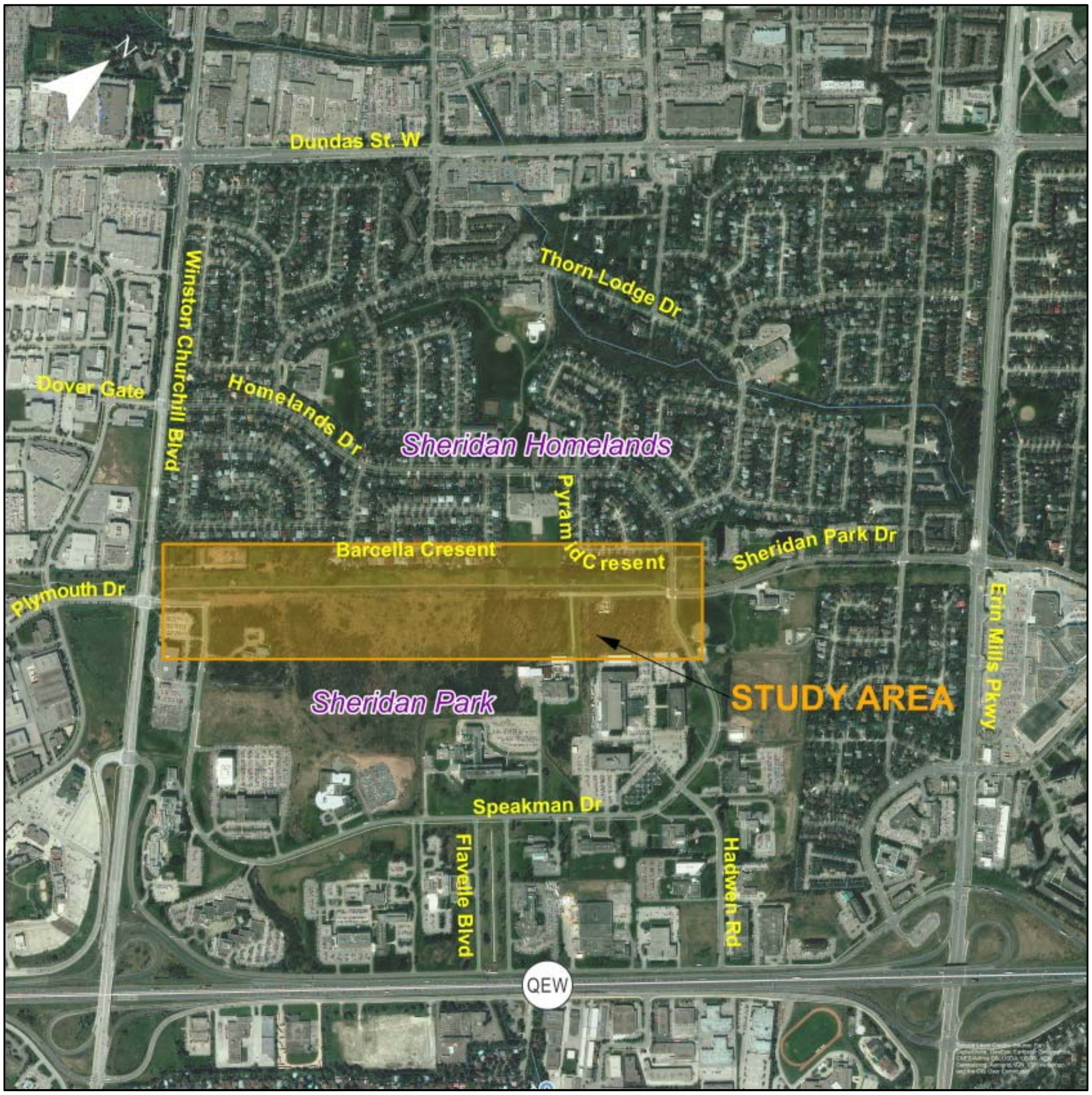
The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail and the Sheridan Homelands residential neighbourhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the City of Mississauga's Official Plan (MOP). The majority of the Park is occupied by private industries and businesses, which include in their landholdings significant natural areas on the north side of the corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City's Natural Areas Survey (2016 Update). Sheridan Park is also identified as one of the City's cultural landscape due to its scenic and distinct visual qualities.

The City maintains a paved multi-use trail through the utility corridor from Winston Churchill Boulevard to Homelands Drive/Speakman Drive. The trail then continues east along the south side of Sheridan Park Drive to Erin Mills Parkway. To the west of Winston Churchill Boulevard, the trail continues through the hydro corridor in Oakville. The trail provides recreational opportunities to the local residents and commuter cyclists.

Figure 1: Study Area



3.0 Noise Assessment

3.1 Sensitive Receptors

Noise sensitive land use, as described by the Ministry of the Environment and Climate Change (MOECC, 2013), means:

- A property of a person that accommodates a dwelling and includes a legal nonconforming residential use; or
- A property of a person that accommodates a building used for a noise sensitive commercial purpose; or
- A property of a person that accommodates a building used for a noise sensitive institutional purpose.

There are residential land uses to the north of the Study Area which are part of the Sheridan Homelands neighbourhood that would be a sensitive land use. The only institutional purpose sensitive land use in the Study Area is Homelands Sr. Public School. There are no commercial purpose sensitive land uses within the Study Area.

The residential dwelling at 2536 Barcella Crescent north of the proposed road extension was determined to be the location where the impact from the proposed roadway would result in the largest change in sound level and so was designated as one of the points of reception (POR1) and selected for the purpose of this assessment. This dwelling is the closest building to the proposed road extension alignment and furthest from all other existing road noise. The distance is 70 m from the centre of the proposed road alignment to the backyard (3 m from the building). The rest of the buildings along the road corridor including Homelands Sr. Public School are the same distance or further away from the proposed Sheridan Park Drive extension. Since the road noise decreases with the distance, all other dwellings are expected to experience the same or lower sound levels than POR1 as a result of the proposed road extension.

In addition to POR1, the following receptors were also assessed:

- POR2 - 2682 Hollington Crescent
- POR3 - Homelands Sr. Public School
- POR4 - 2248 Pyramid Crescent

Figure 2: Sensitive Receptors

The “most exposed side” of the dwelling must be assessed according to the Ontario Ministry of Transportation (MTO) Environmental Guide for Noise (Noise Guide) (MTO, 2006). The most exposed side refers to the closest side of the dwelling unit even if there is no Outdoor Living Area (OLA) associated with this side and without the shielding of the building. However, required mitigation measures (if applicable) should be based on sound levels predicted at the OLA. In the case of POR1, the most exposed side and OLA are located on the same side of the building (i.e., the backyard side).

3.2 Existing Sound Levels

Measurements of the existing acoustical environment were performed by taking sound level measurements at the backyard of the sensitive receptor POR1. A noise meter was placed within the utility corridor, close to the backyard fenceline. The location was 4.1 m south east of the property line and 1.4 m northeast of the southwest corner of the property for 2536 Barcella Crescent. This location is closer to the proposed road extension corridor than the rear of the house or OLA and also closer to the QEW. Therefore, the sound levels measured at this location are expected to be louder than experienced at the OLA of 2536 Barcella Crescent. This provides for a more conservative approach than the Noise Guide recommendation that existing sound levels to be measured at locations approximately 3 m away from the dwelling wall.

The sound level is measured by a sound level meter collecting measurements 20,000 times every second for an entire hour.

At the end of the hour, the “Leq-1h” is calculated as the average of all the measurements within that hour (Leq means “equivalent sound level” and 1h means one hour. Leq-1h one hour average). When deciding the background noise level for a location, a proponent must measure the sound level for at least 48 hours and then use the lowest Leq-1h measured for both daytime and nighttime. The measured level is compared to the default level and the higher level is used. The longer the measurement, the more likely a lower number will be measured.

Sound level measurements were collected from 11:42 AM on Thursday, April 13, 2017 through 8:07 AM on Friday, April 21, 2017. This time period corresponded to the Easter weekend and following week, during which time existing sound levels were expected to measure the lowest in relation to impact from traffic on local roads. This was a more conservative approach since the sound levels during this period would be lower than the typical weekday levels and lower than the default levels.

The measured background average 1-h Leq sound levels during daytime period (between 7 AM and 11 PM) were between 47 dBA and 61 dBA. Nighttime period (between 11 PM and 7 AM) sound levels were measured to be between 40 dBA and 56 dBA. The background sound levels take into account any noise sources that were active and audible during the measurement period and include all the traffic on surrounding roads and all the industrial operations that were running during that time. The minimum hour recorded during the monitoring was screened for airplane impacts. No airplanes were found so the minimum 1h-Leq was not reduced below the measured value.

Current noise levels experienced by residents is noise from the adjacent arterial and collector roads, the Sheridan Park to the south, and the QEW, which is approximately 1 km away.

Standard practice is to use the higher of default noise values taken from the Ontario Ministry of Transportation’s (MTO) Environmental Guide for Noise (MTO Noise Guide) (MTO, 2006) or the lowest of the noise levels measured for each time period. The higher of the two is selected. As a result of these measurements, it was confirmed that the default background values applied to the project. Those default background values are 50 dBA during the day and 45 dBA during the night.

3.3 Noise Impact Assessment Criteria

The noise impact due to the proposed road extension was assessed based on MTO Noise Guide criteria and the City of Mississauga Policy 09-03-03, Noise Attenuation Barriers on Major Roadways (City Noise Policy)(CoM, March 2015).

According to the MTO Noise Guide, where an increase in sound level is predicted, mitigation measures may be required as summarized in Table 1.

Table 1: Mitigation Effort Required for the Projected Noise Level with the Proposed Improvements above the Current Noise Levels

Change in Noise Level Above Current / Projected Noise Levels with Proposed Improvements	Mitigation Effort Required
< 5 dBA[1] change AND < 65 dBA	• None
≥5 dBA change OR ≥65 dBA	• Investigate noise control measures on right-of-way. • Introduce noise control measures within right-of-way and mitigate to current noise level if technically, economically and administratively feasible. • Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers.

Mitigation measures, if applicable, must attempt to achieve levels that otherwise would be experienced without the proposed project if technically, economically, and administratively feasible.

For this project, the change noted in Table 1 is the difference between the default background and the predicted sound level.

According to the City Noise Policy, the installation of new noise attenuation barriers is subject to the following:

- The noise level must be greater than 60 dBA (LEQ daytime). (LEQ means "equivalent sound level" and daytime means 7:00 a.m. to 11:00 p.m. LEQ daytime means daytime average.), and
- The residential area must be adjacent to arterial and major collector roads.

Note that this policy indicates a noise wall will be installed at a lower sound level than required by the MTO Noise Guide.

3.4 Noise Impact Assessment Methodology

The noise impact assessment was performed following the MTO Noise Guide. In order to determine the potential noise impact, future predicted sound levels with and without the proposed road extension were compared for the OLA, which coincides with the most exposed side of each POR. Sound levels were predicted using traffic noise prediction

---

1dBA (A-weighted decibel) is an expression of the relative loudness of sounds in air as perceived by the human ear.

model ORNAMENT (Ontario Road Noise Analysis Method), implemented through the STAMSON (version 5.04) computer program as required by MTO.

The future sound levels were predicted based on the Annual Average Daily Traffic (AADT) value forecast for 2031 calendar year for three scenarios: Current, Future No Build, and Future Build.

Future No Build scenario represents conditions in the future without proposed road extension; while Future Build scenario includes proposed road extension in the future. The AADT and percentages of commercial vehicles are summarized in Table 2.

Table 2: Traffic Volumes

Road	Time Frame	AADT	Max Hourly	% of Medium Trucks	% of Heavy Trucks
Sheridan Park Drive Extension	Present	0	0	0	0
Sheridan Park Drive Extension	Future No Build	0	0	0	0
Sheridan Park Drive Extension	Future Build	2,200	220	3.64 %	1.36 %
Homelands Drive	Present	5,300	605	3.64 %	1.36 %
Homelands Drive	Future No Build	6,100	690	3.64 %	1.36 %
Homelands Drive	Future Build	5,200	580	3.64 %	1.36 %
Winston Churchill Blvd	Present	26,000	2,623	3.64 %	1.36 %
Winston Churchill Blvd	Future No Build	36,350	3,700	3.64 %	1.36 %
Winston Churchill Blvd	Future Build	37,000	3,760	3.64 %	1.36 %

3.5 Results

Current and predicted sound levels including calculated change in sound levels due to the proposed road extension in the Future No Build Scenario and Future Build Scenario are summarized in Table 3.

Table 3: Predicted (Modelled) Sound Levels for Future No Build and Future Build Scenarios

Receiver Location	Current Levels (dBA)	Future Sound Levels for No Build Scenario (dBA)	Future Sound Levels for Build Scenario (dBA)	Change due to Proposed Road Extension (dBA)[2]
POR1 Daytime	50 (default)	50	51.0	1.0
POR1 Nighttime	45 (default)	45	45.8	0.8
POR2 Daytime	55.5	56.5	55.6	-0.9
POR2 Nighttime	52.4	53.4	53.5	0.1
POR3 Daytime[3]	50 (default)	50	50.2	0.2
POR4 Daytime	54.0	55.0	54.2	-0.8
POR4 Nighttime	47.6	48.8	47.2	-1.6

[2] Negative values indicate that the sound level will decrease if the extension is built.
[3] POR3 is a school so nighttime impacts were not assessed.

As shown in Table 3, the predicted sound levels for the Future Build Scenario are low and the increase due to the undertaking is expected to be well below 5 dBA; therefore, no mitigation measures are required at these receptors.

Further, the Future Sound Level will be below 60 dBA so the City Noise Policy indicates a noise wall is not required and will not be installed.

Based on the Future Build Scenario, the future sound level is reduced at POR2 and POR4 because the traffic that currently drives on the closest road will be reduced if the extension is built. For instance, at POR4 during the day, the traffic on Homelands Drive will be 6,100 vehicles per day without the extension but only 5,200 vehicles per day if the extension is built (see Table 2 above).

The predicted future sound levels were performed for a variety of locations throughout the Study Area and none of the locations meet the criteria for a noise wall so noise mitigation is not required at any location within the Study Area.

4.0 Conclusions

If the Sheridan Park Drive extension is constructed, the increase in sound levels expected throughout the area will be less than 5 dBA therefore noise mitigation is not warranted.

5.0 References

Computer Program STAMSON Version 5.04. Ministry of the Environment.

Environmental Guide for Noise. Ministry of Transportation, October 2006 (MTO, 2006).

Noise Attenuation Barriers on Major Roadways, City of Mississauga, Policy Number: 09-03-03 March 2015 (CoM, March 2015)

Environmental Noise Guideline. Stationary and Transportation Sources – Approval and Planning. Publication NPC-300.Ministry of the Environment and Climate Change, August 2013 (MOECC, 2013).

ORNAMENT – Ontario Road Noise Analysis Method for Environment and Transportation. Technical Document. Ministry of the Environment, October 1989.

Transit Noise and Vibration Impact Assessment, Office of Planning and Environment Federal Transit Administration, May 2006 (FTA, 2006).

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Appendix A

Sample Noise Modelling Printout

```
STAMSON 5.0        NORMAL REPORT        Date: 28-07-2017 14:06:43
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: por01.te              Time Period: Day/Night 16/8 hours
Description: POR01 AADT4,400vpd


Road data, segment # 1: ShrdPrkwy (day/night)
---------------------------------------------
Car traffic volume  :  3762/418   veh/TimePeriod  *
Medium truck volume :   144/16    veh/TimePeriod  *
Heavy truck volume  :    54/6     veh/TimePeriod  *
Posted speed limit  :    50 km/h
Road gradient       :     0 %
Road pavement       :     1 (Typical asphalt or concrete)

* Refers to calculated road volumes based on the following input:

    24 hr Traffic Volume (AADT or SADT):   4400
    Percentage of Annual Growth        :   0.00
    Number of Years of Growth          :   5.00
    Medium Truck % of Total Volume     :   3.64
    Heavy Truck  % of Total Volume     :   1.36
    Day (16 hrs) % of Total Volume     :  90.00

Data for Segment # 1: ShrdPrkwy (day/night)
-------------------------------------------
Angle1   Angle2           : -90.00 deg   90.00 deg
Wood depth                :      0       (No woods.)
No of house rows          :      0 / 0
Surface                   :      1       (Absorptive ground surface)
Receiver source distance  :  70.00 / 70.00  m
Receiver height           :   1.50 / 4.50   m
Topography                :      1       (Flat/gentle slope; no barrier)
Reference angle           :   0.00

♀
Results segment # 1: ShrdPrkwy (day)
------------------------------------

Source height = 1.08 m

ROAD (0.00 + 47.16 + 0.00) = 47.16 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.66  59.72   0.00 -11.11  -1.46   0.00   0.00   0.00  47.16
----------------------------------------------------------------------------

Segment Leq : 47.16 dBA

Total Leq All Segments: 47.16 dBA

♀
Results segment # 1: ShrdPrkwy (night)
--------------------------------------

Source height = 1.08 m

ROAD (0.00 + 41.28 + 0.00) = 41.28 dBA
Angle1 Angle2  Alpha RefLeq  P.Adj  D.Adj  F.Adj  W.Adj  H.Adj  B.Adj SubLeq
----------------------------------------------------------------------------
   -90     90   0.58  53.19   0.00 -10.59  -1.32   0.00   0.00   0.00  41.28
----------------------------------------------------------------------------

Segment Leq : 41.28 dBA

Total Leq All Segments: 41.28 dBA
```

♀

TOTAL Leq FROM ALL SOURCES (DAY): 47.16
(NIGHT): 41.28

AADT double to avoid <40 vph at night so subtract 3 dBA
TOTAL Leq FROM ALL SOURCES (DAY): 44.16
(NIGHT): 38.28

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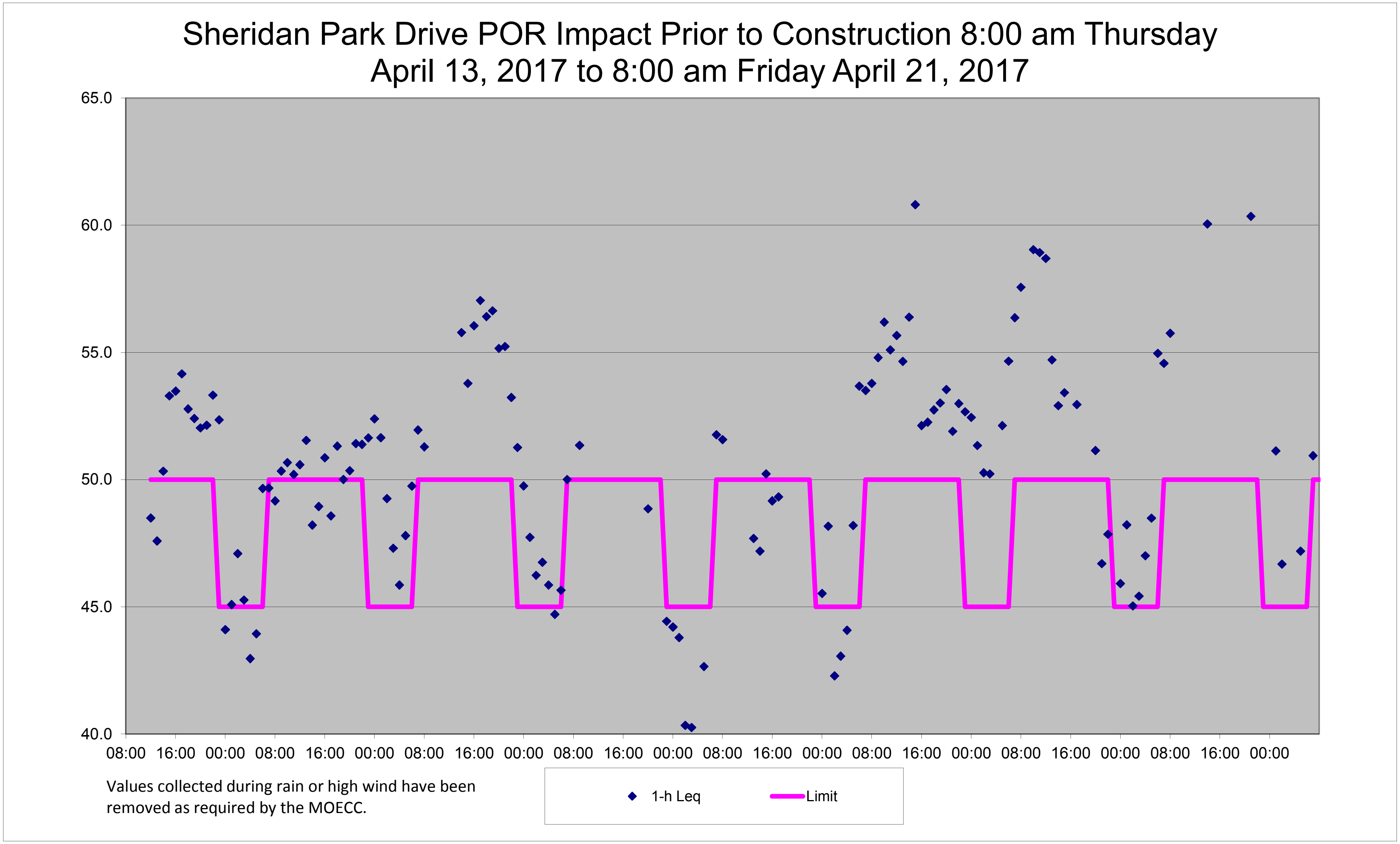
Appendix B

Background Measurements



Sheridan Park Drive POR Impact Prior to Construction 8:00 am Thursday April 13, 2017 to 8:00 am Friday April 21, 2017
65.0
60.0
55.0
50.0
45.0
40.0
08:00
16:00
00:00
08:00
16:00
00:00
08:00
16:00
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08:00
16:00
00:00
Values collected during rain or high wind have been removed as required by the MOECC.
1-h Leq
Limit

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Appendix C

Weather Conditions

Station Name	TORONTO INTL A
Province	ONTARIO
Latitude	43.68
Longitude	-79.63
Elevation	173.4
Climate Identifier	6158731
WMO Identifier	71624
TC Identifier	YYZ

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E	Estimated
M	Missing
NA	Not Available
‡	Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Temp (°C)	Dew Point	Rel Hum (%	Wind Dir (1	Wind Spd (	Visibility (k	Stn Press (	Weather
13Apr2017 0:00	2017	1.8	-2.7	72	28	13	24.1	100.96	NA
13Apr2017 1:00	2017	2.4	-2.5	70	31	17	24.1	100.94	Mainly Clear
13Apr2017 2:00	2017	1.8	-2.3	74	33	13	24.1	100.94	NA
13Apr2017 3:00	2017	1.6	-2.7	73	32	10	24.1	100.97	NA
13Apr2017 4:00	2017	1.8	-2.9	71	36	3	24.1	100.99	Cloudy
13Apr2017 5:00	2017	2	-3.1	69	25	5	24.1	101	NA
13Apr2017 6:00	2017	2.1	-2.4	72	29	5	24.1	101.03	NA
13Apr2017 7:00	2017	3.5	-1.5	70	28	5	24.1	101.12	Mainly Clear
13Apr2017 8:00	2017	6.6	-1.3	57	26	5	24.1	101.14	NA
13Apr2017 9:00	2017	8.3	-4.2	41	27	8	24.1	101.22	NA
13Apr2017 10:00	2017	9.2	-3	42	35	5	24.1	101.18	Mostly Cloudy
13Apr2017 11:00	2017	10.2	-2.8	40	36	2	24.1	101.14	NA
13Apr2017 12:00	2017	11	-3.9	35	25	5	24.1	101.09	NA
13Apr2017 13:00	2017	12.2	-1.7	38	26	7	24.1	101.02	Mostly Cloudy
13Apr2017 14:00	2017	13.3	-2.2	34	36	2	24.1	100.94	NA
13Apr2017 15:00	2017	12.3	-2.7	35	16	18	24.1	100.87	NA
13Apr2017 16:00	2017	12.6	-1.7	37	20	16	24.1	100.8	Mostly Cloudy
13Apr2017 17:00	2017	12.2	-2.4	36	17	13	24.1	100.78	NA
13Apr2017 18:00	2017	11.6	-1.5	40	16	10	24.1	100.81	NA
13Apr2017 19:00	2017	9.8	-3.8	38	14	9	24.1	100.77	Mostly Cloudy
13Apr2017 20:00	2017	8.7	-4.5	39	16	7	24.1	100.79	NA
13Apr2017 21:00	2017	9.1	-5.2	36	22	5	24.1	100.85	NA
13Apr2017 22:00	2017	7.5	-2.5	49	27	12	24.1	100.87	Mostly Cloudy
13Apr2017 23:00	2017	8	-4.8	40	34	14	24.1	100.88	NA
14Apr2017 0:00	2017	6.7	-4.4	45	36	12	24.1	100.87	NA
14Apr2017 1:00	2017	6	-3.9	49	36	13	24.1	100.86	Mostly Cloudy
14Apr2017 2:00	2017	4.9	-3.9	53	34	13	24.1	100.84	NA
14Apr2017 3:00	2017	4.9	-4.4	51	35	12	24.1	100.83	NA
14Apr2017 4:00	2017	5	-4.8	49	34	10	24.1	100.83	Mostly Cloudy
14Apr2017 5:00	2017	4.8	-5.6	47	34	9	24.1	100.86	NA
14Apr2017 6:00	2017	4.3	-5	51	33	12	24.1	100.91	NA
14Apr2017 7:00	2017	4.9	-4.9	49	34	11	24.1	100.95	Mostly Cloudy
14Apr2017 8:00	2017	6.6	-4.2	46	36	13	24.1	100.97	NA
14Apr2017 9:00	2017	9.2	-3.7	40	2	8	24.1	100.95	NA
14Apr2017 10:00	2017	11.3	-3.6	35	28	3	24.1	100.96	Clear
14Apr2017 11:00	2017	12.3	-1.6	38	13	11	24.1	100.92	NA
14Apr2017 12:00	2017	13.1	-2	35	16	11	24.1	100.88	NA
14Apr2017 13:00	2017	13.4	-6.2	25	13	15	24.1	100.82	Clear
14Apr2017 14:00	2017	14.6	-5.2	25	14	15	24.1	100.77	NA
14Apr2017 15:00	2017	14.5	-6.9	22	14	13	24.1	100.68	NA
14Apr2017 16:00	2017	14.3	-6.5	23	12	9	24.1	100.64	Clear
14Apr2017 17:00	2017	14.2	-6.6	23	15	16	24.1	100.61	NA
14Apr2017 18:00	2017	13.2	-7.5	23	14	10	24.1	100.61	NA
14Apr2017 19:00	2017	11.6	-8.3	24	14	9	24.1	100.58	Mainly Clear
14Apr2017 20:00	2017	10.3	-7.9	27	9	8	24.1	100.56	NA
14Apr2017 21:00	2017	9.5	-7.7	29	13	5	24.1	100.58	NA
14Apr2017 22:00	2017	8.3	-4.8	39	10	5	24.1	100.57	Clear
14Apr2017 23:00	2017	7.2	-4.2	44	4	8	24.1	100.54	NA
15Apr2017 0:00	2017	7	-4.4	44	4	9	24.1	100.47	NA
15Apr2017 1:00	2017	5.7	-3.1	53	3	9	24.1	100.39	Mainly Clear
15Apr2017 2:00	2017	5.3	-3.3	54	2	8	24.1	100.3	NA
15Apr2017 3:00	2017	5.5	-3.3	53	36	6	24.1	100.2	NA
15Apr2017 4:00	2017	5	-2.8	57	34	4	24.1	100.13	Mostly Cloudy
15Apr2017 5:00	2017	5.2	-2.6	57	33	6	24.1	100.1	NA
15Apr2017 6:00	2017	5.7	-2.4	56	36	9	24.1	100.08	NA
15Apr2017 7:00	2017	6.7	-2.5	52	2	4	24.1	100.05	Mostly Cloudy
15Apr2017 8:00	2017	7.8	-2	50	19	4	19.3	100.02	Rain
15Apr2017 9:00	2017	6.8	0.5	64	36	1	19.3	99.98	Rain
15Apr2017 10:00	2017	6.6	3.2	79	14	5	16.1	99.91	Rain
15Apr2017 11:00	2017	6.5	5	90	15	13	12.9	99.78	Rain
15Apr2017 12:00	2017	5.4	4.5	94	15	10	12.9	99.7	Rain
15Apr2017 13:00	2017	7.4	6	91	14	10	24.1	99.6	Mostly Cloudy
15Apr2017 14:00	2017	10.7	7.6	81	14	10	24.1	99.45	NA
15Apr2017 15:00	2017	13.9	8.6	70	16	15	24.1	99.3	NA
15Apr2017 16:00	2017	13.7	7.7	67	17	18	24.1	99.21	Mostly Cloudy
15Apr2017 17:00	2017	15	8.5	65	18	13	24.1	99.17	NA

Station Name	TORONTO INTL A
Province	ONTARIO
Latitude	43.68
Longitude	-79.63
Elevation	173.4
Climate Identifier	6158731
WMO Identifier	71624
TC Identifier	YYZ

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E	Estimated
M	Missing
NA	Not Available
‡	Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Temp (°C)	Dew Point	Rel Hum (%	Wind Dir (1	Wind Spd (	Visibility (k	Stn Press (	Weather
15Apr2017 18:00	2017	14.3	8.3	67	14	12	24.1	99.1	NA
15Apr2017 19:00	2017	12	7.4	73	15	8	24.1	99.04	Clear
15Apr2017 20:00	2017	11.2	7.4	77	17	8	24.1	99	NA
15Apr2017 21:00	2017	14	9.5	74	16	4	24.1	99.03	NA
15Apr2017 22:00	2017	20	12.1	60	22	21	24.1	99	Mostly Cloudy
15Apr2017 23:00	2017	19.6	11.7	60	23	22	24.1	98.98	NA
16Apr2017 0:00	2017	19	11.2	60	24	18	24.1	98.96	NA
16Apr2017 1:00	2017	18.6	10.5	59	23	19	24.1	98.91	Clear
16Apr2017 2:00	2017	19.3	9.9	54	23	21	24.1	98.86	NA
16Apr2017 3:00	2017	18.6	10	57	22	19	24.1	98.83	NA
16Apr2017 4:00	2017	17.4	10.1	62	21	15	24.1	98.8	Mostly Cloudy
16Apr2017 5:00	2017	17.3	10	62	24	21	24.1	98.79	NA
16Apr2017 6:00	2017	16.9	10.4	65	24	13	24.1	98.8	NA
16Apr2017 7:00	2017	17.7	9.7	59	23	25	24.1	98.76	Mostly Cloudy
16Apr2017 8:00	2017	18.6	10	57	23	23	24.1	98.72	NA
16Apr2017 9:00	2017	19.7	10	53	22	31	24.1	98.61	NA
16Apr2017 10:00	2017	21.3	10.9	51	23	33	24.1	98.56	Mostly Cloudy
16Apr2017 11:00	2017	21	11.2	53	24	43	24.1	98.54	NA
16Apr2017 12:00	2017	20.9	11.4	54	26	57	24.1	98.57	NA
16Apr2017 13:00	2017	20.8	12.1	57	28	42	24.1	98.64	Mostly Cloudy
16Apr2017 14:00	2017	21.1	12.6	58	27	41	24.1	98.66	NA
16Apr2017 15:00	2017	19.6	12.9	65	28	36	24.1	98.69	Rain Showers
16Apr2017 16:00	2017	20	12.8	63	28	33	24.1	98.76	Mostly Cloudy
16Apr2017 17:00	2017	20.1	12.5	61	27	34	24.1	98.76	NA
16Apr2017 18:00	2017	19.6	12	61	27	28	24.1	98.8	NA
16Apr2017 19:00	2017	18.8	12.2	65	27	24	24.1	98.85	Mostly Cloudy
16Apr2017 20:00	2017	16.1	14	87	30	27	24.1	98.95	NA
16Apr2017 21:00	2017	12.8	11.4	91	35	28	24.1	99.12	NA
16Apr2017 22:00	2017	10.9	9.3	90	33	21	24.1	99.19	Mainly Clear
16Apr2017 23:00	2017	10.7	9.1	90	31	10	24.1	99.27	NA
17Apr2017 0:00	2017	10.9	6.3	73	31	19	24.1	99.3	NA
17Apr2017 1:00	2017	10.5	4	64	29	18	24.1	99.35	Mostly Cloudy
17Apr2017 2:00	2017	10	2.6	60	31	23	24.1	99.36	NA
17Apr2017 3:00	2017	9.2	2.1	61	30	28	24.1	99.41	NA
17Apr2017 4:00	2017	8.5	1.7	62	31	24	24.1	99.43	Mainly Clear
17Apr2017 5:00	2017	7.3	1.8	68	30	25	24.1	99.52	NA
17Apr2017 6:00	2017	6.2	1.9	74	32	17	24.1	99.67	NA
17Apr2017 7:00	2017	6.4	1.7	72	32	23	24.1	99.77	Mainly Clear
17Apr2017 8:00	2017	7.1	2	70	32	26	24.1	99.8	NA
17Apr2017 9:00	2017	8.4	2	64	32	32	24.1	99.89	NA
17Apr2017 10:00	2017	9.4	2.3	61	31	26	24.1	99.93	Mainly Clear
17Apr2017 11:00	2017	10	1.9	57	30	33	24.1	99.98	NA
17Apr2017 12:00	2017	10.2	3.1	61	34	17	24.1	99.97	NA
17Apr2017 13:00	2017	11.6	3.2	56	34	18	24.1	99.97	Mainly Clear
17Apr2017 14:00	2017	11.8	3.6	57	3	21	24.1	99.98	NA
17Apr2017 15:00	2017	11.8	3.4	56	36	14	24.1	99.99	NA
17Apr2017 16:00	2017	11.5	2.8	55	1	22	24.1	100.03	Mainly Clear
17Apr2017 17:00	2017	10.1	1.5	55	36	28	24.1	100.1	NA
17Apr2017 18:00	2017	7.8	0.5	60	36	25	24.1	100.18	NA
17Apr2017 19:00	2017	5	-1.2	64	34	28	24.1	100.28	Mainly Clear
17Apr2017 20:00	2017	3.2	-1.7	70	35	28	24.1	100.4	NA
17Apr2017 21:00	2017	2.5	-2.2	71	35	28	24.1	100.47	NA
17Apr2017 22:00	2017	2	-2.7	71	35	26	24.1	100.5	Clear
17Apr2017 23:00	2017	1.6	-2.7	73	35	19	24.1	100.56	NA
18Apr2017 0:00	2017	1.1	-2.8	75	36	18	24.1	100.61	NA
18Apr2017 1:00	2017	0.9	-2.7	77	34	11	24.1	100.67	Clear
18Apr2017 2:00	2017	0.4	-2.5	81	36	11	24.1	100.69	NA
18Apr2017 3:00	2017	0.4	-2.3	82	36	10	24.1	100.73	NA
18Apr2017 4:00	2017	0.2	-2.5	82	1	10	24.1	100.76	Clear
18Apr2017 5:00	2017	0.2	-2.5	82	2	10	24.1	100.82	NA
18Apr2017 6:00	2017	0.8	-3.3	74	7	9	24.1	100.86	NA
18Apr2017 7:00	2017	2.1	-2.6	71	7	13	24.1	100.93	Mainly Clear
18Apr2017 8:00	2017	3.3	-2.5	66	8	10	24.1	100.98	NA
18Apr2017 9:00	2017	4.5	-2.6	60	14	10	24.1	100.97	NA
18Apr2017 10:00	2017	5.4	-1.5	61	14	14	24.1	100.98	Mainly Clear
18Apr2017 11:00	2017	5.9	-1	61	14	20	24.1	100.95	NA

Station Name	TORONTO INTL A
Province	ONTARIO
Latitude	43.68
Longitude	-79.63
Elevation	173.4
Climate Identifier	6158731
WMO Identifier	71624
TC Identifier	YYZ

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E	Estimated
M	Missing
NA	Not Available
‡	Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Temp (°C)	Dew Point	Rel Hum (%	Wind Dir (1	Wind Spd (	Visibility (k	Stn Press (	Weather
18Apr2017 12:00	2017	6.3	-0.4	62	12	17	24.1	100.91	NA
18Apr2017 13:00	2017	6.7	-0.5	60	11	15	24.1	100.9	Mostly Cloudy
18Apr2017 14:00	2017	8.1	-2.2	48	8	18	24.1	100.8	NA
18Apr2017 15:00	2017	8.8	-2.8	44	15	18	24.1	100.74	NA
18Apr2017 16:00	2017	9.1	-3.8	40	12	12	24.1	100.68	Mostly Cloudy
18Apr2017 17:00	2017	8.1	-4	42	7	14	24.1	100.62	NA
18Apr2017 18:00	2017	6.2	-4.3	47	10	15	24.1	100.57	NA
18Apr2017 19:00	2017	5.2	-6.4	43	8	16	24.1	100.53	Mostly Cloudy
18Apr2017 20:00	2017	5	-6	45	8	12	24.1	100.54	NA
18Apr2017 21:00	2017	4.8	-4.8	50	8	8	24.1	100.45	NA
18Apr2017 22:00	2017	4.8	-4.5	51	8	9	24.1	100.39	Mostly Cloudy
18Apr2017 23:00	2017	5	-3.1	56	8	9	24.1	100.39	NA
19Apr2017 0:00	2017	5.1	-2	60	9	13	24.1	100.27	NA
19Apr2017 1:00	2017	6.2	-1.9	56	8	10	24.1	100.18	Mostly Cloudy
19Apr2017 2:00	2017	6.4	-1.3	58	9	8	24.1	100.03	NA
19Apr2017 3:00	2017	6.2	0.1	65	6	9	19.3	99.94	Rain Showers
19Apr2017 4:00	2017	6.3	0.8	68	11	10	24.1	99.84	Cloudy
19Apr2017 5:00	2017	6.6	1.3	69	6	6	24.1	99.76	NA
19Apr2017 6:00	2017	6.8	1.5	69	13	5	24.1	99.73	NA
19Apr2017 7:00	2017	7.2	2.7	73	15	4	24.1	99.68	Cloudy
19Apr2017 8:00	2017	7.3	4.8	84	16	4	24.1	99.66	Rain Showers
19Apr2017 9:00	2017	9.9	5.9	76	19	7	24.1	99.59	NA
19Apr2017 10:00	2017	10.5	7.6	82	16	15	24.1	99.49	Mostly Cloudy
19Apr2017 11:00	2017	14	9.7	75	18	13	24.1	99.51	NA
19Apr2017 12:00	2017	17.1	12.5	74	20	20	24.1	99.4	NA
19Apr2017 13:00	2017	17.9	14.3	79	21	24	24.1	99.38	Cloudy
19Apr2017 14:00	2017	17.1	14.8	86	22	22	24.1	99.39	NA
19Apr2017 15:00	2017	19.2	15.5	79	22	27	19.3	99.36	NA
19Apr2017 16:00	2017	20.2	15.1	72	27	22	19.3	99.4	Mostly Cloudy
19Apr2017 17:00	2017	20.3	11.1	55	32	32	24.1	99.46	NA
19Apr2017 18:00	2017	18.4	9.3	55	32	27	24.1	99.54	NA
19Apr2017 19:00	2017	15.9	8.7	62	36	20	24.1	99.63	Mostly Cloudy
19Apr2017 20:00	2017	13.3	7.6	68	36	20	24.1	99.72	NA
19Apr2017 21:00	2017	11.6	6.4	70	35	23	24.1	99.81	NA
19Apr2017 22:00	2017	10.7	5.9	72	35	25	24.1	99.81	Mostly Cloudy
19Apr2017 23:00	2017	9.6	5.6	76	1	18	24.1	99.86	NA
20Apr2017 0:00	2017	8.9	4.9	76	36	21	24.1	99.92	NA
20Apr2017 1:00	2017	8.3	5.3	81	1	18	24.1	99.91	Mostly Cloudy
20Apr2017 2:00	2017	7.5	5	84	2	9	24.1	99.97	NA
20Apr2017 3:00	2017	8.3	5.4	82	4	13	24.1	99.99	NA
20Apr2017 4:00	2017	8.2	5.2	81	5	14	24.1	99.99	Cloudy
20Apr2017 5:00	2017	7.9	4.7	80	5	15	24.1	99.99	NA
20Apr2017 6:00	2017	7.9	4.7	80	8	19	24.1	99.91	NA
20Apr2017 7:00	2017	7.1	3.7	79	9	15	24.1	100.05	Cloudy
20Apr2017 8:00	2017	6.5	3.1	79	10	26	24.1	99.98	NA
20Apr2017 9:00	2017	5.7	3.4	85	9	15	19.3	100.28	Rain
20Apr2017 10:00	2017	5.1	3.8	91	7	19	8.1	100	Moderate Rain Showers,Fog
20Apr2017 11:00	2017	5	4	93	9	21	9.7	99.92	Rain Showers,Fog
20Apr2017 12:00	2017	4.9	3.6	91	9	24	19.3	99.78	Rain Showers
20Apr2017 13:00	2017	5.4	3.6	88	9	16	24.1	99.7	Cloudy
20Apr2017 14:00	2017	5.4	3.1	85	10	28	24.1	99.58	Rain Showers
20Apr2017 15:00	2017	5.3	3.3	87	8	19	16.1	99.51	Rain Showers
20Apr2017 16:00	2017	5.2	3.9	91	8	26	16.1	99.35	Rain Showers
20Apr2017 17:00	2017	5.4	4.2	92	8	22	12.9	99.28	Rain Showers
20Apr2017 18:00	2017	5.8	4.8	93	8	16	19.3	99.31	Rain Showers
20Apr2017 19:00	2017	6.2	5.3	94	10	18	9.7	99.21	Moderate Rain Showers
20Apr2017 20:00	2017	6	5.1	94	9	23	24.1	99.05	NA
20Apr2017 21:00	2017	5.9	5.2	95	10	20	16.1	99.07	Rain Showers
20Apr2017 22:00	2017	5.8	5.1	95	11	17	16.1	98.97	Rain Showers
20Apr2017 23:00	2017	5.8	5.2	96	11	14	16.1	98.89	Rain
21Apr2017 0:00	2017	5.9	5.3	96	7	10	12.9	98.82	NA
21Apr2017 1:00	2017	5.9	5.3	96	16	7	3.2	98.81	Fog
21Apr2017 2:00	2017	6	5.6	97	36	2	1.2	98.76	Drizzle,Fog
21Apr2017 3:00	2017	6.2	5.8	97	27	9	2	98.78	Drizzle,Fog
21Apr2017 4:00	2017	6.3	5.9	97	28	5	6.4	98.74	Fog
21Apr2017 5:00	2017	6.3	5.9	97	25	12	1	98.77	Drizzle,Fog

Station Name	TORONTO INTL A
Province	ONTARIO
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All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Legend

E	Estimated
M	Missing
NA	Not Available
‡	Partner data that is not subject to review by the National Climate Archives

Date/Time	Year	Temp (°C)	Dew Point	Rel Hum (%	Wind Dir (1	Wind Spd (	Visibility (k	Stn Press (	Weather
21Apr2017 6:00	2017	6.8	6.4	97	25	13	16.1	98.84	NA
21Apr2017 7:00	2017	8	7.7	98	25	18	16.1	98.88	Cloudy
21Apr2017 8:00	2017	9.7	8.2	90	25	19	16.1	98.87	NA
21Apr2017 9:00	2017	10.6	8	84	23	19	19.3	98.9	NA
21Apr2017 10:00	2017	10.7	6.9	77	25	24	24.1	98.93	Rain Showers
21Apr2017 11:00	2017	11.2	8.1	81	26	22	24.1	98.94	NA
21Apr2017 12:00	2017	11.3	5.9	69	28	28	24.1	98.97	NA
21Apr2017 13:00	2017	12.2	5	61	26	28	24.1	99	Cloudy
21Apr2017 14:00	2017	11.9	4	58	28	34	24.1	99.03	NA
21Apr2017 15:00	2017	11.9	4	58	26	28	24.1	99.01	NA
21Apr2017 16:00	2017	11.2	3	57	26	30	24.1	99.11	Mostly Cloudy
21Apr2017 17:00	2017	10.1	2.5	59	28	28	24.1	99.22	NA
21Apr2017 18:00	2017	8.6	2.4	65	28	31	24.1	99.31	NA
21Apr2017 19:00	2017	7.8	2.1	67	30	26	24.1	99.37	Cloudy
21Apr2017 20:00	2017	7.1	1.6	68	30	18	24.1	99.43	NA
21Apr2017 21:00	2017	6	1.4	72	28	18	24.1	99.51	NA
21Apr2017 22:00	2017	6.1	1.6	73	27	14	24.1	99.5	Mostly Cloudy
21Apr2017 23:00	2017	6.4	1.5	71	29	20	24.1	99.54	NA

Appendix K

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix K

Phase One Environmental Site Assessment Report

Sheridan Park Drive Extension
Municipal Class EA

Phase One Environmental Site Assessment

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON   L5N 8R9 CANADA

December 2017
300039474.0000

Distribution List

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Record of Revisions

Revision	Date	Description
0	September 8, 2017	Draft Submission to City
1	October 17, 2017	2nd Draft Submission to City
2	December 11, 2017	Final Submission to City

R.J. Burnside & Associates Limited

Report Prepared By:

Laura DeCoste, B.Sc.
Environmental Scientist
LD:sr

Report Reviewed By:

Kathleen Langstaff, P.Geo., QP$_{ESA}$
Geoscientist
KL:sr

Executive Summary

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. This Phase One Environmental Site Assessment (ESA) for the extension of Sheridan Park Drive (the “Site”) was completed as part of the EA Study.

Sheridan Park Drive currently terminates west of Speakman Drive and the proposed extension will see the road continue to Winston Churchill Boulevard. The Site is currently vacant.

The Phase One ESA was completed in accordance with the requirements of Ontario Regulation (O. Reg.) 153/04, as amended, with the exception of a historical title search, as a Record of Site Condition (RSC) is not required at this stage. Figure 1 shows the Site location and Figure 2 shows the Site boundary and Study Area (250 m buffer around Site).

The findings of the Phase One ESA are as follows:

- Historical mapping indicates first developed use of the Site was agricultural in 1880;
- Historical mapping, aerial photographs and satellite images show property use of the Site was Agricultural or Other Use from 1880 to 1960. By 1970, the ends of the Site were developed into roads, defined as Community Use in O. Reg. 153/04. The recent Site visit confirmed that between the road ends, the Site is grass covered land with shrubs and trees (Agricultural or Other Use);
- Piles of debris were observed on the Site, consisting primarily of brush and concrete;
- There were no underground storage tanks (USTs) or aboveground storage tanks (ASTs) identified at the Site, currently or historically;
- There were no Potentially Contaminating Activities (PCAs) identified on the Site; and
- The records review, interview and Site visit indicate there are no Areas of Potential Environmental Concern (APECs) on the Site.

A Phase Two ESA is not required.

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Appendices

Disclaimer

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighborhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.

As part of the EA Study, Burnside has completed a Phase One Environmental Site Assessment (ESA) for the extension of Sheridan Park Drive (the "Site").

Sheridan Park Drive currently terminates west of Speakman Drive and the proposed extension will see the road continue to Winston Churchill Boulevard. The Site is currently vacant. The Phase One ESA was completed in general accordance with the requirements of Ontario Regulation (O. Reg.) 153/04, as amended. Figure 1 shows the Site location. Figure 2 shows the Site and Study Area (250 m buffer around Site).

1.1 Phase One Property Information

A Title search was not completed as the property is owned and has been owned for a period of time by the Regional Municipality of Peel. There is no municipal address associated with the Site. Information from mapping indicates the Site is situated on:

- Part Lots 32, Lot 33, Lot 34, Lot 35, Concession 1 South of Dundas Street, Toronto Township, Mississauga.

1.2 Client Contact Information

Client contact information for this project is as follows:

Ms. Dana Glofcheskie, P.Eng.
Transportation Engineer
City of Mississauga
201 City Centre Drive, Suite 800
Mississauga, ON L5B 2T4

2.0 Scope of Work

The Phase One ESA was completed in accordance with the requirements of O. Reg. 153/04, as amended.

The scope of work included:

- A records review of the Site and surrounding lands in the Study Area;
- Interviews with individuals familiar with the Site;
- A Site visit; and
- Preparation of a Phase One ESA Report.

The following information was used to evaluate past and/or current practices on the Site:

- Aerial photographs and satellite images;
- Geological maps, topographical maps and historical maps;
- Insurance Advisory Mapping (fire insurance maps);
- Municipal records and directories;
- Environmental Risk Information Services (ERIS) database search results;
- Technical Standards & Safety Authority (TSSA) record search results;
- Ministry of the Environment and Climate Change (MOECC) Freedom of Information (FOI) spill records;
- Region of Peel spill record; and
- Land Registry Information.

A historical title search was not conducted as a Record of Site Condition (RSC) is not required at this stage.

A Site visit was conducted to observe current environmental conditions and to assess:

- Existing and previously existing aboveground storage tanks (ASTs) and underground storage tanks (USTs);
- Evidence of fill material importation;
- Chemical storage and handling;
- Housekeeping and waste disposal practises;
- Infrastructure and servicing;
- Site drainage and topography; and
- Surrounding land uses.

Burnside understands that the scope of work at this stage does not require a RSC.

3.0 Records Review

3.1 General

3.1.1 Phase One Study Area

The Study Area for the Phase One ESA included the land referred to as the Site, as well as surrounding lands located within 250 m of the Site boundary. The surrounding properties were visually examined from the Site and public property. In addition, an archive search of the Study Area was completed.

3.1.2 First Developed Use

A historical map of Peel County (Figure 3) indicates property use of the Site was agricultural in 1880. First developed use of the Site is considered to be 1880.

3.1.3 Chain of Title

A Title search was not completed as the property is owned and has been owned for a significant period of time by the Regional Municipality of Peel.

3.1.4 Fire Insurance Maps

Fire Insurance maps were not available for the Study Area.

3.1.5 City Directory

A City Directory search was not ordered because the property does not have a municipal address and has been vacant land since the 1800s.

3.1.6 Land Registry Information

Land Registry Information confirmed the location of spills associated with the Union Gas property (PIN 13426-0513) situated on the east side of Winston Churchill Boulevard. The Union Gas property is a 786.87 m^2 parcel approximately 70 m north of the Site boundary.

3.2 Environmental Source Information

3.2.1 ERIS Database Search

A review of selected environmental databases was conducted through Environmental Risk Information Services (ERIS) for the Study Area, defined as the Site plus a primary search radius of approximately 250 m from the boundary of the Site.

The following databases were included in the ERIS search:

- Abandoned Aggregate Inventory;
- Certificates of Approval;
- Commercial Fuel Oil Tanks;
- Environmental Compliance Approval;
- Fuel Storage Tank;
- Fuel Storage Tank – Historic;
- Inventory of Coal Gasification Plants and Coal Tar Sites;
- Inventory of PCB Storage Sites;
- List of TSSA Expired Facilities;
- Ontario Regulation 347 Waste Generators Summary;
- Ontario Regulation 347 Waste Receivers Summary;
- Ontario Spills;
- Pesticide Register;
- Private and Retail Fuel Storage Tanks;
- Record of Site Condition;
- TSSA Historic Incidents;
- TSSA Incidents;
- TSSA Pipeline Incidents;
- TSSA Variances for Abandonment of Underground Storage Tanks;
- Waste Disposal Sites – MOECC 1991 Historical Approval Inventory;
- Anderson's Waste Disposal Sites;
- ERIS Historical Searches; and
- Retail Fuel Storage Tanks.

A total of 36 records were identified in the Study Area. Details are provided in the following sections. The ERIS report is provided in Appendix A.

3.2.1.1 Certificates of Approval (CA)

There were 4 records identified in the Certificates of Approval (CA) database associated with environmental approvals for R.M of Peel, Steel Tech Limited, 2748355 Canada Inc. and the Ontario Ministry of the Environment. These records are not an environmental concern to the Site.

3.2.1.2 ERIS Historical Searches (EHS)

There were 6 records identified in the ERIS Historical Searches database associated with environmental risk reports and document searches for properties in the Study Area. These reports are not an environmental concern to the Site.

3.2.1.3 Ontario Regulation 347 Waste Generators Summary (GEN)

There were 19 records identified in the Waste Generators Summary database associated with the following:

- 2 records associated with Enersource Hydro Mississauga located at 2340 Sheridan Park Drive, 22.1 m southeast of the Site. The type of waste is not specified.
- 2 records associated with Hatch Ltd., located at 2800 Speakman Drive, 126 m southwest of the Site. Wastes generated are inorganic laboratory chemicals and waste crankcase oils and lubricants.
- 8 records associated with Mississauga – Oakville Veterinary Emergency Hospital located at 2285 Bristol Circle, 144 m southwest of the Site. Wastes generated are pharmaceuticals, aliphatic solvents and residues and pathological wastes.
- 5 records associated with Candu Energy Inc. located at 2233 Speakman Drive, 165 m southeast of the Site. Wastes generated are petroleum distillates, inorganic laboratory chemicals, light fuels, alkaline wastes, PCBs, aliphatic solvents, paint / pigment / coating residues, pathological wastes, wastes oils and lubricants, pharmaceuticals, phosphates, waste compressed gases, oil skimming and sludges, emulsified oils, halogenated solvents, organic laboratory chemicals, miscellaneous wastes and inorganic chemicals, organic non-halogenated pesticide and herbicide wastes and other polymeric wastes.
- 2 records associated with Peel District School Board located at 2420 Homelands Drive, 189 m north of the Site. Wastes generated are light fuels (Waste Code 221).

Based on the inferred direction of groundwater flow (southeast), the Peel District School Board is the only GEN record located upgradient from the Site. There were no bulk fuel storage records or fuel spills of concern associated with light fuels (Waste Code 221) at the school. There were no significant environmental concerns associated with the Site in the review of GEN records.

3.2.1.4 TSSA Pipeline Incidents (PINC)

There was 1 report identified in the TSSA Pipeline Incidents database associated with a natural gas pipeline hit at 2420 Homelands Drive. The incident occurred in March 2017. Natural gas is expected dissipate into the air and therefore this record is not an environmental concern to the Site.

3.2.1.5 Ontario Spills (SPL)

There were 6 records in the Ontario Spills (SPL) database associated with the following:

- 1 record associated with The Corporation of the City of Mississauga located at Speakman Drive and Sheridan Park Drive, 7.6 m north of the Site. The spill was caused by a broken watermain in 2010, releasing chlorinated water into the sewer. This incident is not considered to be an environmental concern to the Site.

- 1 record occurred 9 m north of the Site near Winston Churchill Boulevard. 25 m^3 of slurry was dumped onto the land in January 2015. This record is not an environmental concern to the Site.
- 2 records associated with The Regional Municipality of Peel located at 2420 Homelands Drive, 189 m north of the Site. One record was associated with a leak / break in 2014 releasing potable water / sediment to Sheridan Creek. There was a confirmed environmental impact to the surface water. Since the water came from the drinking water supply, this record is unlikely to be an environmental concern to the Site. The second record was associated with a leak / break releasing natural gas to the air. Natural gas is expected to dissipate into the air and therefore this record is not an environmental concern to the Site.
- 2 records associated with Union Gas Ltd. located at 2345 Winston Churchill Boulevard, 122 m northwest of the Site. One record reported "205 L petroleum oil found while cleaning up under-ground line" in 1992, noting the source is unknown. There was a confirmed environmental impact to the land. The second record was associated with an intentional hose leak releasing 900 L of water with possible traces of natural gas. Natural gas is expected to dissipate into the air and therefore this record is not an environmental concern to the Site. The actual location of these spill are not clear, other than they occurred on the Union Gas property north of the Site. Additional information received from the MOECC FOI confirmed that in both cases, contaminated soil was removed from the Union Gas property. In both cases, the MOECC noted "File Closed" indicating no further action was required. These spill incidents are not considered to be a significant environmental concern to the Site.

3.2.1.6 Unplottable Records

There were a total of 40 unplottable records associated with the following:

3.2.1.7 Certificates of Approval (CA)

There were 28 records identified in the Certificates of Approval (CA) database associated with environmental approvals. These records are not an environmental concern to the Site.

3.2.1.8 Environmental Compliance Approval (ECA)

There were 2 records identified in the Environmental Compliance Approval (ECA) database. These records are not an environmental concern to the Site.

3.2.1.9 ERIS Historical Searches (EHS)

There was 1 record identified in the ERIS Historical Searches database associated with environmental risk reports and document searches for properties in the Study Area. This report is not an environmental concern to the Site.

3.2.1.10 Ontario Regulation 347 Waste Generators Summary (GEN)

There was 1 record identified in the Waste Generators Summary database associated with Enbridge Gas Distributions Inc. The wastes generated are oil skimmings and sludges. This record is not within the Study Area and therefore is not a concern to the Site.

3.2.1.11 Ontario Spills (SPL)

There were 8 records listed in the Ontario Spills (SPL) database were associated with spills that occurred outside of the Study Area and therefore are not an environmental concern to the Site.

3.2.1.12 Summary

There were no significant environmental concerns associated with the Site identified in the review of the ERIS report.

3.2.2 Regulatory Agencies

3.2.2.1 Ministry of the Environment and Climate Change

The Ministry of the Environment and Climate Change (MOECC) Freedom of Information and Protection of Privacy Office (FOI) was not contacted to obtain information regarding Orders, Spills, Investigations / Prosecutions, Certificates of Approval, environmental concerns, correspondence, occurrence reports or abatement for the Site because the property does not have a municipal address.

A request was submitted to the MOECC FOI to obtain details regarding spill records associated with the Union Gas Ltd. property located north of the Site at 2345 Winston Churchill Boulevard. The MOECC FOI provided two Occurrence Reports describing the two spill incidents that occurred in 1992. Details regarding the first spill incident (occurrence date August 21, 1992) indicate contaminated soil was removed from the Union Gas property and disposed of at a landfill. Details regarding the second spill incident (occurrence date August 26, 1992) note a 6 inch layer of soil would be excavated and replaced with clean fill and sod. In both cases, the MOECC noted "File Closed" indicating no further action was required. These spill incidents are not considered to be a significant environmental concern to the Site. Correspondence and Occurrence Reports received from the MOECC FOI are provided in Appendix B.

3.2.2.2 Technical Standards and Safety Authority

The Technical Standards and Safety Authority (TSSA) Fuel Safety Branch was contacted to search for records associated with 2345 Winston Churchill Boulevard, a property north of the Site where two spill records were identified. The TSSA stated "We have no record in our database of any fuel storage tanks at the subject address". The Site was not included in the TSSA search because the Site does not have a municipal address. The ERIS database search included searching several TSSA databases for records within the Study Area. A TSSA Pipeline Incident described a natural gas pipeline hit that occurred during an excavation at 2420 Homelands Drive, Mississauga. This incident is not considered to be a significant environmental concern to the Site. Correspondence from the TSSA is provided in Appendix C.

3.2.3 Region of Peel

A request for a search of spill reports and waste disposal sites in the vicinity of the Site was submitted to the Region of Peel.

The Region of Peel provided a spill report dated 1994, documenting the discovery of a significant amount of oil-based paint in a storm outfall and sewer pipe at Sheridan Park Drive and Homelands Drive. The City of Mississauga hired Philip Environmental to remove the paint from the outfalls. The report notes that restoration was not required. This incident is not considered to be a significant environmental concern to the Site.

There were no records found which indicate the existence of a municipal waste disposal site or hazardous wastes on the Site or in the vicinity of the Study Area.

Correspondence and the Spill Report received from the Region of Peel are provided in Appendix D.

3.2.4 Aerial Photographs

A review of historical aerial photographs and satellite images from 1934 to 2016, covering a period of 82 years, were examined to assess development patterns on the Site and surrounding area. While the resolution of the images limits observation of the surface conditions, the following provides a summary of our interpretation.

1934 Aerial Photograph – Figure 7

The resolution of the 1934 aerial photograph is fairly clear and shows that the Site and surrounding areas are mainly agricultural with some patches of forests. There are very few houses shown in this photograph. Sheridan Park Drive has not yet been constructed. Dundas Street West is north of the Site and Winston Churchill Boulevard is west of the Site.

1960 Aerial Photograph – Figure 8

The resolution of the 1960 aerial photograph is fairly clear and shows that the Site no longer appears to be used for agricultural purposes. It has remained vacant with some forested areas. The majority of the surrounding area has remained agricultural; however there are some residential developments north and east of the Site. The Queen Elizabeth Way has been constructed south of the Site.

1970 Aerial Photograph – Figure 9

The resolution of the 1970 aerial photograph is fairly clear and shows that Sheridan Park Drive has been constructed adjacent to the northeast corner of the Site. The Site has remained vacant with some forested areas. Most of the land north and east of the Site is now residential. South of the Site appears to be commercial.

1978 Aerial Photograph – Figure 10

The resolution of the 1978 aerial photograph is fairly clear and shows that the Site and the surrounding area have remained the same as seen in the 1970 aerial photograph.

1988 Aerial Photograph – Figure 11

The resolution of the 1988 aerial photograph is fairly clear and shows that the Site has remained constant since the 1960 aerial photograph. West of the Site (previously agricultural) has been partly developed for commercial use. The majority of the surrounding area has remained the same since 1970, although the density of development has increased.

2004 Aerial Photograph – Figure 12

The resolution of the 2004 aerial photograph is fairly clear and shows the Site has remained constant since the 1960 aerial photograph. West of the Site is now completely developed for commercial / industrial use. The majority of the surrounding area has remained the same since the 1988 aerial photograph.

Summary

The review of aerial photographs show the Site was used for agricultural purposes until 1960. At this time, development surrounding the Site increased. Sheridan Park Drive was constructed sometime between 1960 and 1970. The Site has remained vacant since the 1880 historical county map.

3.2.5 Topography, Hydrology, Geology

The topography of the Site and surrounding area is fairly flat. Elevation of the Site is approximately 145 m above sea level (asl). The inferred direction of groundwater flow is southeast towards Sheridan Creek.

The Site is within the Lake Ontario Shoreline West Subwatershed, part of Credit Valley Watershed, which drains south toward Lake Ontario.

A review of available mapping by the Ontario Geological Survey was undertaken to characterize the general surficial and bedrock geology of the area. Surficial geology of the Site is mostly described as glaciolacustrine – derived silty to clayey till. The southwest corner of the Site is Paleozoic bedrock. Bedrock is described as shale, limestone, dolostone and siltstone. The Site is part of the Queenston, Georgian Bay, Blue Mountain, Billings, Collingwood and Eastview formations.

3.2.6 Water Bodies and Areas of Natural Significance

There are no water bodies on the Site. The Sheridan Creek is approximately 400 m south of the Site.

The Site is within the Lake Ontario Shoreline West Subwatershed, part of Credit Valley Watershed, which drains south toward Lake Ontario.

Various databases and documents were reviewed to determine if the Site is in an Area of Natural Significance, defined as any of the following:

1. An area reserved or set apart as a provincial park or conservation reserve under the *Provincial Parks and Conservation Reserves Act*, 2006.
2. An area of natural and scientific interest (life science or earth science) identified by the Ministry of Natural Resources as having provincial significance.
3. A wetland identified by the Ministry of Natural Resources as having provincial significance.
4. An area designated by a municipality in its official plan as environmentally significant, however expressed, including designations of areas as environmentally sensitive, as being of environmental concern and as being ecologically significant.
5. An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act*.
6. An area identified by the Ministry of Natural Resources as significant habitat of a threatened or endangered species.
7. An area which is habitat of a species that is classified under Section 7 of the *Endangered Species Act*, 2007 as a threatened or endangered species.
8. Property within an area designated as a natural core area or natural linkage area within the area to which the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act*, 2001 applies.
9. An area set apart as a wilderness area under the *Wilderness Areas Act*.

There are no Areas of Natural Significance associated with the Site.

4.0 Interviews

Interview questions were provided to Katrina MacDonald at the City of Mississauga. Katrina MacDonald provided responses to the interview questions by email on November 3, 2017 (Appendix E). Contact information for Katrina is as follows:

Katrina MacDonald, P.Eng.
Environmental Coordinator, Site Assessments
T 905-615-3200 ext.3165
katrina.macdonald@mississauga.ca

Katrina has been with the City of Mississauga for 14 months. Katrina indicated that the City of Mississauga had conducted a review of their available records and there were no violations of the Storm Sewer By-Law No. 259-05.

There were no Potentially Contaminating Activities (PCAs) or Areas of Potential Environmental Concern (APECs) identified from the interview.

5.0 Site Visit

A Site visit was conducted on June 16, 2017 by David Marks of Burnside. The weather was sunny and warm (24°C) with blue sky and light cloud cover.

A visual inspection of the Site and surrounding area was completed to observe and document current environmental conditions.

A visual assessment of adjacent properties and surrounding land use was completed from publicly accessible areas.

Photographs from the Site visit are presented in Appendix F.

5.1 Specific Observations at the Phase One Property

The Site is a long, narrow, rectangular shaped parcel of vacant land extending west from Homelands Drive and Sheridan Park Drive to Winston Churchill Boulevard. Metal barriers are at the paved road ends at the west end and east end of the Site.

Vacant grass and shrub covered land extends between the road ends. A paved walking trail within a utility corridor is north of the Site. Small piles of construction debris (bricks and concrete rubble) have been dumped on the Site.

A residential subdivision is north of the utility corridor. In general, grass and tree covered land is adjacent to the south boundary of the Site. Commercial / industrial properties are southwest, northwest, northeast, southeast, south and east of the Site.

5.1.1 Fill Materials

There were no significant quantities of fill material identified at the Site. There were small piles of brush and construction debris (bricks and concrete rubble) dumped in various locations on the Site.

There were no significant environmental concerns associated with the debris observed on the Site.

5.1.2 Water Sources

There are no water wells on the Site. The area is serviced by a municipal water supply.

5.1.3 Sewage Systems

The area is serviced by municipal sanitary sewers and storm sewers.

5.1.4 Buildings and Structures

There are no buildings on the Site. Metal barriers are at the paved road ends at the west end and east end of the Site. A paved walking trail and pole mounted power lines are on the utility corridor north of the Site.

5.1.5 Chemical Storage and Tanks

There are currently no ASTs or USTs located on the Site and there were no ASTs or USTs identified at the Site in the records review.

5.1.6 Designated Substances and Other Potentially Hazardous Materials

There were no environmental concerns relating to designated substances or other hazardous materials identified during the Site visit.

5.1.7 Vegetation Distress and Staining

There were small piles of brush and construction debris (bricks and concrete rubble) that have been dumped on the grass on the Site, next to the paved asphalt walking trail. There was no evidence of vegetation distress or staining.

5.1.8 Housekeeping

There were small piles of brush and construction debris (bricks and concrete rubble) that have been dumped on the grass on the Site, next to the paved asphalt walking trail. There were no significant environmental concerns relating to litter or housekeeping.

5.1.9 Adjacent Property Use

Adjacent property use surrounding the Site is Commercial, Industrial and Residential. Commercial and industrial buildings are northeast, east, southeast, south, northwest and southwest of the Site and utility corridor north of the Site. Residential dwellings are in subdivisions west, northwest, north and northeast of the Site. A school (Institutional) is in the residential subdivision northwest of the Site.

A visual assessment of properties adjacent to the Site was completed from publicly accessible areas. There was no evidence of significant contamination at adjacent properties.

5.1.10 Written Description of Investigation

The Phase One ESA was completed in accordance with O. Reg. 153/04, as amended. The work included:

- A records review of the Site and surrounding lands in the Study Area;
- Interviews with individuals familiar with the Site; and
- A Site visit and visual assessment of the property and surrounding property uses.

6.0 Review and Evaluation of Information

6.1 Current and Past Uses

Historical mapping and aerial photographs indicate the property use of the Site was Agricultural or Other Use in 1880 until the 1960s. By 1970, the ends of the Site were developed into roads (Community Use). The recent Site visit confirmed that between the road ends, the Site is grass covered land with shrubs and trees (Agricultural or Other Use). Table 1 notes the observations from mapping and aerial photographs of the Site.

Table 1: Property Uses of the Site

Years	Property Use	Resources
1880 to present	Agricultural or Other Use	Historical map of Peel County indicates agricultural use of the Site in 1880 (Figure 3). Aerial photographs dated 1934 (Figure 7) and 1960 (Figure 8) show the Site appears to be cultivated agricultural fields and forested areas. Aerial photographs dated 1970 to 2016 (Figures 9 to 13 and Figure 2) show the central area of the Site is grass covered land with shrubs and trees.
1970 to present	Community Use	Aerial photographs dated 1970 to 2016 (Figures 9 to 13 and Figure 2) show the ends of

Years	Property Use	Resources
		the Site were developed into roads (Community Use).

6.2 Potential Contaminating Activities

A Potentially Contaminating Activity (PCA) is a property use or activity listed in O. Reg. 153/04 that is occurring or has occurred in the Phase One ESA Study Area.

6.2.1 On-Site Potentially Contaminating Activities (PCA)

There were no on-Site PCAs identified on the Site.

6.2.2 Off-Site Potentially Contaminating Activities (PCA)

There were no off-Site PCAs identified in the Study Area.

6.3 Areas of Potential Environmental Concern

An Area of Potential Environmental Concern (APEC) is an area on, in or under the Site, where one or more contaminants are potentially present, as determined by a Phase One ESA.

Historical mapping, aerial photographs, records, spill incidents, property use activities, information from interviews and Site observations are evaluated in order to identify any significant environmental concerns. The records review, interview and Site visit indicate there are no APECs on the Site.

6.4 Contaminants of Potential Concern

There were no contaminants of potential concern identified on the Site.

6.5 Phase One Conceptual Site Model

The Conceptual Site Model (Figure 13) identifies the Site boundary, adjacent property use, the Union Gas property, the inferred direction of groundwater flow and roads. The uncertainty or absence of information of each of the Phase One components could affect the validity of the model.

7.0 Conclusions

The findings of the Phase One ESA are as follows:

- Historical mapping indicates first developed use of the Site was agricultural in 1880;
- Historical mapping, aerial photographs and satellite images show property use of the Site was Agricultural or Other Use from 1880 to 1960. By 1970, the ends of the Site were developed into roads, defined as Community Use in O. Reg. 153/04. The recent Site visit confirmed that between the road ends, the Site is grass covered land with shrubs and trees (Agricultural or Other Use) ;
- Piles of debris were observed on the Site, consisting primarily of brush and concrete;
- There were no USTs or ASTs identified at the Site, currently or historically;
- There were no PCAs identified on the Site; and
- The records review, interview and Site visit indicate there are no APECs on the Site.

A Phase Two ESA is not required.

8.0 Qualifications of Assessors

The following staff conducted the work presented herein:

Laura DeCoste, B.Sc.

Laura DeCoste is an Environmental Scientist with experience in environmental investigations, sample collection and research. Ms. DeCoste has studied geology, hydrology and sedimentology, and has a sound understanding of the requirements of CSA Standard Z768-01 and O. Reg. 153/04 for conducting Phase One Environmental Site Assessments. For this project, Laura conducted research, the records review and contributed to report preparation.

David Marks, P.Geo., QP_{ESA}

David Marks is a Senior Hydrogeologist and Project Manager with R.J. Burnside & Associates Limited. He has accumulated almost 30 years of experience in the engineering consulting industry. He is a Licensed Professional Geoscientist (#0354) with the Association of Professional Geoscientists of Ontario (APGO) and is a Qualified Person (QP) as per O. Reg. 153/04. David's experience includes hydrogeological investigations, development impact analysis, site assessment, remediation, brownfield redevelopment, pollution prevention, compliance auditing, landfill assessment, groundwater supply assessment and land development permitting and approvals. For this project, David reviewed and evaluated the records and conducted the Site visit.

Kathleen E. Langstaff, B.Sc., P.Geo., QP_{ESA}

Kathleen Langstaff is a Licensed Professional Geoscientist with the APGO and has over 25 years of experience in environmental investigations. Ms. Langstaff has conducted numerous Phase One and Phase Two Environmental Site Assessments (ESA) at a variety of sites involving potentially contaminated soil and groundwater in urban and remote areas. Kathleen is a Qualified Person (QP) as per O. Reg. 153/04 and her project experience includes soil investigations, groundwater studies, drilling and test pit programs, tank removals, excavation of contaminated material and remediation. For this project, Kathleen reviewed the records, evaluated Site information, provided interview questions to the City of Mississauga, contributed to report preparation and provided quality assurance / quality control review and project oversight.

R.J. Burnside & Associates Limited

Burnside was founded in 1970 and currently comprises over 335 professional, technical, and support staff providing a wide range of environmental and engineering services to both the public and private sectors, domestically and internationally. Burnside provides a wide range of specialized ESA services.

9.0 Limitations and Use of Report

R.J. Burnside & Associates Limited confirms that it has completed a Phase One ESA at the Site, situated on Part Lot 32, Lot 33, Lot 34, Lot 35, Concession 1 South of Dundas Street, Toronto Township, Mississauga and Part Lot 1, Concession 1 South of Dundas Street, Trafalgar Township, Oakville, and has made the findings and conclusions provided herein.

The conclusions in this report are professional opinions based upon observations of the Site conditions existing at the time of our assessment. This report has been prepared in accordance with accepted environmental study and/or engineering practices for a Phase One Environmental Site Assessment in accordance with O. Reg. 153/04, as amended.

It should be noted that some of the information and resulting conclusions of a Phase One ESA are time sensitive. Burnside does not guarantee the accuracy and reliability of the information provided by other persons or agencies and does not claim responsibility for undisclosed or non-visible environmental concerns that may result in costs for environmental clean-up or remediation.

The results of an investigation of this nature should, in no way, be construed as a warranty that the Site is free from any and all contamination from past or current practices.

This report was prepared for the use of the City of Mississauga, and any financial institution, municipality or regulatory agency, to which the report is submitted by the addressee. Any use of, reliance on, or decisions based on this report by a third party are the responsibility of such third parties. Burnside accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. Reports or memoranda resulting from this assignment are not to be used, in whole or in part, outside the client's organization without prior written permission.

10.0 References

Canadian County Atlas Digital Project Map Collection. Peel County. 1880.

Ontario Geological Survey 2010. 1:50,000 scale. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 128 – Revised.

Ontario Geological Survey 2011. 1:250,000 scale. Bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release – Data 126 – Revision 1.

Ontario Regulation 153/04, Environmental Protection Act, 2004.

Ontario Regulation 511/09, Environmental Protection Act, 2009.

Ontario Regulation 269/11, Environmental Protection Act, 2011.

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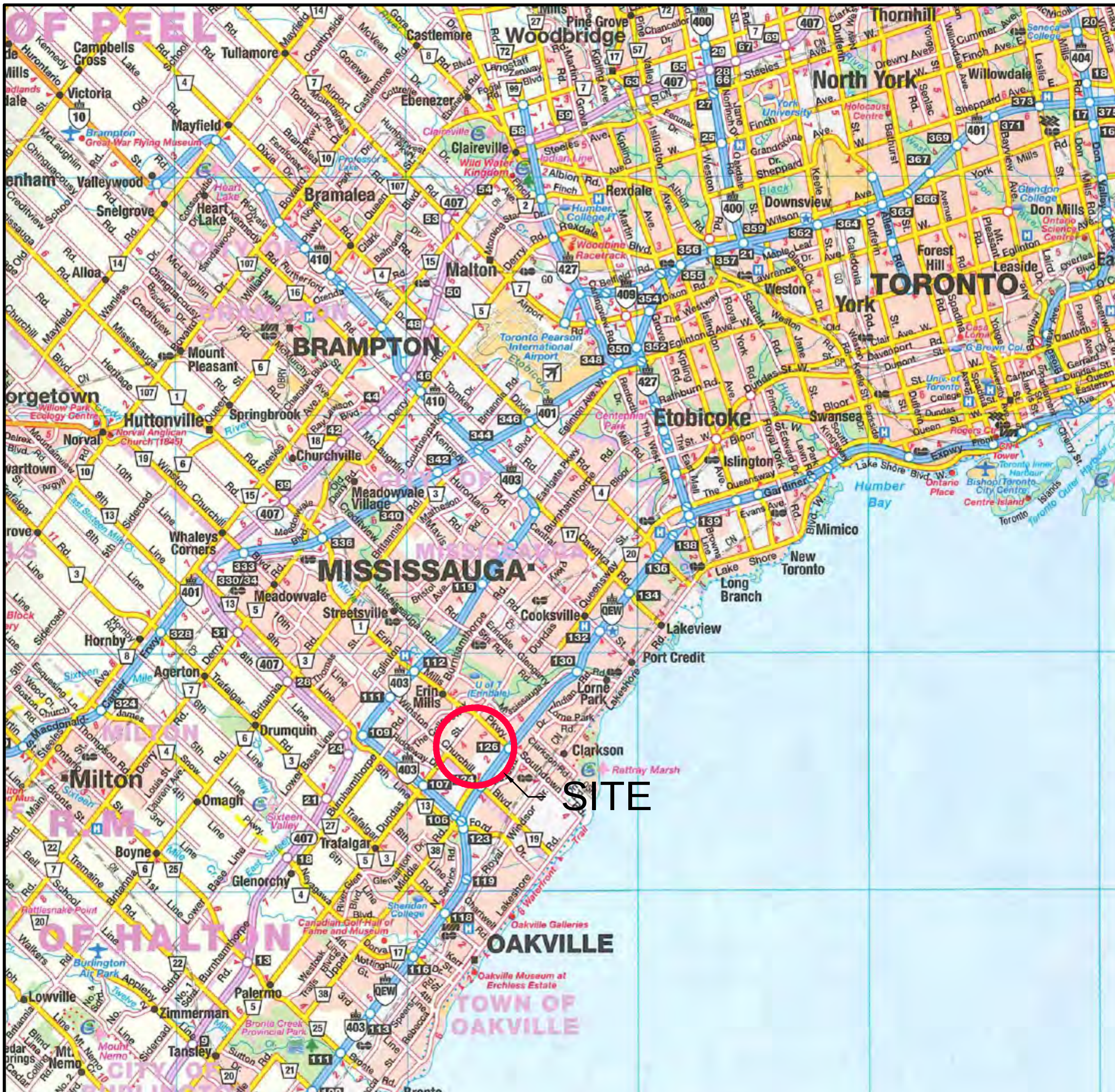
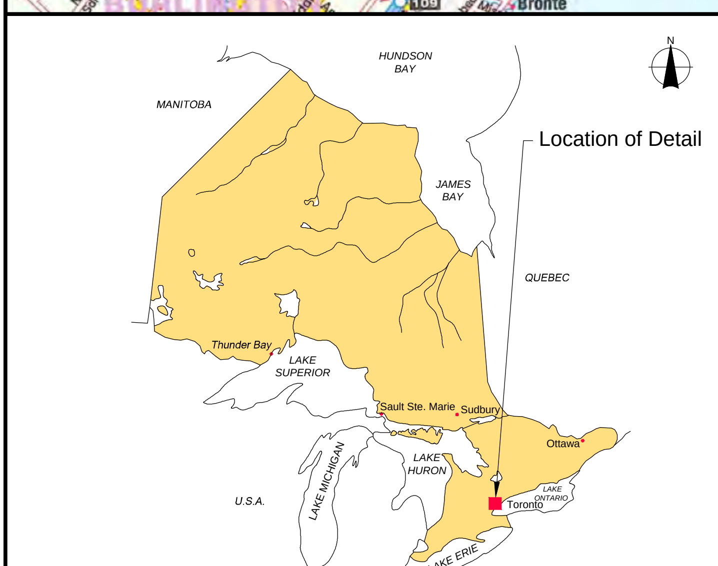
Figures





KEY MAP OF ONTARIO

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Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

SITE LOCATION PLAN

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	1
Scale		Project No.	
N.T.S.		300039474	

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LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

Air Photo Source:
Background 2016 Air Photo obtained from Google Earth Professional / DigitalGlobe © Google Earth, use of products are subject to the Terms and Conditions of Licensed Google Earth Software.

N

0 50 100 200 300 400
Metres

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Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
SITE PLAN

Drawn	Checked	Date	Figure No.
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STUDY AREA

Source:
McGill University digital library, "The Canadian County Atlas Digital Project"
1880 Map of Ontario Counties

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CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
1880 HISTORICAL COUNTY MAPPING

Drawn	Checked	Date	Figure No.
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Scale		Project No.	
N.T.S.		300039474	

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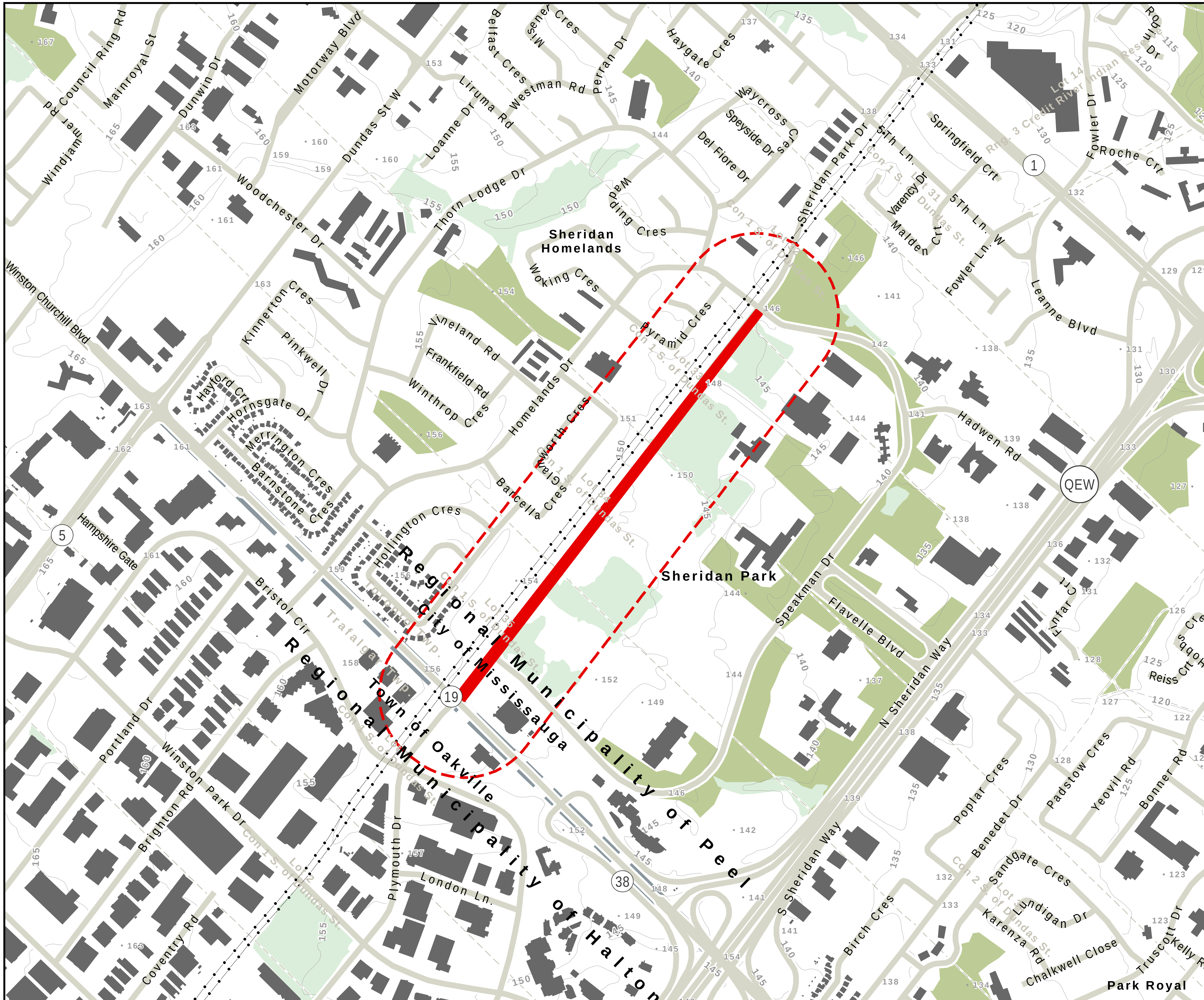

Approximate Site Boundary
Study Area
Building
Power Transmission Line
Road
Trail
Spot Elevation
Contour
County, Regional Municipality, District Boundary
Municipal Boundary
Geographic Township Boundary
Lot Boundary
Wooded Area
Built-Up Area: Pervious

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.

Datum: North American 1983 CSRS
Coord. System: NAD 1983 CSRS UTM Zone

N
Grid North

0 250 500 750
Metres

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Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

TOPOGRAPHY AND DRAINAGE

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	4
Scale		Project No.	
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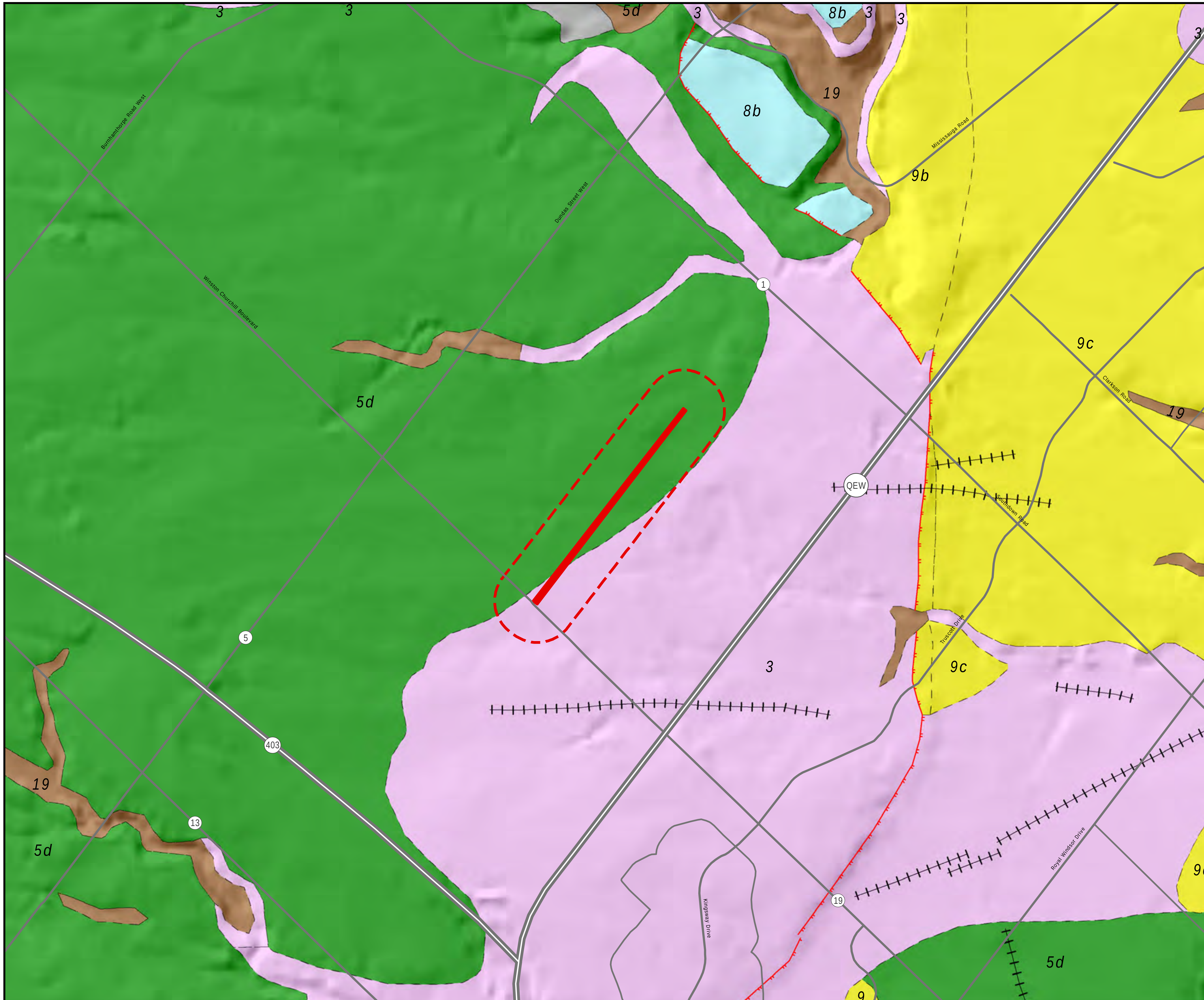


LEGEND

- Approximate Site Boundary
- Study Area
- Freeway
- Arterial / Collector Road
- Local Road

Surficial Geology

- 3: Paleozoic bedrock
- 5d: Glaciolacustrine-derived silty to clayey till
- 8b: Fine-textured glaciolacustrine deposits: Interbedded flow till, rainout deposits and silt and clay
- 9: Coarse-textured glaciolacustrine deposits
- 9b: Coarse-textured glaciolacustrine deposits: Littoral-foreshore deposits
- 9c: Coarse-textured glaciolacustrine deposits: Foreshore-basinal deposits
- 12: Older alluvial deposits
- 19: Modern alluvial deposits
- 20: Organic deposits
- Bluff
- Bedrock Pressure Release Ridge

Sources:

1. Ministry of Natural Resources, © Queen's Printer for Ontario
2. Natural Resources Canada © Her Majesty the Queen in Right of Canada.
3. Ontario Geological Survey 2003. Surficial Geology of Southern Ontario; Ontario Geological Survey.

N

Datum: North American 1983 CSRS

Coord. System: NAD 1983 CSRS UTM Zone 17N

0 250 500 750 1,000 1,250 1,500

Metres

BURNSIDE

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

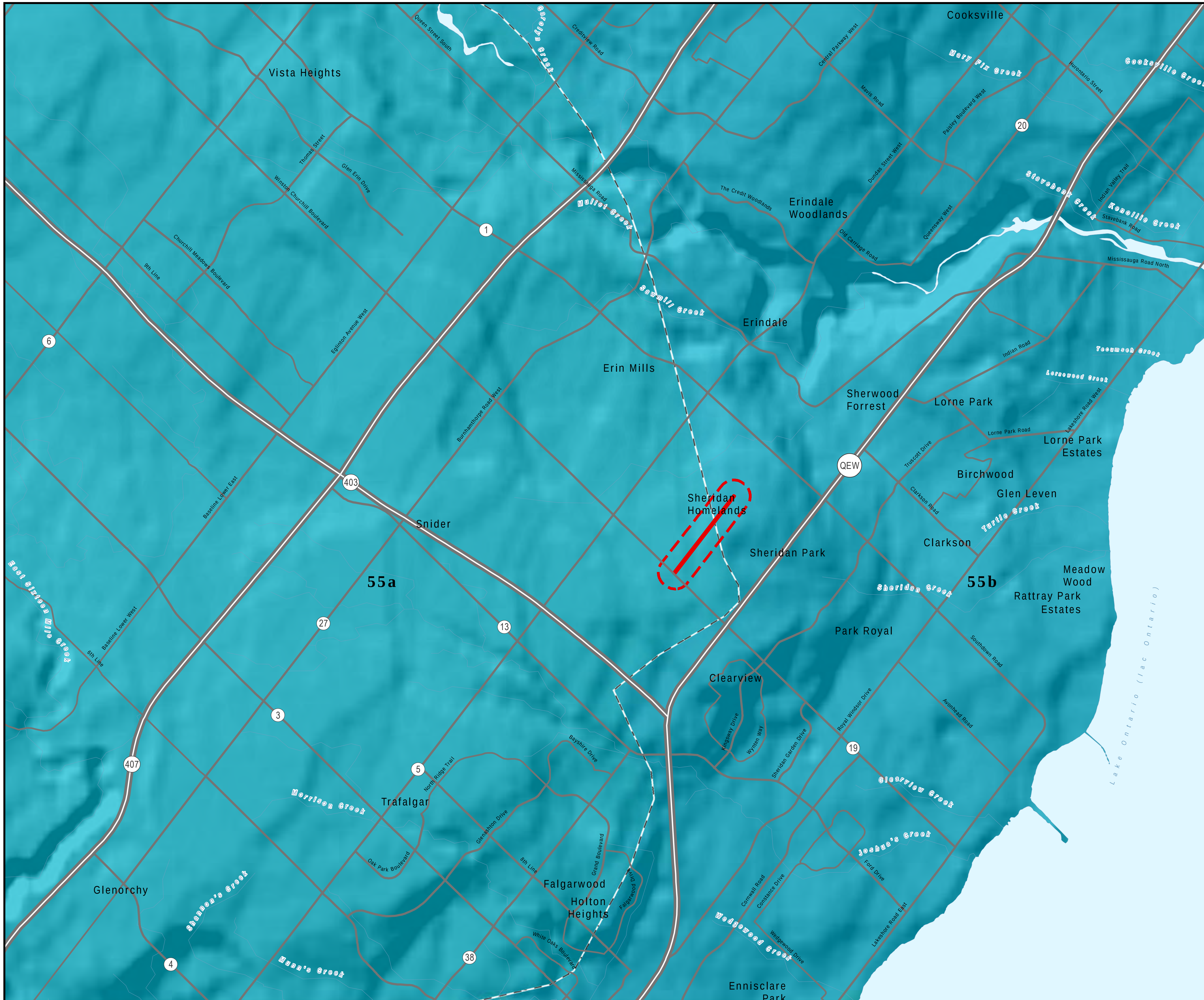
Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

SURFICIAL GEOLOGY

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	5
Scale		Project No.	
1:20,000		300039474	

File Path: \\Elmo\gis\Project\300\039474 (Sheridan Park Drive)\Phase One ESA\039474 PH1 Surficial Geology.mxd Print Date: 2017/11/29 Time: 11:31 AM



LEGEND

- Approximate Site Boundary
- Study Area
- Freeway
- Arterial / Collector Road
- Local Road
- Watercourse
- Waterbody

UPPER ORDOVICIAN - 55 Shale, limestone, dolostone, siltstone

- 55a Queenston Fm.
- 55b Georgian Bay Fm.; Blue Mountain Fm.; Billings Fm.; Collingwood Mb.; Eastview Mb. MinStr:
- Bedrock Geology Unit Boundary

Sources:

1. Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release–Data 126 - Revision 1.
2. Ministry of Natural Resources, © Queen's Printer for Ontario
3. Natural Resources Canada © Her Majesty the Queen in Right of Canada

Datum: North American 1983

Coord. System: NAD 1983 UTM Zone 17N

N

0 1 2 3 4

Kilometers

BURNSIDE

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

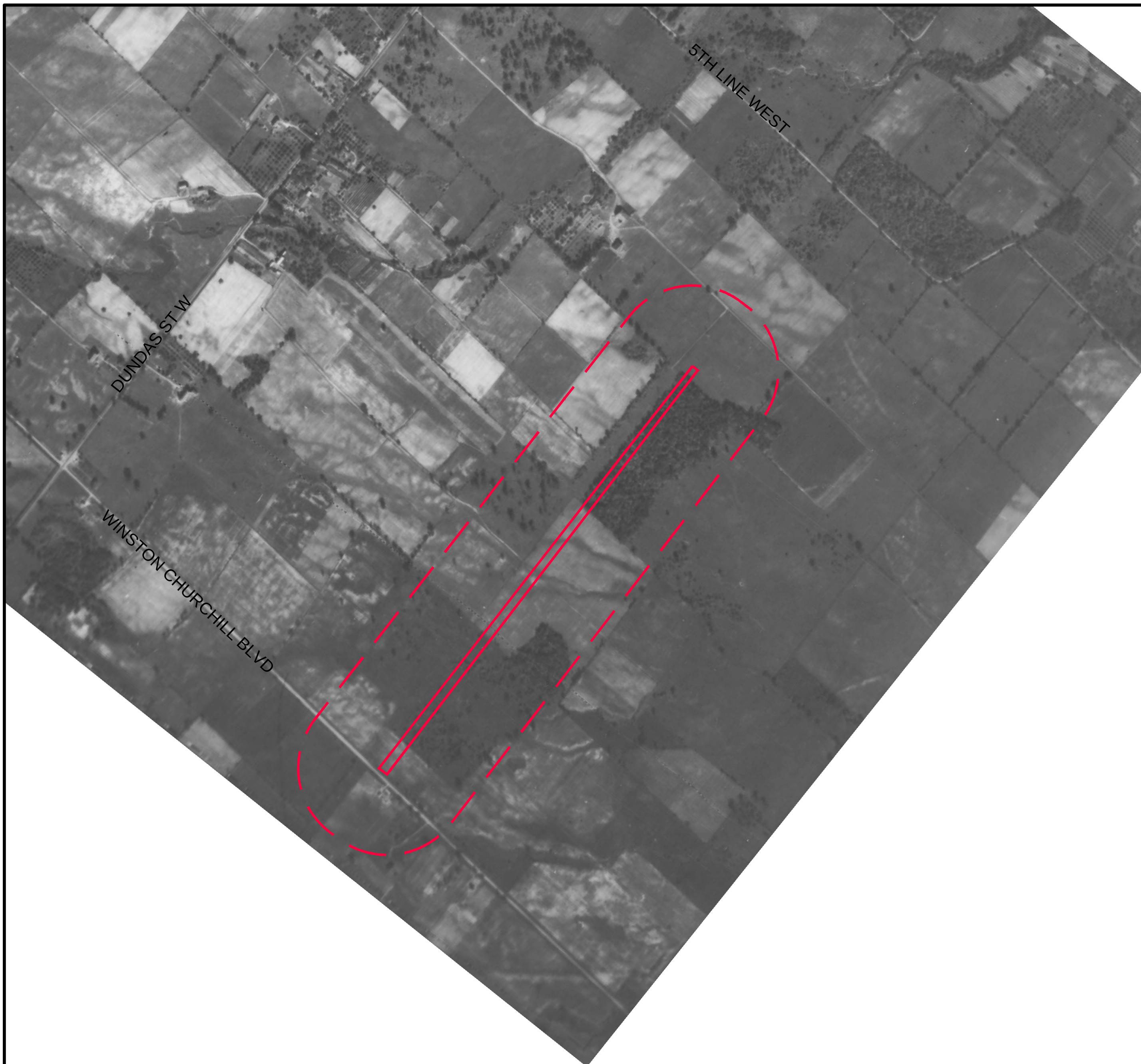
Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

BEDROCK GEOLOGY

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	6
Scale		Project No.	
1:50,000		300039474	

File Path: \\Elmo\gis\Project\300039474 (Sheridan Park Drive)\Phase One ESA\039474 PH1 Bedrock Geology.mxd Print Date: 2017/11/29 Time: 10:34 AM



Air Photo Source:
Background air photo reproduced with the permission of Natural Resources Canada, courtesy of the National Air Photo Library

N

0 300 600 900 1,200

Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

1934 AIR PHOTO

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	7
Scale		Project No.	
1:15,000		300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:34 AM

Air Photo Source:
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N

0 300 600 900 1,200

Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

1960 AIR PHOTO

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	8
Scale		Project No.	
1:15,000		300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:34 AM

Air Photo Source:
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N

0 300 600 900 1,200
Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

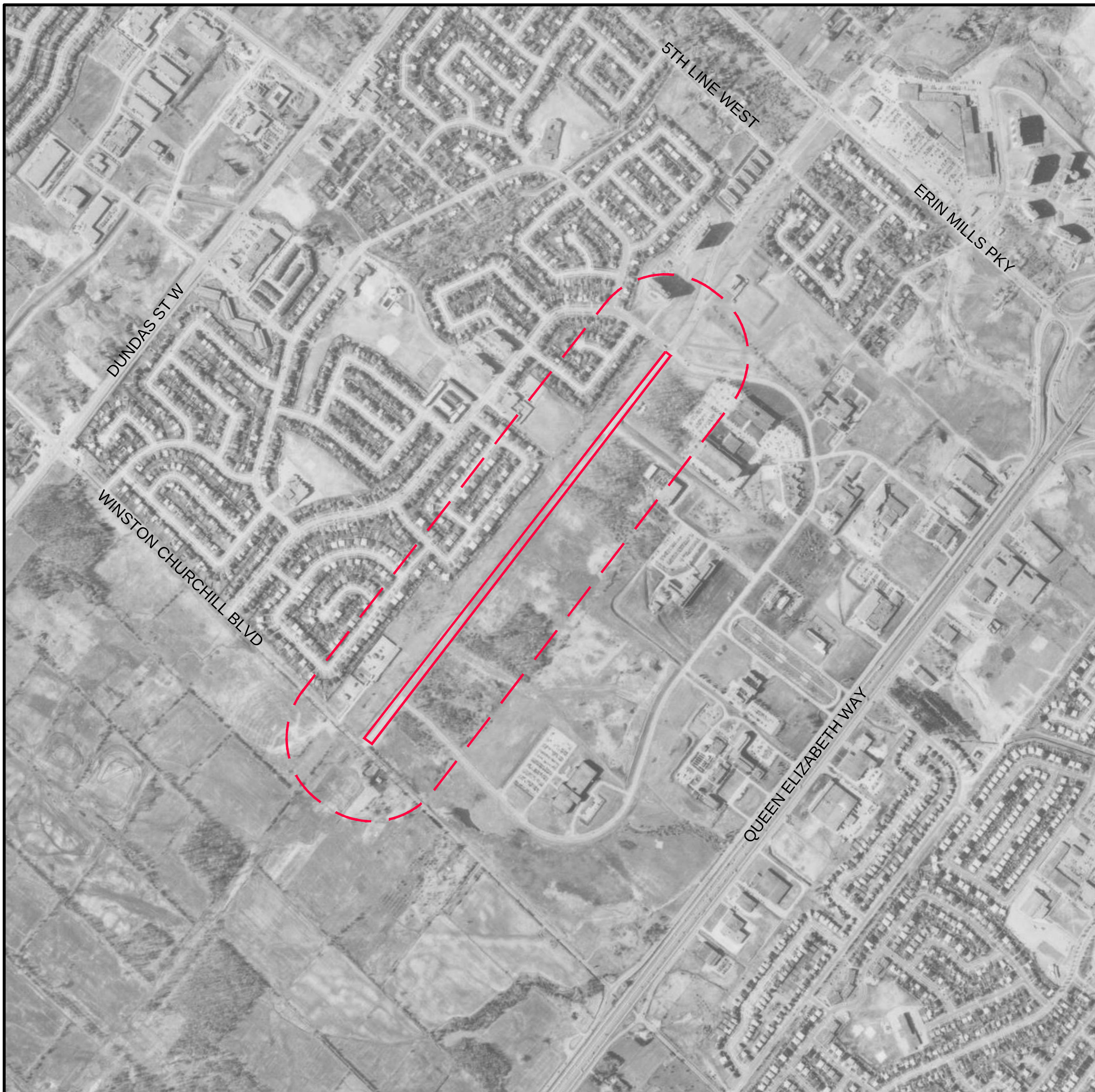
1970 AIR PHOTO

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	9
Scale		Project No.	
1:15,000		300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:35 AM



Air Photo Source:
Background air photo reproduced with the permission of Natural Resources Canada, courtesy of the National Air Photo Library

N

0 300 600 900 1,200
Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

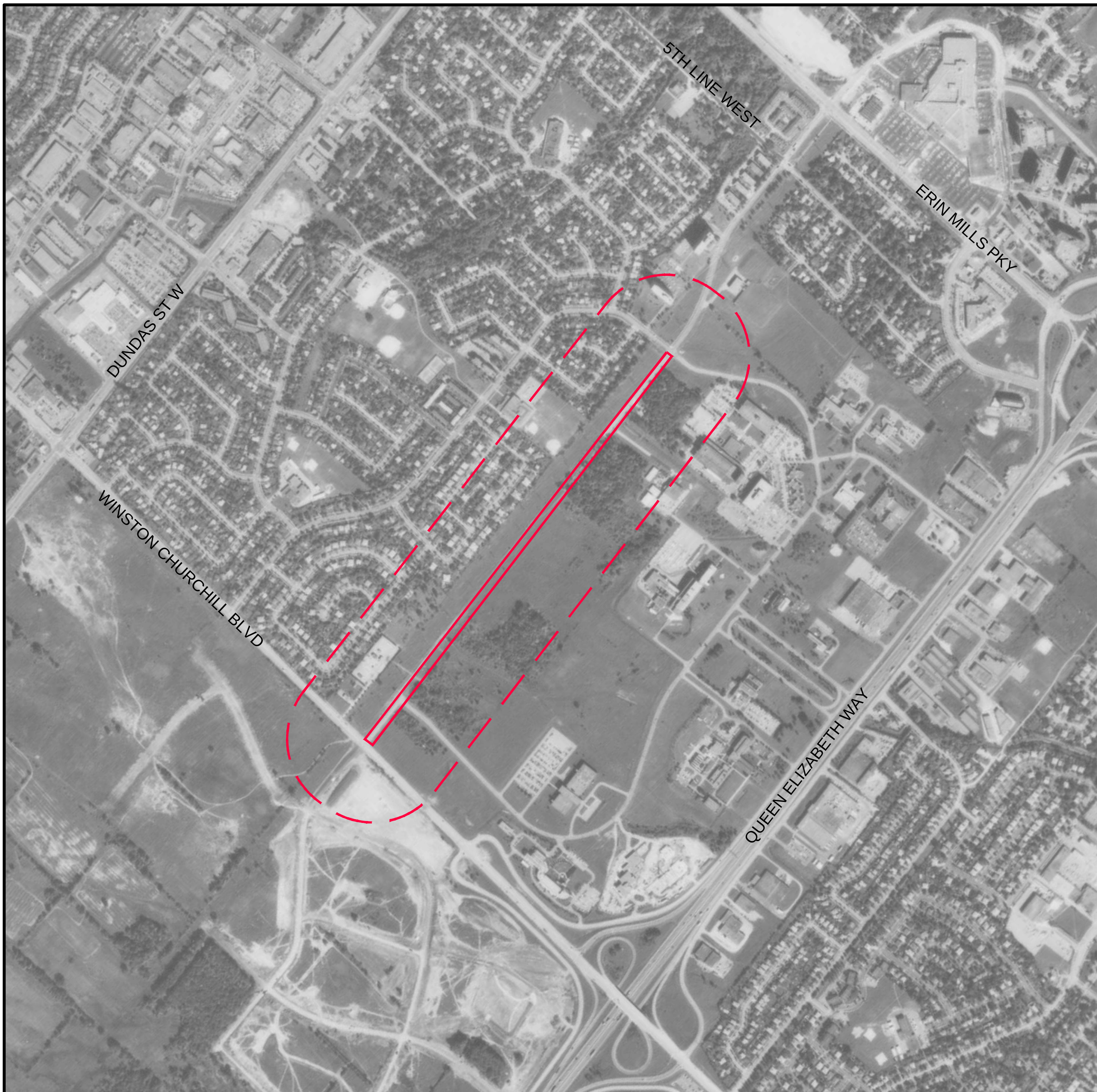
Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

1978 AIR PHOTO

Client	Drawn	Checked	Date	Figure No.
CITY OF MISSISSAUGA SHERIDAN PARK DRIVE EXTENSION	CD	DM	June 2017	**10**
	Scale: 1:15,000		Project No.: 300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:35 AM



Air Photo Source:
Background air photo reproduced with the permission of Natural Resources Canada, courtesy of the National Air Photo Library

N

0 300 600 900 1,200
Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

1988 AIR PHOTO

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	**11**
Scale		Project No.	
1:15,000		300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:35 AM

Air Photo Source:
Background Air Photo obtained from Google Earth Professional / DigitalGlobe © Google Earth, use of products are subject to the Terms and Conditions of Licensed Google Earth Software.

N

0 300 600 900 1,200
Metres

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

BURNSIDE

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

2004 AIR PHOTO

Client	Drawn	Checked	Date	Figure No.
CITY OF MISSISSAUGA SHERIDAN PARK DRIVE EXTENSION	CD	DM	June 2017	**12**
	Scale: 1:15,000		Project No.: 300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:35 AM

LEGEND

APPROXIMATE SITE BOUNDARY

STUDY AREA

INFERRED GROUNDWATER FLOW DIRECTION

Air Photo Source:
Background 2016 Air Photo obtained from Google Earth Professional / DigitalGlobe © Google Earth, use of products are subject to the Terms and Conditions of Licensed Google Earth Software.

N

0 50 100 200 300 400
Metres

BURNSIDE

Client

CITY OF MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Figure Title

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
CONCEPTUAL SITE MODEL

Drawn	Checked	Date	Figure No.
CD	DM	June 2017	13
Scale		Project No.	
1:7,500		300039474	

File: W:\WORKING DIRECTORY FILENET\039474-Sheridan Park Edits\039474 PH1 ESA Figures.dwg Date Plotted: November 29, 2017 - 11:35 AM

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

ERIS Report

ENVIRONMENTAL RISK INFORMATION SERVICES

DATABASE REPORT

Project Property:	*Sheridan Park EA Study* *Sheridan Park Drive* *Mississauga ON*
Project No:	*039474*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*20170529041*
Requested by:	*R.J. Burnside & Associates Limited*
Date Completed:	*June 2, 2017*

Environmental Risk Information Services
A division of Glacier Media Inc.
P: 1.866.517.5204
E: info@erisinfo.com

www.erisinfo.com

Table of Contents

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Executive Summary

Property Information:

Project Property:	*Sheridan Park EA Study* *Sheridan Park Drive Mississauga ON*
Project No:	*039474*

Order Information:

Order No:	*20170529041*
Date Requested:	*May 29, 2017*
Requested by:	*R.J. Burnside & Associates Limited*
Report Type:	*Quote - Custom-Build Your Own Report*

Additional Products:

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.20km	Total
AAGR	***Abandoned Aggregate Inventory***	*Y*	*0*	*0*	*0*
AGR	***Aggregate Inventory***	*N*	-	-	-
AMIS	***Abandoned Mine Information System***	*N*	-	-	-
ANDR	***Anderson's Waste Disposal Sites***	*Y*	*0*	*0*	*0*
AUWR	***Automobile Wrecking & Supplies***	*N*	-	-	-
BORE	***Borehole***	*N*	-	-	-
CA	***Certificates of Approval***	*Y*	*0*	*4*	*4*
CFOT	***Commercial Fuel Oil Tanks***	*Y*	*0*	*0*	*0*
CHEM	***Chemical Register***	*N*	-	-	-
CNG	***Compressed Natural Gas Stations***	*N*	-	-	-
COAL	***Inventory of Coal Gasification Plants and Coal Tar Sites***	*Y*	*0*	*0*	*0*
CONV	***Compliance and Convictions***	*N*	-	-	-
CPU	***Certificates of Property Use***	*N*	-	-	-
DRL	***Drill Hole Database***	*N*	-	-	-
EASR	***Environmental Activity and Sector Registry***	*N*	-	-	-
EBR	***Environmental Registry***	*N*	-	-	-
ECA	***Environmental Compliance Approval***	*Y*	*0*	*0*	*0*
EEM	***Environmental Effects Monitoring***	*N*	-	-	-
EHS	***ERIS Historical Searches***	*Y*	*0*	*6*	*6*
EIIS	***Environmental Issues Inventory System***	*N*	-	-	-
EMHE	***Emergency Management Historical Event***	*N*	-	-	-
EXP	***List of TSSA Expired Facilities***	*Y*	*0*	*0*	*0*
FCON	***Federal Convictions***	*N*	-	-	-
FCS	***Contaminated Sites on Federal Land***	*N*	-	-	-
FOFT	***Fisheries & Oceans Fuel Tanks***	*N*	-	-	-
FST	***Fuel Storage Tank***	*Y*	*0*	*0*	*0*
FSTH	***Fuel Storage Tank - Historic***	*Y*	*0*	*0*	*0*
GEN	***Ontario Regulation 347 Waste Generators Summary***	*Y*	*0*	*19*	*19*
GHG	***Greenhouse Gas Emissions from Large Facilities***	*N*	-	-	-
HINC	***TSSA Historic Incidents***	*Y*	*0*	*0*	*0*
IAFT	***Indian & Northern Affairs Fuel Tanks***	*N*	-	-	-
INC	***TSSA Incidents***	*Y*	*0*	*0*	*0*
LIMO	***Landfill Inventory Management Ontario***	*N*	-	-	-
MINE	***Canadian Mine Locations***	*N*	-	-	-
MNR	***Mineral Occurrences***	*N*	-	-	-
NATE	***National Analysis of Trends in Emergencies System (NATES)***	*N*	-	-	-

Database	Name	Searched	Project Property	Boundary to 0.20km	Total
NCPL	***Non-Compliance Reports***	*N*	-	-	-
NDFT	***National Defense & Canadian Forces Fuel Tanks***	*N*	-	-	-
NDSP	***National Defense & Canadian Forces Spills***	*N*	-	-	-
NDWD	***National Defence & Canadian Forces Waste Disposal Sites***	*N*	-	-	-
NEBI	***National Energy Board Pipeline Incidents***	*N*	-	-	-
NEBW	***National Energy Board Wells***	*N*	-	-	-
NEES	***National Environmental Emergencies System (NEES)***	*N*	-	-	-
NPCB	***National PCB Inventory***	*N*	-	-	-
NPRI	***National Pollutant Release Inventory***	*N*	-	-	-
OGW	***Oil and Gas Wells***	*N*	-	-	-
OOGW	***Ontario Oil and Gas Wells***	*N*	-	-	-
OPCB	***Inventory of PCB Storage Sites***	*Y*	*0*	*0*	*0*
ORD	***Orders***	*N*	-	-	-
PAP	***Canadian Pulp and Paper***	*N*	-	-	-
PCFT	***Parks Canada Fuel Storage Tanks***	*N*	-	-	-
PES	***Pesticide Register***	*Y*	*0*	*0*	*0*
PINC	***TSSA Pipeline Incidents***	*Y*	*0*	*1*	*1*
PRT	***Private and Retail Fuel Storage Tanks***	*Y*	*0*	*0*	*0*
PTTW	***Permit to Take Water***	*N*	-	-	-
REC	***Ontario Regulation 347 Waste Receivers Summary***	*Y*	*0*	*0*	*0*
RSC	***Record of Site Condition***	*Y*	*0*	*0*	*0*
RST	***Retail Fuel Storage Tanks***	*Y*	*0*	*0*	*0*
SCT	***Scott's Manufacturing Directory***	*N*	-	-	-
SPL	***Ontario Spills***	*Y*	*0*	*6*	*6*
SRDS	***Wastewater Discharger Registration Database***	*N*	-	-	-
TANK	***Anderson's Storage Tanks***	*N*	-	-	-
TCFT	***Transport Canada Fuel Storage Tanks***	*N*	-	-	-
VAR	***TSSA Variances for Abandonment of Underground Storage Tanks***	*Y*	*0*	*0*	*0*
WDS	***Waste Disposal Sites - MOE CA Inventory***	*N*	-	-	-
WDSH	***Waste Disposal Sites - MOE 1991 Historical Approval Inventory***	*Y*	*0*	*0*	*0*
WWIS	***Water Well Information System***	*N*	-	-	-
		Total:	*0*	*36*	*36*

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number

No records found in the selected databases for the project property.

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
1	EHS		Sheridan Park Dr/Speakman Dr Mississauga ON	SW/7.6	2.55	15
1	SPL	The Corporation of the City of Mississauga	Speakman Dr and Sheridan park drive Mississauga ON	SW/7.6	2.55	15
2	SPL		just north of Sheridan park Dr and Winston Churchill Blvd Mississauga ON	SW/9.9	2.31	15
3	GEN	Enersource Hydro Mississauga	2340 Sheridan Park Drive Mississauga ON L5K1B2	NE/22.1	-3.37	16
3	GEN	Enersource Hydro Mississauga	2340 Sheridan Park Drive Mississauga ON L5K1B2	NE/22.1	-3.37	16
4	SPL	UNION GAS LTD.	UNION GAS-OAKVILLE SHERIDAN 2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	SW/122.0	3.55	16
4	SPL	UNION GAS LTD.	2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	SW/122.0	3.55	16
5	CA	R.M. OF PEEL	L.33,C.1/CORSICA CT/PYRAMID CR MISSISSAUGA ON	NNE/123.4	-2.52	17
6	CA	STELTECH LIMITED	2800 SPEAKMAN DRIVE MISSISSAUGA CITY ON L5K 2R7	SSW/126.7	1.55	1
6	CA	2748355 Canada Inc.	2800 Speakman Drive Mississauga ON L5K 2R7	SSW/126.7	1.55	17
6	EHS		2800 Speakman Drive Mississauga ON L5K 2R7	SSW/126.7	1.55	18
6	GEN	HATCH Ltd.	2800 Speakman Dr., Mississauga ON L5K 2R7	SSW/126.7	1.55	18
6	GEN	Hatch Ltd.	2800 Speakman Drive Mississauga ON	SSW/126.7	1.55	18
7	EHS		2285 Bristol Cir Oakville ON L6H6P8	SW/141.7	3.55	19
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	19
8	GEN	MOVEH	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	19
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	19
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	20
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	20
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	21
8	GEN	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON	SW/144.3	3.55	21

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
8	GEN	MOVEH	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	SW/144.3	3.55	21
9	EHS		2233 Speakman Dr Mississauga ON L5K0A3	NE/165.0	-6.52	22
9	GEN	Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	NE/165.0	-6.52	22
9	GEN	Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON	NE/165.0	-6.52	23
9	GEN	Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	NE/165.0	-6.52	24
9	GEN	Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON	NE/165.0	-6.52	25
9	GEN	Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	NE/165.0	-6.52	27
10	CA	ONTARIO MIN. OF THE ENVIR. S. PEEL W.	HERRIDGE P.S. MISSISSAUGA ON	NE/165.7	-7.89	28
11	EHS		2250 Homelands Drive Mississauga ON	NNE/180.5	-5.44	29
12	EHS		Plymouth Dr Winston Churchill Blvd Oakville ON	SSW/185.5	0.55	29
13	GEN	Peel District School Board	2420 Homelands Drive Mississauga ON	N/189.1	0.55	29
13	GEN	Peel District School Board	2420 Homelands Drive Mississauga ON L5K1H2	N/189.1	0.55	29
13	PINC		2420 HOMELANDS DRIVE, MISSISSAUGA ON	N/189.1	0.55	30
13	SPL	The Regional Municipality of Peel	2420 Homelands Dr Mississauga ON L5K 1H2	N/189.1	0.55	30
13	SPL		2420 Homelands Drive Mississauga ON	N/189.1	0.55	30

Executive Summary: Summary By Data Source

CA - Certificates of Approval

A search of the CA database, dated 1985-Oct 30, 2011* has found that there are 4 CA site(s) within approximately 0.20 kilometers of the project property.

Site	Address	Distance (m)	Map Key
R.M. OF PEEL	L.33,C.1/CORSICA CT/PYRAMID CR MISSISSAUGA ON	123.4	5
2748355 Canada Inc.	2800 Speakman Drive Mississauga ON L5K 2R7	126.7	6
STELTECH LIMITED	2800 SPEAKMAN DRIVE MISSISSAUGA CITY ON L5K 2R7	126.7	6
ONTARIO MIN. OF THE ENVIR. S. PEEL W.	HERRIDGE P.S. MISSISSAUGA ON	165.7	10

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Aug 2016 has found that there are 6 EHS site(s) within approximately 0.20 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	Sheridan Park Dr/Speakman Dr Mississauga ON	7.6	1
	2800 Speakman Drive Mississauga ON L5K 2R7	126.7	6
	2285 Bristol Cir Oakville ON L6H6P8	141.7	7
	2233 Speakman Dr Mississauga ON L5K0A3	165.0	9
	2250 Homelands Drive Mississauga ON	180.5	11
	Plymouth Dr Winston Churchill Blvd Oakville ON	185.5	12

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Sep 2016 has found that there are 19 GEN site(s) within approximately 0.20 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Enersource Hydro Mississauga	2340 Sheridan Park Drive Mississauga ON L5K1B2	22.1	3

Site	Address	Distance (m)	Map Key
Enersource Hydro Mississauga	2340 Sheridan Park Drive Mississauga ON L5K1B2	22.1	3
HATCH Ltd.	2800 Speakman Dr., Mississauga ON L5K 2R7	126.7	6
Hatch Ltd.	2800 Speakman Drive Mississauga ON	126.7	6
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MOVEH	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON	144.3	8
MOVEH	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA	2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	144.3	8
Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON	165.0	9
Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	165.0	9
Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON	165.0	9
Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	165.0	9
Candu Energy Inc.	2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	165.0	9
Peel District School Board	2420 Homelands Drive Mississauga ON	189.1	13
Peel District School Board	2420 Homelands Drive Mississauga ON L5K1H2	189.1	13

PINC - TSSA Pipeline Incidents

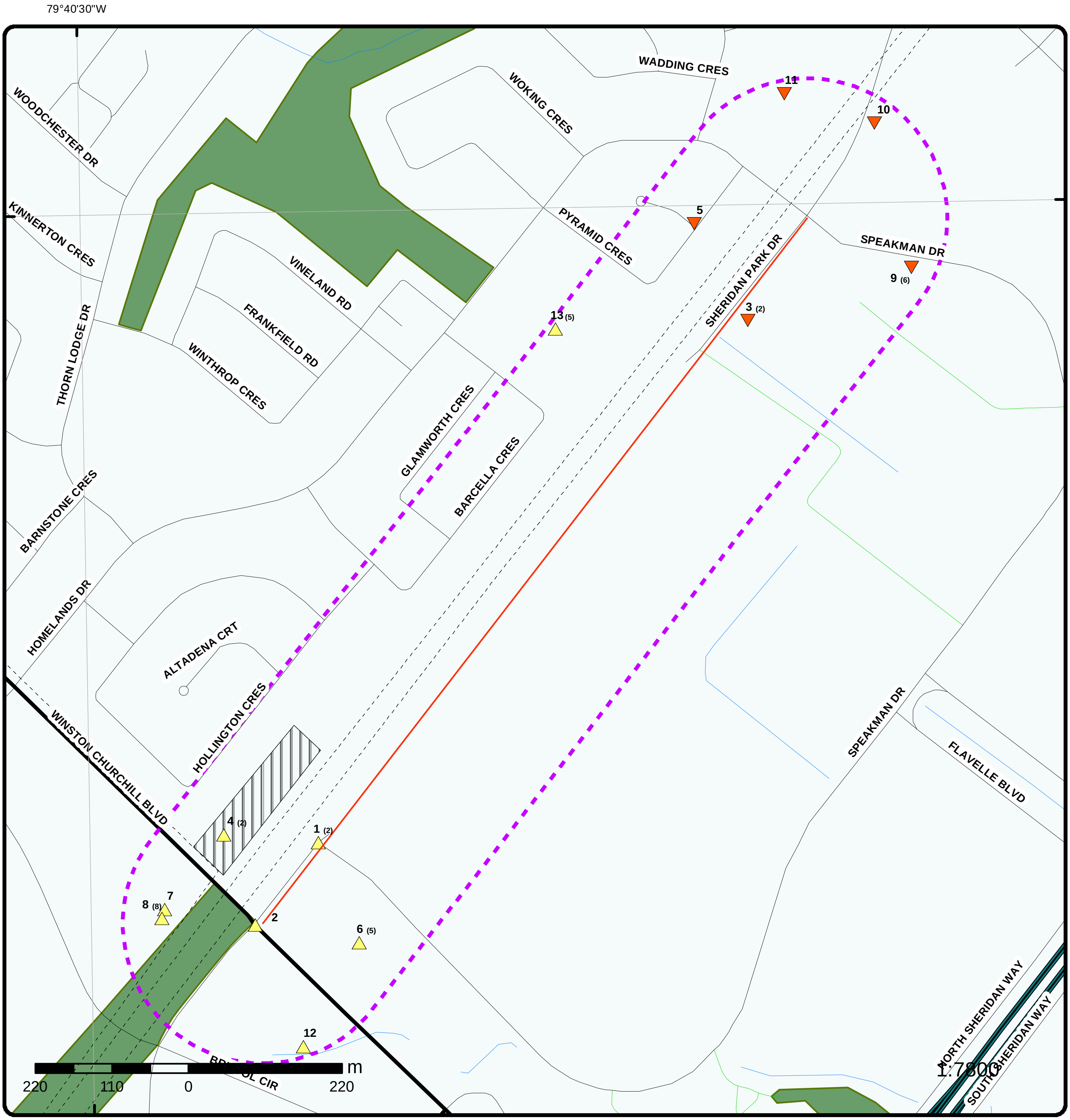
A search of the PINC database, dated Feb 28, 2017 has found that there are 1 PINC site(s) within approximately 0.20 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	2420 HOMELANDS DRIVE, MISSISSAUGA ON	189.1	13

SPL - Ontario Spills

A search of the SPL database, dated 1988-Dec 2016 has found that there are 6 SPL site(s) within approximately 0.20 kilometers of the project property.

Site	Address	Distance (m)	Map Key
The Corporation of the City of Mississauga	Speakman Dr and Sheridan park drive Mississauga ON	7.6	1
	just north of Sheridan park Dr and Winston Churchill Blvd Mississauga ON	9.9	2
UNION GAS LTD.	2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	122.0	4
UNION GAS LTD.	UNION GAS-OAKVILLE SHERIDAN 2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	122.0	4
	2420 Homelands Drive Mississauga ON	189.1	13
The Regional Municipality of Peel	2420 Homelands Dr Mississauga ON L5K 1H2	189.1	13



Map : 0.2 Kilometer Radius

Order No: 20170529041

Address: Sheridan Park Drive, Mississauga, ON

ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

Project Property	Expressway	Industrial and Resource - Regions	National Park
Buffer Outline	Principal Highway	Main Line	Provincial or Territorial Park
Eris Sites with Higher Elevation	Secondary Highway	Sidetrack	Other Park
Eris Sites with Same Elevation	Major Road	Transit Line	Golf Course or Driving Range
Eris Sites with Lower Elevation	Local road	Abandoned Line	Park or Sports Field
Eris Sites with Unknown Elevation	Trail		Other Recreation Area
	Proposed Road		
	Ferry Route/Ice Road		

Source: © 2015 DMTI Spatial Inc.

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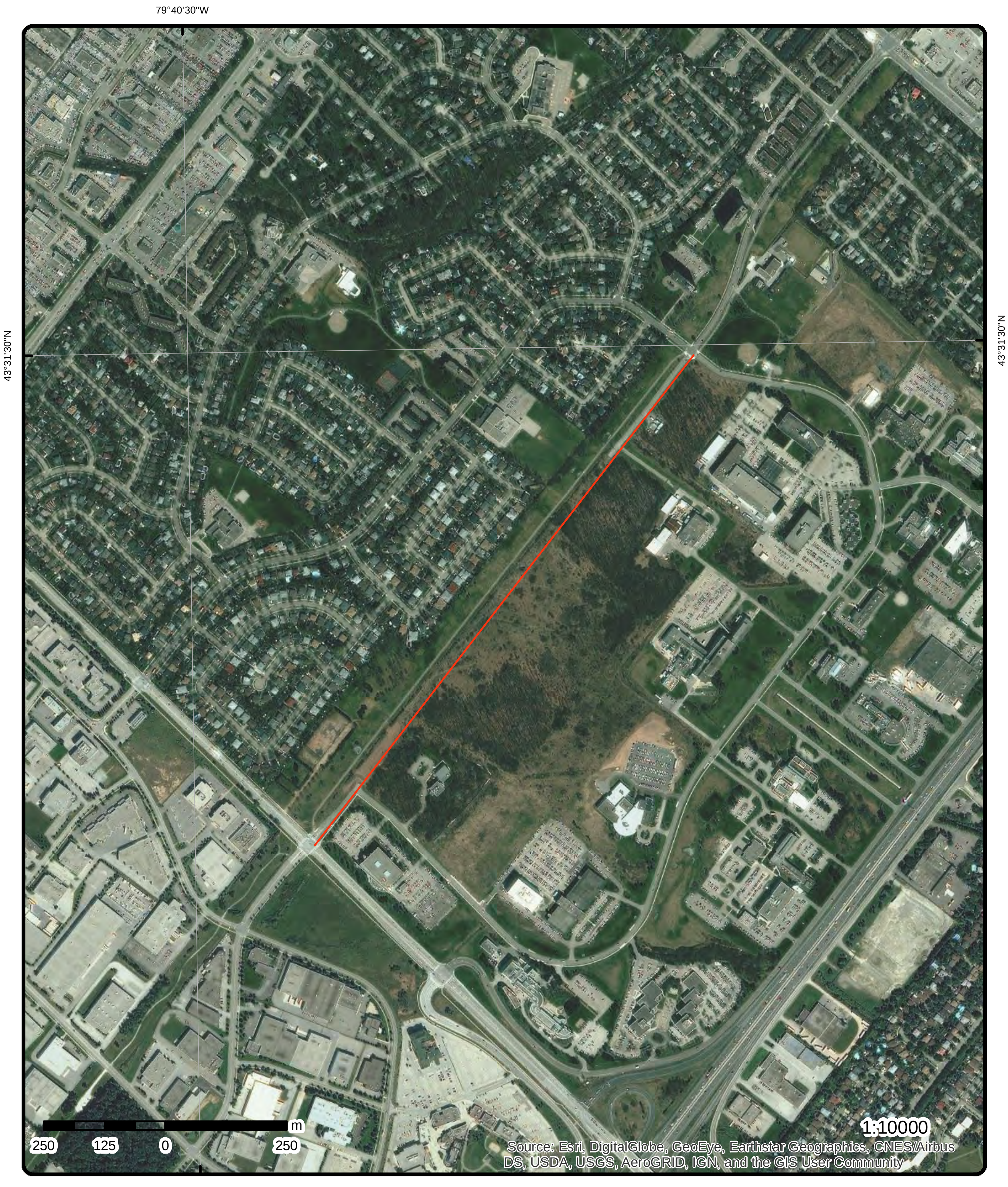


Aerial

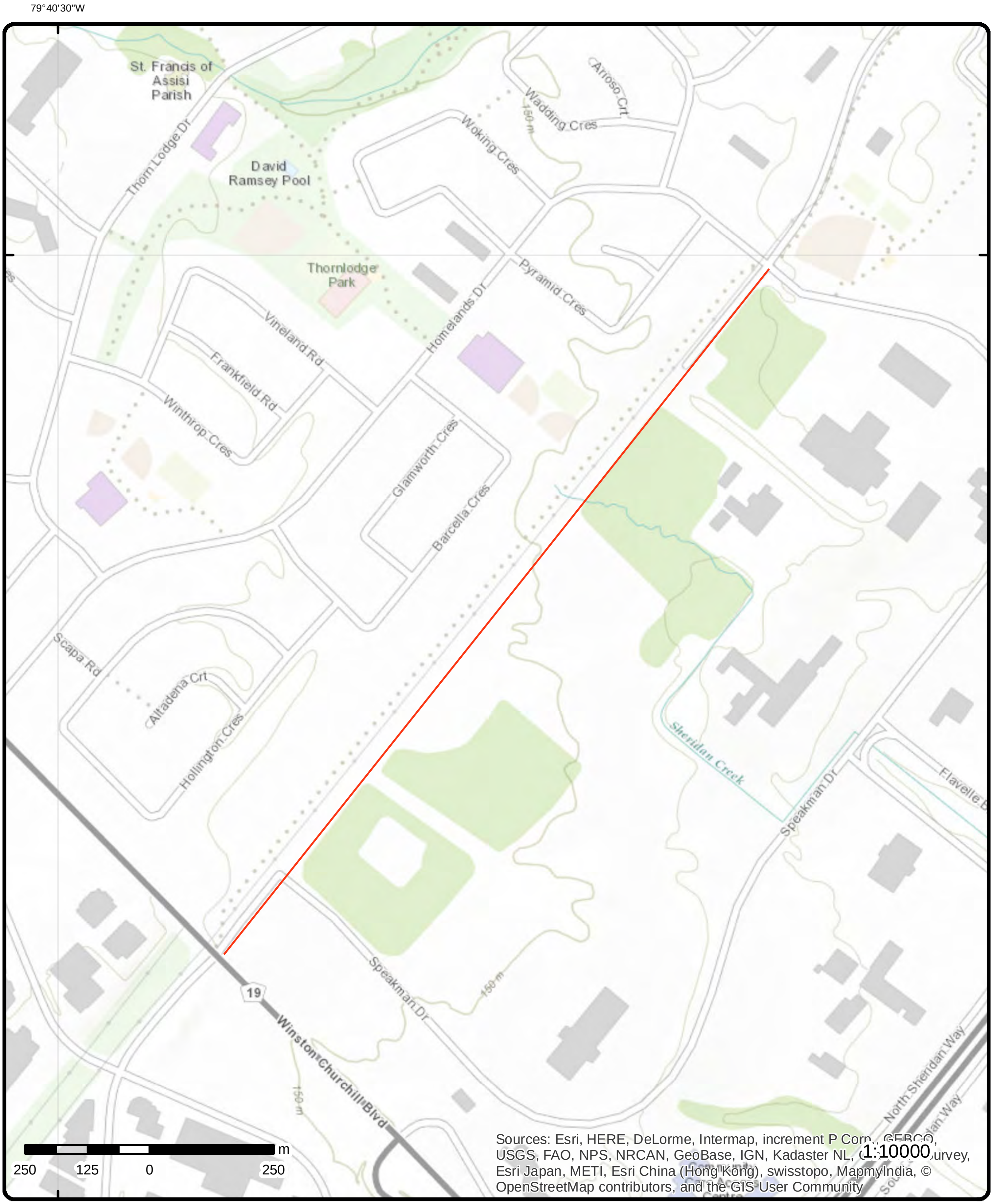
Order No: 20170529041

Address: Sheridan Park Drive, Mississauga, ON

Source: ESRI World Imagery

ERIS ENVIRONMENTAL RISK INFORMATION SERVICES

© ERIS Information Limited Partnership



Topographic Map

Order No: 20170529041

Address: Sheridan Park Drive, Mississauga, ON

Source: ESRI World Topographic Map

ERIS
ENVIRONMENTAL RISK INFORMATION SERVICES

© ERIS Information Limited Partnership

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
1	1 of 2	SW/7.6	151.8	Sheridan Park Dr/Speakman Dr Mississauga ON	EHS

Postal Code:	
City:	
Address2:	
Address1:	
Provstate:	
Order No.:	20010516006
Addit. Info Ordered::	
Report Date:	5/22/01
Report Type:	Complete Report
Search Radius (km):	0.35

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
1	2 of 2	SW/7.6	151.8	The Corporation of the City of Mississauga Speakman Dr and Sheridan park drive Mississauga ON	SPL

Ref No:	5887-82HMGE
Contaminant Code:	99
Contaminant Name:	CHLORINATED WATER
Contaminant Quantity:	0 other - see incident description
Incident Cause:	Pipe Or Hose Leak
Incident Dt:	
Incident Reason:	Error- Operator error
Incident Summary:	Mississauga - broken watermain, chl.water to sewer
MOE Reported Dt:	2/9/2010
Environmental Impact:	Confirmed
Nature of Impact:	Surface Water Pollution
Receiving Medium:	
SAC Action Class:	Land Spills
Sector Source Type:	Water Supply
Receiving Environment:	
Incident Event:	
Site Municipality:	

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
2	1 of 1	SW/9.9	151.6	just north of Sheridan park Dr and Winston Churchill Blvd Mississauga ON	SPL

Ref No:	4008-9SQRAM
Contaminant Code:	41
Contaminant Name:	SLURRY (N.O.S.)
Contaminant Quantity:	25 m^3
Incident Cause:	Dumping
Incident Dt:	1/13/2015
Incident Reason:	Unknown / N/A
Incident Summary:	Sheridan Park Dr/Winston Churchill Blvd - slurry dumping
MOE Reported Dt:	1/13/2015
Environmental Impact:	
Nature of Impact:	Land
Receiving Medium:	
SAC Action Class:	Primary Assessment of Spills

Sector Source Type:
Receiving Environment:
Incident Event:
Site Municipality: Mississauga

3	1 of 2	NE/22.1	145.9	Enersource Hydro Mississauga 2340 Sheridan Park Drive Mississauga ON L5K1B2	GEN

PO Box Num:
Status:
Country:
Generator #: ON7522160
Approval Yrs:: 2011
SIC Code: 221122
SIC Description:

3	2 of 2	NE/22.1	145.9	Enersource Hydro Mississauga 2340 Sheridan Park Drive Mississauga ON L5K1B2	GEN

PO Box Num:
Status:
Country:
Generator #: ON7522160
Approval Yrs:: 2012
SIC Code: 221122
SIC Description: Electric Power Distribution

4	1 of 2	SW/122.0	152.8	UNION GAS LTD. UNION GAS-OAKVILLE SHERIDAN 2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	SPL

Ref No: 75186
Contaminant Code:
Contaminant Name:
Contaminant Quantity:
Incident Cause: UNKNOWN
Incident Dt: 8/21/1992
Incident Reason: UNKNOWN
Incident Summary: 205L PETROLEUM OIL FOUND WHILE CLEANING UP UNDER- GROUND LINE.SOURCE UNKN'N
MOE Reported Dt: 8/24/1992
Environmental Impact: CONFIRMED
Nature of Impact: Soil contamination
Receiving Medium: LAND
SAC Action Class:
Sector Source Type:
Receiving Environment:
Incident Event:
Site Municipality: 21102

4	2 of 2	SW/122.0	152.8	UNION GAS LTD. 2345 WINSTON CHURCHILL BLVD PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON	SPL

Ref No: 75329

Contaminant Code:
Contaminant Name:
Contaminant Quantity:
Incident Cause: PIPE/HOSE LEAK
Incident Dt: 8/26/1992
Incident Reason: INTENTIONAL/PLANNED
Incident Summary: UNION GAS: 900L H20 WITH POSSIBLE TRACES NATURAL GAS TO GRND FROM PIPELINE
MOE Reported Dt: 8/27/1992
Environmental Impact: POSSIBLE
Nature of Impact: Soil contamination
Receiving Medium: LAND
SAC Action Class:
Sector Source Type:
Receiving Environment:
Incident Event:
Site Municipality: 21102

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
5	1 of 1	NNE/123.4	146.8	R.M. OF PEEL L.33,C.1/CORSICA CT/PYRAMID CR MISSISSAUGA ON	CA

Certificate #: 7-0144-98-
Application Year: 98
Issue Date: 3/20/1998
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
6	1 of 5	SSW/126.7	150.8	STELTECH LIMITED 2800 SPEAKMAN DRIVE MISSISSAUGA CITY ON L5K 2R7	CA

Certificate #: 8-3307-94-
Application Year: 94
Issue Date: 7/21/1994
Approval Type: Industrial air
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description:: INSTALL EXHAUST FAN FOR MACROETCHER
Contaminants:: Hydrogen Chloride
Emission Control:: No Controls

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
6	2 of 5	SSW/126.7	150.8	2748355 Canada Inc. 2800 Speakman Drive Mississauga ON L5K 2R7	CA

Certificate #: 1332-6KRLFU
Application Year: 2006
Issue Date: 1/19/2006

Approval Type:	Air
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

6	***3 of 5***	***SSW/126.7***	***150.8***	***2800 Speakman Drive Mississauga ON L5K 2R7***	***EHS***

Postal Code:	
City:	
Address2:	
Address1:	
Provstate:	
Order No.:	20110713009
Addit. Info Ordered::	
Report Date:	7/19/2011
Report Type:	Custom Report
Search Radius (km):	0.25

6	***4 of 5***	***SSW/126.7***	***150.8***	***HATCH Ltd. 2800 Speakman Dr., Mississauga ON L5K 2R7***	***GEN***

PO Box Num:	
Status:	
Country:	
Generator #:	ON8457999
Approval Yrs::	2010
SIC Code:	493110
SIC Description:	General Warehousing and Storage

--Details--

Waste Code:	148
Waste Description:	INORGANIC LABORATORY CHEMICALS

6	***5 of 5***	***SSW/126.7***	***150.8***	***Hatch Ltd. 2800 Speakman Drive Mississauga ON***	***GEN***

PO Box Num:	
Status:	
Country:	
Generator #:	ON8717800
Approval Yrs::	As of April 2014
SIC Code:	
SIC Description:	

--Details--

Waste Code:	252
Waste Description:	Waste crankcase oils and lubricants

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
7	1 of 1	SW/141.7	152.8	2285 Bristol Cir Oakville ON L6H6P8	EHS

Postal Code: L6H6P8
City: Oakville
Address2:
Address1: 2285 Bristol Cir
Provstate: ON
Order No.: 20160824049
Addit. Info Ordered::
Report Date: 29-AUG-16
Report Type: RSC Report (Urban)
Search Radius (km): .3

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	1 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 05,06,07,08
SIC Code: 541940
SIC Description: Veterinary Services

--Details--
Waste Code: 261
Waste Description: PHARMACEUTICALS

Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	2 of 8	SW/144.3	152.8	MOVEH 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: As of May 2015
SIC Code:
SIC Description:

--Details--
Waste Code: 212
Waste Description: Aliphatic solvents and residues

Waste Code: 261
Waste Description: Pharmaceuticals

Waste Code: 312
Waste Description: Pathological wastes

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	3 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE	GEN

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
				OAKVILLE ON L6H 6P8	

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 2009
SIC Code: 541940
SIC Description: Veterinary Services

--Details--
Waste Code: 261
Waste Description: PHARMACEUTICALS

Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	4 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 2010
SIC Code: 541940
SIC Description: Veterinary Services

--Details--
Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 261
Waste Description: PHARMACEUTICALS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	5 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 2011
SIC Code: 541940
SIC Description: Veterinary Services

--Details--
Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 261
Waste Description: PHARMACEUTICALS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	6 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 2012
SIC Code: 541940
SIC Description: Veterinary Services

--Details--
Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 261
Waste Description: PHARMACEUTICALS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	7 of 8	SW/144.3	152.8	MISSISSAUGA- OAKVILLE VETERINARY EMERGENCY HOSPITA 2285 BRISTOL CIRCLE OAKVILLE ON	GEN

PO Box Num:
Status:
Country:
Generator #: ON2237685
Approval Yrs:: 2013
SIC Code: 541940
SIC Description: VETERINARY SERVICES

--Details--
Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 261
Waste Description: PHARMACEUTICALS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
8	8 of 8	SW/144.3	152.8	MOVEH 2285 BRISTOL CIRCLE OAKVILLE ON L6H 6P8	GEN

PO Box Num:
Status: Registered
Country: Canada
Generator #: ON2237685
Approval Yrs:: As of Sep 2016
SIC Code:
SIC Description:

--Details--
Waste Code: 212 I
Waste Description: Aliphatic solvents and residues

Waste Code: 261 A
Waste Description: Pharmaceuticals

Waste Code: 312 P

Waste Description: Pathological wastes

9	1 of 6	NE/165.0	142.8	2233 Speakman Dr Mississauga ON L5K0A3	EHS

Postal Code: L5K0A3
City: Mississauga
Address2:
Address1: 2233 Speakman Dr
Provstate: ON
Order No.: 20150116062
Addit. Info Ordered:: Fire Insur. Maps and/or Site Plans; Aerial Photos
Report Date: 27-JAN-15
Report Type: Custom Report
Search Radius (km): .25

9	2 of 6	NE/165.0	142.8	Candu Energy Inc. 2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	GEN

PO Box Num:
Status:
Country:
Generator #: ON0029500
Approval Yrs:: 2011
SIC Code: 541330, 541710, 332410
SIC Description: Engineering Services, Research and Development in the Physical Engineering and Life Sciences, Power Boiler and Heat Exchanger Manufacturing

--Details--

Waste Code: 213
Waste Description: PETROLEUM DISTILLATES

Waste Code: 148
Waste Description: INORGANIC LABORATORY CHEMICALS

Waste Code: 221
Waste Description: LIGHT FUELS

Waste Code: 146
Waste Description: OTHER SPECIFIED INORGANICS

Waste Code: 121
Waste Description: ALKALINE WASTES - HEAVY METALS

Waste Code: 243
Waste Description: PCBS

Waste Code: 212
Waste Description: ALIPHATIC SOLVENTS

Waste Code: 122
Waste Description: ALKALINE WASTES - OTHER METALS

Waste Code: 145
Waste Description: PAINT/PIGMENT/COATING RESIDUES

Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 252

Waste Description:	WASTE OILS & LUBRICANTS
Waste Code:	141
Waste Description:	INORGANIC PIGMENT WASTES
Waste Code:	261
Waste Description:	PHARMACEUTICALS
Waste Code:	123
Waste Description:	ALKALINE PHOSPHATES
Waste Code:	331
Waste Description:	WASTE COMPRESSED GASES
Waste Code:	251
Waste Description:	OIL SKIMMINGS & SLUDGES
Waste Code:	253
Waste Description:	EMULSIFIED OILS
Waste Code:	112
Waste Description:	ACID WASTE - HEAVY METALS
Waste Code:	241
Waste Description:	HALOGENATED SOLVENTS
Waste Code:	263
Waste Description:	ORGANIC LABORATORY CHEMICALS
Waste Code:	233
Waste Description:	OTHER POLYMERIC WASTES

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
9	*3 of 6*	*NE/165.0*	*142.8*	*Candu Energy Inc.* *2233 SPEAKMAN DRIVE* *MISSISSAUGA ON*	GEN

PO Box Num:	
Status:	
Country:	
Generator #:	ON0029500
Approval Yrs::	As of May 2015
SIC Code:	
SIC Description:	

--Details--

Waste Code:	251
Waste Description:	Waste oils/sludges (petroleum based)
Waste Code:	141
Waste Description:	Inorganic wastes from pigment manufacturing
Waste Code:	263
Waste Description:	Misc. waste organic chemicals
Waste Code:	252
Waste Description:	Waste crankcase oils and lubricants
Waste Code:	269
Waste Description:	Organic non-halogenated pesticide and herbicide wastes
Waste Code:	112
Waste Description:	Acid solutions - containing heavy metals

Waste Code: 213
Waste Description: Petroleum distillates

Waste Code: 146
Waste Description: Other specified inorganic sludges, slurries or solids

Waste Code: 211
Waste Description: Aromatic solvents and residues

Waste Code: 212
Waste Description: Aliphatic solvents and residues

Waste Code: 243
Waste Description: PCB

Waste Code: 122
Waste Description: Alkaline slutions - containing other metals and non-metals (not cyanide)

Waste Code: 253
Waste Description: Emulsified oils

Waste Code: 331
Waste Description: Waste compressed gases including cylinders

Waste Code: 233
Waste Description: Other polymeric wastes

Waste Code: 241
Waste Description: Halogenated solvents and residues

Waste Code: 145
Waste Description: Wastes from the use of pigments, coatings and paints

Waste Code: 121
Waste Description: Alkaline slutions - containing heavy metals

Waste Code: 148
Waste Description: Misc. wastes and inorganic chemicals

Waste Code: 221
Waste Description: Light fuels

9	4 of 6	NE/165.0	142.8	Candu Energy Inc. 2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	GEN

PO Box Num:
Status:
Country:
Generator #: ON0029500
Approval Yrs:: 2012
SIC Code: 541330, 541710, 332410
SIC Description: Engineering Services, Research and Development in the Physical Engineering and Life Sciences, Power Boiler and Heat Exchanger Manufacturing

--Details--
Waste Code: 145
Waste Description: PAINT/PIGMENT/COATING RESIDUES

Waste Code: 212
Waste Description: ALIPHATIC SOLVENTS

Waste Code: 243

Waste Description: PCBS

Waste Code: 213
Waste Description: PETROLEUM DISTILLATES

Waste Code: 122
Waste Description: ALKALINE WASTES - OTHER METALS

Waste Code: 123
Waste Description: ALKALINE PHOSPHATES

Waste Code: 146
Waste Description: OTHER SPECIFIED INORGANICS

Waste Code: 251
Waste Description: OIL SKIMMINGS & SLUDGES

Waste Code: 121
Waste Description: ALKALINE WASTES - HEAVY METALS

Waste Code: 261
Waste Description: PHARMACEUTICALS

Waste Code: 148
Waste Description: INORGANIC LABORATORY CHEMICALS

Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 263
Waste Description: ORGANIC LABORATORY CHEMICALS

Waste Code: 141
Waste Description: INORGANIC PIGMENT WASTES

Waste Code: 233
Waste Description: OTHER POLYMERIC WASTES

Waste Code: 252
Waste Description: WASTE OILS & LUBRICANTS

Waste Code: 112
Waste Description: ACID WASTE - HEAVY METALS

Waste Code: 221
Waste Description: LIGHT FUELS

Waste Code: 331
Waste Description: WASTE COMPRESSED GASES

Waste Code: 241
Waste Description: HALOGENATED SOLVENTS

Waste Code: 253
Waste Description: EMULSIFIED OILS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
9	5 of 6	NE/165.0	142.8	Candu Energy Inc. 2233 SPEAKMAN DRIVE MISSISSAUGA ON	GEN

PO Box Num:
Status:
Country:
Generator #: ON0029500

Approval Yrs:: 2013
SIC Code: 541330, 541710, 332410
SIC Description: ENGINEERING SERVICES, RESEARCH AND DEVELOPMENT IN THE PHYSICAL, ENGINEERING AND LIFE SCIENCES, POWER BOILER AND HEAT EXCHANGER MANUFACTURING

--Details--

Waste Code: 148
Waste Description: INORGANIC LABORATORY CHEMICALS

Waste Code: 251
Waste Description: OIL SKIMMINGS & SLUDGES

Waste Code: 112
Waste Description: ACID WASTE - HEAVY METALS

Waste Code: 146
Waste Description: OTHER SPECIFIED INORGANICS

Waste Code: 212
Waste Description: ALIPHATIC SOLVENTS

Waste Code: 241
Waste Description: HALOGENATED SOLVENTS

Waste Code: 122
Waste Description: ALKALINE WASTES - OTHER METALS

Waste Code: 221
Waste Description: LIGHT FUELS

Waste Code: 263
Waste Description: ORGANIC LABORATORY CHEMICALS

Waste Code: 123
Waste Description: ALKALINE PHOSPHATES

Waste Code: 243
Waste Description: PCBS

Waste Code: 331
Waste Description: WASTE COMPRESSED GASES

Waste Code: 253
Waste Description: EMULSIFIED OILS

Waste Code: 141
Waste Description: INORGANIC PIGMENT WASTES

Waste Code: 213
Waste Description: PETROLEUM DISTILLATES

Waste Code: 233
Waste Description: OTHER POLYMERIC WASTES

Waste Code: 312
Waste Description: PATHOLOGICAL WASTES

Waste Code: 261
Waste Description: PHARMACEUTICALS

Waste Code: 145
Waste Description: PAINT/PIGMENT/COATING RESIDUES

Waste Code: 121
Waste Description: ALKALINE WASTES - HEAVY METALS

Waste Code: 252
Waste Description: WASTE OILS & LUBRICANTS

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
9	6 of 6	NE/165.0	142.8	Candu Energy Inc. 2233 SPEAKMAN DRIVE MISSISSAUGA ON L5K 0A3	GEN

PO Box Num:
Status: Registered
Country: Canada
Generator #: ON0029500
Approval Yrs:: As of Sep 2016
SIC Code:
SIC Description:

--Details--
Waste Code: 122 C
Waste Description: Alkaline slutions - containing other metals and non-metals (not cyanide)

Waste Code: 112 C
Waste Description: Acid solutions - containing heavy metals

Waste Code: 121 C
Waste Description: Alkaline slutions - containing heavy metals

Waste Code: 141 B
Waste Description: Inorganic wastes from pigment manufacturing

Waste Code: 145 H
Waste Description: Wastes from the use of pigments, coatings and paints

Waste Code: 146 T
Waste Description: Other specified inorganic sludges, slurries or solids

Waste Code: 211 I
Waste Description: Aromatic solvents and residues

Waste Code: 251 L
Waste Description: Waste oils/sludges (petroleum based)

Waste Code: 331 I
Waste Description: Waste compressed gases including cylinders

Waste Code: 331 B
Waste Description: Waste compressed gases including cylinders

Waste Code: 212 L
Waste Description: Aliphatic solvents and residues

Waste Code: 212 I
Waste Description: Aliphatic solvents and residues

Waste Code: 212 H
Waste Description: Aliphatic solvents and residues

Waste Code: 212 B
Waste Description: Aliphatic solvents and residues

Waste Code: 213 I
Waste Description: Petroleum distillates

Waste Code: 252 L

Waste Description:	Waste crankcase oils and lubricants
Waste Code:	262 L
Waste Description:	Detergents and soaps
Waste Code:	148 R
Waste Description:	Misc. wastes and inorganic chemicals
Waste Code:	148 L
Waste Description:	Misc. wastes and inorganic chemicals
Waste Code:	148 I
Waste Description:	Misc. wastes and inorganic chemicals
Waste Code:	148 C
Waste Description:	Misc. wastes and inorganic chemicals
Waste Code:	148 B
Waste Description:	Misc. wastes and inorganic chemicals
Waste Code:	221 I
Waste Description:	Light fuels
Waste Code:	233 B
Waste Description:	Other polymeric wastes
Waste Code:	253 L
Waste Description:	Emulsified oils
Waste Code:	241 B
Waste Description:	Halogenated solvents and residues
Waste Code:	269 T
Waste Description:	Organic non-halogenated pesticide and herbicide wastes
Waste Code:	269 L
Waste Description:	Organic non-halogenated pesticide and herbicide wastes
Waste Code:	243 D
Waste Description:	PCB
Waste Code:	263 L
Waste Description:	Misc. waste organic chemicals
Waste Code:	263 I
Waste Description:	Misc. waste organic chemicals
Waste Code:	263 B
Waste Description:	Misc. waste organic chemicals

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
10	***1 of 1***	***NE/165.7***	***141.4***	***ONTARIO MIN. OF THE ENVIR. S. PEEL W. HERRIDGE P.S. MISSISSAUGA ON***	***CA***

Certificate #:	7-0014-86-
Application Year:	86
Issue Date:	2/4/1986
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	

Project Description::
Contaminants::
Emission Control::

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
11	1 of 1	NNE/180.5	143.9	2250 Homelands Drive Mississauga ON	EHS

Postal Code:	
City:	
Address2:	
Address1:	
Provstate:	
Order No.:	20120420009
Addit. Info Ordered::	
Report Date:	4/26/2012 10:08:06 AM
Report Type:	Custom Report
Search Radius (km):	0.25

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
12	1 of 1	SSW/185.5	149.8	Plymouth Dr Winston Churchill Blvd Oakville ON	EHS

Postal Code:	
City:	
Address2:	
Address1:	
Provstate:	
Order No.:	20131108011
Addit. Info Ordered::	
Report Date:	18-NOV-13
Report Type:	Standard Report
Search Radius (km):	.25

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
13	1 of 5	N/189.1	149.8	Peel District School Board 2420 Homelands Drive Mississauga ON	GEN

PO Box Num:	
Status:	
Country:	
Generator #:	ON9208692
Approval Yrs::	As of May 2015
SIC Code:	
SIC Description:	

--Details--

Waste Code:	221
Waste Description:	Light fuels

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
13	2 of 5	N/189.1	149.8	Peel District School Board 2420 Homelands Drive Mississauga ON L5K1H2	GEN

PO Box Num:	
Status:	Registered
Country:	Canada
Generator #:	ON9208692
Approval Yrs::	As of Sep 2016
SIC Code:	

SIC Description:

--Details--
Waste Code: 221 L
Waste Description: Light fuels

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
13	3 of 5	N/189.1	149.8	2420 HOMELANDS DRIVE, MISSISSAUGA ON	PINC

Incident ID:
Incident No: 1551330
Type: FS-Pipeline Incident
Status Code: Pipeline Damage Reason Est
Fuel Occurrence Tp:
Fuel Type:
Tank Status: RC Established
Task No: 5314086
Spills Action Centre:
Method Details: E-mail
Fuel Category: Natural Gas
Date of Occurrence:
Occurrence Start Date: 2015/03/17
Operation Type:
Pipeline Type:
Regulator Type:
Summary: 2420 HOMELANDS DRIVE, MISSISSAUGA - PIPELINE HIT - 1 ¼"
Reported By: Blake Frost - ENBRIDGE
Affiliation:
Occurrence Desc:
Damage Reason: Excavation practices not sufficient
Notes:

Health Impact:
Environment Impact:
Property Damage: Yes
Service Interupt:
Enforce Policy: Yes
Public Relation:
Pipeline System:
Depth:
Pipe Material:
PSIG:
Attribute Category: FS-Perform P-line Inc Invest
Regualtor Location:

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
13	4 of 5	N/189.1	149.8	The Regional Municipality of Peel 2420 Homelands Dr Mississauga ON L5K 1H2	SPL

Ref No: 3151-9PC5T3
Contaminant Code: 43
Contaminant Name: SEDIMENT(SUSPENDED SOLIDS/ SAND/ SILT)
Contaminant Quantity: 0 other - see incident description
Incident Cause: Leak/Break
Incident Dt: 2014/09/26
Incident Reason: Unknown / N/A
Incident Summary: Homelands School - potable water, sediment to Sheridan Creek
MOE Reported Dt: 2014/09/26
Environmental Impact: Confirmed
Nature of Impact: Surface Water Pollution
Receiving Medium:
SAC Action Class: Watercourse Spills
Sector Source Type: Water Supply
Receiving Environment:
Incident Event:
Site Municipality: Mississauga

Map Key	Number of Records	Direction/ Distance (m)	Elevation (m)	Site	DB
13	5 of 5	N/189.1	149.8	2420 Homelands Drive Mississauga ON	SPL

Ref No: 0654-9SJLHX
Contaminant Code: 35

Contaminant Name:	NATURAL GAS (METHANE)
Contaminant Quantity:	0 other - see incident description
Incident Cause:	Leak/Break
Incident Dt:	1/7/2015
Incident Reason:	Operator/Human Error
Incident Summary:	TSSA: 1.25" plastic service damage; safe
MOE Reported Dt:	1/7/2015
Environmental Impact:	
Nature of Impact:	Air
Receiving Medium:	
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Sector Source Type:	
Receiving Environment:	
Incident Event:	
Site Municipality:	Mississauga

Unplottable Summary

Total: <u>40</u> Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	THE ERIN MILLS DEVELOPMENT CORPORATION	WINSTON CHURCHILL BLVD. T86106	MISSISSAUGA CITY ON	
CA	DANIELS ANNEX CORPORATION	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	THE SPORTS AUTHORITY CANADA INC.	WINSTON CHURCHILL BLVD.	OAKVILLE TOWN ON	
CA	JAMES LUCAS PROPERTIES LTD.	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	ERIN MILLS DEVELOPMENT CORP.	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	ERIN MILLS DEVELOPMENT CORP.	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	MISSISSAUGA CITY CREDIT VALLEY RD.	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	ERIN MILLS DEV. CORP.	WINSTON CHURCHILL BLVD.	MISSISSAUGA ON	
CA	R.M. OF HALTON	WINSTON CHURCHILL BLVD.	OAKVILLE TOWN ON	
CA	ERIN MILLS DEVELOPMENT CORP.NGHB.205&206	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	JAMES LUCAS PROPETIES LTD.	WINSTON CHURCHILL BLVD	MISSISSAUGA CITY ON	
CA	R.M. OF HALTON	WINSTON CHURCHILL BLVD.	OAKVILLE TOWN ON	
CA	THE ERIN MILLS DEVELOPMENT CORP.	STREET B/W.CHURCHILL BLVD/ST.A	MISSISSAUGA ON	
CA	R.M. OF PEEL	WINSTON CHURCHILL BLVD.	MISSISSAUGA CITY ON	
CA	FRIEDMAN GROUP	SPEAKMAN DR.	MISSISSAUGA CITY ON	
CA	SOUTH WINSTON PROPERTIES INC.	PLYMOUTH DRIVE	OAKVILLE TOWN ON	

CA	PINETREE DEVELOPMENT CO. LTD.	PLYMOUTH DR., SUB. PHASE 1	OAKVILLE TOWN ON
CA	PINETREE DEVELOPMENT CO. LTD.	PLYMOUTH DR., SUB. PHASE 1	OAKVILLE TOWN ON
CA	PINETREE DEVELOPMENT CO. LTD.	BRISTOL CIRCLE PURPLE KNIGHTS	OAKVILLE TOWN ON
CA	PINETREE DEVELOPMENT CO. LTD.	BRISTOL CIRCLE PURPLE KNIGHTS	OAKVILLE TOWN ON
CA	690737 ONTARIO LIMITED	BRISTOL CIRCLE IND. SUBD.	OAKVILLE TOWN ON
CA	690737 ONTARIO LIMITED	BRISTOL CIRCLE	OAKVILLE TOWN ON
CA	690737 ONTARIO LIMITED	BRISTOL CIRCLE	OAKVILLE TOWN ON
CA	PINETREE DEVELOPMENT CO. LTD.	BRISTOL CIRCLE	OAKVILLE TOWN ON
CA	DROF BUILDINGS LTD.	WINSTON CHURCHILL BLVD. SUBD.	MISSISSAUGA CITY ON
CA	Schawk Inc.	Part of Lot 1 Conc	Mississauga ON
CA	R.M. OF PEEL	WINSTON CHURCHILL BLVD.	OAKVILLE TOWN ON
CA	The Corporation of the City of Mississauga	Lot 1 and Conc. 1	Mississauga ON
ECA	The Corporation of the City of Mississauga	Winston Churchill Boulevard	Mississauga ON
ECA	Metrolinx	Part of Lot 1	City of Mississauga ON
EHS		Winston Churchill Blvd	Mississauga ON
GEN	Enbridge Gas Distribution Inc.	Part of Lot 35, Conc. 1, South of Dundas St. E side of Winston Churchill, N of Sheridan Park Dr	Mississauga ON
SPL		Winston Churchill Blvd	Mississauga ON
SPL	UNION GAS LTD.	WINSTON CHURCHILL BL. PIPELINE/COMPRESSOR STATION	MISSISSAUGA CITY ON
SPL	CONSUMERS GAS	LISGARD STN. WINSTON CHURCHILL BLVD REGULATOR/COMPRESSOR STATION	MISSISSAUGA CITY ON
SPL	Enersource Hydro Mississauga Inc.		Mississauga ON
SPL	Chrysler Transport<UNOFFICIAL>	just East of Winston Churchill Blvd	Mississauga ON
SPL		near Winston Churchill Blvd HWY 403 EB <UNOFFICIAL>	Mississauga ON

SPL	Enersource Hydro Mississauga Inc.		Mississauga ON
SPL	Samuel, Son, & Co., Inc.<UNOFFICIAL>	Toronto Bound Lanes of QEW - just East of Winston Churchill Dr.	Oakville ON

Unplottable Report

Site: ***THE ERIN MILLS DEVELOPMENT CORPORATION***
WINSTON CHURCHILL BLVD. T86106 MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-0468-89-
Application Year:	89
Issue Date:	3/29/1989
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***DANIELS ANNEX CORPORATION***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-0606-88-
Application Year:	88
Issue Date:	5/5/1988
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***THE SPORTS AUTHORITY CANADA INC.***
WINSTON CHURCHILL BLVD. OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	8-3409-96-
Application Year:	96
Issue Date:	9/5/1996
Approval Type:	Industrial air
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	EMERGENCY GEN-SET FOR RETAIL PLAZA
Contaminants::	Nitrogen Oxides
Emission Control::	No Controls

Site: ***JAMES LUCAS PROPERTIES LTD.***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-0592-86-

Application Year:	86
Issue Date:	6/13/1986
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***ERIN MILLS DEVELOPMENT CORP.***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-0826-89-
Application Year:	89
Issue Date:	6/7/1989
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***ERIN MILLS DEVELOPMENT CORP.***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-1837-88-
Application Year:	88
Issue Date:	10/30/1988
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***MISSISSAUGA CITY CREDIT VALLEY RD.***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-0120-87-
Application Year:	87
Issue Date:	2/20/1987
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***ERIN MILLS DEV. CORP.***
WINSTON CHURCHILL BLVD. MISSISSAUGA ON

Database: **CA**

Certificate #: 7-0649-85-006
Application Year: 85
Issue Date: 8/6/85
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***R.M. OF HALTON***
WINSTON CHURCHILL BLVD. OAKVILLE TOWN ON

Database: **CA**

Certificate #: 7-0648-94-
Application Year: 94
Issue Date: 7/19/1994
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***ERIN MILLS DEVELOPMENT CORP.NGHB.205&206***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: **CA**

Certificate #: 3-1138-89-
Application Year: 89
Issue Date: 6/28/1989
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***JAMES LUCAS PROPETIES LTD.***
WINSTON CHURCHILL BLVD MISSISSAUGA CITY ON

Database: **CA**

Certificate #: 3-0752-86-
Application Year: 86
Issue Date: 6/13/1986
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name::
Client Address::

Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***R.M. OF HALTON***
WINSTON CHURCHILL BLVD. OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	3-0869-94-
Application Year:	94
Issue Date:	7/19/1994
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***THE ERIN MILLS DEVELOPMENT CORP.***
STREET B/W.CHURCHILL BLVD/ST.A MISSISSAUGA ON

Database: ***CA***

Certificate #:	3-1779-98-
Application Year:	98
Issue Date:	12/9/1998
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***R.M. OF PEEL***
WINSTON CHURCHILL BLVD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-0720-97-
Application Year:	97
Issue Date:	7/29/1997
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***FRIEDMAN GROUP***
SPEAKMAN DR. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	7-1493-86-
Application Year:	86

Issue Date:	12/29/1986
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***SOUTH WINSTON PROPERTIES INC.***
PLYMOUTH DRIVE OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	3-0354-88-
Application Year:	88
Issue Date:	3/30/1988
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***PINETREE DEVELOPMENT CO. LTD.***
PLYMOUTH DR., SUB. PHASE 1 OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	7-1451-88-
Application Year:	88
Issue Date:	9/15/1988
Approval Type:	Municipal water
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***PINETREE DEVELOPMENT CO. LTD.***
PLYMOUTH DR., SUB. PHASE 1 OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	3-1693-88-
Application Year:	88
Issue Date:	9/15/1988
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***PINETREE DEVELOPMENT CO. LTD.***
BRISTOL CIRCLE PURPLE KNIGHTS OAKVILLE TOWN ON

Database: ***CA***

Certificate #: 3-1790-88-
Application Year: 88
Issue Date: 10/3/1988
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***PINETREE DEVELOPMENT CO. LTD.***
BRISTOL CIRCLE PURPLE KNIGHTS OAKVILLE TOWN ON

Database: ***CA***

Certificate #: 7-1536-88-
Application Year: 88
Issue Date: 10/3/1988
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***690737 ONTARIO LIMITED***
BRISTOL CIRCLE IND. SUBD. OAKVILLE TOWN ON

Database: ***CA***

Certificate #: 3-1586-88-
Application Year: 88
Issue Date: 9/2/1988
Approval Type: Municipal sewage
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***690737 ONTARIO LIMITED***
BRISTOL CIRCLE OAKVILLE TOWN ON

Database: ***CA***

Certificate #: 7-1189-88-
Application Year: 88
Issue Date: 8/5/1988
Approval Type: Municipal water
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::

Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***690737 ONTARIO LIMITED***
BRISTOL CIRCLE OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	3-1388-88-
Application Year:	88
Issue Date:	8/5/1988
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***PINETREE DEVELOPMENT CO. LTD.***
BRISTOL CIRCLE OAKVILLE TOWN ON

Database: ***CA***

Certificate #:	3-1832-88-
Application Year:	88
Issue Date:	10/3/1988
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***DROF BUILDINGS LTD.***
WINSTON CHURCHILL BLVD. SUBD. MISSISSAUGA CITY ON

Database: ***CA***

Certificate #:	3-1336-89-
Application Year:	89
Issue Date:	7/14/1989
Approval Type:	Municipal sewage
Status:	Approved
Application Type:	
Client Name::	
Client Address::	
Client City::	
Client Postal Code::	
Project Description::	
Contaminants::	
Emission Control::	

Site: ***Schawk Inc.***
Part of Lot 1 Conc Mississauga ON

Database: ***CA***

Certificate #:	9237-7MCVSC
Application Year:	2009
Issue Date:	1/6/2009

Approval Type: Air
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***R.M. OF PEEL***
WINSTON CHURCHILL BLVD. OAKVILLE TOWN ON

Database: ***CA***

Certificate #: 3-1398-86-
Application Year: 86
Issue Date: 8/7/1987
Approval Type: Municipal sewage
Status: Approved in 1987
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***The Corporation of the City of Mississauga***
Lot 1 and Conc. 1 Mississauga ON

Database: ***CA***

Certificate #: 2093-8EXP5F
Application Year: 2011
Issue Date: 6/21/2011
Approval Type: Municipal and Private Sewage Works
Status: Approved
Application Type:
Client Name::
Client Address::
Client City::
Client Postal Code::
Project Description::
Contaminants::
Emission Control::

Site: ***The Corporation of the City of Mississauga***
Winston Churchill Boulevard Mississauga ON

Database: ***ECA***

Approval No: 5659-96EQU8
Project Type: Municipal and Private Sewage
Date: 10-APR-13
Status: Approved
Longitude:
Latitude:
Record Type:
PDF URL:
Full Address:

Site: ***Metrolinx***
Part of Lot 1 City of Mississauga ON

Database: ***ECA***

Approval No: 0445-9YVPCU

Project Type:	Municipal and Private Sewage Works
Date:	7/30/15
Status:	Approved
Longitude:	
Latitude:	
Record Type:	ECA
PDF URL:	https://www.accessenvironment.ene.gov.on.ca/instruments/4036-9YVJFG-14.pdf
Full Address:	Eglinton Avenue West Part of Lot 1, Concession 6 E..S. City of Mississauga, Regional Municipality of Peel

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Site: **Database: EHS**

Winston Churchill Blvd Mississauga ON

Postal Code:	
City:	
Address2:	
Address1:	
Provstate:	
Order No.:	20130306016
Addit. Info Ordered::	
Report Date:	15-MAR-13
Report Type:	Custom Report
Search Radius (km):	.25

Site: ***Enbridge Gas Distribution Inc.*** **Database: GEN**

Part of Lot 35, Conc. 1, South of Dundas St. E side of Winston Churchill, N of Sheridan Park Dr Mississauga ON

PO Box Num:	
Status:	
Country:	
Generator #:	ON6134180
Approval Yrs::	2013
SIC Code:	221210
SIC Description:	NATURAL GAS DISTRIBUTION

--Details--

Waste Code:	243
Waste Description:	PCBS
Waste Code:	251
Waste Description:	OIL SKIMMINGS & SLUDGES

Site: **Database: SPL**

Winston Churchill Blvd Mississauga ON

Ref No:	8340-6Y3N2K
Contaminant Code:	13
Contaminant Name:	DIESEL FUEL
Contaminant Quantity:	30 L
Incident Cause:	Other Transport Accident
Incident Dt:	
Incident Reason:	Error- Operator error
Incident Summary:	TT: roll-over on QEW- 20 to 30L diesel to grnd & snow
MOE Reported Dt:	2/3/2007
Environmental Impact:	Confirmed
Nature of Impact:	Soil Contamination
Receiving Medium:	Land
SAC Action Class:	
Sector Source Type:	Transport Truck
Receiving Environment:	
Incident Event:	
Site Municipality:	Mississauga

Site: ***UNION GAS LTD.***
WINSTON CHURCHILL BL. PIPELINE/COMPRESSOR STATION MISSISSAUGA CITY ON

Database: ***SPL***

Ref No:	40087
Contaminant Code:	
Contaminant Name:	
Contaminant Quantity:	
Incident Cause:	PIPE/HOSE LEAK
Incident Dt:	8/30/1990
Incident Reason:	UNKNOWN
Incident Summary:	UNION GAS -MAJOR GAS-LINEBREAK, STRONG ODOURS THROUGHOUT MISSISSAUGA.
MOE Reported Dt:	8/30/1990
Environmental Impact:	POSSIBLE
Nature of Impact:	Human health
Receiving Medium:	AIR
SAC Action Class:	
Sector Source Type:	
Receiving Environment:	
Incident Event:	
Site Municipality:	21102

Site: ***CONSUMERS GAS***
LISGARD STN. WINSTON CHURCHILL BLVD REGULATOR/COMPRESSOR STATION MISSISSAUGA CITY ON

Database: ***SPL***

Ref No:	141
Contaminant Code:	
Contaminant Name:	
Contaminant Quantity:	
Incident Cause:	PROCESS UPSET
Incident Dt:	2/8/1988
Incident Reason:	OTHER
Incident Summary:	SMALL GAS LEAK
MOE Reported Dt:	2/8/1988
Environmental Impact:	NOT ANTICIPATED
Nature of Impact:	OTHER
Receiving Medium:	AIR
SAC Action Class:	
Sector Source Type:	
Receiving Environment:	
Incident Event:	
Site Municipality:	21102

Site: ***Enersource Hydro Mississauga Inc.***
Mississauga ON

Database: ***SPL***

Ref No:	4022-9LERFW
Contaminant Code:	15
Contaminant Name:	TRANSFORMER OIL (N.O.S.)
Contaminant Quantity:	40 L
Incident Cause:	Collision/Accident
Incident Dt:	2014/06/25
Incident Reason:	Unknown / N/A
Incident Summary:	40L pcb (14ppm) transformer oil to road, cb, cleaning
MOE Reported Dt:	2014/06/25
Environmental Impact:	Confirmed
Nature of Impact:	Surface Water Pollution
Receiving Medium:	
SAC Action Class:	Watercourse Spills
Sector Source Type:	Transformer
Receiving Environment:	
Incident Event:	
Site Municipality:	Mississauga

Site: ***Chrysler Transport<UNOFFICIAL>***
just East of Winston Churchill Blvd Mississauga ON

Database: ***SPL***

Ref No: 7087-9SX57T
Contaminant Code: 13
Contaminant Name: DIESEL FUEL
Contaminant Quantity: 300 L
Incident Cause: Collision/Accident
Incident Dt: 1/19/2015
Incident Reason: Road Conditions
Incident Summary: Hwy 401 Mississauga 300 L of dsl to shoulder
MOE Reported Dt: 1/19/2015
Environmental Impact:
Nature of Impact:
Receiving Medium:
SAC Action Class: Highway Spills (usually highway accidents)
Sector Source Type:
Receiving Environment:
Incident Event:
Site Municipality: Mississauga

Site:
near Winston Churchill Blvd HWY 403 EB <UNOFFICIAL> Mississauga ON

Database: ***SPL***

Ref No: 0714-6S594W
Contaminant Code: 15
Contaminant Name: HYDRAULIC OIL
Contaminant Quantity: 18 L
Incident Cause: Overturn - Truck Or Trailer
Incident Dt: 7/28/2006
Incident Reason: Other - Reason not otherwise defined
Incident Summary: MVA Hwy 403: 4 gal of hydr. oil on grnd
MOE Reported Dt: 7/28/2006
Environmental Impact: Possible
Nature of Impact: Soil Contamination
Receiving Medium: Land
SAC Action Class:
Sector Source Type: Other Motor Vehicle
Receiving Environment:
Incident Event:
Site Municipality: Mississauga

Site: ***Enersource Hydro Mississauga Inc.***
Mississauga ON

Database: ***SPL***

Ref No: 8785-9KBJTE
Contaminant Code: 15
Contaminant Name: TRANSFORMER OIL (N.O.S.)
Contaminant Quantity: 118 L
Incident Cause: Leak/Break
Incident Dt: 2014/04/28
Incident Reason: Equipment Failure
Incident Summary: Enersource Hydro: 118L non PCB transformer oil to grd
MOE Reported Dt: 2014/05/21
Environmental Impact: Confirmed
Nature of Impact: Soil Contamination
Receiving Medium:
SAC Action Class: Land Spills
Sector Source Type: Transformer
Receiving Environment:
Incident Event:
Site Municipality: Mississauga

Site: ***Samuel, Son, & Co., Inc.<UNOFFICIAL>***

Database: ***SPL***

Toronto Bound Lanes of QEW - just East of Winston Churchill Dr.   Oakville ON

Ref No:	5338-8YFGP8
Contaminant Code:	13
Contaminant Name:	DIESEL FUEL
Contaminant Quantity:	750 L
Incident Cause:	Unknown / N/A
Incident Dt:	24-SEP-12
Incident Reason:	Unknown / N/A
Incident Summary:	Samuel Transportation: Unkn Qty Diesel to Ditch, QEW
MOE Reported Dt:	24-SEP-12
Environmental Impact:	Confirmed
Nature of Impact:	Surface Water Pollution
Receiving Medium:	
SAC Action Class:	Watercourse Spills
Sector Source Type:	Truck - Only Saddle Tanks
Receiving Environment:	
Incident Event:	
Site Municipality:	Oakville

Appendix: Database Descriptions

*Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. **Note:** Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Natural Resources maintains a database of all active pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Sep 2016

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Nov 2016

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999 - Oct 2016

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2014

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Commercial Fuel Oil Tanks: Provincial CFOT

Since May 2002, Ontario developed a new act where it became mandatory for fuel oil tanks to be registered with Technical Standards & Safety Authority (TSSA). This data would include all commercial underground fuel oil tanks in Ontario with fields such as location, registration number, tank material, age of tank and tank size.

Government Publication Date: Feb 28, 2017

Chemical Register: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999 - Oct 2016

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 31, 2012

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Mar 2017

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994-Apr 2017

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886-Aug 2015

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011-Mar 2017

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994-Apr 2017

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011-Mar 2017

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Aug 2016

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

The Emergency Management Historical Event data class will store the locations of historical occurrences of emergency events. Events captured will include those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance.

Government Publication Date: May 31, 2014

List of TSSA Expired Facilities: Provincial EXP

List of facilities with removed tanks which were once registered with the Fuels Safety Program of the Technical Standards and Safety Authority (TSSA). Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc. Tanks which have been removed automatically fall under the expired facilities inventory held by TSSA.

Government Publication Date: Feb 28, 2017

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government.

Government Publication Date: June 2000-Aug 2016

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sept 2003

Fuel Storage Tank: Provincial FST

The Technical Standards & Safety Authority (TSSA), under the Technical Standards & Safety Act of 2000 maintains a database of registered private and retail fuel storage tanks in Ontario with fields such as location, tank status, license date, tank type, tank capacity, fuel type, installation year and facility type.

Government Publication Date: Feb 28, 2017

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Sep 2016

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO_2 eq).

Government Publication Date: 2013-Dec 2015

TSSA Historic Incidents: Provincial HINC

This database will cover all incidences recorded by TSSA with their older system, before they moved to their new management system. TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. The TSSA works to protect the public, the environment and property from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from pipelines, diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

TSSA Incidents: Provincial INC

TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Includes incidents from fuel-related hazards such as spills, fires and explosions. This database will include spills and leaks from diesel, fuel oil, gasoline, natural gas, propane and hydrogen recorded by the TSSA.

Government Publication Date: Feb 28, 2017

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the ministry compiles new and updated information. The inventory will include small and large landfills. Additionally, each year the ministry will request operators of the larger landfills complete a landfill data collection form that will be used to update LIMO and will include the following information from the previous operating year. This will include additional information such as estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills will include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Dec 31, 2013

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2017

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2014

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Aug 2010

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008 - Dec 2016

National Energy Board Wells: Federal NEBW

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-2014

Oil and Gas Wells: Private OGW

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Jan 2017

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Oct 2016

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994-Apr 2017

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: 1988-Oct 2016

TSSA Pipeline Incidents: Provincial PINC

TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. This database will include spills, strike and leaks from recorded by the TSSA.

Government Publication Date: Feb 28, 2017

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include all PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994-Apr 2017

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-2013

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-Apr 2017

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999 - Oct 2016

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X.

Government Publication Date: 1988-Dec 2016

Wastewater Discharger Registration Database: Provincial SRDS

Information under this heading is combination of the following 2 programs. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment maintained a database of all direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation; Mining; Petroleum Refining; Organic Chemicals; Inorganic Chemicals; Pulp & Paper; Metal Casting; Iron & Steel; and Quarries. All sampling information is now collected and stored within the Sample Result Data Store (SRDS).

Government Publication Date: 1990-2014

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970-Jan 2015

TSSA Variances for Abandonment of Underground Storage Tanks: Provincial VAR

List of variances granted for abandoned tanks. Under the Technical Standards and Safety Authority (TSSA) Liquid Fuels Handling Code and Fuel Oil Code, all underground storage tanks must be removed within two years of disuse. If removal of a tank is not feasible, an application may be sought for a variance from this code requirement.

Government Publication Date: Feb 28, 2017

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: 1970-Mar 2017

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Jun 30, 2016

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

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Appendix B

MOECC FOI Correspondence and Spill Reports

Appendix B

Ministry of the Environment and Climate Change

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc.: (416) 314-4285

Ontario

October 13, 2017

RECEIVED
OCT 18 2017
BURNSIDE

Kathleen Langstaff
R.J. Burnside & Associates ltd.
15 Townline
Orangeville, ON L9W 3R4

Dear Kathleen Langstaff:

RE: ***Freedom of Information and Protection of Privacy Act* Request**
Our File # A-2017-07113, Your Reference 300039474.0000

The Ministry is in receipt of your request made pursuant to the *Freedom of Information and Protection of Privacy Act* and has received your payment in the amount of $5.00 (non-refundable application fee), along with your $30.00 deposit.

The search is being conducted on the following: 2345 Winston Churchill Blvd, Mississauga. If there is any discrepancy please contact us immediately.

You may expect a reply or additional communication as your request is processed. For your information, the Ministry charges for search, copying and preparation time.

If you have any questions regarding this matter, please contact Jeneska Abano at jeneska.abano@ontario.ca.

Yours truly,

for Ja

Janet Dadufalza
FOI Manager

Ministry of the Environment and Climate Change

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc.: (416) 314-4285

Ontario

RECEIVED
NOV - 7 2017
BURNSIDE

November 2, 2017

Kathleen Langstaff
R.J. Burnside & Associates ltd.
15 Townline
Orangeville, ON L9W 3R4

Dear Kathleen Langstaff:

RE: *Freedom of Information and Protection of Privacy Act* Request
Our File #: A-2017-07113, Your Reference #: 300039474.0000

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to 2345 Winston Churchill Blvd, Mississauga.

After a thorough search of the Ministry's Halton Peel District Office, Environmental Approvals Branch, Sector Compliance Branch and Safe Drinking Water Branch, records were located in response to your request. It is my decision to provide full access to the attached information.

In accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, detailed below are our charges:

• Search Time 1 hour @ $30/hour	$ 30.00
• Copying 4 pages @ $0.20/page	$ 0.80
• Delivery	3.00
• **Total**	**$ 33.80**
• Deposit Received	- 30.00
• **BALANCE WAIVED (NOT REQUIRED)**	**$ 3.80**

You may request a review of my decision by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a $25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Rhea Fernandes at rhea.fernandes@ontario.ca.

Yours truly,

RFernandes

for Janet Dadufalza
FOI Manager

Attachments

Ontario

Ministry of the
Environment

OCCURENCE REPORT

Location of Occurence: MISSISSAUGA CITY UNION GAS-OAKVILLE SHERIDAN 2345 WINSTON CHURCHILL BLVD **Reg:** 3 **Dist:** HP **Municipality:** 21102		Source: UNION GAS LTD. TRAFALGAR COMPRESSOR STATION 6627 TENTH LINE, MISSISSAUGA **Sector:** PE **Source:** PL **SIC:** 4921 **UTM:** **N:** [] **E:** [] **Zone:** []	
Entered: 1992/08/24 10:34	**ORIS No.** 9230001254	**Abstracts:**	**Diaries:**
Received By: MICHEL CATTAN		**Batch:** 1268	**I. E. B. No.**
Occurence Type: S	**Subtype:** L	**Occurence Date:**	1992/08/21
Work Plan:		**Occurence Time:**	:
Reported By: JOHN BREMNER UNION GAS		**Report to MOE :** 1992/08/24 10:34 **MOE at Scene:** :	
Telephone No. 519-352-3100 x	**Alternate No.** 519-753-8611 x	**Assigned To:**	GERRY HEALY
Address: CHATHAM **Postal Code:**		**ERP Contacted:** **Callout:** [] **NSP:** [N] **ERP Name:**	

Syn: 205L PETROLEUM OIL FOUND WHILE CLEANING UP UNDER- GROUND LINE.SOURCE UNKN'N

Brief Summary:
CALLER REPORTS 45GAL OIL WAS FOUND AT THE ABOVE MENTIONED LOCATION WHILE CLEANING UP A GAS LINE. CONTRACTOR DID NOT BELEIVE QUANTITY WAS SUBSTANTIALTO BE REPORTED. SOIL IS BEING EXCAVATED NOW. OIL SAMPLE WAS SEND TO A LAB &CALLER WILL UPDATE WHEN LAB RESULTS WILL BE AVAILABLE.

If there are related reports, record initial/master ORIS No. here >> 9209397

Followup Action: Abatement IEB Other
BF Date:
FIELD REPORT RECEIVED ON 93/04/22. SAMPLES TESTED REGULAR PETROLEUM OIL, SOIL REMOVED TO LANDFILL SITE. FILE CLOSED.

File Closed: X **Abatement: IEB Other**
Suspected Violation:

Report Prepared By:	Date:	IEB Investigator:	IEB BF Date
GERRY HEALY	13/12/91		
Approving Officer	**Date:**	**Reviewing Officer:**	**Date**
ROBERT ADCOCK	15/04/93		

Specify number(s) for routing Original [ ] [ ] [ ] [ ] **Continued [ ] Yes**
Specify number(s) for copy distribution [ ] [ ] [ ] [ ] [ ]
1. Investigator/E.O. **2. D. O. /File** **3. SAC (initial spills)**
4. Reg. Dir. /______ Mgr. **5. IEB Reg. Spv** **6. IEB H.O./file** **7. Other ________**

SAC Action Class: 1:25 **2:**

Material 1: PETROLEUM OIL (N.O.S.) **Code :** 15
Amount : 205 L **UN No.:** 1270
Material 2: **Code :**
Amount : **UN No.:**

Material 3:	**Code :**
Amount :	**UN No.:**
Cause. . . . . :	**Code. . :** 98
Reason. . . . . :	**Code. . :** 98
Person in Control: UNION GAS	**Waste GenNum :**
Owner . . . . : UNKNOWN	**Waste GenNum :**
Agencies Involved . . . . :	

Clean up and Restoration Carried out by:

[v] Controller	**[v] Owner**	**[N] Other** UNION GAS
N	N	

% Cleaned up: 99 **Estimated Cost:**

Were Directions or Approval Given Under

EPA Part X [v]	**Regulation 362 [v]**	**Manifest No.**
N	N	

Waste Class :	**Code . . :** 000
Hauler :	**Code . . :**
Disposal Site :	**Code . . :**

Environmental Impact:	**Nature of Impact:**	
C	Soil contamination	**Code . . :** 07

People/Business Damaged

(Other than to Owner/Controller) :

Nature of Damage: **Code . . :**

Ministry of the **Environment**

Ontario

OCCURENCE REPORT

Location of Occurence:
MISSISSAUGA CITY
2345 WINSTON CHURCHILL BLVD

Reg: 3 **Dist:** HP **Municipality:** 21102

Source:
UNION GAS LTD.
TRAFALGAR COMPRESSOR STATION 6627 TENTH LINE, MISSISSAUGA
Sector: PE **Source:** PL **SIC:** 4921
UTM:
N: [] **E:** [] **Zone:** []

Entered:	**ORIS No.**	**Abstracts:**	**Diaries:**
1992/08/27 08:15	9230001229		
Received By:		**Batch:**	**I. E. B. No.**
LISA LOCKERBY		1268	
Occurence Type:	**Subtype:**	**Occurence Date:**	1992/08/26
S	L		
Work Plan:		**Occurence Time:**	19:30

Reported By: MELANIE MACDONALD
UNION GAS

Report to MOE : 1992/08/27 08:15
MOE at Scene: :

Telephone No. 519-352-3100 **x**
Alternate No. - - **x**

Assigned To: GRANT YARROW

Address:
CHATHAM

Postal Code:

ERP Contacted:
Callout: [] **NSP:** [N]
ERP Name:

Syn: UNION GAS: 900L H20 WITH POSSIBLE TRACES NATURAL GAS TO GRND FROM PIPELINE

Brief Summary:
CALLER REPORTED APPROXIMATELY 200 GALLONS SLIGHTLY DISCOLOURED WATER DISCHARGED ONTO THE GROUND WHILE UNION GAS WERE CLEANING OUT THE LINE USINGCOMPRESSED AIR. SAMPLES TAKEN TO DETERMINE IF WATER WAS CONTAMINATED. LAB ANALYSIS WILL LIKELY BE COMPLETED WITHIN THE NEXT FEW DAYS. UNION GAS HIREDA CONTRACTOR TO EXCAVATE 6" OF GROUND & REPLACE WILL CLEAN FILL & SOD.

If there are related reports, record initial/master ORIS No. here >> 9209538

Followup Action: X **Abatement IEB Other**
BF Date:
NO FURTHER ACTION REQUIRED.

File Closed: X **Abatement: IEB Other**
Suspected Violation:

Report Prepared By:	**Date:**	**IEB Investigator:**	**IEB BF Date**
GRANT YARROW	28/08/92		
Approving Officer	**Date:**	**Reviewing Officer:**	**Date**
ROBERT ADCOCK	31/08/92		

Specify number(s) for routing Original [ ] [ ] [ ] [ ] **Continued [ ] Yes**
Specify number(s) for copy distribution [ ] [ ] [ ] [ ] [ ]
1. Investigator/E.O. **2. D. O. /File** **3. SAC (initial spills)**
4. Reg. Dir. /_______ Mgr. **5. IEB Reg. Spv** **6. IEB H.O./file** **7. Other _________**

SAC Action Class: 1:14 2: 25

Material 1: OILY WATER (N.O.S.) **Code :** 41
Amount : 900 L **UN No.:**
Material 2: **Code :**
Amount : **UN No.:**

Material 3:	Code :
Amount :	UN No.:
Cause. . . . . :	Code. . : 10
Reason. . . . . :	Code. . : 01
Person in Control: UNION GAS	Waste GenNum :
Owner . . . . : UNION GAS	Waste GenNum :
Agencies Involved . . . . :	

Clean up and Restoration Carried out by:

[v] Controller	[v] Owner	[N] Other
Y	Y	

% Cleaned up: 50 Estimated Cost:

Were Directions or Approval Given Under

EPA Part X [v]	Regulation 362 [v]	Manifest No.
N	N	

Waste Class :	Code . . : 000
Hauler :	Code . . :
Disposal Site :	Code . . :

Environmental Impact:	Nature of Impact:	
P	Soil contamination	Code . . : 07

People/Business Damaged

(Other than to Owner/Controller) :

Nature of Damage: Code . . :

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Appendix C

TSSA Correspondence

Kathleen Langstaff

From: Public Information Services <publicinformationservices@tssa.org>
Sent: Monday, October 16, 2017 12:35 PM
To: Kathleen Langstaff
Subject: RE: 2345 Winston Churchill Blvd., Mississauga - TSSA Record Search

Hello Kathleen,

Thank you for your inquiry.

We have no record in our database of any fuel storage tanks at the subject address (addresses).

For a further search in our archives please submit your request in writing to Public Information Services via e-mail (publicinformationservices@tssa.org) or through mail along with a fee of $56.50 (including HST) per location. The fee is payable with credit card (Visa or MasterCard) or with a Cheque made payable to TSSA.

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Thank you and have a great day,

Sherees

Sherees Thompson | Public Information Agent
Facilities
345 Carlingview Drive
Toronto, Ontario M9W 6N9
Tel: +1-416-734-3363 | Fax: +1-416-231-6183 | E-Mail: sthompson@tssa.org
www.tssa.org

Employeur remarquable du Canada 2016 PARTENARIAT EN ÉDUCATION
Canada's Outstanding Employer 2016 THE LEARNING PARTNERSHIP

From: Kathleen Langstaff [mailto:Kathleen.Langstaff@rjburnside.com]
Sent: Wednesday, October 11, 2017 11:29 AM
To: Public Information Services
Subject: 2345 Winston Churchill Blvd., Mississauga - TSSA Record Search

TSSA record search:

Do you have any TSSA records associated with the following address:

2345 Winston Churchill Blvd., Mississauga, Ontario

BURNSIDE
Kathleen Langstaff, P.Geo., QP$_{ESA}$
Geoscientist

R.J. Burnside & Associates Limited
15 Townline, Orangeville, ON L9W 3R4
Office Tel: 800-265-9662 Direct Tel: 519-938-3034
Email: kathleen.langstaff@rjburnside.com
www.rjburnside.com

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[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Region of Peel Correspondence and Spill Report

Region of Peel
working with you

Public Works

3515 Wolfedale Rd.
Mississauga, ON
L5C 1V8
tel: 905-791-7800

peelregion.ca

November 23, 2017
File: WP PG-01.00

R.J. Burnside & Associates Limited
15 Townline
Orangeville, ONT
L9W 3R4

ATTENTION: Kathleen Langstaff

Dear Ms Langstaff:

SUBJECT: Sheridan Park Drive Extension
Your Project No.: 300039474.0000

The Environmental Control Section, Wastewater Division, Public Works Department, Regional Municipality of Peel is responsible for the enforcement of Wastewater Bylaw 53-2010.

We have reviewed our records with regard to the above property and find that we do not have a record of any violations, infractions or outstanding orders under Wastewater Bylaw 53-2010 and the former Sewer Use By-laws 90-90 and 9-75.

There is one spill events for the above property listed in our files (copy enclosed).

For information pertaining to waste disposal sites within the Region of Peel, a copy of this request is being forwarded to Munir Ahmad of the Waste Program Planning Section (905-791-7800, Ext. 4891). You can also contact the Ministry of the Environment Halton/Peel district office (1-800-335-5906 or 905-319-3847) for more information.

For information pertaining to stormwater By-law issues, please contact Katrina Macdonald of the City of Mississauga Transportation & Works Department, Environmental Engineering Section (905-615-3200, Ext. 3165). Please note additional fees are required; a copy of this request is being forwarded.

Although a careful review of the records in the custody of the Environmental Control Section has been conducted in response to your request, the Region of Peel makes no warranties or representations, express or implied, concerning the accuracy, reliability or completeness of the information contained in this letter. All information from these records is being provided on an "as is" basis, and the responsibility for any consequences of using the information for any purpose whatsoever rests with the person who has requested it.

...2/

Region of Peel
working with you

Public Works

3515 Wolfedale Rd.
Mississauga, ON
L5C 1V8
tel: 905-791-7800

peelregion.ca

If you have any questions, please feel free to contact me at (905) 791-7800, Ext. 3113.

Yours truly,

Sophie Perovic

Sophie Perovic
Inspector
Environmental Control Section
Wastewater Division
Public Works Department

SP/KK

cc: Munir Ahmad, Waste Program Planning, Regional Municipality of Peel
Katrina Macdonald, Transportation & Works Department, City of Mississauga

Enclosure

OPC2.0

Region of Peel

Waste Management

Complaint/Spill Report

C94-162

Reported By	Tel	Yr. Mo. Day	Time
City of Mississauga (Joe Hamilton)	(905) 896-5942	94 06 13	10:00 am

Address

City of Mississauga

Postal Code

[x] Spill [ ] Complaint

Location

Storm outfall at Sheridan Park Drive and Homelands Drive

Source of Contaminant

Unknown

Material Spilled

Green and grey oil based paint

Quantity

Unknown

Owner of Pollutant

Unknown

Telephone ( )

Controller of Pollutant

City of Mississauga

Telephone ( )

Investigated By	Yr. Mo. Day	Time
Steven E. Runowski S. E. Runowski	94 06 13	10:30 am

Investigation/Action Taken/Status

I met with Joe Hamilton and Michelle Charboneau of the City at the storm outfall. A significant amount of paint was trapped in the outfall and in the storm sewer pipe. Existing booms prevented the release of the paint any further. The City of Mississauga hired Philip Environmental to pump out the paint in the outfalls. We were unable to determine who the discharger of the paint was. At 4:30 pm, Philip Environmental arrived and with the assistance of the Mississauga Fire Department (Flushing of the storm sewer) the outfall was cleaned up.

ENTERED OCT 23 1995

Agencies Notified:

☐ Police ☐ Fire ☒ MOE ☒ Other(specify) City of Mississauga

Billing:

Required ☐ Yes ☒ No **To:** ☐ Owner ☐ Controller

Man Hours 3 (Reg) 3 (O/T) Van Mileage ____ km

Van Hours ____ Non-Van Mileage ____

Regional Materials and Services: 20 pads

Will billing be made to Region from outside agency (ies)? ☐ Yes ☒ No If yes, give details:

Clean-Up/Disposal:

By: ☐ Owner ☐ Carrier ☐ Region ☒ Other (specify)

How Disposed: Philip Environmental

MOE Approval ~~(For Region Ordered Work Only)~~ To: City of Mississauga

Given By Gerry Healy Branch Oakville

Emergency # ____ Date June 13, 1994

Restoration:

Restoration Required ☒ No ☐ Yes (specify)

Restoration to be performed by:

Additional Remarks/Follow-Up

Report Prepared By:
Name: Steven E. Runowski
Title: Technical Analyst
Date: June 16, 1994

V-12-116 92/05

December 8, 2017

Kathleen Langsstaff
Burnside
6990 Creditview Road
Mississauga, ON L5N 8R9

P: 519.938.3034
F: 519.941.8120

Re: Sheridan Park Drive Extension

Dear Ms. Langstaff:

The Regional Municipality of Peel's Waste Management Division received your inquiry on December 6, 2017. We have reviewed the Region's records for the above property and have found no records which indicate the existence of a municipal waste disposal site or hazardous wastes on the subject property or in the vicinity of the area.

The records of the Regional Municipality of Peel concerning the location and nature of waste disposal sites or hazardous wastes are incomplete. The Regional Municipality of Peel makes no representation that the records may be relied upon in determining whether or not lands have been used for the disposal of wastes or hazardous wastes. The Region's response is provided in an effort to assist the inquirer in making their own determinations as to the integrity of the subject property. If there are any doubts as to the integrity of this or any property, we recommend that a qualified Geotechnical Engineer carry out a detailed soil investigation. If it is found that the subject lands have been used for the disposal of waste or hazardous waste, then approval of the Minister, for the proposed use, as per Section 46 of the Environmental Protection Act (Ontario), may be required.

This response is not intended for general circulation or publication. The Region does not assume any responsibility or liability for losses occasioned to you or third parties as a result of circulation, publication, reproduction or use of this report by third parties. The Region reserves the right to alter its opinion on the status of the site in light of further information that may be provided. Further, the Region specifically disclaims any undertaking or obligation to advise any person of any change in fact or matter impacting this opinion as may become available or brought to its attention after the date hereof. The advice provided in this report should not be a substitute for conducting your own investigations of the site.

For additional information, please contact the Ministry of Environment Halton-Peel District Office: 4145 North Service Road, Suite 300, Burlington, ON, L7L 6A3 or call 1-905-319-3847 or Toll Free 1-800-335-5906.

Please note that future inquiries regarding waste disposal sites should be sent to the undersigned (Munir Ahmad).

Sincerely,

Morgan Chandler | Assistant Technical Analyst
Waste Management | Public Works
Region of Peel, Public Works Department
10 Peel Centre Dr., Suite A, 4th fl. | Brampton, ON
Tel: 905.791.7800 ext. 4652
Email: morgan.chandler@peelregion.ca

Munir Ahmad
Technical Analyst, Waste Operational Planning
Waste Management Division
10 Peel Centre Dr., Suite A, 4th Flr.
Brampton, ON
905-791-7800 ext. 4891

[The Difference is our People]

Appendix E

Interview

Appendix E

Kathleen Langstaff

From:	Katrina MacDonald <Katrina.MacDonald@mississauga.ca>
Sent:	Friday, November 03, 2017 11:03 AM
To:	Kathleen Langstaff
Subject:	RE: follow up - interview questions for Phase One ESA for Sheridan Park Drive Extention (project no. 300039474)

Morning Kathleen,

Please see below for the City's response to the interview questions.

1. How long have you been familiar with the Site?

   I have been with the City of Mississauga for 14 months.

2. What was the property used for in the past?

   Based on a review of aerial photographs, it appears this property has never been developed.

3. Have there been any buildings removed from the Site?

   Based on a review of aerial photographs, it appears this property has never been developed.

4. Has fill material been placed on the Site to raise the grade?

   Not to my knowledge.

4. Have there ever been any fuel tanks on the property that have been removed?

   Not to my knowledge.

6. Have there been any fuel spills on the Site or adjacent to the Site?

   The City of Mississauga has conducted a review of our available records and no violations of the Storm Sewer Use By-Law No. 259-05 were identified. As the City of Mississauga is part of a two-tier municipality, the Region of Peel is responsible for spill response services. Please contact them for further details regarding spill reporting for the area.

Kind regards,

MISSISSAUGA

Katrina MacDonald, P.Eng.
Environmental Coordinator, Site Assessments
T 905-615-3200 ext.3165
katrina.macdonald@mississauga.ca

Please consider the environment before printing.

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Appendix F

Photographs

Photo 1: Looking eastward at grass covered Site, from west end of Site.

Photo 2: Road barrier at Sheridan Park Drive at east end of Site.

Photo 3: Looking east (towards Sheridan Park Drive) along utility corridor and trail north of Site.

Photo 4: Looking west (to Winston Churchill Blvd.) along utility corridor and trail north of Site.

Photo 5: Looking north at residential properties north of utility corridor.

Photo 6: Groundwater seep on Site.

Photo 7: Dumping – Brush dumped on Site.

Photo 8: Dumping – Brush dumped on Site.


Photo 9: Dumping – Brush, brush and plastic dumped on Site.


Photo 10: Dumping – Brush and concrete rubble dumped on Site.

Photo 11: Dumping – Plaster, wood, metal and aerosol cans dumped on Site.

Photo 12: Dumping – Concrete dumped on Site.

Photo 13: Dumping – Brush and concrete dumped on Site.

Photo 14: Dumping – Bricks dumped on Site.

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Appendix L

Evaluation of Alternative Solutions

Sheridan Park Drive Environmental Assessment
Evaluation of Alternative Solutions

Alternative Descriptions	Do Nothing, do not make any changes / improvements to road network. Do not extend Sheridan Park Drive.	Limit development growth in surrounding areas.	Extend Sheridan Park Drive through from Speakman Drive to Homelands Drive.	Make improvements to adjacent roads to enable existing and future traffic to use alternate route options.

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
A	NATURAL ENVIRONMENT				
1	**Existing trees and vegetation communities**	No impacts to existing conditions.	No impacts to existing conditions.	Based on the tree inventory there are no tree Species at Risk (SAR) in the Sheridan Park Drive right-of-way. Based on the preliminary preferred design plan, 105 trees (10 cm diameter or greater) and vegetation removals will be required to accommodate the road extension; however, tree removals will be minimized to the extent possible and compensated with new plantings of native species. Approximately 20 trees (10 cm diameter or greater) may be saved with grading revisions and/or arboricultural treatments like root pruning. Tree and vegetation removals within the existing road right-of-way will result in local edge effects to the adjacent wooded areas and thicket/meadow communities. The road extension is not anticipated to impact the form and function of the vegetation communities in the Study Area as there are significant wooded areas and large meadow/thicket vegetation communities within the private lands to the south of the right-of-way.	Avoids potential impact to natural environment in the Study Area, but potential for impacts to natural features along other roadways.
	Rating	●	●	○	◑
2	**Wildlife**	No impacts to existing conditions.	No impacts to existing conditions.	Some disturbance is expected in construction. The wooded area on the south side of the proposed road extension has the characteristics that could support bat habitat. Impacts to bat habitat can be readily mitigated through the installation of bat habitat boxes within the Study Area where appropriate. Based on the breeding bird surveys, no Threatened or Endangered avian SAR were observed. Two Special Concern SAR species (Eastern Wood Pewee and Wood Thrush) were observed; however, the proposed road extension will not directly affect breeding habitat for these two species. Proper mitigation measures for all confirmed species habitat will be implemented into construction and post construction monitoring.	No impacts to existing conditions within Study Area; however, potential impacts to wildlife along other roadways.
	Rating	●	●	○	◑
3	**Aquatic habitat**	No impacts to existing conditions.	No impacts to existing conditions.	There is no confirmed direct fish habitat in the Study Area. However, the headwater drainage features within the Study Area potentially contributes to the water quality and quantity of the downstream Sheridan Creek, which contains fish populations. With appropriate mitigation measures such as Low Impact Development (LID) techniques, the form and function of these headwater features can be maintained to ensure minimal impacts to downstream watercourses.	No impacts to existing conditions within Study Area; however, potential impacts to aquatic habitat along other roadways.
	Rating	●	●	○	◑
4	**Hazard lands**	No impacts to existing conditions.	No impacts to existing conditions.	No impacts are anticipated to the existing hazard lands within the Study Area.	No impacts to existing conditions.
	Rating	●	●	●	●
5	**Surface water quality and drainage (stormwater management)**	No impacts to existing conditions.	No impacts to existing conditions.	With appropriate mitigation measures, the form and function of the existing headwater drainage features in the Study Area can be maintained. There will be indirect impacts to surface water quality as a result of the road extension (i.e. road runoff); however, there are Low Impact Development (LID) opportunities to mitigate these impacts.	Improvements to adjacent roads may impact surface water quality if improvements require alterations to watercourse crossings (i.e. culverts or bridges); however, there are LID opportunities to mitigate these impacts.
	Rating	●	●	◑	◑
6	**Groundwater quality**	No impacts to existing conditions.	No impacts to existing conditions.	No impacts to existing conditions.	No impacts to existing conditions.
	Rating	●	●	●	●
	SUMMARY NATURAL ENVIRONMENT	●	●	◑	◑
	SUMMARY COMMENTS	No impacts to existing conditions.	No impacts to existing conditions.	Requires some tree / vegetation removals; however, impacts can be mitigated by tree plantings at a 2:1 replacement ratio. No tree Species at Risk (SAR) observed in Study Area. The proposed road extension will not directly affect wildlife habitat, any potential impacts will be mitigated. Road extension is not anticipated to impact the form and function of vegetation and headwater drainage features.	Avoids potential impacts to natural environment in the Study Area; however, there are potential for impacts to natural features along other roadways.

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
B	SOCIO-ECONOMIC ENVIRONMENT				
1	**Routing and connectivity within Study Area for all travel modes**	Pedestrian and cycling travel will continue to be accomodated on the existing multi-use trail. Future vehicle connectivity within the Study Area will be limited without the road extension.	Pedestrian and cycling travel will continue to be accomodated on the existing multi-use trail. Future vehicle connectivity within the Study Area will be limited without the road extension.	Pedestrian and cycling travel will continue to be accomodated on the existing multi-use trail. Vehicle connectivity of the Study Area will be improved by providing additional connection to the broader road network.	Pedestrian and cycling travel will continue to be accomodated on the existing multi-use trail. Improvements to alternative roads does not increase connectivity within the Study Area.
	Rating	○	○	●	○
2	**Noise and air quality**	No impacts to existing conditions.	No impacts to existing conditions.	Noise assessment confirmed future noise levels are within Ministry and City standards and do not require mitigation. Short term nuisance noise and dust emissions expected during the construction phases and will be mitigated.	Improvements to adjacent roads would results in short term nuisance noise and dust emissions as well as potential for noise impacts.
	Rating	●	●	●	◑
3	**Provision for emergency services**	Emergency services access is provided within the existing road network.	Emergency services access is provided within the existing road network.	Provides additional access routes for emergency services.	Emergency services access is provided within the existing road network.
	Rating	◑	◑	●	◑
4	**Lifestyle and culture of local residents**	Opportunities for increased plantings along the multi-use trail. Local residents will continue to have access to the multi-use trail for recreation and leisure.	Opportunities for increased plantings along the multi-use trail. Local residents will continue to have access to the multi-use trail for recreation and leisure.	Views of utility corridor / green space will not change as a result of the road extension. Opportunities for increased plantings along the multi-use trail. Local residents will continue to have access to the multi-use trail for recreation and leisure.	Opportunities for increased plantings along the multi-use trail. Local residents will continue to have access to the multi-use trail for recreation and leisure.
	Rating	●	●	●	●
5	**Supports planned development**	Does not support the future potential development in the business park.	Does not support the future potential development in the business park.	The extension of the roadway supports the future potential development and diversification of business park by creating increased roadway connectivity and improving access routes for local traffic.	Does not support the future potential development in the business park.
	Rating	○	○	●	○
	SUMMARY SOCIO-ECONOMIC ENVIRONMENT	◑	◑	●	◑
	SUMMARY COMMENTS	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	Connectivity will be improved for all modes of transportation. Provides increased access routes for emergency services. No changes to pedestrian and cycling use of corridor.	Providing alternate route options does not increase connectivity within the Study Area. No changes to pedestrian and cycling use of corridor.

Sheridan Park Drive Environmental Assessment
Evaluation of Alternative Solutions

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
C	**CULTURAL ENVIRONMENT**				
1	**Archaeological Resources**	No impacts to existing conditions.	No impacts to existing conditions.	Stage 1 Archaeological Assessment has identified some areas of archaeological potential within the Study Area, predominantly within the undeveloped lands of the Sheridan Park Drive right-of-way. A Stage 2 Archaeological Assessment will be conducted to determine if there are any potential archaeological resources within the Study Area.	No impacts to existing conditions within Study Area; however, some potential for impacts to archaeological resources in other corridors.
	Rating	●	●	◑	◑
2	**Heritage Features**	No impacts to existing conditions.	No impacts to existing conditions.	Cultural Heritage Resources Assessment notes that Sheridan Park is identified as a significant Cultural Landscape by the City with properties listed on the City's Heritage Register. No cultural heritage impacts to these resources are anticipated from the proposed extension of Sheridan Park Drive.	No impacts to existing conditions. Some potential for impacts to cultural heritage resources in other corridors.
	Rating	●	●	●	◑
	SUMMARY CULTURAL ENVIRONMENT	●	●	◑	◑
	SUMMARY COMMENTS	No impacts to existing conditions.	No impacts to existing conditions.	Some areas of archaeological potential to be investigated. No impacts anticipated to cultural heritage features.	No impacts to existing conditions within the Study Area. Some potential for impacts to archaeological resources and cultural heritage resources in other corridors.

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
D	**TRANSPORTATION ENGINEERING ENVIRONMENT**				
1	**Balancing of all travel modes**	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity for all travel modes.	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity for all travel modes.	Consistent with City planning policies (e.g., Official Plan). Addresses anticipated transportation needs. Improves network connectivity for all travel modes.	Would potentially provide capacity in other corridors; however, does not improve network connectivity for all travel modes.
	Rating	○	○	●	○
2	**Traffic Management**	Does not allow for alternate route options or opportunity to divert traffic from the residential neighbourhood.	Does not allow for alternate route options or opportunity to divert traffic from the residential neighbourhood.	Allows for alternate route options and has potential to divert traffic from the residential community.	Does not allow for alternate route options within the Study Area and does not provide opportunity to divert traffic from the residential neighbourhood.
	Rating	○	○	●	○
3	**Construction and Staging**	No impacts to existing conditions.	No impacts to existing conditions.	Limited impact during construction at the adjacent intersections; however, most of the road construction can be accomplished without impact to the existing transportation network.	Improvements to adjacent roads would have a greater construction impact (within active roadways) as compared to the road extension which can be primarily constructed off-line (non-active road).
	Rating	●	●	◑	○
4	**Speed Management**	No impacts to existing conditions.	No impacts to existing conditions.	Road design can accommodate a variety speed management features including narrower roads and centre islands to mitigate potential speeding concerns.	May or may not be able to accommodate speed management on adjacent roads depending on roadway classification.
	Rating	●	●	◑	○
5	**Vehicular level of service**	Does not improve traffic operations because it does not provide alternate route options.	Does not improve traffic operations because it does not provide alternate route options.	Improves network redundancy by providing more alternate route options, which improves traffic operations.	Does not improve traffic operations within the Study Area as it does not provide alternate route options. Existing arterial routs are constrainted and have limited potential to increase capacity.
	Rating	○	○	●	○
6	**Impacts to Utilities**	Limited access to existing hydro infrastructure in Study Area.	Limited access to existing hydro infrastructure in Study Area.	Extended roadway will have positive impacts for utilities, allowing for improved access to existing hydro corridor. May require utility relocations at intersections.	Limited access to existing hydro infrastructure in Study Area. Potential for utility relocations along adjacent corridors.
	Rating	◑	◑	●	◑
7	**Comparative capital and operations costs of implementing alternatives**	No capital costs. Continual costs for existing operations and maintenance.	No capital costs. Continual costs for existing operations and maintenance.	Capital costs and additional operations costs associated with extending Sheridan Park Drive.	Capital costs associated with improvements to adjacent roads.
	Rating	◑	◑	○	◑
	SUMMARY TRANSPORTATION ENGINEERING ENVIRONMENT	○	○	●	○
	SUMMARY COMMENTS	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	Consistent with City planning policies (e.g., Official Plan). Addresses anticipated transportation needs. Improves network connectivity and provides alternate route options for all travel modes.	Would potentially provide capacity in other corridors; however, does not improve network connectivity or provide alternate route options for all travel modes within the Study Area.

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
E	**Project Opportunity Statement**				
	Addresses Project Opportunity Statement	✗	✗	✓	✗
	SUMMARY COMMENTS	Alternative 1 is unable to address the Project Opportunity Statement with the exception of preserving the natural feel and recreational benefits of the Study Area.	Alternative 2 is unable to address the Project Opportunity Statement with the exception of preserving the natural feel and recreational benefits of the study area.	Alternative 3 can fully address the Project Opportunity Statement as it supports multi-modal transportation for all users, can potentially divert traffic from the neighbourhood and improves network redundancy and improves access to the Study Area. Additionally, this alternative will preserve the natural feel and recreational benefits of the Study Area by implementing appropriate mitigation.	Alternative 4 partially addresses the Project Opportunity Statement as it supports multi-modal transportation however it does not improve network redundancy or improves access to the study area.

	CRITERIA FOR EVALUATING ALTERNATIVES	Alternative 1: Do Nothing	Alternative 2: Limit/ Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternative Routes for Existing and Traffic
	OVERALL SUMMARY	**Not Carried Forward**	**Not Carried Forward**	**Carried Forward**	**Not Carried Forward**
	SUMMARY COMMENTS	Does not impact natural or cultural environments. Do Nothing does not complete road network and is not consistent with City planning policies (e.g. Official Plan).	Does not impact natural or cultural environments. Limiting growth does not support future potential growth within business park and is not consistent with City planning policies (e.g. Official Plan).	Road extension will complete the road network and is consistent with City planning policies (e.g. Official Plan). This alternative provides an alternate route and improved access in the Study Area, for all travel modes. Any impacts to natural environment can be mitigated.	Would potentially provide capacity in other corridor; however, does not improve network connectivity or provide alternate route options for all travel modes within the Study Area.

ORDER OF PREFERENCE

Most Preferred ●

Somewhat Preferred ◑

Least Preferred ○

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Appendix M

Study Consultation

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Appendix M1

Appendix M1

Notice of Study Commencement

MISSISSAUGA

CITY OF MISSISSAUGA – NOTICE OF STUDY COMMENCEMENT

Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension

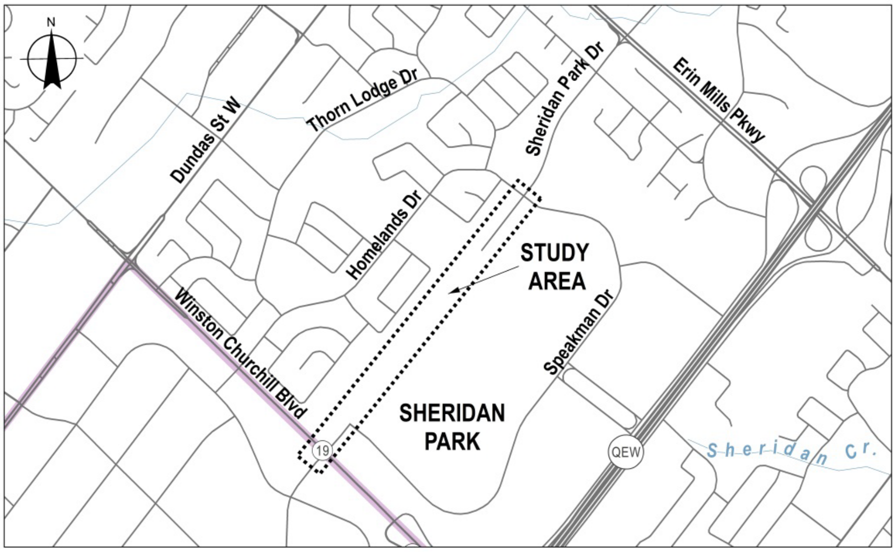
WHAT?

- The City of Mississauga is undertaking a study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.
- The site location and approximate extent of the Study Area are shown on the map.

WHY?

- Complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding commercial areas for all users.
- Maximize access to the Sheridan Park (Sheridan Park).
- Improve the pedestrian and cycling network for employees in Sheridan Park and neighbouring residents.

WHERE?



HOW?

- The Study is being carried out in accordance with the requirements of a Schedule B undertaking as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment Manual* (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.
- The study will examine how traffic operates both now and in the future – and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures.
- Several alternatives will be developed and evaluated and refined through community and agency consultation. The Project Team will then select a preferred alternative.
- At the end of the study, a Project File documenting the entire Study process will be available for public review.

GET INVOLVED!

- Consultation is an important part of the Municipal Class EA process. Throughout the Study, the City will make contact with various agencies and members of the community, and consider their opinions as part of any decisions that are made.
- A Public Information Centre (PIC) will be held in Phase 2 to present information related to the study and answer any questions you may have. Details regarding PIC will be advertised publicly and communicated as the study progresses.
- To find out more about project announcements and other information please visit the project website:

www.mississauga.ca/sheridanparkea

WE WANT TO HEAR FROM YOU – PLEASE VISIT THE WEBSITE AND COMPLETE A SURVEY!
(If you require a hard copy of the survey, please contact the Project Team – see below)

If you have any questions or comments regarding the study or would like to be added to the Project Contact List, please contact:
SheridanParkEA@rjburnside.com

Dana Glofcheskie, P.Eng.
Project Manager
City of Mississauga
201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4
(905) 615-3200 ext. 8243

David Argue, P.Eng., PTOE
Consultant Project Manager
R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga, ON L5N 8R9
(905) 821-5895

Personal information is collected under the authority of the Environmental Assessment Act and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed in the notice.

This Notice First Issued January 26, 2017.

R.J. Burnside & Associates Limited 6990 Creditview Rd #2, Mississauga, ON L5N 8R9 CANADA
telephone (905) 821-1800 **fax** (519) 821-1809 **web** www.rjburnside.com

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Date

Via: «Via»

«Title» «First_Name» «Last_Name»
«Position»
«AgencyOrganization»
«Address_1»
«Address_2»
«City» «Province» «Postal_Code»

Dear «Title» «Last_Name»

Re: Notice of Study Commencement
Sheridan Park Drive Extension
Municipal Class Environmental Assessment Study
Project No.: 300039474.0000

The City of Mississauga has initiated a Municipal Class Environmental Assessment (EA) for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive. R.J. Burnside & Associates Limited (Burnside) has been retained by the City of Mississauga.

The City aims to complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding areas for all users. The study will examine how traffic operates both now and in the future – and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures. The approximate extent of the Study Area for this project is shown on the Map provided in the attached Notice of Commencement.

The EA will be conducted as a Schedule B in accordance with the "Municipal Class Environmental Assessment" (Municipal Engineers Association, October 2000, as amended in 2007, 2011, and 2015) which is an approved process under the *Ontario Environmental Assessment Act*. A key component of the study will be engagement with Indigenous communities, the public and agencies.

At this stage of the process, Burnside is requesting on behalf of the City of Mississauga, that your agency complete the enclosed Response Form (to be returned by February 16, 2017), to assist us in understanding your agency's involvement with this project. Specifically, we are seeking information on:

- Policies, positions or guidelines implemented or administered by your agency that may affect implementation of improvements to the study area;

- Background information that is pertinent to the compilation of an environmental inventory of the general area of study;
- Any preliminary comments or concerns that your agency has on the proposed projects; and
- Other projects proposed within or near the general area of study.

We are making contact early in the project development so concerns from your agency can be addressed and incorporated into the overall project design. Input and comments received from agencies, Indigenous communities and the public will be incorporated into the planning and design of this project.

Your input and questions are encouraged. To provide the study team with your comments, please email SheridanParkEA@rjburnside.com, or for further project information please contact Jennifer Vandermeer at 226-486-1559.

Your participation in this EA study is much appreciated.

Yours truly,

R.J. Burnside & Associates Limited

Jennifer Vandermeer

Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead
JCV:js

Enclosure(s) Notice of Commencement
Response Form

cc: Dana Glofcheskie, City of Mississauga (enc.) (Via: Email)
David Argue, Burnside (enc.) (Via: Email)

MISSISSAUGA

BURNSIDE

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: ______________________________
(Please Print)

Phone No.: ______________________________

Agency: ______________________________

Signed : ______________________________

Date: ______________________________

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?		
2.	If the answer to Question 1 is "no," would you like to be removed from contact list?		

3. Please identify any concerns or comments your agency may have at this time.

Please return this completed form by **February 16, 2017** to **SheridanParkEA@rjburnside.com**

City of Mississauga
Transportation and Works Department
201 City Centre Drive, Suite 800
MISSISSAUGA ON L5B 2T4
mississauga.ca

January 24, 2017

Via: «Via»

«Title» «First_Name» «Last_Name»
«Position»
«AgencyOrganization»
«Address_1»
«Address_2»
«City» «Province» «Postal_Code»

Dear «Title» «First_Name» «Last_Name»

Re: Notice of Study Commencement
Sheridan Park Drive Extension
Municipal Class Environmental Assessment Study
Project No.: 300039474.0000

The City of Mississauga (City) has initiated a Municipal Class Environmental Assessment (EA) for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive. R.J. Burnside & Associates Limited (Burnside) has been retained by the City to help facilitate the EA process.

The City aims to complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding areas for all users. The study will examine how traffic operates both now and in the future - and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures. The approximate extent of the Study Area for this project is shown on the Map provided in the attached Notice of Commencement.

The EA will be conducted as a Schedule B in accordance with the "Municipal Class Environmental Assessment" (Municipal Engineers Association, October 2000, as amended in 2007 and 2011) which is an approved process under the *Ontario Environmental Assessment Act*. A key component of the study will be engagement with Indigenous communities, the public and agencies.

This notification is being provided to you in hope that you can assist the Project Team in determining if your organization may hold an interest in this project. Your comments are welcome and we encourage you to provide us with your views. For your convenience, we have enclosed a 'Response Form'.

Specifically, we are seeking input on:

- Any preliminary comments or concerns that your community has on the proposed project;
- The level of interest in the project from the community for further engagement; and
- The best methods to communicate with your community.

Unless you indicate otherwise, the Project Team will continue to provide you with updates throughout the study including notification of and materials from public meetings and study completion. The Project Team can also provide the Archeological Assessment Report, or any other technical reports, as requested.

The Project Team would be pleased to meet with you at any time during the study to answer your questions or respond to any concerns you may have.

We are making contact early in the project development so concerns from Indigenous communities can be addressed and incorporated into the overall project design. Input and comments received from Indigenous communities, the public and agencies will be incorporated into the planning and design of this project.

If you have any questions or comments regarding the study please email SheridanParkEA@rjburnside.com, or for further project information please contact Dana Glofcheskie at (905) 615-3200 ext. 8243 or by email at dana.glofcheskie@mississauga.ca.

Your participation in this EA study is much appreciated.

Yours truly,

City of Mississauga

Dana Glofcheskie, P.Eng.
Project Manager
Transportation & Works Department,
Transportation & Infrastructure Planning
Division
DG:js

Enclosure(s) Notice of Commencement
Response Form

cc: David Argue, Burnside (enc.) (Via: Email)
Jennifer Vandermeer, Burnside (enc.) (Via: Email)

MISSISSAUGA

BURNSIDE

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

www.mississauga.ca

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: ______________________________
(Please Print)

Phone No.: ______________________________

Signed : ______________________________

Date: ______________________________

If there is a different contact for your organization that we should follow-up with, please let us know:	
Name:	
Address:	
Phone:	
Email:	

The study is in its initial stages and information can be provided as it progresses.

Please assist us in identifying your interests:

		YES	**NO**
1.	Do you wish to participate in this project?		
2.	If the answer to Question 1 is "no," would you like to be removed from contact list?		
3.	Are there areas of cultural significance to your community in close proximity to the study area that the City should be aware of? (if yes, please provide details below)		
4.	Is the project within an area subject to a land claim?		
5.	Would your community / organization like to meet with the City to discuss this study?		

Continued on back

Is there any additional information your community requires from the City in order to better understand the study and to identify if / how the project may adversely impact Aboriginal and / or Treaty rights of your community?

Please identify any initial comments your community or organization may have at this time.

Please return this completed form by **February 16, 2017** to **SheridanParkEA@rjburnside.com**

R.J. Burnside & Associates Limited 6990 Creditview Rd #2, Mississauga, ON L5N 8R9 CANADA
telephone (905) 821-1800 **fax** (519) 821-1809 **web** www.rjburnside.com

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January 24, 2017

Via: «Via»

«Title» «First_Name» «Last_Name»
«Position»
«AgencyOrganization»
«Address_1»
«Address_2»
«City» «Province» «Postal_Code»

Dear «Title» «First_Name» «Last_Name»

Re: Notice of Study Commencement and Invitation to Participate on the Stakeholder Advisory Committee
Sheridan Park Drive Extension
Municipal Class Environmental Assessment Study
Project No.: 300039474.0000

The City of Mississauga has initiated a Municipal Class Environmental Assessment (EA) Study to establish the preferred approach for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

The City aims to complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding areas for all users. The study will examine how traffic operates both now and in the future - and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures. The approximate extent of the Study Area for this project is shown on the Map provided in the attached Notice of Commencement.

The EA study will be conducted as a Schedule B in accordance with the "Municipal Class Environmental Assessment" (Municipal Engineers Association, October 2000, as amended in 2007, 2011, and 2015) which is an approved process under the *Ontario Environmental Assessment Act*. The City has retained R.J. Burnside & Associates Limited (Burnside) to undertake this study. The Study Team, responsible for completing the Class EA, consists of City and Burnside staff.

At this stage of the process, Burnside is requesting on behalf of the City of Mississauga, that your agency complete the enclosed Response Form (to be returned by February 9, 2017), to assist us in understanding your agency's involvement with this project. Specifically, we are seeking information on:

- Policies, positions or guidelines implemented or administered by your agency that may affect implementation of improvements to the study area.

- Background information that is pertinent to the compilation of an environmental inventory of the general area of study.
- Any preliminary comments or concerns that your agency has on the proposed projects.
- Other projects proposed within or near the general area of study.

We are making contact early in the project development so concerns from your agency can be addressed and incorporated into the overall project design. Input and comments received from agencies, Indigenous communities and the public will be incorporated into the planning and design of this project.

Stakeholder Advisory Committee Invitation

Public and agency consultation will be an important component of the overall study process. As part of the consultation process, the City intends to form a Stakeholder Advisory Committee (SAC). The purpose of the SAC is to provide comments and advice pertaining to decisions to be made by the City of Mississauga with regard to the Sheridan Park Drive Extension. The SAC mandate is to be a forum for more in-depth discussion of the key study issues, concerns or solutions, and to provide advice to the Study Team. The role of SAC is advisory, with no voting to be undertaken.

Please consider this letter as the City of Mississauga's Notice of Study Commencement and an invitation for you or an appointed member of your organization to participate on the SAC. One of the first functions of the SAC will be to develop a Problem Statement, which will guide the study. It is expected that there will be three (3) SAC meetings during the study process.

In the space on the enclosed Response Form, please provide the contact information for one (1) designated representative from your organization, and return to the undersigned no later than February 16, 2017.

Your input and questions are encouraged. To provide the study team with your comments, please email SheridanParkEA@rjburnside.com, or for further project information please contact Jennifer Vandermeer at 226-486-1559.

Thank you for your interest in this Class EA study.

Yours truly,

R.J. Burnside & Associates Limited

Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead
JCV::js

Enclosure(s) Notice of Commencement
Response Form

cc: Dana Glofcheskie, City of Mississauga (enc.) (Via: Email)
David Argue, Burnside (enc.) (Via: Email)

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: ______________________________
(Please Print)

Phone No.: ______________________________

Agency: ______________________________

Signed : ______________________________

Date: ______________________________

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?		
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?		

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

Continued on back

If there is a different contact for your organization that will be participating in the Stakeholder Advisory Committee, please let us know:	
Name:	
Address:	
Phone:	
Email:	

Please return this completed form by **February 16, 2017** to SheridanParkEA@rjburnside.com

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Appendix M2

Appendix M2

Project Contact List

Agency/Organization	Title	First Name	Last Name	Position	Address 1	Address 2	City	Province	Postal Code	Email	Telephone	Fax	NOCm Mailed (Jan 24, 2017)	NOCm Emailed (Jan 24, 2017)	NoPIC Mailed (June 12, 2017)	NoPIC Emailed (June 15, 2017)
Hydro One Networks Inc.	**Mr.**	**Walter**	**Kloostra**	**Manager, Transmission Lines Sustainment Investment Planning**	**483 Bay Street**	**North Tower, 15th Floor**	**Toronto**	**ON**	**M5G 2P5**	**w.d.kloostra@hydroone.com**	**(416) 345-5114**	**(416) 345-5443**	1			1
Hydro One Networks Inc.	**Mr.**	**Richard**	**Schatz**	**Senior Real Estate Coordinator**						**rick.schatz@hydroone.com**	**905-946-6233 416-735-2909 (cell)**					
Infrastructure Ontario	**Mr.**	**Keith**	**Noronha**	**Environmental Management, Team Assistant**						**Keith.Noronha@infrastructureontario.ca**	**(416) 327-2755**			1		
Infrastructure Ontario	**Ms.**	**Lisa**	**Myslicki**	**Environmental Specialist**	**1 Dundas Street West**	**Suite 100**	**Toronto**	**ON**	**M5G 2L5**	**lisa.myslicki@infrastructureontario.ca**						1
Infrastructure Ontario	**Mr.**	**Patrick**	**Grace**	**Director- Land Transactions, Hydro Corridors and Public Works**	**1 Dundas Street West**	**Suite 100**	**Toronto**	**ON**	**M5G 2L5**	**patrick.grace@infrastructureontario.ca**						1
Ministry of Environment and Climate Change - Environmental Approvals Branch										**MEA.NOTICES.EAAB@ontario.ca**						
Ministry of Municipal Affairs - Central Municipal Service Office	**Mr.**	**Mark**	**Christie**	**Manager, Community Planning and Development**	**777 Bay Street**	**13th Floor**	**Toronto**	**ON**	**M5G 2E5**	**Mark.Christie@ontario.ca**	**(416) 585-6063**	**(416) 585-6882**	1			1
Ministry of Natural Resources - Aurora District (Southern Region)	**Ms.**	**Jackie**	**Burkart**	**District Planner**	**50 Bloomington Road**		**Aurora**	**ON**	**L4G 0L8**	**jackie.burkart@ontario.ca**	**905-713-7368**	**905-713-7429**	1			1
Ministry of Natural Resources - Aurora District (Southern Region)	**Mr.**	**Mark**	**Heaton**	**Fish and Wildlife Biologist**	**50 Bloomington Road**		**Aurora**	**ON**	**L4G 0L8**	**mark.heaton@ontario.ca**						1
Ministry of Natural Resources - Aurora District (Southern Region)	**Mr.**	**Bohdan**	**Kowalyk**		**50 Bloomington Road**		**Aurora**	**ON**	**L4G 0L8**	**bohdan.kowalyk@ontario.ca**						1
Ministry of the Environment and Climate Change - Central Region	**Mr.**	**Trevor**	**Bell**	**Environmental Resource Planner and Environmental Assessment Coordinator**	**5775 Yonge Street**	**8th Floor**	**Toronto**	**ON**	**M2M 4J1**	**trevor.bell@ontario.ca**	**416-326-3577**		1			1
Ministry of Tourism, Culture and Sport	**Mr.**	**Dan**	**Minkin**	**Heritage Planner**						**dan.minkin@ontario.ca**						1
Ministry of Tourism, Culture and Sport - Culture Division	Ms.	Laura	Hatcher	Team Lead, Heritage Land Use Planning (Acting), Culture Services Unit	401 Bay Street	Suite 1700	Toronto	ON	M7A 0A7	laura.e.hatcher@ontario.ca	(416) 314-3108	(416) 314-7175	1			
Ministry of Transportation- Central Region	**Mr.**	**Jason**	**White**	**Manager (A)- Engineering Office**	**1201 Wilson Avenue, Building D**	**5th Floor**	**Downsview**	**ON**	**M3M 1J8**	**jason.white@ontario.ca**	**(416) 235-5575**	**(416) 325-8070**	1			1
Region of Peel	Ms.	Asha	Saddi		10 Peel Centre Dr.	Suite A	Brampton	ON	L6T 4B9	asha.saddi@peelregion.ca				1		
Region of Peel	**Mr.**	**Serguei**	**Kabanov**							**serguei.kabanov@peelregion.ca**						1
Region of Peel	**Ms.**	**Nicole**	**Sartor**	**Project Manager, Water Capital, Transmission & Distribution**						nicole.sartor@peelregion.ca	**905 791- 7800 ext. 7832**					
Region of Peel	**Ms.**	**Angela**	**Stockman**	**Technical Analyst- Water & Wastewater Program Planning**						angela.stockman@peelregion.ca	**(905) 791 7800 ext. 4143**					1
Region of Peel		**Eisa**	**Eisa**							eisa.eisa@peelregion.ca						1
Haudenosaunee Confederacy	Mr.	Hohahes Leroy	Hill	Secretary to Haudensaunee Confederacy	2634 6th Line	RR#2	Ohsweken	ON	N0A 1H0	jocko@sixnationsns.com	Cell: (519) 717-7326		1			
Haudenosaunee Development Institute	**Ms.**	**Hazel**	**Hill**	**Director**						**hdi2@bellnet.ca hazelehill@gmail.com**				1		1
Mississaugas of the New Credit First Nation	**Ms.**	**Fawn**	**Sault**	**Consultation Manager**	**R.R. #6**	**2789 Mississauga Road**	**Hagersville**	**ON**	**N0A 1H0**	**Fawn.Sault@newcreditfirstnation.com**	**905-768-1133**		1			1
Six Nations of the Grand River	**Chief**	**Ava**	**Hill**			**P.O. Box 5000**	**Ohsweken**	**ON**	**N0A 1M0**	**avahill@sixnations.ca; joannethomas@sixnations.ca**	**(519) 445-2201**		1			1
Bell Canada, Municipal Operations Centre	**Ms.**	**Diana**	**Velez**	**PUCC Mark-up Coordinator**	**200 Town Centre Boulevard**	**Suite 300**	**Markham**	**ON**	**L3R 8G5**	**Bell.moc@telecon.ca**	**(905) 470-2122 ext. 40309**			1		1
Enbridge Gas Distribution Inc.		**Arnel**	**Mangalina**	**Utility Mark-up Coordinator**	**500 Consumers Road**		**North York**	**ON**	**M2J 1P8**	**markups@enbridge.com**				1		1
Enbridge Gas Distribution Inc.	**Mr.**	**Marcel**	**Mallia**	**Planning Supervisor, Brampton**	**6 Colony Court**		**Brampton**	**ON**	**L6T 4E4**	marcel.mallia@enbridge.com	**416-758-4793 Cell: 416-884-3786**					
Enbridge Gas Distribution Inc.	**Mr.**	**Meetpal**	**Chhina**							**meetpal.chhina@enbridge.com**	**905-458-2159**					
Enbridge Pipelines Inc.	Mr.	Chris	Pincombe	Lands & ROW Administrator - Crossings, Eastern Region	Western Research Park	1086 Modeland Road, Bldg. 1050 1st Floor	Sarnia	ON	N7S 6L2	Chris.Pincombe@enbridge.com est.reg.crossing@enbridge.com	519-333-6753	519-339-0510	1			
Enbridge Pipelines Inc.	Ms.	Ann	Newman	Crossing Co-ordinator	1086 Modeland Road.	Building 1050, 1st Floor	Sarnia	ON	N7S 6L2	ann.newman@enbridge.com			1			
Alectra Utilities	**Mr.**	**Chris**	**Kafel**	**Manager, Design and Support Services**	**3240 Mavis Road**		**Mississauga**	**ON**	**L5C 3K1**	**chris.kafel@alectrautilities.com**	**905-283-4036**	**905-566-2737**	1			1
Alectra Utilities	**Mr.**	**Jimmy**	**Truong**	**Design Technician, Central Division**	**3240 Mavis Road**		**Mississauga**	**ON**	**L5C 3K1**	**jimmy.truong@alectrautilities.com**						1
Rogers Communications	**Mr.**	**Edgar**	**Henriquez**	**PUCC Mark-up Coordinator**	**3573 Wolfedale Road**		**Mississauga**	**ON**	**L5C 3T6**	**Edgar.henriquez@rci.rogers.com**	**(905) 897-6463**			1		1
Trans Canada Corporation - MHBC Planning, Urban Design & Landscape Architecture	**Ms.**	**Darlene**	**Presley**	**Planning Co-ordinator, EA contact**	**442 Brant Street, Suite 204**		**Burlington**	**ON**	**L7R 2G4**	**dpresley@mhbcplan.com**	**(905) 639-8686 x 229 (705) 627-2302 (cell)**	**(905) 761-5589**	1			1
Trans-Northern Pipelines Inc.	Mr.	Satish	Korpal	Coordinator, Crossings and Facilities	45 Vogell Road	Suite 310	Richmond Hill	ON	L4B 3P6	skorpal@tnpi.ca	(905) 770-3353 ext. 211	(905) 770-8675		1		
Union Gas Limited	**Mr.**	**David**	**Gadbois**	**Construction Project Manager**	**918 South Service Road**		**Stoney Creek**	**ON**	**L8E 5M4**	**dgadbois@uniongas.com**				1		1
Zayo	**Mr.**	**Ian**	**Fleming**	**PUCC Mark-up Coordinator**	**50 Worcester Road**		**Etobicoke**	**ON**	**M9W 5X2**	**Utility.Circulations@zayo.com**	**(416) 345-3406**			1		
City of Mississauga, Fire and Emergency Services	**Tim**	**Beckett**	**Fire Chief**	**Headquarters 15 Fairview Road West**			**Mississauga**	**ON**	**L5B 1 K7**	**tim.beckett@mississauga.ca**	**905-615-3750**			1		1
Credit Valley Conservation	Mr.	Liam	Marray	Senior Planner	1255 Old Derry Road		Mississauga	ON	L5N 6R4				1			
Credit Valley Conservation	**Mr.**	**Ken**	**Thajer**	**Regulations Officer, Planning**	**1255 Old Derry Road**		**Mississauga**	**ON**	**L5N 6R4**	**kthajer@creditvalleyca.ca**	**Toll Free: 1-800-668-5557; (905) 670-1615**	**(905) 670-2210**				1
Dufferin-Peel Catholic District School Board	**Ms.**	**Stephanie**	**Cox**	**Manager of Planning**	**40 Matheson Blvd. West**		**Mississauga**	**ON**	**L5R 1C5**	**stephanie.cox@dpcdsb.org**			1			1
Mississauga Accessibility Committee	**Ms. Ms.**	**Karen Allyson**	**Morden D'Ovidio**	**Legislative Coordinator**						**karen.morden@mississauga.ca allyson.dovidio@mississauga.ca (current contact)**	**905-615-3200 ext. 5471**			1		1
Mississauga Cycling Advisory Committee	**Ms.**	**Stephanie**	**Smith**	**Legislative Coordinator**	**300 City Centre Drive**	**2nd Floor**	**Mississauga**	**ON**	**L5B 3C1**	**Stephanie.Smith@mississauga.ca**			1			1
Peel District School Board	Ms.	Suzanne	Blakeman	Senior Planner/Manager	5650 Hurontario Street		Mississauga	ON	L5R 1C6				1		1	
Peel Regional Paramedic Services	**Ms.**	**Dana**	**Ralph Banke**	**Supervisor, Risk and Audit**	**5299 Maingate Drive**		**Mississauga**	**ON**	**L4W 1G6**	**dana.banke@peelregional.ca**	**(905) 791-7800 ext. 3931**	**(905) 206 - 9738**	1			1

Legend
Bold Text - Email Only
Grey Highlighted Cells - Do not send further correspondence

Agency/Organization	Title	First Name	Last Name	Position	Address 1	Address 2	City	Province	Postal Code	Email	Telephone	Fax	NOCm Mailed (Jan 24, 2017)	NOCm Emailed (Jan 24, 2017)	NoPIC Mailed (June 12, 2017)	NoPIC Emailed (June 15, 2017)
Peel Regional Police - 11 Division Office		**To Whom it May Concern**		**Superintendent, 11 Division; Officer in Charge**	**11 Division 3030 Erin Mills Pkwy.**		**Mississauga**	**ON**	**L5L 1A1**	**11div.superintendent@peelpolice.ca**	**(905) 453-2121 ext. 1100**		**1**			**1**
Sheridan Homelands Ratepayers' Association	**Mr.**	**Brandon**	**Weidemann**	**President**	**6 – 2400 Dundas Street**		**Mississauga**	**ON**	**L5K 2R8**	**president@shora.ca**			**1**			**1**
Sheridan Park Association	**Dr.**	**Richard**	**Perrier**	**President**						**Richard.perrier@petrocanadalsp.com**				**1**		**1**
Traffic Safety Council	**Ms.**	**Angie**	**Melo**	**Legislative Coordinator**	**300 City Centre Drive**	**Clerks Office**	**Mississauga**	**ON**	**L5B 3C1**	**angie.melo@mississauga.ca**	**905.615.3200 x 5423**	**905.615.4181**	**1**			**1**

Legend
Bold Text - Email Only
Grey Highlighted Cells - Do not send further correspondence

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Appendix M3

Notice of Study Commencement Online Survey

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

____

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ○ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ◉ No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ◉ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

It will reduce the traffic on Homelands drive

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ________

Do you have any other questions, comments, or suggestions for the Project Team?

____

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
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- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- (•) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

____

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
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To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [ ] Walk
- [x] Other: Bus

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- (•) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	(•)	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

I don't believe the proposed extension will in any way improve connectivity or traffic flow. I have taken this route for the past 25 years and can tell you the problem is the major roads ie: Winston Churchill Blvd and Erin Mills Parkway...they are both parking lots during rush hour. The only thing this proposed project will achieve is loss of forest and unique wildlife as well as the piece and serenity it offers to bikers, walkers and joggers...what a shame.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

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- [x] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	◉	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

its about time this got done!

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ○ Yes – please contact me via email
- ◉ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

It is a good idea but could become a raceway like homelands.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: My house backs on to the right-of way, so my experience is as a viewer.

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

Immediate thoughts, with no doubt more to follow as reporting takes place:

- I am imagining that the new roadway will be two lanes, given that Sheridan Park Drive to the east of the study area is two lanes, and not in the study area. Is this the thinking?
- I look forward to studying origin-destination traffic data, particularly the extent to which through traffic, unrelated to the Sheridan Park research centre, is anticipated to be of significance.
- Is a traffic signal planned for the corner of Sheridan Park Drive and Homelands-Speakman?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	◉	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
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Do you have any other questions, comments, or suggestions for the Project Team?

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ◉ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

I enjoy the pathway that is already there. I would not like the road to be extended. There is already enough traffic with the commercial area. I do not wish for their to be more cars as i live right near that intersection. I enjoy the forest and the open field where i can walk my dog peacefully without the fear of cars. Traffic is already heavy enough. We do not need more cars cutting through the neighbourhood.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: It should not be extended

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

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- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

Please do not extend the street

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: would not use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: addressed email

Do you have any other questions, comments, or suggestions for the Project Team?

yes how much of the greenery and forest would we loose. how is the neighbour hood going to be protect from the added noise

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ◉ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

The woodlot adjacent to sheridan park corporate centre and the proposed sheridan park extension is a much treasured asset to the neighbourhood. It is important to leave it much as it is. The many trails criss crossing this natural beauty display the value of this area not only to the natural world but also to us humans.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ◉ Other: The lossof peace andquiet during walks in the area.

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

I believe it will detract from the appeal of the neighboring residential areas and the increased traffic will reduce the enjoyment of the existing greenbelt that is presently in place. I personally would not be in favor of the extension.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

This will negatively affect the area and increase traffic and decrease safety in the area

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Yes – please contact me via regular mail
- ◉ No – I do not wish to be contacted in the future

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To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: There is no need for a road there whatsoever. It will be too close the natural conservations area and protected park.

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ◉ Other: The area is perfect as is with a bike and walk path. It is used by kids, cyclist and pet owners. Putting a road there endangers small children and kids that go to Homelands school.

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

In summary, there is no need for a road here, traffic in this area is not congested in any way. Creating a road between Sheridan Park and Winston Churchill will create an excuse for drivers to speed through a park, school area and people's back yards.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (●) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: We can already bike and walk. PLEASE NO DRIVING!!

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

Please we beg you, do not build a road. Our backyards face that area. The traffic is fine in this area, stop destroying the natural environment. THIS IS AN UNSAFE IDEA FOR CHILDREN! A SCHOOL BACKS OUT INTO THIS AREA. You guys want people flying through this area? I will protest. You cannot build a road there.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [x] Walk
- [x] Other: Maintain as community green space

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

Please consider the impact on local wildlife as the current space serves a corridor for many species, and continues directly into Oakville's Winston Park. This space is currently used by many residents for walking, jogging, and cycling. Ward 2 Councillor pledged to protect green spaces like this in her campaign platform so please involve her office in planning and discussions.

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- ◉ Yes – please contact me via email
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Not use it,there is a walking path already in the area.

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ◉ Other:
Not important for me.the extension would have negative effect on natural,social and cultural environment,more cars ....more pollution.....more noise.....less friendly environment.

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: SHORA ....

Do you have any other questions, comments, or suggestions for the Project Team?

Would the extension...warrant the cost to save shorter driving time to connect east to west via the proposed extension? There does exist and east to west connection via Speakman dr....Why is this extension being proposed? Is there going to be a school proposed in the AECL building? This would mean more traffic ,more air ,noise pollution and effect the natural environment.This is a NIMBY issue,even more so when there is an existing roadway that services the east/west traffic flow via Speakman dr.There are other pathways into this area via North Sheridan Way .

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- (•) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Would not use.

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

What efforts are being taken to ensure this extension doesn't become a racetrack? There are limited businesses that would benefit from this access, so the primary purpose of the extension is to connect Erin Mills Pkwy and Winston Churchill Blvd. While this would re-direct some traffic from Homelands Dr, it could create an expressway between the two major arteries.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: It affords me no benefit beyond reducing cut through traffic on Homelands Drive

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ◉ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: ratepayer newsletter/meeting notes

Do you have any other questions, comments, or suggestions for the Project Team?

The hydro right of way open space has become a defacto private park for some of the residents of Hollington and Barcella Crescents. Any project objections based on noise or reductions in quality of life are likely attempts to maintain the status quo on spurious grounds. Meanwhile, traffic flow, particularly at the West end of Homelands Drive continues to increase.

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	(•)	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

____

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Facebook

Do you have any other questions, comments, or suggestions for the Project Team?

Absolutely do not want a road running through backyards. Find way to make traffic leading out of Sheridan park within Sheridan Park not come any closer to the neighbor adjoining Sheridan Homelands.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ( ) Yes – please contact me via email
- (●) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: i belong to SHORA

Do you have any other questions, comments, or suggestions for the Project Team?

I would hate to see the forest area destroyed because of a road. There are 2 roads that people can access from Winston Churchill over to Erin Mills Parkway. If a road was put in then a concrete sound barrier would have to be erected for noise control.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ● Traffic Calming
- ○ Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	●	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

____

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: None of the above

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

I bought this house on Barcella because of the nature and forestry that is visible from my backyard. Very peaceful and serene. The thought of having cars zooming by my backyard sickens me. I don't appreciate having gas fumes coming into my back yard from the cars that will be driving by, especially when I barbecue in the summer. The proposed street will only cause more traffic to and from Winston Churchill. It's bad enough that a walkway was made in the field as it is majorly used for people to walk their dogs leash free and allow them to crap everywhere. Where is the city for that clean up?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (●) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
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- [ ] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: rate payers association

Do you have any other questions, comments, or suggestions for the Project Team?

I don't think this will do much to reduce traffic through the subdivision as there is already a parallel route to this one (Speakman Drive) so why are we doing this. Will become a drag racing road at night. Also please don't disturb the bush-we need more of it not less

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

- Replacing green space with a roadway that I do understand the need for, seems counterintuitive to protecting green space in Mississauga.
- How would the speed of cars be controlled on this straight stretch of roadway?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: would not use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- ☐ advertisement in Mississauga News
- ☑ advertisement received via mail
- ☐ advertisement received via email
- ☐ browsing City of Mississauga website
- ☐ Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

i do not feel that this project is need it. it is not necessary to disrupt the nature on the path and add a road. there are enough roads there for people to use we would like to keep a little of the green that we have.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- ☐ Drive
- ☐ Bike
- ☐ Walk
- ☑ Other: would not use

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

do not want a road there

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ○ Yes – please contact me via email
- ◉ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: dont think i would use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

dont think this project is necessary

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- ◉ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: do not think that i would use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	◉	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

most people that i have spoke with do not want this so really what and who is this an advantage for

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ○ Yes – please contact me via email
- ◉ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Mostly not use

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

There is not enough traffic to warrant this extension. The area is very quiet at night but is a racetrack for noisy motorcycles and cars etc late at night.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: No

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ◉ Other: Flooding and rodent infestation in the homelands area

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: at failed town hall meeting in the sheridan homelands area due to allowance of more schools causing excess traffic in area

Do you have any other questions, comments, or suggestions for the Project Team?

look into the original reason for study and why it will create unesessary expense and loss of nature

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (●) Yes – please contact me via email
- ○ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [x] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
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Do you have any other questions, comments, or suggestions for the Project Team?

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Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Thank goodness this extension is finally being considered. Too long in coming.

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- ○ Cycling
- ○ Landscaping
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- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	◉	○	○	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Is there an upcoming meeting regarding this study?

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- ☐ Drive
- ☑ Bike
- ☑ Walk
- ☐ Other: ____________

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- ○ Pedestrian facilities
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- ○ Landscaping
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- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Must include significant community enhancements to gain support from homes that back onto study area. parks, recreation/exercise equipment, benches, trees.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Trick question. There's already a multi-use trail for the entire length, so only drivers can derive any benefit at all from an "extension" (actually a widening to >3 times the current width)

If Sheridan Park Drive is extended what is important to you?

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- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____

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Not at all	○	○	○	○	◉	Very Comfortable

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I don't see any need for this project except as part of a new development that would front onto it. There is and will be plenty of space for drivers on Speakman. It would make so much more sense to save the money meant for this project and use it to gradually paint bus lanes on six-lane streets across the city. Eglinton, Mavis and Dixie would all benefit hugely. Hurontario too as a prelude to the LRT. (And when I say hugely I do mean hugely. Peak runs on Hurontario and Eglinton spend about 30% of their time stuck in traffic, with the other two close behind at 25%.)

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- ( ) Traffic Calming
- ( ) Other: ____________

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Not at all	( )	( )	( )	( )	(●)	Very Comfortable

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- [ ] Walk
- [ ] Other: ____________

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- ( ) Pedestrian facilities
- (•) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

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	1	2	3	4	5	
Not at all	( )	( )	(•)	( )	( )	Very Comfortable

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- [ ] Drive
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- [ ] Other: ______________

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- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very Comfortable

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
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Do you have any other questions, comments, or suggestions for the Project Team?

Speakman, N Sheridan Way, Hawden & Flavelle are all underutilized by cars, so NO reason to open it for driving. The pathway is well used by pedestrians, especially those who want to get away from cars, their noise and their smells. It also offers a chance to walk in a more natural setting which is highly desirable. Opening it to cars risks it becoming a speedway.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [x] Other: already enough roads for cars

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	●	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

Speakman Drive, North Sheridan way, Hawden Road and Flavelle are all currently underutilized. Pathway between Erin Mills Parkway and Winston Churchill has heavy foot and bike traffic and a thru road would likely deter people from use of this quiet area. Potential for the extension to become a speedway between Winston Churchill and Homelands Drive

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- [x] Walk
- [ ] Other: ______

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- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	●	○	○	○	○	Very Comfortable

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I currently use to walk, run and bike, and play with kids because there is no vehicular traffic

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

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- [ ] browsing City of Mississauga website
- [x] Other: Meeting

Do you have any other questions, comments, or suggestions for the Project Team?

Full disclosure- I live in the area that would be affected if decision was to proceed, but I truly believe that the rationale that has been presented is vague, unconvincing and frankly I cannot see how the proposed development would deliver the purported benefits. I'd really like to understand how building this better serves any of the constituent groups listed; tech park, employees, residents, pedestrians or even motorists. Surely encouraging further through traffic (no economic benefit) into this area can only make it a less safe and pleasant environment to live or work in. If there was a game-changing economic impact I'd get it...but really, is there?

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- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
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- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

What would happen to the existing multi-use trail if Sheridan drive is to be extended?

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- [ ] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Why is it even necessary to open the road when there are several alternatives that do not infringe on the quiet parklike current setting? Who is pushing for this and why?
I am concerned to see yet one more disruption of the natural lands in this area since we moved here 45 years ago, all in the name of progress. The City has made no effort to preserve the many woodlots originally in the area nor provide for wildlife corridors in the area. There are too many examples of urban wildlife in our backyards that would be happier in woodlot settings. In the past two days we have had two hawks, a raccoon, a skunk, numerous squirrels and wild birds in our small yard.
I reject the plan due to the additional noise in the neighbourhood that this thoroughfare will generate. For the last few decades, the roar from the QEW infringes increasingly on our quiet enjoyment of our property in the Sheridan Homelands.
Past 'designers' would have been much smarter to have provided pedestrian walk-throughs along the southernmost boundary of the subdivision to provide access to Sheridan Park as were made to access Thornlodge Park. Another vehicular road should not be required for this.
I categorically oppose the proposed development that has no redeeming virtues that I can see for the subdivision or the resident companies of Sheridan Park. It is too bad that planners seem to exercise so little common sense these days.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I would rarely use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
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This area of the Homelands provides a natural buffer between the QEW and the residential area and any increase in traffic and resulting noise would be unacceptable. Residents of the Homelands would not use this extension as homes are accessed via the roads within the subdivision. This area along with the research centre has remained static for at least forty years and I have never noticed any problem with traffic circulation. Maintaining green space and providing habitats for various animals is much more important. A bike/walking pathway already exists and provides residents with any access to the woodlot desired. The destruction of the woodlot/park area that would be required for an extension is unnecessary as the ring road throughout the research centre provides adequate access to the various companies, very few, if any, of which are open during the weekend.

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Not at all	○	○	○	○	◉	Very Comfortable

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- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

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Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

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Not at all	○	○	○	○	◉	Very Comfortable

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- [x] Other: SHORA Facebook page

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- [ ] Other:

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- ○ Other:

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Not at all	(•)	( )	( )	( )	( )	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Long overdue project, will help alleviate through traffic along Homelands

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- [ ] Walk
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- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- (•) Traffic Calming
- ( ) Other:

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	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Sheridan Homelands assoc

Do you have any other questions, comments, or suggestions for the Project Team?

This will reduce traffic through remainder of Homelands area traveling from Erin mills to winston Churchill. Currently this traffic runs through residential areas and will move to a commercial area which is more suited

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I wouldn't use it. Its for people from Oakville!

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Is this required because of Oakville boom in population with no improvement to their east west corridors.

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- ○ Other:

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Do you have any other questions, comments, or suggestions for the Project Team?

Please ensure that the walking path is kept. An extension will ease traffic in the homelands but please keep the speed low

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- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I do not agree with the extension

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ◉ Other: Do not agree with extension

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

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- [x] Other: Facebook via SHORA

Do you have any other questions, comments, or suggestions for the Project Team?

People should be encouraged to take transit, car pool or other means such as employers staggering work hours, or staff to work from home to decrease congestion. This area is home to many animals and birds which will be impacted. I am opposed to this project in my neighbourhood as it will likely increase traffic, increase noise pollution, and disrupt the small ecosystem. There is a path for pedestrians and cyclists. I do not see a benefit for the neighbourhood by extending this street for vehicles.

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Not at all	○	○	◉	○	○	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

I think a lot of people walk their dogs in that area, departing from the footpath just north of it. If a road is put in, I recommend some provision for pedestrians to cross the road safely, as I expect some motorists will speed along the new, straight, flat road. But Mississauga has no "pedestrian crossings".

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Not at all	○	○	●	○	○	Very Comfortable

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	1	2	3	4	5	
Not at all	( )	( )	(•)	( )	( )	Very Comfortable

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Facebook

Do you have any other questions, comments, or suggestions for the Project Team?

Why do they feel this is necessary? Will there be homes built here?

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Not at all	(•)	( )	( )	( )	( )	Very Comfortable

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- [ ] browsing City of Mississauga website
- [x] Other: Facebook

Do you have any other questions, comments, or suggestions for the Project Team?

Don't think it should be made for vehicles

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Not at all	○	○	○	○	◉	Very Comfortable

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- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Sheridan Ratepayers Association

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Not at all	( )	( )	( )	( )	(•)	Very Comfortable

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- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

Sheridan Park Drive has been in the city plans for over 40 years....just complete and open the road for those working and living in the area as a means of east/west travel to Erin Mills Parkway or Winston Churchill Blvd. Stop using tax monies for further studies.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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	1	2	3	4	5	
Not at all	○	○	○	○	●	Very Comfortable

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- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

As mentioned before please consider the people who live in this community. This is a classic neighborhood in Mississauga and most people live here because they don't want to be crammed in a new development with a hundred side roads and multiple corridors to have traffic going in and out of. Please do not disrupt what is already here with through traffic looking to get from Winston Churchill to Erin Mills parkway in a hurry.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ( ) Yes – please contact me via regular mail
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Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I won't use it

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	(•)	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

I'm worried of getting a heavy traffic on the extension of Sheridan Park, which would affect the neighbourhood and the bike path. It would need cutting of trees, it would mean noise and pollution on people living nearby, and would promote car traffic instead of carpooling or use of public transportation.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Other: ______

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	1	2	3	4	5	
Not at all	○	◉	○	○	○	Very Comfortable

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Not at all	( )	( )	(●)	( )	( )	Very Comfortable

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Not at all	○	○	○	○	◉	Very Comfortable

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12/12/2017 Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

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Not at all	( )	( )	( )	( )	(•)	Very Comfortable

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

It's been like this for 40 years. I do not see a need for it to change. I do not believe that it will help Sheridan Park Research Center traffic, it may actually increase it. Nobody wants lights at Sheridan Park and Homelands. What will increase is flow through traffic between Erin Mills and Winston Churchill, particularly when it is rush hour and heavy traffic on QE. I walk by the Homelands/Sheridan Park Drive intersection when employees are leaving that area. It takes no more than a few minutes to get through that intersection at the busiest of times. Please let me know what makes anyone think there is a need for this. What study was done and what were the results.

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Do you have any other questions, comments, or suggestions for the Project Team?

This is route the children walk to school (IONA Catholic Secondary School) will this be taken into consideration. What about the wildlife - trees and current path how will this be affected?

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	1	2	3	4	5	
Not at all	○	○	◉	○	○	Very Comfortable

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- [x] Other: Sheridan Times eblast

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why is this project being considered?

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	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

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- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

I think it's a terrible idea to extend this road as it will be used heavily as an alternate to Dundas street.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Traffic along Homelands Drive is terrible and it is being used as a through street by commuters. This is creating unsafe conditions for our residents and their children. Please open Sheridan Park Drive and institute more traffic diversion methods to get the through traffic OFF of Homelands which is a residential street.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

I would like to see entrances/roads leading off proposed extension from HL to WC, as it is now, increased vehicular traffic at Homlands & SP drive is heavy with schools (3 in the area;.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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Sooner the better

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

If this does go ahead (which I hope doesn't), I don't want to be able to see the road from the existing bicycle path. A natural barrier of trees will need to be planted to block the noise and the sight of cars. The existing natural habitat for the birds and animals needs to be preserved as much as possible and additional natural vegetation will need to be planted on the backyards of the homes that line the pathway. This is the only natural green space in Sheridan Homelands. Don't ruin it.

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Do you have any other questions, comments, or suggestions for the Project Team?

Speeding is already a major concern in this area, even through the school zones, and the constant running of stop signs. Concerned that this will just significantly increase the danger of cycling, etc. in this area.

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I support expanding the road.

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Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Shora

Do you have any other questions, comments, or suggestions for the Project Team?

I am concerned that extending Sheridan Park Dr. will increase the flow of traffic through the neighbourhood dramatically. Rather than use the service road or Dundas, non-local traffic will use Sheridan Park Dr. to move quickly from Winston Churchill to Erin Mills Parkway. The volume of traffic will be such that traffic lights will have to added. 4-way stops will be insufficient. Also, traffic currently using Homelands will be little alleviated as it is often local or headed to and from Woodchester Mall and the big box stores on Bristol circle. Finally, this is one of the few remaining natural areas left in the neighbourhood. A thoroughfare and traffic circle would end up destroying much of it.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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Not at all	○	○	◉	○	○	Very Comfortable

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- ○ Other: ____________

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	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

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- [x] Other: SHORA

Do you have any other questions, comments, or suggestions for the Project Team?

Have you considered how extending Sheridan Park Drive will affect traffic along the existing portion? Would a traffic light be needed at Sheridan Park Drive and Fifth Line West? Please don't put in a roundabout. Either a simple stop sign or a traffic light are much preferred.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

Homelands Drive has become a short cut for through traffic from Erin Mills Pkwy to Winston Churchill Blvd, this is a hazard for School children in the area. Also getting out of driveways during rush hour has become risky. This road needs to be built ASAP

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- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ◉ Traffic Calming
- ○ Other: ____________

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Not at all	○	◉	○	○	○	Very Comfortable

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	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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- ☐ advertisement received via email
- ☐ browsing City of Mississauga website
- ☑ Other: sheridan homelands newsletter

Do you have any other questions, comments, or suggestions for the Project Team?

yes! It seems from the survey questions that this extension will happen. None of the questions even ask if I am opposed. The current walking path is used all day long and enjoyed by all who use it. It is a nice quiet place to exercise and reflect. I feel that traffic just meters away (with or without a tree/shrub barrier) would detract from the current quiet. This roadway would be used instead of Homelands by many. Without proper slowing mechanisms, it could become a raceway by some. The corner of Speakman/Homelands/Sheridan Park Dr has become a very busy intersection during high traffic. Aside from the research buildings, there are now several schools. Students are dropped off and picked up by parents (mostly) rather than buses causing further congestion.

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Do you have any other questions, comments, or suggestions for the Project Team?

Our family is anticipating this road expansion, in hopes it will alleviate excessive traffic on Homelands Drive.

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- ○ Landscaping
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- ○ Traffic Calming
- ○ Other: ____________

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Not at all	○	●	○	○	○	Very Comfortable

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- [ ] browsing City of Mississauga website
- [x] Other: SHORA - I guess I'm a member of this

Do you have any other questions, comments, or suggestions for the Project Team?

I've lived in the Homelands since 1990 and this has been an issue since before I arrived here. I think a lot of people cut through the neighbourhood on Homelands and a more direct route makes sense. I do like the bike path that is already on Sheridan. If there is a way to get the buses out of the neighbourhood that would be great. I say that out of self interest since we have a bus stop in front of our house and I often hear the bus stop at 5:04 am weekdays and the very loud recorded voice from the bus announce the current stop or the upcoming stop. Not cool. I'll complain to Miss Transit but I thought I should share my pain with you as well. Over all, less traffic on Homelands would benefit the whole neighbourhood and the Sheridan Park Drive extension would go a long way to achieve this. It's a win for the drivers, pedestrians, and residents. Don't you think?

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	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

The sooner this is done the better. Traffic on Homelands is heavy and too fast. And nobody seems to want to stop at stop signs to let pedestrians cross!

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Not at all	○	○	○	◉	○	Very Comfortable

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- [ ] browsing City of Mississauga website
- [x] Other: Karen Ras Meeting and SHORA Newsletter

Do you have any other questions, comments, or suggestions for the Project Team?

I hould hope this road would not turn into a drag strip during off peak hours.I would like to see safe walking and biking paths created and maintained

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Do you have any other questions, comments, or suggestions for the Project Team?

I am completely opposed to the extension- it will bring noise and safety issues to those of us who live near it...

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- ☑ Other: sheridan homelands ratepayers assocition

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you mention issues, what are they?

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- ☐ Drive
- ☐ Bike
- ☑ Walk
- ☑ Other: Additional housing with residential street access only

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Do you have any other questions, comments, or suggestions for the Project Team?

How will you assure that this extension is not used excessively as a cut through between Winston Churchill and Erin mills?

I have experienced that partial stops are already common at the intersection between Homelands and Sheridan park...as a simple road extension would likely make it more crowded and not safer for the play park at that intersection.

There is a need for more housing in the area which In turn provides more options to workers in Sheridan park to stay local. By combining housing with an extension the city plan would allow the area to prosper while assuring that there is less "highway" like traffic on the proposed street extension.

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- [x] Other: I won't use it

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- ◯ Traffic Calming
- ◯ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◯	◯	◯	◯	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: SHORA newsletter

Do you have any other questions, comments, or suggestions for the Project Team?

I am skeptical of the extension. I am worried about increased noise, traffic, and loss of wildlife space. There is a lot of wildlife in this area which must be considered. A major factor for us moving to our home was the field, trees, and wildlife and not staring at the sides of office buildings.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ◯ Yes – please contact me via regular mail
- ◯ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(●)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [x] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: letters to homeowners

Do you have any other questions, comments, or suggestions for the Project Team?

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- ☐ Drive
- ☐ Bike
- ☐ Walk
- ☐ Other: ____

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very Comfortable

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- ☐ advertisement received via mail
- ☐ advertisement received via email
- ☐ browsing City of Mississauga website
- ☐ Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

I am opposed to this extension. There is no valid reason to do this and it will just create more traffic noise near my home. You will also be disturbing wildlife in the area.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- (•) Traffic Calming
- ( ) Other: ____________

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	1	2	3	4	5	
Not at all	( )	( )	( )	(•)	( )	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

I hope it eases traffic on Homelands , people use Homelands Dr. as a shortcut to there destination.

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Not at all	( )	( )	( )	( )	(•)	Very Comfortable

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Do you have any other questions, comments, or suggestions for the Project Team?

If extension of Sheridan Pk.Dr. would be realized traffic lights must replace inefficient and enviormently prohibitive stop signs along the way

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- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ● Traffic Calming
- ○ Other: ____________

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	1	2	3	4	5	
Not at all	○	○	○	○	●	Very Comfortable

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- ( ) Traffic Calming
- ( ) Other: ________

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Not at all	( )	( )	(•)	( )	( )	Very Comfortable

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- [ ] browsing City of Mississauga website
- [ ] Other: ________

Do you have any other questions, comments, or suggestions for the Project Team?

On all the maps I have not seen North Sheridan Way. There are many businesses and much traffic that use this street. Do we really need another roadway to cut through the area?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- [ ] Other: ____________

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- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

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- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

Please make a walk thru path via hollington crescent. Thankyou.

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- [x] Drive
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- [ ] Other: ______

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- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

12/12/2017 Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Sheridan Homelands Ratepayers Association email list

Do you have any other questions, comments, or suggestions for the Project Team?

When would it be built?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
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- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

Could you please include direction to improve landscaping along the Hydro Corridor and the additional plot of land just north of the billboard along Winston Churchill. These lands are not cared for at all and will be an eye sore for those driving by.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [x] Other: New bus route

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	(•)	( )	( )	( )	Very Comfortable

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- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

When will Mississauga finally get its first protected bike lane? Why are we so afraid to provide such basic, globally-proven best practices for a sustainable mode of transportation? Separate asphalt trails are not an effective means to commute - they are isolated, rarely connect to places of work, often twisting and turning, and best for recreation. Let's get serious and make all of Sheridan Park Drive (not just the extension) the first road in the city to have protected bike lanes (either raised, separated with concrete barriers/bollards, or a planter buffer). Sidewalks are a must, but based on the limited need in this area, should only be considered for one side (the north side), and circle around to become two-sided on roundabouts and the streets which branch off at right angles into the research park, so that every workplace can be accessible by foot. Encroachment and removal of trees/meadow should be avoided, as that long naturalized area where the current trail stands serves as a rare, large, linear, habitat for a number of species, and is maturing to provide significant environmental benefit to the city (as well as a noise buffer to resident). I hope the city is wise to maintain the full length of this natural area (including the meadow - this is key!) and focus on developing lands to the south (entering the natural area to the maximum as Exova, for comparison). Sufficient access and future demand can be handled by the current roads which already branch off the segments of Sheridan Park Dr., namely Speakman Dr. - this new road should be a linear through-road for access across, and to, Speakman Dr., rather than for the creation of new roads that would fragment the forest and meadow, with no benefit. As a result, since there should only be two T-junctions (as there are already) within Sheridan Park Dr., there is no need for a roundabout at this site - unless it is being considered for Erin Mills Pkwy, Fifth Line, Speakman/Homelands and Winston Churchill, where it could provide significant long-term efficiencies and cost-savings.

A new bus route should also be considered for this area, once the research park begins to be redeveloped (and hopefully intensified, with much taller buildings, and innovation industry/commercial/tech). One option for the route could be a loop: Sheridan Bus Terminal (new bus stop*)>Fowler Dr.>Lincoln Green Way>Sheridan Park Dr.>Plymouth Dr.>Bristol Cr.>Plymouth Dr.>Sheridan Park Dr.>Speakman Dr.>Hadwen Rd.>N Sheridan Way>Erin Mills Pkwy>Sheridan Bus Terminal *(create a new bus stop across current Sheridan Bus Terminal, since bus continues on loop, in opposite direction of all other arriving bus routes). Finally, this street should use all possible best practices in LID and smart technology - let's make this a street of firsts, in a place to be celebrated for it's research. Let's make the street with state-of-the-art permeable pavement, with electric heating under the paths, bike lanes, and car lanes, so no salt is ever required. All rain/snow will be collected on-site through bioswales which feed into a new SWM wetland, generously planted, with a visitor look-out and signage - NOT like the massive, heavily fenced/secured (often eroding) SWM facilities being built all over the city.

This one will focus on ecological function, and should have a small boardwalk to explore the site, as well as low wooden fence to keep people away from the peak possible flood height. As for electricity, power will be provided and stored on-site, with a thin linear "solar park", with small vertical wind turbines, if possible, storing power year-round in Tesla power packs (available now) amidst a wildflower-seeded meadow, which requires little to no maintenance. The stored/generated power will run both the LED streetlights, signals, traffic lights, a lit "gateway sign" welcoming people to the park from either end, and electric heating in the winter. Landscaping should be generous, showcasing a diversity of native plants, with trees planted along both sides of the street, and generous flowers, shrubs, and grasses. Signage and labels will highlight the technology and native species along the way, with an opportunity for additional activity on the north sidewalk, such as interactive art, an "exercise walk" of hand/leg-powered machines (like in Meadowvale), and historical signage, denoting what was once here (from Indigenous history, to farming, forestry, and now the story of our city, moving forward). All of this would greatly enhance the site, at relatively low cost (think of the money saved through these initiatives long-term, too!), and perhaps even support greater research investment and tourism!

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [x] Walk
- [ ] Other: __________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: __________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
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Not at all	(●)	( )	( )	( )	( )	Very Comfortable

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- [ ] browsing City of Mississauga website
- [x] Other: Google search

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- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Community meeting

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The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ◉ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

______

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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- [x] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ______

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	●	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Facebook friend spread the word

Do you have any other questions, comments, or suggestions for the Project Team?

______

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Path already exists for walking and biking

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

Protecting natural habitat for wild life

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- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Path exists for walk/bike

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Wife

Do you have any other questions, comments, or suggestions for the Project Team?

Excessive traffic brought to area

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: Not use it

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

This steet is going to be a long straight. People will be racing up amd down the new stretch. The area is peacfull amd quite were people walk with theit kids and coworkers at lunch. Adding a road way will have a negative impact om healtglh

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
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- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____

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- [x] Drive
- [x] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	(•)	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: Twitter

Do you have any other questions, comments, or suggestions for the Project Team?

____

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- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: I would not use it

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- (•) Other: Noise, excessive traffic, and pollution

12/12/2017 Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(•)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: From a neighbour, because there has been no information shared with residents of Sheridan Park it has been very difficult to find information about this proposal.

Do you have any other questions, comments, or suggestions for the Project Team?

When will consultation with people in Sheridan Park take place? Why are the previous studies that have been done to date not been taken into account. It is very concerning that this is being planned without proper public consultation.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	(•)	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

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- ( ) Yes – please contact me via email
- (•) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [x] Bike
- [x] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: a neighbour

Do you have any other questions, comments, or suggestions for the Project Team?

No residential nor commercial development should be done here.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ◉ Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: None of the above

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ______

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [ ] Other: ______

Do you have any other questions, comments, or suggestions for the Project Team?

The extension will create more traffic thru the area, least needed in this area.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

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- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [x] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(●)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [x] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: SHORA residence association

Do you have any other questions, comments, or suggestions for the Project Team?

Will installing the new section of Sheridan Park decrease the traffic on homelands and Thorn lodge, especially in the school zones?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (●) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- (•) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: SHORA monthly newsletter

Do you have any other questions, comments, or suggestions for the Project Team?

This extension is long overdue!

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other: ____

Do you have any other questions, comments, or suggestions for the Project Team?

Benefits of maintaining the green space as is, greatly outweigh any traffic improvements. Don't do it.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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- [ ] Drive
- [ ] Bike
- [x] Walk
- [ ] Other: ____

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other: ____

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	( )	( )	( )	( )	(•)	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [ ] browsing City of Mississauga website
- [x] Other: friend

Do you have any other questions, comments, or suggestions for the Project Team?

This area is a part of a greenway and a great place to walk with many birds found in the shrubby area including red tailed hawks, warblers, and mockingbirds. I am concerned that construction of a road will remove the area that is preferred by these species and add to the habitat loss that is seen throughout the city. I am also concerned that by putting a road there even more forest will be removed for more businesses that would now have access to that new section of road.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- (•) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- ( ) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [ ] Drive
- [ ] Bike
- [ ] Walk
- [x] Other: please leave it alone

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- (•) Maintaining natural features
- ( ) Traffic Calming
- ( ) Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	(●)	( )	( )	( )	( )	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

Please cancel this project.

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ( ) Yes – please contact me via email
- ( ) Yes – please contact me via regular mail
- (●) No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other:

If Sheridan Park Drive is extended what is important to you?

- ( ) Pedestrian facilities
- ( ) Cycling
- ( ) Landscaping
- ( ) Maintaining natural features
- ( ) Traffic Calming
- (●) Other: maintaining separation for the Sheridan Homelands community from new traffic

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- ☐ advertisement in Mississauga News
- ☐ advertisement received via mail
- ☐ advertisement received via email
- ☐ browsing City of Mississauga website
- ☑ Other: Community newsletter

Do you have any other questions, comments, or suggestions for the Project Team?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- ☐ Drive
- ☑ Bike
- ☑ Walk
- ☐ Other:

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ◉ Maintaining natural features
- ○ Traffic Calming
- ○ Other:

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	◉	○	○	○	○	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- ☐ advertisement in Mississauga News
- ☐ advertisement received via mail
- ☐ advertisement received via email
- ☐ browsing City of Mississauga website
- ☐ Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

Do not urbanize the area

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

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If Sheridan Park Drive is extended how would you use it?

- ☑ Drive
- ☐ Bike
- ☐ Walk
- ☐ Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ◉ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ○ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [ ] advertisement received via mail
- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other: ____________

Do you have any other questions, comments, or suggestions for the Project Team?

When would this project be completed?

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

Sheridan Park Drive Extension Environmental Assessment - Study Commencement Survey

The City of Mississauga is undertaking a Municipal Class Environmental Assessment (EA) study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.

Consultation is an important part of the Municipal Class EA process. Please let us know your thoughts about the proposed extension and study using this survey.

To find out more about project announcements and other information please visit the project website: www.mississauga.ca/sheridanparkea

If Sheridan Park Drive is extended how would you use it?

- [x] Drive
- [ ] Bike
- [ ] Walk
- [ ] Other: ____________

If Sheridan Park Drive is extended what is important to you?

- ○ Pedestrian facilities
- ○ Cycling
- ○ Landscaping
- ○ Maintaining natural features
- ◉ Traffic Calming
- ○ Other: ____________

If roundabouts were to be considered as part of the Sheridan Park Drive extension, how comfortable are you with roundabouts?

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How did you hear about this Class EA study? Check all that apply.

- [ ] advertisement in Mississauga News
- [x] advertisement received via mail
- [ ] advertisement received via email
- [x] browsing City of Mississauga website
- [ ] Other:

Do you have any other questions, comments, or suggestions for the Project Team?

I have not seen many people walking or biking on this road we could use it for traffic calming and residents/school kids safety. we need a community center in this area

Would you like to receive updates about the Sheridan Park Drive Extension Class EA from the Project Team? If yes, please provide your contact information using the fields below.

- ◉ Yes – please contact me via email
- ○ Yes – please contact me via regular mail
- ○ No – I do not wish to be contacted in the future

Appendix M4

Public Information Centre Summary Report

Public Information Centre Summary Report
Sheridan Park Drive Municipal Class Environmental Assessment

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON   L5N 8R9 CANADA

October 2017
300039474.0000

R.J. Burnside & Associates Limited

Report Prepared By:

Meaghan Luis, M.Sc. (PI)
Environmental Planner
ML:js/sr

Report Reviewed By:

Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

Second Reviewer:

David Argue, P.Eng., PTOE
Project Manager

Table of Contents

Tables

Appendices

1.0 Introduction and Background

The City of Mississauga has initiated a Municipal Class Environmental Assessment (EA) Study to explore the opportunity to connect the east and west section of Sheridan Park Drive, improve the road and network in the area and create options for alternate routes. The City of Mississauga has identified an opportunity to improve all modes of transportation, increase access to a growing Sheridan Park and potentially divert traffic from the Sheridan Homelands neighbourhood, and achieve objectives in the Mississauga Official Plan. Alternative solutions include: 1) Do Nothing, 2) Limit / Manage Growth, 3) Extend Roadway, and 4) Provide Alternative Routes for Existing and Future Traffic.

The planning of the Sheridan Park Drive Extension study is being carried out in accordance with the Schedule ‘B’ requirements (Phases 1 to 2) of the Municipal Engineers Association Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015), which is approved under the *Ontario Environmental Assessment Act*. A key component of the study includes consultation with interested stakeholders. This report documents the Public Information Centre (PIC), held on June 27, 2017 and summarizes the notification process, the information presented and the comments received during and after the PIC.

2.0 Method of Notification

Details of the date, time, location and purpose of the PIC were published in the Mississauga News on June 15, 2017 and June 22, 2017. A copy of the advertisement is provided in Appendix A.

Notification of the PIC was also mailed to regulatory agencies, Indigenous Communities, local residents who live within 300 m of the Study Area, and other interested parties on the Project Contact List as well as posted on the City of Mississauga website. The Sheridan Homelands Ratepayers’ Association also advised their members of details of the PIC.

A mobile sign was located along Sheridan Park Drive from June 20 to June 28, 2017 advertising the public meeting.

3.0 Public Meeting Format

The PIC was held from 6:00 pm to approximately 8:00 pm. Attendees were greeted upon arrival, encouraged to sign-in, and offered a comment form to provide comments on the project and alternative solutions. The PIC was arranged primarily as an open house style session where participants were given the opportunity to review the display boards and representatives from the Study Team were available to answer questions and discuss the project with interested members of the public on a one-on-one basis or in small groups. A formal presentation was provided by City staff at approximately

6:30 pm. The presentation was followed by a discussion period, whereby participants shared their comments in a large group setting.

A copy of the display boards is provided in Appendix B. The display boards covered the following topics:

- Welcome.
- PIC Purpose.
- Study Context / Overview.
- Study Purpose.
- Municipal Class EA Process (Schedule B).
- Survey Results Summary.
- Planning/ Policy Background.
- Land Use Designations.
- Existing Natural Environment.
- Tree Inventory and Impact Assessment.
- Existing Social/ Cultural Environment.
- Noise and Air Quality Assessment.
- Transportation Conditions and Opportunities.
- Project Opportunity Statement.
- Alternative Solutions.
- Evaluation Criteria.
- Preliminary Preferred Alternative Solution.
- Guiding Principles for Road Design Concept.
- Preliminary Design Concepts- Roll Out Plan.
- Roundabouts.
- Renderings.
- Thank You / Information on how to participate.

Participants were requested to provide input by completing the available comment sheets. For those who were not able to attend the meeting, comments sheets were provided on the City of Mississauga website. It was requested that comments be provided, by July 20, 2017.

4.0 Participation Levels and Summary of Comments Received

A total of 97 people signed in at the PIC excluding the Study Team members. Representatives from the Sheridan Park Association, Sheridan Homelands Ratepayers Association, the Ministry of Natural Resources and Forestry and Councillor Karen Ras (Ward 2) were also in attendance.

4.1 Group Discussion

As noted, City staff facilitated a group discussion period following the presentation. Of the various comments shared by local residents, the following key points were noted:

1. Sheridan Park Drive extension will impact the natural environment and the health and well-being (i.e., noise and air quality) of the residential community.

2. Need / justification for road extension needs to be clarified.

3. Consideration should be given to widening other east-west roads in the area (e.g., Speakman Drive and North Sheridan Way) instead of extending Sheridan Park Drive.

4. Sheridan Park Drive extension will assist in alleviating traffic volume / speeding concerns along Homelands Drive.

5. Concern that speeding will occur on Sheridan Park Drive extension.

6. Attendees expressed both opposition and support for the Sheridan Park Drive extension.

4.2 Written Comments

A total of 56 written comment responses were received during the comment period following the PIC. Comments were provided through three methods including paper comment sheets supplied at the PIC, an online version of the comment sheet (available on the study website) or via email. Of the 56 comment responses, 3 people provided responses through multiple methods. Copies of these comments are provided in Appendix C.

On the comment sheets, participants were asked to rate the following general design concepts presented in order of preference based on a range of Most Important to Least Important:

- Compatibility with adjacent communities and natural areas.
- Access to a growing Sheridan Park.
- Speed Management Features.
- Roundabouts.
- Opportunity for Streetscaping.
- Provisions for pedestrians and cyclists.

Of the six design concepts presented, the majority of participants rated “Compatibility with adjacent communities and natural areas”, “Provisions for pedestrians and cyclists” and “Speed Management Features” as Most Important. The majority of participants rated “Access to a growing Sheridan Park” as “Less or Least Important”. Participants did not indicate a dominant preference for “Roundabouts” or “Opportunity for Streetscaping”.

Key comments relate to the following:

- Safety
  - Concerns about the safety of nearby school children and local residents who use the multi-use trail.
  - It was noted that local residents will continue to access the private property (woodlots, greenspace) and were concerned about crossing the road extension.
- Concerns regarding the reduced air quality in the area and benzene levels.
- Concerns of increased noise.
- Concerns about the impact to the existing natural area, as it is felt that this is one of the few natural areas remaining in this area of the City.
- Justification of Proposed Extension
  - The need for the extension is unclear and that there are other viable options available (e.g. widen Speakman Drive).
  - Concern that the extension does not provide a benefit to residents in the area and only accommodates businesses and more development.

Table 4-1 below provides the Study Team response to these key comments.

Table 4-1: Public Information Centre Comments and Study Team Response

Comment	Project Team Response
Safety	
Pedestrian safety	Designated pedestrian crossings will be provided at proposed intersection locations which are located at Speakman Drive and at Homelands Drive / Speakman Drive. Roundabouts are proposed at the two intersection locations. Roundabouts provide a safe pedestrian crossing as only one direction of traffic is crossed at a time by a pedestrian. In addition, vehicles slow down to navigate a roundabout, decreasing travel speed within the intersection and crosswalks. As part of this project, the existing multi-use trail is to be maintained in its current location to support pedestrian and cycling activity. It is located on average 15 to 20 m north from the proposed extension and will be separated by a combination of the existing vegetation as well as new plantings.
Speeding along extension	A variety of speed management features are being considered. Wide medians are proposed to mitigate potential speeding, as

Comment	Project Team Response
	vehicles will be required to slow down to navigate around the medians. In addition, roundabouts are proposed for both ends of the extension, which will also control speeding, as vehicles will be required to slow down in order to enter and circulate through the roundabout.
Air Quality	
Local air quality	An Air Quality Impact Assessment has been completed for this project. Based on the forecasted 2031 traffic volumes, future predicted air quality levels with and without a road extension were compared to the existing air quality levels to understand the impact of a potential road extension on local air quality. Typical contaminants from automobile exhaust were evaluated including Particulate Matter (PM2.5 and PM10), Total Suspended Particulates (TSP), Nitrogen Oxides (NOx), Carbon Monoxide (CO), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde. The future predicted air quality levels at sensitive receptor locations (residential properties and the Homelands Senior Public School) **were all below the Ministry of Environment and Climate Change (MOECC) criteria with the exception of Benzene**, **which already exceeds the criteria based on background air quality**. The Air Quality Assessment shows that change in concentration of benzene at any location in the Study Area is negligible. The variability in the National Air Pollution Surveillance (NAPS) background measurements (standard deviation of 0.22 $\mu g/m^3$) is much higher than the predicted change in impact (0.0003 $\mu g/m^3$ worst case impact). The background benzene concentration is continuing to fall as shown in Figure 19 of the Air Quality in Ontario 2015 Report. As a result, based on the analysis, **there is no expectation that the benzene concentration will increase because of the project.** It should be noted that the **elevated Benzene levels detected are not isolated to the Sheridan Park area, but observed all over the Province**. Improvements to address benzene levels are being dealt with at a national and provincial level that in turn improves air quality at a local level. Local reductions have a limited effect as a result reducing benzene concentrations

Comment	Project Team Response
	requires a provincial solution. According to Air Quality in Ontario 2015 Report published by the MOECC, over the 10 year period from 2005 to 2014, benzene concentrations have decreased 42%. A review of the National Pollutant Release Inventory (NPRI) data did not show any significant industrial / commercial operations emitting benzene in the vicinity of the project area. Through initiatives to make buildings more green, improvements on vehicle emissions, and as improvements to other fuel burning equipment (such as high efficiency furnaces) continue to be made, it is expected that benzene levels should continue to drop. The City as a whole is encouraging sustainable development and growth. By providing alternative routes, which an extension to Sheridan Park Drive would do, the City is hoping to assist in lessening the environmental impact by minimizing congestion and vehicle idling throughout the city.
Noise	
Increase in noise levels	Based on the forecasted 2031 traffic volumes, the future predicted noise levels at the closest POR (Point of Reception) were found to be **no more than 1 dBA** greater than the existing noise levels. Therefore, **the extension has negligible impact on the noise levels in the neighbourhood**. In general, sound level increases of less than 3 dBA are not noticeable to the human ear. A Noise Impact Assessment has been completed within the Study Area. The existing noise levels were measured at various POR in the Study Area (e.g., at fence line of residential house). The existing noise levels at this POR were found to be 47 dBA during daytime hours (7am-11pm) and 40 dBA during nigh time hours (11pm-7am). The predicted future noise levels are below Provincial and City of Mississauga standards. No noise mitigation measures (sound barriers) are required.
Environment	
Impacts to the natural areas	The project is being carried out to balance several objectives. The protection of and minimization of negative impacts to the

Comment	Project Team Response
	environment is one of the important objectives of the study. The proposed alignment of the Sheridan Park Drive extension as illustrated on the Preliminary Preferred Design Plan (as presented at the PIC on June 27, 2017) has avoided encroachment into the private wooded areas. **Approximately 120 trees will need to be removed** within the City-owned lands. 68% of these trees to be removed are Ash trees. Currently the City is focusing on City-owned ash tree removals in high risk areas next to roadways, trails and paths, homes, schools and buildings / facilities. All trees being removed will be **replaced at a 2:1 ratio**, of varying maturity and species. Wherever possible, existing trees can be preserved by implementing tree protection measures during construction. It is expected that the existing trees between the Multi-Use Trail and proposed roadway will be maintained. The proposed medians provide the opportunity to implement additional landscaping and low impact development (LID). LID is a design approach to manage stormwater runoff and emphasizes conservation and use of on-site natural features to protect water quality. Proper mitigation measures will be implemented to minimize any potential negative impacts to wildlife in the Study Area. The road extension is proposed to be narrowed in areas to reduce impacts to wooded and meadow areas within the City-owned lands. There are **no Provincially Significant Wetlands, Areas of Natural or Scientific Interest or Environmentally Significant Areas**. No Threatened or Endangered Species at Risk (SAR) were observed. There are three wooded areas southeast of the Sheridan Park Drive right-of-way that are designated as Significant Natural Areas in the City's Natural Areas Survey (2016).
Impacts to views from homes (back onto utility corridor)	There will be **no impacts to the views of the residents** that back onto the existing utility corridor. The right-of-way of the extension will run parallel to the multi-use trail on the south side of the utility corridor. The multi-use trail will be separated from the proposed extension by a combination of the existing vegetation as well as new plantings.

Comment	Project Team Response
Justification of Proposed Extension	
Why the extension is being considered	The Sheridan Park Drive extension has been in the City's Official Plan since 1987. All of the City's roadway initiatives are reviewed yearly and prioritized. The recently completed draft Sheridan Park Land Use Master Plan has provided additional guidance on the future vision of Sheridan Park Corporate Centre. Therefore, the City determined that it was appropriate to review the needs, opportunities and impacts of this corridor given the new policy and zoning regulations in the Sheridan Park Corporate Centre and existing Homelands neighbourhood.
No destinations on the road extension	The primary function of the proposed Sheridan Park Drive extension is to provide an alternate route for the Study Area and provide redundancy in the broader road network rather than providing access to a specific destination on the road extension itself. In addition to providing increased connectivity within Sheridan Park Corporate Centre and Sheridan Homelands neighbourhood., the road extension will also provide an alternate route for destinations east and west of the Study Area. This will assist with minimizing traffic infiltration within the Sheridan Homelands neighbourhood.
Who will use Sheridan Park Drive extension	The Sheridan Park Drive extension will play an important role in providing additional access to and from the residential community. The traffic analysis indicates approximately 77% of trips along the extension in the morning rush hours and 72% in the evening rush hours originate from or are destined to the Sheridan Homelands neighbourhood. Further, there is an overall reduction of vehicles along Homelands Drive (e.g., from Winston Churchill Boulevard to Thorn Lodge Drive east) by approximately 29% in the morning rush hours and 26% in the afternoon rush hours as compared to no Sheridan Park Drive extension.
Consider alternative routes, e.g. Widening of Speakman Drive or	Following the PIC, the widening of Speakman Drive was investigated further as an alternative route (Alternative Solutions – Alternative 4).

Comment	Project Team Response
North Sheridan Way	Based on the traffic analysis, Speakman Drive widening to four lanes, does not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive. Even with widening Speakman Drive, the traffic analysis indicates that there will be an increase of 17% in the morning rush hours on Homelands Drive without the extension in place. As a result, widening Speakman Drive will serve the Sheridan Park Corporate Centre only. Similarly, it is not expected that the widening of North Sheridan Way would not provide alternate routing for Sheridan Homelands neighbourhood or remove cut through traffic along Homelands Drive.
Rationale for Selecting Alternative 3 (Extension of Sheridan Park Drive) as Preliminary Preferred Solution	Through a process of evaluating alternative solutions, the Study Team identified extending Sheridan Park Drive as the preliminary preferred solution as it provides several benefits for the Study Area. Specifically, the extension will improve network connectivity, increase access to a growing Sheridan Park, encourage walking, cycling and transit, potentially divert traffic from the adjacent neighbourhood, preserve the natural look and recreational benefits of the Study Area and at the same time, minimize negative impacts to local wildlife and the natural spaces in the area.

5.0 Next Steps

Comments received at the PIC will be reviewed and incorporated into the evaluation of a preferred alternative and the Project File Report. Next steps include:

- Review input from public and agencies;
- Selection of a preferred alternative; and
- Issue of Notice of Completion and the Project File Report.

A Project File Report will be available for a 30-day review period in early 2018. During this period members of the community/public will be able to review and comment on the report.

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Newspaper Advertisement

MISSISSAUGA

CITY OF MISSISSAUGA – NOTICE OF PUBLIC INFORMATION CENTRE

Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension

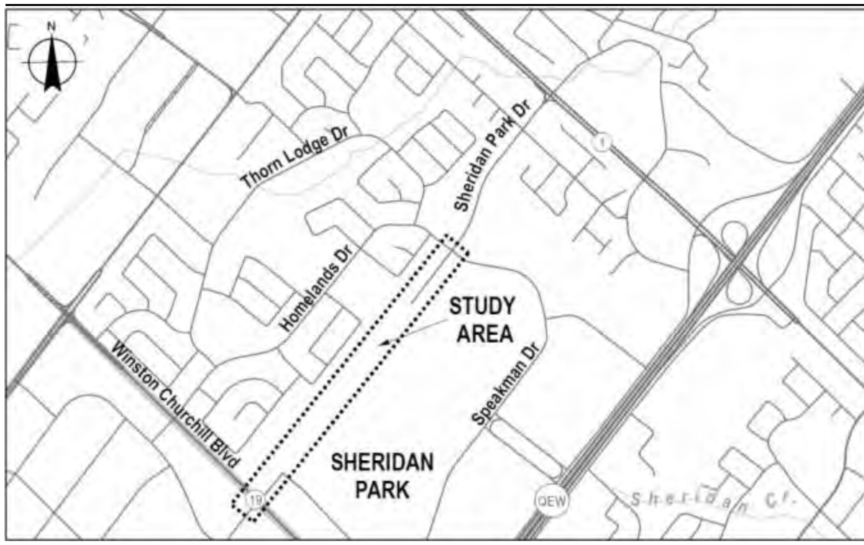
WHAT?

- The City of Mississauga is undertaking a study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.
- The site location and approximate extent of the Study Area are shown on the map.

WHY?

- Complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding areas for all users.
- Maximize access to the neighbourhood and business areas.
- Support multi-modal transportation in the study area.

WHERE?



HOW?

- The study is being carried out in accordance with the requirements of a Schedule B undertaking as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment Manual* (October 2000, as amended in 2015), which is an approved process under the *Ontario Environmental Assessment Act*.
- The study will examine how traffic operates both now and in the future – and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures.
- Several alternatives have been developed and evaluated and are being refined through community and agency consultation. The Project Team will then select a preferred alternative.
- At the end of the study, a Project File documenting the entire study process will be available for public review.

GET INVOLVED!

- Consultation is an important part of the Municipal Class EA process. Throughout the study, the City will make contact with various agencies and members of the community, and consider their opinions as part of any decisions that are made.
- A Public Information Centre (PIC) has been scheduled so that attendees can review study progress and discuss any questions or comments with the Project Team directly. At the PIC, the Project Team will present information on the study area as it is today, the alternative solutions evaluated, the preliminary preferred solution and some design concepts / options.

WE WANT TO HEAR FROM YOU – PLEASE ATTEND THE PUBLIC INFORMATION CENTRE!
6:00 – 8:00 pm
Tuesday June 27, 2017
Sheridan Park Alliance Church – 2440 Fifth Line West, Mississauga

To find out more about project announcements and other information please visit the project website:

www.mississauga.ca/sheridanparkea

If you have any questions or comments regarding the study, please contact:

SheridanParkEA@rjburnside.com

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Mississauga, ON L5N 8R9
(905) 821-5895

Personal information is collected under the authority of the Environmental Assessment Act and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed in the notice.
This notice was first published June 15, 2017.

Burnside

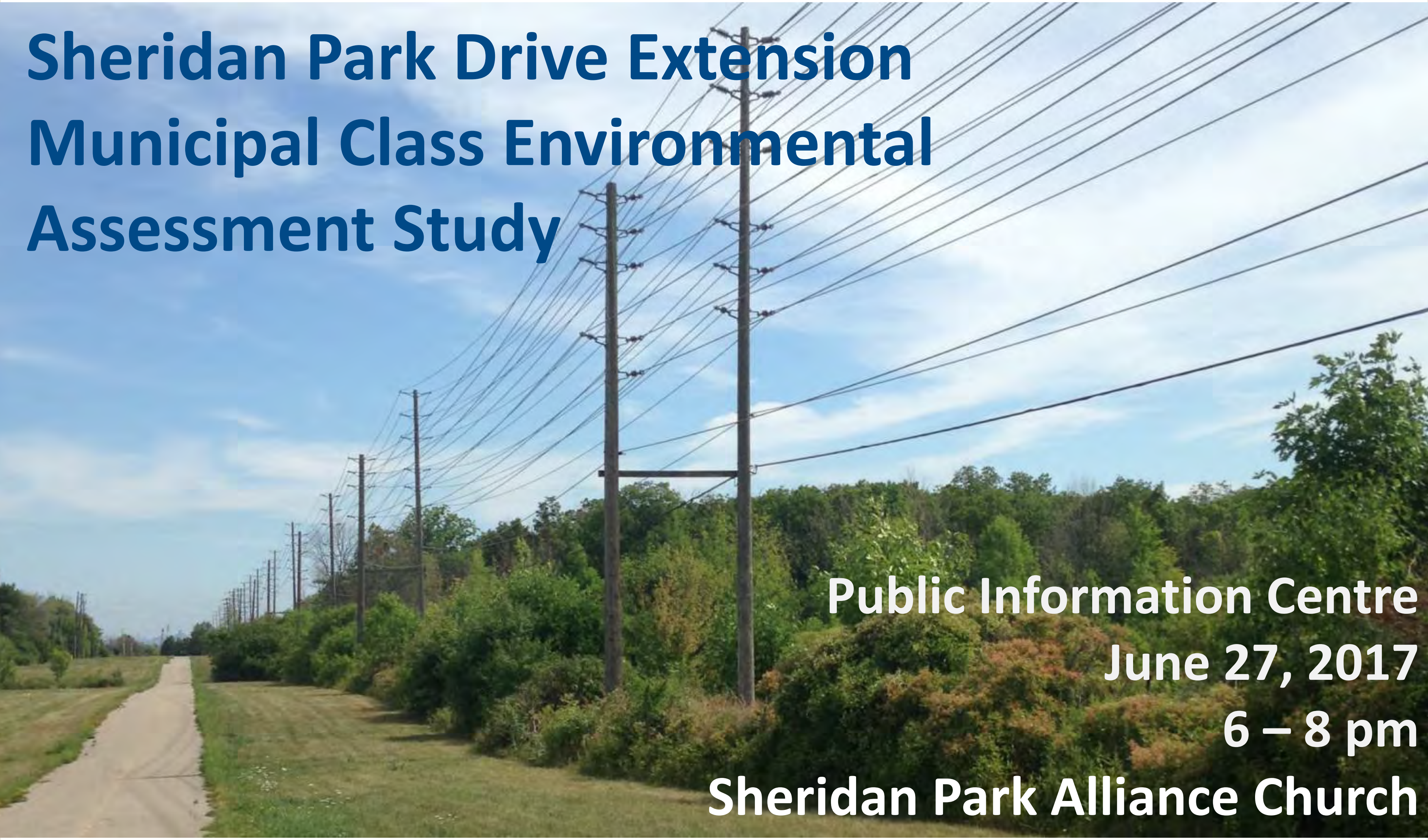
[The Difference is our People]

Appendix B

Display Boards

Appendix B

Sheridan Park Drive Extension Municipal Class Environmental Assessment Study



Public Information Centre
June 27, 2017
6 – 8 pm
Sheridan Park Alliance Church

Welcome

to the Public Information Centre for the

Sheridan Park Drive Extension Class Environmental Assessment

- Please Sign In
- Meet with Study Team Members
- Review the display materials and discuss your questions and ideas with the Study Team
- Please fill out a Comment Sheet and return it to the Study Team in person, by mail, email, fax or online by **July 20, 2017**

Purpose of the Public Information Centre

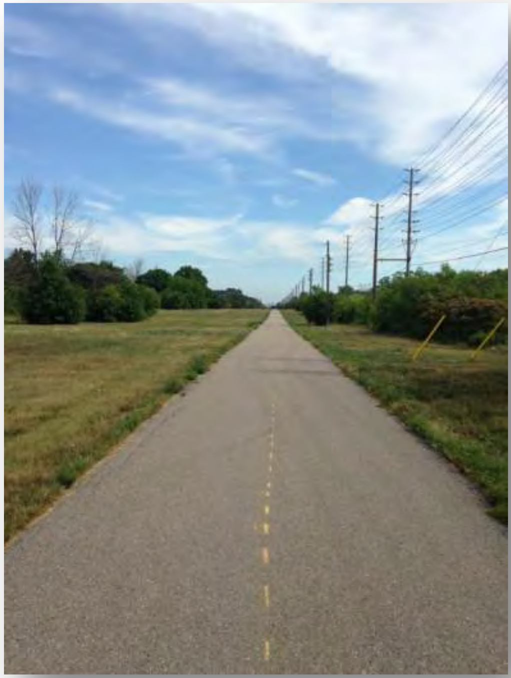
- Introduce the study
- Provide a summary of feedback received to date
- Present policy background and existing conditions
- Identify the opportunities of the project
- Present alternative solutions and evaluation
- Present preliminary design alternatives
- Obtain further community feedback
- Identify next steps

Study Context / Overview

- The Study Area is a unique combination of land uses including:
  - Residential
  - Businesses
  - Utility Corridor
- Key Features include:
  - Sheridan Homelands Residential Community
  - Sheridan Park Corporate Centre
  - Utility corridor with Multi-Use Trail
  - Natural areas within road right-of-way (ROW) and private lands adjacent to Study Area

Purpose of Study

- Explore the opportunity to connect the east and west section of Sheridan Park Drive
- Improve road network in the neighborhood and business area
- Create options for alternate routes
- Improve multi-modal network connectivity
- Evaluate potential impacts to the natural, cultural, social and economic environments within the Study Area



Municipal Class EA Process (Schedule B)

Identify Opportunity
Spring 2017

- Notice of Commencement (late January)

Alternative Solutions
Summer/ Fall 2017

- SAC Meeting #1 (early May)
- SAC Meeting #2 (early June)
- Public Information Centre (late June)

Project Filing

- File Project File for 30-day review period (Fall 2017)

Detailed Design

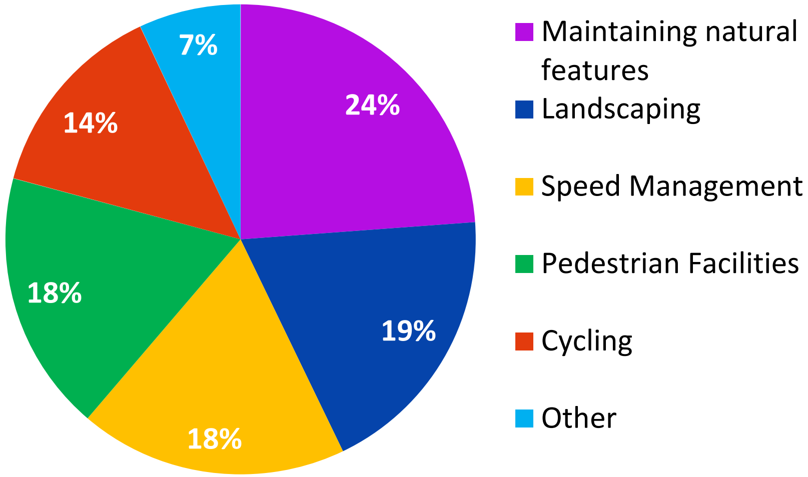
Implementation

What we have heard so far…

133 survey responses received to date

We asked…

If the roadway is extended, what is important to you?



Over **65%** are comfortable using roundabouts.

We heard…

*…concerns about the impact to existing **natural spaces** and wildlife*

*…that the roadway extension would **decrease traffic** and speeding through the Homelands neighbourhood*

*…concerns about the potential increased **safety risk** for residents, cyclists and pedestrians*

Planning / Policy Background

Mississauga Strategic Plan (2009)

The Strategic Plan identifies several Strategic Pillars for Change, intended to provide guidance towards the creation of a city for the 21st century. Most relevant include:

- Increasing transportation capacity by creating additional links in street networks and active mobility choices
- Creation of complete streets with inclusive cross-sections and an urban form that supports walking and active modes of transportation
- Develop walkable, connected communities
- Maintain a safe city
- Attract innovative businesses
- Meet employment needs

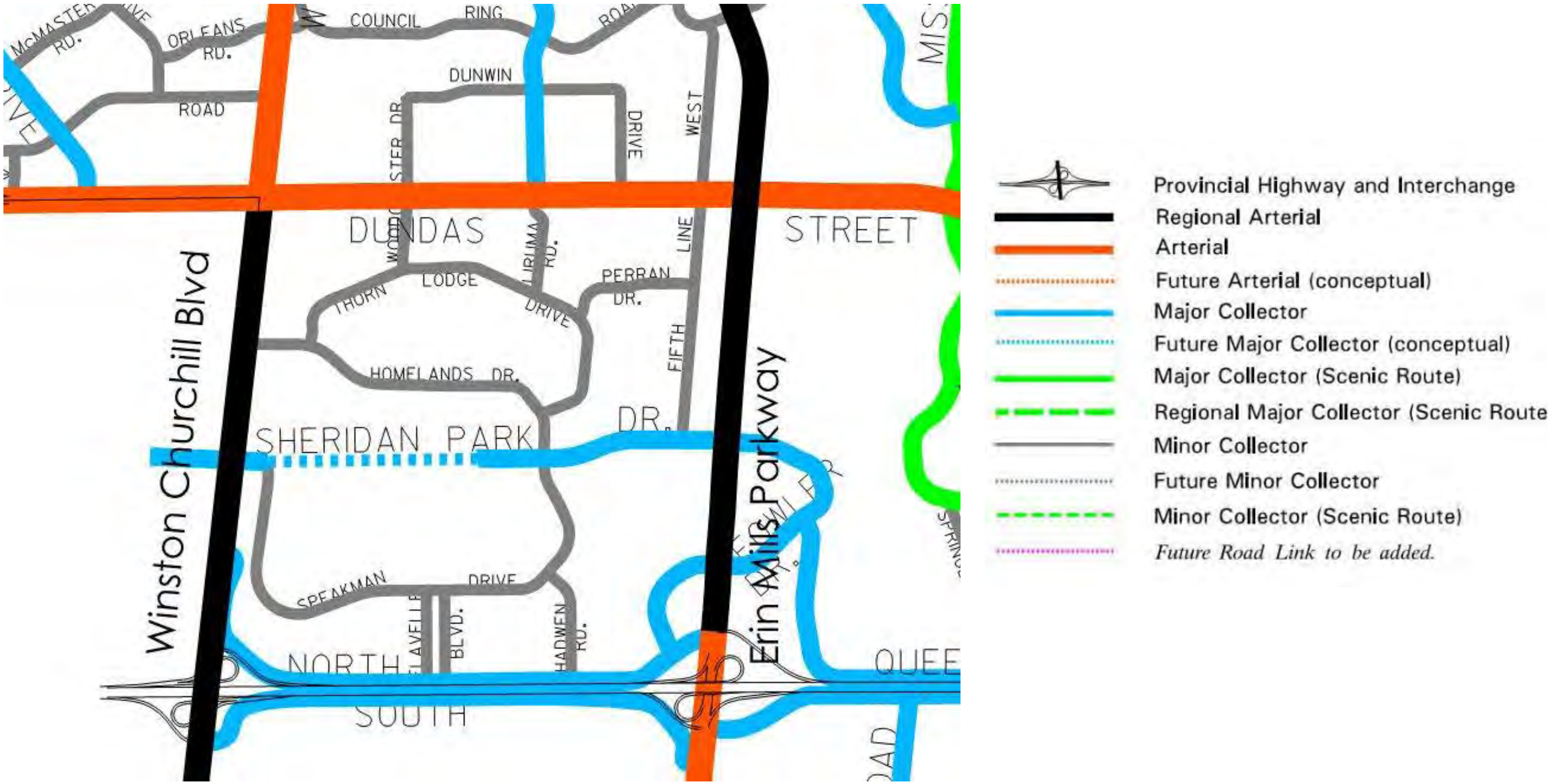
Planning / Policy Background

Mississauga Official Plan (MOP)

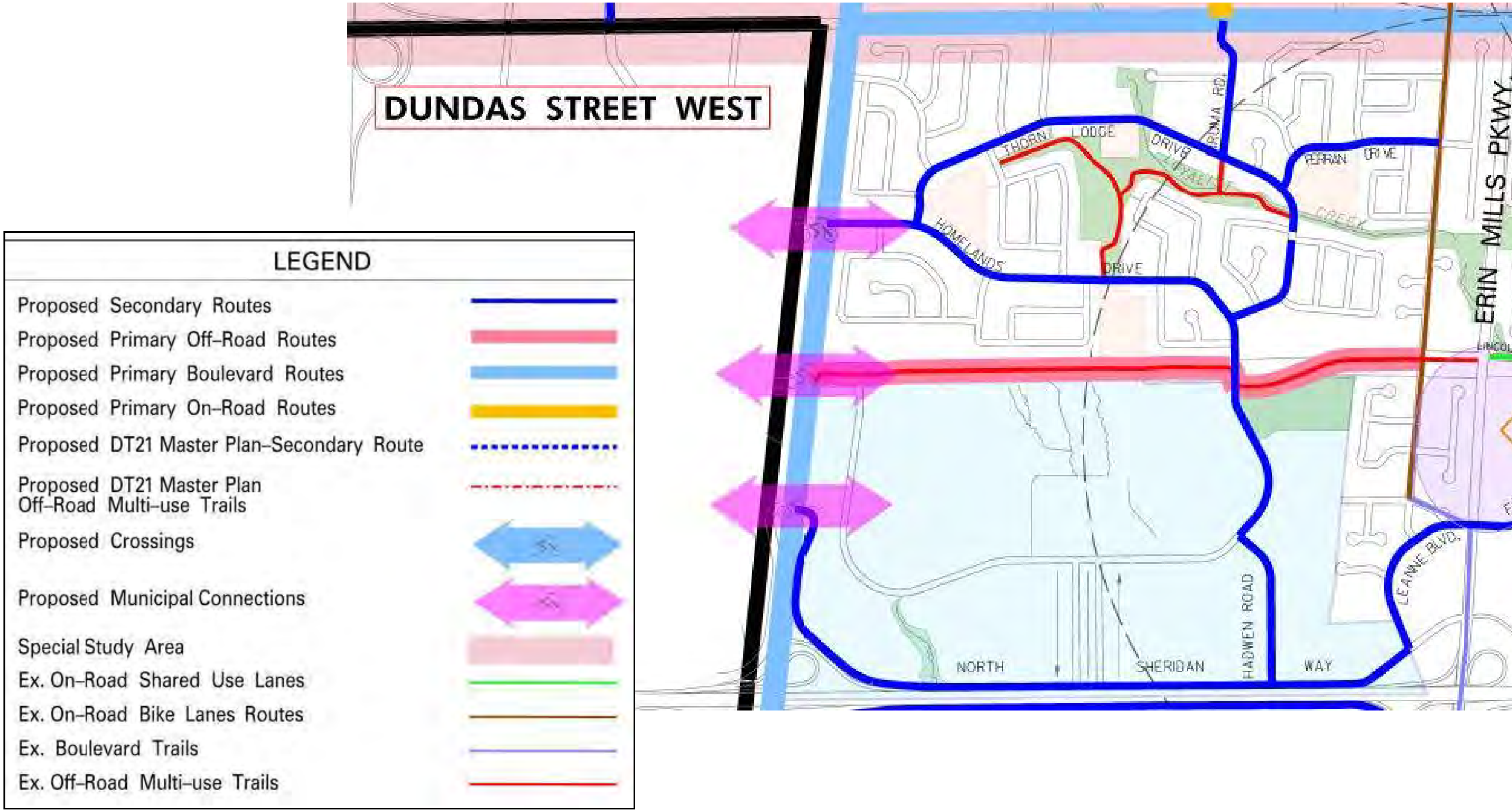
- Develop a multi-modal transportation system that connects important destinations and safely accommodates all roadways users
- Encourage development of healthy, vibrant communities that accommodate a range of mobility choices
- Develop a fine-grained roadway network, with short streets and small block sizes
- Encourages Corporate Centres (e.g., Sheridan Park) to provide for employment uses and densities similar to major nodes (less than downtown, but more than elsewhere)

Mississauga Official Plan

Schedule 5 – Long Term Road Network



Mississauga Cycling Master Plan (2010)

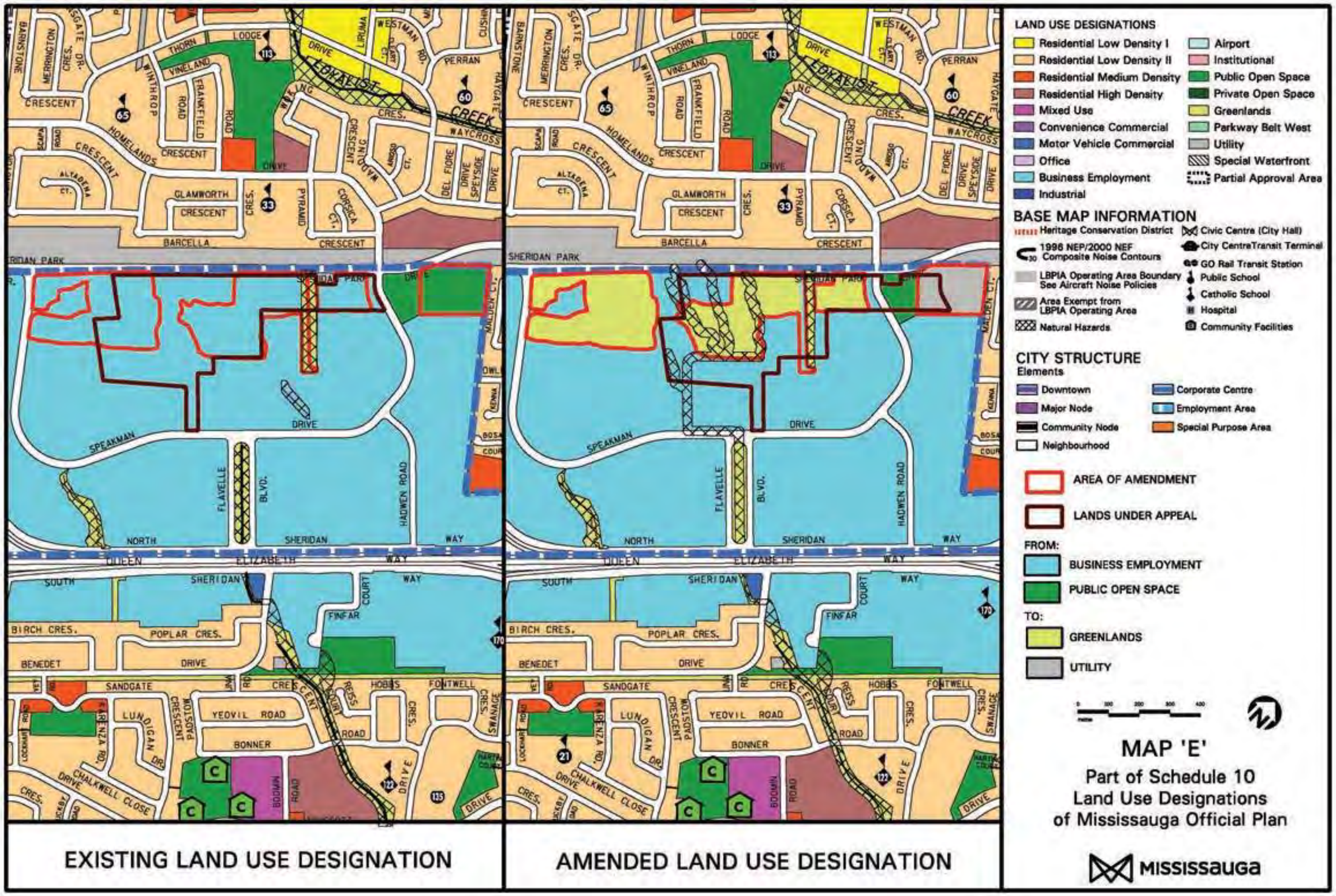


Planning / Policy Background

Sheridan Park Land Use Master Plan (December 2014)

- The City completed a study to review existing conditions of the area and recommend amendments to land use designations within the Corporate Centre.
- The area is transitioning to more diverse employment uses.
- Future development applications may bring new businesses to Sheridan Park, but the policies support increasing the protected green spaces and maintaining the unique campus feel of the area.

Land Use Designations



Existing Natural Environment

Vegetation Community Classification

- CUM - Cultural Meadow
- CUT - Cultural Thicket
- FOD9-1 / FOD9-4 - Fresh Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest

- Intermittent Watercourse
- Headwater Drainage Features
- Sheridan Park Drive Right-of-Way

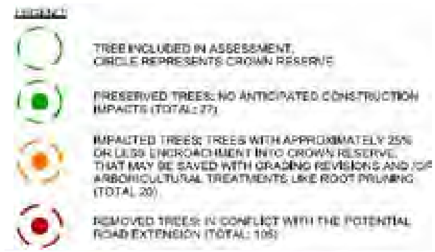
0 25 50 100 Meters

Imagery Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

- There are no Provincially Significant Wetlands, Areas of Natural and Scientific Interest or Environmental Significant Areas in the Study Area.
- There are three wooded areas southeast of the Sheridan Park Drive right-of-way that are designated as Significant Natural Areas in the City's Natural Areas Survey (2016).
- The existing vegetation communities were classified based on the Ecological Land Classification system (as shown on above map).
- There is potential for bat habitat within the wooded area. Impacts to bat habitat can be readily mitigated through the installation of bat habitat boxes within the Study Area where appropriate.
- Three frog call surveys were completed in the Study Area. No frog calls were observed.
- Two breeding bird surveys were completed in the Study Area. Two Special Concern Species At Risk (SAR) species (Eastern Wood Pewee and Wood Thrush) were observed. The proposed road extension will not directly affect breeding habitat for these two species. No Threatened or Endangered SAR species observed.

Tree Inventory and Impact Assessment

152 trees 10 cm diameter (DBH) or greater were identified within the Sheridan Park Drive right-of-way. 15 species were observed (approximately 67% native to Ontario). No tree Species at Risk (SAR) were present. Based on the preliminary preferred design plan, some trees would need to be removed, while others can be protected and/or preserved (as illustrated in the maps below).



Note: Tree Impacts at Sheridan Park Drive / Speakman Drive intersections at east and west limits of the Study Area are to be determined based on preferred intersection configuration.

Existing Social / Cultural Environment

- Over 2,700 employed in Sheridan Park Corporate Centre (Sheridan Park).
- A Stage 1 Archaeological Assessment has been completed and identified some areas of archaeological potential within the Study Area. A Stage 2 Archaeological Assessment will be conducted to determine if there are any archaeological resources within the Study Area.
- A Cultural Heritage Resource Assessment has been completed for the Study Area. Sheridan Park is identified as a significant Cultural Landscape by the City with properties listed on the City's Heritage Register. No significant cultural heritage impacts to these resources will result from the proposed extension of Sheridan Park Drive.

Noise and Air Quality Impact Assessment

- A Noise Impact Assessment has been completed within the Study Area. The existing noise levels were measured at a Point of Reception (POR) in the Study Area (at fence line of residential backyard). The existing noise levels at this POR were found to be 47 dBA during daytime hours (7am-11pm) and 40 dBA during nightime hours (11pm-7am).
- Based on the forecasted 2031 traffic volumes, the future predicted noise levels at the closest POR were found to be no more than 0.5 dBA greater than the existing noise levels. In general, sound level increases of less than 3 dBA are not noticeable to the human ear.
- These predicted future noise levels are below Ministry of Transportation and City of Mississauga standards, therefore no noise mitigation (sound barriers) are required.
- The map below illustrates the location of the POR and the distance of this POR to the proposed road extension corridor.

- An Air Quality Impact Assessment has been completed within the Study Area. Based on the forecasted 2031 traffic volumes, future predicted air quality levels with a road extension in place were compared to existing air quality levels to understand the impact of a potential road extension on local air quality.
- Typical contaminants from automobile exhaust were evaluated including Carbon Monoxide (CO), Nitrogen Oxides (NOx), Particulate Matter (PM2.5 and PM10), Total Suspended Particulates (TSP), 1-3 Butadiene, Benzene, Acrolein, Acetylaldehyde, and Formaldehyde.
- The future predicted air quality levels at sensitive receptor locations in the Study Area (including seven residential properties and the Homelands Senior Public School) were all below the Ministry of the Environment and Climate Change criteria with the exception of Benzene, which already exceeds the criteria based on background air quality.

Transportation Conditions and Opportunities

Field observations made on Thursday January 26, 2017.

Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Project Opportunity Statement

The City of Mississauga fully recognizes that this Study Area offers diverse and complimentary land uses that all need to be carefully considered. The implementation of this link would be an important piece of the City's overall road network. The science and technology facilities in Sheridan Park will continue to develop to support the growth of a contemporary science and business park. At the same time, it is important to recognize the need to protect the existing residential community and recreational facilities.

Through this EA, the City has an opportunity to:

- Improve network redundancy in the broader road network to improve traffic flow for all modes of transportation;
- Increase access to a growing / developing Sheridan Park;
- Support multi-modal transportation and encourage walking, cycling and transit;
- Potentially divert traffic from the Sheridan Homelands neighbourhood; and
- Preserve the natural feel and recreational benefits of the Study Area.

Alternative Solutions

- Alternative 1: Do Nothing
  - Do not make any changes/ improvements to road network. Do not extend Sheridan Park Drive.
- Alternative 2: Limit / Manage Growth
  - Limit development growth in surrounding areas.
- Alternative 3: Extend Roadway (Sheridan Park Drive)
  - Extend Sheridan Park Drive from Speakman Drive to Homelands Drive.
- Alternative 4: Provide Alternative Routes for Existing and Future Traffic
  - Make improvements to adjacent roads to enable existing and future traffic to use alternate route options.

Evaluation Criteria

Natural Environment

- Impacts to existing trees and vegetation communities
- Impacts to wildlife
- Impacts to aquatic habitat
- Impacts to hazard lands
- Impacts to surface water quality and drainage (stormwater management)
- Impacts to groundwater quality

Socio-Economic Environment

- Routing and connectivity within Study Area for all travel modes
- Impacts to noise and air quality
- Lifestyle and culture of local residents
- Provision for emergency services
- Support for future potential development

Cultural Environment

- Impacts to archaeological resources
- Impacts to heritage features

Transportation Engineering Environment

- Balancing of all travel modes
- Facilitating active transportation
- Traffic management
- Construction and staging
- Speed of traffic
- Impacts to vehicular level of service
- Impacts to utilities
- Capital and operation costs

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Evaluation of Alternative Solutions

Evaluation Criteria	Alternative 1: Do Nothing		Alternative 2: Limit / Manage Growth		Alternative 3: Extend Roadway (Sheridan Park Drive)		Alternative 4: Improve Alternatives Routes for Existing or Anticipated Traffic	
Natural Environment	●	No impacts to existing conditions.	●	No impacts to existing conditions.	◑	Requires tree / vegetation removals; however, impacts can be mitigated by tree plantings at a 2:1 replacement ratio. No tree Species at Risk (SAR) observed in Study Area. The proposed road extension will not directly affect wildlife habitat, any potential impacts will be mitigated. Road extension not anticipated to impact the form and function of vegetation and headwater drainage features.	◑	Avoids potential impact to natural environment in the Study Area, but potential for impacts to natural features along other roadways.
Socio-Economic Environment	◑	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	◑	Future vehicle connectivity in area is limited without extension. No changes to pedestrian and cycling use of corridor.	●	Connectivity will be improved for all modes of transportation. Provides increased access routes for emergency services. No changes to pedestrian and cycling use of corridor.	◑	Providing alternate route options does not increase connectivity within the Study Area. No changes to pedestrian and cycling use of corridor.
Cultural Environment	●	No impacts to existing conditions.	●	No impacts to existing conditions.	◑	Some areas of archaeological potential to be investigated. No impacts anticipated to cultural heritage features.	◑	No impacts to existing conditions within the Study Area. Some potential for impacts to archaeological resources and cultural heritage resources in other corridors.
Transportation Engineering Environment	○	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	○	Not consistent with City planning policies (e.g., Official Plan). Does not address anticipated transportation needs. Does not improve network connectivity or provide alternate route options for all travel modes.	●	Consistent with City planning policies (e.g., Official Plan). Addresses anticipated transportation needs. Improves network connectivity and provides alternate route options for all travel modes.	○	Would potentially provide capacity in other corridors; however, does not improve network connectivity or provide alternate route options for all travel modes within the Study Area.
Addresses Project Opportunity Statement	✗		✗		✓		✗	
Overall Summary	**Not Carried Forward**		**No Carried Forward**		**Carried Forward**		**Not Carried Forward**	

Ranking Order of Preference: Most Preferred ● Somewhat Preferred ◑ Least Preferred ○

Preliminary Preferred Alternative Solution

	Alternative 1: Do Nothing	Alternative 2: Limit / Manage Growth	Alternative 3: Extend Roadway (Sheridan Park Drive)	Alternative 4: Improve Alternatives Routes for Existing and Future Traffic
Addresses Project Opportunity Statement	✗	✗	✓	✗

Alternative 1 (Do Nothing) and **Alternative 2** (Limit/Manage Growth) are unable to address the Project Opportunity Statement with the exception of preserving the natural feel and recreational benefits of the Study Area.

Alternative 3 (Extend Sheridan Park Drive) can fully address the Project Opportunity Statement, because it:

- Supports multi-modal transportation for all users;
- Has the potential to divert traffic from the residential neighbourhood;
- Improves network redundancy;
- Improves access to the Study Area; and
- Will preserve the natural feel and recreational benefits of the Study Area by implementing appropriate mitigation.

Alternative 4 (Improve Alternative Routes) partially addresses the Project Opportunity Statement as it supports multi-modal transportation; however, it does not improve network redundancy or improve access to the Study Area.

Therefore, **Alternative 3** is the **Preliminary Preferred Alternative**.

Guiding Principles for Road Design Concept

In developing the design concepts, a number of key constraints and design elements are considered:

- Compatibility with adjacent communities and natural areas
- Access to Sheridan Park Corporate Centre
- Speed Management features
- Opportunity for streetscaping
- Provisions for pedestrians and cyclists
- Major utilities within the study area
- Geometric design requirements
- Existing and future intersection and turning lane requirements

BURNSIDE

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web www.rjburnside.com

RJB Project No. 300039474

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SHERIDAN PARK DRIVE EXTENSION

STA 0+000 TO STA 1+285

SCALE HOR. 1:500 VERT. 1:50	AREA X-XX	PROJECT No. XX-XXX
C.A.D.D. BY L.R.	CHECKED BY D.A.	PLAN No.1
DATE JUNE 2017	SHEET 1 OF 1	

Roundabouts

A roundabout could be constructed at Sheridan Park Drive - Speakman Drive and Sheridan Park Drive - Homelands Drive intersections

	Pedestrians… ➡ **cross** at a marked crosswalk, using **splitter islands** to cross one direction of traffic at a time
	Cyclists… ➡ **dismount** before the roundabout and cross either at the crosswalks (like pedestrian) ➡ or, **ride** through the roundabout (like a vehicle)
	Vehicles… ➡ **enter** by yielding to traffic that is already in the roundabout ➡ **circulate** in a counterclockwise direction (i.e. to the right of the central island) ➡ **exit** by signaling right ➡ **stop** at crosswalk for pedestrians

Roundabouts

Roundabouts can offer a number of improvements **over signalized intersections**

	**Improved Safety**	Roundabouts reduce the severity of potential collisions by: ➧ Lower travel speeds ➧ Fewer conflict points ➧ Reducing conflict angles
	**Lower Speeds**	Vehicles **slow down** to navigate a roundabout
	**Fewer Delays**	Vehicles **yield** rather than stop, when entering a roundabout, which reduces delay when compared to waiting for either a green light at a traffic signal or waiting for a gap in traffic at a stop sign
	**Reduced Environmental Impacts**	Fewer delays ➧ Reduces fuel consumption ➧ Improves air quality by reducing emissions
	**Less Maintenance**	Roundabouts eliminate traffic signal costs for **maintenance** and **electricity**.
	**Improved Aesthetics**	The central island of a roundabout provides an opportunity to accommodate **public art** and **landscaping**.

Rendering of Potential Roundabout

View Looking East along Sheridan Park Drive from near Winston Churchill Boulevard (low vegetation in roundabout)

Rendering of Potential Roundabout

View Looking East along Sheridan Park Drive from near Winston Churchill Boulevard (with tree plantings in roundabout)

Rendering of Potential Median

View Looking East along Sheridan Park Drive extension corridor showing potential median (horizontal deflection)

Thank you for attending

NEXT STEPS

Following this PIC the Project Team will:

- Review all public and agency comments
- Confirm preferred solution based on input
- Prepare the Final Project File and issue for 30-day Public Review Period

Please complete a comment sheet or send comments to:

Dana Glofcheskie
City of Mississauga Project Manager
City of Mississauga
201 City Center Drive, Suite 800
Mississauga, ON L5B 2T4
Tel: 905-615-3200 ext. 8243

Dave Argue
Consultant Project Manager
R.J. Burnside and Associates
6690 Creditview Road, Unit 2
Mississauga, ON L5N 8R9
Tel: 905-821-5895

Email: SheridanParkEA@rjburnside.com

Your comments are welcome at any time during the study. However, with respect to the PIC we ask you provide your comments by **July 20, 2017.**

Thank You!

THORN LODGE / HOMELANDS NEIGHBOURHOOD TRAFFIC CALMING REVIEW

What has been done so far?

- Traffic volume and speed data collected in June 2016

- Edge lines and centerline pavement markings implemented in August 2016

What's Next?

- Follow-up studies conducted in June 2017
- Neighbourhood under consideration for physical traffic calming devices
- Further community consultation in Fall 2017

Examples of physical traffic calming measures

Appendix C

Comment Sheets and Emails

Appendix C

CITY OF MISSISSAUGA

Municipal Class Environmental Assessment Study for Sheridan Park Drive
Public Information Centre – June 27, 2017 6-8pm
Sheridan Park Alliance Church
Comment Sheet

The City of Mississauga, is conducting a Schedule 'B' Class Environmental Assessment (Class EA) study for Sheridan Park Drive from Winston Churchill Boulevard to Homelands Drive. Through this Class EA study, the City is exploring the opportunity to connect the east and west section of Sheridan Park Drive. Several alternatives have been developed and evaluated and are being refined through community and agency consultation.

The purpose of this Comment Sheet is to gather input from the public on the material presented at the PIC. Your input is greatly appreciated.

Please take a few minutes to complete this Comment Sheet.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	✓	○	○	○
Access to a growing Sheridan Park	○	✓	○	○	○	○
Speed Management Features	○	✓	○	○	○	○
Roundabouts	○	○	○	✓	○	○
Opportunity for Streetscaping	○	○	✓	○	○	○
Provisions for pedestrians and cyclists	✓	○	○	○	○	○

Comments:

The Sheridan Park Dr. extension have always been in the city plans. Build the darn road extension. Good for employees of Sheridan Research Centre. Keeps drive through the Homelands area to a minimal.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ✓ I don't know

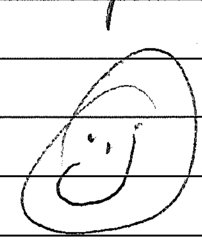
More expension + delay

Comments:

Stop the surveys, reassessments, town hall meetings + just build the darn extension.

3. Please share any other comments you may have.

Should have been completed 50 years ago.



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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	O	O	O
Access to a growing Sheridan Park	✓	O	O	O	O	O
Speed Management Features	O	✓	O	O	O	O
Roundabouts	✓	O	O	O	O	O
Opportunity for Streetscaping	✓	O	O	O	O	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

3. Please share any other comments you may have.

I agree to have the road connection AVAILABLE to the Community. it is vital to relieve some of the traffic away from Homelands Community

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DESIGN CONCEPTS

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	O
Speed Management Features	O	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	O	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

3. Please share any other comments you may have.

I heard that the Region will be making improvements to the Winston Churchill + Erin Mills Parkway. Will rush hour traffic problem be solved by intersection improvements

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	☑	O	O	O	O	O
Access to a growing Sheridan Park	☑	O	O	O	O	O
Speed Management Features	O	O	O	O	O	☑
Roundabouts	O	O	☑	O	O	O
Opportunity for Streetscaping	O	O	O	☑	O	O
Provisions for pedestrians and cyclists	O	☑	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

☑ The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

3. Please share any other comments you may have.

This project is long over due. -

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	X	O	O	O	O
Access to a growing Sheridan Park	O	X	O	O	O	O
Speed Management Features	O	X	O	O	O	O
Roundabouts	O	X	O	O	O	O
Opportunity for Streetscaping	O	X	O	O	O	O
Provisions for pedestrians and cyclists	O	X	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- X The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

3. Please share any other comments you may have.

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	○	●	○	○
Access to a growing Sheridan Park	○	○	○	○	●	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	●	○	○	○	○
Opportunity for Streetscaping	○	○	●	○	○	○
Provisions for pedestrians and cyclists	○	○	○	○	○	●

Comments:

Simply saying that the project meets EA criteria is not sufficient reason for putting the road through. The three reasons "WHY" this road should be built are weak. Why not say something about need and traffic flows? Origin-destination studies?

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

○ The results of the survey are more or less what I expected
○ The results of the survey were unexpected
● I don't know

Comments:

3. Please share any other comments you may have.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	X	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	X
Speed Management Features	O	X	O	O	O	O
Roundabouts	O	X	O	O	O	O
Opportunity for Streetscaping ?	O	O	O	O	O	O
Provisions for pedestrians and cyclists	O	O	X	O	O	O

Comments:

Please don't build this road. We don't need this. Stop destroying the environment. We need to conserved established wildlife areas.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- X I don't know

Comments:

I think you people are pretending to care about what we want (no road) and you'll do what you want.

3. Please share any other comments you may have.

If people are worried about speeding and traffic on homelands, put more stop signs and tweak traffic lights and make other more helpful arrangements.

Please don't build this road

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	○	●	○	○
Access to a growing Sheridan Park research area	○	○	○	○	○	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	~~●~~	●	○	○	○	○
Opportunity for Streetscaping	○	○	●	○	○	○
Provisions for pedestrians and cyclists	○	○	○	○	○	●

Comments:

- We already have a cyclist/pedestrian trail – don't need another

I think round-abouts will keep the traffic early in the morning and later in the afternoon to move much more efficiently

- Would like to see traffic calming bumps placed on new road as well as the road separations as proposed.
- I like the road separations but feel there should be one additional one near the east end.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

○ The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

3. Please share any other comments you may have.

Love the idea of the roundabouts!

P.S. I appreciate all you've done to consider so many possible problems.

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CITY OF MISSISSAUGA

Municipal Class Environmental Assessment Study for Sheridan Park Drive
Public Information Centre – June 27, 2017 6-8pm
Sheridan Park Alliance Church
Comment Sheet

The City of Mississauga, is conducting a Schedule 'B' Class Environmental Assessment (Class EA) study for Sheridan Park Drive from Winston Churchill Boulevard to Homelands Drive. Through this Class EA study, the City is exploring the opportunity to connect the east and west section of Sheridan Park Drive. Several alternatives have been developed and evaluated and are being refined through community and agency consultation.

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	O
Speed Management Features	O	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	O	O	O	O	O	O

Comments:

DO NOT BUILD THE ROAD

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	●	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	●	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	●	○	○	○	○	○
Opportunity for Streetscaping	●	○	○	○	○	○
Provisions for pedestrians and cyclists	●	○	○	○	○	○

Comments:

A comprehensive plan for the Sheridan Community is required. Tonights presentation was one dimensional and more town halls are needed.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ● I don't know

Comments:

3. Please share any other comments you may have.

I am very concerned about the possibility of this road extension.

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DESIGN CONCEPTS

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	●	○	○	○
Access to a growing Sheridan Park	○	○	○	○	○	●
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	○	○	●	○	○
Opportunity for Streetscaping	○	○	○	○	●	○
Provisions for pedestrians and cyclists	●	●	○	○	○	○

Comments:

→ With the construction slated to close & redevelop QEW, South Service road + Dundas I don't believe traffic will ease with these measures.
→ Are you going to increase advanced greens at all surrounding intersections to keep the flow of traffic around Homelands?

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

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○ The results of the survey were unexpected
○ I don't know

Comments:

3. Please share any other comments you may have.

- We are very concerned about a road being developed & impacting trees/nature, noise & traffic volume actually increasing instead of calming traffic
  → it would be a real shame to destroy habitat & green space for nothing.
- Other measures haven't been addressed to ease concerns (ie) crosswalks to help kids/families safely cross Homelands

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	X	O	O	O
Access to a growing Sheridan Park	X	O	O	O	O	O
Speed Management Features	O	X	O	O	O	O
Roundabouts	O	X	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	X	O
Provisions for pedestrians and cyclists	O	O	O	X	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:
SOME INPUTS FROM TRAFFIC MTG SEEM TO HAVE BEEN HEARD

3. Please share any other comments you may have.

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1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	X	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	O
Speed Management Features	O	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	X	O	O	O	O	O

Comments:

Please leave area as is.
We use it and don't change it.
Thank You.

RESULTS OF ONLINE SURVEY

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O The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

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<u>DESIGN CONCEPTS</u>

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	✓	○
Speed Management Features	○	✓	○	○	○	○
Roundabouts	○	✓	○	○	○	○
Opportunity for Streetscaping	○	✓	○	○	○	○
Provisions for pedestrians and cyclists	✓	○	○	○	○	○

Comments:

<u>RESULTS OF ONLINE SURVEY</u>

2. What were your thoughts on the online survey results presented at the PIC?

- ✓ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ○ I don't know

Comments:

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	✓	O	O
Access to a growing Sheridan Park	O	✓	O	O	O	O
Speed Management Features	✓	O	O	O	O	O
Roundabouts	O	✓	O	O	O	O
Opportunity for Streetscaping	O	✓	O	O	O	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

WHY BUILD? WHO NEEDS IT?

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know
- ✓ MY FAULT, I DIDN'T DO SURVEY

Comments:

3. Please share any other comments you may have.

I AM BIASED - AS I LIVE ON PYRAMID BACKING ON FIELD. UNLESS THERE IS SOMETHING BEING BUILT ON SOUTH SIDE OF ROAD THAT WILL PROVIDE JOBS. MY OPINION IS THIS ROAD LEADS FROM NOWHERE GOING TO NOWHERE.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	●	○	○	○	○
Access to a growing Sheridan Park	○	●	○	○	○	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	●	○	○	○	○	○
Opportunity for Streetscaping	●	○	○	○	○	○
Provisions for pedestrians and cyclists	●	○	○	○	○	○

Comments:

RESULTS OF ONLINE SURVEY

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● The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

3. Please share any other comments you may have.

At the meeting I feel there was a disportionate voice from those who feel they have something to lose vs those who have something to gain ie the Homelands Drive & Thorn Lodge Drive routes who face many of the issues that the opposers fear.
SHERA AGM in December had a different feel.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	⊗	O	O
Access to a growing Sheridan Park	O	O	O	O	⊗	O
Speed Management Features	O	O	⊗	O	O	O
Roundabouts	O	⊗	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	⊗
Provisions for pedestrians and cyclists	⊗	O	O	O	O	O

Comments:

Not clear as to why this road is being proposed.
Do nothing option is viable but need to fix
Homeland traffic/speed

RESULTS OF ONLINE SURVEY

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- ⊗ The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

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Again, not clear why road is being proposed.

Fix ~~Homeland~~ Homeland traffic (speed bumps etc)
and save the money. this project is not needed

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	✓	O	O	O
Access to a growing Sheridan Park	✓	O	O	O	O	O
Speed Management Features	✓	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	✓	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

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- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

3. Please share any other comments you may have.

we don't need more congestion in our area.

Also Now more traffic on a Fri. with yet another mosk.

There's one just across ~~from~~ Q.E.W. now

just wait + see.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	✓	O
Speed Management Features	✓	O	O	O	O	O
Roundabouts	O	O	O	O	✓	O
Opportunity for Streetscaping	✓	O	O	O	O	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

If one of the purposes of the proposed road is to get access to the northern part of Sheridan Park, then why not just ~~ex~~ extend the road partially to allow partial access to the northern part?

RESULTS OF ONLINE SURVEY

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- O The results of the survey were unexpected
- ✓ I don't know

Comments:

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	⊗	O
Access to a growing Sheridan Park	O	O	O	O	O	⊗
Speed Management Features	⊗	O	O	O	O	O
Roundabouts	O	⊗	O	O	O	O
Opportunity for Streetscaping	O	O	⊗	O	O	O
Provisions for pedestrians and cyclists	O	O	O	⊗	O	O

Comments:

RESULTS OF ONLINE SURVEY

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- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- ⊗ I don't know

Comments:

3. Please share any other comments you may have.

Most attendees tonight seem to be those that are very near the affected property, and have no concerns about the traffic problem north of them. The biggest problem in the Homelands is the heavy traffic on the main roads. We believe that this proposed extension would reduce traffic on Homelands & Thorn Lodge, especially cut-through.

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1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	X
Access to a growing Sheridan Park	O	O	O	O	O	X
Speed Management Features	X	O	O	O	O	O
Roundabouts	O	O	O	O	O	X
Opportunity for Streetscaping	O	O	O	O	O	X
Provisions for pedestrians and cyclists	O	O	O	O	O	X

Comments:

The only reason the wants to build this road is to develope the land. We need more green spaces.

RESULTS OF ONLINE SURVEY

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- O The results of the survey were unexpected
- O I don't know

Comments:

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1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	X	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	X
Speed Management Features	O	O	O	O	O	X
Roundabouts	O	O	O	O	O	X
Opportunity for Streetscaping	O	O	O	O	O	X
Provisions for pedestrians and cyclists	X	O	O	O	O	O

Comments:

The road isn't going to improve the access to the park and ~~won't be~~ isn't beneficial to the nearby residents - only the research park businesses. Please ask the Park members to expand Speakman Drive to get their employees out to Winston Churchill & Erin Mills.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- X I don't know

Comments:

3. Please share any other comments you may have.

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CITY OF MISSISSAUGA

Municipal Class Environmental Assessment Study for Sheridan Park Drive
Public Information Centre – June 27, 2017 6-8pm
Sheridan Park Alliance Church
Comment Sheet

The City of Mississauga, is conducting a Schedule 'B' Class Environmental Assessment (Class EA) study for Sheridan Park Drive from Winston Churchill Boulevard to Homelands Drive. Through this Class EA study, the City is exploring the opportunity to connect the east and west section of Sheridan Park Drive. Several alternatives have been developed and evaluated and are being refined through community and agency consultation.

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Please take a few minutes to complete this Comment Sheet.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	O	O	O
Access to a growing Sheridan Park	✓	O	O	O	O	O
Speed Management Features	O	O	O	O	O	✓
Roundabouts	O	O	O	O	O	✓
Opportunity for Streetscaping	O	O	O	O	O	✓
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

O The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

Did not get the survey

3. Please share any other comments you may have.

If there will be another meeting, please try to answer with precise answers

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	✓
Speed Management Features	✓	O	O	O	O	O
Roundabouts	O	O	O	O	O	✓
Opportunity for Streetscaping	✓	O	O	O	O	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

3. Please share any other comments you may have.

- HOW WILL YOU ENSURE SAFETY OF STUDENTS AND RESIDENTS? PRESENTERS HAD NO RESPONSE BUT "THERE WILL BE VEGETATION"

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Please take a few minutes to complete this Comment Sheet. Plan 3 is great ☺

DESIGN CONCEPTS Stop the future studies, committees + build the road – help the people who work in the SR Centre Park.

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	✓	O	O	O	O
Access to a growing Sheridan Park	✓	O	O	O	O	O
Speed Management Features	O	✓	O	O	O	O
Roundabouts	✓	O	O	O	O	O
Opportunity for Streetscaping	O	O	✓	O	O	O
Provisions for pedestrians and cyclists	O	✓	O	O	O	O

Comments:

Build the road – the roundabout + islands are a brillant concept. Congrats to City planners for this speed management concept.
Plant more trees to cut down noise + improve air quality.

* The wooded areas are great for the coyotees + other 4-legged animals.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ✓ The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- O I don't know

Comments:

Thanks for the details + information.

3. Please share any other comments you may have.

Have UTM use space in the Research Centre for future research development – older/adult research – science / health
The city needs to encourage future research Companies to move in + use the empty buildings (not schools) for research + development.

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	X
Speed Management Features	O	X	O	O	O	O
~~Roundabouts~~	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	X
Provisions for pedestrians and cyclists	O	O	X	O	O	O

DANGEROUS

Comments:

NO TRAFFIC CAPACITY

RESULTS OF ONLINE SURVEY

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- O The results of the survey were unexpected
- X I don't know

Comments:

3. Please share any other comments you may have.

BAD IDEA.

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1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	O
Speed Management Features	O	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	O	O	O	O	O	O

Comments:

Subsequent thought: STAGE THE PROJECT
BUILD THE HOMELANDS-SPEAKMAN ROUNDABOUT FIRST,
AND EVALUATE THE OUTCOME.
THEN ASK ~~THE~~ AGAIN WHAT PEOPLE THINK.

RESULTS OF ONLINE SURVEY

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O The results of the survey were unexpected
O I don't know

Comments:

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	●	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	○	●
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	○	○	○	○	○
Opportunity for Streetscaping	○	○	○	○	○	○
Provisions for pedestrians and cyclists	○	○	○	○	○	○

Not growing

Barely ~~Not~~ mentioned

Comments:

If you go ahead with this plan, you will destroy an ~~ex~~ exceptionally beautiful area of Mississauga FOREVER. The city is ~~tur~~ starting to turn into an ugly concrete jungle.

RESULTS OF ONLINE SURVEY PLEASE do not destroy this

2. What were your thoughts on the online survey results presented at the PIC?

○ The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

I'm not sure that all the important data/factors were taken into consideration during this survey.

3. Please share any other comments you may have.

unique environment. There are alternatives that you must consider. We, ~~and~~ the residents and all the nature in the area (animals & plants) do NOT want this area destroyed. Air & noise pollution will greatly increase; residents' health and well-being will be adversely affected. If you care, you will NOT go ahead with this plan, not NOW, not EVER.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	●	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	●	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	○	●	○	○	○
Opportunity for Streetscaping	●	○	○	○	○	○
Provisions for pedestrians and cyclists	●	○	○	○	○	○

Comments:

I am most concerned about extending this road and the impact on the quality of life in the surrounding area. I use the path daily and am very concerned about the impact on the wildlife and trees.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

○ The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

3. Please share any other comments you may have.

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	●	○	○	○
Access to a growing Sheridan Park	○	○	●	○	○	○
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	○	○	●	○	○
Opportunity for Streetscaping	○	●	○	○	○	○
Provisions for pedestrians and cyclists	●	○	○	○	○	○

Comments:

RESULTS OF ONLINE SURVEY

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○ The results of the survey were unexpected
○ I don't know

Comments:

3. Please share any other comments you may have.

1) Unless we have better enforcement of traffic violators (ie ignoring stop signs) we ~~[illegible]~~ will be faced with mayhem at Fifth Line West & Sheridan Park Dr.

2) We have enough pollution in our immediate area.

3) are round-abouts based on British model or the old QEW & Southdown Russian Roulette model?

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	●	○	○
Speed Management Features	○	●	○	○	○	○
Roundabouts	○	○	●	○	○	○
Opportunity for Streetscaping	○	○	○	○	●	○
Provisions for pedestrians and cyclists	●	○	○	○	○	○

Comments:

RESULTS OF ONLINE SURVEY

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● The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	⊗	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	⊗	O	O
Speed Management Features	O	O	O	⊗	O	O
Roundabouts	O	O	⊗	O	O	O
Opportunity for Streetscaping	⊗	O	O	O	O	O
Provisions for pedestrians and cyclists	⊗	O	O	O	O	O

Comments:

i like the design concepts, but I would have liked to have seen the following:

1) A planting compensation plan which includes 'utility' lands which do not have ~~pipe~~ pipeline underneath. While these lands may be owned by TransCanada/Enbridge/Union Gas, there is an opportunity to work with them to enhance and beautify what is now greenspace.

2) During rush hours, I am ~~concerned~~ concerned that cars will be idling for long periods in and surrounding the proposed traffic circles.

3) There is an opportunity to build a secondary drop off point for parents to drop off their children at Homelands Sr. Public School. Currently cars park along Homelands Drive and in addition to blocking bike lanes, creates a hazardous area for pedestrians, cyclists and vehicular traffic.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

⊗ The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

N/A.

3. Please share any other comments you may have.

I believe that this EA process can be positive for the community. In particular, I would like to see the City be more proactive in ensuring that the utility companies take care of their land. As it is part of the study area, I would like the city to collaborate with TransCanada/Enbridge/Union Gas ~~and~~ to improve the land just east of Winston Churchill and north of Speakman Drive. Additional trees in this area will ~~also~~ dampen the expected noise which will come from the new road. I am aware that trees cannot be planted along the actual pipeline ROW; however, there are no pipes in the area I am referring to.

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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	☑	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	☑
Speed Management Features	O	O	O	O	O	☑
Roundabouts	O	O	O	O	O	☑
Opportunity for Streetscaping	O	O	O	O	O	☑
Provisions for pedestrians and cyclists	☑	O	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- O The results of the survey are more or less what I expected
- O The results of the survey were unexpected
- ☒ I don't know

Comments:

3. Please share any other comments you may have.

I am strongly against the proposed extension of Sheridan Park Drive

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	○	○	○	●	○	○
Access to a growing Sheridan Park	○	○	○	○	○	●
Speed Management Features	●	○	○	○	○	○
Roundabouts	○	○	○	○	○	○
Opportunity for Streetscaping	○	●	○	○	○	○
Provisions for pedestrians and cyclists	○	○	●	○	○	○

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ● I don't know

Comments:

3. Please share any other comments you may have.

I am primarily interested in reducing traffic along Homelands Dr, so I welcome the recommendation. I suspect that there would have been a lot more support for it if more residents who live along Homelands had attended

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	O	O	O	O	O	O
Access to a growing Sheridan Park	O	O	O	O	O	O
Speed Management Features	O	O	O	O	O	O
Roundabouts	O	O	O	O	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	✓	O	O	O	O	O

Comments:

I disagree with the implementation of this project. This road will bring more traffic into the area, reduce area for wildlife, cause more traffic noise, it is also a waste of money

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

O The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

3. Please share any other comments you may have.

I think that this project is for the convenience of the research centre and to accomodate the potential expansion of companies on Sheridan Park Drive. Please do not go ahead with this!

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	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	O	O	O	O	O
Access to a growing Sheridan Park	✓	O	O	O	O	O
Speed Management Features	O	O	✓	O	O	O
Roundabouts	✓	O	O	✓	O	O
Opportunity for Streetscaping	O	O	O	O	O	O
Provisions for pedestrians and cyclists	O	✓	O	O	O	O

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

O The results of the survey are more or less what I expected
O The results of the survey were unexpected
O I don't know

Comments:

3. Please share any other comments you may have.

it may get rid of wild life

Notice of Collection of Personal Information:
Personal information is collected under the authority of the Environmental Assessment Act and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed on this sheet.

CITY OF MISSISSAUGA

Municipal Class Environmental Assessment Study for Sheridan Park Drive
Public Information Centre – June 27, 2017 6-8pm
Sheridan Park Alliance Church
Comment Sheet

The City of Mississauga, is conducting a Schedule 'B' Class Environmental Assessment (Class EA) study for Sheridan Park Drive from Winston Churchill Boulevard to Homelands Drive. Through this Class EA study, the City is exploring the opportunity to connect the east and west section of Sheridan Park Drive. Several alternatives have been developed and evaluated and are being refined through community and agency consultation.

The purpose of this Comment Sheet is to gather input from the public on the material presented at the PIC. Your input is greatly appreciated.

Please take a few minutes to complete this Comment Sheet.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	☒	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	○	○
Speed Management Features	○	○	○	○	○	○
Roundabouts	○	○	○	○	○	○
Opportunity for Streetscaping	○	○	○	○	○	○
Provisions for pedestrians and cyclists	☒	○	○	○	○	○

Comments:

We would like it to stay unchanged.
Thank You

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

○ The results of the survey are more or less what I expected
○ The results of the survey were unexpected
○ I don't know

Comments:

No microphone in the meeting. Hearing impaired not able to hear. ?

3. Please share any other comments you may have.

Notice of Collection of Personal Information:
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DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Comments:

Claiming the extension has the opportunity to "potentially divert traffic from the Sheridan Homelands neighbourhood" is misleading. While the mentioned traffic models show an extension could temporarily reduce traffic, it does not show that Sheridan Homelands specifically will benefit from this change. Furthermore, the fact that one of the goals of creating the extension is to "increase access to a growing/developing Sheridan Park" suggests the extension is meant to attract new businesses to Sheridan Park, and with those businesses will come more employees and vehicle use in the area. It was clear that the majority of residents in favour of the extension believe it will reduce the traffic along Homelands Dr. I feel this claim needs to be addressed more directly and the language used in publicly facing materials more explicit.

I am also concerned about the lack of safety considerations presented. A speed limit has yet to be proposed even though this will be a major road adjacent to a school. Arial photos show trails and foot traffic from the school and walkway into the wooded area yet there have been no considerations for cross walks or stop signs. At the meeting we were told that vegetation would be enough to protect pedestrians in the case of cars going off road in an accident. There appears to be no plan to construct guardrails or barriers.

Finally, the presented air quality impact assessment showed that Benzene levels in the area already exceed Ministry criteria. The construction and vehicle use of this planned extension along with the continued development of Sheridan Park will only increase these levels. City planning should be mitigating the levels of toxins in our air, not exacerbating situation.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- (selected) The results of the survey are more or less what I expected
- The results of the survey were unexpected
- I don't know

Comments:

Again, the survey results show that the presentation materials used by the team behind this development have convinced residents that the extension will decrease traffic in the Sheridan Homelands neighbourhood. However, no evidence was presented to show that this extension will provide long-term improvements to congestion or volume experience in the area. I ask that the team retract statements that are hypothetical in nature or provide evidence to support these claims.

3. Please share any other comments you may have.

Who will be responsible for approval of the extension?

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	○	○	○	◉	○	Least Important

Comments:

This online survey has different instructions from those handed out at the meeting. This rendition doesn't allow me to select "least important." Also, the instructions on the hand-out sheet said to "select one response per column."

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ◉ I don't know

Comments:

I cannot recall a presentation of the results of earlier surveys. I do not think there was such a presentation.

3. Please share any other comments you may have.

The presenters tried hard, but they got virtually no support for the plan from those present.There was no one who argued for having this road built. And no one could see how this would reduce the significant traffic up and download Homelands drive, which is where the big problem is. Most, if not all, thought the green space should be preserved or enhanced, and NOT given over to the road. Many argued that Speakman Drive should be widened, or in some other way changed to accommodate the traffic. It was not apparent that any study had been done regarding the incredible traffic on Homelands, i.e. where are these cars and trucks going? And no one could see how a road through that greenspace could alleviate traffic on Homelands. There appears to be lots of access to the business park from the North Service Road, and from the two ends of Speakman Drive. My assessment of the mood of those attending was that it was energetically against the proposed road through the green space.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	◉	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Comments:

I am very concerned about the negative impact to the community. There is a vibrant use of the bike trails and natural area in the wood lot area. I am concerned about protection of an older growth woodlot that is an ecosystem that cannot be replaced with streetscaping. This woodlot contains many varieties of trillium and is also habitat to hawks and various other wildlife ecosystems. This area has been identified as a Carolinian Forest that is becoming rarer in Ontario. The Homelands has become an area that is surrounded by a highly congested traffic area and the extension would further encroach upon this community. The area in question is a buffer to the congestion, noise and air quality of this community. My concerns are to protect the character and community functioning of this small but vulnerable area of Mississauga. I would like to see the focus on Speakman Drive which is underutilized at this date.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ◉ The results of the survey were unexpected
- ○ I don't know

Comments:

3. Please share any other comments you may have.

I would like to see more information regarding long term planning for this community and road system as it connects to the Oakville Industrial/commercial community. I would also like to see what the long term plans are for the Sheridan Research Park regarding types of development. I would like the next information meeting to include fiscal plans for this proposal.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	●	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	○	●	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	●	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	●	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	○	●	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Comments:

What is the relevance of this?

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ◉ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ○ I don't know

Comments:

What is the relevance of this?

3. Please share any other comments you may have.

There was no logical detailed reason give for option 3 and no logical detailed reason for rejecting option 1. Lack of costing is glaring missing item.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Comments:

I don't know what is meant by "importance" above (maybe a holdover from the last survey) which leaves only this field to put any comments in.

** Compatibility **
Is the noise reduction on Homelands Drive, where houses have always fronted onto a collector street where traffic can be expected, enough to justify new noise for residents backing onto a ROW closed to motor vehicles since the area was developed?

** Access to Sheridan Park **
The only improved access I can see in the draft plan is to 2285 Speakman Drive, only for drivers (not pedestrians or cyclists, who would have to take *longer* routes than drivers since there's no access to the driveway from the multi-use trail, even in the plan), and only those coming from the west. If Sheridan Park Drive needs to be widened [1] for access to new development between the two woodlots, it should be done whenever that development happens, to limit net new car traffic attracted by spare capacity.
[1] Widened, not extended! It already exists in its full length for everyone but drivers.

What would improve access to both future pipe dreams and, perhaps less importantly, Sheridan Park as it is today, is a formal pedestrian and cycling connection from Thorn Lodge Park, through Homelands Senior PS and 2285 Speakman, to Speakman Drive and on to North Sheridan Way over a new sidewalk on Flavelle Blvd. Perhaps with a new bridge or tunnel across the QEW in a second phase, to connect the Homelands with Park Royal away from arterial roads with freeway onramps.

** Speed management **
The median islands are a welcome change from the usual tendency for wide, arrow-straight roads, but why the extra wide 10 metre roadway between the two islands? Remember that bicycles and pedestrians already have the trail to the north. If on-street parking is needed for future development fronting onto this section, it should be built as a layby that doesn't invite drivers to race between them as if they were all-way stops (and which could incorporate some hip trendy LID features).

** Roundabouts **
Both roundabouts look to be better designed than both the new Skymark and Explorer one (sufficient queuing space before crosswalks) and the planned one on Square One Drive (no confusing lane assignments). The eastern one takes care of bicycle connectivity well, but the eastern one only has a sidewalk connection to the trail. Why not add a parallel bike path that connects to the circle directly opposite Speakman Drive? People won't dismount and walk

either way, as every existing flawed design like this shows.

** Streetscaping **
No comments

** Pedestrians and cyclists **
Already addressed above

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- (selected) The results of the survey are more or less what I expected
- The results of the survey were unexpected
- I don't know

Comments:

3. Please share any other comments you may have.

The slides often refer to future growth in Sheridan Park. What growth is this? Is there any development planned that would front onto Sheridan Park Drive? I haven't seen any plans make it to PDC yet.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Comments:

Design concepts really didn't address why there is a requirement for this extension. Concepts were based on a seemingly predetermined plan with no solid reasons being given for the need of an extension

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

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- ○ The results of the survey were unexpected
- ○ I don't know

Comments:

Area residents on the whole do not want this and as outlined during the meeting there isn't a need being presented by the Sheridan Research Centre

3. Please share any other comments you may have.

1. as admitted in the meeting it will not alleviate traffic issues on Homelands
2. it won't provide any more access to Winston Churchill or Erin Mills Pkwy as the # of exits will remain the same and will probably make getting into and out of the Sheridan Research Park worse with the increase of traffic
3. we will lose one of the very few trails available to us in this area. It is currently used by a wide variety of people both residents and Sheridan Park employees on a daily basis and allows them to enjoy a peaceful and safe area away from noise and traffic.
4. no concrete reasons have been presented as to why the city feels this is necessary and would seemingly be a waste of tax payers money

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

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- ○ The results of the survey were unexpected
- ◉ I don't know

Comments:

3. Please share any other comments you may have.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	◉	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Comments:

No real reason was given at the meting as to way extending Sheridan Park Drive is necessary or makes sense.
I do believe access to Sheridan Park is important, but Speakman Drive and North Sheridan Way are under utilized and would be more beneficial to Sheridan Park. The extension would provide no more access to Winston Churchill or Erin Mills than there is now. If North Sheridan Way (which is in bad shape at the moment) could be hooked up to Upper Middle Road, there would be access beyond Winston Churchill to the west.

The pathway that has been put in along the utility corridor is widely used by local residents as well as employees of Sheridan Park on their lunch time. The employees always turn along the path west of Homelands Drive, not to the same path east of Homelands Drive. This allows pedestrians to stay away from traffic noise and emissions. this is the only trail we have between Dundas & the QEW and it is well used. It also provides habitat for many animals and birds, important for a healthy ecosystem and a healthy space for humans.

The CVC report from a few years ago also indicated that there is not the recommended forestration for the headwaters of Sheridan Creek. Extension of the road would add further pollution to the creek.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- ○ The results of the survey are more or less what I expected
- ○ The results of the survey were unexpected
- ◉ I don't know

Comments:

Basically it was what I thought it would be but I don't believe it will alieviate the traffic on Homelands Drive to any extent. I travel Homelands frequently to get to Winston Churchill and other than "rush" hour for people going to or from work, or to the school, traffic is not high. I have also talked to some on Homelands & Thornlodge that are much more concerned about losing the only "nature" corridor we have for the Homelands vs reducing traffic in the Homelands.

3. Please share any other comments you may have.

I do not believe any valid reason for extending the road was given. On top of that, a vital natural area could be enhanced vs destroyed. Cutting down the trees to complete the project is not a green option. It would take half a century for them to mature and could adversely affect Sheridan Creek and the animals, birds and fauna of the area. This does not seem viable for a project that will not aid in traffic flow for Sheridan Park or for Sheridan Homelands

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	○	○	○	○	○	Least Important

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

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- ○ The results of the survey were unexpected
- ○ I don't know

Comments:

This is the survey provided at the June 27th public meeting. It cannot be answered as most of this was not covered. Most of us were there to have input into whether or not an extension would be constructed, not on compatibility, access, speed management etc. The results asked about in question 2 were not even presented or at least discussed, unless you are referring to the 4 alternatives. The presentation and process has felt like the city and it's representatives are doing lip service to involvement in this important decision-making process. How can a community provide feedback on a plan when they were told they were being invited to a session to provide their opinions on the viability of extending Sheridan Park Drive. Very, very disappointing presentation and change management process.

3. Please share any other comments you may have.

Can I please have the results of the original survey sent to local residents.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	○	○	◉	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	(●)	( )	( )	( )	( )	Least Important

Comments:

the survey presumes a road is inevitable. the road is not desired and has a significantly negative impact on the natural environment. options for NOT including this proposed road MUST be included in any plans. Make the North Service Road wider instead.

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

( ) The results of the survey are more or less what I expected

(●) The results of the survey were unexpected

( ) I don't know

Comments:

I didn't see online survey results at the meeting. What I heard was the city wants to build this road--likely due to more employees in the business park. Most residents there were NOT in favour of this road being laid. The trees being destroyed will significantly damage the environment. More cars and more roads are NOT the answer. The survey presumes a road is inevitable. the road is not desired and has a significantly negative impact on the natural environment. options for NOT including this proposed road MUST be included in any plans. Make the North Service Road wider instead.

3. Please share any other comments you may have.

City planners should not be told what to do by big businesses. Just because there are more employees in the business park does not mean that all those trees should be removed. No trees or shrubs or any vegetation should be removed. Most residents are NOT in favour of this road being laid. The trees being destroyed will significantly damage the ecosystem in that area. More cars and more roads are NOT the answer. Alternative options, not just 'doing nothing' MUST be included in any plans. Make the North Service Road wider instead. Make a parking garage near the QEW with regular shuttle service for the employees. This would allow all those trees to remain intact, and still allow workers access to their places of work, including the expected additional employees for the business that is making use of its entire building.
Ask for creative solutions from the community--the students at the nearby schools, from the primary levels to university. This type of input can be accessed without any cost to taxpayers.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one per line)

Compatibility with adjacent communities and natural areas

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Access to a growing Sheridan Park

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Speed Management Features

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Roundabouts

	1	2	3	4	5	
Most Important	○	○	◉	○	○	Least Important

Opportunity for Streetscaping

	1	2	3	4	5	
Most Important	○	◉	○	○	○	Least Important

Provisions for pedestrians and cyclists

	1	2	3	4	5	
Most Important	◉	○	○	○	○	Least Important

Comments:

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

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- ○ The results of the survey were unexpected
- ◉ I don't know

Comments:

3. Please share any other comments you may have.

Prepare to accommodate a future road running south from the new road to improve service to Sheridan Research Park roughly half way between Speakman and Homelands intersections. The new east-west road will likely need to become four-lanes in near future. Left-turns onto new east-west road from Erin Mills (northbound) and Winston Churchill (southbound) will grow dramatically.

Please complete the following information for our records

Jennifer Vandermeer

From: [redacted]
Sent: Sunday, June 18, 2017 10:36 AM
To: Karen Ras
Cc: Sheridan Park EA
Subject: Sheridan Park Drive Environmental Assessment

Hello Karen.

I read your article in The Sheridan Times regarding the Sheridan Park Drive extension. I have also received notification of the meeting on June 27, 2017 which I hope to attend.
I have some comments as my house backs on to the right-of-way. I am trying to not be a NIMBY in this matter. Several of my neighbours concur with this.
I believe this to be a waste of taxpayers money.

1. The traffic in the Sheridan Park Corporate Centre is not excessive being heavier only in the AM and PM rush. I have done my own drive through to check.

2. Improving the pedestrian and cycling network is not necessary as the paved path in the right-of-way is well used and adequate.

3. The prime reason for this study I believe is "accommodating future development". This means destroying mature trees and a good wildlife habitat. I used to visit the woodlot many times as there was acres of Trilliums and other wildflowers. Can Mississauga not keep an area such as this undeveloped for all kinds of environmental reasons? Need I mention climate change?

4. The existing straight-away on Speakman Drive is a local racetrack for cars and motorcycles especially late at night and on the weekends which wakes us up. We don't need a new street to add to that.

Regards
[redacted]

Jennifer Vandermeer

From: [redacted]
Sent: Tuesday, June 27, 2017 10:20 PM
To: Sheridan Park EA
Cc: dana.glofcheskie@mississauga.ca; David Argue
Subject: Sheridan Park Drive Extension PIC

Hello,

Thank you for meeting with the residents of Sheridan Homelands at tonight's PIC. The discussion was heated yet informative. I have some follow up questions I hope you can answer.

1. I raised the question of safety during tonight's discussion. I didn't get a clear answer about what steps will be made to ensure the safety of residents and the students of the adjacent school? I was told that the road would be 30 m from the school and there would be vegetation. Could you elaborate on what will be done to protect pedestrians and enforce traffic laws.

2. While models may show an overall reduction in citywide traffic, did the results of the traffic study show that the Sheridan Park Drive Extension will reduce traffic specifically along Homelands Dr? Is there evidence that shows the current traffic along Homelands Dr. is due to throughput traffic from Erin Mills Pkwy to Winston Churchill Blvd, or due to vehicles specifically accessing the business park? Is there evidence to show traffic along Homelands Dr. is not due to the residents within Sheridan Homelands?

Thank you for you time. I look forward to hearing your responses.

Best,
[redacted]

Jennifer Vandermeer

From: [redacted]
Sent: Wednesday, June 28, 2017 4:07 PM
To: Sheridan Park EA
Cc: [redacted]
Subject: Comment sheet re: Sheridan Park dr extension

CITY OF MISSISSAUGA

Municipal Class Environmental Assessment Study for Sheridan Park Drive
Public Information Centre – June 27, 2017 6-8pm
Sheridan Park Alliance Church
Comment Sheet

The City of Mississauga, is conducting a Schedule 'B' Class Environmental Assessment (Class EA) study for Sheridan Park Drive from Winston Churchill Boulevard to Homelands Drive. Through this Class EA study, the City is exploring the opportunity to connect the east and west section of Sheridan Park Drive. Several alternatives have been developed and evaluated and are being refined through community and agency consultation.

The purpose of this Comment Sheet is to gather input from the public on the material presented at the PIC. Your input is greatly appreciated.

Please take a few minutes to complete this Comment Sheet.

DESIGN CONCEPTS

1. Please rate the general design concepts that were presented (select one response per column)

	(1) Most Important	(2)	(3)	(4)	(5)	(6) Least Important
Compatability with adjacent communities and natural areas	✓	○	○	○	○	○
Access to a growing Sheridan Park	○	○	○	○	○	✓
Speed Management Features	✓	○	○	○	○	○
Roundabouts	✓	○	○	○	○	○
Opportunity for Streetscaping	✓	○	○	○	○	○
Provisions for pedestrians and cyclists	✓	○	○	○	○	○

Comments:

Should consider expaning (1) North Sheridan Way And or Speakman Dr for better access to QEW.
- Consider speed bumps installation on Flavelle Blvd to prevent speeders. (speeders use this road late @ night

RESULTS OF ONLINE SURVEY

2. What were your thoughts on the online survey results presented at the PIC?

- [x] The results of the survey are more or less what I expected
- [ ] The results of the survey were unexpected
- [ ] I don't know

Comments: BY INSTALLING THE EXTENSION - IT WOULD DEFEAT THE INSTALLED WALKPATH THAT SO MANY PEOPLE ENJOY.

3. Please share any other comments you may have.

PLEASE CONSIDER OTHER OPTION 1 OR 2 OR 4 & NOT JUST OPTION 3. MORE OPEN MEETINGS TO DISCUSS PRO'S & CON'S OF OPTION 1, 2 & 4 & NOT JUST OPTION 3 WHICH IT SEEMED WAS DONE.

Notice of Collection of Personal Information:
Personal Information is collected under the authority of the Environmental Assessment Act and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed on this sheet.

[redacted]

Sent from Mail for Windows 10

Jennifer Vandermeer

From: [redacted]
Sent: Wednesday, June 28, 2017 12:53 PM
To: Sheridan Park EA
Subject: 2017-06-28 Sheridan Park Drive Extension

Dear Sir or Madam,

Unfortunately , my wife and I missed the meeting last night about the extending of Sheridan Park drive to Winston Churchill Blvd. We were wondered if any minutes of the meeting will be published ?, and if so how do we access them ?

We are hopping that extending the Sheridan Park Drive goes ahead as soon as possible for the following reasons:-

1) Most importantly this would reduce the through traffic in the surrounding residential area.

2) We think this this reduction in traffic along Homelands Drive is important as there is a school on Homelands and there are quite a few children who get to this school from Thornlodge Park. This route to school means that the children must cross Homelands Drive to get to School. Therefore, reducing the traffic (especially the morning rush hour) on Homelands can only make it safer for children to cross the road.

Therefore, my wife and I support the extending of Sheridan Park Drive as soon as possible.

Cheers

[redacted]

[redacted]

From: Jennifer Waye
Sent: 2017/06/29 9:04 AM
To: Dana Glofcheskie; Leslie Green
Cc: Karen Ras
Subject: FW: Sheridan Park Extension

Good morning,

Would you please assist with a response to the below questions?

Dear Councillor Ras,

Thank you for your reply. I understand now that there has not been a formal request for the extension by a business but last night you did name a party involved in the conversations and inquiries. Could you please repeat that name for me, please?

I also understand that like myself, you have many unanswered questions about the project. I encourage you to ask those questions at the next PIC and with the staff. I have already contacted the staff with many of my own follow up questions.

This morning, I had the chance to review the slides from last night's presentation and I do have a concern I hope you can address. Slide 17 on Noise and Air Quality Impact Assessment states:

The future predicted air quality levels at sensitive receptor locations in the Study Area...were all below the Ministry of the Environment and Climate Change criteria ***with the exception of Benzene, which already exceeds the criteria based on background air quality***

According to the Canada-wide standards implementation plan, benzene is classified a carcinogen and non-threshold toxicant, a substance which causes probability of harm at any level of exposure. A primary source of benzene emissions is from vehicles, to which the Sheridan Park Dr extension and continued development of Sheridan Park will contribute.

1. What measures are currently in place to bring the benzene levels of our neighbourhood back within acceptable Ministry criteria?

2. What is your stance on what should be done to improve the air quality of Ward 2 and Sheridan Homelands? Given the study results presented to date, do you feel the Sheridan Park Dr Extension project is in line with these measures?

Cheers,

Jen Waye
Executive Assistant to
Councillor Karen Ras, Ward 2

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"This e-mail may not be forwarded to anyone for any reason without express written permission of the author."

From: [redacted]
Sent: 2017/06/30 8:11 AM
To: Dana Glofcheskie; Karen Ras
Subject: Sheridan Park Drive Extension

My family has lived in Mississauga since 1974 and in the Homelands are since 1981. On June 27 I attended a meeting at the Alliance Church regarding the proposed extension of Sheridan Park Drive. I arrived at 6:05 PM so I was able to read only about half of the presentation on the boards around the sides and back of the room. Subsequently, I have downloaded the study produced by Burnside from the website and had a chance to fully absorb the information. I am disturbed by the information regarding air quality in the area as listed on page 17 of the report.

"The future predicted air quality levels at sensitive receptor locations in the study area ... were all below the Ministry of the Environment and Climate change criteria with the **exception of Benzene**, which **already exceeds the criteria based on background air quality**." In other words, since Benzene levels are already high in that area it does not matter if the proposed extension increases that level.

Benzene is a carcinogen. A woman in the audience stated that there a several cases of people in her area who have developed cancers. My daughter, who grew up in the Homelands, found out that she had bladder cancer when she was 38 years old. It is unusual for someone so young and a female to get bladder cancer. She is going into hospital at noon today to have another round of surgery on new cancer on her bladder.

1. Are Benzene levels higher in that area compared to other parts of Mississauga or the GTHA?
2. Was there any follow up to determine why levels are higher in that area?
3. Is Benzene being emitted by any of the research facilities in the area?
4. Are any studies under way to determine if there are clusters of cancers in the area?

Thank you

[redacted]

Sent from Mail for Windows 10

From: [redacted]
Sent: July 11, 2017 5:55 PM
To: Dana Glofcheskie
Subject: Re: Sheridan Park Drive Extension

Hi Dana

Thank you for the information on the benzene levels in the area. You should add that explanation to your future reports.

The presentation regarding the extensions was generally well done although I had to read the downloaded study to get a better understanding of what was proposed (too many interruptions from the audience). Since then I have walked around the area and through the woodlot paths to try to get a better feel for the reasoning behind the need for the extension and what the pros and cons are. The research area is very spread out and there seems to be several unused buildings and land so I can understand the need for action to attract new business to the area. The 2014 Sheridan Park Corporate Centre Draft Plan I read stated that the extension was a must but if I put myself in the car driver's seat at any of the businesses in the area now I don't see how the extension could be of much benefit - Winston Churchill at Sheridan Park Drive seems to be the pinch point. Is there some traffic study in layman's language that is available to help understand the projected flow change with the extension?

Thanks
[redacted]

From: Jennifer Waye
Sent: July 31, 2017 8:34 AM
To: Leslie Green; Dana Glofcheskie
Cc: Karen Ras
Subject: FW: Sheridan Park Extension

Good morning,

Would you please assist with a response to this email?

While the province of Ontario has indeed implemented legislation to deal with benzene emissions by companies and facilities, this does not change that fact that the one of the largest benzene contributors is vehicle emissions. The amount and density of vehicles in the Sheridan Park area will directly impact the levels of benzene in our air. The roadways which will drive these levels fall to city of Mississauga, and not the province, to regulate.

Could you please provide me with your source showing provincial benzene levels are above the criteria from the Ministry of the Environment and Climate Change? Are you referring to an average calculated from levels measured across the province, or are you referring to specific regions within in the province? In either case, a direct comparison cannot be made with Sheridan Homelands. We are a residential neighbourhood of homes and schools; much different that dense metropolitan centres or areas reserved for manufacturing or petroleum production. The fact of the matter is the air quality assessment performed in Sheridan Park specifically for the EA study for the Sheridan Park Drive extension found that our ambient benzene levels are already higher than the criteria set forth by the ministry. I would like to know what these measured levels actually were. Steps can and should be taken at the municipal level to remedy this.

Once more, increasing vehicle traffic to an already compromised airshed will make the problem worse. Benzene emissions will rise and the health of the residents of Ward 2 will be impacted. Again, benzene is a non-threshold toxicant and known carcinogen. Any amount is harmful to one's health. Any increase in exposure will result in greater health risks to those exposed. I do hope you take these concerns seriously.

I would like you to know that my own concern for this issue is not solely due the fact that I live in Sheridan Homelands. I grew up in Mississauga and I have been able to raise my own daughters here as well. I was lucky enough to attend UTM where I earned my Hons. BSc in Biology and MSc in Ecology and Evolutionary Biology. I now work on scientific affairs resources with pharmaceutical and biotech companies, primarily on cancer therapeutics. Furthermore, I know first hand what it is like to lose loved ones to cancer. The benzene data presented in the EA report may have only been a footnote on a single slide, but I recognize the severity of its implications. Over the past few weeks I have sourced several VOC sensors that myself and other residents will be using to record ambient benzene levels on our properties. It is a form of citizen science but not without the potential for partnerships in academia and industry. A real time feed of our benzene levels will soon be made publicly available online via a third party service. Data collection has already started and will continue indefinitely. When construction on the Sheridan Park expansion begins we will have evidence of any increase in benzene due to both the construction or resulting increase in vehicles.

Cheers,

Jen Waye
Executive Assistant to
Councillor Karen Ras, Ward 2

MISSISSAUGA

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Appendix M5

Public Correspondence

Appendix M5

A

Shae Richter

From: [redacted]
Sent: Tuesday, January 31, 2017 12:54 PM
To: Sheridan Park EA
Subject: Re: study doc access
Attachments: Homelands and Thornlodge Jan 27 12017.jpg

The photo below illustrates my point. There is a lot of truck traffic using Homelands Drive to access Winston Churchill Blvd.

On Tuesday, January 31, 2017 11:29 AM, Sheridan Park EA <SheridanParkEA@rjburnside.com> wrote:

Hello [redacted],

Thank you for your email. The project team would appreciate your feedback through the completion of the survey. The link to the online survey has been repaired. It is available at Mississauga.ca - Residents - Sheridan Park Drive Extension Class EA Study for your completion.

Regards,
The Sheridan Park EA Project Team

From: [redacted]
Sent: Thursday, January 26, 2017 10:16 AM
To: Sheridan Park EA
Subject: study doc access

Hello.
The link provided does not access a survey. I would like to be part of this survey and request a hard copy.
We have lived at the West end of Homelands Drive for 30 years, (it had only a stop sign when we moved here) and have watched it become a very busy thoroughfare, with a great deal of traffic cutting through the neighbourhood to avoid Dundas St. There are times in the day when it is difficult to get out of the driveway as a result.

Regards

[redacted]


MT
MILLTOWN TRUCKING
19
66

B

Shae Richter

From: Sheridan Park EA
Sent: Tuesday, February 07, 2017 10:04 AM
To: [redacted]
Cc: David Argue; Dana Glofcheskie
Subject: RE: Concerned Community Member- Sheridan Park Drive Extension

Hello [redacted]

Thank you for your email regarding the Sheridan Park Drive Extension EA - Notice of Commencement, your input is important to us.

We have just started the Class EA process, which requires us to look at a number of factors including transportation (all modes), social, cultural and natural environments as well as mitigation measures. During our assessment we will be taking into consideration your comments. We will look at issues that are important to you including traffic, safety and preservation of natural heritage features. In addition to considering the option of a roadway connection, we will also consider do-nothing option.

To help you understand why this proposal is moving forward, this roadway connection has been identified in the City's Official Plan as a Future Major Collector. The City is undertaking the EA study to determine the needs for this area.

Public input is a key part of the EA process. A Public Information Centre (PIC) will be held for the EA to present information related to the study and allow for any questions. Information on this PIC will be made available as the study progresses.

We will also add your name to the Project Contact List such that you are directly circulated on future project notices. Please feel free to contact us should you have any more comments or questions.

Sincerely,
The Sheridan Park Drive EA Project Team

From: [redacted]
Sent: Sunday, January 29, 2017 2:45 PM
To: Sheridan Park EA
Subject: Concerned Community Member- Sheridan Park Drive Extension

To whom it may concern,

With regards to the Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension,

I am a resident on Barcella Cres and I have some comments about this proposal that I wish to share.

I am extremely concerned about this proposal. I live here with my husband and young daughter with plans to expand our family and carry out the rest of our lives in this home. Our backyard faces Sheridan Park. I adore going on walks in Sheridan Park with my family and daughter, greeting neighbors walking their dogs, community members riding their bikes and taking in the lush scenery, and waving at business people getting some fresh air. As I write this email, I am looking through my window out onto Sheridan Park. It is currently such a beautiful view, a gem and rare green space, thriving within the city walls.

I am utterly baffled and confused as to why a proposal for extending Sheridan Park Drive is moving forward.

First, I have never witnessed a problem with any traffic on Homelands Drive. We have so many roads in this area, and enough roads in the commercial area for cars to drive to their destination easily.

Second, I cannot believe the city is allowed to build on the precious green space we are so lucky to have. Why can't the city focus instead on preserving our priceless environment and green spaces? We do not need more roads, we need to more natural landscapes.

Third, I am very concerned about safety. Sheridan Park and the surrounding area is a space for the community to go on walks, and importantly, for children to play. A school backs out onto this park. If we build a road, the chances of car accidents will only rise. People in cars will inevitably speed down such a straight, hidden road.

We do not want traffic in our backyard. We do not need car pollution even closer to our home. Right now we have a wonderful green space to filter the emissions and help support our beautiful planet. We want safety and natural beauty for our community members to enjoy.

Please, do not ruin our beautiful natural space.

I ask to hear back regarding our concerns. Do not hesitate to contact me at any time with questions or updates. Please keep our family in mind while moving forward with this study.

Kind regards,

[redacted]

[redacted]

C

Shae Richter

From: Sheridan Park EA
Sent: Tuesday, February 07, 2017 10:04 AM
To: [redacted]
Cc: David Argue; Dana Glofcheskie
Subject: RE: I say full stop

Hello [redacted],

Thank you for your email regarding the Sheridan Park Drive Extension EA survey, your input is important to us. A hard copy of the survey will be mailed to the address provided in your email.

We have just started the Class EA process, which requires us to look at a number of factors including transportation (all modes), social, cultural and natural environments as well as mitigation measures. During our assessment we will be taking into consideration your comments. We will look at issues that are important to you including traffic, noise and preservation of community and neighborhood character. In addition to considering the option of a roadway connection, we will also consider–a do-nothing option. The survey provided will be used to gather initial comments on the EA study to be considered as the studies begin.

Please note that the previous wildlife report is currently under review. As part of this study we will be completing existing conditions surveys which will include a wildlife review which will become available as the study progresses.

To help you understand why this proposal is moving forward, this roadway connection has been identified in the City's Official Plan as a Future Major Collector. The City is undertaking the EA study to determine the needs for this area.

Public input is a key part of the EA process. A Public Information Centre (PIC) will be held for the EA to present information related to the study and allow for any questions. Information on this PIC will be made available as the study progresses.

We will also add your name to the Project Contact List so that you are directly circulated on future project notices. Please feel free to contact us should you have any more comments or questions.

Sincerely,
The Sheridan Park Drive EA Project Team

From: [redacted]
Sent: Thursday, February 02, 2017 1:06 PM
To: Sheridan Park EA
Subject: I say full stop

The survey you supplied is all weight towards the future of the extension, how about a survey for which direction to move forward with. Also, you are entertaining a traffic through way in my backyard. I see no upside for all the home owners along that corridor only increased noise and a gateway into future development. BTW: The last study I received was a wildlife study, please provide the outcome of that study and a hard copy of this survey.

Hey I have a better study for you, how about extending the Queensway further west across the Mississauage Golf Course into Blyth RD over into Licoln Green Close and right into Erin Mills Parkway.

[redacted]

[redacted]

D

Shae Richter

From: Meaghan Luis
Sent: Tuesday, October 31, 2017 10:26 AM
To: Sheridan Park EA
Subject: FW: Additional Details

-----Original Message-----
From: Sheridan Park EA
Sent: Thursday, April 13, 2017 4:42 PM
To: [redacted]
Subject: RE: Additional Details

Hello [redacted],

Thank you for your email regarding the Sheridan Park Drive Extension EA - Study Commencement Survey, your input is important to us. Our apologies for the delayed response.

We have just started the Class EA process, which requires us to look at a number of factors including transportation (all modes), social, cultural and natural environments as well as mitigation measures. During our assessment we will be taking into consideration your comments, and this survey is a part of that process. We will look at issues including traffic, safety and preservation of natural heritage features. In addition to considering the option of a roadway connection, we will also consider do-nothing option.

The survey is designed to help gather thoughts about the study and potential extension of Sheridan Park Drive. The first question is working to understand what would be the most common use of a road extension to local residents. The second question will help inform the study team about a potential road extension by understanding what is important to local residents who may use it, and what local residents would like to see incorporated into the potential road extension. The existing multi use trail will not be affected.

Public input is a key part of the EA process. A Public Information Centre (PIC) will be held for the EA to present information related to the study and allow for any questions. Information on this PIC will be made available as the study progresses.

Sincerely,
The Sheridan Park Drive EA Project Team

-----Original Message-----
From: [redacted]
Sent: Tuesday, March 07, 2017 12:20 PM
To: Sheridan Park EA
Subject: Additional Details

Hi,

Are there any additional details around the plans that would help me answer the questionnaire? For example, the first question deals with how I will use the extension: drive, walk, cycle, other. Since there is already a multi-use path extending to Winston Churchill in the study area, I'm wondering if there are plans to change the existing path? Or is the question asking whether I would cycle on the extended roadway rather than the path?

Thanks,

[redacted]

[redacted]

E

Jennifer Vandermeer

From:	Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent:	Tuesday, June 27, 2017 10:40 AM
To:	David Argue
Cc:	Jennifer Vandermeer; Leslie Green
Subject:	Sheridan Park Dr EA - PIC Comment

Hi David,

I spoke with [redacted], who works in the area and he requested us to look into if there is a need for a protected left turn phase at WCB / Sheridan Park Drive in the northbound to westbound direction (NBL) specifically in the morning and afternoon peak period. We should also send this to our Region of Peel traffic contact for this project.

He is very supportive of the project and feels there needs to be an additional east-west connection in this area.

[redacted]

Thanks,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

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F

Jennifer Vandermeer

From: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent: Monday, August 28, 2017 9:31 AM
To: Jennifer Vandermeer; Meaghan Luis
Cc: David Argue
Subject: FW: Sheridan Homelands EA

All,

See below for your records. Please add [redacted] to the contact list.

Thanks,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: Dana Glofcheskie
Sent: August 28, 2017 9:14 AM
To: [redacted]
Cc: Leslie Green
Subject: RE: Sheridan Homelands EA

Good Morning [redacted],

Thank you for your interest in the study. The study team is currently completing the documentation for all of the required technical studies including the traffic analysis, natural environment review, noise assessment, air quality assessment and several other studies. Once the documentation of the technical studies are completed, the final Project File will be available for public review.

I have added you to our Project Contact list to ensure you receive notification when this additional information regarding the Sheridan Park Drive Extension EA Study becomes available.

Thank you again for your interest in the study.

Regards,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Date: August 24, 2017 at 8:49:37 PM EDT
To: <leslie.green@mississauga.ca>
Subject: Fwd: Sheridan Homelands EA

Sent from my iPhone

Begin forwarded message:

> **From:** [redacted]
> **Date:** August 11, 2017 at 3:27:23 AM EDT
> **To:** leslie.green@mississauga.com
> **Subject: Sheridan Homelands EA**
>
> Hi Leslie,
>
> I spoke to you briefly after the community consultation at the end of June about possibly obtaining any traffic studies used in preparing the assessment. Would you be able to forward these to me as well as any data used in establishing the noise impacts? I would appreciate any help you can provide.
>
> Thanks,
>
> [redacted]
>
> [redacted]

G

-----Original Message-----
From: Dana Glofcheskie
Sent: August 24, 2017 8:28 AM
To: [redacted]
Cc: Karen Ras
Subject: RE: Sheridan Park Extension Study

Good Morning [redacted]

Thank you for your interest in the study. The study team is currently completing the documentation for all of the required technical studies including the traffic analysis, natural environment review, noise assessment, air quality assessment and several other studies. This Fall we will be providing a Public Meeting Summary Report which will discuss the key questions we heard from the community at the June 27th meeting as well as the comments received throughout the study. Additionally, once the documentation of the technical studies are completed, the final Project File will be available for public review. This will discuss in greater detail the rationale for the selection of the preferred alternative.

I have added you to our Project Contact list to ensure you receive notification when this additional information regarding the Sheridan Park Drive Extension EA Study becomes available.

Thank you again for your interest in the study and feel free to give me a call to discuss further.

Regards,

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department, Transportation & Infrastructure Planning Division

Please consider the environment before printing.

-----Original Message-----
From: [redacted]
Sent: August 23, 2017 9:10 PM
To: Dana Glofcheskie
Cc: Karen Ras
Subject: Sheridan Park Extension Study

Hello Dana,

We attended the June 27th meeting. We and our neighbours are very concerned about the focus on extending Sheridan Park Drive and want to be sure we are at the next meeting. On June 27th we were told there will be a meeting in September. What is that date, at what location will the meeting be held, and would you please forward your agenda for the meeting. Any new information regarding this project would be helpful.

It is unclear to us how Alternative 3 became your choice and no clear reason was given at the June meeting, so any explanation would be appreciated.

Thank you for your help.

[redacted]

H

From: Dana Glofcheskie
Sent: September 6, 2017 7:47 AM
To: [redacted]
Cc: Leslie Green
Subject: RE: Sheridan Park Road Proposed Extension

Good Morning [redacted],

Thank you for your email. Regarding the additional public meeting, as noted in the material from our June meeting, as part of the Thorne Lodge / Homelands Neighbourhood Traffic Calming Review there will be a meeting with the public this Fall/Winter. Please see the attached display boards on the Sheridan Park Drive EA study timeline as well as the information provided as part of Neighbourhood Traffic Calming Review which were presented at the June PIC.

Thank you,

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Sent: September 4, 2017 1:46 PM
To: Dana Glofcheskie
Subject: Re: Sheridan Park Road Proposed Extension

Hi Ms. Glofcheskie:
Thank you for your response.

I do want to follow up on my question in my initial email re: a second public meeting - it was my understanding, and that of many I have discussed the meeting with, that a commitment was made to hold a second public meeting. Can you clarify that a meeting will be scheduled.

Regards, [redacted]

> On Sep 1, 2017, at 3:30 PM, Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca> wrote:
>
> Hi [redacted]
>
> Thank you for your interest in the study. The study team is currently completing the documentation for all of the required technical studies including the traffic analysis, natural environment review, noise assessment, air quality assessment and several other studies. This Fall we will be providing a Public Meeting Summary Report which will discuss the key questions we heard from the community at the June 27th meeting as well as the comments received throughout the study. This will include a discussion of reviewing alternate routes, such as Speakman Drive. Additionally, once the documentation of the technical studies are completed, the final Project File will be available for public review. This will discuss in greater detail the rationale for the selection of the preferred alternative.
>
> I have added you to our Project Contact list to ensure you receive notification when this additional information regarding the Sheridan Park Drive Extension EA Study becomes available.
>
> Thank you again for your interest in the study and feel free to give me a call to discuss further.
>
> Regards,
>
> <image001.png>
>
> **Dana Glofcheskie, P.Eng.**
> Transportation Project Engineer

T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Sent: September 1, 2017 1:40 PM
To: Dana Glofcheskie
Subject: Sheridan Park Road Proposed Extension

Ms. Glofcheskie:

I am contacting you as follow up to the June 27 Public Information Meeting re: above subject.

My understanding is that there was a commitment to a second public meeting. Can you provide an update on when this is scheduled?

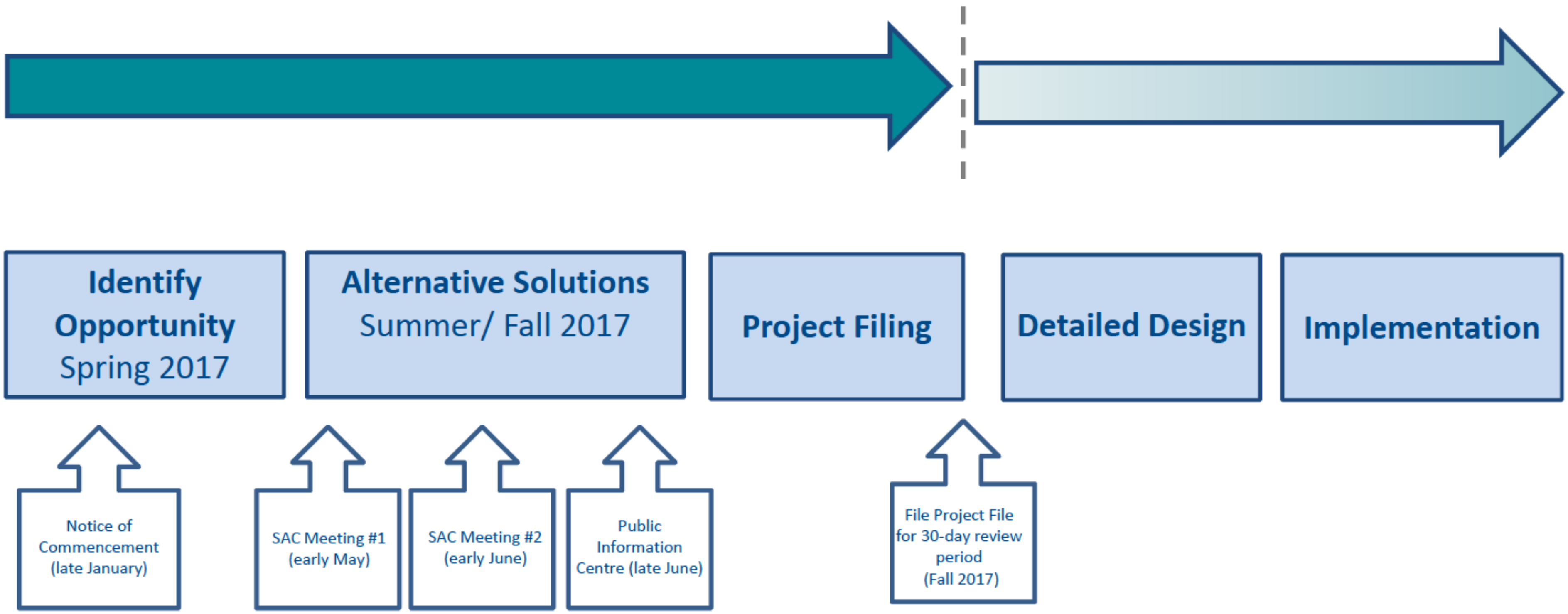
Also, has the City expanded the study to include the utilization and expansion possibilities for Speakman Drive and North Service Road? As you recall, many in attendance suggested this was an important element of the overall project assessment.

My sense at the meeting was that the vast majority of attendees oppose this proposal, so there is an expectation for significant opportunities for increased public involvement in the due diligence of this proposal.

Regards,

[redacted]

Municipal Class EA Process (Schedule B)



THORN LODGE / HOMELANDS NEIGHBOURHOOD TRAFFIC CALMING REVIEW

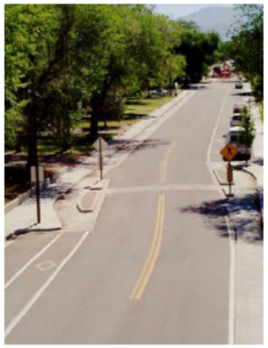
What has been done so far?

- Traffic volume and speed data collected in June 2016
- Edge lines and centerline pavement markings implemented in August 2016

What's Next?

- Follow-up studies conducted in June 2017
- Neighbourhood under consideration for physical traffic calming devices
- Further community consultation in Fall 2017

Examples of physical traffic calming measures



Shae Richter

From: Meaghan Luis
Sent: Thursday, October 26, 2017 2:42 PM
To: Sheridan Park EA
Subject: FW: Sheridan Park Drive Extension

From: Jennifer Vandermeer
Sent: Wednesday, September 06, 2017 1:13 PM
To: Meaghan Luis
Subject: FW: Sheridan Park Drive Extension

For Master Contact List and EA File

From: Dana Glofcheskie [mailto:Dana.Glofcheskie@mississauga.ca]
Sent: Wednesday, September 06, 2017 1:11 PM
To: Jennifer Vandermeer
Cc: David Argue
Subject: FW: Sheridan Park Drive Extension

See below. Please add [redacted] to the mailing list.

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: Dana Glofcheskie
Sent: September 6, 2017 1:11 PM
To: [redacted]
Subject: RE: Sheridan Park Drive Extension

Hi [redacted],

Thank you for your interest in this study. The study team is currently completing the documentation for all of the required technical studies including the traffic analysis, natural environment review, noise assessment, air quality assessment and several other studies. We held a public meeting on June 27th to present the preliminary preferred alternative. The presentation material can be found at:
www.mississauga.ca/sheridanparkea.

Once the documentation of the technical studies are completed, the final Project File will be available for public review. This will discuss in greater detail the rationale for the selection of the preferred alternative. Timing of any improvements will be identified following the completion of the Project File.

I have added you to our Project Contact list to ensure you receive notification when this additional information regarding the Sheridan Park Drive Extension EA Study becomes available.

Thank you again for your interest in the study and feel free to give me a call to discuss further.

Regards,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Sent: September 6, 2017 12:29 PM
To: Dana Glofcheskie
Subject: Sheridan Park Drive Extension

Hi Dana,

We are looking at purchasing a property in the Sheridan Park Corporate Centre and I was wondering if there has been any initial discussion on timing for the extension of Sheridan Park Drive.

Thanks kindly,
[redacted]

[redacted]

J

Shae Richter

From: Sheridan Park EA
Sent: Friday, November 10, 2017 1:55 PM
To: [redacted]
Cc: Dana Glofcheskie; David Argue
Subject: RE: Sheridan Park Drive Extension Environmental Assessment - Public Information Centre Summary Report Now Available

Good afternoon [redacted]

Thank you for your email. Your opinion is important to us, and we appreciate hearing from you. The Study Team has reviewed your comments and would like to offer the following responses.

1)
The Sheridan Park Drive extension will play an important role in providing additional access to and from the residential community. The traffic analysis indicates approximately 77% of trips along the extension in the morning rush hours and 72% in the evening rush hours originate from or are destined to the Sheridan Homelands neighbourhood.

Further, there is an overall reduction of vehicles along Homelands Drive (e.g., from Winston Churchill Boulevard to Thorn Lodge Drive east) by approximately 29% in the morning rush hours and 26% in the afternoon rush hours as compared to no Sheridan Park Drive extension.

Pending EA approval and selection of the Preferred Design, the proposed Sheridan Park Drive extension is included in the City of Mississauga's 10 Year Capital Roads Program and subject to funding availability and Council approval. Each year, City staff prioritize the capital roads project for Council approval.

2)
The EA process addresses the social, cultural and natural environmental context of the Study Area and will identify mitigation measures for any potential impacts.

Your suggestions for community improvements such as a park, enhanced recreational facilities or a community garden are important and will be brought to the attention of City staff in the Community Services Department for their future planning in the area.

There was focus placed on minimizing the impacts to the existing natural features within the right-of-way, therefore sidewalks were not proposed as part of the road extension. The extension of the east and west portions of Sheridan Park Drive will have no impacts to the existing multi-use trail in the Study Area.

Any lands south of the right of way of the extension are privately owned. Recreational access to these lands is prohibited.

3)
The Study team is completing the design for the stormwater management system for the corridor to ensure appropriate stormwater management is implemented. The Community Services Department is responsible for maintaining the multi-use trail through the utility corridor. The City will further investigate the potential flooding issue. All trees removed as part of the road extension would be replaced at a 2:1 ratio and would not impact the conveyance of storm water in the Study Area.

We hope that this information is helpful. Please feel free to contact us should you have any more comments or questions.

Sincerely,
Jennifer
For the Sheridan Park Drive EA Study Team

From: [redacted]
Sent: Thursday, October 19, 2017 12:26 PM
To: Sheridan Park EA
Subject: Re: Sheridan Park Drive Extension Environmental Assessment - Public Information Centre Summary Report Now Available

Hi,

Thank you for sending this. I wanted to add a few things as I do not see my response in the attachment with all of the responses received:

1) At the meeting, there was talk about mitigation members/community benefits. I do not see this reflected in the report. My sense from the area is that most people do not know why this needs to be built now. Unless you live on Homelands, where there is increased traffic from those cutting through, who do not actually live in the area. Why does it need to be built now? Can it not be considered for future works? Are there not bigger priorities?

2) Where is any talk about community benefits? It was raised and I thought it would be addressed here. If work will be done in the green space, why not use this opportunity to put in an actual park, or a soccer field, or a splash pad (there is not one anywhere in the Sheridan Homelands area)? An adult outdoor workout gym? A community garden (since so many who have their houses back onto the space plant massive gardens, why not make something everyone can enjoy?). The business community should contribute financially to this, as most residence see the road as only benefiting business.

3) Even this fall, there was flooding adjacent to the pathway that currently exists north of the proposed road. How can you be sure that taking away the trees will not cause even more flooding in the field, leaving the pathway unusable?

Thank you,

[redacted]

On Thu, Oct 19, 2017 at 12:12 PM, Sheridan Park EA <SheridanParkEA@rjburnside.com> wrote:

Good afternoon,

As part of the City of Mississauga Municipal Class Environmental Assessment (EA) Study for Sheridan Park Drive Extension, a Summary Report has been prepared to document the Public Information Centre (PIC) that was held on June 27, 2017. This report summarizes the format of the meeting, participation levels, comments received by members of the public and the Study Team response to these comments. A copy of the PIC Summary Report is now available on the City’s website at www.mississauga.ca/sheridanparkea

This notification has been provided to all attendees of the PIC, people who completed a comment sheet or sent an email to the Study Team in response to the PIC.

A Project File will be available through the City's website for a 30-day review period in early 2018. The Project File will document the EA process including an account of all comments received during the Study and how these comments are being addressed by the Study Team. During the 30-day review period, members of the public will be able to review the Project File and contact the Study Team if they have questions. A Notice of Study Completion will be issued to all parties on the Project Contact List to notify them of the availability of and access to the Project File.

Thank-you for your interest in this Study. Please contact the Study Team at SheridanParkEA@rjburnside.com if you have any questions.

Best regards,

Jennifer

For Sheridan Park Drive EA Study Team

K

Shae Richter

From: Sheridan Park EA
Sent: Friday, November 10, 2017 1:55 PM
To: [redacted] 'karen.ras@mississauga.ca'
Cc: [redacted]; Dana Glofcheskie; David Argue
Subject: RE: Sheridan Park Drive Extension Environmental Assessment - Public Information Centre Summary Report Now Available

Good afternoon [redacted]

Thank you for your email. We appreciate hearing from you and your support for the proposed extension.

The Study Team will review all public and agency comments, including this email, and will confirm the preferred solution based on the input received and prepare the final project file and issue the 30-day Public Review Period.

Please feel free to contact us should you have any more comments or questions.

Sincerely,
Jennifer
For the Sheridan Park Drive EA Study Team

From: [redacted]
Sent: Thursday, October 19, 2017 12:49 PM
To: Sheridan Park EA; 'karen.ras@mississauga.ca'
Cc: [redacted]'
Subject: RE: Sheridan Park Drive Extension Environmental Assessment - Public Information Centre Summary Report Now Available

Thank you for providing the details of the submissions you received at and following the Public Information Centre for this project. I am copying this to our local Councillor to ensure this opinion gets to her despite being past this stage of public input.

I am a City Planner and have been involved in EA studies for the creation of widened and new roads in much more problematic areas involving the expropriation and demolition of homes (Beecroft Road and Doris Avenue around North York Centre), so I am well aware of how difficult such planning work is. I am nevertheless surprised and dismayed at the extent of negative comments you have received. Please keep in mind the normal script for this type of consultation is that those who oppose are usually the most vocal, and supportive viewpoints do not get expressed as much. I was unable to attend the actual information centre and therefore cannot verify this, but if the crowd became agitated, this would lead to supportive persons suppressing their own input.

Having lived in the Sheridan Homelands for 23 years, I have no doubt the extension of Sheridan Park Drive will become very busy and is very important to reduce the current and growing level of traffic along Homelands Drive. It will provide an immediate benefit to the safety of children at Homelands Drive Public School, and will be even more valuable in the future. Furthermore, the intersection movements at both the corner of Homelands and Winston Churchill and the corner of Homelands and Sheridan Park Drive are now much more jammed than ever before and I expect the extension of Sheridan Park Drive will alleviate these current (and growing) problems.

I also have no doubt that, by far, the majority of residents in my community concur with me.

There will of course be a change to the rather pastoral setting that residents along the south side of Pyramid, Barcella and Hollington currently enjoy. They have benefitted tremendously from what was a utility corridor. However, given the very large distance between their real properties and the proposed road, the degree of impact upon them is easily mitigated. I do not think the relatively slight reduction of the public benefit they have taken advantage of (the utility corridor becoming a de-facto park) outweighs the clear benefit in reduced through-traffic and increased safety for school children along Homelands Drive that the extension of Sheridan Park Drive will provide.

Councillor Ras, please keep in mind that a year from now the quiet supporters of the project surely will out-vote the seemingly more vocal opponents.

[redacted]

From: Sheridan Park EA [mailto:SheridanParkEA@rjburnside.com]
Sent: October 19, 2017 11:40 AM
Cc: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>; David Argue <David.Argue@rjburnside.com>
Subject: Sheridan Park Drive Extension Environmental Assessment - Public Information Centre Summary Report Now Available

Good afternoon,

As part of the City of Mississauga Municipal Class Environmental Assessment (EA) Study for Sheridan Park Drive Extension, a Summary Report has been prepared to document the Public Information Centre (PIC) that was held on June 27, 2017. This report summarizes the format of the meeting, participation levels, comments received by members of the public and the Study Team response to these comments. A copy of the PIC Summary Report is now available on the City's website at www.mississauga.ca/sheridanparkea

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Thank-you for your interest in this Study. Please contact the Study Team at SheridanParkEA@rjburnside.com if you have any questions.

Best regards,

Jennifer
For Sheridan Park Drive EA Study Team

Shae Richter

From: Sheridan Park EA
Sent: Monday, November 27, 2017 3:23 PM
To: [redacted]
Cc: Dana Glofcheskie; David Argue
Subject: RE: Noise Impact Assessment

Good afternoon [redacted],

Thank you for your email. The Noise Impact Assessment Report will be included as part of the Project File. The Project File will be available through the City's website for a 30-day review period in early 2018. The Project File will document the Environmental Assessment (EA) process including all studies completed as part of the EA, including the Noise Impact Assessment Report. During the 30-day review period, members of the public will be able to review the Project File and contact the Study Team if they have questions. A Notice of Study Completion will be issued to all parties on the Project Contact List to notify them of the availability of and access to the Project File.

In response to your specific questions regarding the sound measurements, we offer the following information:

The sound level meter used to measure the background sound levels was a Bruel & Kjaer Model 2270 type one sound level meter. The meter was purchased in 2015 from Bruel & Kjaer and was most recently factory calibrated in December 2016, four months prior to performing the sound level measurement for this study. While there are no published recommendations on the frequency of factory calibration, most vendors recommend every 1-3 years. The calibrator was also factory recalibrated at the same time. The calibration of both pieces of equipment was performed by an accredited testing lab who provided certificates. During data collection, the meter was checked against the calibrator as directed by the Ministry of the Environment and Climate Change (MOECC) both before and after the measurements were taken. The difference between the two checks was less than 0.5 dBA as required by the MOECC to indicate valid measurements. Based on City and Provincial guidelines, the existing sound level was measured for the outdoor living area (OLA) of a residential home (e.g., the backyard). As a result, the sound level meter was located at the fence line of the house. This location is closer to the proposed road extension corridor than the rear of the house or OLA and also closer to the QEW. Therefore, the sound levels measured at this location are expected to be louder than experienced at the OLA of the home along Barcella Crescent. This provides for a more conservative approach than the Provincial guidelines that require existing sound levels to be measured at locations approximately 3 m away from the dwelling wall. The meter was installed 4.5 m above the ground as per the MOECC guidance for points of reception that are 2-storey residential houses.

Sincerely,
Jennifer
For the Sheridan Park Drive EA Study Team

From: [redacted]
Sent: Tuesday, November 21, 2017 9:38 AM
To: Sheridan Park EA
Subject: Noise Impact Assessment

Gentlemen:

As a resident in the affected area, I desire some clarification of the Noise Impact Assessment conducted as part of the EA.

Specifically, I need an copy of the Noise Impact Assessment, model and age of the sound level measuring equipment used in the study, information on the most recent calibration of that sound level measuring equipment and it's traceability, and the assumptions made regarding the placing of the sound measuring equipment.

All of this will assist me in evaluating the study and it's conclusions.

[redacted]

From: Sheridan Park EA
Sent: Thursday, December 07, 2017 1:05 PM
To: [redacted]
Cc: [redacted]; Dana Glofcheskie; David Argue
Subject: RE: Extension of Sheridan Park Drive

Good afternoon [redacted],
Thank-you for clarification of your request. The City of Mississauga will include a commitment to complete a noise assessment after the construction of the road extension to reassess the Study Team recommendation that a noise barrier is not required.

Sincerely,
Jennifer
For the Sheridan Park Drive EA Study Team

From: [redacted]
Sent: Monday, November 27, 2017 4:11 PM
To: Sheridan Park EA
Cc: [redacted]; Dana Glofcheskie; David Argue
Subject: Re: Extension of Sheridan Park Drive

Thank you Jennifer on your response.
To clarify my request for a sound review,what better time to do a real time dB sound impact is when the road is built and the sounds can be measured in real time to see if a WALL is required.
Therefore provide in your budget for this possibility that a WALL may be required.
Regards.
[redacted]

On Nov 27, 2017 at 2:47 PM, <Sheridan Park EA> wrote:

Good afternoon [redacted],

Thank you for your email. Can you please clarify your request for sound review study? Please note that a noise impact assessment has been completed as part of this EA study. The Noise Impact Assessment Report will be included as part of the Project File. The Project File will be available through the City's website for a 30-day review period in early 2018. The Project File will document the Environmental Assessment (EA) process including all studies completed as part of the EA, including the Noise Impact Assessment Report. During the 30-day review period, members of the public will be able to review the Project File and contact the Study Team if they have questions. A Notice of Study Completion will be issued to all parties on the Project Contact List to notify them of the availability of and access to the Project File.

Sincerely,
Jennifer
For the Sheridan Park Drive EA Study Team

From: [redacted]
Sent: Friday, October 27, 2017 7:49 AM

To: Sheridan Park EA
Cc: [redacted]
Subject: Extension of Sheridan Park Drive

Hi, I would like to say if the road does go ahead, a sound review study must be undertaken to justify your recommendation of NO WALL to be installed due to no sufficient increase in the dB.
This way the dB numbers can be realistically compared.
Thanks on your attention to this matter.
Regards.
[redacted]

N

Jennifer Vandermeer

From: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent: Wednesday, December 13, 2017 11:22 AM
To: [redacted]
Cc: Karen Ras; Leslie Green; Sheridan Park EA
Subject: RE: Evaluation Criteria: Natural Environment

Good afternoon [redacted]

Thank you for your email. Your opinion is important to us, and we appreciate hearing from you. The Study Team has reviewed your comments and would like to offer the following responses.

Impacts to existing trees and vegetation communities:
The impacts to the existing vegetation within the Study Area were assessed based on baseline conditions documented through surveys completed as part of the Environmental Assessment. An estimated 114 trees will need to be removed with approximately 62% (i.e. 70 trees) of the trees for removal is Green Ash. There is concern about the long term survivability of Green Ash throughout most of Ontario due to Emerald Ash Borer (EAB). The City's policy is to remove ash species where necessary during construction due to their short lifespan. This forest edge is not connected to the north to any other habitat features and based on the existing species and vegetation community attributes the replacement value of 2:1 trees was determined to be appropriate. The number of replacement trees required is calculated using the Trunk Formula Method of the International Society of Arboriculture (ISA). The ISA formula takes into consideration a variety of factors to determine the value of a tree, including size, age, species, health, and location. It is not possible to recreate a forest immediately and while this ratio is intended to compensate both for the loss of more "mature" trees it also compensates for survival of the planted specimens. The goal is to both replace and improve the habitat features by providing site specific restoration recommendations to ensure no net loss of forest within the Study Area.

Impacts to wildlife:
There are no Provincially Significant Wetlands, Areas of Natural and Scientific Interest or Environmental Significant Areas in the Study Area. There is potential for bat habitat within the wooded area. Impacts to bat habitat can be readily mitigated through the installation of bat habitat boxes within the Study Area where appropriate. Three frog call surveys were completed in the Study Area and no frog calls were observed. Two breeding bird surveys were completed in the Study Area. Two Special Concern Species At Risk (SAR) species (Eastern Wood Pewee and Wood Thrush) were observed. The proposed road extension will not directly affect breeding habitat for these two species. No Threatened or Endangered SAR species were observed.

Mitigation measures to address potential impacts to wildlife habitats and species typically include the following and these are appropriate for the natural heritage features and functions associated with the Study Area.

- Construction hoarding will be installed prior to commencement of construction activities to prevent pedestrian access, prevent the unnecessary encroachment / disturbance by humans and machinery into vegetation communities and to prevent wildlife from entering the construction areas.
- Plant species loss will be minimized, where possible, and compensatory planting plans established in areas of the Study Area when no clearing activities are proposed, referencing CVC's Plant Selection Guidelines for the existing soil and vegetation communities. Potential for establishing pollinator species of plants should also be included when establishing a formal planting plan.
- The inclusion of bio swales, infiltration galleries or other features to promote localized surface water infiltration to maintain the existing water balance should be included as part of the detailed design and landscape plan for the road extension.
- To reduce the risk of contravening the *Migratory Bird Convention Act, 1994*, timing constraints shall be applied to avoid any limited vegetation clearing (including grubbing) and/or structure works (construction, maintenance) during the breeding bird period – broadly from April 1st to August 31st for most species (regardless of the calendar year).
- Active nests (nests with eggs or young birds) of protected migratory birds, including SAR protected under the *Endangered Species Act (ESA, 2007)*, cannot be destroyed at any time of the year. The destruction of inactive nests for some species may also be prohibited.
- If a nesting migratory bird (or Species at Risk (SAR) protected under *ESA, 2007*) is identified within or adjacent to the construction site (or during operations and maintenance activities) and the activities are such that continuing

works in that area would result in a contravention of the *Migratory Bird Convention Act, 1994* or *ESA, 2007*, all activities will stop and the Contract Administrator (with assistance from an Avian Biologist) shall discuss mitigation measures with the City. Should SAR be identified, all activities will stop and MNRF will be contacted immediately to ensure compliance with the ESA. The Contract Administrator shall instruct the Contractor on how to proceed based on the mitigation measures established through discussions with the Town, the MNRF and/or Environment Canada.

- In the event that an animal is encountered during construction and does not move from the construction zone, the Contract Administrator will be notified. If the construction activities are such that continuing construction in the area would result in harm to wildlife, construction activities in that location will temporarily stop and the MNRF shall be contacted for direction;
- If temporary construction hoarding is used at a location, it shall be installed to allow wildlife to leave the fenced area during vegetation clearing. Once the work area has been cleared, it can be securely fenced to prevent wildlife from returning.
- The excluded area will be searched immediately following hoarding installation for any wildlife (including SAR) that may have become trapped. Any wildlife will be safely relocated, or permitted to escape, to a suitable habitat. All works should stop immediately and MNRF contacted should a SAR be encountered within a construction or operational area to ensure compliance with the ESA.
- Avoid vegetation clearing during sensitive times of the year for local wildlife, such as spring and early summer (when many animals bear their young or migrate between wintering and summer habitats).

A complete set of mitigation measures will be provided as part of the Project File that will be made available through the City's website for a 30-day review period in early 2018.

Impacts to hazard lands:
Based on the Mississauga Official Plan Amendment 40 (MOPA 40), there are hazard lands within Sheridan Homelands associated with Loyalist Creek; however, these lands are not impacted by the proposed road extension. Within Sheridan Park, there are four features that are classified as hazard lands. These include an existing concrete lined channel that conveys stormwater south adjacent to the hydro sub-station, a watercourse that runs through the woodland on the east end of the Study Area and two headwater drainage features that traverse through the meadow/thicket area of the Study Area, all of which are outside the impact zone of the proposed road extension.

Impacts to surface water quality & drainage (storm water management):
A Stormwater Management Report has been prepared as part of the Environmental Assessment. Impacts to water quality are anticipated to be minimal. Nonetheless, a relatively large portion of the new road will be directed to a bioretention area, located within one of the proposed horizontal deflection (landscaped) medians in the roadway. Runoff which cannot be treated and infiltrated at this location will be intercepted by an overflow system and directed to an existing drainage feature. The City continuously explores alternative materials to address snow and ice conditions on City roads. As an example, the City is currently using brine on approximately 1,000 lane kilometers of roads, which results in a lower amount of salt use. This year, the City is piloting a new brine solution, which works at lower temperatures and should allow the City to further reduce the use of salt.

Impacts to ground water quality:
The City is committed to reviewing the need for a hydrogeological study during the detailed design phase of the project.

Thank you,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Sent: December 7, 2017 9:36 PM

To: Dana Glofcheskie
Cc: Karen Ras
Subject: Evaluation Criteria: Natural Environment

Hello Dana,

After reviewing the Sheridan Park Drive Municipal Class EA and the associated Evaluation Criteria, we have a few questions as it relates to the Natural Enviroment.

Impacts to existing trees and vegetation communities:
Based on the Sheridan Creek Watershed Study and Impact Monitoring Characterization Report CVC March 2011, "The Environment Canada Habitat Guideline" is to keep 30% of a watershed in forest. In 2011, only 16.6% of the Sheridan Creek watershed was forest. How does your proposal of a 2:1 replacement of the removal of very mature trees with immature ones seek to achieve this recommendation?

Impacts to wildlife:
Our expectation would be the proposed road extension through a currently natural forested area would dramatically impact current wildlife inhabitants. What proper mitigation measures will be implemented to minimize any potential impacts to wildlife.

Impacts to hazard lands:
Are there any hazard lands within our community of Sheridan Homelands and Sheridan Park?

Impacts to surface water quality & drainage (storm water management):
The CVC March 2011 report indicated there are "excessively high levels of sodium and chloride due to intensive application of road salt." We are concerned the proposed road extension with increased traffic will result in higher use of road salt. What mitigation measures do you propose to implement to combat this issue?

Impacts to ground water quality:
The CVC March 2011 report recommended " groundwater quality should be investigated further. More sampling and experience is needed to get statistically real results from outfall sampling". Have you investigated this further and what are your proposals to address the ground water quality.

We look forward to your feedback,

Sincerely,
[redacted]

O

Jennifer Vandermeer

From: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent: Thursday, December 21, 2017 1:23 PM
To: [redacted]
Cc: Karen Ras; Mayor Bonnie Crombie; Leslie Green
Subject: RE: Sheridan Park Drive Municipal Class EA

Good afternoon [redacted]

Thank you for your email. Your opinion is important to us, and we appreciate hearing from you. The Study Team has reviewed your comments and would like to offer the following responses.

The City recognizes the importance of the multi-use trail to families, employees from Sheridan Park Corporate Centre, dog walkers and cyclists. The extension of the east and west portions of Sheridan Park Drive will have no impacts to the existing multi-use trail in the Study Area. People will be able to continue to use the multi-use trail as they do now. The City will explore opportunities for planting additional vegetation within the utility corridor between the multi-use trail and the hydro lines to further enhance the natural features of this area.

As noted above, students will continue to be accommodated on the existing multi-use trail. The multi-use trail is set back approximately 14 m (46 ft) from the proposed road extension except where it connects at adjacent existing intersections as it does today with Winston Churchill Boluevard and Homelands Drive / Speakman Drive. This is a greater separation than one would see along a sidewalk adjacent to a public road including arterial roads. In addition, at the proposed roundabouts, cross-walks will be available to accommodate pedestrians and cyclists. Roundabouts provide a safe crossing for pedestrians and cyclists as raised medians, which are referred to as splitter islands, allow for users to cross one direction of travel at a time. In addition to the existing roundabouts throughout the City, a number of new roundabouts will be implemented across the City in the next few years. As a result, the City will be launching a City-wide initiative in 2018 to promote awareness and education about roundabouts to residents. Please note that there is no existing parking area provided for users of the multi-use trail. We understand that trail users may be parking at the terminus of Sheridan Park Drive; however, this is not an official marked parking area.

The Study Team has endeavoured to minimize impacts to the existing natural features within the City owned right-of-way. The impacts to the existing vegetation within the Study Area were assessed based on baseline conditions documented through surveys completed as part of the study. An estimated 114 trees will need to be removed with approximately 62% (i.e. 70 trees) of the trees identified for removal being Green Ash. There is concern about the long term survivability of Green Ash throughout most of Ontario due to Emerald Ash Borer (EAB).

The forest edge is not connected to any other natural habitat features to the north of the road extension corridor. Based on the existing species and vegetation community attributes of the area, a replacement value of 2:1 trees was determined to be appropriate as part of the proposed project. The number of replacement trees required is calculated using the Trunk Formula Method of the International Society of Arboriculture (ISA). The ISA formula takes into consideration a variety of factors to determine the value of a tree, including size, age, species, health, and location. It is not possible to recreate the forest edge immediately but the goal is to both replace and improve the habitat features by providing site specific restoration recommendations to ensure no net loss of forest within the Study Area.

A Noise Impact Assessment was completed as a part of the study. The existing noise levels were measured at various Points of Reception (POR) in the Study Area (e.g., at fence line of residential homes). The existing noise level at the closest POR to the proposed road extension was found to be 47 dBA during day time hours (7am-11pm) and 40 dBA during night time hours (11pm-7am). The future predicted noise levels at the closest POR was found to be no more than 1 dBA greater than the existing noise levels. Therefore, the extension was found to have negligible impact on the noise levels in the neighbourhood. The predicted future noise levels are below Provincial and City of Mississauga standards. As a result, the Study Team concluded that no noise mitigation measures (sound barriers) are required.

The traffic analysis undertaken by the Study Team indicates approximately 77% of trips along the extension in the morning rush hours and 72% in the evening rush hours originate from or are destined to the Sheridan Homelands neighbourhood. Further, there is an overall reduction of vehicles along Homelands Drive (e.g., from Winston Churchill Boulevard to Thorn Lodge Drive east) by approximately 29% in the morning rush hours and 26% in the evening rush hours as compared to not extending Sheridan Park Drive. Therefore, traffic disruptions within the Sheridan Homelands neighbourhood will be reduced.

Thank you,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: [redacted]
Sent: December 19, 2017 1:50 PM
To: Dana Glofcheskie
Cc: Karen Ras; Mayor Bonnie Crombie
Subject: Re: Sheridan Park Drive Municipal Class EA

From: [redacted]
Sent: 17 December 2017 7:07 PM
To:
Subject: Sheridan Park Drive Municipal Class EA

Hi Dana,

In follow up to your Proposal, we would like to express concerns relating to the LIFESTYLE AND CULTURE section of the Sheridan Park Drive Municipal Class EA.

Green space promotes healthy living by buffering stress along with encouraging physical activities and fostering social interaction. The biking/walking path along Sheridan Park Drive, was built for this purpose and facilitates families, employees from Sheridan Park Research Park, dog walkers and cyclists. This all contributes to an integrated community. Many residents purchased their home here for this green space and connection with nature.

The proposed expansion of the road will disrupt cohesion of our neighbourhood in the following ways:

- Safety to students from Homelands Public School, who use this as a secure corridor for travel to and from school, without close proximity to traffic
- Nature and resident disruption with additional traffic, noise and loss of trees
- Less accessibility to users of the path with roundabouts and no parking area
- Mayor Crombie, on Earth Day '17, stated "Only 241,000 of the 1 Million trees planned have been planted." Your plan does not seem to be consistent with her vision.

- In the same report, our mayor also stated, "Trees help mitigate climate by sequestering carbon dioxide from our air." Why would mature trees be eliminated?
- Removal of forest does not comply with a healthy, green and sustainable Mississauga.

We would sincerely appreciate further consideration into these areas of concern.
Thank you.

Yours truly,
[redacted]

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

Appendix M6

Agency Correspondence

Shae Richter

From: Karen Morden <Karen.Morden@mississauga.ca>
Sent: Thursday, January 26, 2017 8:43 AM
To: Sheridan Park EA
Subject: RE: Sheridan Park EA Notice of Study Commencement
Attachments: 20170126084541100.pdf

Please see the attached.

MISSISSAUGA

Karen Morden
Legislative Coordinator, Office of the City Clerk
T 905-615-3200 ext.5471
karen.morden@mississauga.ca

City of Mississauga | Corporate Services Department,
Legislative Services Division

Please consider the environment before printing.

From: Sheridan Park EA [mailto:SheridanParkEA@rjburnside.com]
Sent: 2017/01/24 4:17 PM
To: Karen Morden
Subject: Sheridan Park EA Notice of Study Commencement

Please find the attached letter, form and notice of study commencement for the Sheridan Park Drive Environmental Assessment.

MISSISSAUGA

BURNSIDE

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: Karen Morden
(Please Print)

Phone No.: (905) 615-3200 x5471

Agency: City of Mississauga - Accessibility Advisory Committee.

Signed: K Morden

Date: 2017-01-26

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?	✓	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?		✓

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

If this project involves on street parking, the Accessibility Advisory Committee must be consulted. Additionally, the City of Mississauga - 2015 Facility Accessibility Design Standards must be followed: www.mississauga.ca/accessibilitystandards

Continued on back

Shae Richter

From: Gasser, Matthew (IO) <Matthew.Gasser@infrastructureontario.ca>
Sent: Monday, January 30, 2017 9:09 AM
To: Sheridan Park EA
Subject: IO Notice Letter- Sheridan Park Drive Extension
Attachments: 039474_Sheridan Park Drive EA_NOCm_NoronhaEmail.pdf; IO EA Notice Letter_Sheridan Park Drive .pdf

Follow Up Flag: Follow up
Flag Status: Completed

Good morning,

Please review the attached IO Notice Letter on behalf of Lisa Myslicki. Thank You.

Sincerely,

Matthew Gasser
Environmental Management

Infrastructure Ontario
1 Dundas Street West, Suite 2000
Toronto, ON M5G 2L5

(416) 212-6975
Matthew.Gasser@infrastructureontario.ca

This email, including any attachments, is intended for the personal and confidential use of the recipient(s) named above. If you are not the intended recipient of the email, you are hereby notified that any dissemination or copying of this email and/or any attachment files is strictly prohibited. If you have received this e-mail in error, please immediately notify the sender and arrange for the return of any and all copies and the permanent deletion of this message including any attachments, without reading it or making a copy. Thank you.

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Infrastructure Ontario

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1, rue Dundas Ouest, bureau 2000, Toronto, ON M5G 2L5

January 30, 2017

Response to EA Notice

Thank you for providing Infrastructure Ontario (IO) with a copy of your Environmental Assessment Notice. From the information you have provided, it is unclear if you are proposing to use lands under the control of the Ministry of Infrastructure (MOI lands) to support your proposed project.

Prior to MOI consenting to the use of MOI lands, the applicable environmental assessment, duty to consult Aboriginal peoples (if triggered) and heritage obligations will need to be met. In order for MOI to allow you access to MOI lands and to carry out proposed activities, MOI must ensure that provincial requirements and due diligence obligations are satisfied. These requirements are in addition to any such obligations you as the proponent of the project may have.

You as the proponent of the project will be required to work with Infrastructure Ontario (IO) to fulfill MOI's obligations which may include considering the use of any MOI lands as part of your individual environmental assessment. All costs associated with meeting MOI's obligations will be the responsibility of the proponent. Please note that time should be allocated in your project timelines for MOI to ensure that its obligations have been met and to secure any required internal government approvals required to allow for the use of the MOI lands for your proposed project.

In order for MOI and IO to assist you to meet your required project timelines, please recognize that early, direct contact with IO is imperative. The due diligence required prior to the use of MOI lands for your proposed project, may include but may not be limited to the following:

- Procedural aspects of the Provincial Crown's Aboriginal Duty to Consult obligations – *see Instruction Note 1*
- Requirements of the MOI Public Work Class Environmental Assessment – *see Instruction Note 2*
- Requirements of the Ministry of Tourism Culture and Sport (MTCS) Standards and Guidelines for Consultant Archaeologists– *see Instruction Note 3*
- Requirements of the MTCS Standards and Guidelines for the Conservation of Provincial Heritage Properties Consultant Archaeologists – *see Instruction Note 4*

Representatives from IO are available to discuss your proposed project, the potential need for MOI lands and the corresponding provincial requirements and due diligence obligations.

Please review the attached instruction notes which provide greater detail on the due diligence obligations associated with the use of MOI lands for your proposed project. We are providing this information to allow you as the proponent to allocate adequate time and funding into your project schedule and budgets. If your project requires you to study MOI lands, then an agreement is required and all studies undertaken on MOI lands will be considered confidential until approval is received. IO will require electronic copies of all required studies on MOI lands that you undertake.

We strongly encourage you to work with IO as early as possible in your process to identify if any MOI lands would be required for your proposed project. Please note that on title MOI control may be identified under the name of MOI or one of its predecessor ministries or agencies which may include but is not limited to variations of the following: Her Majesty the Queen/King, Hydro One, MBS, MEI, MEDEI, MGS, MOI, OLC, ORC, PIR or Ministry of Public Works[1].

Please provide Rita Kelly with a confirmation in writing of any MOI lands that you propose to use for your proposed project and why the lands are required along with a copy of a title search for the MOI lands.

For more information concerning the identification of MOI lands in your study area or the process for acquiring access to or an interest in MOI lands, please contact:

Rita Kelly
Project Manager
Land Transactions, Hydro Corridors & Public Works
Infrastructure Ontario
1 Dundas Street West, Suite 2000
Toronto, ON
M5G 2L5
Tel: (416) 212-4934
Email: rita.kelly@infrastructureontario.ca

An application package and requirements checklist is attached for your reference. Please note that transfer of an interest in MOI lands to a proponent can take up to one year and there is no certainty that approval will be obtained.

For more information concerning the MOI Public Work Class Environmental Assessment process and due diligence requirements, please contact:

Lisa Myslicki
Environmental Specialist
Infrastructure Ontario
1 Dundas Street West, Suite 2000
Toronto, ON

[1] MBS - Management Board Secretariat; MEI - Ministry of Energy and Infrastructure; MEDEI – Ministry of Economic Development, Employment and Infrastructure; MGS - Ministry of Government Services; MOI - Ministry of Infrastructure; OLC - Ontario Lands Corporation; ORC - Ontario Realty Corporation; PIR - Ministry of Public Infrastructure Renewal

M5G 2L5
Tel: (416) 557-3116
Email: lisa.myslicki@infrastructureontario.ca

If MOI lands are not to be impacted by the proposed project, please provide a confirmation in writing to Infrastructure Ontario.

Thank you for the opportunity to provide initial comments on your proposed project.

Sincerely,

Patrick Grace
Director
Land Transactions, Hydro Corridors & Public Works
Infrastructure Ontario
1 Dundas Street West, Suite 2000
Toronto, ON, M5G 2L5

One Dundas Street West, Suite 2000, Toronto, ON M5G 2L5
1, rue Dundas Ouest, bureau 2000, Toronto, ON M5G 2L5

INSTRUCTION NOTE 1

Provincial Crown's Aboriginal Duty to Consult obligations

The Crown has a constitutional Duty to Consult (DTC) in certain circumstances and Aboriginal consultation may be required prior to MOI granting access to MOI lands or undertaking other activities. The requirement for Aboriginal consultation may be triggered given Aboriginal or treaty rights, established consultation or notification protocols, government policy and/or program decisions, archaeological potential or results, and/or cultural heritage consultation obligations. The requirement for Aboriginal consultation will be assessed by MOI.

Prior to the use of MOI lands, MOI must first meet any duty to consult obligations that may be triggered by the proposed use of MOI lands. It is incumbent on you to consult with IO as early in the process as possible once you have confirmed that MOI lands would be involved.

MOI will evaluate the potential impact of your proposed project on Aboriginal and treaty rights. MOI may assess that the Crown's Duty to Consult (DTC) requires consultation of Aboriginal communities. Proponents should discuss with IO whether MOI will require consultation to occur and if so, which communities should be consulted.

Where MOI determines that Aboriginal consultation is required, MOI will formally ask you to consult or continue to consult with Aboriginal peoples at the direction of MOI.

On behalf of MOI you will also be required to:

1. Maintain a record and document all notices and engagement activities, including telephone calls and/or meetings;
2. Provide the Ministry updates on these activities as requested; and
3. Notify the Ministry of any issues raised by Aboriginal communities.

If consultation has already occurred, IO strongly encourages you to provide complete Aboriginal consultation documentation to IO as soon as possible. This documentation should include all notices and engagement activities, including telephone calls and/or meetings.

Any duty to consult obligations must be met prior to publically releasing the Notice of Completion for the assessment undertaken under the MOI PW Class EA.

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INSTRUCTION NOTE 2

Requirements of the MOI Public Work Class Environmental Assessment

MOI has an approved Class EA (the Ministry of Infrastructure Public Work Class Environmental Assessment (Public Work Class EA) to assesses undertakings that affect MOI lands including disposing of an interest in land or site development. Details on the Public Work Class EA can be found at:
http://www.infrastructureontario.ca/Templates/Buildings.aspx?id=2147490336&langtype=1033

You may be required to work with IO to complete an environmental assessment under the Public Work Class EA for the undertakings related to MOI lands. IO will work with you to ensure that all of the MOI undertakings or activities related to the use of MOI lands are identified, that the appropriate Category of undertaking is used and a monitoring and report back mechanism is established to ensure that MOI's obligations are met.

The completion of another environmental assessment process that assesses the undertakings related to MOI lands may satisfy MOI's obligations under the Public Work Class EA. You will be required to work with IO to determine the most appropriate approach to meeting the Public Work Class EA obligations for undertakings related to MOI lands on a case by case basis.

Where it is decided that the assessment of undertakings related to MOI lands can be assessed as part of the environmental assessment being undertaken by the proponent then it is likely that the following provisions will be required:

- that the environmental assessment documents set out that one process will be relied on by both the proponent and MOI to evaluate their respective undertakings and meet their respective obligations to assess the potential impacts of their undertakings;
- that the proponent's description of the undertaking to be assessed include all of the MOI undertakings related to the use or access to MOI lands (see Glossary of Terms);
- the associated EA Category from the Public Works Class EA be identified and met by the environmental assessment (see Figure 22. Category Listing Matrix and/or Tale 2.1 EA Category Identification Table);
- that the proponent's environmental assessment indicate that MOI would be relying on the proponent's assessment to satisfy MOI's obligations under the *Environment Assessment Act*;
- establish a monitoring and report back mechanism to ensure that any obligations of MOI resulting from the assessment will be met; and

An environmental assessment consultation plan be developed to ensure that all stakeholders required to be consulted regarding the undertakings on the MOI lands are consulted

Other Due Diligence Requirements

There may also be other additional due diligence requirements for the use of MOI lands in the proposed project. These may include:

- Phase One Environmental Site Assessment and follow up
- Stage 1 Archaeological Assessment and follow up
- Survey
- Title Search
- Species at Risk Survey(s)
- Appraisal

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INSTRUCTION NOTE 3 – ARCHAEOLOGY - (see also *Instruction Note on Duty to Consult*)

Archaeological sites are recognized and protected under the *Ontario Heritage Act*. Carrying out archaeological fieldwork is a licensed, regulated activity under the 2011 Ministry of Culture Standards and Guidelines for Consulting Archaeologists.

Archaeological due diligence is required for any proposed project on MOI land that could cause significant below ground disturbance such as, new building construction, installation/modification of site services, and installation/maintenance of new pipelines or transmission lines.

You, as the proponent, must engage IO prior to undertaking any archaeological work on MOI lands.

IO has two in-house licensed archaeologists who should be consulted early in the preparatory stages of a proposed project when geographic and site locations are being considered so that the potential for archaeological resources including historic and Aboriginal material (ion Aboriginal villages and burials sites) can be assessed.

To support both the Public Work Class EA and MOI's duty to consult analysis, archaeological assessments are required to determine if there are any significant findings that may be of cultural value or interest to Aboriginal people (e.g., archaeological or burial sites).

Archaeological work can begin before the assessment under the Public Works Class EA begins but the Class EA cannot be completed until the duty to consult that may be triggered regarding archaeological resources are fulfilled.

Depending upon the number or significance of resources found, the duty to consult may be triggered during any of the 4 phases of archaeological work (see below) or anytime during project construction.

The discovery of Aboriginal resources can impact on activities, including project and site plans, timelines and all costs. As the proponent, you are expected to ensure that you project timelines include adequate time and resources to address MOI due diligence obligations, including internal government approvals. All costs associated with meeting MOI's archaeological obligations will be the responsibility of the proponent.

For Archaeological Assessments (Stages 1 through 4), proponents must adhere to the four stage archaeological fieldwork process prescribed by the Ontario Ministry of Tourism, Culture and Sport (MTCS) as per the 2011 Standards and Guidelines for Consultant Archeologists. Not all noted Stages will be necessary for all work. Respondents must follow industry procedures and practices as per the MTCS Standards and Guidelines for Consultant Archeologists 2011 for each Stage of archaeological assessment, all reporting criteria and formatting, and any other license requirements and/or obligations.

- Stage 1 Background Study - Evaluation of Archaeological Potential
  - Archival research and non-intrusive site visit
- Stage 2 Property Assessment
  - In-field systematic pedestrian survey or test pitting and reporting
  -
- Stage 3 Site-specific Assessment
  - Limited excavation to determine site significance and size
  - Field works and reporting
- Stage 4 Site mitigation
  - Through either avoidance/protection or excavation Field work 4 to 8 weeks
  - Develop summary report
  - MTCS review – expedited review of summary report 6 weeks
  - Final report
  - Time to develop and implement mitigation measures – negotiation, legal protections, avoidance

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INSTRUCTION NOTE 4 – HERITAGE REQUIREMENTS

Built Heritage/Cultural Landscapes

Built heritage/cultural landscapes (cultural heritage) are recognized and protected under the Ontario Heritage Act, the regulations to that Act and the 2010 Ministry of Culture Standards and Guidelines for Conservation of Provincial Heritage Properties (S&Gs) Criteria for determining cultural heritage value or interest are set out in O. Reg. 9/06 and 10/06. The S&Gs set out a process for identifying properties of cultural heritage value, and the standards for protection, maintenance, use and disposal of these properties.

Cultural heritage due diligence will be required for any proposed project on MOI land with the potential to impact cultural heritage resources, such as new building construction, installation/modification of site services, landscape modifications and installation/maintenance of new pipelines, transmission lines.

To support MOI's heritage and MOI PW Class EA obligations, proponents will be required to undertake cultural heritage assessments for all projects that require MOI lands. This will help to determine if the MOI lands are of cultural value or interest to the Province and the level of heritage significance. Where a property has heritage value, proponents may be required to develop appropriate conservation measures/plans and heritage management plans.

You, as the proponent, are strongly encouraged engage IO heritage staff as early in your project planning process as possible and in advance of beginning any cultural heritage assessment work. IO staff will be able to provide advice on the S&Gs and will provide any available heritage information for the MOI lands.

Proponents must also follow industry procedures and practices for all components of cultural heritage assessment work, all reporting criteria and formatting, and any other requirements and/or obligations. IO heritage staff can help identify any required reports.

Should MOI lands be identified under the S&Gs as a Provincial Heritage Property (local significance) or a Provincial Heritage Property of Provincial Significance, IO must be engaged to determine next steps.

Please note that if a Provincial Heritage Property of Provincial Significance is to be impacted, it is likely that consent from the Minister, Ontario Minister, Tourism, Culture and Sport (MTCS) will be required prior to access being granted to MOI lands. Minister's consent requires a detailed application and approvals should land dispositions or building demolitions be applied for as part of the proposed project.

As the proponent, you are expected to ensure that your project timelines include adequate time

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1, rue Dundas Ouest, bureau 2000, Toronto, ON M5G 2L5

and resources to address MOI's heritage due diligence obligations, including internal government approvals. All costs associated with meeting MOI's heritage obligations are the responsibility of the proponent.

Shae Richter

From: ian.fleming@zayo.com on behalf of Utility Circulations <utility.circulations@zayo.com>
Sent: Monday, February 06, 2017 1:20 PM
To: Sheridan Park EA
Subject: Re: Sheridan Park EA Notice of Study Commencement

Good Afternoon,

Zayo has no existing plant in the area indicated in your submission. No markup and no objection. Thank you.

Ian Fleming
Utility Circulations

On 24 January 2017 at 16:16, Sheridan Park EA <SheridanParkEA@rjburnside.com> wrote:

Please find the attached letter, form and notice of study commencement for the Sheridan Park Drive Environmental Assessment.

Shae Richter

From: Chris Pincombe <Chris.Pincombe@enbridge.com>
Sent: Monday, February 06, 2017 9:49 AM
To: Sheridan Park EA
Cc: Eastern Region Crossing; Amy Vandendool
Subject: Enbridge Pipelines Comments Re: Sheridan Park Drive Extension, Mississauga

Hi,

For your records, Enbridge Pipelines Inc. has reviewed the subject application and does not have any facilities within the area. This is an Enbridge Gas Distribution area – if you have not already contacted Enbridge Gas please forward the same information to mark-ups@enbridge.com.

Regards,

Chris Pincombe C.E.T.
Lands & ROW Administrator - Crossings
Eastern Region

ENBRIDGE PIPELINES INC.
TEL: 519-333-6753 | FAX: 519-339-0510
Western Research Park
1086 Modeland Road, Bldg. 1050 1st Floor, Sarnia, ON, N7S 6L2

enbridge.com
Integrity. Safety. Respect.

ENBRIDGE

Shae Richter

From: Cliff Lee <clee@tnpi.ca>
Sent: Wednesday, February 08, 2017 10:02 AM
To: Sheridan Park EA
Subject: Project Response Form
Attachments: 4598_001.pdf

To Whom may concern

Please contact myself Cliff Lee for all 3rd Party Crossings - Permit applications. Satish Korpal has retired after 25 yrs at TNPI, and I am his replacement.

Kindest Regards,

Cliff Lee, C.E.T.
Trans-Northern Pipeline Inc.
45 Vogell Rd
Richmond Hill, ON
L4B 3P6
Ph:905-770-3353 ext 292
Fx: 905-770-8675
Em:clee@tnpi.ca

Trans-Northern // Trans-Nord
Operational Excellence Management System

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201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: CLIFF LEE
(Please Print)

Phone No.: 289-475-5351

Agency: Trans Northern Pipeline Inc

Signed: Cliff Lee

Date: 2017-02-07

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?		X
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?	X	
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?		X

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

Satish Karpal has retired from TNPI
Cliff Lee is new contact person.

Continued on back

Shae Richter

From:	Bell, Trevor (MOECC) <Trevor.Bell@ontario.ca>
Sent:	Thursday, February 09, 2017 2:02 PM
To:	dana.glofcheskie@mississauga.ca
Cc:	Jennifer Vandermeer; David Argue; Sheridan Park EA; Martin, Paul (MOECC); Webb, Tim (MOECC)
Subject:	Sheridan Park Drive Extension Schedule B Municipal Class EA
Attachments:	TSS_NoSC_Response Letter_Sheridan Park Drive Extension.docx; A Proponent's Introduction to the Delegated Aspects of Consultation with....pdf; TSS_NoSC_Response Letter_Sheridan Park Drive Extension_signed.PDF

Good afternoon,

Please find attached a letter from the Ministry of the Environment and Climate Change, Central Region Technical Support Section regarding the above mentioned project. Feel free to contact me directly with any questions or concerns you may have.

Sincerely,

Trevor Bell
Environmental Resource Planner and EA Coordinator
Technical Support Section | Central Region
Ministry of the Environment and Climate Change
5775 Yonge St., 8th Floor
Toronto, ON M2M 4J1
T: 416-326-3577
E: trevor.bell@ontario.ca

Ministry of the Environment and Climate Change

Central Region
Technical Support Section

5775 Yonge Street, 8th Floor
North York, OntarioM2M 4J1

Tel.: (416) 326-6700
Fax: (416) 325-6347

Ministère de l'Environnment et de l'Action en Matière de Changement Climatique

Région du Centre
Section d'appui technique

5775, rue Yonge, 8ième étage
North York, Ontario M2M 4J1

Tél. : (416) 326-6700
Téléc. : (416) 325-6347

Ontario

February 9, 2017

File No.: EA 01-06-05

Dana Glofcheskie, P.Eng.
Project Manager
City of Mississauga
201 City Centre Drive, Suite 800
Mississauga, ON L5B 2T4
dana.glofcheskie@mississauga.ca

Re: **Sheridan Park Drive Extension**
City of Mississauga
Schedule B Municipal Class Environmental Assessment
Response to Notice of Commencement

Dear Ms. Glofcheskie:

This letter acknowledges that the City of Mississauga has initiated a Schedule B project under the Municipal Engineers Association's Municipal Class Environmental Assessment (Class EA) for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the City of Mississauga.

The attached "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class EA process. Please identify the areas of interest which are applicable to your project and ensure they are addressed. Proponents who address all of the applicable areas of interest can minimize potential delays to their project schedule.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project, **the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown's preliminary assessment you are required to consult with the following communities who have been identified as potentially affected by your proposed project:

- Six Nations of the Grand River
- Haudenosaunee Confederacy Chiefs Council
- Mississaugas of the New Credit First Nation

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link: https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

Please also refer to the document "A Proponent's Introduction to the Delegation of Procedural Aspects of consultation with Aboriginal Communities" for further information.

You must contact the Director of Environmental Approvals Branch under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director of the Environmental Approvals Branch can be notified either by email with the subject line "Potential Duty to Consult" to EAASIBgen@ontario.ca or by mail or fax at the address provided below:

Email:	EAASIBGen@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Approvals Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MOECC will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

A draft copy of the Project File Report (PFR) should be sent to this office prior to the filing of the final report, allowing a minimum of 30 days for the ministry's technical reviewers to provide comments. Please also forward the Notice of Completion and final PFR to me when completed.

Should you or any members of your project team have any questions regarding the material above, please contact me at (416) 326-3577 or by email at trevor.bell@ontario.ca.

Sincerely,

Trevor Bell
Environmental Resource Planner and EA Coordinator

Air, Pesticides and Environmental Planning
Central Region Technical Support Section
Ministry of the Environment and Climate Change

c. J. Vandermeer, Environmental Assessment Lead, R.J. Burnside & Associates Ltd.
D. Argue, Consultant Project Manager, R.J. Burnside & Associates Ltd.
P. Martin, Supervisor, APEP, Central Region, MOECC
T. Webb, Manager (A), Halton Peel District Office, MOECC
Central Region EA File
A & P File

AREAS OF INTEREST

It is suggested that you check off each applicable area after you have considered / addressed it.

☐ **Source Water Protection (all projects)**

The Clean Water Act, 2006 (CWA) aims to protect existing and future sources of drinking water. To achieve this, several types of vulnerable areas have been delineated around surface water intakes and wellheads for every municipal residential drinking water system that is located in a source protection area. These vulnerable areas are known as a Wellhead Protection Areas (WHPAs) and surface water Intake Protection Zones (IPZs). Other vulnerable areas that have been delineated under the CWA include are Highly Vulnerable Aquifers (HVAs), Significant Groundwater Recharge Areas (SGRAs), Event-based modelling areas (EBAs), and Issues Contributing Areas (ICAs). Source protection plans have been developed that include policies to address existing and future risks to sources of municipal drinking water within these vulnerable areas.

Projects may include activities that, if located in a vulnerable area, could be a threat to sources of drinking water (i.e. have the potential to adversely affect the quality or quantity of drinking water sources) and the activity could therefore be subject to policies in a source protection plan. Where an activity poses a risk to drinking water, policies in the local source protection plan may impact how or where that activity is undertaken. Policies may prohibit certain activities, or they may require risk management measures for these activities. Municipal Official Plans, planning decisions, Class EA projects (where the project includes an activity that is a threat to drinking water) and prescribed instruments must conform with policies that address significant risks to drinking water and must have regard for policies that address moderate or low risks.

- As part of the project, the proponent should clearly document how the proximity of the project to sources of drinking water (municipal or other) and any delineated vulnerable areas was considered and assessed, whether there were any source protection plan policies that applied, and if so, how they impacted the project, as well as identify mitigating measures to address any negative environmental impacts to those sources (considering natural, economic and social/cultural environmental impacts). As you may be aware, in October 2015, the MEA Parent Class EA document was amended to include reference to the Clean Water Act (Section A.2.10.6) and indicates that proponents undertaking a Municipal Class EA project must identify early in their process whether a project is or could potentially be occurring with a vulnerable area. Given this requirement, the proponent should include a section in the PFR on source water protection.

- While most source protection plans focused on including policies for significant drinking water threats in the WHPAs and IPZs it should be noted that even though source protection plan policies may not apply in HVAs, these are areas where aquifers are sensitive and at risk to impacts and within these areas, activities may impact the quality of sources of drinking water for systems other than municipal residential systems.

- In order to determine if this project is occurring within a vulnerable area, proponents can use this mapping tool: http://www.applications.ene.gov.on.ca/swp/en/index.php. The mapping tool will also provide a link to the appropriate source protection plan in order to identify what policies may be applicable in the vulnerable area.

- For further information on the maps or source protection plan policies which may relate to their project, proponents should contact the Project Manager for Drinking Water Source Protection at the local source protection authority (i.e., conservation authority).

More Information
For more information on the Clean Water Act, source protection areas and plans, including specific information on the vulnerable areas and drinking water threats, please refer to Conservation Ontario's website where you will also find links to the local source protection plan/assessment report.

A list of the prescribed drinking water threats can be found in section 1.1 of Ontario Regulation 287/07 made under the Clean Water Act. In addition to prescribed drinking water threats, some source protection plans may include policies to address additional "local" threat activities, as approved by the MOECC.

☐ **Ecosystem Protection and Restoration**

- Any impacts to ecosystem form and function must be avoided where possible. The PFR should describe any proposed mitigation measures and how project planning will protect and enhance the local ecosystem.

- All natural heritage features should be identified and described in detail to assess potential impacts and to develop appropriate mitigation measures. The following sensitive environmental features may be located within or adjacent to the study area:

  - Areas of Natural and Scientific Interest (ANSIs)
  - Rare Species of flora or fauna
  - Watercourses
  - Wetlands
  - Woodlots

We recommend consulting with the Ministry of Natural Resources and Forestry (MNRF), Fisheries and Oceans Canada (DFO) and your local conservation authority to determine if special measures or additional studies will be necessary to preserve and protect these sensitive features.

☐ **Surface Water**

- The PFR must include a sufficient level of information to demonstrate that there will be no negative impacts on the natural features or ecological functions of any watercourses within the study area. Measures should be included in the planning and design process to ensure that any impacts to watercourses from construction or operational activities (e.g. spills, erosion, pollution) are mitigated as part of the proposed undertaking.

- Additional stormwater runoff from new pavement can impact receiving watercourses and flood conditions. Quality and quantity control measures to treat stormwater runoff should be considered for all new impervious areas and, where possible, existing surfaces. The ministry's Stormwater Management Planning and Design Manual (2003) should be referenced in the PFR and utilized when designing stormwater control methods. We recommend that a Stormwater Management Plan should be prepared as part of the Class EA process that includes:

  - Strategies to address potential water quantity and erosion impacts related to stormwater draining into streams or other sensitive environmental features, and to ensure that adequate (enhanced) water quality is maintained
  - Watershed information, drainage conditions, and other relevant background information
  - Future drainage conditions, stormwater management options, information on erosion and sediment control during construction, and other details of the proposed works
  - Information on maintenance and monitoring commitments.

- Ontario Regulation 60/08 under the Ontario Water Resources Act (OWRA) applies to the Lake Simcoe Basin, which encompasses Lake Simcoe and the lands from which surface water drains into Lake Simcoe. If the proposed sewage treatment plant is listed in Table 1 of the regulation, the PFR should describe how the proposed project and its mitigation measures are consistent with the requirements of this regulation and the OWRA.

☐ **Groundwater**

- The status of, and potential impacts to any well water supplies should be addressed. If the project involves groundwater takings or changes to drainage patterns, the quantity and quality of groundwater may be affected due to drawdown effects or the redirection of existing contamination flows. In addition, project activities may infringe on existing wells such that they must be reconstructed or sealed and abandoned. Appropriate information to define existing groundwater conditions should be included in the PFR.

- If the potential construction or decommissioning of water wells is identified as an issue, the PFR should refer to Ontario Regulation 903, Wells, under the OWRA.

- Potential impacts to groundwater-dependent natural features should be addressed. Any changes to groundwater flow or quality from groundwater taking may interfere with the ecological processes of streams, wetlands or other surficial features. In addition, discharging contaminated or high volumes of groundwater to these features may have direct impacts on their function. Any potential effects should be identified, and appropriate mitigation measures should be recommended. The level of detail required will be dependent on the significance of the potential impacts.

- Any potential approval requirements for groundwater taking or discharge should be identified in the PFR. In particular, a Permit to Take Water (PTTW) under the OWRA will be required for any water takings that exceed 50,000 litres per day.

☐ **Air Quality, Dust and Noise**

- If there are sensitive receptors in the surrounding area of this project, an air quality/odour impact assessment will be useful to evaluate alternatives, determine impacts and identify appropriate mitigation measures. The scope of the assessment can be determined based on the potential effects of the proposed alternatives, and typically includes source and receptor characterization, a quantification of air quality impacts by determining emission rates and conducting dispersion modelling, and an assessment of effects. The assessment will compare to all available standards for any contaminants of concern. Please contact this office during the scoping process to confirm the appropriate level of assessment.

- Dust and noise control measures should be addressed and included in the construction plans to ensure that nearby residential and other sensitive land uses within the study area are not adversely affected during construction activities.

- The PFR should consider the potential impacts of increased noise levels during the operation of the undertaking due to potentially higher traffic volumes resulting from this project. The proponent should explore all potential measures to mitigate significant noise impacts during the assessment of alternatives.

☐ **Servicing and Facilities**

- Any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste must have an Environmental Compliance Approval (ECA) before it can operate lawfully. Please consult with the Environmental Approvals Access and Service Integration Branch (EAASIB) to determine whether a new or amended ECA will be required for any proposed infrastructure.

- We recommend referring to the ministry's "D-Series" guidelines – Land Use Compatibility to ensure that any potential land use conflicts are considered when planning for any infrastructure or facilities related to wastewater, pipelines, landfills or industrial uses.

☐ **Contaminated Soils**

- Since the removal or movement of soils may be required, appropriate tests to determine contaminant levels from previous land uses or dumping should be undertaken. If the soils are contaminated, you must determine how and where they are to be disposed of, consistent with *Part XV.1 of the Environmental Protection Act* (EPA) and Ontario Regulation 153/04, Records of Site Condition, which details the new requirements related to site assessment and clean up. Please contact the ministry's District Offices for further consultation if contaminated sites are present.

- Any current or historical waste disposal sites should be identified in the PFR. The status of these sites should be determined to confirm whether approval pursuant to Section 46 of the EPA may be required for land uses on former disposal sites.

- The location of any underground storage tanks should be investigated in the PFR. Measures should be identified to ensure the integrity of these tanks and to ensure an appropriate response in the event of a spill. The ministry's Spills Action Centre must be contacted in such an event.

- The PFR should identify any underground transmission lines in the study area. The owners should be consulted to avoid impacts to this infrastructure, including potential spills.

☐ **Mitigation and Monitoring**

- Design and construction reports and plans should be based on a best management approach that centres on the prevention of impacts, protection of the existing environment, and opportunities for rehabilitation and enhancement of any impacted areas.

- All waste generated during construction must be disposed of in accordance with ministry requirements.

- Contractors must be made aware of all environmental considerations so that all environmental standards and commitments for both construction and operation are met. Mitigation measures should be clearly referenced in the PFR and regularly monitored during the construction stage of the project. In addition, we encourage proponents to conduct post-construction monitoring to ensure all mitigation measures have been effective and are functioning properly. The proponent's construction and post-construction monitoring plans should be documented in the PFR.

☐ **Planning and Policy**

- Parts of the study area may be subject to the Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan, Greenbelt Plan, Lake Simcoe Protection Plan, or Growth Plan for the Greater Golden Horseshoe. The PFR should demonstrate how the proposed study adheres to the relevant policies in these plans.

- The Provincial Policy Statement (2014) contains policies that protect Ontario's natural heritage and water resources, including designated vulnerable areas mapped in source water protection assessment reports under the *Clean Water Act* (CWA). Applicable policies should be referenced in the PFR, and the proponent should demonstrate how this proposed project is consistent with these policies. Assessment reports can be found on the Conservation Ontario website at: http://www.conservation-ontario.on.ca/uncategorised/143-otherswpregionsindex.

☐ **Class EA Process**

- If this project is a Master Plan: there are several different approaches that can be used to conduct a Master Plan, examples of which are outlined in Appendix 4 of the Class EA. The Master Plan should clearly indicate the selected approach for conducting the plan, in particular by identifying whether the levels of assessment, consultation and documentation are sufficient to fulfill the requirements for Schedule B or C projects. Please note that any Schedule B or C projects identified in the plan would be subject to Part II Order Requests under the *Environmental Assessment Act* (EAA), although the plan itself would not be.

- The PFR should provide clear and complete documentation of the planning process in order to allow for transparency in decision-making. The PFR must also demonstrate how the consultation provisions of the Class EA have been fulfilled, including documentation of all public consultation efforts undertaken during the planning process. Additionally, the PFR should identify all concerns that were raised and how they have been addressed throughout the planning process. The Class EA also directs proponents to include copies of comments submitted on the project by interested stakeholders, and the proponent's responses to these comments.

- The Class EA requires the consideration of the effects of each alternative on all aspects of the environment. The PFR should include a level of detail (e.g. hydrogeological investigations, terrestrial and aquatic assessments) such that all potential impacts can be identified and appropriate mitigation measures can be developed. Any supporting studies conducted during the Class EA process should be referenced and included as part of the PFR.

- Please include in the PFR a list of all subsequent permits or approvals that may be required for the implementation of the preferred alternative, including MOECC's PTTW and ECAs, conservation authority permits, and approval under the *Canadian Environmental Assessment Act* (CEAA).

- Ministry guidelines and other information related to the issues above are available at http://www.ontario.ca/environment-and-energy/environment-and-energy under the publications link. We encourage you to review all the available guides and to reference any relevant information in the PFR.

A PROPONENT'S INTRODUCTION TO THE DELEGATION OF PROCEDURAL ASPECTS OF CONSULTATION WITH ABORIGINAL COMMUNITIES

DEFINITIONS

The following definitions are specific to this document and may not apply in other contexts:

Aboriginal communities – the First Nation or Métis communities identified by the Crown for the purpose of consultation.

Consultation – the Crown's legal obligation to consult when the Crown has knowledge of an established or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. This is the type of consultation required pursuant to s. 35 of the *Constitution Act, 1982*. Note that this definition does not include consultation with Aboriginal communities for other reasons, such as regulatory requirements.

Crown – the Ontario Crown, acting through a particular ministry or ministries.

Procedural aspects of consultation – those portions of consultation related to the process of consultation, such as notifying an Aboriginal community about a project, providing information about the potential impacts of a project, responding to concerns raised by an Aboriginal community and proposing changes to the project to avoid negative impacts.

Proponent – the person or entity that wants to undertake a project and requires an Ontario Crown decision or approval for the project.

I. PURPOSE

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that may adversely impact that right. In outlining a framework for the duty to consult, the Supreme Court of Canada has stated that the Crown may delegate procedural aspects of consultation to third parties. This document provides general information about the Ontario Crown's approach to delegation of the procedural aspects of consultation to proponents.

This document is not intended to instruct a proponent about an individual project, and it does not constitute legal advice.

II. WHY IS IT NECESSARY TO CONSULT WITH ABORIGINAL COMMUNITIES?

The objective of the modern law of Aboriginal and treaty rights is the *reconciliation* of Aboriginal peoples and non-Aboriginal peoples and their respective rights, claims and interests. Consultation is an important component of the reconciliation process.

The Crown has a legal duty to consult Aboriginal communities when it has knowledge of an existing or asserted Aboriginal or treaty right and contemplates conduct that might adversely impact that right. For example, the Crown's duty to consult is triggered when it considers issuing a permit, authorization or approval for a project which has the potential to adversely impact an Aboriginal right, such as the right to hunt, fish, or trap in a particular area.

The scope of consultation required in particular circumstances ranges across a spectrum depending on both the nature of the asserted or established right and the seriousness of the potential adverse impacts on that right.

Depending on the particular circumstances, the Crown may also need to take steps to accommodate the potentially impacted Aboriginal or treaty right. For example, the Crown may be required to avoid or minimize the potential adverse impacts of the project.

III. THE CROWN'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

The Crown has the responsibility for ensuring that the duty to consult, and accommodate where appropriate, is met. However, the Crown may delegate the procedural aspects of consultation to a proponent.

There are different ways in which the Crown may delegate the procedural aspects of consultation to a proponent, including through a letter, a memorandum of understanding, legislation, regulation, policy and codes of practice.

If the Crown decides to delegate procedural aspects of consultation, the Crown will generally:

- Ensure that the delegation of procedural aspects of consultation and the responsibilities of the proponent are clearly communicated to the proponent;
- Identify which Aboriginal communities must be consulted;
- Provide contact information for the Aboriginal communities;
- Revise, as necessary, the list of Aboriginal communities to be consulted as new information becomes available and is assessed by the Crown;
- Assess the scope of consultation owed to the Aboriginal communities;

- Maintain appropriate oversight of the actions taken by the proponent in fulfilling the procedural aspects of consultation;
- Assess the adequacy of consultation that is undertaken and any accommodation that may be required;
- Provide a contact within any responsible ministry in case issues arise that require direction from the Crown; and
- Participate in the consultation process as necessary and as determined by the Crown.

IV. THE PROPONENT'S ROLE AND RESPONSIBILITIES IN THE DELEGATED CONSULTATION PROCESS

Where aspects of the consultation process have been delegated to a proponent, the Crown, in meeting its duty to consult, will rely on the proponent's consultation activities and documentation of those activities. The consultation process informs the Crown's decision of whether or not to approve a proposed project or activity.

A proponent's role and responsibilities will vary depending on a variety of factors including the extent of consultation required in the circumstance and the procedural aspects of consultation the Crown has delegated to it. Proponents are often in a better position than the Crown to discuss a project and its potential impacts with Aboriginal communities and to determine ways to avoid or minimize the adverse impacts of a project.

A proponent can raise issues or questions with the Crown at any time during the consultation process. If issues or concerns arise during the consultation that cannot be addressed by the proponent, the proponent should contact the Crown.

a) What might a proponent be required to do in carrying out the procedural aspects of consultation?

Where the Crown delegates procedural aspects of consultation, it is often the proponent's responsibility to provide notice of the proposed project to the identified Aboriginal communities. The notice should indicate that the Crown has delegated the procedural aspects of consultation to the proponent and should include the following information:

- a description of the proposed project or activity;
- mapping;
- proposed timelines;
- details regarding anticipated environmental and other impacts;
- details regarding opportunities to comment; and
- any changes to the proposed project that have been made for seasonal conditions or other factors, where relevant.

Proponents should provide enough information and time to allow Aboriginal communities to provide meaningful feedback regarding the potential impacts of the project. Depending on the nature of consultation required for a project, a proponent also may be required to:

- provide the Crown with copies of any consultation plans prepared and an opportunity to review and comment;
- ensure that any necessary follow-up discussions with Aboriginal communities take place in a timely manner, including to confirm receipt of information, share and update information and to address questions or concerns that may arise;
- as appropriate, discuss with Aboriginal communities potential mitigation measures and/or changes to the project in response to concerns raised by Aboriginal communities;
- use language that is accessible and not overly technical, and translate material into Aboriginal languages where requested or appropriate;
- bear the reasonable costs associated with the consultation process such as, but not limited to, meeting hall rental, meal costs, document translation(s), or to address technical & capacity issues;
- provide the Crown with all the details about potential impacts on established or asserted Aboriginal or treaty rights, how these concerns have been considered and addressed by the proponent and the Aboriginal communities and any steps taken to mitigate the potential impacts;
- provide the Crown with complete and accurate documentation from these meetings and communications; and
- notify the Crown immediately if an Aboriginal community not identified by the Crown approaches the proponent seeking consultation opportunities.

b) What documentation and reporting does the Crown need from the proponent?

Proponents should keep records of all communications with the Aboriginal communities involved in the consultation process and any information provided to these Aboriginal communities.

As the Crown is required to assess the adequacy of consultation, it needs documentation to satisfy itself that the proponent has fulfilled the procedural aspects of consultation delegated to it. The documentation required would typically include:

- the date of meetings, the agendas, any materials distributed, those in attendance and copies of any minutes prepared;
- the description of the proposed project that was shared at the meeting;
- any and all concerns or other feedback provided by the communities;
- any information that was shared by a community in relation to its asserted or established Aboriginal or treaty rights and any potential adverse impacts of the proposed activity, approval or disposition on such rights;

- any proposed project changes or mitigation measures that were discussed, and feedback from Aboriginal communities about the proposed changes and measures;
- any commitments made by the proponent in response to any concerns raised, and feedback from Aboriginal communities on those commitments;
- copies of correspondence to or from Aboriginal communities, and any materials distributed electronically or by mail;
- information regarding any financial assistance provided by the proponent to enable participation by Aboriginal communities in the consultation;
- periodic consultation progress reports or copies of meeting notes if requested by the Crown;
- a summary of how the delegated aspects of consultation were carried out and the results; and
- a summary of issues raised by the Aboriginal communities, how the issues were addressed and any outstanding issues.

In certain circumstances, the Crown may share and discuss the proponent's consultation record with an Aboriginal community to ensure that it is an accurate reflection of the consultation process.

c) Will the Crown require a proponent to provide information about its commercial arrangements with Aboriginal communities?

The Crown may require a proponent to share information about aspects of commercial arrangements between the proponent and Aboriginal communities where the arrangements:

- include elements that are directed at mitigating or otherwise addressing impacts of the project;
- include securing an Aboriginal community's support for the project; or
- may potentially affect the obligations of the Crown to the Aboriginal communities.

The proponent should make every reasonable effort to exempt the Crown from confidentiality provisions in commercial arrangements with Aboriginal communities to the extent necessary to allow this information to be shared with the Crown.

The Crown cannot guarantee that information shared with the Crown will remain confidential. Confidential commercial information should not be provided to the Crown as part of the consultation record if it is not relevant to the duty to consult or otherwise required to be submitted to the Crown as part of the regulatory process.

V. WHAT ARE THE ROLES AND RESPONSIBILITIES OF ABORIGINAL COMMUNITIES' IN THE CONSULTATION PROCESS?

Like the Crown, Aboriginal communities are expected to engage in consultation in good faith. This includes:

- responding to the consultation notice;
- engaging in the proposed consultation process;
- providing relevant information;
- clearly articulating the potential impacts of the proposed project on Aboriginal or treaty rights; and
- discussing ways to mitigate any adverse impacts.

Some Aboriginal communities have developed tools, such as consultation protocols, policies or processes that provide guidance on how they would prefer to be consulted. Although not legally binding, proponents are encouraged to respect these community processes where it is reasonable to do so. Please note that there is no obligation for a proponent to pay a fee to an Aboriginal community in order to enter into a consultation process.

To ensure that the Crown is aware of existing community consultation protocols, proponents should contact the relevant Crown ministry when presented with a consultation protocol by an Aboriginal community or anyone purporting to be a representative of an Aboriginal community.

VI. WHAT IF MORE THAN ONE PROVINCIAL CROWN MINISTRY IS INVOLVED IN APPROVING A PROPONENT'S PROJECT?

Depending on the project and the required permits or approvals, one or more ministries may delegate procedural aspects of the Crown's duty to consult to the proponent. The proponent may contact individual ministries for guidance related to the delegation of procedural aspects of consultation for ministry-specific permits/approvals required for the project in question. Proponents are encouraged to seek input from all involved Crown ministries sooner rather than later.

Shae Richter

From: Marray, Liam <lmarray@creditvalleyca.ca>
Sent: Friday, February 10, 2017 2:41 PM
To: Sheridan Park EA
Cc: Thajer, Ken
Subject: Sheridan Park EA
Attachments: SKM_C554e17021015460.pdf

Dana/David

Please find attached CVC's response to your Notice of Commencement for the above-noted project.

If you have any additional questions do not hesitate to contact the undersigned.

Liam Marray
Senior Manager, Planning Ecology| Credit Valley Conservation
905.670.1615 ext 239 | C: 416.896.1064| 1.800.668.5557
lmarray@creditvalleyca.ca | creditvalleyca.ca

MISSISSAUGA

BURNSIDE

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: LIAM MARRAY
(Please Print)

Phone No.: 905 670-1615 ext 239

Agency: Credit Valley Conservation

Signed: L Murray

Date: Feb 10/17

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?	✓	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?	✓	

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☑ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

- potential regulated watercourse, adjacent to ~~site~~ Peel Core Woodland, significant wildlife habitat, storm water management

Continued on back

Shae Richter

From: Mona McDonald <mona.mcdonald@mississauga.ca>
Sent: Friday, February 10, 2017 8:01 AM
To: Sheridan Park EA
Subject: Project Response Form
Attachments: 20170210074629966.pdf

Hi Jennifer,

Please find attached a completed Project Response Form from Assistant Chief Mark Ormond.

If you have any questions, please let me know.

Thanks,
Mona

MISSISSAUGA

Mona McDonald
Administrative Coordinator, Fire
Fire Headquarters, 15 Fairview Rd. West
T 905-615-3200 ext.3757
mona.mcdonald@mississauga.ca
City of Mississauga | Community Services,
Fire Division

Mississauga Fire
& Emergency Services

MISSISSAUGA

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201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: MARK ORMOND
(Please Print)

Phone No.: (905) 615-3754

Agency: MISSISSAUGA FIRE + EMERGENCY SERVICES

Signed: [signature]

Date: February 10, 2017

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?		X
2.	If the answer to Question 1 is "no," would you like to be removed from contact list?		X

3. Please identify any concerns or comments your agency may have at this time.

(1) Fire Hydrants will be installed on this road following accepted codes.
(2) This road extension will offer MFES additional access routes during emergency response. (minimal improvement.

Please return this completed form by **February 16, 2017** to **SheridanParkEA@rjburnside.com**

Shae Richter

From:	Kabanov, Serguei <serguei.kabanov@peelregion.ca>
Sent:	Wednesday, February 15, 2017 9:37 AM
To:	Sheridan Park EA
Cc:	David Argue; dana.glofcheskie@mississauga.ca
Subject:	Sheridan Park Drive Extension EA
Attachments:	SKMBT_C284e17021509341.pdf

Please see attached Project Response Form for the subject project.

Serguei Kabanov, CD, CET, rcca
Project Manager
Roads – Design and Construction
Public Works
10 Peel Centre Drive
Suite 'B', 4th Floor
Brampton, Ontario
L6T 4B9
Tel: 905-791-7800 ext. 8754
Cell: 416-902-7425
Serguei.kabanov@peelregion.ca

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201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: SERGUEÏ KABANOV
(Please Print)

Phone No.: 905-791-7800 EXT. 8754

Agency: REGION OF PEEL

Signed:

Date: FEB. 15, 2017

Please assist us in identifying your Interests:

		YES	NO
1.	Does your organization wish to participate in this project?	✓	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?	—	—
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?	✓	

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☑ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

THE AGENCY IS INTERESTED IN IMPROVEMENTS TO
WCB AND SHERIDAN PARK DRIVE INTERSECTION
AND A PROVISION OF A RIGHT TURN LANE.

Continued on back

If there is a different contact for your organization that will be participating in the Stakeholder Advisory Committee, please let us know:	
Name:	
Address:	N/A
Phone:	
Email:	

Please return this completed form by **February 16, 2017** to SheridanParkEA@rjburnside.com

peel District School Board

5650 Hurontario Street
Mississauga, ON, Canada L5R 1C6
t 905.890.1010 1.800.668.1146
f 905.890.6747
www.peelschools.org

February 16th, 2017

Ms. Dana Glofcheski
Project Manager
City of Mississauga
201 City Centre Drive, Suite 800
Mississauga, ON L5B 2T4

Dear Ms. Glofcheskie:

RE: **Notice of Study Commencement – Sheridan Park Drive Extension**
Municipal Class Environmental Assessment Study
City of Mississauga

Thank you for your letter dated January 26, 2017 notifying the Board of the Municipal Class Environmental Assessment Study for the Sheridan park Drive extension.

As you are aware, Homelands Sr. Public School is located immediately north of the proposed extension of Sheridan Park Drive.

Please keep us informed of the status of this project and provide us with any information you have available so that we may monitor its progress and provide comments as necessary.

Yours truly,

Amar Singh

Amar Singh, BURPl
Planner
Planning & Accommodations Support Services

c. B. Bielski, Peel District School Board

Sheridan Park Drive Extension.doc

Trustees
Janet McDougald, Chair
Suzanne Nurse, Vice-Chair
Carrie Andrews
Stan Cameron
Robert Crocker
Nokha Dakroub
David Green
Sue Lawton
Brad MacDonald
Kathy McDonald
Harkirat Singh
Rick Williams

Director of Education and Secretary
Tony Pontes

Associate Director, Instructional Support Services
Scott Moreash

Associate Director, Operational Support Services
Jaspal Gill

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Shae Richter

From: Minkin, Dan (MTCS) <Dan.Minkin@ontario.ca>
Sent: Thursday, February 16, 2017 4:37 PM
To: Sheridan Park EA
Subject: Sheridan Park Drive - MTCS Comments
Attachments: 2017-02-16 - Sheridan Park Drive Extension - MTCS Comments.pdf

Good afternoon,
Please see attached.

Dan Minkin
Heritage Planner
Ministry of Tourism, Culture and Sport
Culture Division | Programs and Services Branch | Heritage Program Unit
401 Bay Street, Suite 1700
Toronto, Ontario M7A 0A7
Tel. 416.314.7147 | Fax. 416.314.7175

Ministry of Tourism,
Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 7147
Fax: 416 212 1802

Ministère du Tourisme,
de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 7147
Téléc: 416 212 1802

February 16, 2017 (EMAIL ONLY)

Dana Glofcheskie, P.Eng.
Project Manager
City of Mississauga
201 City Centre Drive, Suite 800
Mississauga, ON L5B 2T4
E: SheridanParkEA@rjburnside.com

RE:	**MTCS file #:**	**0006251**
	Proponent:	**City of Mississauga**
	Subject:	**Notice of Commencement Sheridan Park Drive Extension**
	Location:	**City of Mississauga, Ontario**

Dear Ms. Glofcheskie:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for your project. MTCS's interest in this EA project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land-based and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Aboriginal communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Aboriginal communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
Your EA project may impact archaeological resources and you should screen the project with the MTCS *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MTCS archaeological sites data are available at *archaeology@ontario.ca*. If your EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether your EA project may impact cultural heritage resources. The Clerk for the City of Mississauga can provide information on property registered or

designated under the *Ontario Heritage Act*. Municipal Heritage Planners can also provide information that will assist you in completing the checklist.

If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS for review, and make it available to local organizations or individuals who have expressed interest in heritage.

Environmental Assessment Reporting
All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical heritage studies will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MTCS on this project: please continue to do so through the EA process, and contact me for any questions or clarification.

Sincerely,

Dan Minkin
Heritage Planner
Dan.Minkin@Ontario.ca

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MTCS makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MTCS be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police as well as the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Shae Richter

From: Brandon Wiedemann <brandon.wiedemann@yahoo.com>
Sent: Thursday, February 16, 2017 12:01 PM
To: Sheridan Park EA
Subject: sheridan park EA - SHORA
Attachments: sheridan park EA.pdf

Please see attached PDF of SHORA's project response form.

Brandon Wiedemann
President SHORA
Shora.ca

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BURNSIDE

201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: BRANDON WIEDEMANN
(Please Print)

Phone No.: 416 908 6344

Agency: SHORA SHERIDAN HOMELANDS RATEPAYERS' ASSOC.

Signed:

Date: FEB 16 2017.

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?	X	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?	X	

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☒ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

MANY MEMBERS ARE CONCERNED ABOUT NOISE LEVELS, AS THEIR PROPERTY BACKS ONTO STUDY AREA. OTHER MEMBERS REMAIN CONCERNED ABOUT PEDESTRIAN SAFETY AND VEHICLE SPEED. THE LOSS OF RECREATIONAL AND PUBLIC, PARK SPACE.

Continued on back

Scanned by CamScanner

Shae Richter

From:	Perrier, Richard <Richard.Perrier@petrocanadalsp.com>
Sent:	Thursday, February 16, 2017 9:24 AM
To:	Sheridan Park EA
Subject:	RE: Sheridan Park EA Notice of Study Commencement
Attachments:	Response to Burnside - Feb 16- 2017.pdf

Jennifer, attached is the response regarding the Sheridan Park Environmental Assessment Study for the Sheridan Park Association.

Please note that my work email address has changed: It is now Richard.perrier@petrocanadalsp.com

Richard Perrier
Director, Research and Development
Petro-Canada Lubricants Inc.
2489 N. Sheridan Way
Mississauga, Ont.
L5K 1A8
905-804-4741
416-889-5958 Cell
905-804-4738 Fax
Richard.perrier@petrocanadalsp.com
www.lubricants.petro-canada.com
www.hollyfrontier.com

From: Sheridan Park EA [mailto:SheridanParkEA@rjburnside.com]
Sent: Tuesday, January 24, 2017 4:10 PM
To: Perrier, Richard
Subject: Sheridan Park EA Notice of Study Commencement

Please find the attached letter, form and notice of study commencement for the Sheridan Park Drive Environmental Assessment.

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201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4

6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: Richard Pernie, President of Sheridan Park Association
(Please Print)

Phone No.: 905-804-4741

Agency: Sheridan Park Association

Signed: [signature]

Date: Feb 16, 2017

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?		X
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		X
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?		X

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

The Association would be interested in receiving a summary of the study from the City planning department once it has been completed and approved for public circulation

Continued on back

Shae Richter

From:	Darlene Presley <dpresley@mhbcplan.com>
Sent:	Thursday, March 23, 2017 2:51 PM
To:	Sheridan Park EA
Subject:	Sheridan Park Drive Extension EA Study
Attachments:	Scanned from a Xerox Multifunction Printer.pdf

Hi Megan,

Further to our conversation, attached is the project response form. We will provide comments when we have additional information on the project and confirmation of the pipeline(s) in the study area.

Thank you,

DARLENE PRESLEY | Planning Co-ordinator

MHBC Planning, Urban Design & Landscape Architecture
442 Brant Street, Suite 204 | Burlington | ON | L7R 2G4 | T 905 639 8686 x 229 | F 905 761 5589 | C 705 627 2302 | dpresley@mhbcplan.com |

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-----Original Message-----
From: xerox@mhbcplan.com [mailto:xerox@mhbcplan.com]
Sent: March 23, 2017 2:25 PM
To: Darlene Presley
Subject: Scanned from a Xerox Multifunction Printer

Please open the attached document. It was scanned and sent to you using a Xerox Multifunction Printer.

Attachment File Type: pdf, Multi-Page

Multifunction Printer Location:
Device Name: burlxerox

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Mississauga, ON L5N 8R9

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Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: Darlene Presley
(Please Print)

Phone No.: 905-639-8686 xt 229

Agency: MHBC Planning on behalf of TransCanada PipeLines Limited

Signed: [signature]

Date: Mar. 23/17

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?	✓	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?		✓

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	☐ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

Continued on back

Shae Richter

From: Helena Turkiewicz <Helena.Turkiewicz@alectrautilities.com>
Sent: Wednesday, April 05, 2017 2:22 PM
To: Sheridan Park EA
Cc: Chris Kafel
Subject: RE: Sheridan Park EA- SAC Response Form
Attachments: Sheridan Park Drive Extension - Project Response Form.pdf

Good Afternoon

Attached please find Alectra Utilities Corp. (formally Enersource Hydro Mississauga), signed and completed form for participation in the Stakeholder Advisory Committee (SAC) meetings .

Thank you

Helena Turkiewicz
Permit & Easement Coordinator
3240 Mavis Road. Mississauga, ON L5C 3K1
t 905.283.4184
alectrautilities.com

From: Sheridan Park EA [mailto:SheridanParkEA@rjburnside.com]
Sent: March-24-17 1:16 PM
To: Chris Kafel
Subject: Sheridan Park EA- SAC Response Form

Hello Mr. Kafel,

As per our conversation earlier this week, attached is the project response form for the Sheridan Park Drive EA. Please return completed at your earliest convenience, indicating if you would like to be part of the Stakeholder Advisory Committee.

Below is a link to the Notice of Commencement for the project, which would have been send out at the end of January 2017.
http://www7.mississauga.ca/Departments/Marketing/sheridanparkea/26-01-2017-Sheridan-Park-EA-Notice-of-Study.pdf

Your contact information is part of the project contact list, and you will receive notices as the study progresses. Please feel free to contact us should you have any more comments or questions.

Sincerely,
The Sheridan Park Drive EA Project Team

Confidentiality Warning: This message and any attachments are intended only for the use of the intended recipient(s), and may be confidential and/or privileged. If you are not the intended recipient, you are hereby notified that any review, retransmission, conversion to

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6990 Creditview Rd #2,
Mississauga, ON L5N 8R9

www.mississauga.ca www.burnside.com

Project Response Form

Notice of Study Commencement
Sheridan Park Drive Extension
Class Environmental Assessment Study

Name: Chris Kafel

Phone No.: (905) 283-4036

Agency: Alectra Utilities Corporation

Signed:

Date: APR. 5, 2017

Please assist us in identifying your interests:

		YES	NO
1.	Does your organization wish to participate in this project?	✓	
2.	If the answer to Question 1 is "No," would you like to be removed from contact list?		✓
3.	Does your organization wish to participate as a member of the **Stakeholder Advisory Committee (SAC)**?	✓	

4.	If the answer to Question 3 is "Yes", what time would work best for scheduling SAC Meetings?	■ 2-4pm	☐ 4-6pm

5. Please identify any concerns or comments your agency may have at this time.

Currently Alectra Utilities has a pole line in proximity to the proposed road extension.
I would like to participate in SAC meetings.

Continued on back

If there is a different contact for your organization that will be participating in the Stakeholder Advisory Committee, please let us know:	
Name:	
Address:	
Phone:	
Email:	

Please return this completed form by **February 16, 2017** to SheridanParkEA@rjburnside.com

MISSISSAUGA

CITY OF MISSISSAUGA – NOTICE OF STUDY COMMENCEMENT
Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension

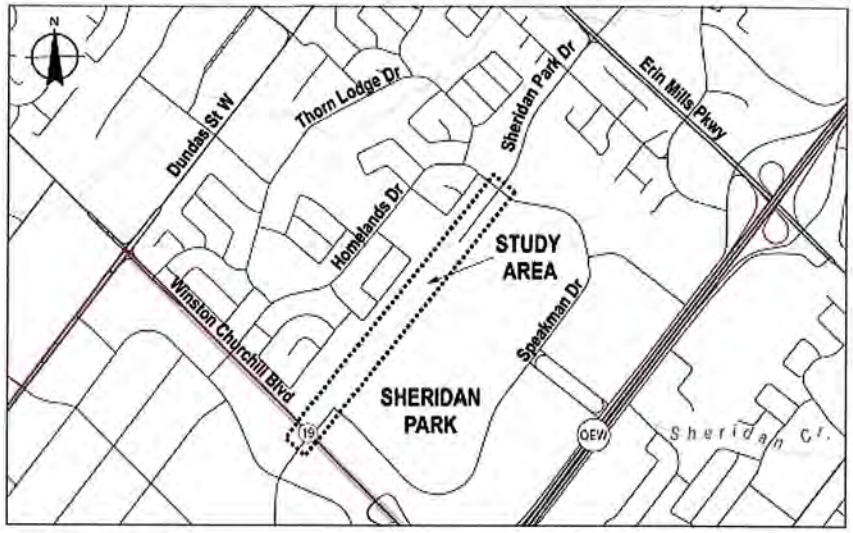
WHAT?

- The City of Mississauga is undertaking a study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive.
- The site location and approximate extent of the Study Area are shown on the map.

WHY?

- Complete the road network in the area to improve connectivity in Sheridan Park Corporate Centre (Sheridan Park) and surrounding commercial areas for all users.
- Maximize access to the Sheridan Park (Sheridan Park).
- Improve the pedestrian and cycling network for employees in Sheridan Park and neighbouring residents.

WHERE?



HOW?

- The Study is being carried out in accordance with the requirements of a Schedule B undertaking as outlined in the Municipal Engineers Association *Municipal Class Environmental Assessment Manual* (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act*.
- The study will examine how traffic operates both now and in the future – and determine ways to address existing and future issues. It will also examine the impacts of extending Sheridan Park Drive on the social, cultural and natural environments and develop mitigation measures.
- Several alternatives will be developed and evaluated and refined through community and agency consultation. The Project Team will then select a preferred alternative.
- At the end of the study, a Project File documenting the entire Study process will be available for public review.

GET INVOLVED!

- Consultation is an important part of the Municipal Class EA process. Throughout the Study, the City will make contact with various agencies and members of the community, and consider their opinions as part of any decisions that are made.
- A Public Information Centre (PIC) will be held in Phase 2 to present information related to the study and answer any questions you may have. Details regarding PIC will be advertised publicly and communicated as the study progresses.
- To find out more about project announcements and other information please visit the project website:

www.mississauga.ca/sheridanparkea

WE WANT TO HEAR FROM YOU – PLEASE VISIT THE WEBSITE AND COMPLETE A SURVEY!
(If you require a hard copy of the survey, please contact the Project Team – see below)

If you have any questions or comments regarding the study or would like to be added to the Project Contact List, please contact:
SheridanParkEA@rjburnside.com

Dana Glofcheskie, P.Eng.
Project Manager
City of Mississauga
201 City Centre Dr, Suite 800
Mississauga, ON L5B 2T4
(905) 615-3200 ext. 8243

David Argue, P.Eng., PTOE
Consultant Project Manager
R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga, ON L5N 8R9
(905) 821-5895

Personal information is collected under the authority of the Environmental Assessment Act and will be used in the assessment process. With exception of personal information, all comments shall become part of the public records. Questions about this collection should be directed to the Project Manager listed in the notice.

This Notice First Issued January 26, 2017.

Shae Richter

From: Jennifer Vandermeer
Sent: Friday, April 07, 2017 4:47 PM
To: Marray, Liam
Cc: JCampbell@creditvalleyca.ca; MMarinas@creditvalleyca.ca; Dana Glofcheskie; David Argue; Sheridan Park EA
Subject: RE: Sheridan Park EA

Categories: Red Category

Good morning Liam,

Thank-you for providing your response to the Notice of Commencement for the City of Mississauga's Sheridan Park Drive EA and your willingness to participate as a member of the Stakeholder Advisory Committee (SAC). We acknowledge CVC's interests with regard to watercourses, significant wildlife habitat and storm water management in relation to this Study and will look to discuss these interests at the SAC meetings. We are planning to host the first SAC meeting at the end of April at the City of Mississauga office, and you will receive an invitation for this meeting shortly. I would also like to take this opportunity to advise CVC that Burnside staff will be conducting the following natural heritage field studies starting next week and running to the end of June 2017:

- Frog Call Surveys
- Aquatic Habitat Assessment
- Tree Inventory
- Ecological Land Classification
- Breeding Bird Surveys

We are happy to provide updates on the results of these studies at the SAC meetings for discussion and feedback from the SAC members.
I look forward to meeting you at the upcoming SAC meeting.

Best regards,
Jennifer

Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead
R.J. Burnside & Associates Limited | www.rjburnside.com
Office: 800-265-9662 Direct: 226-486-1559

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Thank you.

****

From: Marray, Liam [mailto:lmarray@creditvalleyca.ca]
Sent: Friday, February 10, 2017 2:41 PM
To: Sheridan Park EA
Cc: Thajer, Ken
Subject: Sheridan Park EA

Dana/David

Please find attached CVC’s response to your Notice of Commencement for the above-noted project.

If you have any additional questions do not hesitate to contact the undersigned.

Liam Marray
Senior Manager, Planning Ecology| Credit Valley Conservation
905.670.1615 ext 239 | C: 416.896.1064| 1.800.668.5557
lmarray@creditvalleyca.ca | creditvalleyca.ca

Shae Richter

From: Jennifer Vandermeer
Sent: Wednesday, May 10, 2017 2:22 PM
To: Sheridan Park EA
Subject: FW: Information Request - Sheridan Park Drive EA, Mississauga
Attachments: 039474 Information Request MNRF 170417-signed.pdf

For EA File and Project Contact List.

From: Gilchrist, Gabrielle (MNRF) [mailto:Gabrielle.Gilchrist@ontario.ca]
Sent: Tuesday, April 18, 2017 10:25 AM
To: Sarah Robbins; ESA Aurora (MNRF)
Cc: Nicholle Smith; Jennifer Vandermeer
Subject: FW: Information Request - Sheridan Park Drive EA, Mississauga

Hi Sarah,

I'm glad to hear that you're making progress!

I'm forwarding your information request to our ESA inbox since I don't cover the Mississauga area. It typically takes 6 weeks or more to do this type of screening.

Take care,

Gabby

Gabrielle Gilchrist
A/Management Biologist | Aurora District | Regional Operations Division | Ministry of Natural Resources and Forestry | 50 Bloomington Rd W. Aurora, ON L4G 0L8 | 905-713-7398 | gabrielle.gilchrist@ontario.ca

---

From: Sarah Robbins [mailto:Sarah.Robbins@rjburnside.com]
Sent: April 17, 2017 10:08 AM
To: Gilchrist, Gabrielle (MNRF)
Cc: Nicholle Smith; Jennifer Vandermeer
Subject: Information Request - Sheridan Park Drive EA, Mississauga

Hello Gabrielle,

Thank you for taking my call last week regarding the bat habitat survey protocol. It's been tricky navigating the recent developments on protocol within each MNRF district and your advice to contact our site biologist helped direct our questions to the right person. I appreciate it.

In regards to another project, I have attached an information request that pertains to the site located within the unopened right of way in between the east and west sections of Sheridan Park Drive, in Mississauga. Would it be possible to have someone send me the information we are seeking for this area?

If you have any questions, please do not hesitate to give me a call.

Thank you,

Sarah

Sarah Robbins,
Engineering Technologist

R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301, Barrie, Ontario L4N 8J6
Office: 800-265-9662 Direct: 705-797-4254
www.rjburnside.com

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Thank you.

****

R.J. Burnside & Associates Limited 128 Wellington Street West Suite 301 Barrie ON L4N 8J6 CANADA
telephone (705) 797-2047 **fax** (705) 797-2037 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

April 17, 2017

Via: Gabrielle.Gilchrist@ontario.ca

Gabrielle Gilchrist
Management Biologist
Aurora District Ministry of Natural Resources and Forestry
50 Bloomington Road
Aurora ON L4G 0L8

Dear Gabrielle:

Re: Sheridan Park Drive, Mississauga
Municipal Class Environmental Assessment
Project No.: 300039474.0000

R.J. Burnside & Associates Limited (Burnside) has been retained by The City of Mississauga to conduct a Class Environmental Assessment for the extension of Sheridan Park Drive, between Homelands Drive and Speakman Drive. A site location map is attached to this letter.

In fulfillment of this work, current environmental background information (both aquatic and terrestrial) is required within the study area and adjacent lands. At this time, we are requesting any applicable/available data (preferably in GIS format) as listed below. We have also completed and attached an information request form, as per Aurora District MNRF protocol requirements. As part of our data gathering strategy, we plan to contact the local Conservation Authority. Information we are seeking from MNRF includes:

Terrestrial

- Significant wildlife habitat (e.g., nesting/breeding/hibernation) that may not yet be available from LIO.
- Sensitive avian nesting sites (heronries, stick nest locations) that may not yet be available from LIO.
- Digital boundary information for updated designated natural features that may not yet be available from LIO (e.g., Areas of Natural and Scientific Interest (ANSI), Environmentally Significant Areas (ESA), Provincially Significant Wetlands (PSW) etc.).

Aquatics

- Fish/Freshwater Mussel sampling locations (e.g., fish dot mapping) along with sample dates and species occurrence records for water bodies that are located within the study area.
- Confirmed and/or potential spawning/rearing/foraging habitat locations.
- Thermal regime classification(s).
- Recommended in-water works window(s).

Species at Risk (SAR) Information

- Locations, observation dates and any other relevant information about terrestrial and aquatic SAR that is not included in the list below – if possible, please provide the UTM's/accuracy codes.
- Locally rare species lists or species records known from the study area and adjacent lands.

Our search of the NHIC database on April 11, 2017 resulted in three records for NHIC Squares 17PJ0819 and 17PJ0719 that encompass the study area and adjacent lands:

- Redside Dace (Clinostomus elongates)
- Henslow's Sparrow (Ammodramus hensolii)
- Eastern Musk Turtle (Sternotherus odoratus)

In addition to this, our search resulted in two Restricted Species (Occurrence ID 13219 and 35591). We would like to include the identification of these two species in our request.

If you are able to respond by May 1, 2017 it would be greatly appreciated. Please do not hesitate to contact the undersigned below if you have any questions or concerns.

Yours truly,

R.J. Burnside & Associates Limited

Sarah Robbins
Environmental Technologist
SR:sr

Enclosure(s) Site Location Map
Aurora Information Request Form

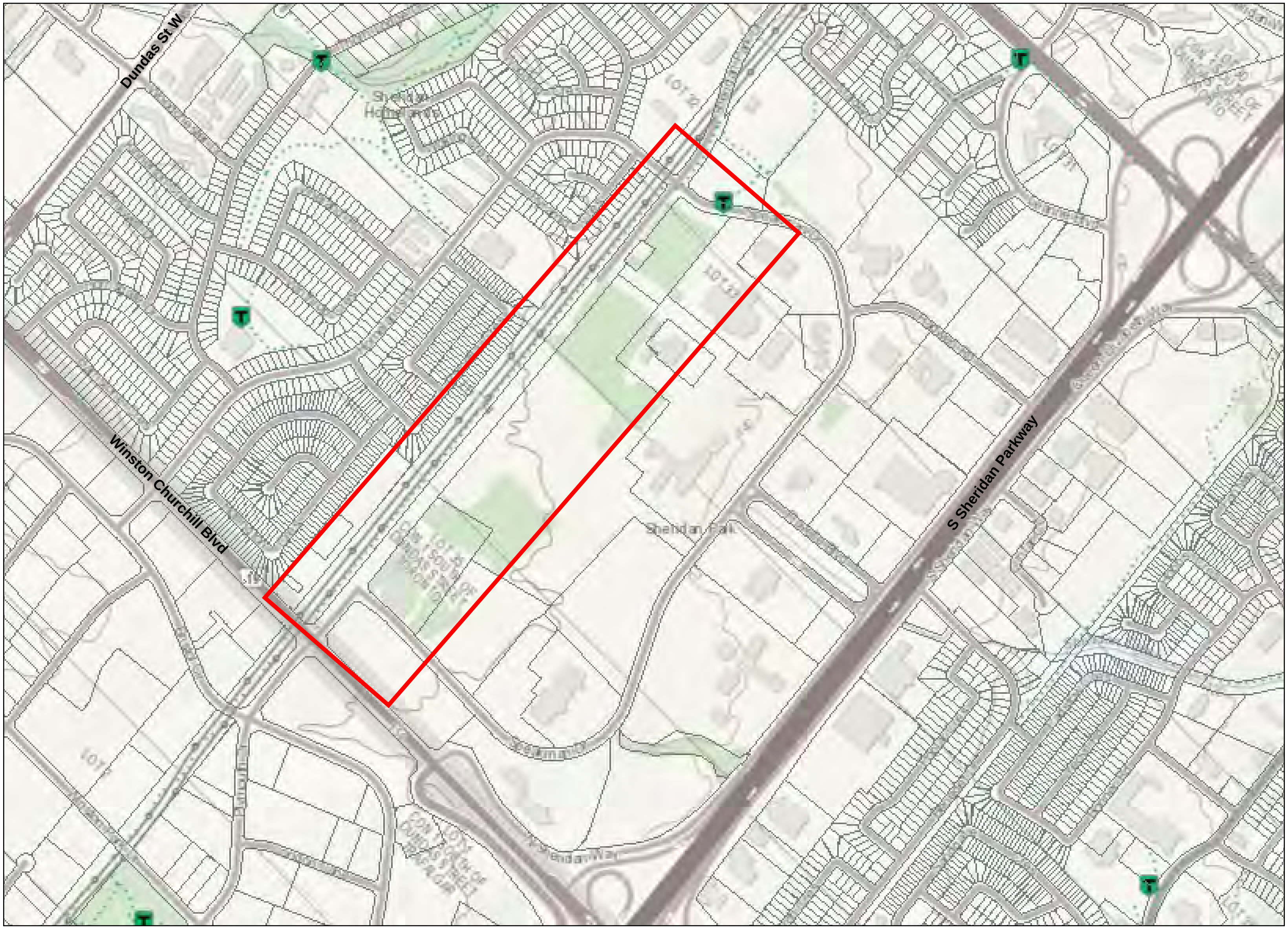
Other than by the addressee, copying or distribution of this document, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited.

MINISTRY OF NATURAL RESOURCES AND FORESTRY

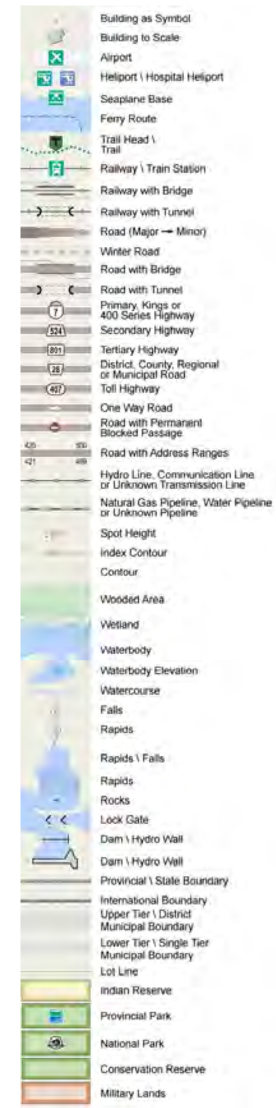
Make a Topographic Map

Sheridan Park Drive Extension EA

Notes:



Legend



0 0.7 km

Projection: Web Mercator

N

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Ontario

Aurora MNRF
Information Request Form

Name:	Sarah Robbins
Company Name:	R.J. Burnside & Associates Limited
Proponent Name:	The City of Mississauga
Phone Number:	1-705-797-4254
Email Address:	Sarah.Robbins@RJBurnside.com
Project Name:	Sheridan Park Drive Extension EA
Property Location:	Sheridan Park Drive, between Homelands Drive and Speakman Drive.
Township:	Toronto Township
Lot & Concession:	Lot 35, Lot 34, Lot 33 and Lot 32 (Concession 1 South of Dundas Street)

UTM Coordinates: Easting (X) 607710.86 Northing (Y) 4819429.32

Brief Description of Undertaking Study of extension and connection of Sheridan Park Drive.

Have you previously contacted someone at MNRF for information on this site? ☐ Yes ☑ No

If yes, when and who?

Provide a map of accurate scale to illustrate footprint/study area of the proposed activity in relation to the surrounding landscape (e.g. property boundaries, roads, waterbodies, natural features, towns, transmission corridors, and other human landmarks). Use of aerial photography is strongly encouraged. Include scale, north arrow and legend.

ATTACHMENTS - I have attached a:

☐ Picture ☑ Map ☐ Other

REQUEST - I would like to request the following information for the property identified above:
**Requires an appointment and remittance of fees. See Information Request Guideline for details.*

☑ *Fish Dot Information (fish and other aquatic species found in a particular area of a watercourse)

☑ Species at Risk

☑ Other Significant habitat, PSW, ANSI

For additional natural heritage information please visit Land Information Ontario | Ontario.ca

Please forward the completed form to: esa.aurora@ontario.ca
Or send by mail:
Aurora District, Ministry of Natural Resources and Forestry
50 Bloomington Rd Aurora, ON L4G 0L8

Shae Richter

From: Sarah Robbins
Sent: Thursday, May 11, 2017 11:39 AM
To: kthajer@creditvalleyca.ca
Cc: Jennifer Vandermeer; Devin Soeting; Nicholle Smith; Tony Elias; Sheridan Park EA
Subject: Sheridan Park EA Information Request (300039474)
Attachments: 039474 Information Request CVC 170510-signed.pdf

Hello Ken,

My name is Sarah Robbins. I am assisting Jenn Vandermeer with the Sheridan Park Road extension project in Richmond Hill. Jenn has informed me that you are our primary contact at Credit Valley Conservation for this project.

I have attached a letter of request for background information on the study area. Could you please ensure that someone fulfills our request?

If you have any questions, please don't hesitate to give me a call. I'm sure we will be in touch soon.

Thank you,
Sarah

BURNSIDE
Sarah Robbins,
Engineering Technologist

R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301, Barrie, Ontario L4N 8J6
Office: 800-265-9662 Direct: 705-797-4254
www.rjburnside.com

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R.J. Burnside & Associates Limited 128 Wellington Street West Suite 301 Barrie ON L4N 8J6 CANADA
telephone (705) 797-2047 **fax** (705) 797-2037 **web** www.rjburnside.com

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

May 10, 2017

Via: kthajer@creditvalleyca.ca

Ken Thajer, MCIP, RPP
Regulations Officer
Credit Valley Conservation Authority
1255 Old Derry Road
Mississauga ON L5N 6R4

Dear Liam:

Re: Sheridan Park Drive Extension, Mississauga
Municipal Class Environmental Assessment
Project No.: 300039474.0000

R.J. Burnside & Associates Limited (Burnside) has been retained by the City of Mississauga to conduct a Municipal Class Environmental Assessment for the extension of Sheridan Park Drive, between Homelands Drive and Speakman Drive. A location map is attached to this letter.

In fulfillment of this work, current environmental background information (both aquatic and terrestrial) is required for the study area and adjacent lands. At this time, we are requesting any applicable/available data (preferably in GIS format) as listed below. We have also contacted the Aurora MNRF District Office. Information we are seeking from the CVC includes:

Terrestrial

Sensitive wildlife habitat locations (e.g., nesting/breeding/hibernation) known to the CVC.

Aquatics

- Fish/Freshwater Mussel sampling locations (e.g., fish dot mapping) along with sample dates and species occurrence records for water bodies that are located within the study area.
- Confirmed and/or potential spawning/rearing/foraging habitat locations.
- Flow and temperature data.
- Surface water quality data.
- Channel structure and geomorphic information.
- Watershed reports.
- Thermal regime classifications.
- Stormwater drainage mapping and/or models.
- Any other aquatic information collected during CVC's field characterization of the study area in the Summer of 2016.

Species at Risk (SAR) Information

- Locations, observation dates and any other relevant information about terrestrial and aquatic SAR that is not included in the above – if possible, please provide the UTM's/accuracy codes.
- Locally rare species lists or species records applicable to the study area and adjacent lands.

If you are able to respond by May 23, 2017, it would be greatly appreciated. Please do not hesitate to contact the undersigned below if you have any questions or concerns.

Yours truly,

R.J. Burnside & Associates Limited

Sarah Robbins
Environmental Technologist
SR:sr

Enclosure(s) Site Location Map

Distribution:

Jennifer Vandermeer	R.J. Burnside & Associates Limited	Jennifer.Vandermeer@rjburnside.com
Devin Soeting	R.J. Burnside & Associates Limited	Devin.Soeting@rjburnside.com
Nicholle Smith	R.J. Burnside & Associates Limited	Nicholle.Smith@rjburnside.com
Tony Elias	R.J. Burnside & Associates Limited	Tony.Elias@rjburnside.com

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039474 Information Request CVC 170510
11/05/2017 8:57 AM

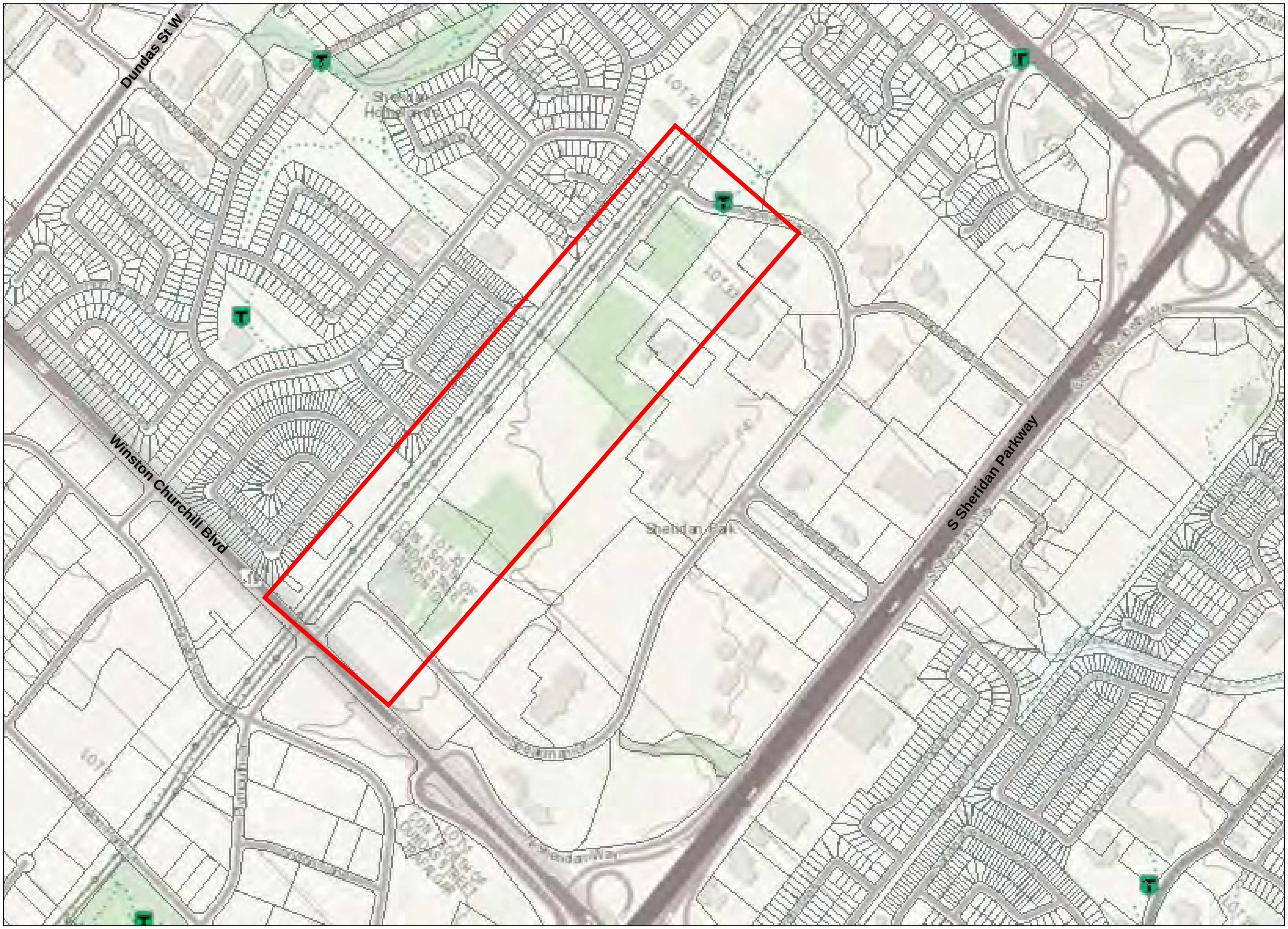
Ontario

MINISTRY OF NATURAL RESOURCES AND FORESTRY

Make a Topographic Map

Sheridan Park Drive Extension EA

Notes:



0 0.7 km

Projection: Web Mercator

The Ontario Ministry of Natural Resources and Forestry shall not be liable in any way for the use of, or reliance upon, this map or any information on this map. This map should not be used for: navigation, a plan of survey, routes, nor locations.

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Shae Richter

From: Jennifer Vandermeer
Sent: Thursday, June 15, 2017 11:20 AM
To: Sheridan Park EA
Subject: FW: Information Request - Sheridan Park Drive EA, Mississauga
Attachments: Sheridan Park Dr, Mississauga.pdf

For Project Contact List and EA File.

From: ESA Aurora (MNRF) [mailto:ESA.Aurora@ontario.ca]
Sent: Monday, May 29, 2017 3:29 PM
To: Sarah Robbins
Cc: Nicholle Smith; Jennifer Vandermeer
Subject: RE: Information Request - Sheridan Park Drive EA, Mississauga

Hello,

Attached is a screening for the area,

Regards,

Bohdan Kowalyk, R.P.F.
Aurora District
Ontario Ministry of Natural Resources and Forestry
50 Bloomington Road, Aurora, Ontario   L4G 0L8
Phone: 905-713-7387; Email: Bohdan.Kowalyk@Ontario.ca

From: Gilchrist, Gabrielle (MNRF)
Sent: April-18-17 10:25 AM
To: Sarah Robbins; ESA Aurora (MNRF)
Cc: Nicholle Smith; Jennifer Vandermeer
Subject: FW: Information Request - Sheridan Park Drive EA, Mississauga

Hi Sarah,

I'm glad to hear that you're making progress!

I'm forwarding your information request to our ESA inbox since I don't cover the Mississauga area. It typically takes 6 weeks or more to do this type of screening.

Take care,

Gabby

Gabrielle Gilchrist
A/Management Biologist | Aurora District | Regional Operations Division | Ministry of Natural Resources and Forestry | 50 Bloomington Rd W. Aurora, ON L4G 0L8 | 905-713-7398 | gabrielle.gilchrist@ontario.ca

From: Sarah Robbins [mailto:Sarah.Robbins@rjburnside.com]
Sent: April 17, 2017 10:08 AM
To: Gilchrist, Gabrielle (MNRF)
Cc: Nicholle Smith; Jennifer Vandermeer
Subject: Information Request - Sheridan Park Drive EA, Mississauga

Hello Gabrielle,

Thank you for taking my call last week regarding the bat habitat survey protocol. It's been tricky navigating the recent developments on protocol within each MNRF district and your advice to contact our site biologist helped direct our questions to the right person. I appreciate it.

In regards to another project, I have attached an information request that pertains to the site located within the unopened right of way in between the east and west sections of Sheridan Park Drive, in Mississauga. Would it be possible to have someone send me the information we are seeking for this area?

If you have any questions, please do not hesitate to give me a call.

Thank you,
Sarah

BURNSIDE
Sarah Robbins,
Engineering Technologist

R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301, Barrie, Ontario L4N 8J6
Office: 800-265-9662 Direct: 705-797-4254
www.rjburnside.com

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Thank you.

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Ministry of
Natural Resources
and Forestry
Aurora District Office
50 Bloomington Road
Aurora, Ontario L4G 0L8

Ministère des
Richesses naturelles
et des Forets

Telephone: (905) 713-7400
Facsimile: (905) 713-7361

Ontario

May 29, 2017

Sarah Robbins
R.J, Burnside & Associates Limited
128 Wellington Street West, Suite 301
Barrie, ON L4N 8J6
705-797-4254
Sarah.Robbins@rjburnside.com

Re: Sheridan Park Drive EA, Mississauga

Dear Sarah Robbins,

In your email of April 18, 2017 you requested information regarding the above location.

Species at risk recorded in the vicinity include Butternut (endangered), Barn Swallow (threatened), Bobolink (threatened), Chimney Swift (threatened), and Eastern Meadowlark (threatened). There is potential for endangered bats (i.e., Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-colored Bat) in cavities or leaf clusters.

Absence of information provided by MNRF for a given geographic area, or lack of current information for a given area or element, does not categorically mean the absence of sensitive species or features. Many areas in Ontario have never been surveyed and new plant and animal species records are still being discovered for many localities. Appropriate inventory work is needed depending on the undertakings proposed. Approval from MNRF may be required if work you are proposing could cause harm to any species that receive protection under the *Endangered Species Act 2007*.

Species at risk information is highly sensitive and is not intended for any person or project unrelated to this undertaking. Please do not include any specific sensitive information in reports that will be available for public record. As you complete your fieldwork in these areas, please report all information related to any species at risk to our office. This will assist with updating our database and facilitate early consultation regarding your project.

If you have any questions or comments, please do not hesitate to contact ESA.aurora@ontario.ca or Bohdan.Kowalyk@Ontario.ca.

Sincerely,

B. Kowalyk

Bohdan Kowalyk, R.P.F.
Aurora District, Ontario Ministry of Natural Resources and Forestry

Shae Richter

From: Thajer, Ken <kthajer@creditvalleyca.ca>
Sent: Wednesday, June 07, 2017 11:19 AM
To: Sheridan Park EA
Subject: Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension - CVC comments

Re: City of Mississauga–Notice of Study Commencement/Stakeholder Advisory Committee Meeting No.1
Municipal Class Environmental Assessment Study for Sheridan Park Drive Extension
CVC File No.: EA 17/001

CVC staff offer the following preliminary/initial comments with respect to the above noted project:

It is the understanding of CVC staff that the City of Mississauga is undertaking a Schedule B Municipal Class Environmental Assessment (EA) with the purpose of exploring the opportunity to connect the east and west sections of Sheridan Park Drive to maximize access to Sheridan Park, create options for alternative routes and improve road network connectivity.

Site Characteristics:
The proposed works are located within the Sheridan Creek watershed. The location of the proposed works does fall within an area located in close proximity to a watercourse and its associated floodplain.

Permit Approval Requirements:
In accordance with Ontario Regulation 160/06 (our Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation), a permit would be required from the CVC prior to commencement of the works involving development, interference with a wetland and/or alterations to a watercourse.

Fish Habitat and Fisheries and Oceans Canada (DFO):
Please note that CVC's agreement with the DFO establishes a streamlined approach to addressing issues pertaining to the Federal Fisheries Act. CVC staff, in consultation with the DFO staff, is responsible for co-coordinating the review of proposed works that may potentially result in the harmful alteration, disruption or destruction (HADD) of fish habitat. Please be advised that in stream works where the HADD of fish habitat requires compensation; authorization from DFO is required pursuant to Section 35(2) of the Federal Fisheries Act.

General comments:

1. The proposed natural environment evaluation criteria focus heavily on impacts to existing natural features and wildlife. CVC suggests these are expanded to include other higher level objectives such as the preservation and enhancement of a functional natural heritage system and urban forest, and protecting/enhancing/restoring/improving natural connections. CVC recommends that the city of Mississauga's Natural Heritage and Urban Forest Strategy also be consulted when developing objectives and goals for the EA.

2. As per the intent of CVC's guiding policies, the proposal is to demonstrate, to the satisfaction of CVC, that an ecological gain is achieved. As such, the EA must outline the proposed rehabilitation, restoration, or habitat improvements for existing disturbed and adjacent natural heritage areas.

3. CVC encourages options which pursue the following objectives in order to avoid impacts, and maintain/enhance ecological functions:

- Retention and enhancement of natural features and habitat (avoidance of natural heritage features is the preferred approach to mitigation)
- Fish habitat protection and enhancement
- Mitigation measures for roadways adjacent to natural areas – lighting, landscaping, noise attenuation, debris management, etc.
- Incorporation of wildlife friendly plantings, in particular for migrant and breeding birds since this area is known to be within significant areas for migratory birds.

4. Please note that CVC is no longer administering the *Fisheries Act* on behalf of Fisheries and Oceans Canada (DFO). As a result, it is up to the proponent to ensure that the DFO requirements under the self-assessment process are addressed.

5. Depending on the nature of the preferred option, it is anticipated that restoration and enhancement plans will be required for both watercourses at the detailed design stage. The EA should address the restoration/enhancement potential of the property, and include at minimum the recommended/required measures to demonstrate an ecological gain for the proposal. The restoration/enhancement plans must be prepared by a qualified professional such as an ecologist or landscape architect.

6. Depending on the nature of the preferred option, if watercourse interference is pursued, detailed isolation and dewatering arrangements must be provided to the satisfaction of CVC.

Detailed comments:

7. In order to ensure that the proposed supporting environmental studies are sufficient and in keeping with accepted ecological protocols, a terms of reference/statement of work detailing the studies should be provided and reviewed by CVC and the City. The comments below provide some preliminary direction on which to base this TOR/statement of work. CVC would be happy to meet and discuss further details of study design.

8. CVC is supportive of the proposed terrestrial ecology assessment components, namely: bat habitat surveys, frog call surveys, tree inventory, breeding bird surveys, and ecological land classification (ELC). Please note that supplementary surveys may be required based on the results of the initial surveys; for example, bat acoustic surveys if suitable mat habitat and maternity roost trees are identified; or targeted nests searches for species at risk bids or birds that may indicate the presence of significant wildlife habitat.

9. The proposed tree inventory should document all trees <10cm DBH within the limit of disturbance in order to help inform avoidance/mitigation/restoration opportunities.

10. Vegetation inventory/ELC: the optimal period is between end of May and September. Protocol to follow is the ELC system for Southern Ontario. A full vegetation list should be provided on a polygon basis. Species rarity is to be based on the following sources: Vascular Plant Flora of the Region of Peel & the Credit River Watershed. (2001) (Kaiser, 2001 and amendments), City of Mississauga local rarity ranks, S-Ranks using the NHIC species lists and Species at Risk in Ontario list. Rare, at risk or otherwise significant species will be required to be georeferenced. Please consult the NHIC, MNRF and the City of Mississauga Natural Areas Survey for any already documented rare and uncommon species within the natural areas in the study area; these should be an additional focus of the vegetation inventory work.

11. The breeding bird survey must be done in accordance with the Forest Bird Monitoring Program, 2002 (CWS) or the Marsh Monitoring Program (CWS and Bird Studies Canada). That is, two surveys must be conducted at least 10 days apart between late May and July 5th. The surveys must be conducted in either the early morning and/or early evening depending on habitat and potential species present, as per the protocols. These surveys should be designed to ensure that the *full habitat patch* is sampled in order to base recommendations and conclusions on the feature

and its function. CVC notes that much of the forest and meadow habitat within the study area extends beyond the study area and should be included in the survey.

12. Amphibian surveys – Sampling is to follow Bird Studies Canada Great Lakes Marsh Monitoring Program protocol, with 3 separate spring/early summer seasonal survey timing windows. Since this is in a very urbanized area with much noise, point counts should be extended to a minimum of 6 minutes from the typical 3 minutes.
13. Bat habitat surveys should follow the protocol for species at risk bats within tree habitats (Ministry of Natural Resources and Forestry, April 2017). CVC notes that much of the forest habitat within the study area extends beyond the study area and should be included in the survey.

14. Depending on the nature of the aquatic habitat within the study area a Headwater Drainage Feature assessment may also be required to determine appropriate management recommendations. Please refer to the following document: Evaluation, Classification and Management of Headwater Drainage Features Guidelines (CVC & TRCA, January 2014).

15. An evaluation of significant wildlife habitat must be undertaken in order to address impacts to candidate or confirmed habitat within or adjacent to the study area. The assessment should be based both on the Ministry of Natural Resources Ecoregion criteria for 7E (2015), and the Region of Peel -Town of Caledon Significant Woodland and Wildlife Habitat technical guide (2009). Please assess referencing applicable current literature. Previous work in this vicinity has indicated the potential for the following types of significant wildlife habitat (others may also exist) which must be specifically addressed:
    - Raptor wintering habitat
    - Land bird Migratory Stopover Areas
    - Migratory Butterfly Stopover Area
    - Habitat for Species of Special Concern

16. It is anticipated that a staking of natural features (woodland, wetland) will be required in the future.

17. Preliminary screening of this project indicates that species at risk are known for the area. The proponent should contact the local district MNRF office (Aurora) to request a species at risk screening for his/her project in order to identify any concerns related to species at risk and associated habitat. Inquiries can be directed to: Esa.aurora@ontario.ca

Given CVC's interest staff would like to be kept informed of future meetings and proceedings through the Environmental Assessment process. Please forward any information or reports when available to ensure that this Authority's policy and program interest are reflected in the planning and design components for this project.

Jennifer Vandermeer

From: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent: Wednesday, July 05, 2017 8:31 AM
To: 'Perrier, Richard'
Cc: Jennifer Vandermeer; Sheridan Park EA; David Argue
Subject: RE: Diagram of the proposed recommendation for the Sheridan Park Drive Road

Hi Richard,

Thank you for attending the meeting. All of the display material from the public meeting can be found:
http://www.mississauga.ca/portal/residents/sheridanparkea

Specifically, the plan presented can be found:
http://www7.mississauga.ca/Departments/Marketing/sheridanparkea/Sheridan-Park-EA-Preliminary-Plan.pdf

If you require any additional information, please let me know.

Thank you,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

Please consider the environment before printing.

From: Perrier, Richard [mailto:Richard.Perrier@petrocanadalsp.com]
Sent: June 29, 2017 6:24 AM
To: Dana Glofcheskie
Subject: Diagram of the proposed recommendation for the Sheridan Park Drive Road

Hi Dana. It was a pleasure meeting you on Tuesday. I am wondering if you could send me a picture or diagram of the proposed recommendation for the Sheridan Park Drive Road that I can send to the Sheridan Park Association Board Members.

Councillor Ras mentioned to me that there were questions from the residences in the area in the SPA supported the road.   I mentioned to her that I would send an email to the board members and if I could obtain a diagram that would be great.

Thanks in advance for your help.

Richard Perrier
Director, Research and Development
Petro-Canada Lubricants Inc.
2489 N. Sheridan Way
Mississauga, Ont.

L5K 1A8
905-804-4741
416-889-5958 Cell
905-804-4738 Fax
Richard.perrier@petrocanadalsp.com
www.lubricants.petro-canada.com
www.hollyfrontier.com

From: Sheridan Park EA [mailto:SheridanParkEA@rjburnside.com]
Sent: Thursday, June 15, 2017 12:07 PM
To: Sheridan Park EA
Cc: Dana Glofcheskie; David Argue
Subject: Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre

Good afternoon,
Please find attached a copy of the Notice of Public Information Centre for the City of Mississauga's Sheridan Park Drive Environmental Assessment.
Best regards,
Jennifer
For Sheridan Park Drive EA Study Team

Jennifer Vandermeer

From:	Ahmad, Iftekhar (CVC) <iahmad@creditvalleyca.ca>
Sent:	Monday, July 10, 2017 5:46 PM
To:	Sarah Robbins
Cc:	Jennifer Vandermeer
Subject:	RE: DR 17/027 Sheridan Park Drive Extension Class EA
Attachments:	RQ338_FinalFiles.zip

Hi Sarah,

Thank you for the signed data sharing agreement. Please find attached the required data along with below comments from our ecology and water resources staff.

Ecology staff comments

- We have no data on rearing and foraging habitat locations. We have data on spawning but there were no records within or nearby the study area.
- The consultant will need to be directed to MNRF for all SAR species records and location details.
- The consultant is responsible for assessing the area for Significant Wildlife Habitat (SWH) criteria as we have not fully assessed the data for SWH.

Water Resources Staff comments

We have one site in the Sheridan Creek watershed where we collect monthly grab samples for 11 months of the year. This is a Provincial Water Quality site so surface water quality data can be accessed through the MOECC.
ID: **06006800102**
Stream: **Sheridan Creek**
Location: **Rattray Marsh, Meadow Wood Rd, Clarkson**

Here is a link to the MOECC site where they list data availability and MOECC contact information:
https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/metadata.show?id=13826
There is an online data catalogue updated to 2014 that data can be retrieved from:
https://www.ontario.ca/data/provincial-stream-water-quality-monitoring-network
There is also a portal where data can be retrieved from but it looks like it is under maintenance at the moment:
http://www.moegisportal.ca/welcome/front.html

Should you have any questions, please contact me.

Regards,

Iftekhar Ahmad
Technician, Planning | Credit Valley Conservation
905.670.1615 ext 296 | iahmad@creditvalleyca.ca

From: Sarah Robbins [mailto:Sarah.Robbins@rjburnside.com]
Sent: July 6, 2017 9:12 AM
To: Ahmad, Iftekhar (CVC)
Cc: Jennifer Vandermeer
Subject: RE: DR 17/027 Sheridan Park Drive Extension Class EA

Hi Iftekhar,

I apologize for the delayed response. Here is a signed copy of the data sharing agreement.

Please let me know if you have any questions.

Sarah

Sarah Robbins,
Environmental Technologist | R.J. Burnside & Associates Limited | www.rjburnside.com
Office: 800-265-9662 Direct: 705-797-4254

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From: Ahmad, Iftekhar (CVC) [mailto:iahmad@creditvalleyca.ca]
Sent: Monday, June 19, 2017 5:00 PM
To: Sarah Robbins
Subject: DR 17/027 Sheridan Park Drive Extension Class EA

Hi Sarah,

Please complete the attached Data Sharing Agreement. I will send you the data as soon as the signed agreement is received.

Should you have any questions, please contact me.

Regards,

Iftekhar Ahmad
Technician, Planning | Credit Valley Conservation
905.670.1615 ext 296 | iahmad@creditvalleyca.ca

From: Ahmad, Iftekhar (CVC)
Sent: June 7, 2017 10:40 AM
To: Sarah.Robbins@rjburnside.com
Cc: Thajer, Ken
Subject: DR 17/027 Sheridan Park Drive Extension EA

Hi Sarah,

Thank you for your email to Ken Thajer for the data request. Please note that a Data Sharing Agreement will be required and sent to you after the data is compiled internally. Generally, it takes 3-4 weeks to complete the data request.

Should you have any questions, please contact me.

Regards,

Iftekhar Ahmad
Technician, Planning | Credit Valley Conservation
1255 Old Derry Road, Mississauga L5N 6R4

905.670.1615 ext 296 | 1.800.668.5557
iahmad@creditvalleyca.ca | creditvalleyca.ca

From: Sarah Robbins [mailto:Sarah.Robbins@rjburnside.com]
Sent: May 11, 2017 11:39 AM
To: Thajer, Ken
Cc: Jennifer Vandermeer; Devin Soeting; Nicholle Smith; Tony Elias; Sheridan Park EA
Subject: Sheridan Park EA Information Request (300039474)

Hello Ken,

My name is Sarah Robbins. I am assisting Jenn Vandermeer with the Sheridan Park Road extension project in Richmond Hill. Jenn has informed me that you are our primary contact at Credit Valley Conservation for this project.

I have attached a letter of request for background information on the study area. Could you please ensure that someone fulfills our request?

If you have any questions, please don't hesitate to give me a call. I'm sure we will be in touch soon.

Thank you,
Sarah

BURNSIDE
Sarah Robbins,
Engineering Technologist

R.J. Burnside & Associates Limited
128 Wellington Street West, Suite 301, Barrie, Ontario L4N 8J6
Office: 800-265-9662 Direct: 705-797-4254
www.rjburnside.com

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Jennifer Vandermeer

From: Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent: Monday, July 10, 2017 7:59 AM
To: David Argue; Jennifer Vandermeer; Meaghan Luis
Subject: FW: Mtg last night - Sheridan Park Drive Extension.

Good Morning Everyone,

See below from Richard Perrier.

Thank you,

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department, Transportation & Infrastructure Planning Division

Please consider the environment before printing.

-----Original Message-----
From: Perrier, Richard [mailto:Richard.Perrier@petrocanadalsp.com]
Sent: July 10, 2017 7:27 AM
To: Karen Ras
Cc: Dana Glofcheskie
Subject: RE: Mtg last night - Sheridan Park Drive Extension.

Hi Karen and Dana. I have received feedback for the SPA members. The membership is supportive of this initiative. The only member I have not heard directly back is Hatch Engineering. Fred Theiss wanted to have one of his road engineers provide a few comments.

Richard Perrier
Director, Research and Development
Petro-Canada Lubricants Inc.
2489 N. Sheridan Way
Mississauga, Ont.
L5K 1A8
905-804-4741
416-889-5958 Cell
905-804-4738 Fax
Richard.perrier@petrocanadalsp.com
https://urldefense.proofpoint.com/v2/url?u=http-3A__www.lubricants.petro-2Dcanada.com&d=DQIFAg&c=euGZstcaTDllvimEN8b7jXrwqOf-v5A_CdpgnVfiiMM&r=LzCYgyxDPbMnqtrbe44CPubP9JunixX1y4mwmwXHfeU&m=Z0k93oXqZ2vxKlb2DKXMc_vpfmqzg4r80zr1zbPbZcg&s=Y_ePHCNvn_cBs4N82dHa2VRSQagisMXyNcNsY1m2m3Y&e=
https://urldefense.proofpoint.com/v2/url?u=http-3A__www.hollyfrontier.com&d=DQIFAg&c=euGZstcaTDllvimEN8b7jXrwqOf-

v5A_CdpgnVfiiMM&r=LzCYgyxDPbMnqtrbe44CPubP9JunixX1y4mwmwXHfeU&m=Z0k93oXqZ2vxKlb2DKXMc_vpfmqzg4r80zr1zbPbZcg&s=iL6G-JqeUR8yq-KLT_DrRhk2SmFHDCMCn60RXsXzjXE&e=

-----Original Message-----
From: Perrier, Richard
Sent: Wednesday, June 28, 2017 10:34 AM
To: Karen Ras
Subject: Re: Mtg last night

Hi Karen. I sent an email to the board members regarding the proposed recommendation. I will go back to them asking for their input and get back to you. I am sure that there was a lot of discussion. For my knowledge, were the residences supported of the road extension

Richard Perrier. Sent from my iPhone

> On Jun 28, 2017, at 10:25 AM, Karen Ras <Karen.Ras@mississauga.ca> wrote:
>
> Hi Richard,
> Thank your for attending the meeting last night.
>
> Not sure how long you stayed.
>
> There were some questions about the official position of businesses in SP.
>
> Can I officially say that the SPA is generally supportive of this EA review?
>
> Thanks!
>
> Karen Ras
> Councillor, Ward 2
> 300 City Centre Drive, Mississauga
> (905) 896-5200

Shae Richter

From: Darlene Presley <dpresley@mhbcplan.com>
Sent: Monday, October 16, 2017 11:51 AM
To: Sheridan Park EA
Subject: Sheridan Park Drive Extenstion EA

Good Morning,

We received notice of the Sheridan Park Drive EA. TransCanada PipeLines Limited has one abandoned pipeline crossing the study area.

Please note the following requirements for activity/crossings within 30m of TransCanada's pipeline for inclusion in the Study:

TransCanada's pipeline is subject to the jurisdiction of the National Energy Board ("NEB"). As such, certain activities must comply with the National Energy Board Act (the "Act") and the National Energy Board Damage Prevention Regulations (the "Regulations").

1. Written consent must be obtained from TransCanada prior to undertaking the following activities:
    a. constructing or installing a facility across, on, along or under a TransCanada pipeline right-of-way. A facility may include, but is not limited to: driveways, roads, access ramps, trails, pathways, utilities, berms, fences/fence posts;
    b. conducting a ground disturbance (excavation or digging) on TransCanada's pipeline right-of-way or within 30 meters of the centreline of TransCanada's pipe (the "Prescribed Area");
    c. driving a vehicle, mobile equipment or machinery across a TransCanada pipeline right-of-way outside the travelled portion of a highway or public road; and
    d. using any explosives within 300 meters of TransCanada's pipeline right-of-way.

If you have any questions or require any additional information let me know.

Thank you,

DARLENE PRESLEY | Planning Co-ordinator

MHBC **Planning, Urban Design & Landscape Architecture**
442 Brant Street, Suite 204 | Burlington | ON | L7R 2G4 | T 905 639 8686 x 229 | F 905 761 5589 | C 705 627 2302 | dpresley@mhbcplan.com |

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Jennifer Vandermeer

From: Darlene Presley <dpresley@mhbcplan.com>
Sent: Wednesday, November 22, 2017 11:11 AM
To: Jennifer Vandermeer
Subject: Sheridan Park Drive Extension

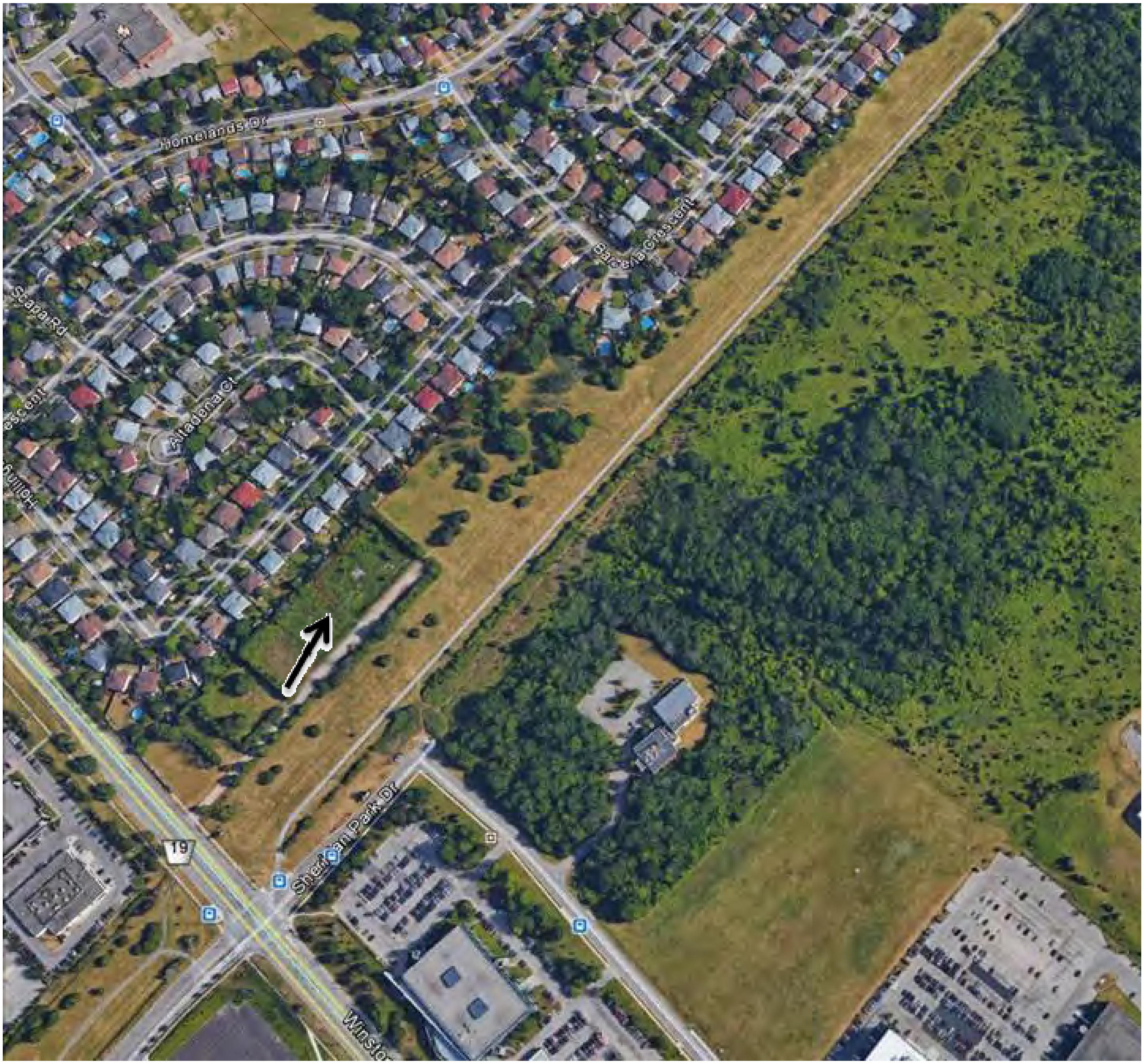
Hi Jennifer,

Further to our conversation, below is a map showing the abandoned pipeline in red, north of the utility corridor.

As discussed, the Sheridan Park Drive extension will be south of the utility corridor, approximately . As such, the road extension will not impact the pipeline.

If you require any additional information let me know.

Thank you,



DARLENE PRESLEY | Planning Co-ordinator

MHBC **Planning, Urban Design & Landscape Architecture**
On behalf of TransCanada PipeLines Limited

442 Brant Street, Suite 204 | Burlington | ON | L7R 2G4 | T 905 639 8686 x 229 | F 905 761 5589 | C 705 627 2302 | dpresley@mhbcplan.com |

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Jennifer Vandermeer

From: Peter DeCarvalho
Sent: Thursday, December 07, 2017 2:42 PM
To: Kowalyk, Bohdan (MNRF)
Cc: Heaton, Mark (MNRF); Nicholle Smith; Jennifer Vandermeer
Subject: RE: Bat Protocol Discussion
Attachments: 039474 ELC (Tabloid).pdf

Dear Mr. Kowalyk,

I have recently been analyzing the potential impacts to candidate Bat Maternity Habitat for the Sheridan Park Drive extension in Mississauga. We have worked closely with our road development group to minimize the impacts to forested ecosites to the greatest possible extent. The vast majority of areas to be impacted are cultural meadow/thicket/hedgerow ecosites with minimal BMH potential.

Following substantial constriction and modification on limit-of-grading, we anticipate a total area loss in forest habitat to be less than 500 m^2. Please see the attached figure for forest ELC delineation and proposed grading limits. Only three candidate BMH trees have been identified for removal within forested ecosites. We have additionally identified five candidate BMH trees in Cultural Thicket communities either adjacent or within close proximity to forested ecosites that have been identified for removal.

These impacted areas are, in our opinion, marginal edge habitat due to heavy urban use, dumping, and the abundance of invasive and horticultural species. We are proposing to compensate the removal of these eight trees with a combination of either bat boxes or artificial bark at a 1:1 ratio.

Your input for our proposed actions regarding candidate BMH and proposed mitigation measures would be most appreciated. Thanks so much for your time.

All the best,

Peter

BURNSIDE

Peter De Carvalho, EIT
B.Sc. (Bio), B.Eng. (Env)
Terrestrial Ecologist/Engineering Assistant

R.J. Burnside & Associates Limited
292 Speedvale Ave. West, Unit 20
Guelph ON N1H 1C4
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www.rjburnside.com

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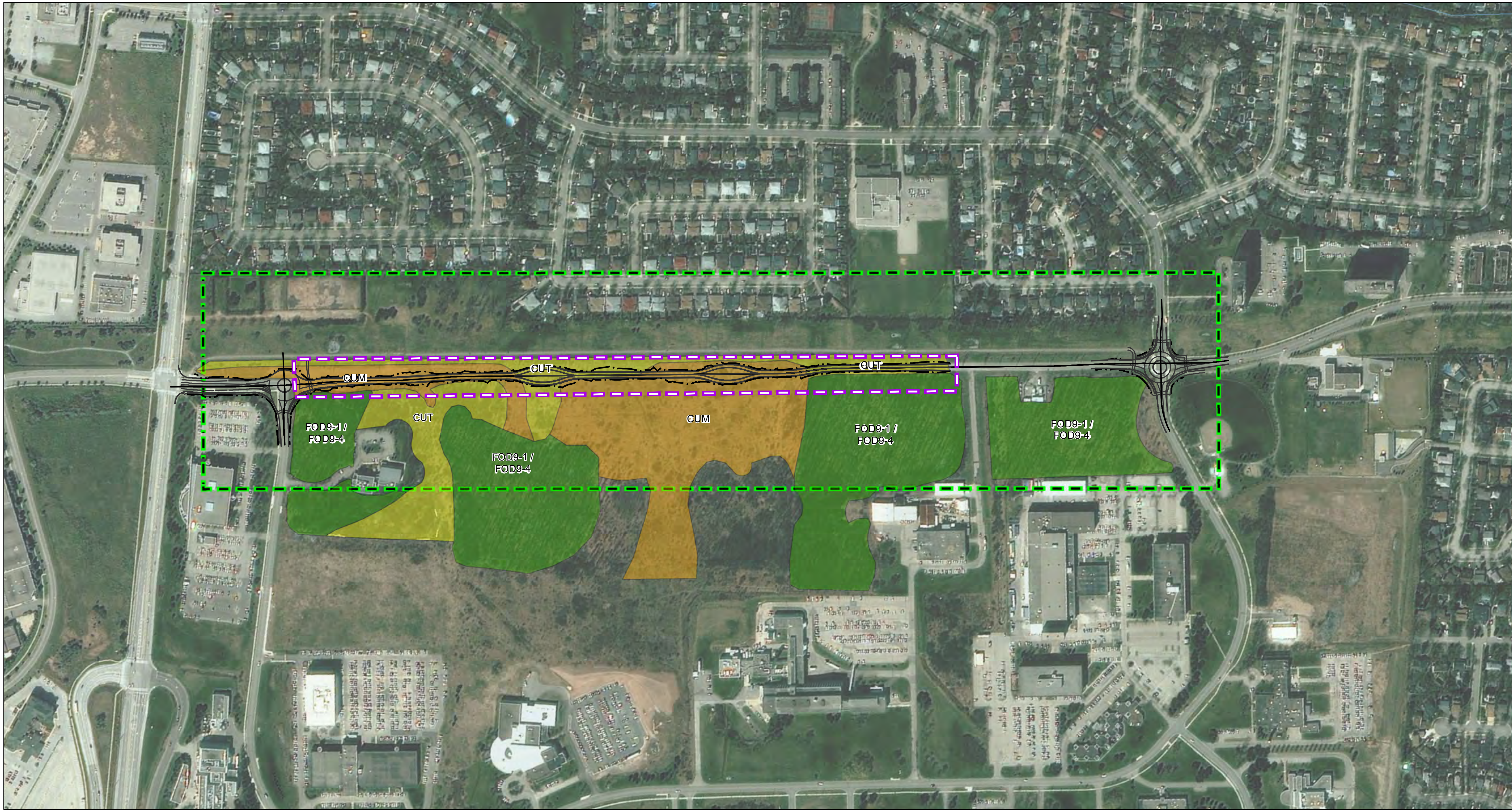
Thank you.

****



Datum: North American 1983
Coord. System: NAD 1983 UTM Zone 17N
Projection: Transverse Mercator
Central Meridian: 81°0'0.00"W
False Easting: 500,000m | False Northing: 0m
Rotation: -51.2 | Scale Factor: 0.99960

True North

0 100 200 300 400
Metres

Sheridan Park Drive Right-of-Way

Vegetation Community Classification

CUM - Cultural Meadow

CUT - Cultural Thicket

FOD9-1 / FOD9-4 - Fresh Moist Oak-Sugar Maple Deciduous Forest / Fresh-Moist Shagbark Hickory Deciduous Forest

Study Area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

BURNSIDE

Client
CITY OF MISSISSAUGA

Figure Title
SHERIDAN PARK DRIVE EXTENSION
ECOLOGICAL LAND CLASSIFICATION

Drawn	Checked	Date	Figure No.
HN	PD	2017/12/07	4
Scale		Project No.	
H 1:5,000		300039474	

File Path: E:\Project\300039474 (Sheridan Park Drive)\Map\039474 ELC (Tabloid).mxd Print Date: 2017/12/07 Time: 12:31 PM

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Appendix M7

Indigenous Correspondence

Appendix M7

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

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Telephone Conversations/ Follow- Up Calls

Date Received: April 5, 2017 **Project No.:** 300039474.0000

Project Name: Sheridan Park Drive Extension EA

Subject: Indigenous Communities Follow-Up calls

From: Various

Prepared By: Meaghan Luis

Message/Conversation:

Missisaugas of the New Credit First Nation

On April 5, 2017 at 8:30 am Dana left a voice message with Ms. Sault of the MNCFN. The message was regarding the Sheridan Park Drive EA, and to confirm receipt of the Notice of Commencement for the project. Dana noted if they had any questions or concerns to call or email.

On April 5, 2017 at 12:20 pm Meaghan left a voice message with Ms. Sault of the MNCFN. Meaghan indicated the call was on behalf of the City of Mississauga, regarding the Sheridan Park Drive EA, and enquired if the Notice of Commencement for the project had been received by MNCFN. Meaghan also asked if the First Nation has any interest or concerns regarding the project, and indicated to follow up if any more information is needed. Meaghan left her direct contact number at the conclusion of the message.

Haudenosaunee Confederacy

On April 5, 2017 at 9:30 am Dana spoke with Tracey from HDI (519-445-4222). Dana noted the call was to confirm receipt of the Notice of Commencement for the project. Dana recent the notice via email to hdi2@bellnet.ca and noted if they had any questions or concerns to call or email.

On April 5, 2017 at 12:00 pm Meaghan left a voice message with Mr. Hill of the Haudenosaunee Confederacy. Meaghan indicated the call was on behalf of the City of Mississauga, regarding the Sheridan Park Drive EA, and enquired if the notice of commencement for the project had been received by the confederacy. Meaghan also asked if the confederacy has any interest or concerns regarding the project, and indicated to follow up if any more information is needed. Meaghan left her direct contact number at the conclusion of the message.

Six Nations of the Grand River

On April 5, 2017 at 8:30 am Dana left a voice message with for Chief Hill (519-445-2201 x3236). The message was regarding the Sheridan Park Drive EA, and to confirm receipt of the Notice of Commencement for the project. Dana noted if they had any questions or concerns to call or email.

On April 5, 2017 at 1:10 pm, Meaghan left a voice message with Joanne Thomas, at the Lands and Resources Department of Six Nations (519-753- 0665). Meaghan indicated the purpose for the call, on behalf of the City of Mississauga, and asked if the Notice of Commencement had been received. Meaghan also asked if the Six Nations had interest or concerns regarding the project at this time, and to get in contact if more information is needed. Meaghan left her direct contact number at the end of the message to Ms. Thomas.

Shae Richter

From: Jennifer Vandermeer
Sent: Thursday, June 15, 2017 12:07 PM
To: hazelehill@gmail.com; hdi2@bellnet.ca
Cc: Dana Glofcheskie; David Argue; Sheridan Park EA
Subject: Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre
Attachments: 039474_Sheridan Park Drive EA_Notice of PIC FINALrev.pdf

Good afternoon Hazel,
Please find attached a copy of the Notice of Public Information Centre for the City of Mississauga's Sheridan Park Drive Schedule B Municipal Class Environmental Assessment (EA) for a proposed road extension in the southwestern area of the City of Mississauga. I understand that the City's Project Manager, Dana Glofcheskie spoke to Tracey General on April 5, 2017 following up on the Notice of Commencement that was issued for this EA study earlier this year and emailed her a copy of the Notice of Commencement. I would be grateful if you could let us know if HDI has any interest in this project moving forward. I'm happy to provide you with additional information about the project if you would like it.
Best regards,
Jennifer

BURNSIDE
Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20, Guelph, Ontario N1H 1C4
Office: 800-265-9662 Direct: 226-486-1559
www.rjburnside.com

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Thank you.

****

Shae Richter

From:	Jennifer Vandermeer
Sent:	Thursday, June 15, 2017 12:07 PM
To:	avahill@sixnations.ca; joannethomas@sixnations.ca
Cc:	Dana Glofcheskie; David Argue; Sheridan Park EA
Subject:	Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre
Attachments:	039474_Sheridan Park Drive EA_Notice of PIC FINALrev.pdf

Good afternoon Chief Hill and Ms. Thomas,

Please find attached a copy of the Notice of Public Information Centre for the City of Mississauga's Sheridan Park Drive Schedule B Municipal Class Environmental Assessment (EA) for a proposed road extension in the southwestern area of the City of Mississauga. I understand that the City's Project Manager, Dana Glofcheskie left a message for Chief Hill on April 5, 2017 following up on the Notice of Commencement that was issued for this EA study earlier this year. My colleague Meaghan Luis also left a message for Ms. Thomas on April 5, 2017. I would be grateful if you could let us know if Six Nations of the Grand River Territory has any interest in this project moving forward. I'm happy to provide you with additional information about the project if you would like it.

Best regards,

Jennifer

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Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

R.J. Burnside & Associates Limited
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****

Shae Richter

From:	Jennifer Vandermeer
Sent:	Thursday, June 15, 2017 12:08 PM
To:	Fawn.Sault@newcreditfirstnation.com
Cc:	Dana Glofcheskie; David Argue; Sheridan Park EA
Subject:	Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre
Attachments:	039474_Sheridan Park Drive EA_Notice of PIC FINALrev.pdf

Good afternoon Fawn,
Please find attached a copy of the Notice of Public Information Centre for the City of Mississauga's Sheridan Park Drive Schedule B Municipal Class Environmental Assessment (EA) for a proposed road extension in the southwestern area of the City of Mississauga. I understand that the City's Project Manager, Dana Glofcheskie and my colleague Meaghan Luis left messages for you on April 5, 2017 following up on the Notice of Commencement that was issued for this EA study earlier this year. I would be grateful if you could let us know if Mississaugas of the New Credit First Nation has any interest in this project moving forward. I'm happy to provide you with additional information about the project if you would like it.
Best regards,
Jennifer

BURNSIDE
Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

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Thank you.

****

Jennifer Vandermeer

From: Fawn Sault <Fawn.Sault@mncfn.ca>
Sent: Thursday, June 15, 2017 4:47 PM
To: Jennifer Vandermeer
Cc: Dana Glofcheskie
Subject: RE: Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre

Hi Jennifer,

Has the EA been completed? If so can you please send the report? If not let me know what has been completed and what still needs to be completed.

Sorry for the delay. Please call if you need anything else.

Miigwetch

From: Jennifer Vandermeer [mailto:Jennifer.Vandermeer@rjburnside.com]
Sent: Thursday, June 15, 2017 12:08 PM
To: Fawn Sault
Cc: Dana Glofcheskie; David Argue; Sheridan Park EA
Subject: Sheridan Park Drive Environmental Assessment - Notice of Public Information Centre

Good afternoon Fawn,
Please find attached a copy of the Notice of Public Information Centre for the City of Mississauga's Sheridan Park Drive Schedule B Municipal Class Environmental Assessment (EA) for a proposed road extension in the southwestern area of the City of Mississauga. I understand that the City's Project Manager, Dana Glofcheskie and my colleague Meaghan Luis left messages for you on April 5, 2017 following up on the Notice of Commencement that was issued for this EA study earlier this year. I would be grateful if you could let us know if Mississaugas of the New Credit First Nation has any interest in this project moving forward. I'm happy to provide you with additional information about the project if you would like it.
Best regards,
Jennifer

BURNSIDE
Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

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Office: 800-265-9662 Direct: 226-486-1559
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Thank you.

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R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
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Telephone Conversations/ Follow- Up Calls

Date Received: July 19, 2017 **Project No.:** 300039474.0000

Project Name: Sheridan Park Drive Extension EA

Subject: Indigenous Communities Follow-Up calls

From: Various

Prepared By: Dana Glofcheskie

Message/Conversation:

Missisaugas of the New Credit First Nation 905-768-4260 x105

On July 19, 2017 at 3:30 pm Dana left a voice message with Ms. Sault of the MNCFN. The message was regarding the Sheridan Park Drive EA, and to confirm receipt of the follow-up email regarding the PIC for the project. Dana noted if they had any questions or concerns to call or email.

Haudenosaunee Confederacy – 519-445-4222

On July 19, 2017 at 3:30 pm Dana spoke with HDI. Dana noted the call was to confirm receipt of the follow-up email regarding the PIC for the project. HDI confirmed receipt of the email and it has been circulated. Dana noted if they had any questions or concerns to call or email.

Six Nations of the Grand River – 519-753- 0665

On July 19, 2017 at 3:30 pm Dana spoke with Lonny Bomberry, Director at the Lands and Resources Department of Six Nations. Dana noted the call was to confirm receipt of the follow-up email regarding the PIC for the project. Lonny confirmed receipt of the email and to continue to send to Chief Hill and it has been circulated. Dana noted if they had any questions or concerns to call or email.

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA
telephone (519) 823-4995 **fax** (519) 836-5477 **web** www.rjburnside.com

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Telephone Conversations/ Follow- Up Calls

Date Received: October 24, 2017 **Project No.:** 300039474.0000

Project Name: Sheridan Park Drive Extension EA

Subject: MNCFN Stage 2 AA Update

From: MNCFN

Prepared By: Dana Glofcheskie

Message/Conversation:

Missisaugas of the New Credit First Nation

On October 24, 2017 at 10:00 am Dana spoke with Ms. Sault of the MNCFN. A project update was provided noting that the Stage 2 Archaeological Assessment was completed and no archaeological resources were encountered. Ms. Sault requested for the Stage 2 Archaeological Report to be sent to MNCFN and include Megan (megan.devries@mncfn.ca). Dana noted if they had any questions or concerns to call or email.

Jennifer Vandermeer

From:	Dana Glofcheskie <Dana.Glofcheskie@mississauga.ca>
Sent:	Monday, December 11, 2017 2:04 PM
To:	'Megan DeVries'
Cc:	'Fawn Sault'; Leslie Green; Jennifer Vandermeer
Subject:	City of Mississauga Sheridan Park Drive Extension EA - Archaeological Report
Attachments:	17EA-128 Sheridan Park EA Stage 2 Arch Report 08DEC17.pdf

Hi Megan,

Please find attached the Stage 2 Archaeological Report for the Sheridan Park Drive Extension EA.

Thanks,

MISSISSAUGA

Dana Glofcheskie, P.Eng.
Transportation Project Engineer
T 905-615-3200 ext.8243
dana.glofcheskie@mississauga.ca

City of Mississauga | Transportation & Works Department,
Transportation & Infrastructure Planning Division

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Appendix M8

Stakeholder Advisory Committee

Appendix M8

R.J. Burnside & Associates Limited 6990 Creditview Road, Unit 2 Mississauga ON L5N 8R9 CANADA
telephone (905) 821-1800 **fax** (905) 821-1809 **web** www.rjburnside.com

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Minutes of Meeting

Meeting Date:	May 8, 2017	**Project No.:**	300039474.000
Project Name :	Sheridan Park Drive EA		
Meeting Subject:	Stakeholder Advisory Committee Meeting No. 1		
Meeting Location:	City of Mississauga City Hall, 300 City Centre Drive, 2nd Floor, Committee Room C		
Date Prepared:	May 19, 2017		

Those in attendance were:

Dana Glofcheskie (DG)	City of Mississauga	Dana.Glofcheskie@mississauga.ca
Leslie Green (LG)	City of Mississauga	Leslie.Green@mississauga.ca
Raniel Pinto (RP)	City of Mississauga	Raniel.Pinto@mississauga.ca
Ken Thajer (KT)	Credit Valley Conservation	kthajer@creditvalleyca.ca
Brandon Wiedemann (BW)	Sheridan Park Homelands Ratepayers Association	president@shora.ca
Nathan Sinka (NS)	Region of Peel	Nathan.Sinka@peelregion.com
Jimmy Truong (JT)	Alectra Utilities	Jimmy.Truong@alectrautilities.com
David Argue (DA)	R.J. Burnside & Associates (Burnside)	David.Argue@rjburnside.com
Jennifer Vandermeer (JV)	Burnside	Jennifer.Vandermeer@rjburnside.com
Meaghan Luis (ML)	Burnside	Meaghan.Luis@rjburnside.com

The following items were discussed		Action by
1.	**Introductions**	
1.1	Introductions were made around the table. DG indicated the handout with an overview of project information was available for each participant.	
2.	**Purpose of the SAC**	
2.1	DA explained the purpose of the SAC.	

The following items were discussed		Action by
3.	**Presentation by Study Team**	
3.1	JV described the general EA process being followed, indicating the requirements of a Schedule B Municipal Class EA process.	
	JV described the purpose of the study, to maximize access between the neighborhood and the business area, improving the road network for the future.	
	JV indicated the study area on the aerial imagery, and the various land uses of the study area.	
	BW asked about the status of the properties within the utility corridor closest to Winston Churchill Boulevard. BW indicated this was a smaller fenced in area, trees surrounded by barbed wire, gated off with an entrance off Winston Churchill Boulevard. JV and DG noted this property has an address and may be owned by utilities as well. DG indicated she would follow-up to confirm ownership of this parcel. [Post Meeting Note: The City confirmed this property is owned by utility companies.]	
	DA discussed existing traffic volumes. DA indicated that if Sheridan Park Drive is extended, traffic on Homelands Drive would decrease by 20-30 percent. DA noted there are some areas with longer queues in the study area. DA noted the Region had identified a westbound right turn lane at Sheridan Park and Winston Churchill Boulevard and that Burnside's findings would support that.	
	BW indicated that he had spoken with Richard Perrier (Sheridan Business Association) expressing concerns for queueing on Speakman Drive when employees leave Sheridan Park in the afternoon.	
	NS indicated that a dedicated westbound right turn lane at the Speakman / Winston Churchill Boulevard would be beneficial to alleviate queueing at this location.	
	DA continued with the presentation, describing the policy background of the study area. JV described the supporting environmental studies / assessments. Specific to the environmental studies, JV noted: • First of three frog call surveys were completed. • Initial tree inventory was completed. • Breeding birds survey to commence later in May.	
	JV described the opportunity statement.	

The following items were discussed		Action by
	JV described proposed evaluation criteria.	
	JV and DA concluded the presentation.	
4.	**Question and Answer Period / Group Discussion**	
4.1	BW noted concerns about the improvements being made to the Queen Elizabeth Way and potential impacts to local traffic, i.e. along North Sheridan Way and beyond. Specifically, BW noted concerns about compounded traffic impacts if both projects are being constructed at the same time. BW noted that bridge improvements have started in the area.	
	LG indicated that these projects are focused on structure rehabilitation; they are phased projects over a 20 year span. The missing ramps will be implemented. North Sheridan Way will be shifted but traffic will still be maintained along North Sheridan Way. LG noted that the City communicates regularly with MTO to coordinate on the timing of simultaneous projects to minimize impacts.	
	BW expressed interests in seeing the results of the online survey thus far. DG noted that the project has had good interest in the online survey to date. JV indicated that approximately 113 responses have been provided to date. The survey will remain open and the results of the survey will be summarized for the PIC and for SAC Meeting No. 2.	
	BW expressed residents concern regarding the traffic cutting through between Fifth Line and Winston Churchill Boulevard using Thorn Lodge Drive. The streets are busier, with speeders. People are speculating that this will create a negative impact for Sheridan Park Drive.	
	BW asked when the Sheridan Park Drive extension would be constructed, if it is selected as the preferred solution. LG noted the timeline for this project is in the 10 year capital plan. Can only plan the budget for one year ahead, 2018. If the extension were to be approved, it could go into the 2019 capital plan at the earliest. However, LG advised that an extension of this length would only require one construction season, spring - fall.	
	BW noted that there are rumors in the neighbourhood of a mixed use building being planned within the general study area.	
	LG noted that there are no current development applications. Also noted that any planned development would have to go through the	

The following items were discussed		Action by
	City's application process, that this EA does not permit future development.	
	KT indicated there is a citizen asking about the feasibility of a mixed use high rise, nothing official, at this point. The CVC is identifying development hazards in the area as a preliminary step.	
4.2	NS indicated concern with higher collision rates along Erin Mills Parkway. NS questioned the reason for the collisions wondering if it was related to poor sightlines.	
	LG stated that the collisions were not due to poor design, only the volume of traffic in combination with aggressive driving. DA advised that dedicated left turn phasing is being assessed at Erin Mills Parkway / Sheridan Park Drive to mitigate some of the collision patterns.	
4.3	JT noted that on a high level, extending Sheridan Park Drive would be a benefit for Alectra. An extension would give Alectra better access to their pole lines. This would also reduce liability, since they would have improved access.	
	DA asked JT is there are any standard offsets from roadways to poles that Alectra would like to see in the design.	
	JT stated that it would depend on the speed of the road. If kept at 50 km/hr, 2 m is preferred or 1.5 m.	
	DA to follow up directly with JT for offsets when get to design.	Burnside
4.4	BW indicated that residents had mentioned there was a homeless population using the vacant lands. LG was not aware of any homeless people using the private vacant lands for shelter. JV indicated that Burnside's Arborist saw some garbage piled up at each road terminus.	
4.5	KT noted that there are some headwater features in the area, not water courses. There are 3 or 4, and they branch out. They are not regulated. Need to ensure that water flows are maintained. If the project moves to construction be sure the ESC measures are incorporated. KT noted that all appropriate natural environment studies seem to be planned; however, he asked that Burnside send him the list of planned natural environment studies for further verification by CVC ecology staff.	Burnside

The following items were discussed		Action by
4.6	BW indicated that there was a SHORA meeting next Wednesday (May 17, 2017). BW to report information obtained in this meeting at the SHORA meeting and report back any feedback to Study Team at the next SAC Meeting.	
4.7	General note – Attendees were asked to look at evaluation criteria and alternative solutions presented at the meeting and provide feedback to the Study Team within the next week. JV asked that SAC members send their comments to the Sheridan Park EA email account (SheridanParkEA@rjburnside.com).	SAC Members
4.8	A one page summary / handout of the information was provided to attendees.	

The preceding are the minutes of the meeting as observed by the undersigned. Should there be a need for revision, please advise Burnside within seven days of issuance. In the absence of notification to the contrary, these minutes will be deemed to be an accurate record of the meeting.

Minutes prepared by:

R.J. Burnside & Associates Limited

Jennifer Vandermeer

Jennifer Vandermeer
Environmental Assessment Lead
JCV:sr

Enclosure(s) SAC Meeting No. 1 Information Handout

Distribution:

All Attendees

Philip Rowe	Burnside	Via: Email
Doug Keenie	Burnside	Via: Email

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R.J. Burnside & Associates Limited 6990 Creditview Road, Unit 2 Mississauga ON L5N 8R9 CANADA
telephone (905) 821-1800 **fax** (905) 821-1809 **web** www.rjburnside.com

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Minutes of Meeting

Meeting Date:	June 12, 2017	**Project No.:**	300039474.000
Project Name :	Sheridan Park Drive EA		
Meeting Subject:	Stakeholder Advisory Committee Meeting No. 2		
Meeting Location:	City of Mississauga City Hall, 300 City Centre Drive, 2nd Floor, Committee Room C		
Date Prepared:	June 19, 2017		

Those in attendance were:

Dana Glofcheskie (DG)	City of Mississauga	Dana.Glofcheskie@mississauga.ca
Leslie Green (LG)	City of Mississauga	Leslie.Green@mississauga.ca
Raniel Pinto (RP)	City of Mississauga	Raniel.Pinto@mississauga.ca
Ken Thajer (KT)	Credit Valley Conservation	kthajer@creditvalleyca.ca
Brandon Wiedemann (BW)	Sheridan Park Homelands Ratepayers Association	president@shora.ca
Serguei Kabanov (SK)	Region of Peel	Serguei.kabanov@peelregion.ca
Angela Stockman (AS)	Region of Peel	Angela.stockman@peelregion.ca
David Argue (DA)	R.J. Burnside & Associates (Burnside)	David.Argue@rjburnside.com
Jennifer Vandermeer (JV)	Burnside	Jennifer.Vandermeer@rjburnside.com
Meaghan Luis (ML)	Burnside	Meaghan.Luis@rjburnside.com

The following items were discussed		Action by
1.	**Present Results of Survey** Survey results presented to the group. 135 responses in total.	
2.	**Present Results of Assessments** JV presented the results of the various assessments within the EA process.	

The following items were discussed		Action by
3.	**Evaluation of Alternative Solutions** JV summarized the results of the preliminary evaluation of alternative solutions. Based on the evaluation, the road extension is identified as the preliminary preferred solution. The road extension satisfies the City's Official Plan, which identifies Sheridan Park Drive as a major collector road. The extension also allows for additional routes. The impacts to the natural environmental can be largely mitigated.	
4.	**Guiding Principles of Design** DA indicated a large focus of the road design is on implementing speed management features, to address concerns about speeding in the area.	
5.	**Draft Preliminary Design** DA presented the preliminary design concepts. DG noted that the Project Team tried to balance the competing objectives within this project. The plan shows the various speed management tools that could be in place, but it is a preliminary draft and can be changed with input from stakeholders. The design tries to maintain the natural feel of the study area, while creating something unique, and minimizing impacts to the natural area features (e.g., adjacent woodlots). The island median provides an opportunity for additional planting and will help with speed management. The proposed roundabout design can provide something unique to the area and to the business park, there may be opportunities for public art in the area. LG noted that this island / median design provides a similar intent as the median installed on Square One Drive (image of this site was shown to SAC members). The main difference being that the median installed on Square One Drive has walkways across it and one installed on Sheridan Park Drive would be green. DA indicated that narrower medians were considered; however, during maintenance operations the road would need to be shut down; also having wider (17 m) medians would allow substantial area for plantings etc. KT noted that ecologists at CVC will be asking if there are any alternatives to the speed management features (as the medians may	

The following items were discussed		Action by
	be seen as fragmentation of the natural area, between the medians and larger green space to the south of the right of way) DG stated the traditional intersections would work to satisfy the requirements of the EA and minimizing impacts, but since we are trying to minimize opportunities for speeding traffic, a more unique approach is necessary. SK asked if a double lane roundabout had ever been considered at the Winston Churchill Boulevard side. SK felt that with one roundabout, it will be very congested. Winston Churchill Boulevard has 600 cars at 3:30, 4:00 pm, that light will not be able to handle the number of exits. DA indicated that Winston Churchill Boulevard is scheduled to be widened in 10-15 years so the understanding was that traffic would be alleviated at the Winston Churchill Boulevard by way of this widening. DA/JV noted that with the current design, the footprint is tight against the property line, there is a 5 m buffer identified on the drawing. BW noted the footpaths coming out of business park are used often, how are people going to safely cross the road. DA referenced the roll plan, stating that there are no planned sidewalks for the south side of the right of way, as we are trying to minimize the impacts to the naturalized areas. LG noted that the area to the south of the City's right-of-way is private property, and not meant for recreational use. SK indicated that if someone travelling along the road breaks down, where do they go. LG noted that in the event of an emergency, if an individual did have to cross, they would only be crossing two lanes of traffic. The key here is to ensure the design is preserving the natural areas, while balancing the need for speed management. The City will continue to maintain the multi-use trail that serves the area. Adding a sidewalk to the south side of the road extension would have required another 2 m encroachment into the natural area.	
6.	**General Discussion** BW noted that people from the business park use it on the lunch hour and go to the trail and that people don't cross at stop signs.	

The following items were discussed	Action by
LG agreed, stating that this is always an issue. Cannot control how people walk across the road.	
BW indicated that the 20 people who have spoken about the proposed extension are happy with the addition of the roundabout in the design. BW also noted that people didn’t realize the road extension was proposed south of the multi use trail, they thought the road would run through the utility corridor, so overall this change in people’s perception / assumptions is viewed as a positive.	
SK noted that there is a high pressure gas main in the north east corner of Winston Churchill Boulevard and Sheridan Park Drive. You cannot build on top of it, as the main is very shallow. There are 20” gas mains in Winston Churchill Boulevard. The gas mains are high pressure and very old. No weights or vibrations can occur in these areas, most likely underneath the curb. The Region had to take precautions when doing work in this area.	
LG noted that the project team will need to meet with Enbridge regarding this.	Burnside
DG also noted that the final renderings will add cars and people to create a realistic setting.	
BW noted that residents at the PIC will likely bring up sound barriers; residents do not want a wall.	
DG indicated that no noise mitigation is required as the increase in noise due to the project is negligible.	
DA stated that the traffic numbers used in the noise study are conservative, to be sure of the results.	
BW noted that there is some interest from residents in using the project to also provide enhancement of the trail, connecting the trail into the rest of the park system in the area, people are thinking of different places to rest. People also like the idea of body weight sets being provided along the trail. This study area is at the bottom of the park network, so enhancements would be helpful in strengthening this link.	
LG noted this request will be forwarded to Community Services and is not part of this study.	
BW noted that he sent reminder to do the surveys about 2 weeks ago, using the association’s mailing list. Will also put up a reminder for the upcoming PIC and has a mailing list to send the notice to.	SHORA
SK asked if there have been any changes to the intersection at	

The following items were discussed	Action by
Winston Churchill Boulevard. DA indicated that the island may have to get pulled back a bit. DG noted that if the extension went forward, there would be coordination with the Region for any improvements. AS noted that there is a 600 mm diameter watermain that runs through the City's right-of-way. This watermain is in good condition. AS to send GIS locations of watermains to the study team. The watermain on Winston Churchill Boulevard is scheduled to be replaced. DG reiterated that the proposed road extension is a positive for utilities as it gives more formal access for utilities specifically this was noted by Alectra at the first SAC meeting.	

The preceding are the minutes of the meeting as observed by the undersigned. Should there be a need for revision, please advise Burnside within seven days of issuance. In the absence of notification to the contrary, these minutes will be deemed to be an accurate record of the meeting.

Minutes prepared by:

R.J. Burnside & Associates Limited

Meaghan Luis
Environmental Planner
MAL:sr

Distribution:

All Attendees

Philip Rowe	Burnside	Via: Email
Doug Keenie	Burnside	Via: Email

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Shae Richter

From: Sheridan Park EA
Sent: Monday, May 01, 2017 10:16 AM
To: serguei.kabanov@peelregion.ca
Cc: Dana Glofcheskie; David Argue
Subject: Sheridan Park Drive Extension Environmental Assessment Study - Stakeholder Advisory Committee Meeting No.1 - Monday May 8, 2017

Good morning Serguei,

Thank you for your interest in participating in the Stakeholder Advisory Committee (SAC), for the Sheridan Park Drive Extension Environmental Assessment (EA) Study. The Region of Peel has been identified as a key stakeholder for this EA study and we look forward to your input throughout this process. Based on the results of the SAC response forms that were circulated at the commencement of the EA process, a date and time for the first SAC meeting has been identified. We selected a meeting time that falls in the middle of the timeslots noted on the response form in an effort to accommodate the preferred timing of all SAC members.

The first SAC meeting will take place on:
Monday May 8, 2017
3pm- 5pm
Location:
City of Mississauga – City Hall
300 City Centre Drive, 2nd floor, Committee Room C

The format of SAC Meeting No.1 will be as follows:
1. Introductions and Discussion of the SAC Meeting Purpose / Mandate
2. Presentation by Study Team
3. Q&A Period / Group Discussion

Through the Presentation and the Q&A Period, we hope to cover the following topics at SAC Meeting No.1:
- An overview of the EA Study and Study Area
- A summary of the existing conditions within the Study Area
- Presentation of the Opportunity Statement
- A summary of studies/assessments being undertaken to support the EA Study
- A discussion of the potential alternative solutions
- A summary of the criteria being considered by the Study Team to evaluation the alternative solutions
- A discussion surrounding any initial concerns or interests that the SAC members may have regarding the EA Study

We are proposing to host a second SAC Meeting in early June 2017 in advance of the Public Information Centre (PIC). At SAC Meeting No.2, we would hope to cover the following topics:
- The results of the various studies/assessments (that have been completed to date)
- The results of the evaluation of alternative solutions
- A discussion about the preliminary preferred solution
- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

<u>Please confirm you attendance to this meeting</u> by responding to this email by **Friday May 5, 2017**.

We look forward to the first SAC meeting and to your continued input through this EA Study.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From:	Sheridan Park EA
Sent:	Monday, May 01, 2017 10:16 AM
To:	chris.kafel@alectrautilities.com
Cc:	Dana Glofcheskie; David Argue
Subject:	Sheridan Park Drive Extension Environmental Assessment Study - Stakeholder Advisory Committee Meeting No.1 - Monday May 8, 2017

Good morning Chris,

Thank you for your interest in participating in the Stakeholder Advisory Committee (SAC), for the Sheridan Park Drive Extension Environmental Assessment (EA) Study. Alectra Utilities has been identified as a key stakeholder for this EA study and we look forward to your input throughout this process. Based on the results of the SAC response forms that were circulated at the commencement of the EA process, a date and time for the first SAC meeting has been identified. We selected a meeting time that falls in the middle of the timeslots noted on the response form in an effort to accommodate the preferred timing of all SAC members.

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- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

Please confirm you attendance to this meeting by responding to this email by **Friday May 5, 2017**.

We look forward to the first SAC meeting and to your continued input through this EA Study.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From:	Sheridan Park EA
Sent:	Monday, May 01, 2017 10:15 AM
To:	Marray, Liam
Cc:	Dana Glofcheskie; David Argue
Subject:	Sheridan Park Drive Extension Environmental Assessment Study - Stakeholder Advisory Committee Meeting No.1 - Monday May 8, 2017

Good morning Liam,

Thank you for your interest in participating in the Stakeholder Advisory Committee (SAC), for the Sheridan Park Drive Extension Environmental Assessment (EA) Study. CVC has been identified as a key stakeholder for this EA study and we look forward to your input throughout this process. Based on the results of the SAC response forms that were circulated at the commencement of the EA process, a date and time for the first SAC meeting has been identified. We selected a meeting time that falls in the middle of the timeslots noted on the response form in an effort to accommodate the preferred timing of all SAC members.

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Monday May 8, 2017
3pm- 5pm
Location:
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300 City Centre Drive, 2nd floor, Committee Room C

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- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

Please confirm you attendance to this meeting by responding to this email by **Friday May 5, 2017**.

We look forward to the first SAC meeting and to your continued input through this EA Study.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From:	Sheridan Park EA
Sent:	Monday, May 01, 2017 10:16 AM
To:	karen.morden@mississauga.ca
Cc:	Dana Glofcheskie; David Argue
Subject:	Sheridan Park Drive Extension Environmental Assessment Study - Stakeholder Advisory Committee Meeting No.1 - Monday May 8, 2017

Good morning Karen,

Thank you for your interest in participating in the Stakeholder Advisory Committee (SAC), for the Sheridan Park Drive Extension Environmental Assessment (EA) Study. The Mississauga Accessibility Committee has been identified as a key stakeholder for this EA study and we look forward to your input throughout this process. Based on the results of the SAC response forms that were circulated at the commencement of the EA process, a date and time for the first SAC meeting has been identified. We selected a meeting time that falls in the middle of the timeslots noted on the response form in an effort to accommodate the preferred timing of all SAC members.

The first SAC meeting will take place on:
Monday May 8, 2017
3pm- 5pm
Location:
City of Mississauga – City Hall
300 City Centre Drive, 2nd floor, Committee Room C

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- A discussion about the preliminary preferred solution
- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

Please confirm you attendance to this meeting by responding to this email by **Friday May 5, 2017**.

We look forward to the first SAC meeting and to your continued input through this EA Study.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From: Jennifer Vandermeer
Sent: Monday, May 01, 2017 11:10 AM
To: Richard.perrier@petrocanadalsp.com
Cc: Dana Glofcheskie; David Argue
Subject: Sheridan Park Drive Environmental Assessment - Stakeholder Advisory Committee Meetings - Information Only

Good morning Richard,

Further to the email I sent you on Thursday last week, I just wanted to provide you with the following information in relation to the Stakeholder Advisory Committee (SAC). This is just for your information only.

The first SAC meeting will take place on:
Monday May 8, 2017
3pm- 5pm
Location:
City of Mississauga – City Hall
300 City Centre Drive, 2nd floor, Committee Room C

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- A discussion about the preliminary preferred solution
- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From: Jennifer Vandermeer
Sent: Monday, May 01, 2017 10:16 AM
To: Brandon Wiedemann
Cc: Dana Glofcheskie; David Argue
Subject: Sheridan Park Drive Extension Environmental Assessment Study - Stakeholder Advisory Committee Meeting No.1 - Monday May 8, 2017

Good morning Brandon,

Thank you for your interest in participating in the Stakeholder Advisory Committee (SAC), for the Sheridan Park Drive Extension Environmental Assessment (EA) Study. The Sheridan Homelands Ratepayers' Association has been identified as a key stakeholder for this EA study and we look forward to your input throughout this process. Based on the results of the SAC response forms that were circulated at the commencement of the EA process, a date and time for the first SAC meeting has been identified. We selected a meeting time that falls in the middle of the timeslots noted on the response form in an effort to accommodate the preferred timing of all SAC members.

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3pm- 5pm
Location:
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3. Q&A Period / Group Discussion

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- A summary of the existing conditions within the Study Area
- Presentation of the Opportunity Statement
- A summary of studies/assessments being undertaken to support the EA Study
- A discussion of the potential alternative solutions
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- A discussion surrounding any initial concerns or interests that the SAC members may have regarding the EA Study

We are proposing to host a second SAC Meeting in early June 2017 in advance of the Public Information Centre (PIC). At SAC Meeting No.2, we would hope to cover the following topics:
- The results of the various studies/assessments (that have been completed to date)
- The results of the evaluation of alternative solutions
- A discussion about the preliminary preferred solution
- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

<u>Please confirm you attendance to this meeting</u> by responding to this email by **Friday May 5, 2017**.

We look forward to the first SAC meeting and to your continued input through this EA Study.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park Drive EA Study Team

Shae Richter

From: Sheridan Park EA
Sent: Monday, October 30, 2017 3:33 PM
To: Sheridan Park EA
Subject: FW: Sheridan Park EA - SAC Meeting No. 2 - confirmed Monday June 12, 2017

From: Sheridan Park EA
Sent: Wednesday, June 07, 2017 8:53 AM
To: president@shora.ca; kthajer@creditvalleyca.ca; Jimmy.Truong@alectrautilities.com; eisa.eisa@peelregion.ca; Stockman, Angela; Kabanov, Serguei
Cc: Dana Glofcheskie; Leslie Green; David Argue
Subject: Sheridan Park EA - SAC Meeting No. 2 - confirmed Monday June 12, 2017

Good Morning Everyone,

Thank you for your response to my previous email regarding the date of SAC Meeting No. 2. Based on the responses received, the Meeting will take place on **Monday June 12, 2017**. It is our hope that everyone is able to attend this meeting. We realize that this was not the ideal date for all attendees, if you would like to send a representative to attend the meeting if you are not able to attend, please do so. The details of the confirmed meeting date are listed below.

SAC Meeting No. 2 will take place on:
Monday June 12
3pm- 5pm
Location:
City of Mississauga – City Hall
300 City Centre Drive, 2nd floor, Committee Room B

We hope to cover the following topics at this meeting:

- The results of the various studies/assessments (that have been completed to date)
- The results of the evaluation of alternative solutions
- An overview of the Draft PIC boards to date
- A discussion about the preliminary preferred solution
- A presentation of the preliminary design concepts being considered
- A group discussion to obtain feedback / input from the SAC members on the EA study findings so the Study Team can take this feedback into consideration for the information presented at the PIC.

We look forward to SAC Meeting No. 2 on Monday and to your continued input through this EA Study. Thank you again for your participation in this committee.

Sincerely,
Jennifer Vandermeer
for the Sheridan Park EA Study Team

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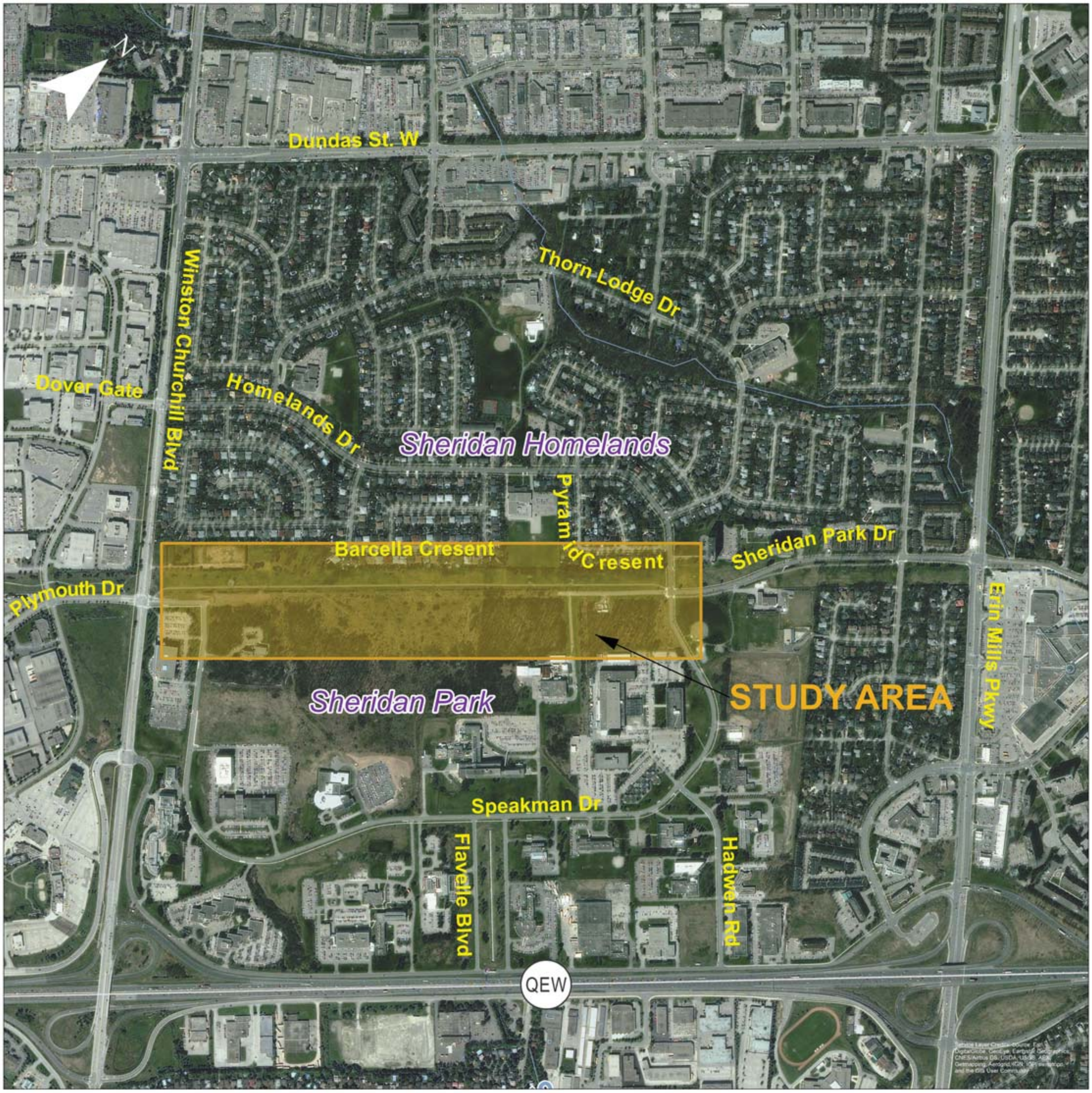
Appendix M9

Key Utility Correspondence

Jennifer Vandermeer

From: Jennifer Vandermeer
Sent: Friday, July 21, 2017 10:36 AM
To: 'tpumarkup@HydroOne.com'
Cc: 'Dana Glofcheskie'; David Argue; Sheridan Park EA
Subject: Sheridan Park Drive Extension Environmental Assessment - Request for meeting with HydroOne
Attachments: 039474 Study Area_SAC_v2_small.pdf; Roll Plan-Prf_500 - Small.pdf

Good morning Mark,
Thanks for taking my call this morning. As noted, the City is undertaking an Environmental Assessment (EA) to study the potential extension of Sheridan Park Drive in the southwest area of the City of Mississauga. As I explained, the proposed extension would run through the City owned right-of-way to the south of the Hydro One utility corridor. We are still undertaking the EA for this project; however, the City would like to meet with representatives from Hydro One to discuss the potential road extension and understand any potential impacts to Hydro One lands known at this stage of the project. I have enclosed a map of the study area, which includes the utility corridor lands and the preliminary proposed road extension concept as presented at the recent Public Information Centre for your information. I would be grateful if you could pass this information onto the appropriate contact in the Real Estate group at Hydro One who would be able to participate in a meeting with the City so we can arrange a convenient date and time with them.
Best regards,
Jennifer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Dover Gate
Homelands Dr
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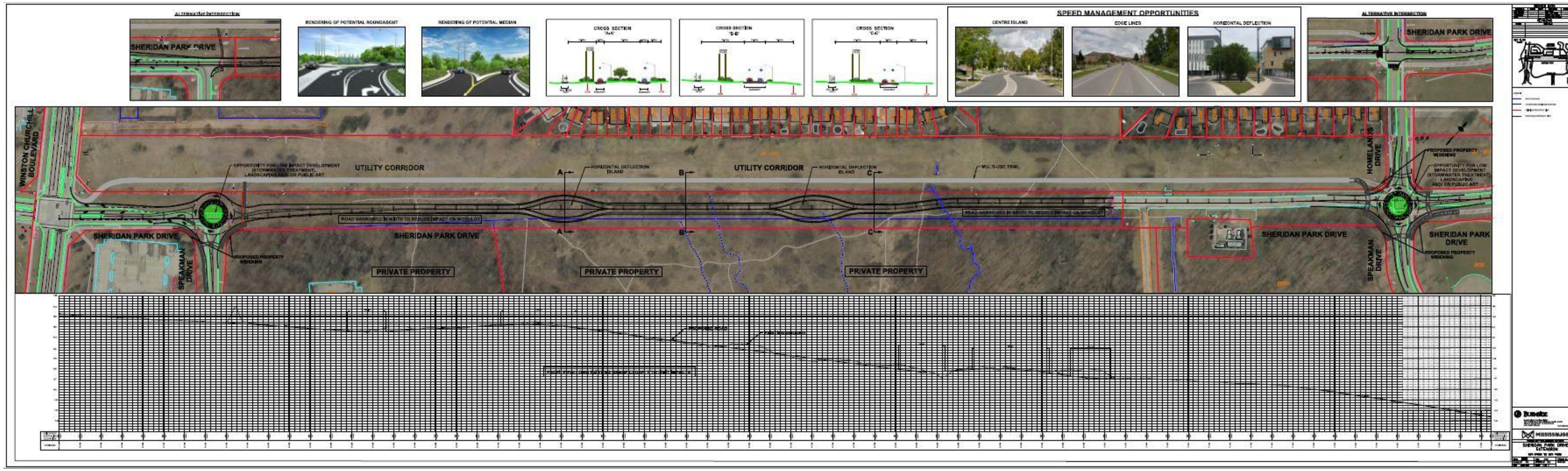
Barcella Cresent
Sheridan Park Dr
Plymouth Dr
Erin Mills Pkwy
STUDY AREA
Sheridan Park
Speakman Dr
Flavelle Blvd
Hadwen Rd
QEW


ALTERNATIVE INTERSECTION
SHERIDAN PARK DRIVE
RENDERING OF POTENTIAL ROUNDABOUT
RENDERING OF POTENTIAL MEDIAN
CROSS SECTION "A-A"
CROSS SECTION "B-B"
CROSS SECTION "C-C"
SPEED MANAGEMENT OPPORTUNITIES
CENTRE ISLAND
EDGE LINES
HORIZONTAL DEFLECTION
ALTERNATIVE INTERSECTION
SHERIDAN PARK DRIVE
WINSTON CHURCHILL BOULEVARD
OPPORTUNITY FOR LOW IMPACT DEVELOPMENT (STORMWATER TREATMENT) LANDSCAPING AND OR PUBLIC ART
UTILITY CORRIDOR
HORIZONTAL DEFLECTION ISLAND
UTILITY CORRIDOR
HORIZONTAL DEFLECTION ISLAND
MULTI-USE TRAIL
ROAD NARROWED IN WIDTH TO REDUCE IMPACT ON WOODLOT
ROAD NARROWED IN WIDTH TO REDUCE IMPACT ON WOODLOT
SHERIDAN PARK DRIVE
SHERIDAN PARK DRIVE
PROPOSED PROPERTY WIDENING
SPEAKMAN DRIVE
PRIVATE PROPERTY
PRIVATE PROPERTY
PRIVATE PROPERTY
SHERIDAN PARK DRIVE
HOMELANDS DRIVE
PROPOSED PROPERTY WIDENING
OPPORTUNITY FOR LOW IMPACT DEVELOPMENT (STORMWATER TREATMENT) LANDSCAPING AND OR PUBLIC ART
SHERIDAN PARK DRIVE
SPEAKMAN DRIVE
PROPOSED PROPERTY WIDENING
BURNSIDE
MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Jennifer Vandermeer

From:	Jennifer Vandermeer
Sent:	Monday, July 24, 2017 2:10 PM
To:	'Marcel Mallia'
Cc:	'Dana Glofcheskie'; David Argue
Subject:	RE: Enbridge Contacts
Attachments:	039474 Study Area_SAC_v2_small.pdf; Roll Plan-Prf_500 - Small.pdf

Good afternoon Marcel,
Thanks for your call this morning. As noted, the City is undertaking an Environmental Assessment (EA) to study the potential extension of Sheridan Park Drive in the southwest area of the City of Mississauga. The proposed extension would run through the City owned right-of-way (southeast of the utility corridor). We are still undertaking the EA for this project; however, the City would like to meet with representatives from Enbridge Gas to discuss the potential road extension and understand any potential impacts to Enbridge Gas facilities/plants known at this stage of the project. I have enclosed a map of the study area and the preliminary proposed road extension concept as presented at the recent Public Information Centre for your information. We'd like to set up a meeting with you sometime during the week of August 21-25, 2017. Since you have graciously indicated that you can make a meeting date work, by way of this email I'm going to ask Dana Glofcheskie (City Project Manager) and David Argue (Consultant Project Manager) to confirm their availability for a meeting the week of August 21-25 and then I will provide your team with a few options.
Best regards,
Jennifer

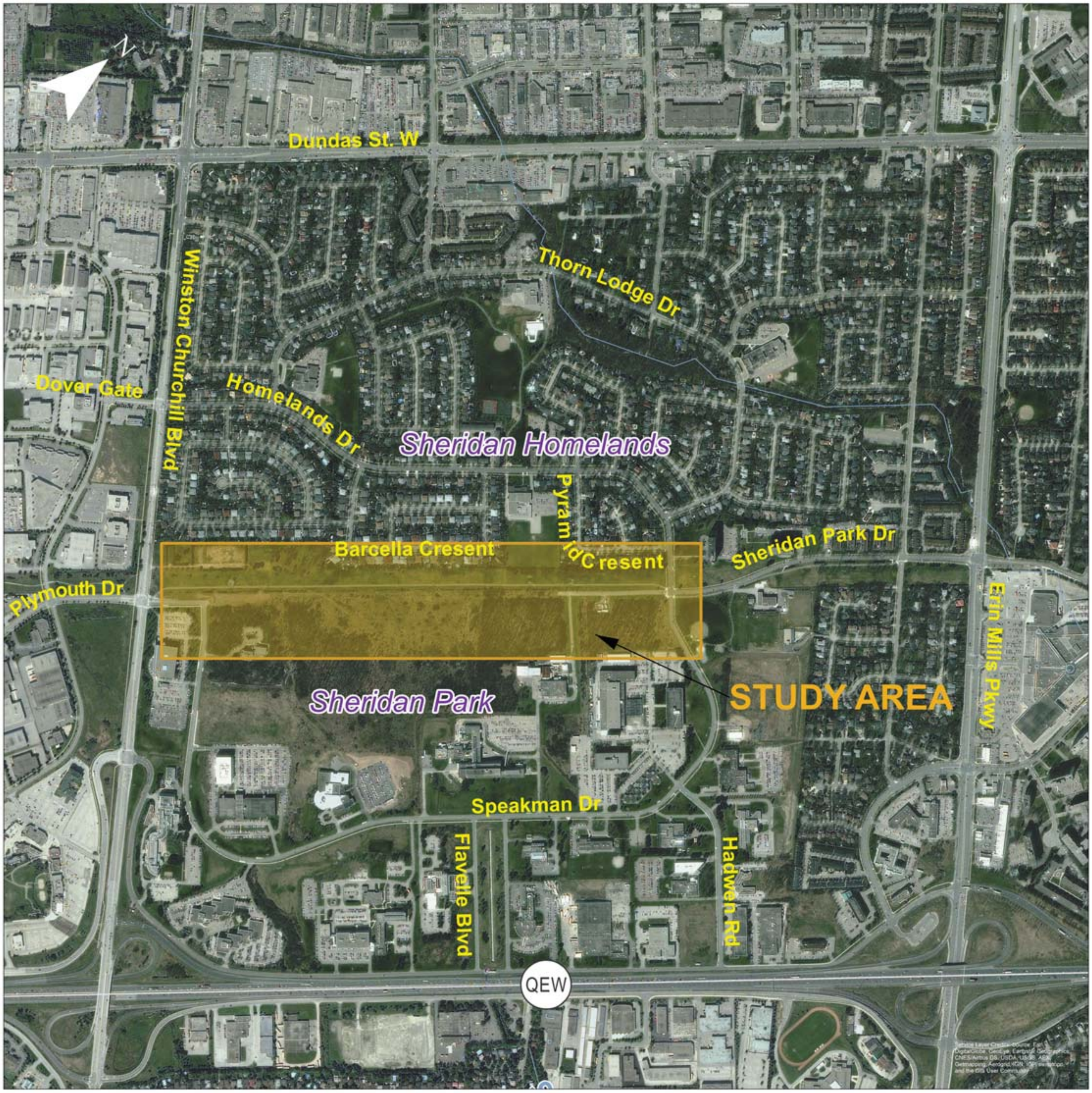
From: Marcel Mallia [mailto:Marcel.Mallia@enbridge.com]
Sent: Monday, July 24, 2017 11:46 AM
To: Jennifer Vandermeer
Subject: Enbridge Contacts

Good Morning Jennifer;

Please see below for a list of contacts at Enbridge Planning.

Meetpal Chinna (905)458-2159

Marcel Mallia
Planning Supervisor, Brampton
—
ENBRIDGE GAS DISTRIBUTION
TEL: 416-758-4793 | | CELL: 416-884-3786
6 Colony Court
Brampton, Ontario, L6T 4E4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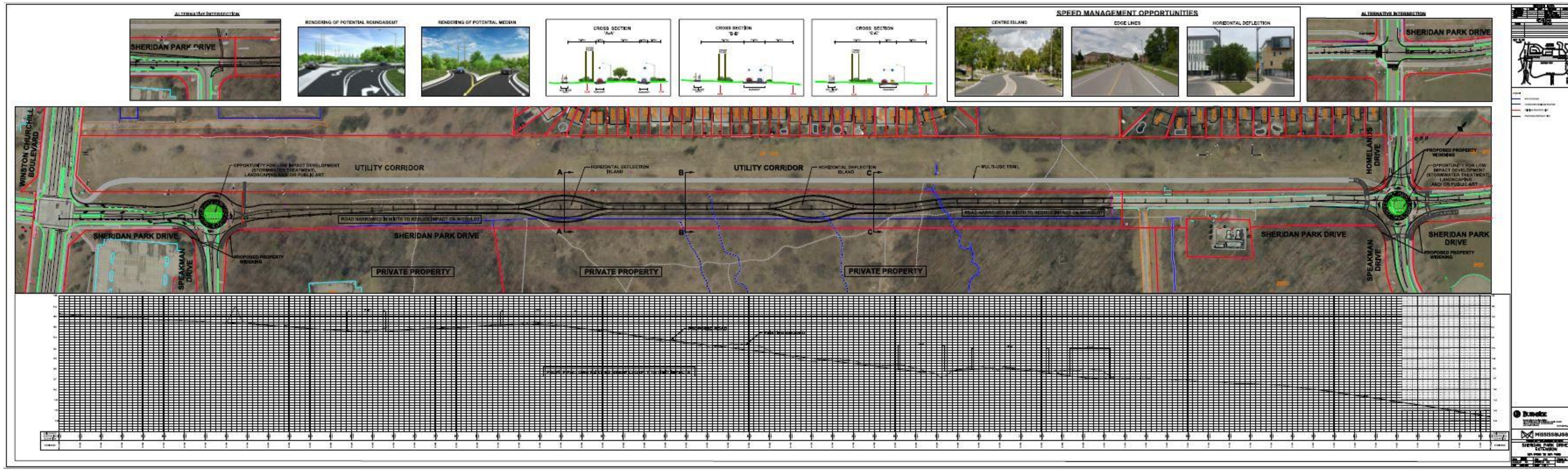

SPEED MANAGEMENT OPPORTUNITIES
CENTRE ISLAND
EDGE LINES
HORIZONTAL DEFLECTION
ALTERNATIVE INTERSECTION
RENDERING OF POTENTIAL ROUNDABOUT
RENDERING OF POTENTIAL MEDIAN
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PROPOSED PROPERTY WIDENING
PRIVATE PROPERTY
SPEAKMAN DRIVE
HOMELANDS DRIVE
Burnside
MISSISSAUGA
SHERIDAN PARK DRIVE EXTENSION

Jennifer Vandermeer

From:	rick.schatz@HydroOne.com
Sent:	Monday, July 24, 2017 9:51 AM
To:	Jennifer Vandermeer
Cc:	Meredith.Nyers@HydroOne.com
Subject:	FW: Sheridan Park Drive Extension Environmental Assessment - Request for meeting with HydroOne
Attachments:	IO_LandSaleProcess_012.pdf; Proposal Submission Requirements.pdf; Technical Considerations (HONI Corridors).pdf; 039474 Study Area_SAC_v2_small.pdf; Roll Plan-Prf_500 - Small.pdf

Hi Jennifer,

I am your contact at Hydro One in this matter.

At this point it's too early to meet on this. I looked at the drawing and it appears that you will need to extend the daylight triangles in two locations and add some trail connections. An operational land sale will be required for the daylight triangles and the trail connections will fall within the existing park licence.

There is currently no hydro transmission infrastructure within the hydro corridor so I can't see this being a problem from our perspective. That said, I have included three attachments:

- The first attachment outlines the process involved in obtaining an operational land sale. To begin the process you will need to submit the items listed in the first 5 bullet points.
- The second attachment provides guidance in terms of what we need to see on drawings that you submit for our review. Please ensure that this is followed or the review of the submission may be delayed or returned.
- The third attachment provides some technical considerations when planning new infrastructure near Hydro One plant.

Our current turn around time to review drawings is about 12 -1 6 weeks.

If you have any questions please call me.

Regards,

Richard (Rick) Schatz SR/WA
Senior Real Estate Coordinator

Hydro One Networks Inc.
Tel: 905-946-6233
Cell: 416.735.2909
Email: Rick.Schatz@HydroOne.com

From: HAMILTON Mark **On Behalf Of** TPUCC DRAWINGS
Sent: Friday, July 21, 2017 10:51 AM
To: SCHATZ Richard; NYERS Meredith
Cc: TPUCC DRAWINGS
Subject: FW: Sheridan Park Drive Extension Environmental Assessment - Request for meeting with HydroOne

Meredith,

As discussed on the phone, please review the attached proposed work in the City of Mississauga and their request below.

Thank you and have a great weekend.

Mark Hamilton
Grid Operations Supervisor
Barrie Corporate Office - BAH
Phone: 705-797-4142 Cisco: 88974142

From: Jennifer Vandermeer [mailto:Jennifer.Vandermeer@rjburnside.com]
Sent: Friday, July 21, 2017 10:37 AM
To: TPUCC DRAWINGS
Cc: Dana Glofcheskie; David Argue; Sheridan Park EA
Subject: Sheridan Park Drive Extension Environmental Assessment - Request for meeting with HydroOne

Good morning Mark,
Thanks for taking my call this morning. As noted, the City is undertaking an Environmental Assessment (EA) to study the potential extension of Sheridan Park Drive in the southwest area of the City of Mississauga. As I explained, the proposed extension would run through the City owned right-of-way to the south of the Hydro One utility corridor. We are still undertaking the EA for this project; however, the City would like to meet with representatives from Hydro One to discuss the potential road extension and understand any potential impacts to Hydro One lands known at this stage of the project. I have enclosed a map of the study area, which includes the utility corridor lands and the preliminary proposed road extension concept as presented at the recent Public Information Centre for your information. I would be grateful if you could pass this information onto the appropriate contact in the Real Estate group at Hydro One who would be able to participate in a meeting with the City so we can arrange a convenient date and time with them.
Best regards,
Jennifer

BURNSIDE
Jennifer Vandermeer, P.Eng.
Environmental Assessment Lead

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Unit 20, Guelph, Ontario N1H 1C4
Office: 800-265-9662 Direct: 226-486-1559
www.rjburnside.com

**** CONFIDENTIALITY NOTICE ****

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Ontario Infrastructure and Lands Corporation Land Sale Process -- Public Uses

Land sales involving former Hydro One owned corridor lands must be direct transfers from the Province as represented by Ontario Infrastructure and Lands Corporation (OILC), which is also known as Infrastructure Ontario (IO) to either a municipality or a Provincial Ministry. Hydro One will still retain its statutory easement rights over the lands being transferred.

The Provincial Secondary Land Use Program (PSLUP) permits compatible "secondary" uses on corridor lands. Secondary uses are those uses which can coexist with the safe and efficient operation of Hydro One's transmission and distribution businesses. These uses are based on approved public use principles as set out in the policy and guidelines of the PSLUP.

To initiate a land sale under the PSLUP, the proponent must submit a written proposal with the following information:

- State the proposed secondary land use for which a land sale is being sought.
- Provide the proponent's legal name/company name, contact name, phone and fax numbers, address for legal notification.
- A key map of the neighbourhood/area where the property is located.
- Include a concept drawing locating the proposed lands to be transferred; identify the corridor property lines relative to the proposed transfer and include all Hydro facilities (towers, poles, etc.); provide approximate area to be transferred (ie. 0.25 acre subject to survey).
- Provide the legal description of the portion of the corridor lands required (ie. Lot, Concession and name of original geographic boundary) and provide a property abstract such as the PIN sheet.
- Submit the required Engineering Review Fee (ERF).

Engineering Review Fee (ERF)

An Engineering Review Fee (ERF) of $1,250 + HST are charged for processing a land sale to a municipality or Provincial Ministry. This **non-refundable fee** should be made payable to "Ontario Infrastructure and Lands Corporation" and it is intended to offset costs incurred in reviewing the proposal. The fee is based on reviewing a typical proposal; however, if additional engineering input or further internal or external expertise is required, then the proponent will be charged accordingly. The ERF is payable at the time the signed Agreement of Purchase and Sale is submitted to Hydro One for final processing.

Property Management Proposal (PMP)

After Hydro One receives the above information, a Property Management Proposal (PMP) describing the proposed use is circulated to IO and a number of Hydro One stakeholders for review and comments. IO circulates it to other Provincial bodies such as its planning specialist, the Ministry of Environment, etc.

Hydro One stakeholders review and comment from a technical perspective with a focus on how the proposed use impacts the assets. To obtain Hydro One's final technical approval, the proponent must submit four (4) full size **folded** copies of a grading and drainage plan, a composite utility plan, landscape plan, and a lighting plan if lighting is required. The plans should show the property lines of the corridor, and any Hydro One structures in the vicinity. There may be further requirements for cross-sections, elevation etc. which will be assessed during the review process. The result of this technical review will be a Terms and Conditions letter identifying all Hydro One comments and/or approval.

Environmental Assessment (EA)

An Environmental Assessment that complies with IO's requirements is required for the lands to be transferred. This assessment will be undertaken at the proponent's cost. If the proponent already has an environmental consultant, the chosen consultant's name, email and telephone number should be forwarded to Hydro One for direct contact with IO's Environmental Coordinator.

Valuation of Land

A land value appraisal will be required. Before commencing the appraisal work, the appraiser must contact IO's appraiser for the terms of reference. The appraisal is completed at the proponent's expense and typically takes place later in the process. Hydro One will require delivery of THREE copies of the appraisal report for review. The effective date of the appraisal must be within six (6) months of the date of transfer. One of the conditions in the Agreement of Purchase and Sale is IO obtaining an Order-in-Council for the land sale.

Survey and Legal Costs

Prior to signing the Agreement of Purchase and Sale, the proponent must provide a Plan of Survey, at the proponent's expense, which identifies the Parts to be transferred with a Schedule indicating the area of each Part. Eight (8) copies (folded) of the survey are required for circulation and the final submission package.

All legal costs incurred by the Transferor's solicitor, inclusive of disbursements and H.S.T., as they pertain to the sale of land and completion of the transaction are also borne by the proponent.

No Access Until Land Sale is Registered

Construction activity on IO owned Hydro One transmission corridor lands **must not** commence until the sale has been completed and a pre-construction on-site meeting with Hydro One technical staff has taken place.

Hydro One Networks Inc.
Facilities & Real Estate Services
P.O. Box 4300
Markham, ON L3R 5Z5
www.HydroOne.com

Courier:
185 Clegg Road
Markham, ON L6G 1B7

PROPOSAL SUBMISSION REQUIREMENTS
IN AND AROUND HYDRO ONE NETWORKS INC. ELECTRICAL TRANSMISSION CORRIDORS

Hydro One strives to work with proponents to review secondary land use proposals on the Transmission Corridors to ensure they are compatible with the safety and maintenance requirements of its high-voltage equipment. The Hydro One Transmission Network can consist of steel lattice towers, monopoles, twin wood poles, overhead conductors, underground cable ducts. The transmission lines generally conduct electricity at 115kV, 230kV or 500kV.

Technical drawings for any proposal impacting transmission infrastructure and / or corridors must be reviewed and approved by Hydro One. These reviews may require several weeks or months to complete depending on the complexity of the proposal. Currently our turnaround time is about 12 – 16 week. A resubmission will require the same timelines. The drawings must be approved by Hydro One, and occupation agreements in place prior to the commencement of any construction work.

Detailed drawings that need to be submitted include: site plan, grading, drainage, lighting, landscaping, signage (including any other above grade structures) and profiles for underground works. Additional drawings may be requested but please don't send them to us unless we ask for them.

To effectively review and provide comments, your proposal must include the following information.

- LAND/EASEMENT PROPERTY LINES: On all plan drawings, indicate and label the Hydro corridor property limits in RED.
- HYDRO ONE STRUCTURES: On all plan drawings, show all Hydro One towers, other structures and the overhead centreline of the towers, all clearly marked with colour. (Also indicate the tower numbers – these numbers will be provided by Hydro One)
- GRADES and DRAINAGE: Indicate existing and proposed grades. Grading changes must not result in standing water anywhere along the corridor.
- MAINTENANCE ACCESS ROUTE: On all plan drawings, mark in colour and label a 6.0 meter wide Hydro One maintenance access route to each Hydro One tower or other structure.
- MAINTENANCE ZONE: Indicate in colour and label a 15.0 meter radius for the Hydro One maintenance work zone around each Hydro One towers measured from the tower footings. Also show the distance from the edge of the proposed infrastructure to the edge of the nearest tower footing.
- POPOSED UNDERGROUND SERVICES: Plans and profiles are required showing any proposed underground works .
- LIGHTING: Keep lighting as far away from our circuits as possible, toward the outer edge of the corridor. The locations and the height of each light post must be clearly described.
- LANDSCAPING: Plantings which grow to a mature height of over 3 metres are not permitted on the ROW. Hydro One has a Compatible Species List which will be provided on request.
- RESUBMITTED DRAWINGS: If a resubmission of drawings is required, the revised drawings must include "bubbles" over the areas where changes were made to help us identify the areas that need to be reviewed.

Your submission should include:

- **An introduction letter that briefly describes your project and the impact that it will have on the hydro corridor**
- **A neighborhood map (ie Google aerial map) showing the general vicinity of the proposed work**
- **Three full sized hard copies of each drawing (folded) along with an electronic copy in PDF**
- **An engineering review fee**

Hydro One Networks Inc.
Facilities & Real Estate Services
P.O. Box 4300
Markham, ON L3R 5Z5
www.HydroOne.com

Courier:
185 Clegg Road
Markham, ON L6G 1B7

Technical Considerations for Hydro One Electrical Transmission Corridors

Your project may involve proposed works on Hydro One electrical transmission corridors or rights-of-way (ROW). Hydro One will work with proponents to review secondary land use proposals on the ROWs to ensure that they are compatible with the safety and maintenance requirements of its high-voltage equipment. The Hydro One transmission network can consist of steel lattice towers, monopoles, twin wood poles, overhead and underground conductors etc..

When preparing a proposal, there are a number of technical considerations that should be kept in mind. A number of these are outlined below. Please note that this is not intended to be a comprehensive list of requirements, but aims to serves as a guideline to prepare a proposal. Reviews for each proposal are conducted individually by Hydro One and may require several weeks or months to complete depending on the complexity of the proposal.

Technical Considerations:

Grading, Drainage and Stormwater Management

- Grading changes must not result in standing water anywhere along the corridor, and especially not within 15m radial zone of transmission structures.
- No fill material may be placed on the ROW without written approval from Hydro One.
- Catch basins that are not positioned within a paved roadway are not permitted.
- Stormwater management (SWM) ponds placed under 115 and 230 kV transmission lines cannot exceed two-thirds of the corridor width.
- SWM ponds under 500 kV transmission lines cannot exceed one-third of the corridor width.
- SWM ponds must be designed to withstand the effects of 100-year storm conditions.

Roads and Parking

- Roads crossing the ROW should be perpendicular to the hydro corridor.
- Roads off ROW should stay 15m clear of transmission structures.
- Curb cuts or access gates should be provided for Hydro One maintenance vehicles.
- Parking facilities on 115 kV and 230 kV ROWs should be restricted to passenger vehicles only. Large truck and trailer parking is generally not permitted.
- Parking facilities are generally not permitted under 500 kV ROWs.
- Transmission towers near roads and parking areas must be protected by standard highway barriers.

Vertical Clearances

- Transmission conductors (wires) are dynamic in nature. They can sag lower to the ground depending on parameters such as ambient temperature and operating conditions.
- Minimum vertical clearances must be maintained from the maximum design sag levels of the conductors (worst-case scenario). Hydro One will review these clearances as they are case-specific and not immediately apparent by observation alone.

Access to Structures

- An unhindered, minimum 6-metre wide access path to facilities on the corridor must be provided for maintenance vehicles.
- A 15-metre clear working radius around transmission structures is required in order to maintain access for vehicles carrying out routine maintenance.
- A 3-metre radius around each tower footing must be left unpaved for access to the footing.

Pipelines & Underground Facilities

- All underground facilities must be designed to withstand the loading conditions created by heavy maintenance vehicles that may be used by Hydro One.
- The ROW must be restored to pre-construction condition once the project is completed.
- Excavation using heavy machinery is prohibited within 10 metres of tower footings to protect foundations. Within 10 metres, excavation must be carried out by hand or by use of a VAC system.
- Pipelines on ROWs must adhere to the provisions of CSA Standard C22.3 No. 6.

Landscape Plantings

- Plantings which grow to a maturity height over 3 metres are not permitted on the ROW. Hydro One has a 'Compatible Species List' which will be provided as applicable. It must be noted that plantings should not be planted in such a way as to impede access to the transmission towers. An area of 15 metres around transmission towers should be kept clear of shrubs to permit Hydro One access to towers.

Other Requirements

- **Buildings and permanent structures are not permitted on corridor lands.**
- Flammable or hazardous materials may not be stored on ROWs.
- Consideration should be given to minimizing the use of conductive (metallic) material where alternatives exist (e.g. fences).
- The proponent is responsible for all costs of modifying, relocating, or monitoring Hydro One assets as a result of the proposal.
- **Grounding studies, induction studies, spark discharge and / or step touch potential studies may be required to confirm that the proposal will not conflict with the Hydro One electrical infrastructure.** The cost of these studies, our review of the completed studies, and any mitigation measures required as a result of these studies, will be will be borne by the Proponent.

Property Rights: Who is the landowner?

- Transmission corridor lands can be owned by private landowners, Municipalities, Province of Ontario (Infrastructure Ontario), railway companies, and First Nations and Métis communities.
- Hydro One Networks Inc. owns the transmission components/network.
- Hydro One Networks Inc. has rights either registered on land title or by legislation to operate the transmission network.

Property Rights: What Agreements do you require?

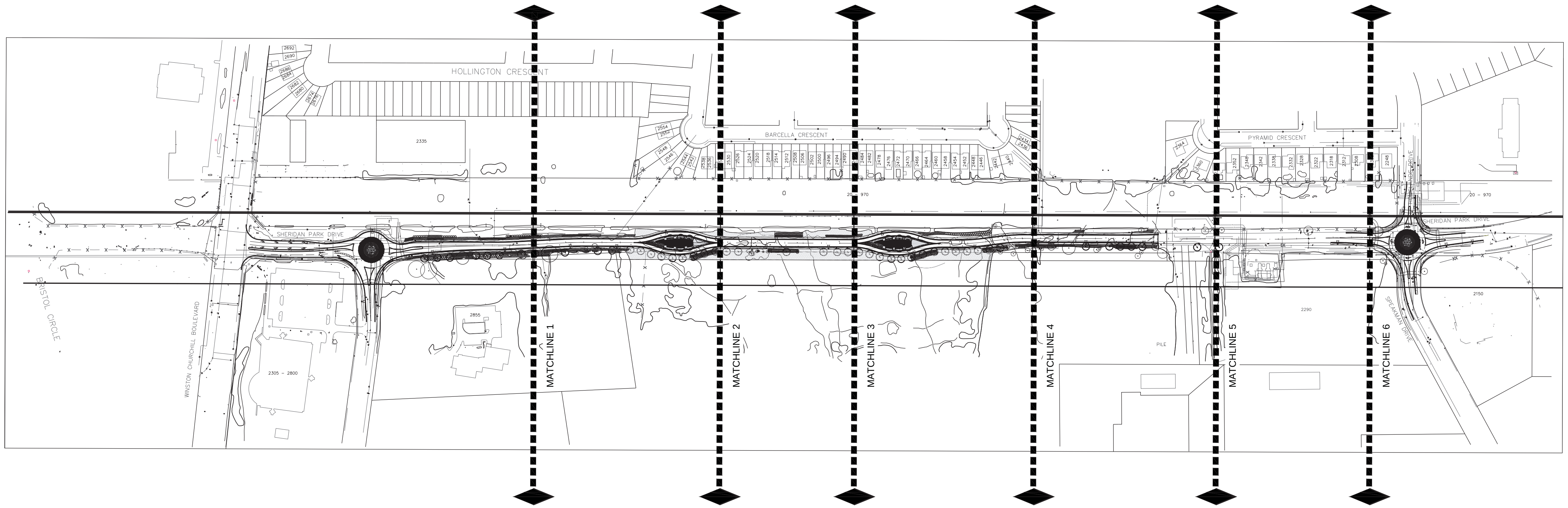
Contact Hydro One Real Estate Services at 1.888.231.6657 for the Real Estate Coordinator for your municipality. The Real Estate Coordinator arranges for Hydro One review of your proposal, advises of documentation and prepares the Agreements.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix N

Preliminary Streetscape Plan



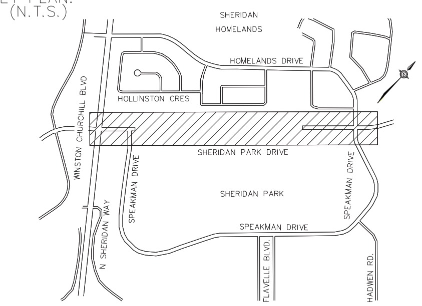
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
12 DEC 17	LANDSCAPE PLAN FOR COORDINATION	N.H.
13 DEC 17	LANDSCAPE PLAN FOR COORDINATION	N.H.

KEY PLAN:
(N.T.S.)



LEGEND:

- EXISTING TREES
- PROPOSED DECIDUOUS TREES
- PROPOSED CONIFEROUS TREES
- PROPOSED DECIDUOUS SHRUBS
- PROPOSED ORNAMENTAL GRASSES
- PROPOSED SOD
- PROPOSED SEEDED AREA - S-1 MIX
- PROPOSED SEEDED AREA - S-2 MIX
- QTY / SPE — PLANT KEY
- LUMINAIRES

GENERAL LANDSCAPE NOTES

1. All dimensions are in metric, unless otherwise noted.
2. Do not scale drawings. Dimensions are to be verified on site by contractor.
3. This drawing shall not be used for construction purposes unless noted as "Issued for Construction".
4. This plan is to be read in conjunction with all details, notes and written specification.
5. Contractor shall review all drawings and verify actual field conditions to determine total scope of work and all required coordination prior to submission of bids and commencement of construction, report any discrepancies to the Landscape Architect for action to the satisfaction of the City of Mississauga.
6. Depicted on this plan are approximate locations of landscape elements, once civil/servicing works are complete the exact location of landscape elements shall be determined by Landscape Architect prior to commencement of work.
7. Contractor shall locate all underground and overhead utilities prior to commencement of any work. All utilities not necessarily shown on this plan, Aboud & Associates assumes no responsibility for the accuracy of any utilities on this plan.
8. Parking and storage for equipment and materials shall be approved by the Landscape Architect to the satisfaction of the City of Mississauga.
9. Contractor is responsible for protecting and/or storing all site elements to be protected or reinstated.
10. All points of construction egress or ingress shall be in accordance with civil drawings and erosion and sediment control plans and maintained to the satisfaction of the City of Mississauga.
11. Landscape Architect shall approve all layout and staking prior to commencement of work.
12. Restoration of adjacent surfaces damaged by the contractor including but not limited to roadway/access road surfaces, curbs, sidewalks, utilities, retaining walls, fencing, vegetation etc. shall be in accordance with applicable City of Mississauga Standards and Ontario Provincial Standards to the satisfaction of the City of Mississauga at no additional cost to the Owner.
13. Where new paving or earthworks meets existing paving or earthwork, smoothly blend line and grade of existing with new.
14. Substitution of materials must be approved by the Landscape Architect in writing.
15. Material quantities on drawings shall take precedent over those in lists.
16. Plants which come over or under any utility shall be relocated by Landscape Architect.
17. Plant materials shall be No. 1 grade nursery grown in accordance with the Canadian Nursery Landscape Association.
18. Landscape Architect reserves the right to reject any plant material displaying life-threatening, poor growth habits, injury, disease or those not true to name. Contractor shall remove rejected plants from site immediately and replace at no additional cost to the Owner.
19. Where traffic control is necessary, use the guideline of the Construction Safety Association of Ontario, Municipal by-laws, the Highway Traffic Act and the Ontario Traffic Manual (Book 7).
20. Topsoil forCity of Mississauga lands shall be tested for nutrients and organics and amended as per test recommendations for chosen plant material.
21. All plant material shall be set back to allow for mature size - min 2m from all city infrastructure (including sidewalks, stormwater items etc. and property lines.
22. All work and materials are to be guaranteed by the Contractor for twenty-four (24) months from date of initial acceptance of all items by City of Mississauga Staff and Project Landscape Architect.The Contractor is responsible for the maintenance of all the installed trees, shrubs, grasses and seeding with the twenty-four month warranty period.
23. Grading and servicing is shown for convenience only. Do not construct grading or servicing from this plan.

MAINTENANCE NOTES

MAINTENANCE DURING ESTABLISHMENT/WARRANTY PERIOD

.1 Perform following maintenance operations from time of planting to end of warranty period two (2) years following substantial performance of the work.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion. In a typical loam soil, optimum soil moisture in planting beds at root depth is 65% of field capacity. **Guidelines during a typical growing season** are as follows:

.1 Deep root water newly planted plants once per week for the first three weeks, such that the water penetrates to a minimum depth of 300mm.

.2 Deep root or surface water trees and shrubs a minimum of every ten (10) days between May 15 and September 15.

.3 Deep root or surface water trees and shrubs a minimum of every twenty-one (21) days between September 15 and freeze up.

.4 Water evergreen plants thoroughly in late fall prior to freeze_up to saturate soil around root system.

.2 Soil moisture to be monitored throughout the growing season:

.1 Watering schedule to be increased when plant materials are reaching the permanent wilting point.

.2 Watering schedule to be reduced when a sufficient volume of rainfall has penetrated the soil fully as required.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from Consultant prior to application.

.5 Control outbreaks of perennial weeds as directed by Consultant, and annual weeds by mechanical or chemical means utilizing acceptable integrated pest management practices to meet acceptance/success targets

.1 If chemical means are used, comply with all municipal, provincial, and federal legislation and regulations.

.6 Remove dead or broken branches from plant material using clean sharp horticultural tools using current arboricultural practices.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Provide adequate protection from winter, wind and rodent damage.

.9 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings, unless otherwise directed by Consultant.

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period, unless otherwise directed by Consultant.

.11 Submit monthly written reports in during the growing season (April - September) to Consultant identifying:

.1 Maintenance work carried out.

.2 Watering method, quantity of water used, water source.

.3 General development and condition of plant material.

.4 Preventative or corrective measures required which are outside Contractor's responsibility.

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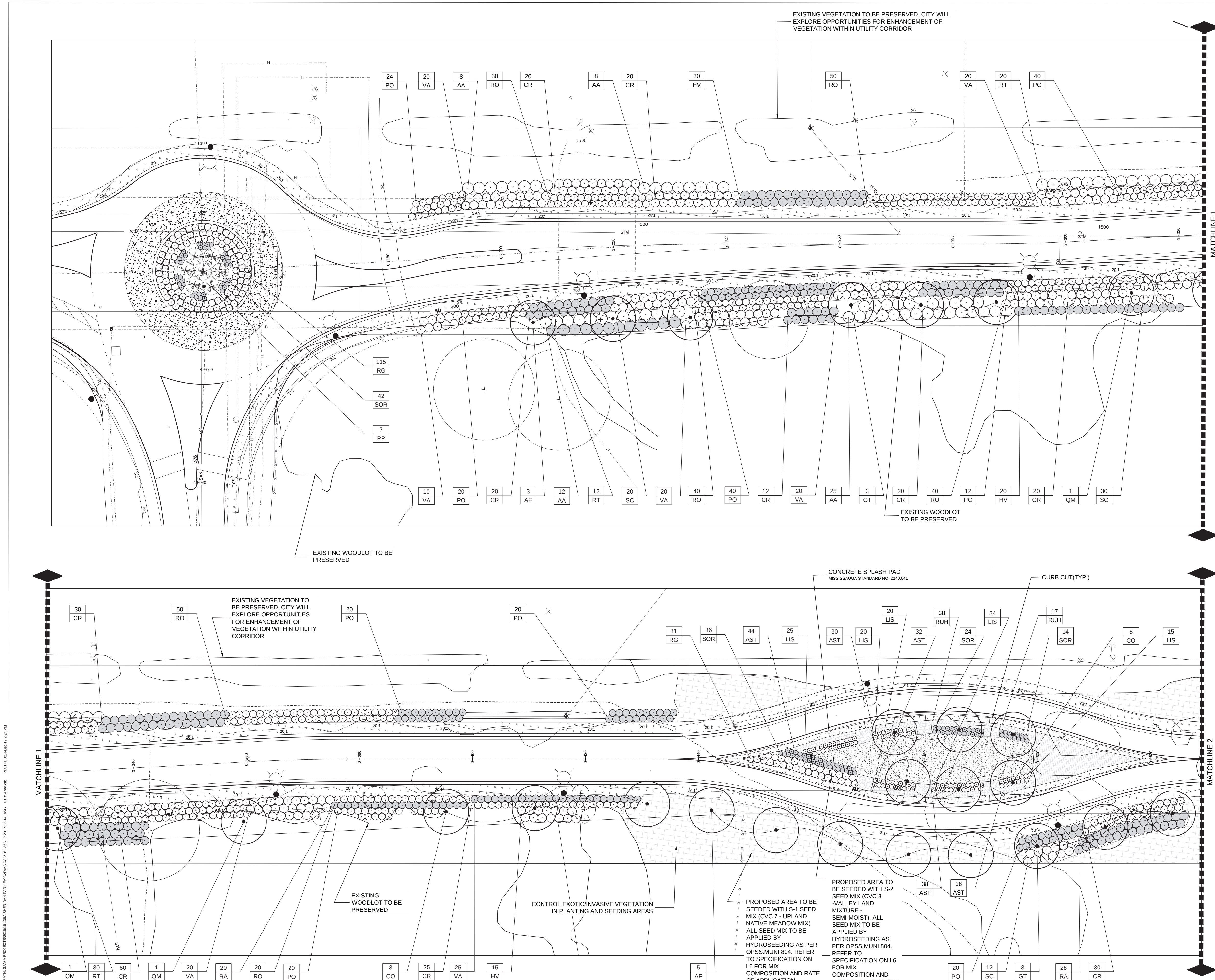
RJB Project No. 300039474

PRODUCED FOR – T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION PRELIMINARY STREETSCAPE PLAN

SCALE 1:2500	AREA	PROJECT No. AA-16-136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No. L1
DATE DECEMBER 2017	SHEET 1 OF 6	

FILEPATH: S:\A+A PROJECTS\2016\16-136A SHERIDAN PARK EA\CAD\AA CAD\16-136A LP 2017-12-14.DWG CTB: Acad.ctb PLOTTED:14-Dec-17 2:24 PM



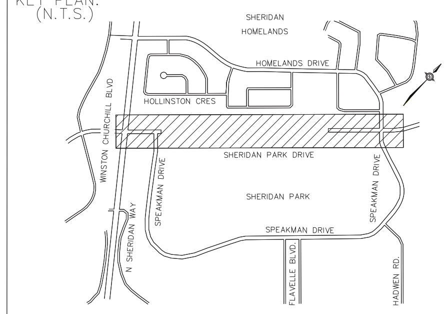
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.
12 DEC 17	LANDSCAPE PLAN FOR COORDINATION	N.H.
13 DEC 17	LANDSCAPE PLAN FOR COORDINATION	N.H.

KEY PLAN:
(N.T.S.)



LEGEND:

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- PROPOSED DECIDUOUS TREES
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- PROPOSED SOD
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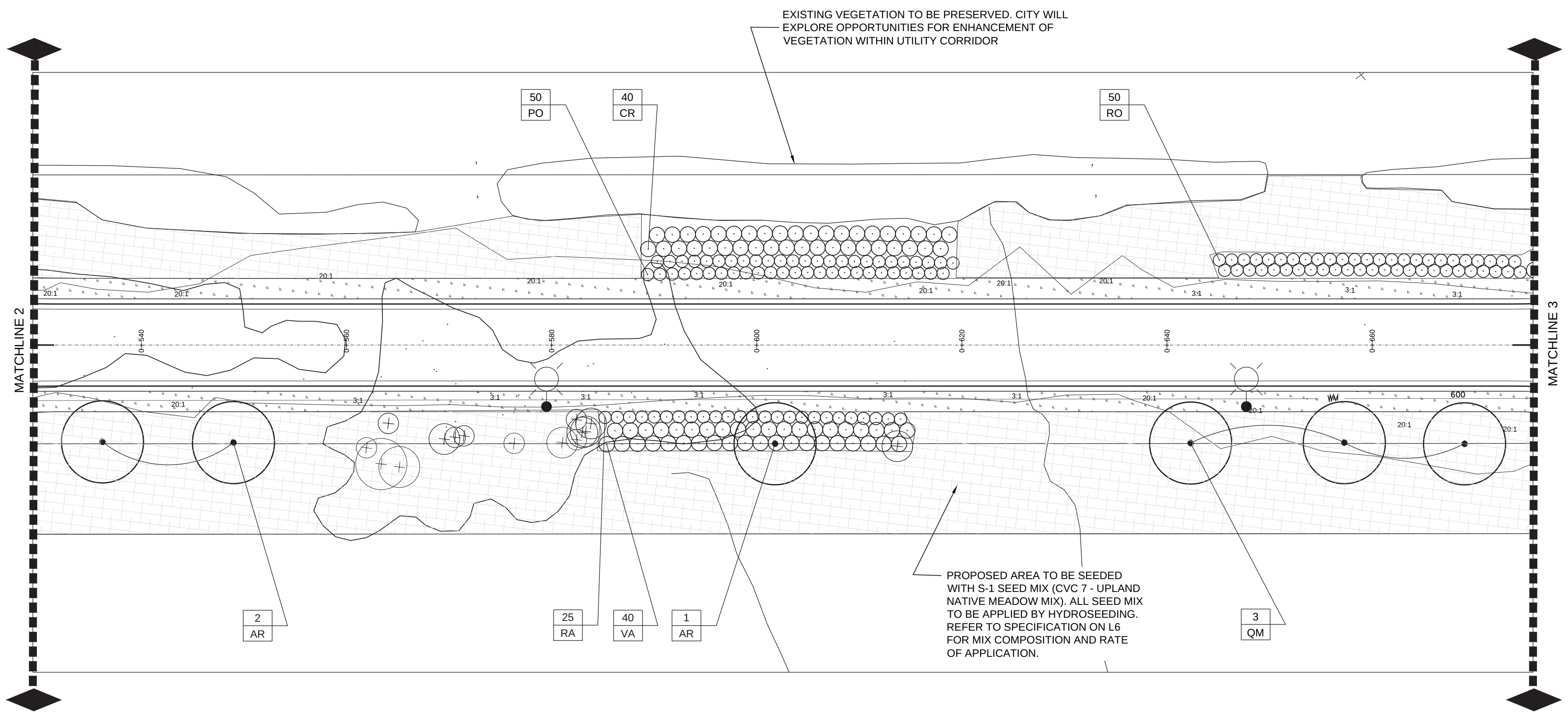
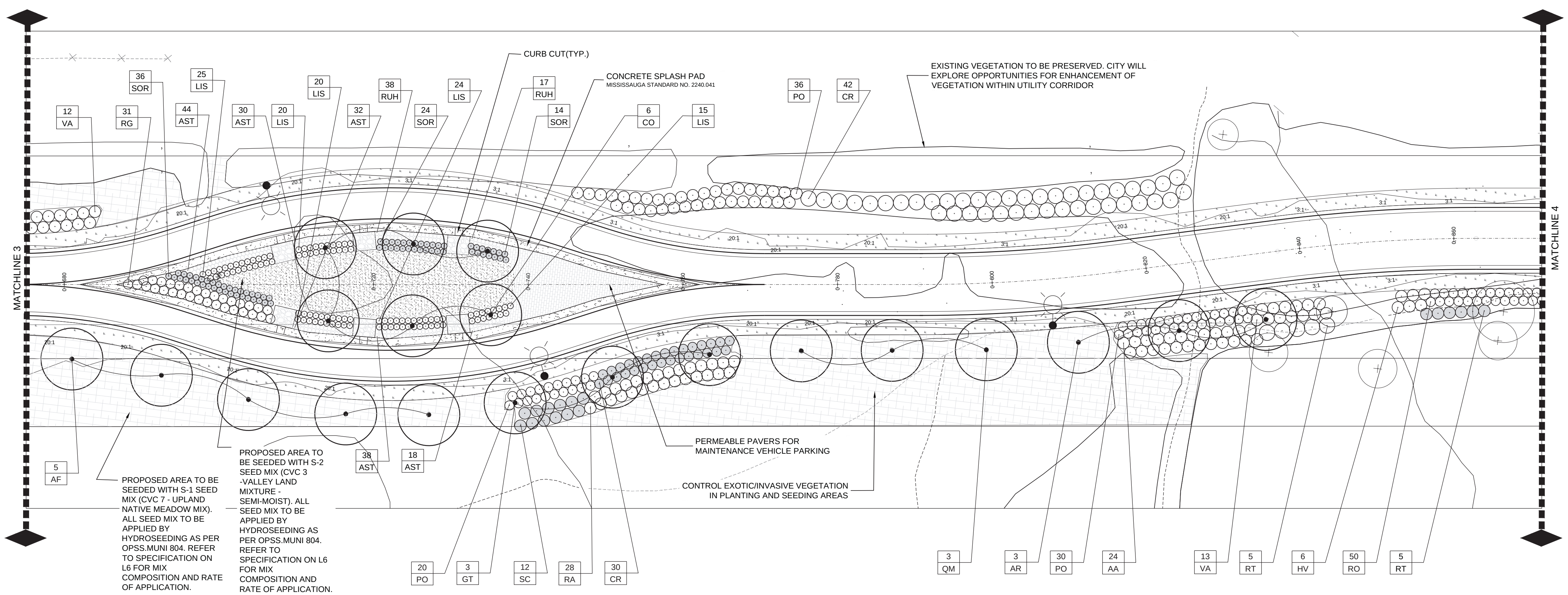
SCALE 1:300	AREA	PROJECT No. AA-16-136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No.
DATE DECEMBER 2017	SHEET 2 OF 6	L2





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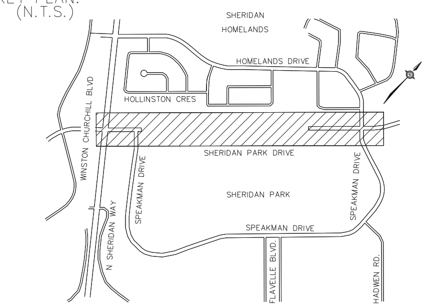

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SCALE 1:300	AREA	PROJECT No. AA-16-136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No.
DATE DECEMBER 2017	SHEET 3 OF 6	L3

SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
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WATERMAINS			HYDRO U/G CABLE		
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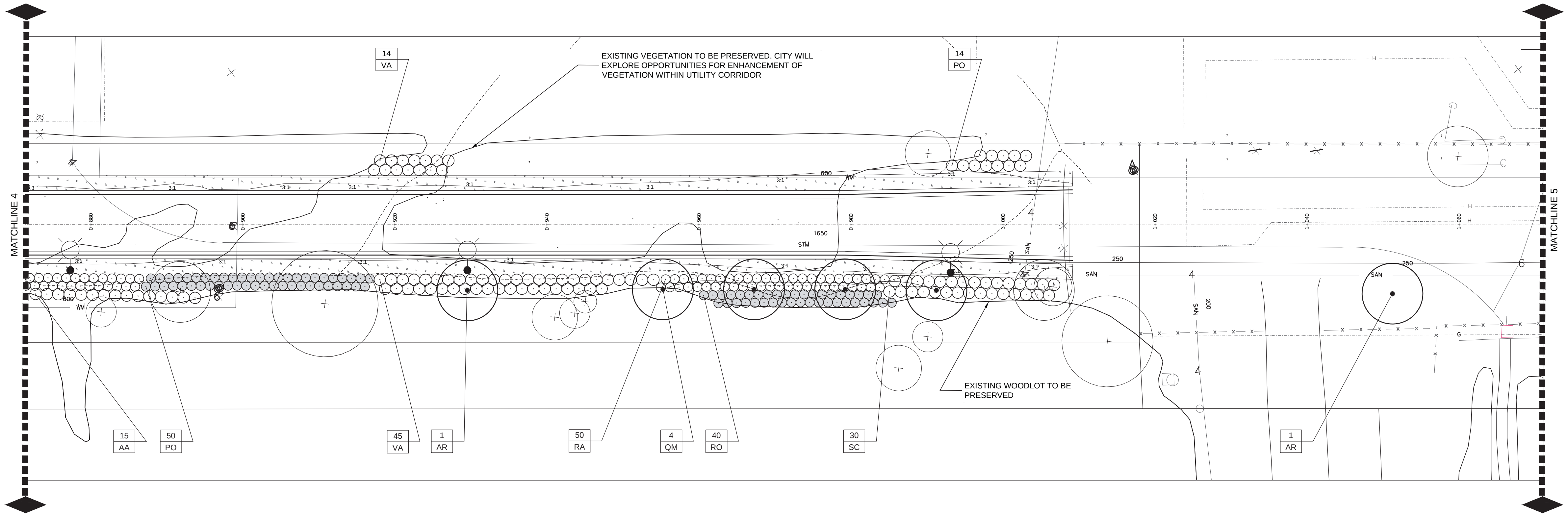

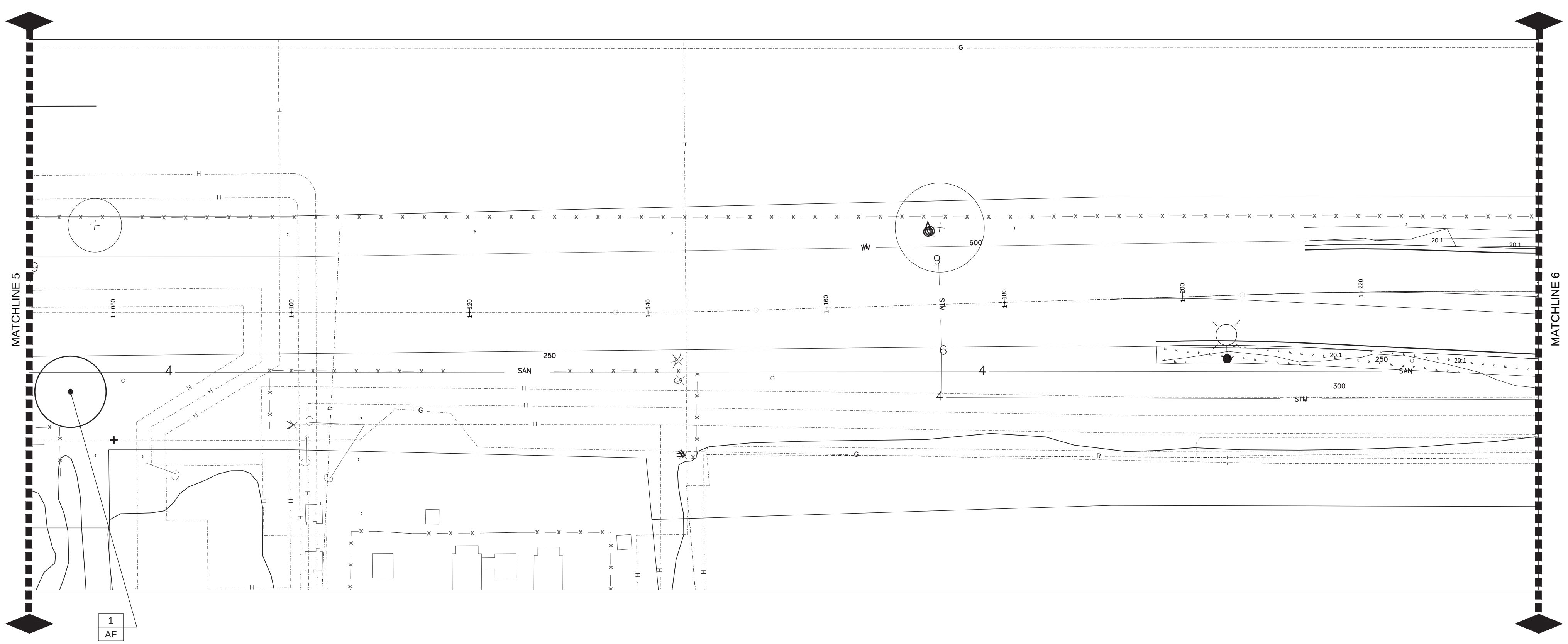

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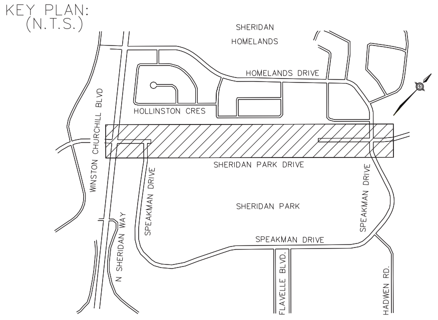

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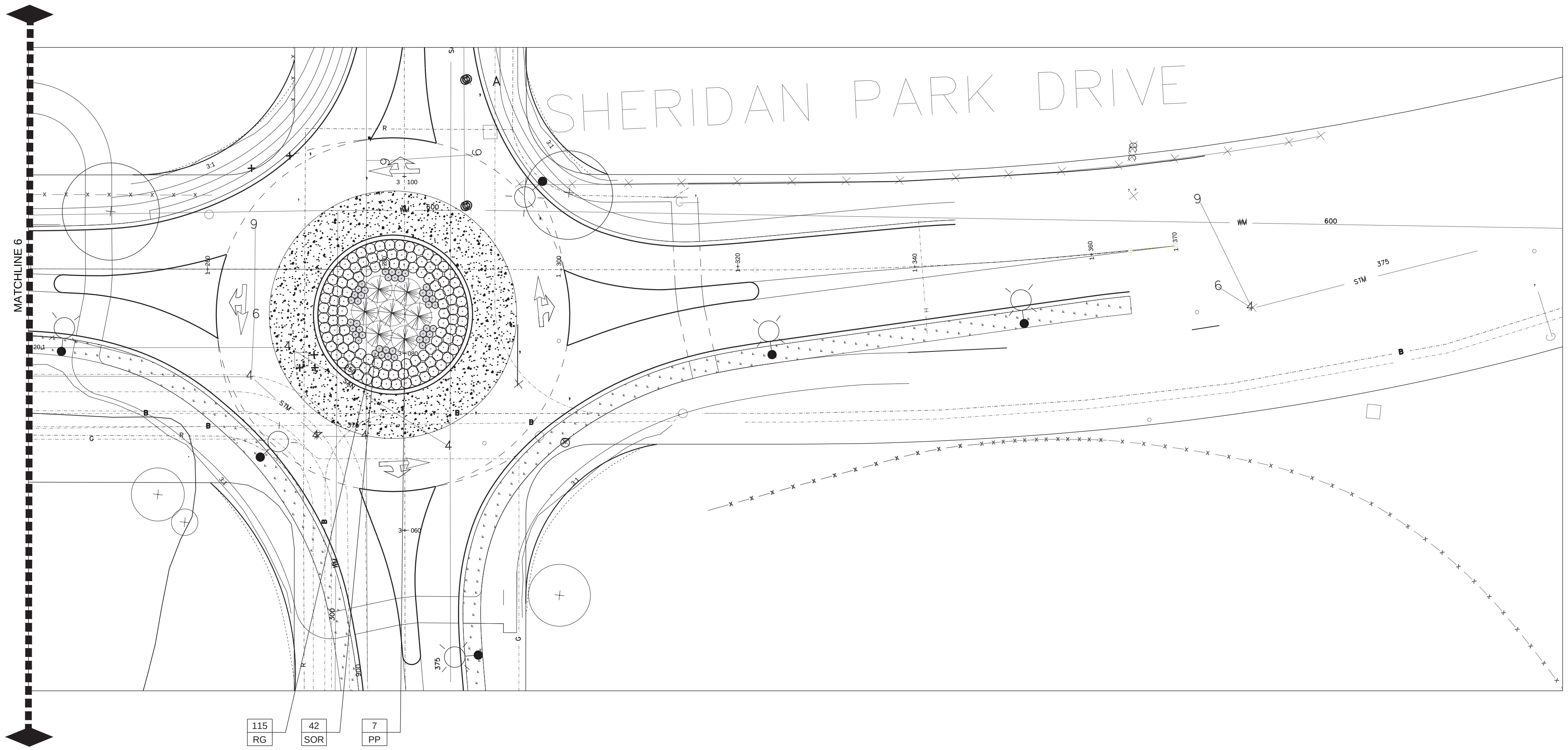
SHERIDAN PARK DRIVE EXTENSION
PRELIMINARY STREETSCAPE PLAN

SCALE 1:300	AREA	PROJECT No. AA-16-136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No.
DATE DECEMBER 2017	SHEET 4 OF 6	L4



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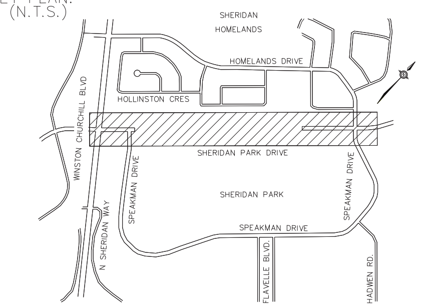
(N.T.S.)



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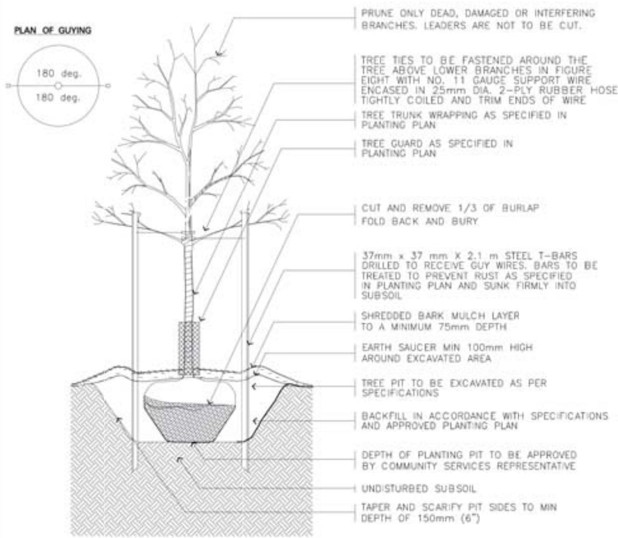
SHERIDAN PARK DRIVE EXTENSION PRELIMINARY STREETSCAPE PLAN

SCALE 1:300	AREA	PROJECT No. AA–16–136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No. L5
DATE DECEMBER 2017	SHEET 5 OF 6	



TYPICAL DECIDUOUS TREE PLANTING (60mm CAL.+)

NOTES:

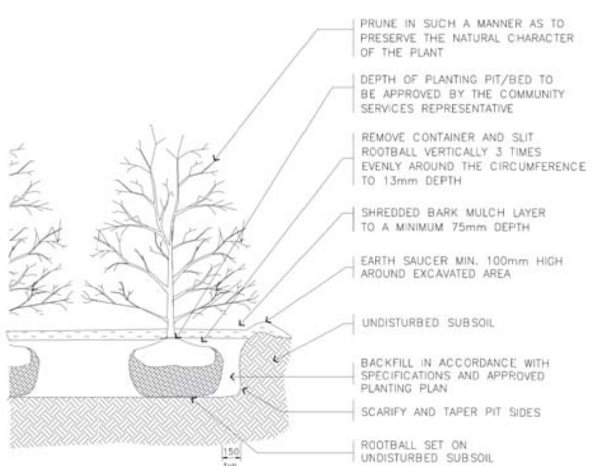
1. ALL PLANTING SHALL BE DONE UNDER THE DIRECTION AND SUPERVISION OF PERSONNEL WITH AT LEAST 5 YRS HORTICULTURAL AND PLANTING EXPERIENCE AND CONFORM TO BEST HORTICULTURAL PRACTICES
2. SAMPLES OF MULCH, TOP SOIL AND TREE ACCESSORIES MUST BE SUBMITTED TO COMMUNITY SERVICES FOR APPROVAL
3. PLANTING OF PLANT MATERIAL PRIOR TO COMMUNITY SERVICES APPROVAL WILL BE AT THE CONTRACTORS RISK. COMMUNITY SERVICES RESERVES THE RIGHT TO REJECT PLANT MATERIAL THAT DOES NOT CONFORM TO PLANTING PLAN SPECIFICATIONS
4. ONLY USE IMPORTED TOPSOIL WHEN TOPSOIL FROM SITE HAS BEEN DEPLETED OR IS UNACCEPTABLE TO COMMUNITY SERVICES
5. PLANTS SHALL BE SOUND HEALTHY, VIGOROUS AND WELL BRANCHED. THEY SHALL BE FREE OF INSECT PESTS' EGGS AND LARVAE AND SHALL HAVE HEALTHY WELL DEVELOPED ROOT SYSTEMS
6. KEEP ALL PLANTS WATERED FROM TIME OF PLANTING UNTIL ACCEPTANCE

NO.	REVISION	DATE

MISSISSAUGA Community Services

SCALE: N.T.S.
DATE: JANUARY 2001
DRAWN BY: P & D
NUMBER: 02950-1

1 / L6 TYPICAL DECIDUOUS TREE PLANTING DETAIL
N.T.S.



TYPICAL CONTINUOUS SHRUB PLANTING BED

NOTES:

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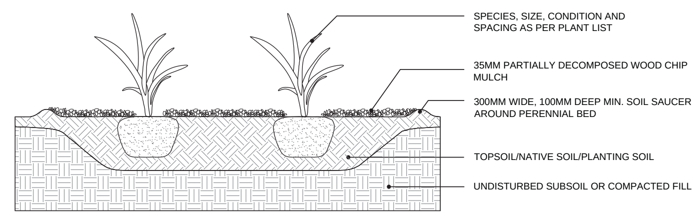
NO.	REVISION	DATE

MISSISSAUGA Community Services

SCALE: N.T.S.
DATE: JANUARY 2001
DRAWN BY: P & D
NUMBER: 02950-4

2 / L6 TYPICAL CONTINUOUS SHRUB PLANTING DETAIL
N.T.S.



NOTES:
1. COVER STOCK WHILE IN TRANSIT OR TEMPORARY STORAGE.
2. EXCAVATE AND PREPARE BED TO DEPTH AS INDICATED. SCARIFY BOTTOM & SIDES OF PLANTING PIT TO A DEPTH OF 50mm.
3. CAREFULLY REMOVE PLANT FROM POT WITHOUT DISTURBING ROOT BALL AND GENTLY PLACE IN PLANTING PIT.
4. PLANT SO THAT NURSERY SOIL LINE MATCHES FINISHED GRADEAFTER SETTLING.
5. BACKFILL PLANTING PIT IN 150MM LIFTS TAMPING BACKFILL TO REMOVE AIR POCKETS, FORMING SOIL SAUCER AS SHOWN.
6. FOLLOWING PLANTING, SOAK THOROUGHLY WITH WATER THEN MULCH, KEEP MULCH AWAY FROM STEM.
7. REMOVE ALL NURSERY TAGS AND WRAPS.

3 / L6 TYPICAL CONTAINER PERENNIAL PLANTING DETAIL
N.T.S.

PLANT LIST

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	TYPE	REMARKS
TREES						
AR	8	ACER RUBRUM	Red Maple	60 MM CAL	WB	
AF	14	ACER X FREEMANII	Hybrid Maple / Freeman Maple	60 MM CAL	WB	
CO	15	CELTIS OCCIDENTALIS	Hackberry	60 MM CAL	WB	
GT	9	GLEDITSIA TRICANTHOS VAR. INERMIS	Thornless Honey Locust	60 MM CAL	WB	
PP	14	PICEA PUNGENS 'FAT ALBERT'	Fat Albert Colorado Blue Spruce	180 CM HT	WB	
QM	13	QUERCUS MACROCARPA	Bur Oak	60 MM CAL	WB	
	73	TOTAL TREES				
SHRUBS						
AA	92	AMELANCHIER ARBOREA	DOWNY SERVICEBERRY	60 CM HT	POTTED	
CR	369	CORNUS RACEMOSA	GRAY DOGWOOD	60 CM HT	POTTED	
HV	71	HAMAMELIS VIRGINIANA	WITCH HAZEL	60 CM HT	POTTED	
PO	416	PHYSOCARPUS OPULIFOLIUS	COMMON NINEBARK	60 CM HT	POTTED	
RA	151	RHUS AROMATICA	FRAGRANT SUMAC	60 CM HT	POTTED	
RG	292	RHUS AROMATICA 'GRO-LOW'	GRO LOW FRAGRANT SUMAC	60 CM HT	POTTED	
RT	72	RHUS TYPHINA	STAGHORN SUMAC	60 CM HT	POTTED	
RO	370	RUBUS ODORATUS	PURPLE FLOWERING RASPBERRY	60 CM HT	POTTED	
SC	104	SAMBUCUS CANADENSIS	AMERICAN ELDER	60 CM HT	POTTED	
VA	259	VIBURNUM ACERIFOLIUM	MAPLE-LEAF VIBURNUM	60 CM HT	POTTED	
	2196	TOTAL SHRUBS				
ORNAMENTAL GRASSES AND PERENNIALS						
AST	324	ASCLEPIAS TUBEROSA	BUTTERFLY MILKWEED	1 GAL	POTTED	
LIS	208	LIATRIS SPICATA	DENSE BLAZINGSTAR	1 GAL	POTTED	
RUH	110	RUDBECKIA HIRTA	BLACK-EYED SUSAN	1 GAL	POTTED	
SCH	118	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	1 GAL	POTTED	
SOR	232	SORGHASTRUM NUTANS	INDIAN GRASS	1 GAL	POTTED	
	992	TOTAL ORNAMENTAL GRASSES AND PERENNIALS				

NURSE CROP

% BY WEIGHT	BOTANICAL NAME	COMMON NAME
50	AVENA SATIVA	OATS
50	FAGOPYRUM ESCULENTUM	BUCKWHEAT
SEEDING RATE = 22 KG / HECTARE		

S-1 SEED MIX (CVC 7 - UPLAND NATIVE MEADOW MIX)

% BY WEIGHT	BOTANICAL NAME	COMMON NAME
10	RUDBECKIA HIRTA	BLACK-EYED SUSAN
1	ASTER CORDIFOLIUS	BLUE WOOD (HEART LEAVED ASTER)
1	ANEMONE CANADENSIS	CANADA ANEMONE
2	SOLIDAGO CANADENSIS	CANADA GOLDENROD
2	ASCLEPIAS SYRIACA	COMMON MILKWEED
25	OENETHERA BIENNIS	EVENING PRIMROSE
1	EUTHAMIA GRAMINIFOLIA	GRASS LEAVED GOLDENROD
15	CAREX GRANULARIS	MEADOW/ OPEN FIELD SEDGE
1	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER
40	ELYMUS RIPARIUS	RIVERBANK WILD RYE
1	CLEMATIS VIRGINIANA	VIRGINS BOWER
1	MONARDA FISTULOSA	WILD BERGAMOT
SEEDING RATE = 25 KG / HECTARE		

S-2 SEED MIX (CVC 3 -VALLEY LAND MIXTURE - SEMI-MOIST)

% BY WEIGHT	BOTANICAL NAME	COMMON NAME
2	GLYCERIA STRIATA	FOWL MANNA GRASS
30	POA PALUSTRIS	FOWL BLUEGRASS
30	CAREX VULPINOIDEA	FOX SEDGE
8	JUNCUS TENUIS	PATH RUSH
30	ELYMUS VIRGINICUS	VIRGINIA WILD RYE
SEEDING RATE = 25 KG / HECTARE		

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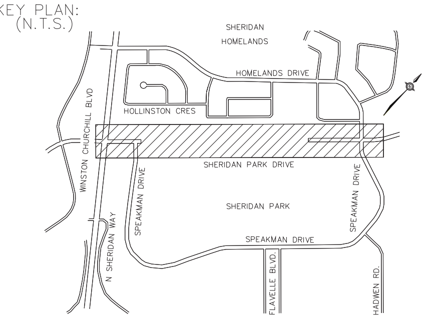

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RJB Project No. 300039474

PRODUCED FOR – T&W, ENGINEERING AND WORKS

SHERIDAN PARK DRIVE EXTENSION PRELIMINARY STREETSCAPE PLAN

SCALE N.T.S.	AREA	PROJECT No. AA–16–136A
DRAWN BY N.H.	CHECKED BY M.G.N.	PLAN No. L6
DATE DECEMBER 2017	SHEET 6 OF 6	

FILEPATH: S:\AA PROJECTS\2016\16-136A SHERIDAN PARK EA\CAD\AA CAD\16-136A LP 2017-12-14.DWG CTB: Acad.ctb PLOTTED:14-Dec-17 2:24 PM

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Appendix O

Stormwater Management Report

Appendix O

Sheridan Park Drive Extension Municipal Class Environmental Assessment

Stormwater Management Report

City of Mississauga

R.J. Burnside & Associates Limited
6990 Creditview Road, Unit 2
Mississauga ON L5N 8R9 CANADA

January 18, 2018
300039474.0000

Distribution List

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Record of Revisions

Revision	Date	Description
0	December 19, 2017	Draft Submission to City
1	January 12, 2018	Second Draft Submission to City and Credit Valley Conservation
2	January 18, 2018	Final Submission to City of Mississauga

R.J. Burnside & Associates Limited

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1.0 Introduction

The City of Mississauga (City) has undertaken a Municipal Class Environmental Assessment (EA) to investigate the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive in the southwestern area of Mississauga. R.J. Burnside & Associates Limited (Burnside) has facilitated the EA on behalf of the City.

The Study has followed a comprehensive planning and design process in order to explore the opportunity to connect the east and west sections of Sheridan Park Drive, improve the road network connectivity in the residential neighbourhood and business area, create options for alternative routes and improve multi-modal network connectivity. The Study has been completed in accordance with the requirements of a Schedule B Undertaking as outlined in the Municipal Engineers Association Municipal Class Environmental Assessment Document (October 2000, as amended 2007, 2011 & 2015), which is an approved process under the *Ontario Environmental Assessment Act.*

As part of the EA Study, Burnside has completed a Stormwater Management Report to provide a stormwater management and conveyance assessment and initial design.

1.1 Description of Study Area

The Study Area is generally bordered by a utility corridor to the north, Winston Churchill Boulevard to the west, Speakman Drive/Homelands Drive to the east and naturalized private lands to the south. The Study Area is illustrated on Figure 1-1. The proposed extension of Sheridan Park Drive falls within the existing City of Mississauga owned right-of-way (ROW), which runs through the centre part of the Study Area.

The Study Area includes a unique combination of uses including the Sheridan Park Corporate Centre (Sheridan Park), a utility corridor that includes a multi-use trail (MUT) and the Sheridan Homelands residential neighbourhood.

Sheridan Park is a 340 acre corporate centre, which is primarily designated Business Employment in the City of Mississauga’s Official Plan (MOP). The majority of Sheridan Park is occupied by private industries and businesses, which include in their landholdings significant natural areas particularly on the north side of corporate centre, within the Study Area. These naturalized areas include two wooded areas that are identified as Significant Natural Areas in the City’s Natural Areas Survey (2016 Update).

Figure 1-1: Study Area

2.0 Design Criteria

The hydrologic and hydraulic design criteria were based on the City design guidelines for a major collector road, and Ministry of the Environment and Climate Change (MOECC) water quality guidelines. The Study Area is also located within the Credit Valley Conservation (CVC) watershed and the Sheridan Creek sub-watershed.

Typically, stormwater quantity control measures are required to ensure post-development peak flow rates do not exceed pre-development levels. For the purposes of this report, the criteria of '1:100-year Post to 1:100-year Pre-development Control' was applied. In this case, the road extension will result in a very minor increase in impervious area, compared to the total drainage area of 185 ha. The hydrologic model results provided in this report show the post-development flows are essentially unchanged from the pre-development condition, without quantity controls (see Section 4.7).

According to Section 3.0, Table 3-1 of the Credit Valley Conservation Stormwater Management Criteria (August 2012), the Flood Control criteria for new development in the Sheridan Creek Watershed is '1:100-year Post to 1:2-year Pre-development Control'. Additional analysis was undertaken applying this criteria. When the stricter controls are applied, there is a storage volume requirement of 590 m^3. The detailed calculations of this additional analysis are provided in Appendix F. Storage containment options within a road right-of-way are somewhat limited. Storage volume may be provided in the form of over-sized storm sewer (i.e., superpipe) or possibly underground storage chambers. These stormwater calculations are preliminary and will be finalized, together with the approach to storing/managing stormwater attributed to the road extension during the detailed design phase of the project. If development has occurred within the tributary catchment between the EA Phase and detailed design phase of the project, the relevant hydrologic parameters will need to be updated. If there are opportunities to combine the flood storage requirement for the Sheridan Park Drive Extension with an adjacent (hydrologically-connected) development where space is less restricted, and the timing is favourable, this is strongly encouraged.

The stormwater management design will also incorporate a Low Impact Development (LID) best practices approach to quality control. The LID feature will also provide some quantity control; however, this has not been quantified in the analysis.

The proposed watercourse crossing has been designed to convey the 1:50-year storm without overtopping the roadway as per City standards.

3.0 Existing Drainage Conditions

Sheridan Park Drive is located within the headwaters area of Sheridan Creek, which empties into Lake Ontario through the Rattray Marsh Conservation Area, approximately 6 km downstream. The channel meanders through a heavily urbanized area of Mississauga.

There are remnants of natural drainage systems within the Study Area, but the area is drained predominantly by engineered drainage systems. Lands to the north have been developed as a residential subdivision, known as Sheridan Homelands. The development of these lands resulted in the conversion of open channels to a combination of storm sewers, to convey minor storms, and overland flow routes in the form of roads, with curbs, and to convey major storm events to a suitable outlet. Based on information provided by the City, minor storm sewer system appears to be based on the 1:10-year storm.

There are two main storm sewer systems which drain the Sheridan Homelands Subdivision through the Study Area. One system drains the westerly portion of the Sheridan Homelands development and the section of Sheridan Park Drive abutting Winston Churchill Boulevard, which currently terminates at Speakman Drive. The system outlets into an open channel via a 1,500 mm dia. storm sewer, roughly 330 m east of Winston Churchill Boulevard, on the south of the Sheridan Park Drive right-of-way.

The second system drains the easterly portion of the Sheridan Homelands development through the Study Area. This system eventually drains into a concrete-lined channel on the south side of the right-of-way, via a 1,650 mm dia. storm sewer. The existing storm sewer systems are illustrated on the Drainage Management Plans.

At the time that these systems were installed, they did not appear to incorporate any type of quantity control or water quality treatment. Today, these systems would include measures such as stormwater management facilities, to prevent flow increases associated with development and also to enhance water quality, prior to discharging to the natural environment.

4.0 Hydrology

4.1 General

In order to ensure that upstream lands are adequately conveyed through the Sheridan Park Drive ROW with the extension in place, a hydrologic analysis was completed. This assessment considers the lands which are presently contributing flows to the undeveloped right-of-way. Once the extent of these areas is delineated, Return Period flows can be generated based on land use, topography and soil type.

The drainage limits of each catchment have been determined based on topographic survey contours. In general, existing topographic features indicate that overland sheet flow occurs from the northwest to southeast, perpendicular to the road ROW. Several minor drainage features begin within the Study Area, which ultimately convey flows to the Sheridan Creek.

It is assumed a portion of the existing rear yards within the Study Area will drain overland towards the Sheridan Park Drive ROW. In addition to the overland flow, two storm sewer outlets for the subdivision cross through the ROW. These sewers are assumed to convey the minor 1:10-year storm from the subdivision. This assumption is to be confirmed in conjunction with the completion of the EA. The remaining major runoff not captured by the subdivision storm sewer system will drain across the Sheridan Park Drive ROW.

A Drainage Area Plan is included in Appendix A of this report.

4.2 Soil Conditions

According to the Peel County soil map, prepared for the Department of Agriculture in 1953, the predominant soil is Trafalgar Clay. A hydrologic soil group of D was chosen as the most representative for all catchment areas. The Runoff Curve Numbers for the individual drainage areas were computed by calculating weighted curve numbers based on the corresponding land use and soil type. A summary of these calculations for each drainage area is included in Appendix B. The hydrologic soil groups were determined in accordance with the Ontario Ministry of Transportation (MTO) soil classification system, and is in agreement with the Draft Geotechnical Investigation (November 17, 2017), prepared by Peto MacCallum Ltd. Consulting Engineers in support of the proposed extension.

4.3 Land Use Patterns

Each catchment area was subdivided into meadow/field and wooded land uses based on the aerial photography illustrated in the Drainage Management Plans included in the back pocket of this report.

4.4 Hydrologic Model

The hydrologic model Visual OTTHYMO 3.0 was used to assess peak flows for each drainage area. OTTHYMO is recognized throughout the industry and by various ministries as being an effective method by which runoff can be determined based on topography, soil conditions and land use. Due to the nature of this drainage area and the relatively low imperious level of each catchment, the NASHYD command was used to assess peak flows. NASHYD is used for rural catchments.

DUHYD commands are used in the model to represent the split in the minor (piped 1:10-year) and major flow within the Sheridan Homelands development.

4.5 Time of Concentration

The City's standard minimum initial time of concentration is 15 minutes, however, calculated values are used in this analysis to account for the site-specific conditions. The areas containing the road extension are relatively pervious, and would not be expected to have a standard urban concentration time. The external areas are very large and therefore have much longer concentration times. The time of concentration is a function of "time to peak" which represents the time from the beginning of rainfall to the peak of the runoff hydrograph. It is indicative of the basin response to storm events. It depends on the physical characteristics of the watershed such as length, slope, area and surface cover. Estimates of time to peak were determined using the catchment area time of concentration by computing the travel time across the catchment. The required flow lengths and slopes were determined from the topographic mapping. The Airport Method was used where the runoff coefficient is less than 0.40, and the Bransby-Williams Formula for higher runoff coefficients. A detailed summary of all hydrologic calculations is included in Appendix B.

4.6 Rainfall Data

City of Mississauga intensity-duration frequency curves (Standard 2111.010) for the 4-hour Chicago and 24-hour SCS Type II rainfall distributions were used for the 2 to 100-year storm event calculations.

When comparing flows generated by the 4 and 24-hour storm distributions, the 24-hour storm was determined to generate the highest peak flows. As such the 24-hour SCS storm distribution was used for design purposes.

4.7 Hydrologic Results

Using the site drainage areas as illustrated in the Drainage Plan Figure and the program OTTHYMO, the total flows were determined for the 2 to 100-year storms. These flows are summarized in Table 4-1 below. The OTTHYMO runs for the 24-hour SCS storm distribution can be found in Appendix C.

Table 4-1: Existing Peak Flows at Outlet Locations

Outlet Location & Catchment Areas		Area (ha)	Existing Peak Flows (24-hour SCS Storm Distribution)					
			2-yr (m^3/s)	**5-yr (m^3/s)**	**10-yr (m^3/s)**	**25-yr (m^3/s)**	**50-yr (m^3/s)**	**100-yr (m^3/s)**
A	101 & 301	64.84	1.66	2.76	3.85	4.74	5.58	6.51
B	102 to 105 & 302 Major	4.86 + 112.64(major)	0.19	0.32	0.45	0.90	1.88	2.85
C	106 & 302 Minor	3.23 + 112.64(minor)	1.74	2.88	4.01	4.15	4.24	4.35
TOTAL 101 to 106 & 301 to 302		**185.57***	**3.16**	**5.27**	**7.35**	**9.05**	**10.68**	**12.47**

*Total Area calculation counts Catchment 302 once, i.e. 64.84+4.86+3.23+112.64 = 185.57 ha.

Table 4-2: Proposed Peak Flows at Outlet Locations

Outlet Location & Catchment Areas		Area (ha)	Proposed Peak Flows (24-hour SCS Storm Distribution)					
			2-yr (m^3/s)	**5-yr (m^3/s)**	**10-yr (m^3/s)**	**25-yr (m^3/s)**	**50-yr (m^3/s)**	**100-yr (m^3/s)**
A	201 & 301	64.84	1.67	2.78	3.87	4.76	5.61	6.54
B	202 to 204 & 302 Major	4.31 + 112.64(major)	0.23	0.38	0.52	0.97	1.85	2.82
C	205 to 206 & 302 Minor	3.78 + 112.64(minor)	1.74	2.89	4.01	4.15	4.28	4.39
TOTAL 101 to 106 & 301 to 302		**185.57***	**3.15**	**5.24**	**7.30**	**9.00**	**10.61**	**12.38**

*Total Area calculation counts Catchment 302 once, i.e. 64.84+4.31+3.78+112.64 = 185.57 ha.

As presented in Tables 4-1 and 4-2, the anticipated increases in peak flows are essentially unchanged from the existing condition. Therefore, it is proposed that quantity control facilities will not be provided. The clay soils beneath the study area are also not suitable for infiltrating large areas of surface runoff.

5.0 Hydraulics

5.1 General

Station 0+840 has been identified as a location where the proposed road extension will interrupt an existing drainage feature. A culvert will be required to maintain this existing flow condition. As noted in Section 2.0, the culvert will be sized to convey the 1:50-year storm in accordance with City of Mississauga design standards.

Within the road, catchbasins are proposed at low points and at regular intervals to maintain the City's standard minimum spacing of 90 m. Where feasible, proposed catchbasins will discharge to the existing storm sewers from the adjacent subdivisions. A review of the capacity of these existing sewers will be required at the detailed design stage to ensure adequate capacity. Where it is not feasible to connect into an existing storm sewer, new storm sewers are provided.

5.2 Hydraulic Modeling

The software program HY-8, has been used to analyze culvert hydraulics at the proposed crossing location. HY-8 is derived by the United States Federal Highway Administration and is recognized throughout the industry and by various ministries as being an effective method by which culvert hydraulics can be analyzed. The tailwater data was estimated based on available survey information and contour data for the downstream watercourse.

5.3 Proposed Culvert Hydraulics

The maximum conveyance capacity for the culvert was calculated based on the culvert diameter, the headwater elevation and the tailwater conditions. The headwater elevation was determined based on the elevation at which road overtopping will occur (the nearest sag).

Peak flow rates estimated in the hydrologic study (Section 4.0) were used to determine an approximate Return Period capacity.

A summary of the proposed culvert dimensions and capacities is provided in Table 5-1 below. Detailed HY-8 hydraulic modelling for proposed conditions is included in Appendix D.

Table 5-1: Sheridan Park Drive Proposed Culvert Capacity Summary

Crossing	Culvert Description	Roadway Elevation (m)	Peak Flow without Overtopping (m^3/s)	1:50-year Flow (m^3/s)
0+840	1.8 m span x 0.9 m rise concrete box culvert	148.25	2.32	1.79

As illustrated in Table 5-1, the proposed culvert has sufficient capacity to convey the 1:50-year flow without overtopping the proposed road centerline.

6.0 Water Quality

6.1 Enhanced Quality Control

The proposed roadway extension will have a very minor impact on the water quality; however, MOE criteria for “enhanced” water quality is required, where possible, prior to discharge into any watercourse or the natural environment. Given the site restrictions noted in Section 4.7, there are minimal opportunities to provide water quality control. As a best efforts approach, the eastern horizontal deflection (median) will be constructed as a bioretention filter and infiltration facility. This bioretention area is illustrated on the Drainage Management Plans provided in the back pocket of this report. This facility is proposed to treat a catchment area of approximately 3.13 ha, with 17% imperviousness (catchment areas 202 and 203). Minor runoff from the road ROW and tributary external area will enter the bioretention area through the proposed storm sewer system. Excess runoff which cannot be infiltrated will drain through a piped outlet to the existing channel crossing near Station 0+740. Major runoff will overflow to the east, following the slope of the road to a low point near Station 0+840.

Using the CVC/TRCA Low Impact Development Planning and Design Guide – Bioretention Fact Sheet (see Appendix E) as a basis for design, the following criteria have been considered:

- Surface area of roughly 550 m^2 provides a surface area to impervious drainage area ratio of 10.6, which is within the recommended 5:1 to 15:1 ratio.
- Based on Table 3.2 of the 2003 MOE SWMP&D Manual, the required infiltration volume to satisfy an ‘enhanced’ level of treatment is 20 m^3/ha, or 62 m^3 (for catchment area of 3.13 ha). The current design calls for 300 mm thick layer of clear stone, with a void ratio of 40% which will provide an infiltration storage volume of 65 m^3. Due to the underlying clay soils, a subdrain will be provided.
- A small parking area is included in the design to accommodate a light-duty maintenance vehicle.

6.2 Water Balance

A water balance analysis ensures efforts are made to maintain existing ground infiltration amounts which may be reduced as a result of the proposed hardened surface. Site conditions are not ideal for infiltration, however, the bioretention area described in Section 6.1 will provide the best available opportunity to achieve water balance volumes.

The minimum City and CVC criteria for erosion protection is to detain the first 5mm of runoff on-site. The minimum CVC water balance criteria is to infiltrate the first 3mm of runoff. These targets are not cumulative, therefore, the 5mm runoff governs in this case. A more comprehensive water balance design may be necessary at detailed design.

The total proposed impervious area is approximately 8,000 m^2. Therefore, the 5mm runoff volume is equal to 40 m^3. As detailed in Section 6.1, the proposed bioretention area is designed to have an infiltration storage volume of 65 m^3. This provided volume relates to a runoff depth of 8mm. Additional volume will also be provided in the 250mm vegetated ponding area above the infiltration gallery, which provides an opportunity for evapotranspiration.

7.0 Sediment and Erosion Controls

As part of the 50% Detailed Design Completion of the project, detailed, phased Erosion and Sediment Control Plans will be provided. The Erosion and Sediment Control Plans will include all necessary siltation control fence and designed in accordance with the current city of Mississauga guideline and the TRCA's / CVC Erosion and Sediment Control Guidelines for Urban Construction (2006).

Below is a list of recommended erosion and sediment control measure that may be installed and maintained during construction of the subject site:

- Temporary sediment control fence, and a tree protection fence if required will be installed prior to grading or any earth work;
- Flow check dams, where necessary, to reduce velocity;
- Controlled access during construction to reduce mud trafficking;
- Use of Mud Mats and nightly clean-up of roads to prevent migration of sediment into City streets;
- Employ on-site Sediment and Erosion Control inspectors to ensure that erosion control practices are adhered to and any breaches are repaired immediately;
- Complete monthly Inspection reports.

8.0 Recommendations and Conclusions

This Stormwater Management Report has been prepared in support of Sheridan Park Drive Schedule B Class EA Study for the proposed extension of Sheridan Park Drive between Homelands Drive and Speakman Drive, in the City of Mississauga. A preliminary hydrologic and hydraulic analysis was completed to ensure that upstream lands are adequately conveyed through the right-of-way following the construction of the extension.

The proposed roadway extension does not alter the runoff potential for the catchment studied and, as a result, no mitigative quantity control measures are proposed for peak flows.

A ‘best efforts’ approach is proposed to address impacts to water quality which are, again, anticipated to be minimal. Nonetheless, a relatively large portion of the new road will be directed to a bioretention area, located within one of horizontal deflection medians. Runoff, which cannot be treated and infiltrated at this location, will be intercepted by an overflow system and directed to an existing drainage feature.

The bioretention area is designed to accommodate parking for a light-duty maintenance vehicle.

Detailed, phased Erosion and Sediment Control Plans will accompany the 50% Design Complete submission.

Appendix A

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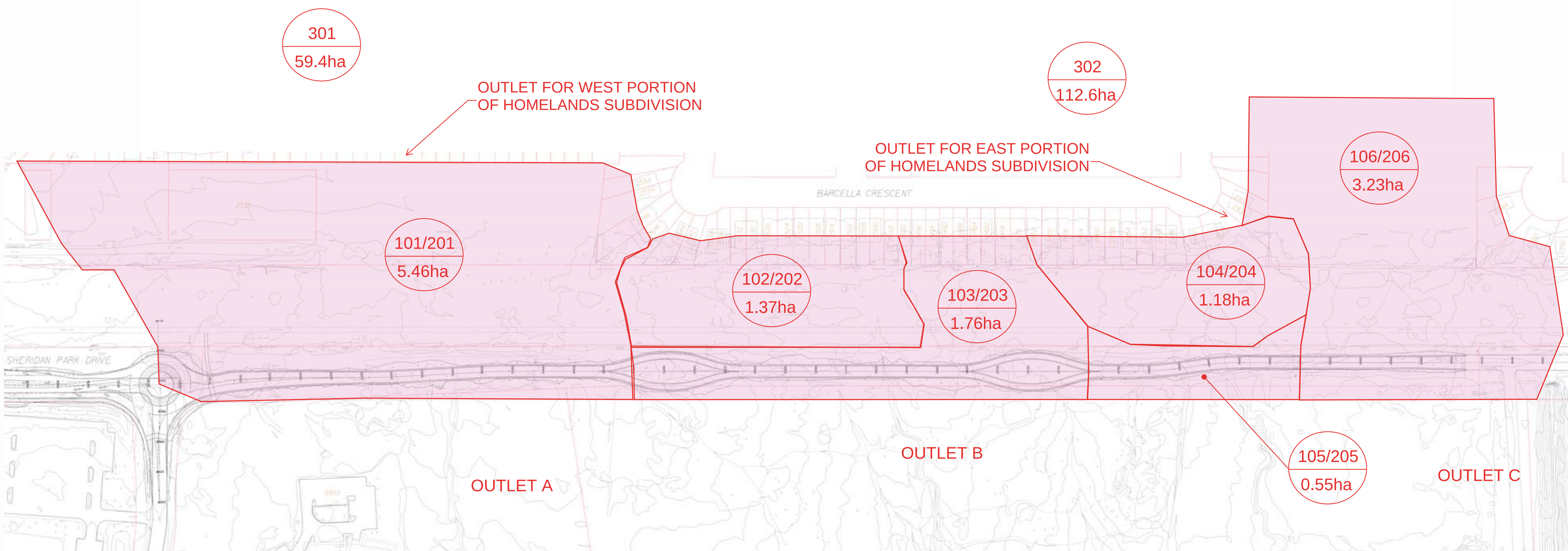
Appendix A

Drainage Area Plan



SERVICE DATA

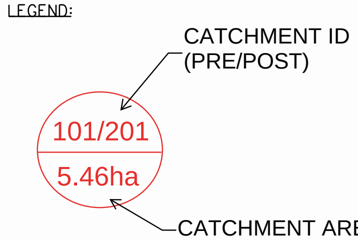
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN:
(N.T.S.)

LEGEND:



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SHERIDAN PARK DRIVE EXTENSION

DRAINAGE AREA PLAN

SCALE 1:3000	AREA	PROJECT No.
DRAWN BY H.F.	CHECKED BY H.F.	PLAN No.
DATE DECEMBER 2017	SHEET 1 OF 1	

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Appendix B

Hydrologic Model Data

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OTTHYMO MODEL DATA - PRE-DEVELOPMENT NASHYD COMMANDS

Project: Sheridan Park Drive Extension
Project No: 300039474

By: H. Faulkner
Date: 18-Dec-17

Catchment	Area (ha)	L (m)	S (%)	CN	IA (mm)	t_p (hr)	DT (min)
101	*5.46*	*300*	*1.2*	80	5.9	0.47	6
102	*1.37*	*165*	*1.5*	82	5.5	0.29	4
103	*1.76*	*160*	*1.6*	81	5.8	0.30	4
104	*1.18*	*130*	*2.7*	82	5.5	0.22	3
105	*0.55*	*80*	*1.9*	80	6.0	0.21	3
106	*3.23*	*220*	*1.7*	81	5.8	0.35	4
301	*59.38*	*1200*	*0.6*	83	5.4	0.56	7
302	*112.64*	*2500*	*0.5*	83	5.4	1.13	14
Total Area	185.57						

Catchment	Landscaped Area (ha)	Impervious Area (ha)	Impervious Percentag (%)	Weighted		
				CN	IA (mm)	C
101	*5.31*	*0.15*	*3*	80.5	5.9	0.32
102	*1.20*	*0.17*	*12*	82.2	5.5	0.38
103	*1.66*	*0.10*	*6*	81.0	5.8	0.34
104	*1.04*	*0.14*	*12*	82.1	5.5	0.38
105	*0.55*	*0.00*	*0*	80.0	6.0	0.30
106	*3.07*	*0.16*	*5*	80.9	5.8	0.33
301	*50.23*	*9.15*	*15*	82.8	5.4	0.40
302	*95.24*	*17.40*	*15*	82.8	5.4	0.40

Summarize Site Conditions Below (soil, land use, etc)

Trafalgar Clay Group D

Land Use or Surface	CN	IA (mm)	C
Landscaped	*80*	*6*	*0.30*
Impervious	*98*	*2*	*0.95*

Airport Equation (When C < 0.40)

$$Tc = 3.26 \times (1.1 - C) \times L^{0.50} \times Sw^{-0.33}$$

Bransby-Williams Formula (When C > 0.40)

$$Tc = 0.057 \times L \times Sw^{-0.20} \times A^{-0.10}$$

Catchment	Equation	Tc (minutes)	Tp (2/3 Tc) (minutes)	Tp (hours)
101	Airport	41.97	27.98	0.47
102	Airport	26.30	17.53	0.29
103	Airport	27.18	18.12	0.30
104	Airport	19.38	12.92	0.22
105	Airport	18.96	12.64	0.21
106	Airport	31.15	20.77	0.35
301	Bransby-Williams	50.36	33.57	0.56
302	Bransby-Williams	102.06	68.04	1.13

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OTTHYMO MODEL DATA - POST-DEVELOPMENT NASHYD COMMANDS

Project: Sheridan Park Drive Extension
Project No: 300039474

By: H. Faulkner
Date: 18-Dec-17

Catchment	Area (ha)	L (m)	S (%)	CN	IA (mm)	t_p (hr)	DT (min)
201	*5.46*	*300*	*1.2*	81	5.7	0.45	5
202	*1.37*	*165*	*1.5*	82	5.5	0.29	4
203	*1.76*	*160*	*1.6*	84	5.2	0.09	2
204	*1.18*	*130*	*2.7*	82	5.5	0.22	3
205	*0.55*	*80*	*1.9*	84	5.1	0.05	2
206	*3.23*	*220*	*1.7*	82	5.6	0.33	4
301	*59.38*	*1200*	*0.6*	83	5.4	0.25	3
302	*112.64*	*2500*	*0.5*	83	5.4	0.26	3
Total Area	185.57						

Catchment	Landscaped Area (ha)	Impervious Area (ha)	Impervious Percentag (%)	Weighted		
				CN	IA (mm)	C
201	*5.03*	*0.43*	*8*	81.4	5.7	0.35
202	*1.20*	*0.17*	*12*	82.2	5.5	0.38
203	*1.39*	*0.37*	*21*	83.8	5.2	0.44
204	*1.04*	*0.14*	*12*	82.1	5.5	0.38
205	*0.42*	*0.13*	*23*	84.1	5.1	0.45
206	*2.92*	*0.31*	*10*	81.7	5.6	0.36
301	*50.23*	*9.15*	*15*	82.8	5.4	0.40
302	*95.24*	*17.40*	*15*	82.8	5.4	0.40

Summarize Site Conditions Below (soil, land use, etc)

Trafalgar Clay Group D

Land Use or Surface	CN	IA (mm)	C
Landscaped	*80*	*6*	*0.30*
Impervious	*98*	*2*	*0.95*

Airport Equation (When C < 0.40)

$$Tc = 3.26 \times (1.1 - C) \times L^{0.50} \times Sw^{-0.33}$$

Bransby-Williams Formula (When C > 0.40)

$$Tc = 0.057 \times L \times Sw^{-0.20} \times A^{-0.10}$$

Catchment	Equation	Tc (minutes)	Tp (2/3 Tc) (minutes)	Tp (hours)
201	Airport	40.19	26.79	0.45
202	Airport	26.30	17.53	0.29
203	Bransby-Williams	7.88	5.26	0.09
204	Airport	19.38	12.92	0.22
205	Bransby-Williams	4.27	2.85	0.05
206	Airport	29.90	19.94	0.33
301	Bransby-Williams	50.36	33.57	0.56
302	Bransby-Williams	102.06	68.04	1.13

[The Difference is our People]

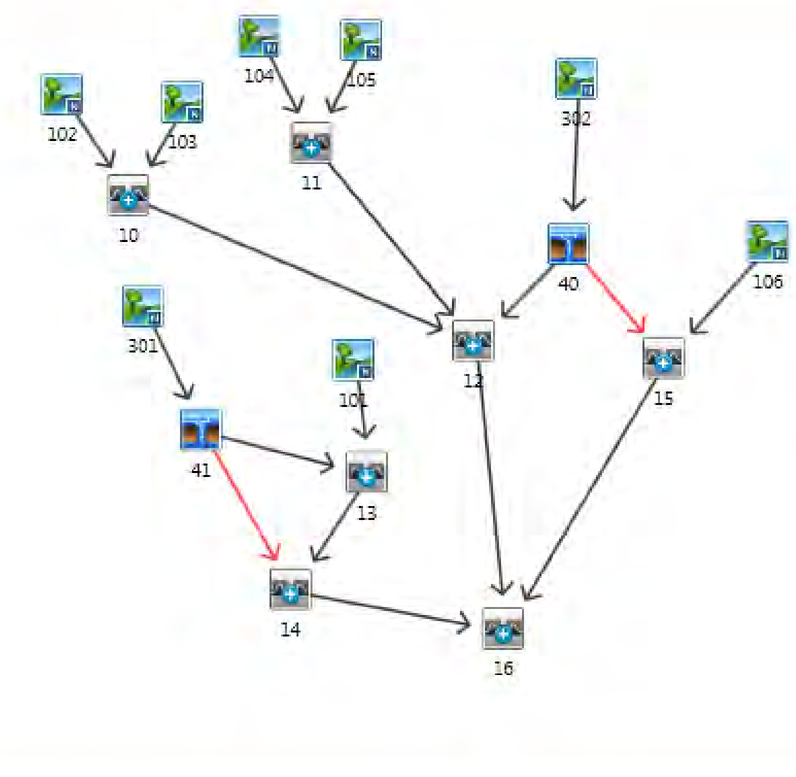
Appendix C

OTTHYMO Model Output

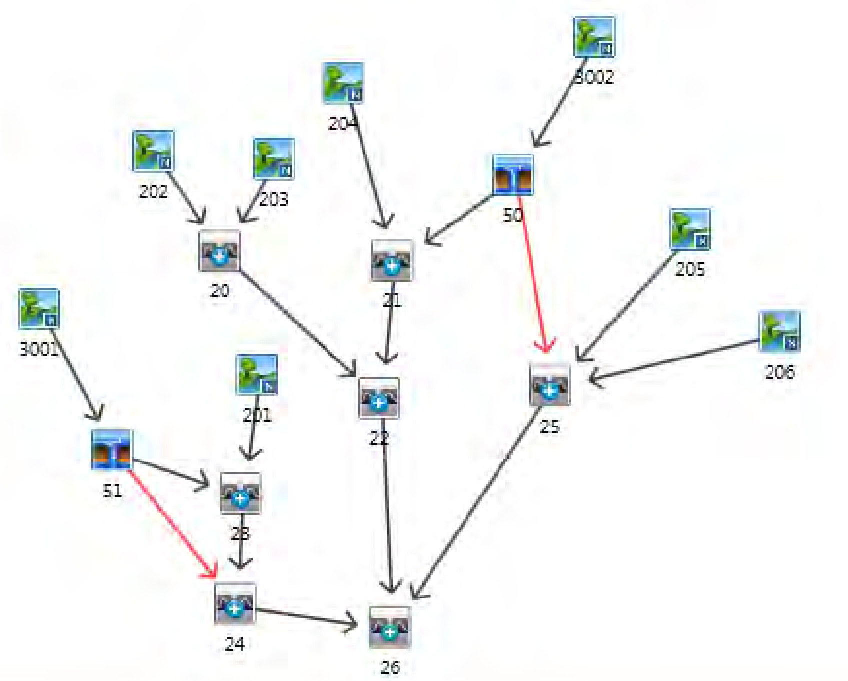
Appendix C

OTTHYMO SCHEMATIC

PRE-DEVELOPMENT



POST-DEVELOPMENT



```
=========================================================================================
=================

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Civica Infrastructure
```


```
Copyright 2007 - 2013 Civica Infrastructure
All rights reserved.
```


```
                   *****  S U M M A R Y   O U T P U T  *****


  Input   filename: C:\Program Files (x86)\VO Suite 3.0\VO2\voin.dat
  Output  filename: C:\Users\hfaulkner\AppData\Local\Temp\5d386156-70e4-411f-bad3-
2103062fc1ea\Scenario.out
  Summary filename: C:\Users\hfaulkner\AppData\Local\Temp\5d386156-70e4-411f-bad3-
2103062fc1ea\Scenario.sum


DATE: 12/18/2017                           TIME: 12:05:33

USER:


COMMENTS: ____________________________________________________________


  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
      MASS STORM                  12.0
      [ Ptot= 50.20 mm ]
*
  **  CALIB NASHYD       0101  1  6.0    5.46    0.14 12.40  18.20 0.36   0.000
      [CN=80.0         ]
      [ N = 3.0:Tp 0.47]
*
  **  CALIB NASHYD       0301  1  5.0   59.38    1.53 12.50  20.73 0.41   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 0.56]
*
      DUHYD              0041  1  5.0   59.38    1.53 12.50  20.73  n/a   0.000
         MAJOR SYSTEM:   0041  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0041  3  5.0   59.38    1.53 12.50  20.73  n/a   0.000
*
      ADD [0101 + 0041]  0013  3  6.0    5.46    0.14 12.40  18.20  n/a   0.000
*
      ADD [0013 + 0041]  0014  3  5.0   64.84    1.66 12.42  20.52  n/a   0.000
*
  **  CALIB NASHYD       0102  1  4.0    1.37    0.05 12.20  19.89 0.40   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.29]
*
  **  CALIB NASHYD       0103  1  4.0    1.76    0.06 12.20  18.96 0.38   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.30]
*
      ADD [0102 + 0103]  0010  3  4.0    3.13    0.12 12.20  19.36  n/a   0.000
*
  **  CALIB NASHYD       0104  1  3.0    1.18    0.06 12.10  19.89 0.40   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.22]
*
  **  CALIB NASHYD       0105  1  3.0    0.55    0.02 12.10  18.13 0.36   0.000
      [CN=80.0         ]
      [ N = 3.0:Tp 0.21]
*
      ADD [0104 + 0105]  0011  3  3.0    1.73    0.08 12.10  19.33  n/a   0.000
*
  **  CALIB NASHYD       0302  1  5.0  112.64    1.71 13.08  20.73 0.41   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 1.13]
*
      DUHYD              0040  1  5.0  112.64    1.71 13.08  20.73  n/a   0.000
         MAJOR SYSTEM:   0040  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0040  3  5.0  112.64    1.71 13.08  20.73  n/a   0.000
*
      ADD [0010 + 0011]  0012  3  3.0    4.86    0.19 12.15  19.35  n/a   0.000
*
      ADD [0012 + 0040]  0012  1  3.0    4.86    0.19 12.15  19.35  n/a   0.000
*
  **  CALIB NASHYD       0106  1  4.0    3.23    0.11 12.27  18.96 0.38   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.35]
*
      ADD [0106 + 0040]  0015  3  4.0  115.87    1.74 13.07  20.68  n/a   0.000
*
      ADD [0012 + 0014]  0016  3  3.0   69.70    1.79 12.40  20.43  n/a   0.000
*
      ADD [0016 + 0015]  0016  1  3.0  185.57    3.16 12.60  20.59  n/a   0.000
*
  **  CALIB NASHYD       0205  1  2.0    0.55    0.05 12.00  21.51 0.43   0.000
      [CN=84.0         ]
      [ N = 3.0:Tp 0.05]
*
  **  CALIB NASHYD       0206  1  4.0    3.23    0.12 12.20  19.82 0.39   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.33]
*
  **  CALIB NASHYD       3002  1  5.0  112.64    1.71 13.08  20.73 0.41   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 1.13]
*
      DUHYD              0050  1  5.0  112.64    1.71 13.08  20.73  n/a   0.000
         MAJOR SYSTEM:   0050  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0050  3  5.0  112.64    1.71 13.08  20.73  n/a   0.000
*
      ADD [0205 + 0206]  0025  3  2.0    3.78    0.13 12.00  20.06  n/a   0.000
*
      ADD [0025 + 0050]  0025  1  2.0  116.42    1.74 13.10  20.71  n/a   0.000
*
  **  CALIB NASHYD       0201  1  5.0    5.46    0.15 12.33  19.02 0.38   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.45]
*
  **  CALIB NASHYD       3001  1  5.0   59.38    1.53 12.50  20.73 0.41   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 0.56]
*
      DUHYD              0051  1  5.0   59.38    1.53 12.50  20.73  n/a   0.000
         MAJOR SYSTEM:   0051  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0051  3  5.0   59.38    1.53 12.50  20.73  n/a   0.000
*
      ADD [0201 + 0051]  0023  3  5.0    5.46    0.15 12.33  19.02  n/a   0.000
*
      ADD [0023 + 0051]  0024  3  5.0   64.84    1.67 12.42  20.58  n/a   0.000
*
  **  CALIB NASHYD       0203  1  2.0    1.76    0.14 12.00  21.66 0.43   0.000
      [CN=84.0         ]
      [ N = 3.0:Tp 0.09]
*
  **  CALIB NASHYD       0202  1  4.0    1.37    0.05 12.20  19.89 0.40   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.29]
*
      ADD [0202 + 0203]  0020  3  2.0    3.13    0.18 12.03  20.88  n/a   0.000
*
  **  CALIB NASHYD       0204  1  3.0    1.18    0.06 12.10  19.89 0.40   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.22]
*
      ADD [0204 + 0050]  0021  3  3.0    1.18    0.06 12.10  19.89  n/a   0.000
*
      ADD [0020 + 0021]  0022  3  2.0    4.31    0.23 12.03  20.61  n/a   0.000
*
      ADD [0022 + 0024]  0026  3  2.0   69.15    1.76 12.43  20.59  n/a   0.000
*
      ADD [0026 + 0025]  0026  1  2.0  185.57    3.15 12.60  20.66  n/a   0.000
*
  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************

  W/E COMMAND             HYD ID   DT     AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                   min     ha   '  cms   hrs     mm          cms

      START @  0.00 hrs
      --------------------
      MASS STORM                  12.0
      [ Ptot= 67.50 mm ]
*
  **  CALIB NASHYD       0101  1  6.0    5.46    0.23 12.30  30.33 0.45   0.000
      [CN=80.0         ]
      [ N = 3.0:Tp 0.47]
*
  **  CALIB NASHYD       0301  1  5.0   59.38    2.53 12.42  33.79 0.50   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 0.56]
*
      DUHYD              0041  1  5.0   59.38    2.53 12.42  33.79  n/a   0.000
         MAJOR SYSTEM:   0041  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0041  3  5.0   59.38    2.53 12.42  33.79  n/a   0.000
*
      ADD [0101 + 0041]  0013  3  6.0    5.46    0.23 12.30  30.33  n/a   0.000
*
      ADD [0013 + 0041]  0014  3  5.0   64.84    2.76 12.42  33.50  n/a   0.000
*
  **  CALIB NASHYD       0102  1  4.0    1.37    0.09 12.13  32.64 0.48   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.29]
*
  **  CALIB NASHYD       0103  1  4.0    1.76    0.11 12.20  31.38 0.46   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.30]
*
      ADD [0102 + 0103]  0010  3  4.0    3.13    0.20 12.20  31.93  n/a   0.000
*
  **  CALIB NASHYD       0104  1  3.0    1.18    0.09 12.10  32.64 0.48   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.22]
*
  **  CALIB NASHYD       0105  1  3.0    0.55    0.04 12.10  30.25 0.45   0.000
      [CN=80.0         ]
      [ N = 3.0:Tp 0.21]
*
      ADD [0104 + 0105]  0011  3  3.0    1.73    0.13 12.10  31.88  n/a   0.000
*
  **  CALIB NASHYD       0302  1  5.0  112.64    2.84 13.08  33.79 0.50   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 1.13]
*
      DUHYD              0040  1  5.0  112.64    2.84 13.08  33.79  n/a   0.000
         MAJOR SYSTEM:   0040  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0040  3  5.0  112.64    2.84 13.08  33.79  n/a   0.000
*
      ADD [0010 + 0011]  0012  3  3.0    4.86    0.32 12.15  31.91  n/a   0.000
*
      ADD [0012 + 0040]  0012  1  3.0    4.86    0.32 12.15  31.91  n/a   0.000
*
  **  CALIB NASHYD       0106  1  4.0    3.23    0.18 12.20  31.39 0.46   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.35]
*
      ADD [0106 + 0040]  0015  3  4.0  115.87    2.88 13.07  33.72  n/a   0.000
*
      ADD [0012 + 0014]  0016  3  3.0   69.70    2.97 12.40  33.39  n/a   0.000
*
      ADD [0016 + 0015]  0016  1  3.0  185.57    5.27 12.60  33.60  n/a   0.000
*
  **  CALIB NASHYD       0205  1  2.0    0.55    0.08 12.00  34.74 0.51   0.000
      [CN=84.0         ]
      [ N = 3.0:Tp 0.05]
*
  **  CALIB NASHYD       0206  1  4.0    3.23    0.19 12.20  32.56 0.48   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.33]
*
  **  CALIB NASHYD       3002  1  5.0  112.64    2.84 13.08  33.79 0.50   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 1.13]
*
      DUHYD              0050  1  5.0  112.64    2.84 13.08  33.79  n/a   0.000
         MAJOR SYSTEM:   0050  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0050  3  5.0  112.64    2.84 13.08  33.79  n/a   0.000
*
      ADD [0205 + 0206]  0025  3  2.0    3.78    0.21 12.00  32.88  n/a   0.000
*
      ADD [0025 + 0050]  0025  1  2.0  116.42    2.89 13.07  33.76  n/a   0.000
*
  **  CALIB NASHYD       0201  1  5.0    5.46    0.25 12.33  31.46 0.47   0.000
      [CN=81.0         ]
      [ N = 3.0:Tp 0.45]
*
  **  CALIB NASHYD       3001  1  5.0   59.38    2.53 12.42  33.79 0.50   0.000
      [CN=83.0         ]
      [ N = 3.0:Tp 0.56]
*
      DUHYD              0051  1  5.0   59.38    2.53 12.42  33.79  n/a   0.000
         MAJOR SYSTEM:   0051  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
         MINOR SYSTEM:   0051  3  5.0   59.38    2.53 12.42  33.79  n/a   0.000
*
      ADD [0201 + 0051]  0023  3  5.0    5.46    0.25 12.33  31.46  n/a   0.000
*
      ADD [0023 + 0051]  0024  3  5.0   64.84    2.78 12.42  33.59  n/a   0.000
*
  **  CALIB NASHYD       0203  1  2.0    1.76    0.22 12.00  35.02 0.52   0.000
      [CN=84.0         ]
      [ N = 3.0:Tp 0.09]
*
  **  CALIB NASHYD       0202  1  4.0    1.37    0.09 12.13  32.64 0.48   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.29]
*
      ADD [0202 + 0203]  0020  3  2.0    3.13    0.29 12.00  33.98  n/a   0.000
*
  **  CALIB NASHYD       0204  1  3.0    1.18    0.09 12.10  32.64 0.48   0.000
      [CN=82.0         ]
      [ N = 3.0:Tp 0.22]
*
      ADD [0204 + 0050]  0021  3  3.0    1.18    0.09 12.10  32.64  n/a   0.000
```

```
*
     ADD [0020 + 0021]  0022  3  2.0    4.31    0.38 12.03  33.61  n/a   0.000
*
     ADD [0022 + 0024]  0026  3  2.0   69.15    2.92 12.40  33.60  n/a   0.000
*
     ADD [0026 + 0025]  0026  1  2.0  185.57    5.24 12.60  33.70  n/a   0.000
*
 ***************************
 ** SIMULATION NUMBER:   3 **
 ***************************

 W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha  '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
     MASS STORM                  12.0
     [ Ptot= 83.20 mm ]
*
 **  CALIB NASHYD       0101  1  6.0    5.46    0.33 12.30  42.43 0.51   0.000
     [CN=80.0        ]
     [ N = 3.0:Tp 0.47]
*
 **  CALIB NASHYD       0301  1  5.0   59.38    3.52 12.42  46.62 0.56   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0041  1  5.0   59.38    3.52 12.42  46.62  n/a   0.000
        MAJOR SYSTEM:   0041  2  5.0    0.00    0.00 12.42  46.62  n/a   0.000
        MINOR SYSTEM:   0041  3  5.0   59.38    3.52 12.42  46.62  n/a   0.000
*
     ADD [0101 + 0041]  0013  3  5.0    5.46    0.33 12.33  42.43  n/a   0.000
*
     ADD [0013 + 0041]  0014  3  5.0   64.84    3.85 12.42  46.27  n/a   0.000
*
 **  CALIB NASHYD       0102  1  4.0    1.37    0.12 12.13  45.23 0.54   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.29]
*
 **  CALIB NASHYD       0103  1  4.0    1.76    0.15 12.20  43.73 0.53   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.30]
*
     ADD [0102 + 0103]  0010  3  4.0    3.13    0.27 12.13  44.38  n/a   0.000
*
 **  CALIB NASHYD       0104  1  3.0    1.18    0.13 12.10  45.23 0.54   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.22]
*
 **  CALIB NASHYD       0105  1  3.0    0.55    0.06 12.10  42.35 0.51   0.000
     [CN=80.0        ]
     [ N = 3.0:Tp 0.21]
*
     ADD [0104 + 0105]  0011  3  3.0    1.73    0.19 12.10  44.31  n/a   0.000
*
 **  CALIB NASHYD       0302  1  5.0  112.64    3.95 13.08  46.62 0.56   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0040  1  5.0  112.64    3.95 13.08  46.62  n/a   0.000
        MAJOR SYSTEM:   0040  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
        MINOR SYSTEM:   0040  3  5.0  112.64    3.95 13.08  46.62  n/a   0.000
*
     ADD [0010 + 0011]  0012  3  3.0    4.86    0.45 12.15  44.36  n/a   0.000
*
     ADD [0012 + 0040]  0012  1  3.0    4.86    0.45 12.15  44.36  n/a   0.000
*
 **  CALIB NASHYD       0106  1  4.0    3.23    0.25 12.20  43.73 0.53   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.35]
*
     ADD [0106 + 0040]  0015  3  4.0  115.87    4.01 13.07  46.54  n/a   0.000
*
     ADD [0012 + 0014]  0016  3  3.0   69.70    4.14 12.40  46.14  n/a   0.000
*
     ADD [0016 + 0015]  0016  1  3.0  185.57    7.35 12.60  46.39  n/a   0.000
*
 **  CALIB NASHYD       0205  1  2.0    0.55    0.11 12.00  47.67 0.57   0.000
     [CN=84.0        ]
     [ N = 3.0:Tp 0.05]
*
 **  CALIB NASHYD       0206  1  4.0    3.23    0.27 12.20  45.15 0.54   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.33]
*
 **  CALIB NASHYD       3002  1  5.0  112.64    3.95 13.08  46.62 0.56   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0050  1  5.0  112.64    3.95 13.08  46.62  n/a   0.000
        MAJOR SYSTEM:   0050  2  5.0    0.00    0.00  0.00   0.00  n/a   0.000
        MINOR SYSTEM:   0050  3  5.0  112.64    3.95 13.08  46.62  n/a   0.000
*
     ADD [0205 + 0206]  0025  3  2.0    3.78    0.30 12.00  45.52  n/a   0.000
*
     ADD [0025 + 0050]  0025  1  2.0  116.42    4.01 13.07  46.59  n/a   0.000
*
 **  CALIB NASHYD       0201  1  5.0    5.46    0.35 12.33  43.81 0.53   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.45]
*
 **  CALIB NASHYD       3001  1  5.0   59.38    3.52 12.42  46.62 0.56   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0051  1  5.0   59.38    3.52 12.42  46.62  n/a   0.000
        MAJOR SYSTEM:   0051  2  5.0    0.00    0.00 12.42  46.62  n/a   0.000
        MINOR SYSTEM:   0051  3  5.0   59.38    3.52 12.42  46.62  n/a   0.000
*
     ADD [0201 + 0051]  0023  3  5.0    5.46    0.35 12.33  43.81  n/a   0.000
*
     ADD [0023 + 0051]  0024  3  5.0   64.84    3.87 12.42  46.39  n/a   0.000
*
 **  CALIB NASHYD       0203  1  2.0    1.76    0.31 12.00  48.08 0.58   0.000
     [CN=84.0        ]
     [ N = 3.0:Tp 0.09]
*
 **  CALIB NASHYD       0202  1  4.0    1.37    0.12 12.13  45.23 0.54   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.29]
*
     ADD [0202 + 0203]  0020  3  2.0    3.13    0.40 12.00  46.83  n/a   0.000
*
 **  CALIB NASHYD       0204  1  3.0    1.18    0.13 12.10  45.23 0.54   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.22]
*
     ADD [0204 + 0050]  0021  3  3.0    1.18    0.13 12.10  45.23  n/a   0.000
*
     ADD [0020 + 0021]  0022  3  2.0    4.31    0.52 12.03  46.39  n/a   0.000
*
     ADD [0022 + 0024]  0026  3  2.0   69.15    4.06 12.40  46.39  n/a   0.000
*
     ADD [0026 + 0025]  0026  1  2.0  185.57    7.30 12.60  46.51  n/a   0.000
*
 ***************************
 ** SIMULATION NUMBER:   4 **
 ***************************

 W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha  '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
     MASS STORM                  12.0
     [ Ptot= 95.50 mm ]
*
 **  CALIB NASHYD       0101  1  6.0    5.46    0.41 12.30  52.43 0.55   0.000
     [CN=80.0        ]
     [ N = 3.0:Tp 0.47]
*
 **  CALIB NASHYD       0301  1  5.0   59.38    4.33 12.42  57.12 0.60   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0041  1  5.0   59.38    4.33 12.42  57.12  n/a   0.000
        MAJOR SYSTEM:   0041  2  5.0    2.10    0.81 12.42  57.12  n/a   0.000
        MINOR SYSTEM:   0041  3  5.0   57.28    3.52 12.17  57.12  n/a   0.000
*
     ADD [0101 + 0041]  0013  3  5.0    7.56    1.22 12.42  53.73  n/a   0.000
*
     ADD [0013 + 0041]  0014  3  5.0   64.84    4.74 12.42  56.72  n/a   0.000
*
 **  CALIB NASHYD       0102  1  4.0    1.37    0.15 12.13  55.56 0.58   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.29]
*
 **  CALIB NASHYD       0103  1  4.0    1.76    0.19 12.20  53.89 0.56   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.30]
*
     ADD [0102 + 0103]  0010  3  4.0    3.13    0.34 12.13  54.62  n/a   0.000
*
 **  CALIB NASHYD       0104  1  3.0    1.18    0.16 12.10  55.56 0.58   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.22]
*
 **  CALIB NASHYD       0105  1  3.0    0.55    0.07 12.10  52.34 0.55   0.000
     [CN=80.0        ]
     [ N = 3.0:Tp 0.21]
*
     ADD [0104 + 0105]  0011  3  3.0    1.73    0.23 12.10  54.54  n/a   0.000
*
 **  CALIB NASHYD       0302  1  5.0  112.64    4.85 13.08  57.12 0.60   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0040  1  5.0  112.64    4.85 13.08  57.12  n/a   0.000
        MAJOR SYSTEM:   0040  2  5.0    4.70    0.90 13.08  57.12  n/a   0.000
        MINOR SYSTEM:   0040  3  5.0  107.94    3.95 12.58  57.12  n/a   0.000
*
     ADD [0010 + 0011]  0012  3  3.0    4.86    0.56 12.15  54.59  n/a   0.000
*
     ADD [0012 + 0040]  0012  1  3.0    9.56    0.99 13.05  55.83  n/a   0.000
*
 **  CALIB NASHYD       0106  1  4.0    3.23    0.31 12.20  53.89 0.56   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.35]
*
     ADD [0106 + 0040]  0015  3  4.0  111.17    4.15 12.60  57.02  n/a   0.000
*
     ADD [0012 + 0014]  0016  3  3.0   74.40    5.09 12.40  56.61  n/a   0.000
*
     ADD [0016 + 0015]  0016  1  3.0  185.57    9.05 12.60  56.86  n/a   0.000
*
 **  CALIB NASHYD       0205  1  2.0    0.55    0.13 12.00  58.21 0.61   0.000
     [CN=84.0        ]
     [ N = 3.0:Tp 0.05]
*
 **  CALIB NASHYD       0206  1  4.0    3.23    0.33 12.20  55.48 0.58   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.33]
*
 **  CALIB NASHYD       3002  1  5.0  112.64    4.85 13.08  57.12 0.60   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0050  1  5.0  112.64    4.85 13.08  57.12  n/a   0.000
        MAJOR SYSTEM:   0050  2  5.0    4.70    0.90 13.08  57.12  n/a   0.000
        MINOR SYSTEM:   0050  3  5.0  107.94    3.95 12.58  57.12  n/a   0.000
*
     ADD [0205 + 0206]  0025  3  2.0    3.78    0.37 12.00  55.88  n/a   0.000
*
     ADD [0025 + 0050]  0025  1  2.0  111.72    4.15 12.60  57.08  n/a   0.000
*
 **  CALIB NASHYD       0201  1  5.0    5.46    0.44 12.33  53.98 0.57   0.000
     [CN=81.0        ]
     [ N = 3.0:Tp 0.45]
*
 **  CALIB NASHYD       3001  1  5.0   59.38    4.33 12.42  57.12 0.60   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0051  1  5.0   59.38    4.33 12.42  57.12  n/a   0.000
        MAJOR SYSTEM:   0051  2  5.0    2.10    0.81 12.42  57.12  n/a   0.000
        MINOR SYSTEM:   0051  3  5.0   57.28    3.52 12.17  57.12  n/a   0.000
*
     ADD [0201 + 0051]  0023  3  5.0    7.56    1.24 12.42  54.85  n/a   0.000
*
     ADD [0023 + 0051]  0024  3  5.0   64.84    4.76 12.42  56.85  n/a   0.000
*
 **  CALIB NASHYD       0203  1  2.0    1.76    0.37 12.00  58.73 0.61   0.000
     [CN=84.0        ]
     [ N = 3.0:Tp 0.09]
*
 **  CALIB NASHYD       0202  1  4.0    1.37    0.15 12.13  55.56 0.58   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.29]
*
     ADD [0202 + 0203]  0020  3  2.0    3.13    0.49 12.00  57.34  n/a   0.000
*
 **  CALIB NASHYD       0204  1  3.0    1.18    0.16 12.10  55.56 0.58   0.000
     [CN=82.0        ]
     [ N = 3.0:Tp 0.22]
*
     ADD [0204 + 0050]  0021  3  3.0    5.88    0.92 13.05  56.79  n/a   0.000
*
     ADD [0020 + 0021]  0022  3  2.0    9.01    0.97 13.03  56.98  n/a   0.000
*
     ADD [0022 + 0024]  0026  3  2.0   73.85    4.99 12.40  56.87  n/a   0.000
*
     ADD [0026 + 0025]  0026  1  2.0  185.57    9.00 12.57  56.99  n/a   0.000
*
 ***************************
 ** SIMULATION NUMBER:   5 **
 ***************************

 W/E COMMAND             HYD ID   DT    AREA  ' Qpeak Tpeak   R.V. R.C.   Qbase
                                  min     ha  '  cms   hrs     mm          cms

     START @  0.00 hrs
     --------------------
     MASS STORM                  12.0
     [ Ptot=107.00 mm ]
*
 **  CALIB NASHYD       0101  1  6.0    5.46    0.49 12.30  62.09 0.58   0.000
     [CN=80.0        ]
     [ N = 3.0:Tp 0.47]
*
 **  CALIB NASHYD       0301  1  5.0   59.38    5.10 12.42  67.19 0.63   0.000
     [CN=83.0        ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0041  1  5.0   59.38    5.10 12.42  67.19  n/a   0.000
        MAJOR SYSTEM:   0041  2  5.0    4.63    1.58 12.42  67.19  n/a   0.000
        MINOR SYSTEM:   0041  3  5.0   54.75    3.52 12.17  67.19  n/a   0.000
```

```
*
     ADD [0101 + 0041]  0013  3  5.0   10.09    2.06 12.42  64.43  n/a   0.000
*
     ADD [0013 + 0041]  0014  3  5.0   64.84    5.58 12.42  66.76  n/a   0.000
*
  ** CALIB NASHYD       0102  1  4.0    1.37    0.18 12.13  65.50 0.61   0.000
     [CN=82.0         ]
     [ N = 3.0:Tp 0.29]
*
  ** CALIB NASHYD       0103  1  4.0    1.76    0.22 12.13  63.69 0.60   0.000
     [CN=81.0         ]
     [ N = 3.0:Tp 0.30]
*
     ADD [0102 + 0103]  0010  3  4.0    3.13    0.40 12.13  64.48  n/a   0.000
*
  ** CALIB NASHYD       0104  1  3.0    1.18    0.19 12.10  65.50 0.61   0.000
     [CN=82.0         ]
     [ N = 3.0:Tp 0.22]
*
  ** CALIB NASHYD       0105  1  3.0    0.55    0.08 12.10  62.00 0.58   0.000
     [CN=80.0         ]
     [ N = 3.0:Tp 0.21]
*
     ADD [0104 + 0105]  0011  3  3.0    1.73    0.27 12.10  64.39  n/a   0.000
*
  ** CALIB NASHYD       0302  1  5.0  112.64    5.72 13.08  67.19 0.63   0.000
     [CN=83.0         ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0040  1  5.0  112.64    5.72 13.08  67.19  n/a   0.000
        MAJOR SYSTEM:   0040  2  5.0   10.38    1.77 13.08  67.19  n/a   0.000
        MINOR SYSTEM:   0040  3  5.0  102.26    3.95 12.42  67.19  n/a   0.000
*
     ADD [0010 + 0011]  0012  3  3.0    4.86    0.66 12.15  64.45  n/a   0.000
*
     ADD [0012 + 0040]  0012  1  3.0   15.24    1.88 13.00  66.33  n/a   0.000
*
  ** CALIB NASHYD       0106  1  4.0    3.23    0.37 12.20  63.69 0.60   0.000
     [CN=81.0         ]
     [ N = 3.0:Tp 0.35]
*
     ADD [0106 + 0040]  0015  3  4.0  105.49    4.24 12.47  67.09  n/a   0.000
*
     ADD [0012 + 0014]  0016  3  3.0   80.08    6.50 12.60  66.68  n/a   0.000
*
     ADD [0016 + 0015]  0016  1  3.0  185.57   10.68 12.60  66.91  n/a   0.000
*
  ** CALIB NASHYD       0205  1  2.0    0.55    0.15 12.00  68.30 0.64   0.000
     [CN=84.0         ]
     [ N = 3.0:Tp 0.05]
*
  ** CALIB NASHYD       0206  1  4.0    3.23    0.39 12.20  65.42 0.61   0.000
     [CN=82.0         ]
     [ N = 3.0:Tp 0.33]
*
  ** CALIB NASHYD       3002  1  5.0  112.64    5.72 13.08  67.19 0.63   0.000
     [CN=83.0         ]
     [ N = 3.0:Tp 1.13]
*
     DUHYD              0050  1  5.0  112.64    5.72 13.08  67.19  n/a   0.000
        MAJOR SYSTEM:   0050  2  5.0   10.38    1.77 13.08  67.19  n/a   0.000
        MINOR SYSTEM:   0050  3  5.0  102.26    3.95 12.42  67.19  n/a   0.000
*
     ADD [0205 + 0206]  0025  3  2.0    3.78    0.43 12.00  65.84  n/a   0.000
*
     ADD [0025 + 0050]  0025  1  2.0  106.04    4.28 12.43  67.14  n/a   0.000
*
  ** CALIB NASHYD       0201  1  5.0    5.46    0.52 12.33  63.78 0.60   0.000
     [CN=81.0         ]
     [ N = 3.0:Tp 0.45]
*
  ** CALIB NASHYD       3001  1  5.0   59.38    5.10 12.42  67.19 0.63   0.000
     [CN=83.0         ]
     [ N = 3.0:Tp 0.56]
*
     DUHYD              0051  1  5.0   59.38    5.10 12.42  67.19  n/a   0.000
        MAJOR SYSTEM:   0051  2  5.0    4.63    1.58 12.42  67.19  n/a   0.000
        MINOR SYSTEM:   0051  3  5.0   54.75    3.52 12.17  67.19  n/a   0.000
*
     ADD [0201 + 0051]  0023  3  5.0   10.09    2.09 12.42  65.34  n/a   0.000
*
     ADD [0023 + 0051]  0024  3  5.0   64.84    5.61 12.42  66.90  n/a   0.000
*
  ** CALIB NASHYD       0203  1  2.0    1.76    0.43 12.00  68.92 0.64   0.000
     [CN=84.0         ]
     [ N = 3.0:Tp 0.09]
*
  ** CALIB NASHYD       0202  1  4.0    1.37    0.18 12.13  65.50 0.61   0.000
     [CN=82.0         ]
     [ N = 3.0:Tp 0.29]
*
     ADD [0202 + 0203]  0020  3  2.0    3.13    0.58 12.00  67.42  n/a   0.000
*
  ** CALIB NASHYD       0204  1  3.0    1.18    0.19 12.10  65.50 0.61   0.000
     [CN=82.0         ]
     [ N = 3.0:Tp 0.22]
*
     ADD [0204 + 0050]  0021  3  3.0   11.56    1.79 13.05  67.04  n/a   0.000
*
     ADD [0020 + 0021]  0022  3  2.0   14.69    1.85 13.03  67.12  n/a   0.000
*
     ADD [0022 + 0024]  0026  3  2.0   79.53    6.42 12.60  66.94  n/a   0.000
*
     ADD [0026 + 0025]  0026  1  2.0  185.57   10.61 12.60  67.06  n/a   0.000
*
 FINISH

==========================================================================================
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```

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=========================================================================================
=================

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
```

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```
                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\VO Suite 3.0\VO2\voin.dat
  Output  filename: C:\Users\hfaulkner\AppData\Local\Temp\c8936e73-3aee-421a-9fb0-
4bfc97ff0070\Scenario.out
  Summary filename: C:\Users\hfaulkner\AppData\Local\Temp\c8936e73-3aee-421a-9fb0-
4bfc97ff0070\Scenario.sum


DATE: 12/18/2017                           TIME: 12:02:31

USER:


COMMENTS: ____________________________________________________________


-----------------------------------------------------------------------------------------
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  ***************************
  ** SIMULATION NUMBER:   6 **
  ***************************

--------------------
| MASS STORM         |    Filename: C:\Users\hfaulkner\AppD
|                    |              ata\Local\Temp\
|                    |              c8936e73-3aee-421a-9fb0-4bfc97ff0070\6d3a9bd3
| Ptotal=119.40 mm   |    Comments: 24-HR SCS Type II
--------------------

                          Duration of storm    = 24.00 hrs
                          Mass curve time step = 12.00 min

                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.20    1.19 |  6.20    2.15 | 12.20   21.25 | 18.20    2.09
                 0.40    1.25 |  6.40    2.27 | 12.40   15.88 | 18.40    2.09
                 0.60    1.25 |  6.60    2.27 | 12.60   10.87 | 18.60    1.97
                 0.80    1.25 |  6.80    2.27 | 12.80    9.19 | 18.80    1.97
                 1.00    1.31 |  7.00    2.39 | 13.00    7.88 | 19.00    1.85
                 1.20    1.31 |  7.20    2.39 | 13.20    6.93 | 19.20    1.85
                 1.40    1.37 |  7.40    2.51 | 13.40    6.33 | 19.40    1.79
                 1.60    1.37 |  7.60    2.51 | 13.60    5.61 | 19.60    1.67
                 1.80    1.37 |  7.80    2.51 | 13.80    5.13 | 19.80    1.61
                 2.00    1.43 |  8.00    2.63 | 14.00    4.66 | 20.00    1.61
                 2.20    1.43 |  8.20    2.75 | 14.20    4.36 | 20.20    1.55
                 2.40    1.49 |  8.40    2.99 | 14.40    4.12 | 20.40    1.55
                 2.60    1.49 |  8.60    3.22 | 14.60    4.00 | 20.60    1.49
                 2.80    1.49 |  8.80    3.46 | 14.80    3.88 | 20.80    1.49
                 3.00    1.55 |  9.00    3.70 | 15.00    3.64 | 21.00    1.49
                 3.20    1.55 |  9.20    3.82 | 15.20    3.52 | 21.20    1.49
                 3.40    1.61 |  9.40    3.82 | 15.40    3.28 | 21.40    1.49
                 3.60    1.61 |  9.60    3.88 | 15.60    3.16 | 21.60    1.49
                 3.80    1.61 |  9.80    4.18 | 15.80    3.04 | 21.80    1.43
                 4.00    1.67 | 10.00    4.60 | 16.00    2.81 | 22.00    1.43
                 4.20    1.67 | 10.20    5.07 | 16.20    2.69 | 22.20    1.43
                 4.40    1.79 | 10.40    5.61 | 16.40    2.69 | 22.40    1.43
                 4.60    1.79 | 10.60    6.27 | 16.60    2.63 | 22.60    1.37
                 4.80    1.79 | 10.80    7.16 | 16.80    2.51 | 22.80    1.37
                 5.00    1.91 | 11.00    8.12 | 17.00    2.51 | 23.00    1.37
                 5.20    1.91 | 11.20    9.73 | 17.20    2.39 | 23.20    1.37
                 5.40    2.03 | 11.40   12.06 | 17.40    2.33 | 23.40    1.37
                 5.60    2.03 | 11.60   21.07 | 17.60    2.33 | 23.60    1.37
                 5.80    2.03 | 11.80   74.03 | 17.80    2.21 | 23.80    1.31
                 6.00    2.15 | 12.00  138.62 | 18.00    2.21 | 24.00    1.31

-----------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD    (0101) |    Area    (ha)=   5.46   Curve Number   (CN)= 80.0
|ID= 1 DT= 6.0 min |    Ia      (mm)=   5.90   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.47

         NOTE:  RAINFALL WAS TRANSFORMED TO   6.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.100    1.19 | 6.100    2.15 |12.100   21.25 | 18.10    2.09
                0.200    1.19 | 6.200    2.15 |12.200   21.25 | 18.20    2.09
                0.300    1.25 | 6.300    2.27 |12.300   15.88 | 18.30    2.09
                0.400    1.25 | 6.400    2.27 |12.400   15.88 | 18.40    2.09
                0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
                0.600    1.25 | 6.600    2.27 |12.600   10.87 | 18.60    1.97
                0.700    1.25 | 6.700    2.27 |12.700    9.19 | 18.70    1.97
                0.800    1.25 | 6.800    2.27 |12.800    9.19 | 18.80    1.97
                0.900    1.31 | 6.900    2.39 |12.900    7.88 | 18.90    1.85
                1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
                1.100    1.31 | 7.100    2.39 |13.100    6.93 | 19.10    1.85
                1.200    1.31 | 7.200    2.39 |13.200    6.93 | 19.20    1.85
                1.300    1.37 | 7.300    2.51 |13.300    6.33 | 19.30    1.79
                1.400    1.37 | 7.400    2.51 |13.400    6.33 | 19.40    1.79
                1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
                1.600    1.37 | 7.600    2.51 |13.600    5.61 | 19.60    1.67
                1.700    1.37 | 7.700    2.51 |13.700    5.13 | 19.70    1.61
                1.800    1.37 | 7.800    2.51 |13.800    5.13 | 19.80    1.61
                1.900    1.43 | 7.900    2.63 |13.900    4.66 | 19.90    1.61
                2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
                2.100    1.43 | 8.100    2.75 |14.100    4.36 | 20.10    1.55
                2.200    1.43 | 8.200    2.75 |14.200    4.36 | 20.20    1.55
                2.300    1.49 | 8.300    2.98 |14.300    4.12 | 20.30    1.55
                2.400    1.49 | 8.400    2.99 |14.400    4.12 | 20.40    1.55
                2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
                2.600    1.49 | 8.600    3.22 |14.600    4.00 | 20.60    1.49
                2.700    1.49 | 8.700    3.46 |14.700    3.88 | 20.70    1.49
                2.800    1.49 | 8.800    3.46 |14.800    3.88 | 20.80    1.49
                2.900    1.55 | 8.900    3.70 |14.900    3.64 | 20.90    1.49
                3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
                3.100    1.55 | 9.100    3.82 |15.100    3.52 | 21.10    1.49
                3.200    1.55 | 9.200    3.82 |15.200    3.52 | 21.20    1.49
                3.300    1.61 | 9.300    3.82 |15.300    3.28 | 21.30    1.49
                3.400    1.61 | 9.400    3.82 |15.400    3.28 | 21.40    1.49
                3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
                3.600    1.61 | 9.600    3.88 |15.600    3.16 | 21.60    1.49
                3.700    1.61 | 9.700    4.18 |15.700    3.04 | 21.70    1.43
                3.800    1.61 | 9.800    4.18 |15.800    3.04 | 21.80    1.43
                3.900    1.67 | 9.900    4.60 |15.900    2.81 | 21.90    1.43
                4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
                4.100    1.67 |10.100    5.07 |16.100    2.69 | 22.10    1.43
                4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20    1.43
                4.300    1.79 |10.300    5.61 |16.300    2.69 | 22.30    1.43
                4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40    1.43
                4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
                4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60    1.37
                4.700    1.79 |10.700    7.16 |16.700    2.51 | 22.70    1.37
                4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80    1.37
                4.900    1.91 |10.900    8.12 |16.900    2.51 | 22.90    1.37
                5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
                5.100    1.91 |11.100    9.73 |17.100    2.39 | 23.10    1.37
                5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20    1.37
                5.300    2.03 |11.300   12.06 |17.300    2.33 | 23.30    1.37
                5.400    2.03 |11.400   12.06 |17.400    2.33 | 23.40    1.37
                5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
                5.600    2.03 |11.600   21.08 |17.600    2.33 | 23.60    1.37
                5.700    2.03 |11.700   74.03 |17.700    2.21 | 23.70    1.31
                5.800    2.03 |11.800   74.03 |17.800    2.21 | 23.80    1.31
                5.900    2.15 |11.900  138.62 |17.900    2.21 | 23.90    1.31
                6.000    2.15 |12.000  138.61 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.444

     PEAK FLOW       (cms)=   0.575 (i)
     TIME TO PEAK    (hrs)=  12.300
     RUNOFF VOLUME    (mm)=  72.771
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.609

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB              |
| NASHYD    (0301) |    Area    (ha)=  59.38   Curve Number   (CN)= 83.0
|ID= 1 DT= 5.0 min |    Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.56

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    1.19 | 6.083    2.15 |12.083   21.27 | 18.08    2.09
                0.167    1.19 | 6.167    2.15 |12.167   21.25 | 18.17    2.09
                0.250    1.23 | 6.250    2.22 |12.250   18.03 | 18.25    2.09
                0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
                0.417    1.25 | 6.417    2.27 |12.417   14.88 | 18.42    2.07
                0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
                0.583    1.25 | 6.583    2.27 |12.583   10.87 | 18.58    1.97
                0.667    1.25 | 6.667    2.27 |12.667    9.53 | 18.67    1.97
                0.750    1.25 | 6.750    2.27 |12.750    9.19 | 18.75    1.97
                0.833    1.28 | 6.833    2.32 |12.833    8.67 | 18.83    1.92
                0.917    1.31 | 6.917    2.39 |12.917    7.88 | 18.92    1.85
                1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
                1.083    1.31 | 7.083    2.39 |13.083    6.93 | 19.08    1.85
                1.167    1.31 | 7.167    2.39 |13.167    6.93 | 19.17    1.85
                1.250    1.35 | 7.250    2.46 |13.250    6.57 | 19.25    1.81
                1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33    1.79
                1.417    1.37 | 7.417    2.51 |13.417    6.19 | 19.42    1.77
                1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
                1.583    1.37 | 7.583    2.51 |13.583    5.61 | 19.58    1.67
                1.667    1.37 | 7.667    2.51 |13.667    5.23 | 19.67    1.62
                1.750    1.37 | 7.750    2.51 |13.750    5.13 | 19.75    1.61
                1.833    1.40 | 7.833    2.56 |13.833    4.94 | 19.83    1.61
                1.917    1.43 | 7.917    2.63 |13.917    4.66 | 19.92    1.61
                2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
                2.083    1.43 | 8.083    2.75 |14.083    4.36 | 20.08    1.55
                2.167    1.43 | 8.167    2.75 |14.167    4.36 | 20.17    1.55
                2.250    1.47 | 8.250    2.89 |14.250    4.21 | 20.25    1.55
                2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33    1.55
                2.417    1.49 | 8.417    3.03 |14.417    4.10 | 20.42    1.54
                2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
                2.583    1.49 | 8.583    3.22 |14.583    4.00 | 20.58    1.49
                2.667    1.49 | 8.667    3.41 |14.667    3.90 | 20.67    1.49
                2.750    1.49 | 8.750    3.46 |14.750    3.88 | 20.75    1.49
                2.833    1.52 | 8.833    3.56 |14.833    3.79 | 20.83    1.49
                2.917    1.55 | 8.917    3.70 |14.917    3.64 | 20.92    1.49
                3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
                3.083    1.55 | 9.083    3.82 |15.083    3.52 | 21.08    1.49
                3.167    1.55 | 9.167    3.82 |15.167    3.52 | 21.17    1.49
                3.250    1.59 | 9.250    3.82 |15.250    3.38 | 21.25    1.49
                3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33    1.49
                3.417    1.61 | 9.417    3.83 |15.417    3.26 | 21.42    1.49
                3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
                3.583    1.61 | 9.583    3.88 |15.583    3.16 | 21.58    1.49
                3.667    1.61 | 9.667    4.12 |15.667    3.07 | 21.67    1.44
                3.750    1.61 | 9.750    4.18 |15.750    3.04 | 21.75    1.43
                3.833    1.64 | 9.833    4.35 |15.833    2.95 | 21.83    1.43
                3.917    1.67 | 9.917    4.60 |15.917    2.81 | 21.92    1.43
                4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
                4.083    1.67 |10.083    5.07 |16.083    2.69 | 22.08    1.43
                4.167    1.67 |10.167    5.07 |16.167    2.69 | 22.17    1.43
                4.250    1.74 |10.250    5.40 |16.250    2.69 | 22.25    1.43
                4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
                4.417    1.79 |10.417    5.74 |16.417    2.67 | 22.42    1.42
                4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
                4.583    1.79 |10.583    6.27 |16.583    2.63 | 22.58    1.37
                4.667    1.79 |10.667    6.98 |16.667    2.53 | 22.67    1.37
                4.750    1.79 |10.750    7.16 |16.750    2.51 | 22.75    1.37
                4.833    1.84 |10.833    7.55 |16.833    2.51 | 22.83    1.37
                4.917    1.91 |10.917    8.12 |16.917    2.51 | 22.92    1.37
                5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
                5.083    1.91 |11.083    9.73 |17.083    2.39 | 23.08    1.37
                5.167    1.91 |11.167    9.73 |17.167    2.39 | 23.17    1.37
                5.250    1.98 |11.250   11.13 |17.250    2.35 | 23.25    1.37
                5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
                5.417    2.03 |11.417   13.86 |17.417    2.33 | 23.42    1.37
                5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
                5.583    2.03 |11.583   21.07 |17.583    2.33 | 23.58    1.37
                5.667    2.03 |11.667   63.43 |17.667    2.23 | 23.67    1.33
                5.750    2.03 |11.750   74.03 |17.750    2.21 | 23.75    1.31
                5.833    2.08 |11.833   99.86 |17.833    2.21 | 23.83    1.31
                5.917    2.15 |11.917  138.62 |17.917    2.21 | 23.92    1.31
                6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   4.050

     PEAK FLOW       (cms)=   5.950 (i)
     TIME TO PEAK    (hrs)=  12.417
     RUNOFF VOLUME    (mm)=  78.276
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.656

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| DUHYD     (0041) |
| Inlet Cap.=3.520 |
| #of Inlets=    1 |
| Total(cms)=  3.5 |      AREA      QPEAK      TPEAK    R.V.
--------------------      (ha)      (cms)      (hrs)    (mm)
     TOTAL HYD.(ID= 1):  59.38       5.95      12.42   78.28
     ======================================================
     MAJOR SYS.(ID= 2):   7.20       2.43      12.42   78.28
     MINOR SYS.(ID= 3):  52.18       3.52      12.08   78.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0013) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0101):     5.46   0.575    12.30    72.77
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      + ID2= 2 (0041):     7.20   2.430    12.42    78.28
        ================================================
        ID = 3 (0013):    12.66   2.992    12.42    75.90

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0014) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0013):     12.66   2.992    12.42    75.90
      + ID2= 2 (0041):     52.18   3.520    12.08    78.28
        ================================================
        ID = 3 (0014):     64.84   6.512    12.42    77.81

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0102) |    Area     (ha)=   1.37   Curve Number   (CN)= 82.0
|ID= 1 DT= 4.0 min |    Ia       (mm)=   5.50   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.29

        NOTE:  RAINFALL WAS TRANSFORMED TO   4.0 MIN. TIME STEP.


                               ---- TRANSFORMED HYETOGRAPH ----
                  TIME     RAIN | TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                   hrs    mm/hr |   hrs   mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                 0.067     1.19 | 6.067    2.15 |12.067    21.27 | 18.07    2.09
                 0.133     1.19 | 6.133    2.15 |12.133    21.25 | 18.13    2.09
                 0.200     1.19 | 6.200    2.15 |12.200    21.25 | 18.20    2.09
                 0.267     1.25 | 6.267    2.27 |12.267    15.88 | 18.27    2.09
                 0.333     1.25 | 6.333    2.27 |12.333    15.88 | 18.33    2.09
                 0.400     1.25 | 6.400    2.27 |12.400    15.88 | 18.40    2.09
                 0.467     1.25 | 6.467    2.27 |12.467    10.87 | 18.47    1.97
                 0.533     1.25 | 6.533    2.27 |12.533    10.87 | 18.53    1.97
                 0.600     1.25 | 6.600    2.27 |12.600    10.87 | 18.60    1.97
                 0.667     1.25 | 6.667    2.27 |12.667     9.19 | 18.67    1.97
                 0.733     1.25 | 6.733    2.27 |12.733     9.19 | 18.73    1.97
                 0.800     1.25 | 6.800    2.27 |12.800     9.19 | 18.80    1.97
                 0.867     1.31 | 6.867    2.39 |12.867     7.88 | 18.87    1.85
                 0.933     1.31 | 6.933    2.39 |12.933     7.88 | 18.93    1.85
                 1.000     1.31 | 7.000    2.39 |13.000     7.88 | 19.00    1.85
                 1.067     1.31 | 7.067    2.39 |13.067     6.93 | 19.07    1.85
                 1.133     1.31 | 7.133    2.39 |13.133     6.93 | 19.13    1.85
                 1.200     1.31 | 7.200    2.39 |13.200     6.93 | 19.20    1.85
                 1.267     1.37 | 7.267    2.51 |13.267     6.33 | 19.27    1.79
                 1.333     1.37 | 7.333    2.51 |13.333     6.33 | 19.33    1.79
                 1.400     1.37 | 7.400    2.51 |13.400     6.33 | 19.40    1.79
                 1.467     1.37 | 7.467    2.51 |13.467     5.61 | 19.47    1.67
                 1.533     1.37 | 7.533    2.51 |13.533     5.61 | 19.53    1.67
                 1.600     1.37 | 7.600    2.51 |13.600     5.61 | 19.60    1.67
                 1.667     1.37 | 7.667    2.51 |13.667     5.13 | 19.67    1.61
                 1.733     1.37 | 7.733    2.51 |13.733     5.13 | 19.73    1.61
                 1.800     1.37 | 7.800    2.51 |13.800     5.13 | 19.80    1.61
                 1.867     1.43 | 7.867    2.63 |13.867     4.66 | 19.87    1.61
                 1.933     1.43 | 7.933    2.63 |13.933     4.66 | 19.93    1.61
                 2.000     1.43 | 8.000    2.63 |14.000     4.66 | 20.00    1.61
                 2.067     1.43 | 8.067    2.75 |14.067     4.36 | 20.07    1.55
                 2.133     1.43 | 8.133    2.75 |14.133     4.36 | 20.13    1.55
                 2.200     1.43 | 8.200    2.75 |14.200     4.36 | 20.20    1.55
                 2.267     1.49 | 8.267    2.98 |14.267     4.12 | 20.27    1.55
                 2.333     1.49 | 8.333    2.99 |14.333     4.12 | 20.33    1.55
                 2.400     1.49 | 8.400    2.99 |14.400     4.12 | 20.40    1.55
                 2.467     1.49 | 8.467    3.22 |14.467     4.00 | 20.47    1.49
                 2.533     1.49 | 8.533    3.22 |14.533     4.00 | 20.53    1.49
                 2.600     1.49 | 8.600    3.22 |14.600     4.00 | 20.60    1.49
                 2.667     1.49 | 8.667    3.46 |14.667     3.88 | 20.67    1.49
                 2.733     1.49 | 8.733    3.46 |14.733     3.88 | 20.73    1.49
                 2.800     1.49 | 8.800    3.46 |14.800     3.88 | 20.80    1.49
                 2.867     1.55 | 8.867    3.70 |14.867     3.64 | 20.87    1.49
                 2.933     1.55 | 8.933    3.70 |14.933     3.64 | 20.93    1.49
                 3.000     1.55 | 9.000    3.70 |15.000     3.64 | 21.00    1.49
                 3.067     1.55 | 9.067    3.82 |15.067     3.52 | 21.07    1.49
                 3.133     1.55 | 9.133    3.82 |15.133     3.52 | 21.13    1.49
                 3.200     1.55 | 9.200    3.82 |15.200     3.52 | 21.20    1.49
                 3.267     1.61 | 9.267    3.82 |15.267     3.28 | 21.27    1.49
                 3.333     1.61 | 9.333    3.82 |15.333     3.28 | 21.33    1.49
                 3.400     1.61 | 9.400    3.82 |15.400     3.28 | 21.40    1.49
                 3.467     1.61 | 9.467    3.88 |15.467     3.16 | 21.47    1.49
                 3.533     1.61 | 9.533    3.88 |15.533     3.16 | 21.53    1.49
                 3.600     1.61 | 9.600    3.88 |15.600     3.16 | 21.60    1.49
                 3.667     1.61 | 9.667    4.18 |15.667     3.04 | 21.67    1.43
                 3.733     1.61 | 9.733    4.18 |15.733     3.04 | 21.73    1.43
                 3.800     1.61 | 9.800    4.18 |15.800     3.04 | 21.80    1.43
                 3.867     1.67 | 9.867    4.60 |15.867     2.81 | 21.87    1.43
                 3.933     1.67 | 9.933    4.60 |15.933     2.81 | 21.93    1.43
                 4.000     1.67 |10.000    4.60 |16.000     2.81 | 22.00    1.43
                 4.067     1.67 |10.067    5.07 |16.067     2.69 | 22.07    1.43
                 4.133     1.67 |10.133    5.07 |16.133     2.69 | 22.13    1.43
                 4.200     1.67 |10.200    5.07 |16.200     2.69 | 22.20    1.43
                 4.267     1.79 |10.267    5.61 |16.267     2.69 | 22.27    1.43
                 4.333     1.79 |10.333    5.61 |16.333     2.69 | 22.33    1.43
                 4.400     1.79 |10.400    5.61 |16.400     2.69 | 22.40    1.43
                 4.467     1.79 |10.467    6.27 |16.467     2.63 | 22.47    1.37
                 4.533     1.79 |10.533    6.27 |16.533     2.63 | 22.53    1.37
                 4.600     1.79 |10.600    6.27 |16.600     2.63 | 22.60    1.37
                 4.667     1.79 |10.667    7.16 |16.667     2.51 | 22.67    1.37
                 4.733     1.79 |10.733    7.16 |16.733     2.51 | 22.73    1.37
                 4.800     1.79 |10.800    7.16 |16.800     2.51 | 22.80    1.37
                 4.867     1.91 |10.867    8.12 |16.867     2.51 | 22.87    1.37
                 4.933     1.91 |10.933    8.12 |16.933     2.51 | 22.93    1.37
                 5.000     1.91 |11.000    8.12 |17.000     2.51 | 23.00    1.37
                 5.067     1.91 |11.067    9.73 |17.067     2.39 | 23.07    1.37
                 5.133     1.91 |11.133    9.73 |17.133     2.39 | 23.13    1.37
                 5.200     1.91 |11.200    9.73 |17.200     2.39 | 23.20    1.37
                 5.267     2.03 |11.267   12.06 |17.267     2.33 | 23.27    1.37
                 5.333     2.03 |11.333   12.06 |17.333     2.33 | 23.33    1.37
                 5.400     2.03 |11.400   12.06 |17.400     2.33 | 23.40    1.37
                 5.467     2.03 |11.467   21.07 |17.467     2.33 | 23.47    1.37
                 5.533     2.03 |11.533   21.07 |17.533     2.33 | 23.53    1.37
                 5.600     2.03 |11.600   21.07 |17.600     2.33 | 23.60    1.37
                 5.667     2.03 |11.667   74.02 |17.667     2.21 | 23.67    1.31
                 5.733     2.03 |11.733   74.03 |17.733     2.21 | 23.73    1.31
                 5.800     2.03 |11.800   74.03 |17.800     2.21 | 23.80    1.31
                 5.867     2.15 |11.867  138.62 |17.867     2.21 | 23.87    1.31
                 5.933     2.15 |11.933  138.62 |17.933     2.21 | 23.93    1.31
                 6.000     2.15 |12.000  138.62 |18.000     2.21 | 24.00    1.31

    Unit Hyd Qpeak  (cms)=    0.180

    PEAK FLOW       (cms)=    0.212 (i)
    TIME TO PEAK    (hrs)=  12.133
    RUNOFF VOLUME    (mm)=  76.453
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =    0.640

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0103) |    Area     (ha)=   1.76   Curve Number   (CN)= 81.0
|ID= 1 DT= 4.0 min |    Ia       (mm)=   5.80   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.30

    Unit Hyd Qpeak  (cms)=    0.224

    PEAK FLOW       (cms)=    0.258 (i)
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    TIME TO PEAK    (hrs)=  12.133
    RUNOFF VOLUME    (mm)=  74.505
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =    0.624

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0010) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0102):      1.37   0.212    12.13    76.45
      + ID2= 2 (0103):      1.76   0.258    12.13    74.51
        ================================================
        ID = 3 (0010):      3.13   0.470    12.13    75.36

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0104) |    Area     (ha)=   1.18   Curve Number   (CN)= 82.0
|ID= 1 DT= 3.0 min |    Ia       (mm)=   5.50   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.22

        NOTE:  RAINFALL WAS TRANSFORMED TO   3.0 MIN. TIME STEP.


                               ---- TRANSFORMED HYETOGRAPH ----
                  TIME     RAIN | TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                   hrs    mm/hr |   hrs   mm/hr |'   hrs    mm/hr |   hrs    mm/hr
                 0.050     1.19 | 6.050    2.15 |12.050    21.25 | 18.05    2.09
                 0.100     1.19 | 6.100    2.15 |12.100    21.25 | 18.10    2.09
                 0.150     1.19 | 6.150    2.15 |12.150    21.25 | 18.15    2.09
                 0.200     1.19 | 6.200    2.15 |12.200    21.25 | 18.20    2.09
                 0.250     1.25 | 6.250    2.27 |12.250    15.88 | 18.25    2.09
                 0.300     1.25 | 6.300    2.27 |12.300    15.88 | 18.30    2.09
                 0.350     1.25 | 6.350    2.27 |12.350    15.88 | 18.35    2.09
                 0.400     1.25 | 6.400    2.27 |12.400    15.88 | 18.40    2.09
                 0.450     1.25 | 6.450    2.27 |12.450    10.87 | 18.45    1.97
                 0.500     1.25 | 6.500    2.27 |12.500    10.87 | 18.50    1.97
                 0.550     1.25 | 6.550    2.27 |12.550    10.87 | 18.55    1.97
                 0.600     1.25 | 6.600    2.27 |12.600    10.86 | 18.60    1.97
                 0.650     1.25 | 6.650    2.27 |12.650     9.19 | 18.65    1.97
                 0.700     1.25 | 6.700    2.27 |12.700     9.19 | 18.70    1.97
                 0.750     1.25 | 6.750    2.27 |12.750     9.19 | 18.75    1.97
                 0.800     1.25 | 6.800    2.27 |12.800     9.19 | 18.80    1.97
                 0.850     1.31 | 6.850    2.39 |12.850     7.88 | 18.85    1.85
                 0.900     1.31 | 6.900    2.39 |12.900     7.88 | 18.90    1.85
                 0.950     1.31 | 6.950    2.39 |12.950     7.88 | 18.95    1.85
                 1.000     1.31 | 7.000    2.39 |13.000     7.88 | 19.00    1.85
                 1.050     1.31 | 7.050    2.39 |13.050     6.93 | 19.05    1.85
                 1.100     1.31 | 7.100    2.39 |13.100     6.93 | 19.10    1.85
                 1.150     1.31 | 7.150    2.39 |13.150     6.93 | 19.15    1.85
                 1.200     1.31 | 7.200    2.39 |13.200     6.92 | 19.20    1.85
                 1.250     1.37 | 7.250    2.51 |13.250     6.33 | 19.25    1.79
                 1.300     1.37 | 7.300    2.51 |13.300     6.33 | 19.30    1.79
                 1.350     1.37 | 7.350    2.51 |13.350     6.33 | 19.35    1.79
                 1.400     1.37 | 7.400    2.51 |13.400     6.33 | 19.40    1.79
                 1.450     1.37 | 7.450    2.51 |13.450     5.61 | 19.45    1.67
                 1.500     1.37 | 7.500    2.51 |13.500     5.61 | 19.50    1.67
                 1.550     1.37 | 7.550    2.51 |13.550     5.61 | 19.55    1.67
                 1.600     1.37 | 7.600    2.51 |13.600     5.61 | 19.60    1.67
                 1.650     1.37 | 7.650    2.51 |13.650     5.13 | 19.65    1.61
                 1.700     1.37 | 7.700    2.51 |13.700     5.13 | 19.70    1.61
                 1.750     1.37 | 7.750    2.51 |13.750     5.13 | 19.75    1.61
                 1.800     1.37 | 7.800    2.51 |13.800     5.13 | 19.80    1.61
                 1.850     1.43 | 7.850    2.63 |13.850     4.66 | 19.85    1.61
                 1.900     1.43 | 7.900    2.63 |13.900     4.66 | 19.90    1.61
                 1.950     1.43 | 7.950    2.63 |13.950     4.66 | 19.95    1.61
                 2.000     1.43 | 8.000    2.63 |14.000     4.66 | 20.00    1.61
                 2.050     1.43 | 8.050    2.75 |14.050     4.36 | 20.05    1.55
                 2.100     1.43 | 8.100    2.75 |14.100     4.36 | 20.10    1.55
                 2.150     1.43 | 8.150    2.75 |14.150     4.36 | 20.15    1.55
                 2.200     1.43 | 8.200    2.75 |14.200     4.36 | 20.20    1.55
                 2.250     1.49 | 8.250    2.99 |14.250     4.12 | 20.25    1.55
                 2.300     1.49 | 8.300    2.99 |14.300     4.12 | 20.30    1.55
                 2.350     1.49 | 8.350    2.99 |14.350     4.12 | 20.35    1.55
                 2.400     1.49 | 8.400    2.99 |14.400     4.12 | 20.40    1.55
                 2.450     1.49 | 8.450    3.22 |14.450     4.00 | 20.45    1.49
                 2.500     1.49 | 8.500    3.22 |14.500     4.00 | 20.50    1.49
                 2.550     1.49 | 8.550    3.22 |14.550     4.00 | 20.55    1.49
                 2.600     1.49 | 8.600    3.22 |14.600     4.00 | 20.60    1.49
                 2.650     1.49 | 8.650    3.46 |14.650     3.88 | 20.65    1.49
                 2.700     1.49 | 8.700    3.46 |14.700     3.88 | 20.70    1.49
                 2.750     1.49 | 8.750    3.46 |14.750     3.88 | 20.75    1.49
                 2.800     1.49 | 8.800    3.46 |14.800     3.88 | 20.80    1.49
                 2.850     1.55 | 8.850    3.70 |14.850     3.64 | 20.85    1.49
                 2.900     1.55 | 8.900    3.70 |14.900     3.64 | 20.90    1.49
                 2.950     1.55 | 8.950    3.70 |14.950     3.64 | 20.95    1.49
                 3.000     1.55 | 9.000    3.70 |15.000     3.64 | 21.00    1.49
                 3.050     1.55 | 9.050    3.82 |15.050     3.52 | 21.05    1.49
                 3.100     1.55 | 9.100    3.82 |15.100     3.52 | 21.10    1.49
                 3.150     1.55 | 9.150    3.82 |15.150     3.52 | 21.15    1.49
                 3.200     1.55 | 9.200    3.82 |15.200     3.52 | 21.20    1.49
                 3.250     1.61 | 9.250    3.82 |15.250     3.28 | 21.25    1.49
                 3.300     1.61 | 9.300    3.82 |15.300     3.28 | 21.30    1.49
                 3.350     1.61 | 9.350    3.82 |15.350     3.28 | 21.35    1.49
                 3.400     1.61 | 9.400    3.82 |15.400     3.28 | 21.40    1.49
                 3.450     1.61 | 9.450    3.88 |15.450     3.16 | 21.45    1.49
                 3.500     1.61 | 9.500    3.88 |15.500     3.16 | 21.50    1.49
                 3.550     1.61 | 9.550    3.88 |15.550     3.16 | 21.55    1.49
                 3.600     1.61 | 9.600    3.88 |15.600     3.16 | 21.60    1.49
                 3.650     1.61 | 9.650    4.18 |15.650     3.04 | 21.65    1.43
                 3.700     1.61 | 9.700    4.18 |15.700     3.04 | 21.70    1.43
                 3.750     1.61 | 9.750    4.18 |15.750     3.04 | 21.75    1.43
                 3.800     1.61 | 9.800    4.18 |15.800     3.04 | 21.80    1.43
                 3.850     1.67 | 9.850    4.60 |15.850     2.81 | 21.85    1.43
                 3.900     1.67 | 9.900    4.60 |15.900     2.81 | 21.90    1.43
                 3.950     1.67 | 9.950    4.60 |15.950     2.81 | 21.95    1.43
                 4.000     1.67 |10.000    4.60 |16.000     2.81 | 22.00    1.43
                 4.050     1.67 |10.050    5.07 |16.050     2.69 | 22.05    1.43
                 4.100     1.67 |10.100    5.07 |16.100     2.69 | 22.10    1.43
                 4.150     1.67 |10.150    5.07 |16.150     2.69 | 22.15    1.43
                 4.200     1.67 |10.200    5.07 |16.200     2.69 | 22.20    1.43
                 4.250     1.79 |10.250    5.61 |16.250     2.69 | 22.25    1.43
                 4.300     1.79 |10.300    5.61 |16.300     2.69 | 22.30    1.43
                 4.350     1.79 |10.350    5.61 |16.350     2.69 | 22.35    1.43
                 4.400     1.79 |10.400    5.61 |16.400     2.69 | 22.40    1.43
                 4.450     1.79 |10.450    6.27 |16.450     2.63 | 22.45    1.37
                 4.500     1.79 |10.500    6.27 |16.500     2.63 | 22.50    1.37
                 4.550     1.79 |10.550    6.27 |16.550     2.63 | 22.55    1.37
                 4.600     1.79 |10.600    6.27 |16.600     2.63 | 22.60    1.37
                 4.650     1.79 |10.650    7.16 |16.650     2.51 | 22.65    1.37
                 4.700     1.79 |10.700    7.16 |16.700     2.51 | 22.70    1.37
                 4.750     1.79 |10.750    7.16 |16.750     2.51 | 22.75    1.37
                 4.800     1.79 |10.800    7.16 |16.800     2.51 | 22.80    1.37
                 4.850     1.91 |10.850    8.12 |16.850     2.51 | 22.85    1.37
                 4.900     1.91 |10.900    8.12 |16.900     2.51 | 22.90    1.37
                 4.950     1.91 |10.950    8.12 |16.950     2.51 | 22.95    1.37
                 5.000     1.91 |11.000    8.12 |17.000     2.51 | 23.00    1.37
                 5.050     1.91 |11.050    9.73 |17.050     2.39 | 23.05    1.37
                 5.100     1.91 |11.100    9.73 |17.100     2.39 | 23.10    1.37
                 5.150     1.91 |11.150    9.73 |17.150     2.39 | 23.15    1.37
                 5.200     1.91 |11.200    9.73 |17.200     2.39 | 23.20    1.37
                 5.250     2.03 |11.250   12.06 |17.250     2.33 | 23.25    1.37
                 5.300     2.03 |11.300   12.06 |17.300     2.33 | 23.30    1.37
                 5.350     2.03 |11.350   12.06 |17.350     2.33 | 23.35    1.37
                 5.400     2.03 |11.400   12.06 |17.400     2.33 | 23.40    1.37
                 5.450     2.03 |11.450   21.07 |17.450     2.33 | 23.45    1.37
                 5.500     2.03 |11.500   21.07 |17.500     2.33 | 23.50    1.37
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              5.550    2.03 |11.550   21.07 |17.550    2.33 | 23.55    1.37
              5.600    2.03 |11.600   21.10 |17.600    2.33 | 23.60    1.37
              5.650    2.03 |11.650   74.03 |17.650    2.21 | 23.65    1.31
              5.700    2.03 |11.700   74.03 |17.700    2.21 | 23.70    1.31
              5.750    2.03 |11.750   74.03 |17.750    2.21 | 23.75    1.31
              5.800    2.03 |11.800   74.06 |17.800    2.21 | 23.80    1.31
              5.850    2.15 |11.850  138.62 |17.850    2.21 | 23.85    1.31
              5.900    2.15 |11.900  138.62 |17.900    2.21 | 23.90    1.31
              5.950    2.15 |11.950  138.62 |17.950    2.21 | 23.95    1.31
              6.000    2.15 |12.000  138.56 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.205

     PEAK FLOW       (cms)=   0.217 (i)
     TIME TO PEAK    (hrs)=  12.100
     RUNOFF VOLUME    (mm)=  76.453
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.640

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB              |
| NASHYD    (0105) |   Area    (ha)=   0.55   Curve Number   (CN)= 80.0
|ID= 1 DT= 3.0 min |   Ia      (mm)=   6.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.21

     Unit Hyd Qpeak  (cms)=   0.100

     PEAK FLOW       (cms)=   0.099 (i)
     TIME TO PEAK    (hrs)=  12.100
     RUNOFF VOLUME    (mm)=  72.677
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.609

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD   (0011) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0104):      1.18    0.217    12.10    76.45
       + ID2= 2 (0105):      0.55    0.099    12.10    72.68
         ==================================================
         ID = 3 (0011):      1.73    0.315    12.10    75.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB              |
| NASHYD    (0302) |   Area    (ha)= 112.64   Curve Number   (CN)= 83.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.13

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                           ---- TRANSFORMED HYETOGRAPH ----
              TIME     RAIN |  TIME    RAIN |'  TIME     RAIN |  TIME     RAIN
               hrs    mm/hr |   hrs   mm/hr |'   hrs    mm/hr |   hrs    mm/hr
              0.083    1.19 | 6.083    2.15 |12.083   21.27 | 18.08    2.09
              0.167    1.19 | 6.167    2.15 |12.167   21.25 | 18.17    2.09
              0.250    1.23 | 6.250    2.22 |12.250   18.03 | 18.25    2.09
              0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
              0.417    1.25 | 6.417    2.27 |12.417   14.88 | 18.42    2.07
              0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
              0.583    1.25 | 6.583    2.27 |12.583   10.87 | 18.58    1.97
              0.667    1.25 | 6.667    2.27 |12.667    9.53 | 18.67    1.97
              0.750    1.25 | 6.750    2.27 |12.750    9.19 | 18.75    1.97
              0.833    1.28 | 6.833    2.32 |12.833    8.67 | 18.83    1.92
              0.917    1.31 | 6.917    2.39 |12.917    7.88 | 18.92    1.85
              1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
              1.083    1.31 | 7.083    2.39 |13.083    6.93 | 19.08    1.85
              1.167    1.31 | 7.167    2.39 |13.167    6.93 | 19.17    1.85
              1.250    1.35 | 7.250    2.46 |13.250    6.57 | 19.25    1.81
              1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33    1.79
              1.417    1.37 | 7.417    2.51 |13.417    6.19 | 19.42    1.77
              1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
              1.583    1.37 | 7.583    2.51 |13.583    5.61 | 19.58    1.67
              1.667    1.37 | 7.667    2.51 |13.667    5.23 | 19.67    1.62
              1.750    1.37 | 7.750    2.51 |13.750    5.13 | 19.75    1.61
              1.833    1.40 | 7.833    2.56 |13.833    4.94 | 19.83    1.61
              1.917    1.43 | 7.917    2.63 |13.917    4.66 | 19.92    1.61
              2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
              2.083    1.43 | 8.083    2.75 |14.083    4.36 | 20.08    1.55
              2.167    1.43 | 8.167    2.75 |14.167    4.36 | 20.17    1.55
              2.250    1.47 | 8.250    2.89 |14.250    4.21 | 20.25    1.55
              2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33    1.55
              2.417    1.49 | 8.417    3.03 |14.417    4.10 | 20.42    1.54
              2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
              2.583    1.49 | 8.583    3.22 |14.583    4.00 | 20.58    1.49
              2.667    1.49 | 8.667    3.41 |14.667    3.90 | 20.67    1.49
              2.750    1.49 | 8.750    3.46 |14.750    3.88 | 20.75    1.49
              2.833    1.52 | 8.833    3.56 |14.833    3.79 | 20.83    1.49
              2.917    1.55 | 8.917    3.70 |14.917    3.64 | 20.92    1.49
              3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
              3.083    1.55 | 9.083    3.82 |15.083    3.52 | 21.08    1.49
              3.167    1.55 | 9.167    3.82 |15.167    3.52 | 21.17    1.49
              3.250    1.59 | 9.250    3.82 |15.250    3.38 | 21.25    1.49
              3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33    1.49
              3.417    1.61 | 9.417    3.83 |15.417    3.26 | 21.42    1.49
              3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
              3.583    1.61 | 9.583    3.88 |15.583    3.16 | 21.58    1.49
              3.667    1.61 | 9.667    4.12 |15.667    3.07 | 21.67    1.44
              3.750    1.61 | 9.750    4.18 |15.750    3.04 | 21.75    1.43
              3.833    1.64 | 9.833    4.35 |15.833    2.95 | 21.83    1.43
              3.917    1.67 | 9.917    4.60 |15.917    2.81 | 21.92    1.43
              4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
              4.083    1.67 |10.083    5.07 |16.083    2.69 | 22.08    1.43
              4.167    1.67 |10.167    5.07 |16.167    2.69 | 22.17    1.43
              4.250    1.74 |10.250    5.40 |16.250    2.69 | 22.25    1.43
              4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
              4.417    1.79 |10.417    5.74 |16.417    2.67 | 22.42    1.42
              4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
              4.583    1.79 |10.583    6.27 |16.583    2.63 | 22.58    1.37
              4.667    1.79 |10.667    6.98 |16.667    2.53 | 22.67    1.37
              4.750    1.79 |10.750    7.16 |16.750    2.51 | 22.75    1.37
              4.833    1.84 |10.833    7.55 |16.833    2.51 | 22.83    1.37
              4.917    1.91 |10.917    8.12 |16.917    2.51 | 22.92    1.37
              5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
              5.083    1.91 |11.083    9.73 |17.083    2.39 | 23.08    1.37
              5.167    1.91 |11.167    9.73 |17.167    2.39 | 23.17    1.37
              5.250    1.98 |11.250   11.13 |17.250    2.35 | 23.25    1.37
              5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
              5.417    2.03 |11.417   13.86 |17.417    2.33 | 23.42    1.37
              5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
              5.583    2.03 |11.583   21.07 |17.583    2.33 | 23.58    1.37
              5.667    2.03 |11.667   63.43 |17.667    2.23 | 23.67    1.33
              5.750    2.03 |11.750   74.03 |17.750    2.21 | 23.75    1.31
              5.833    2.08 |11.833   99.86 |17.833    2.21 | 23.83    1.31
              5.917    2.15 |11.917  138.62 |17.917    2.21 | 23.92    1.31
              6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   3.807

     PEAK FLOW       (cms)=   6.672 (i)
     TIME TO PEAK    (hrs)=  13.083
     RUNOFF VOLUME    (mm)=  78.278
     TOTAL RAINFALL   (mm)= 119.400
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     RUNOFF COEFFICIENT   =   0.656

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| DUHYD     (0040) |
| Inlet Cap.=3.950 |
| #of Inlets=    1 |
| Total(cms)=  4.0 |       AREA      QPEAK      TPEAK     R.V.
--------------------       (ha)      (cms)      (hrs)     (mm)
     TOTAL HYD.(ID= 1): 112.64       6.67      13.08    78.28
     ==================================================
     MAJOR SYS.(ID= 2):  16.13       2.72      13.08    78.28
     MINOR SYS.(ID= 3):  96.51       3.95      12.33    78.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0012) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0010):      3.13    0.470    12.13    75.36
       + ID2= 2 (0011):      1.73    0.315    12.10    75.25
         ==================================================
         ID = 3 (0012):      4.86    0.771    12.15    75.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0012) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0012):      4.86    0.771    12.15    75.32
       + ID2= 2 (0040):     16.13    2.722    13.08    78.28
         ==================================================
         ID = 1 (0012):     20.99    2.850    13.00    77.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB              |
| NASHYD    (0106) |   Area    (ha)=   3.23   Curve Number   (CN)= 81.0
|ID= 1 DT= 4.0 min |   Ia      (mm)=   5.80   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.35

         NOTE:  RAINFALL WAS TRANSFORMED TO   4.0 MIN. TIME STEP.


                           ---- TRANSFORMED HYETOGRAPH ----
              TIME     RAIN |  TIME    RAIN |'  TIME     RAIN |  TIME     RAIN
               hrs    mm/hr |   hrs   mm/hr |'   hrs    mm/hr |   hrs    mm/hr
              0.067    1.19 | 6.067    2.15 |12.067   21.27 | 18.07    2.09
              0.133    1.19 | 6.133    2.15 |12.133   21.25 | 18.13    2.09
              0.200    1.19 | 6.200    2.15 |12.200   21.25 | 18.20    2.09
              0.267    1.25 | 6.267    2.27 |12.267   15.88 | 18.27    2.09
              0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
              0.400    1.25 | 6.400    2.27 |12.400   15.88 | 18.40    2.09
              0.467    1.25 | 6.467    2.27 |12.467   10.87 | 18.47    1.97
              0.533    1.25 | 6.533    2.27 |12.533   10.87 | 18.53    1.97
              0.600    1.25 | 6.600    2.27 |12.600   10.87 | 18.60    1.97
              0.667    1.25 | 6.667    2.27 |12.667    9.19 | 18.67    1.97
              0.733    1.25 | 6.733    2.27 |12.733    9.19 | 18.73    1.97
              0.800    1.25 | 6.800    2.27 |12.800    9.19 | 18.80    1.97
              0.867    1.31 | 6.867    2.39 |12.867    7.88 | 18.87    1.85
              0.933    1.31 | 6.933    2.39 |12.933    7.88 | 18.93    1.85
              1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
              1.067    1.31 | 7.067    2.39 |13.067    6.93 | 19.07    1.85
              1.133    1.31 | 7.133    2.39 |13.133    6.93 | 19.13    1.85
              1.200    1.31 | 7.200    2.39 |13.200    6.93 | 19.20    1.85
              1.267    1.37 | 7.267    2.51 |13.267    6.33 | 19.27    1.79
              1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33    1.79
              1.400    1.37 | 7.400    2.51 |13.400    6.33 | 19.40    1.79
              1.467    1.37 | 7.467    2.51 |13.467    5.61 | 19.47    1.67
              1.533    1.37 | 7.533    2.51 |13.533    5.61 | 19.53    1.67
              1.600    1.37 | 7.600    2.51 |13.600    5.61 | 19.60    1.67
              1.667    1.37 | 7.667    2.51 |13.667    5.13 | 19.67    1.61
              1.733    1.37 | 7.733    2.51 |13.733    5.13 | 19.73    1.61
              1.800    1.37 | 7.800    2.51 |13.800    5.13 | 19.80    1.61
              1.867    1.43 | 7.867    2.63 |13.867    4.66 | 19.87    1.61
              1.933    1.43 | 7.933    2.63 |13.933    4.66 | 19.93    1.61
              2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
              2.067    1.43 | 8.067    2.75 |14.067    4.36 | 20.07    1.55
              2.133    1.43 | 8.133    2.75 |14.133    4.36 | 20.13    1.55
              2.200    1.43 | 8.200    2.75 |14.200    4.36 | 20.20    1.55
              2.267    1.49 | 8.267    2.98 |14.267    4.12 | 20.27    1.55
              2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33    1.55
              2.400    1.49 | 8.400    2.99 |14.400    4.12 | 20.40    1.55
              2.467    1.49 | 8.467    3.22 |14.467    4.00 | 20.47    1.49
              2.533    1.49 | 8.533    3.22 |14.533    4.00 | 20.53    1.49
              2.600    1.49 | 8.600    3.22 |14.600    4.00 | 20.60    1.49
              2.667    1.49 | 8.667    3.46 |14.667    3.88 | 20.67    1.49
              2.733    1.49 | 8.733    3.46 |14.733    3.88 | 20.73    1.49
              2.800    1.49 | 8.800    3.46 |14.800    3.88 | 20.80    1.49
              2.867    1.55 | 8.867    3.70 |14.867    3.64 | 20.87    1.49
              2.933    1.55 | 8.933    3.70 |14.933    3.64 | 20.93    1.49
              3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
              3.067    1.55 | 9.067    3.82 |15.067    3.52 | 21.07    1.49
              3.133    1.55 | 9.133    3.82 |15.133    3.52 | 21.13    1.49
              3.200    1.55 | 9.200    3.82 |15.200    3.52 | 21.20    1.49
              3.267    1.61 | 9.267    3.82 |15.267    3.28 | 21.27    1.49
              3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33    1.49
              3.400    1.61 | 9.400    3.82 |15.400    3.28 | 21.40    1.49
              3.467    1.61 | 9.467    3.88 |15.467    3.16 | 21.47    1.49
              3.533    1.61 | 9.533    3.88 |15.533    3.16 | 21.53    1.49
              3.600    1.61 | 9.600    3.88 |15.600    3.16 | 21.60    1.49
              3.667    1.61 | 9.667    4.18 |15.667    3.04 | 21.67    1.43
              3.733    1.61 | 9.733    4.18 |15.733    3.04 | 21.73    1.43
              3.800    1.61 | 9.800    4.18 |15.800    3.04 | 21.80    1.43
              3.867    1.67 | 9.867    4.60 |15.867    2.81 | 21.87    1.43
              3.933    1.67 | 9.933    4.60 |15.933    2.81 | 21.93    1.43
              4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
              4.067    1.67 |10.067    5.07 |16.067    2.69 | 22.07    1.43
              4.133    1.67 |10.133    5.07 |16.133    2.69 | 22.13    1.43
              4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20    1.43
              4.267    1.79 |10.267    5.61 |16.267    2.69 | 22.27    1.43
              4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
              4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40    1.43
              4.467    1.79 |10.467    6.27 |16.467    2.63 | 22.47    1.37
              4.533    1.79 |10.533    6.27 |16.533    2.63 | 22.53    1.37
              4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60    1.37
              4.667    1.79 |10.667    7.16 |16.667    2.51 | 22.67    1.37
              4.733    1.79 |10.733    7.16 |16.733    2.51 | 22.73    1.37
              4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80    1.37
              4.867    1.91 |10.867    8.12 |16.867    2.51 | 22.87    1.37
              4.933    1.91 |10.933    8.12 |16.933    2.51 | 22.93    1.37
              5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
              5.067    1.91 |11.067    9.73 |17.067    2.39 | 23.07    1.37
              5.133    1.91 |11.133    9.73 |17.133    2.39 | 23.13    1.37
              5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20    1.37
              5.267    2.03 |11.267   12.06 |17.267    2.33 | 23.27    1.37
              5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
              5.400    2.03 |11.400   12.06 |17.400    2.33 | 23.40    1.37
              5.467    2.03 |11.467   21.07 |17.467    2.33 | 23.47    1.37
              5.533    2.03 |11.533   21.07 |17.533    2.33 | 23.53    1.37
              5.600    2.03 |11.600   21.07 |17.600    2.33 | 23.60    1.37
              5.667    2.03 |11.667   74.02 |17.667    2.21 | 23.67    1.31
              5.733    2.03 |11.733   74.03 |17.733    2.21 | 23.73    1.31
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            5.800    2.03 |11.800   74.03 |17.800    2.21 | 23.80    1.31
            5.867    2.15 |11.867  138.62 |17.867    2.21 | 23.87    1.31
            5.933    2.15 |11.933  138.62 |17.933    2.21 | 23.93    1.31
            6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.352

     PEAK FLOW       (cms)=   0.429 (i)
     TIME TO PEAK    (hrs)=  12.200
     RUNOFF VOLUME    (mm)=  74.511
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.624

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0106):     3.23   0.429    12.20    74.51
        + ID2= 2 (0040):    96.51   3.950    12.33    78.28
          ===============================================
          ID = 3 (0015):    99.74   4.353    12.33    78.16

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0016) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):    20.99   2.850    13.00    77.59
        + ID2= 2 (0014):    64.84   6.512    12.42    77.81
          ===============================================
          ID = 3 (0016):    85.83   8.245    12.60    77.76

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0016) |
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0016):    85.83   8.245    12.60    77.76
        + ID2= 2 (0015):    99.74   4.353    12.33    78.16
          ===============================================
          ID = 1 (0016):   185.57  12.467    12.55    77.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0205) |   Area    (ha)=   0.55   Curve Number   (CN)= 84.0
|ID= 1 DT= 2.0 min |   Ia      (mm)=   5.10   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.05

         NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
             TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
              hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
            0.033    1.19 | 6.033    2.15 |12.033   21.25 | 18.03    2.09
            0.067    1.19 | 6.067    2.15 |12.067   21.25 | 18.07    2.09
            0.100    1.19 | 6.100    2.15 |12.100   21.25 | 18.10    2.09
            0.133    1.19 | 6.133    2.15 |12.133   21.25 | 18.13    2.09
            0.167    1.19 | 6.167    2.15 |12.167   21.25 | 18.17    2.09
            0.200    1.19 | 6.200    2.15 |12.200   21.25 | 18.20    2.09
            0.233    1.25 | 6.233    2.27 |12.233   15.88 | 18.23    2.09
            0.267    1.25 | 6.267    2.27 |12.267   15.88 | 18.27    2.09
            0.300    1.25 | 6.300    2.27 |12.300   15.88 | 18.30    2.09
            0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
            0.367    1.25 | 6.367    2.27 |12.367   15.88 | 18.37    2.09
            0.400    1.25 | 6.400    2.27 |12.400   15.87 | 18.40    2.09
            0.433    1.25 | 6.433    2.27 |12.433   10.87 | 18.43    1.97
            0.467    1.25 | 6.467    2.27 |12.467   10.87 | 18.47    1.97
            0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
            0.533    1.25 | 6.533    2.27 |12.533   10.87 | 18.53    1.97
            0.567    1.25 | 6.567    2.27 |12.567   10.87 | 18.57    1.97
            0.600    1.25 | 6.600    2.27 |12.600   10.86 | 18.60    1.97
            0.633    1.25 | 6.633    2.27 |12.633    9.19 | 18.63    1.97
            0.667    1.25 | 6.667    2.27 |12.667    9.19 | 18.67    1.97
            0.700    1.25 | 6.700    2.27 |12.700    9.19 | 18.70    1.97
            0.733    1.25 | 6.733    2.27 |12.733    9.19 | 18.73    1.97
            0.767    1.25 | 6.767    2.27 |12.767    9.19 | 18.77    1.97
            0.800    1.25 | 6.800    2.27 |12.800    9.19 | 18.80    1.97
            0.833    1.31 | 6.833    2.39 |12.833    7.88 | 18.83    1.85
            0.867    1.31 | 6.867    2.39 |12.867    7.88 | 18.87    1.85
            0.900    1.31 | 6.900    2.39 |12.900    7.88 | 18.90    1.85
            0.933    1.31 | 6.933    2.39 |12.933    7.88 | 18.93    1.85
            0.967    1.31 | 6.967    2.39 |12.967    7.88 | 18.97    1.85
            1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
            1.033    1.31 | 7.033    2.39 |13.033    6.93 | 19.03    1.85
            1.067    1.31 | 7.067    2.39 |13.067    6.93 | 19.07    1.85
            1.100    1.31 | 7.100    2.39 |13.100    6.93 | 19.10    1.85
            1.133    1.31 | 7.133    2.39 |13.133    6.93 | 19.13    1.85
            1.167    1.31 | 7.167    2.39 |13.167    6.93 | 19.17    1.85
            1.200    1.31 | 7.200    2.39 |13.200    6.92 | 19.20    1.85
            1.233    1.37 | 7.233    2.51 |13.233    6.33 | 19.23    1.79
            1.267    1.37 | 7.267    2.51 |13.267    6.33 | 19.27    1.79
            1.300    1.37 | 7.300    2.51 |13.300    6.33 | 19.30    1.79
            1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33    1.79
            1.367    1.37 | 7.367    2.51 |13.367    6.33 | 19.37    1.79
            1.400    1.37 | 7.400    2.51 |13.400    6.33 | 19.40    1.79
            1.433    1.37 | 7.433    2.51 |13.433    5.61 | 19.43    1.67
            1.467    1.37 | 7.467    2.51 |13.467    5.61 | 19.47    1.67
            1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
            1.533    1.37 | 7.533    2.51 |13.533    5.61 | 19.53    1.67
            1.567    1.37 | 7.567    2.51 |13.567    5.61 | 19.57    1.67
            1.600    1.37 | 7.600    2.51 |13.600    5.61 | 19.60    1.67
            1.633    1.37 | 7.633    2.51 |13.633    5.13 | 19.63    1.61
            1.667    1.37 | 7.667    2.51 |13.667    5.13 | 19.67    1.61
            1.700    1.37 | 7.700    2.51 |13.700    5.13 | 19.70    1.61
            1.733    1.37 | 7.733    2.51 |13.733    5.13 | 19.73    1.61
            1.767    1.37 | 7.767    2.51 |13.767    5.13 | 19.77    1.61
            1.800    1.37 | 7.800    2.51 |13.800    5.13 | 19.80    1.61
            1.833    1.43 | 7.833    2.63 |13.833    4.66 | 19.83    1.61
            1.867    1.43 | 7.867    2.63 |13.867    4.66 | 19.87    1.61
            1.900    1.43 | 7.900    2.63 |13.900    4.66 | 19.90    1.61
            1.933    1.43 | 7.933    2.63 |13.933    4.66 | 19.93    1.61
            1.967    1.43 | 7.967    2.63 |13.967    4.66 | 19.97    1.61
            2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
            2.033    1.43 | 8.033    2.75 |14.033    4.36 | 20.03    1.55
            2.067    1.43 | 8.067    2.75 |14.067    4.36 | 20.07    1.55
            2.100    1.43 | 8.100    2.75 |14.100    4.36 | 20.10    1.55
            2.133    1.43 | 8.133    2.75 |14.133    4.36 | 20.13    1.55
            2.167    1.43 | 8.167    2.75 |14.167    4.36 | 20.17    1.55
            2.200    1.43 | 8.200    2.75 |14.200    4.36 | 20.20    1.55
            2.233    1.49 | 8.233    2.98 |14.233    4.12 | 20.23    1.55
            2.267    1.49 | 8.267    2.99 |14.267    4.12 | 20.27    1.55
            2.300    1.49 | 8.300    2.99 |14.300    4.12 | 20.30    1.55
            2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33    1.55
            2.367    1.49 | 8.367    2.99 |14.367    4.12 | 20.37    1.55
            2.400    1.49 | 8.400    2.99 |14.400    4.12 | 20.40    1.55
            2.433    1.49 | 8.433    3.22 |14.433    4.00 | 20.43    1.49
            2.467    1.49 | 8.467    3.22 |14.467    4.00 | 20.47    1.49
            2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
            2.533    1.49 | 8.533    3.22 |14.533    4.00 | 20.53    1.49
            2.567    1.49 | 8.567    3.22 |14.567    4.00 | 20.57    1.49
            2.600    1.49 | 8.600    3.22 |14.600    4.00 | 20.60    1.49
            2.633    1.49 | 8.633    3.46 |14.633    3.88 | 20.63    1.49
            2.667    1.49 | 8.667    3.46 |14.667    3.88 | 20.67    1.49
            2.700    1.49 | 8.700    3.46 |14.700    3.88 | 20.70    1.49
            2.733    1.49 | 8.733    3.46 |14.733    3.88 | 20.73    1.49
            2.767    1.49 | 8.767    3.46 |14.767    3.88 | 20.77    1.49
            2.800    1.49 | 8.800    3.46 |14.800    3.88 | 20.80    1.49
            2.833    1.55 | 8.833    3.70 |14.833    3.64 | 20.83    1.49
            2.867    1.55 | 8.867    3.70 |14.867    3.64 | 20.87    1.49
            2.900    1.55 | 8.900    3.70 |14.900    3.64 | 20.90    1.49
            2.933    1.55 | 8.933    3.70 |14.933    3.64 | 20.93    1.49
            2.967    1.55 | 8.967    3.70 |14.967    3.64 | 20.97    1.49
            3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
            3.033    1.55 | 9.033    3.82 |15.033    3.52 | 21.03    1.49
            3.067    1.55 | 9.067    3.82 |15.067    3.52 | 21.07    1.49
            3.100    1.55 | 9.100    3.82 |15.100    3.52 | 21.10    1.49
            3.133    1.55 | 9.133    3.82 |15.133    3.52 | 21.13    1.49
            3.167    1.55 | 9.167    3.82 |15.167    3.52 | 21.17    1.49
            3.200    1.55 | 9.200    3.82 |15.200    3.52 | 21.20    1.49
            3.233    1.61 | 9.233    3.82 |15.233    3.28 | 21.23    1.49
            3.267    1.61 | 9.267    3.82 |15.267    3.28 | 21.27    1.49
            3.300    1.61 | 9.300    3.82 |15.300    3.28 | 21.30    1.49
            3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33    1.49
            3.367    1.61 | 9.367    3.82 |15.367    3.28 | 21.37    1.49
            3.400    1.61 | 9.400    3.82 |15.400    3.28 | 21.40    1.49
            3.433    1.61 | 9.433    3.88 |15.433    3.16 | 21.43    1.49
            3.467    1.61 | 9.467    3.88 |15.467    3.16 | 21.47    1.49
            3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
            3.533    1.61 | 9.533    3.88 |15.533    3.16 | 21.53    1.49
            3.567    1.61 | 9.567    3.88 |15.567    3.16 | 21.57    1.49
            3.600    1.61 | 9.600    3.88 |15.600    3.16 | 21.60    1.49
            3.633    1.61 | 9.633    4.18 |15.633    3.04 | 21.63    1.43
            3.667    1.61 | 9.667    4.18 |15.667    3.04 | 21.67    1.43
            3.700    1.61 | 9.700    4.18 |15.700    3.04 | 21.70    1.43
            3.733    1.61 | 9.733    4.18 |15.733    3.04 | 21.73    1.43
            3.767    1.61 | 9.767    4.18 |15.767    3.04 | 21.77    1.43
            3.800    1.61 | 9.800    4.18 |15.800    3.04 | 21.80    1.43
            3.833    1.67 | 9.833    4.60 |15.833    2.81 | 21.83    1.43
            3.867    1.67 | 9.867    4.60 |15.867    2.81 | 21.87    1.43
            3.900    1.67 | 9.900    4.60 |15.900    2.81 | 21.90    1.43
            3.933    1.67 | 9.933    4.60 |15.933    2.81 | 21.93    1.43
            3.967    1.67 | 9.967    4.60 |15.967    2.81 | 21.97    1.43
            4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
            4.033    1.67 |10.033    5.07 |16.033    2.69 | 22.03    1.43
            4.067    1.67 |10.067    5.07 |16.067    2.69 | 22.07    1.43
            4.100    1.67 |10.100    5.07 |16.100    2.69 | 22.10    1.43
            4.133    1.67 |10.133    5.07 |16.133    2.69 | 22.13    1.43
            4.167    1.67 |10.167    5.07 |16.167    2.69 | 22.17    1.43
            4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20    1.43
            4.233    1.79 |10.233    5.61 |16.233    2.69 | 22.23    1.43
            4.267    1.79 |10.267    5.61 |16.267    2.69 | 22.27    1.43
            4.300    1.79 |10.300    5.61 |16.300    2.69 | 22.30    1.43
            4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
            4.367    1.79 |10.367    5.61 |16.367    2.69 | 22.37    1.43
            4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40    1.43
            4.433    1.79 |10.433    6.27 |16.433    2.63 | 22.43    1.37
            4.467    1.79 |10.467    6.27 |16.467    2.63 | 22.47    1.37
            4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
            4.533    1.79 |10.533    6.27 |16.533    2.63 | 22.53    1.37
            4.567    1.79 |10.567    6.27 |16.567    2.63 | 22.57    1.37
            4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60    1.37
            4.633    1.79 |10.633    7.16 |16.633    2.51 | 22.63    1.37
            4.667    1.79 |10.667    7.16 |16.667    2.51 | 22.67    1.37
            4.700    1.79 |10.700    7.16 |16.700    2.51 | 22.70    1.37
            4.733    1.79 |10.733    7.16 |16.733    2.51 | 22.73    1.37
            4.767    1.79 |10.767    7.16 |16.767    2.51 | 22.77    1.37
            4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80    1.37
            4.833    1.91 |10.833    8.12 |16.833    2.51 | 22.83    1.37
            4.867    1.91 |10.867    8.12 |16.867    2.51 | 22.87    1.37
            4.900    1.91 |10.900    8.12 |16.900    2.51 | 22.90    1.37
            4.933    1.91 |10.933    8.12 |16.933    2.51 | 22.93    1.37
            4.967    1.91 |10.967    8.12 |16.967    2.51 | 22.97    1.37
            5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
            5.033    1.91 |11.033    9.73 |17.033    2.39 | 23.03    1.37
            5.067    1.91 |11.067    9.73 |17.067    2.39 | 23.07    1.37
            5.100    1.91 |11.100    9.73 |17.100    2.39 | 23.10    1.37
            5.133    1.91 |11.133    9.73 |17.133    2.39 | 23.13    1.37
            5.167    1.91 |11.167    9.73 |17.167    2.39 | 23.17    1.37
            5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20    1.37
            5.233    2.03 |11.233   12.06 |17.233    2.33 | 23.23    1.37
            5.267    2.03 |11.267   12.06 |17.267    2.33 | 23.27    1.37
            5.300    2.03 |11.300   12.06 |17.300    2.33 | 23.30    1.37
            5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
            5.367    2.03 |11.367   12.06 |17.367    2.33 | 23.37    1.37
            5.400    2.03 |11.400   12.07 |17.400    2.33 | 23.40    1.37
            5.433    2.03 |11.433   21.07 |17.433    2.33 | 23.43    1.37
            5.467    2.03 |11.467   21.07 |17.467    2.33 | 23.47    1.37
            5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
            5.533    2.03 |11.533   21.07 |17.533    2.33 | 23.53    1.37
            5.567    2.03 |11.567   21.07 |17.567    2.33 | 23.57    1.37
            5.600    2.03 |11.600   21.14 |17.600    2.33 | 23.60    1.37
            5.633    2.03 |11.633   74.03 |17.633    2.21 | 23.63    1.31
            5.667    2.03 |11.667   74.03 |17.667    2.21 | 23.67    1.31
            5.700    2.03 |11.700   74.03 |17.700    2.21 | 23.70    1.31
            5.733    2.03 |11.733   74.03 |17.733    2.21 | 23.73    1.31
            5.767    2.03 |11.767   74.03 |17.767    2.21 | 23.77    1.31
            5.800    2.03 |11.800   74.11 |17.800    2.21 | 23.80    1.31
            5.833    2.15 |11.833  138.62 |17.833    2.21 | 23.83    1.31
            5.867    2.15 |11.867  138.62 |17.867    2.21 | 23.87    1.31
            5.900    2.15 |11.900  138.62 |17.900    2.21 | 23.90    1.31
            5.933    2.15 |11.933  138.62 |17.933    2.21 | 23.93    1.31
            5.967    2.15 |11.967  138.62 |17.967    2.21 | 23.97    1.31
            6.000    2.15 |12.000  138.46 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.420

     PEAK FLOW       (cms)=   0.171 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  79.385
     TOTAL RAINFALL   (mm)= 119.399
     RUNOFF COEFFICIENT   =   0.665

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0206) |   Area    (ha)=   3.23   Curve Number   (CN)= 82.0
|ID= 1 DT= 4.0 min |   Ia      (mm)=   5.60   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.33

         NOTE:  RAINFALL WAS TRANSFORMED TO   4.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
             TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
              hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
            0.067    1.19 | 6.067    2.15 |12.067   21.27 | 18.07    2.09
            0.133    1.19 | 6.133    2.15 |12.133   21.25 | 18.13    2.09
            0.200    1.19 | 6.200    2.15 |12.200   21.25 | 18.20    2.09
            0.267    1.25 | 6.267    2.27 |12.267   15.88 | 18.27    2.09
            0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
            0.400    1.25 | 6.400    2.27 |12.400   15.88 | 18.40    2.09
            0.467    1.25 | 6.467    2.27 |12.467   10.87 | 18.47    1.97
            0.533    1.25 | 6.533    2.27 |12.533   10.87 | 18.53    1.97
            0.600    1.25 | 6.600    2.27 |12.600   10.87 | 18.60    1.97
            0.667    1.25 | 6.667    2.27 |12.667    9.19 | 18.67    1.97
            0.733    1.25 | 6.733    2.27 |12.733    9.19 | 18.73    1.97
            0.800    1.25 | 6.800    2.27 |12.800    9.19 | 18.80    1.97
            0.867    1.31 | 6.867    2.39 |12.867    7.88 | 18.87    1.85
            0.933    1.31 | 6.933    2.39 |12.933    7.88 | 18.93    1.85
            1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
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 1.067    1.31 | 7.067    2.39 |13.067    6.93 | 19.07     1.85
 1.133    1.31 | 7.133    2.39 |13.133    6.93 | 19.13     1.85
 1.200    1.31 | 7.200    2.39 |13.200    6.93 | 19.20     1.85
 1.267    1.37 | 7.267    2.51 |13.267    6.33 | 19.27     1.79
 1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33     1.79
 1.400    1.37 | 7.400    2.51 |13.400    6.33 | 19.40     1.79
 1.467    1.37 | 7.467    2.51 |13.467    5.61 | 19.47     1.67
 1.533    1.37 | 7.533    2.51 |13.533    5.61 | 19.53     1.67
 1.600    1.37 | 7.600    2.51 |13.600    5.61 | 19.60     1.67
 1.667    1.37 | 7.667    2.51 |13.667    5.13 | 19.67     1.61
 1.733    1.37 | 7.733    2.51 |13.733    5.13 | 19.73     1.61
 1.800    1.37 | 7.800    2.51 |13.800    5.13 | 19.80     1.61
 1.867    1.43 | 7.867    2.63 |13.867    4.66 | 19.87     1.61
 1.933    1.43 | 7.933    2.63 |13.933    4.66 | 19.93     1.61
 2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00     1.61
 2.067    1.43 | 8.067    2.75 |14.067    4.36 | 20.07     1.55
 2.133    1.43 | 8.133    2.75 |14.133    4.36 | 20.13     1.55
 2.200    1.43 | 8.200    2.75 |14.200    4.36 | 20.20     1.55
 2.267    1.49 | 8.267    2.98 |14.267    4.12 | 20.27     1.55
 2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33     1.55
 2.400    1.49 | 8.400    2.99 |14.400    4.12 | 20.40     1.55
 2.467    1.49 | 8.467    3.22 |14.467    4.00 | 20.47     1.49
 2.533    1.49 | 8.533    3.22 |14.533    4.00 | 20.53     1.49
 2.600    1.49 | 8.600    3.22 |14.600    4.00 | 20.60     1.49
 2.667    1.49 | 8.667    3.46 |14.667    3.88 | 20.67     1.49
 2.733    1.49 | 8.733    3.46 |14.733    3.88 | 20.73     1.49
 2.800    1.49 | 8.800    3.46 |14.800    3.88 | 20.80     1.49
 2.867    1.55 | 8.867    3.70 |14.867    3.64 | 20.87     1.49
 2.933    1.55 | 8.933    3.70 |14.933    3.64 | 20.93     1.49
 3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00     1.49
 3.067    1.55 | 9.067    3.82 |15.067    3.52 | 21.07     1.49
 3.133    1.55 | 9.133    3.82 |15.133    3.52 | 21.13     1.49
 3.200    1.55 | 9.200    3.82 |15.200    3.52 | 21.20     1.49
 3.267    1.61 | 9.267    3.82 |15.267    3.28 | 21.27     1.49
 3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33     1.49
 3.400    1.61 | 9.400    3.82 |15.400    3.28 | 21.40     1.49
 3.467    1.61 | 9.467    3.88 |15.467    3.16 | 21.47     1.49
 3.533    1.61 | 9.533    3.88 |15.533    3.16 | 21.53     1.49
 3.600    1.61 | 9.600    3.88 |15.600    3.16 | 21.60     1.49
 3.667    1.61 | 9.667    4.18 |15.667    3.04 | 21.67     1.43
 3.733    1.61 | 9.733    4.18 |15.733    3.04 | 21.73     1.43
 3.800    1.61 | 9.800    4.18 |15.800    3.04 | 21.80     1.43
 3.867    1.67 | 9.867    4.60 |15.867    2.81 | 21.87     1.43
 3.933    1.67 | 9.933    4.60 |15.933    2.81 | 21.93     1.43
 4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00     1.43
 4.067    1.67 |10.067    5.07 |16.067    2.69 | 22.07     1.43
 4.133    1.67 |10.133    5.07 |16.133    2.69 | 22.13     1.43
 4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20     1.43
 4.267    1.79 |10.267    5.61 |16.267    2.69 | 22.27     1.43
 4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33     1.43
 4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40     1.43
 4.467    1.79 |10.467    6.27 |16.467    2.63 | 22.47     1.37
 4.533    1.79 |10.533    6.27 |16.533    2.63 | 22.53     1.37
 4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60     1.37
 4.667    1.79 |10.667    7.16 |16.667    2.51 | 22.67     1.37
 4.733    1.79 |10.733    7.16 |16.733    2.51 | 22.73     1.37
 4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80     1.37
 4.867    1.91 |10.867    8.12 |16.867    2.51 | 22.87     1.37
 4.933    1.91 |10.933    8.12 |16.933    2.51 | 22.93     1.37
 5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00     1.37
 5.067    1.91 |11.067    9.73 |17.067    2.39 | 23.07     1.37
 5.133    1.91 |11.133    9.73 |17.133    2.39 | 23.13     1.37
 5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20     1.37
 5.267    2.03 |11.267   12.06 |17.267    2.33 | 23.27     1.37
 5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33     1.37
 5.400    2.03 |11.400   12.06 |17.400    2.33 | 23.40     1.37
 5.467    2.03 |11.467   21.07 |17.467    2.33 | 23.47     1.37
 5.533    2.03 |11.533   21.07 |17.533    2.33 | 23.53     1.37
 5.600    2.03 |11.600   21.07 |17.600    2.33 | 23.60     1.37
 5.667    2.03 |11.667   74.02 |17.667    2.21 | 23.67     1.31
 5.733    2.03 |11.733   74.03 |17.733    2.21 | 23.73     1.31
 5.800    2.03 |11.800   74.03 |17.800    2.21 | 23.80     1.31
 5.867    2.15 |11.867  138.62 |17.867    2.21 | 23.87     1.31
 5.933    2.15 |11.933  138.62 |17.933    2.21 | 23.93     1.31
 6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00     1.31

    Unit Hyd Qpeak  (cms)=   0.374

    PEAK FLOW       (cms)=   0.459 (i)
    TIME TO PEAK    (hrs)=  12.200
    RUNOFF VOLUME    (mm)=  76.370
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =   0.640

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB              |
| NASHYD    (3002) |   Area    (ha)= 112.64   Curve Number   (CN)= 83.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   1.13

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                          ---- TRANSFORMED HYETOGRAPH ----
             TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
              hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
            0.083    1.19 | 6.083    2.15 |12.083   21.27 | 18.08    2.09
            0.167    1.19 | 6.167    2.15 |12.167   21.25 | 18.17    2.09
            0.250    1.23 | 6.250    2.22 |12.250   18.03 | 18.25    2.09
            0.333    1.25 | 6.333    2.27 |12.333   15.88 | 18.33    2.09
            0.417    1.25 | 6.417    2.27 |12.417   14.88 | 18.42    2.07
            0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
            0.583    1.25 | 6.583    2.27 |12.583   10.87 | 18.58    1.97
            0.667    1.25 | 6.667    2.27 |12.667    9.53 | 18.67    1.97
            0.750    1.25 | 6.750    2.27 |12.750    9.19 | 18.75    1.97
            0.833    1.28 | 6.833    2.32 |12.833    8.67 | 18.83    1.92
            0.917    1.31 | 6.917    2.39 |12.917    7.88 | 18.92    1.85
            1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
            1.083    1.31 | 7.083    2.39 |13.083    6.93 | 19.08    1.85
            1.167    1.31 | 7.167    2.39 |13.167    6.93 | 19.17    1.85
            1.250    1.35 | 7.250    2.46 |13.250    6.57 | 19.25    1.81
            1.333    1.37 | 7.333    2.51 |13.333    6.33 | 19.33    1.79
            1.417    1.37 | 7.417    2.51 |13.417    6.19 | 19.42    1.77
            1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
            1.583    1.37 | 7.583    2.51 |13.583    5.61 | 19.58    1.67
            1.667    1.37 | 7.667    2.51 |13.667    5.23 | 19.67    1.62
            1.750    1.37 | 7.750    2.51 |13.750    5.13 | 19.75    1.61
            1.833    1.40 | 7.833    2.56 |13.833    4.94 | 19.83    1.61
            1.917    1.43 | 7.917    2.63 |13.917    4.66 | 19.92    1.61
            2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
            2.083    1.43 | 8.083    2.75 |14.083    4.36 | 20.08    1.55
            2.167    1.43 | 8.167    2.75 |14.167    4.36 | 20.17    1.55
            2.250    1.47 | 8.250    2.89 |14.250    4.21 | 20.25    1.55
            2.333    1.49 | 8.333    2.99 |14.333    4.12 | 20.33    1.55
            2.417    1.49 | 8.417    3.03 |14.417    4.10 | 20.42    1.54
            2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
            2.583    1.49 | 8.583    3.22 |14.583    4.00 | 20.58    1.49
            2.667    1.49 | 8.667    3.41 |14.667    3.90 | 20.67    1.49
            2.750    1.49 | 8.750    3.46 |14.750    3.88 | 20.75    1.49
            2.833    1.52 | 8.833    3.56 |14.833    3.79 | 20.83    1.49
            2.917    1.55 | 8.917    3.70 |14.917    3.64 | 20.92    1.49
            3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
            3.083    1.55 | 9.083    3.82 |15.083    3.52 | 21.08    1.49
            3.167    1.55 | 9.167    3.82 |15.167    3.52 | 21.17    1.49
            3.250    1.59 | 9.250    3.82 |15.250    3.38 | 21.25    1.49
            3.333    1.61 | 9.333    3.82 |15.333    3.28 | 21.33    1.49
            3.417    1.61 | 9.417    3.83 |15.417    3.26 | 21.42    1.49
            3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
            3.583    1.61 | 9.583    3.88 |15.583    3.16 | 21.58    1.49
            3.667    1.61 | 9.667    4.12 |15.667    3.07 | 21.67    1.44
            3.750    1.61 | 9.750    4.18 |15.750    3.04 | 21.75    1.43
            3.833    1.64 | 9.833    4.35 |15.833    2.95 | 21.83    1.43
            3.917    1.67 | 9.917    4.60 |15.917    2.81 | 21.92    1.43
            4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
            4.083    1.67 |10.083    5.07 |16.083    2.69 | 22.08    1.43
            4.167    1.67 |10.167    5.07 |16.167    2.69 | 22.17    1.43
            4.250    1.74 |10.250    5.40 |16.250    2.69 | 22.25    1.43
            4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
            4.417    1.79 |10.417    5.74 |16.417    2.67 | 22.42    1.42
            4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
            4.583    1.79 |10.583    6.27 |16.583    2.63 | 22.58    1.37
            4.667    1.79 |10.667    6.98 |16.667    2.53 | 22.67    1.37
            4.750    1.79 |10.750    7.16 |16.750    2.51 | 22.75    1.37
            4.833    1.84 |10.833    7.55 |16.833    2.51 | 22.83    1.37
            4.917    1.91 |10.917    8.12 |16.917    2.51 | 22.92    1.37
            5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
            5.083    1.91 |11.083    9.73 |17.083    2.39 | 23.08    1.37
            5.167    1.91 |11.167    9.73 |17.167    2.39 | 23.17    1.37
            5.250    1.98 |11.250   11.13 |17.250    2.35 | 23.25    1.37
            5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
            5.417    2.03 |11.417   13.86 |17.417    2.33 | 23.42    1.37
            5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
            5.583    2.03 |11.583   21.07 |17.583    2.33 | 23.58    1.37
            5.667    2.03 |11.667   63.43 |17.667    2.23 | 23.67    1.33
            5.750    2.03 |11.750   74.03 |17.750    2.21 | 23.75    1.31
            5.833    2.08 |11.833   99.86 |17.833    2.21 | 23.83    1.31
            5.917    2.15 |11.917  138.62 |17.917    2.21 | 23.92    1.31
            6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00    1.31

    Unit Hyd Qpeak  (cms)=   3.807

    PEAK FLOW       (cms)=   6.672 (i)
    TIME TO PEAK    (hrs)=  13.083
    RUNOFF VOLUME    (mm)=  78.278
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =   0.656

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------------
--------------------
| DUHYD     (0050) |
| Inlet Cap.=3.950 |
| #of Inlets=    1 |
| Total(cms)=  4.0 |      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1): 112.64      6.67     13.08   78.28
    ====================================================
    MAJOR SYS.(ID= 2):  16.13      2.72     13.08   78.28
    MINOR SYS.(ID= 3):  96.51      3.95     12.33   78.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0025) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0205):      0.55   0.171    12.00    79.39
       + ID2= 2 (0206):      3.23   0.459    12.20    76.37
         ====================================================
         ID = 3 (0025):      3.78   0.505    12.00    76.81

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0025) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0025):      3.78   0.505    12.00    76.81
       + ID2= 2 (0050):     96.51   3.950    12.33    78.28
         ====================================================
         ID = 1 (0025):    100.29   4.387    12.33    78.22

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB              |
| NASHYD    (0201) |   Area    (ha)=   5.46   Curve Number   (CN)= 81.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.45

    Unit Hyd Qpeak  (cms)=   0.463

    PEAK FLOW       (cms)=   0.608 (i)
    TIME TO PEAK    (hrs)=  12.333
    RUNOFF VOLUME    (mm)=  74.600
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =   0.625

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB              |
| NASHYD    (3001) |   Area    (ha)=  59.38   Curve Number   (CN)= 83.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.56

    Unit Hyd Qpeak  (cms)=   4.050

    PEAK FLOW       (cms)=   5.950 (i)
    TIME TO PEAK    (hrs)=  12.417
    RUNOFF VOLUME    (mm)=  78.276
    TOTAL RAINFALL   (mm)= 119.400
    RUNOFF COEFFICIENT   =   0.656

    (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| DUHYD     (0051) |
| Inlet Cap.=3.520 |
| #of Inlets=    1 |
| Total(cms)=  3.5 |      AREA     QPEAK     TPEAK    R.V.
--------------------      (ha)     (cms)     (hrs)    (mm)
    TOTAL HYD.(ID= 1):  59.38      5.95     12.42   78.28
    ====================================================
    MAJOR SYS.(ID= 2):   7.20      2.43     12.42   78.28
    MINOR SYS.(ID= 3):  52.18      3.52     12.08   78.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0023) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0201):      5.46   0.608    12.33    74.60
       + ID2= 2 (0051):      7.20   2.430    12.42    78.28
         ====================================================
         ID = 3 (0023):     12.66   3.019    12.42    76.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0024) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (0023):    12.66   3.019    12.42    76.69
      + ID2= 2 (0051):    52.18   3.520    12.08    78.28
        ===============================================
        ID = 3 (0024):    64.84   6.539    12.42    77.97

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0203) |    Area    (ha)=   1.76   Curve Number   (CN)= 84.0
|ID= 1 DT= 2.0 min |    Ia      (mm)=   5.20   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.09

        NOTE:  RAINFALL WAS TRANSFORMED TO   2.0 MIN. TIME STEP.


                        ---- TRANSFORMED HYETOGRAPH ----
    TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
     hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
   0.033     1.19 | 6.033     2.15 |12.033    21.25 | 18.03     2.09
   0.067     1.19 | 6.067     2.15 |12.067    21.25 | 18.07     2.09
   0.100     1.19 | 6.100     2.15 |12.100    21.25 | 18.10     2.09
   0.133     1.19 | 6.133     2.15 |12.133    21.25 | 18.13     2.09
   0.167     1.19 | 6.167     2.15 |12.167    21.25 | 18.17     2.09
   0.200     1.19 | 6.200     2.15 |12.200    21.25 | 18.20     2.09
   0.233     1.25 | 6.233     2.27 |12.233    15.88 | 18.23     2.09
   0.267     1.25 | 6.267     2.27 |12.267    15.88 | 18.27     2.09
   0.300     1.25 | 6.300     2.27 |12.300    15.88 | 18.30     2.09
   0.333     1.25 | 6.333     2.27 |12.333    15.88 | 18.33     2.09
   0.367     1.25 | 6.367     2.27 |12.367    15.88 | 18.37     2.09
   0.400     1.25 | 6.400     2.27 |12.400    15.87 | 18.40     2.09
   0.433     1.25 | 6.433     2.27 |12.433    10.87 | 18.43     1.97
   0.467     1.25 | 6.467     2.27 |12.467    10.87 | 18.47     1.97
   0.500     1.25 | 6.500     2.27 |12.500    10.87 | 18.50     1.97
   0.533     1.25 | 6.533     2.27 |12.533    10.87 | 18.53     1.97
   0.567     1.25 | 6.567     2.27 |12.567    10.87 | 18.57     1.97
   0.600     1.25 | 6.600     2.27 |12.600    10.86 | 18.60     1.97
   0.633     1.25 | 6.633     2.27 |12.633     9.19 | 18.63     1.97
   0.667     1.25 | 6.667     2.27 |12.667     9.19 | 18.67     1.97
   0.700     1.25 | 6.700     2.27 |12.700     9.19 | 18.70     1.97
   0.733     1.25 | 6.733     2.27 |12.733     9.19 | 18.73     1.97
   0.767     1.25 | 6.767     2.27 |12.767     9.19 | 18.77     1.97
   0.800     1.25 | 6.800     2.27 |12.800     9.19 | 18.80     1.97
   0.833     1.31 | 6.833     2.39 |12.833     7.88 | 18.83     1.85
   0.867     1.31 | 6.867     2.39 |12.867     7.88 | 18.87     1.85
   0.900     1.31 | 6.900     2.39 |12.900     7.88 | 18.90     1.85
   0.933     1.31 | 6.933     2.39 |12.933     7.88 | 18.93     1.85
   0.967     1.31 | 6.967     2.39 |12.967     7.88 | 18.97     1.85
   1.000     1.31 | 7.000     2.39 |13.000     7.88 | 19.00     1.85
   1.033     1.31 | 7.033     2.39 |13.033     6.93 | 19.03     1.85
   1.067     1.31 | 7.067     2.39 |13.067     6.93 | 19.07     1.85
   1.100     1.31 | 7.100     2.39 |13.100     6.93 | 19.10     1.85
   1.133     1.31 | 7.133     2.39 |13.133     6.93 | 19.13     1.85
   1.167     1.31 | 7.167     2.39 |13.167     6.93 | 19.17     1.85
   1.200     1.31 | 7.200     2.39 |13.200     6.92 | 19.20     1.85
   1.233     1.37 | 7.233     2.51 |13.233     6.33 | 19.23     1.79
   1.267     1.37 | 7.267     2.51 |13.267     6.33 | 19.27     1.79
   1.300     1.37 | 7.300     2.51 |13.300     6.33 | 19.30     1.79
   1.333     1.37 | 7.333     2.51 |13.333     6.33 | 19.33     1.79
   1.367     1.37 | 7.367     2.51 |13.367     6.33 | 19.37     1.79
   1.400     1.37 | 7.400     2.51 |13.400     6.33 | 19.40     1.79
   1.433     1.37 | 7.433     2.51 |13.433     5.61 | 19.43     1.67
   1.467     1.37 | 7.467     2.51 |13.467     5.61 | 19.47     1.67
   1.500     1.37 | 7.500     2.51 |13.500     5.61 | 19.50     1.67
   1.533     1.37 | 7.533     2.51 |13.533     5.61 | 19.53     1.67
   1.567     1.37 | 7.567     2.51 |13.567     5.61 | 19.57     1.67
   1.600     1.37 | 7.600     2.51 |13.600     5.61 | 19.60     1.67
   1.633     1.37 | 7.633     2.51 |13.633     5.13 | 19.63     1.61
   1.667     1.37 | 7.667     2.51 |13.667     5.13 | 19.67     1.61
   1.700     1.37 | 7.700     2.51 |13.700     5.13 | 19.70     1.61
   1.733     1.37 | 7.733     2.51 |13.733     5.13 | 19.73     1.61
   1.767     1.37 | 7.767     2.51 |13.767     5.13 | 19.77     1.61
   1.800     1.37 | 7.800     2.51 |13.800     5.13 | 19.80     1.61
   1.833     1.43 | 7.833     2.63 |13.833     4.66 | 19.83     1.61
   1.867     1.43 | 7.867     2.63 |13.867     4.66 | 19.87     1.61
   1.900     1.43 | 7.900     2.63 |13.900     4.66 | 19.90     1.61
   1.933     1.43 | 7.933     2.63 |13.933     4.66 | 19.93     1.61
   1.967     1.43 | 7.967     2.63 |13.967     4.66 | 19.97     1.61
   2.000     1.43 | 8.000     2.63 |14.000     4.66 | 20.00     1.61
   2.033     1.43 | 8.033     2.75 |14.033     4.36 | 20.03     1.55
   2.067     1.43 | 8.067     2.75 |14.067     4.36 | 20.07     1.55
   2.100     1.43 | 8.100     2.75 |14.100     4.36 | 20.10     1.55
   2.133     1.43 | 8.133     2.75 |14.133     4.36 | 20.13     1.55
   2.167     1.43 | 8.167     2.75 |14.167     4.36 | 20.17     1.55
   2.200     1.43 | 8.200     2.75 |14.200     4.36 | 20.20     1.55
   2.233     1.49 | 8.233     2.98 |14.233     4.12 | 20.23     1.55
   2.267     1.49 | 8.267     2.99 |14.267     4.12 | 20.27     1.55
   2.300     1.49 | 8.300     2.99 |14.300     4.12 | 20.30     1.55
   2.333     1.49 | 8.333     2.99 |14.333     4.12 | 20.33     1.55
   2.367     1.49 | 8.367     2.99 |14.367     4.12 | 20.37     1.55
   2.400     1.49 | 8.400     2.99 |14.400     4.12 | 20.40     1.55
   2.433     1.49 | 8.433     3.22 |14.433     4.00 | 20.43     1.49
   2.467     1.49 | 8.467     3.22 |14.467     4.00 | 20.47     1.49
   2.500     1.49 | 8.500     3.22 |14.500     4.00 | 20.50     1.49
   2.533     1.49 | 8.533     3.22 |14.533     4.00 | 20.53     1.49
   2.567     1.49 | 8.567     3.22 |14.567     4.00 | 20.57     1.49
   2.600     1.49 | 8.600     3.22 |14.600     4.00 | 20.60     1.49
   2.633     1.49 | 8.633     3.46 |14.633     3.88 | 20.63     1.49
   2.667     1.49 | 8.667     3.46 |14.667     3.88 | 20.67     1.49
   2.700     1.49 | 8.700     3.46 |14.700     3.88 | 20.70     1.49
   2.733     1.49 | 8.733     3.46 |14.733     3.88 | 20.73     1.49
   2.767     1.49 | 8.767     3.46 |14.767     3.88 | 20.77     1.49
   2.800     1.49 | 8.800     3.46 |14.800     3.88 | 20.80     1.49
   2.833     1.55 | 8.833     3.70 |14.833     3.64 | 20.83     1.49
   2.867     1.55 | 8.867     3.70 |14.867     3.64 | 20.87     1.49
   2.900     1.55 | 8.900     3.70 |14.900     3.64 | 20.90     1.49
   2.933     1.55 | 8.933     3.70 |14.933     3.64 | 20.93     1.49
   2.967     1.55 | 8.967     3.70 |14.967     3.64 | 20.97     1.49
   3.000     1.55 | 9.000     3.70 |15.000     3.64 | 21.00     1.49
   3.033     1.55 | 9.033     3.82 |15.033     3.52 | 21.03     1.49
   3.067     1.55 | 9.067     3.82 |15.067     3.52 | 21.07     1.49
   3.100     1.55 | 9.100     3.82 |15.100     3.52 | 21.10     1.49
   3.133     1.55 | 9.133     3.82 |15.133     3.52 | 21.13     1.49
   3.167     1.55 | 9.167     3.82 |15.167     3.52 | 21.17     1.49
   3.200     1.55 | 9.200     3.82 |15.200     3.52 | 21.20     1.49
   3.233     1.61 | 9.233     3.82 |15.233     3.28 | 21.23     1.49
   3.267     1.61 | 9.267     3.82 |15.267     3.28 | 21.27     1.49
   3.300     1.61 | 9.300     3.82 |15.300     3.28 | 21.30     1.49
   3.333     1.61 | 9.333     3.82 |15.333     3.28 | 21.33     1.49
   3.367     1.61 | 9.367     3.82 |15.367     3.28 | 21.37     1.49
   3.400     1.61 | 9.400     3.82 |15.400     3.28 | 21.40     1.49
   3.433     1.61 | 9.433     3.88 |15.433     3.16 | 21.43     1.49
   3.467     1.61 | 9.467     3.88 |15.467     3.16 | 21.47     1.49
   3.500     1.61 | 9.500     3.88 |15.500     3.16 | 21.50     1.49
   3.533     1.61 | 9.533     3.88 |15.533     3.16 | 21.53     1.49
   3.567     1.61 | 9.567     3.88 |15.567     3.16 | 21.57     1.49
   3.600     1.61 | 9.600     3.88 |15.600     3.16 | 21.60     1.49
   3.633     1.61 | 9.633     4.18 |15.633     3.04 | 21.63     1.43
   3.667     1.61 | 9.667     4.18 |15.667     3.04 | 21.67     1.43
   3.700     1.61 | 9.700     4.18 |15.700     3.04 | 21.70     1.43
   3.733     1.61 | 9.733     4.18 |15.733     3.04 | 21.73     1.43
   3.767     1.61 | 9.767     4.18 |15.767     3.04 | 21.77     1.43
   3.800     1.61 | 9.800     4.18 |15.800     3.04 | 21.80     1.43
   3.833     1.67 | 9.833     4.60 |15.833     2.81 | 21.83     1.43
   3.867     1.67 | 9.867     4.60 |15.867     2.81 | 21.87     1.43
   3.900     1.67 | 9.900     4.60 |15.900     2.81 | 21.90     1.43
   3.933     1.67 | 9.933     4.60 |15.933     2.81 | 21.93     1.43
   3.967     1.67 | 9.967     4.60 |15.967     2.81 | 21.97     1.43
   4.000     1.67 |10.000     4.60 |16.000     2.81 | 22.00     1.43
   4.033     1.67 |10.033     5.07 |16.033     2.69 | 22.03     1.43
   4.067     1.67 |10.067     5.07 |16.067     2.69 | 22.07     1.43
   4.100     1.67 |10.100     5.07 |16.100     2.69 | 22.10     1.43
   4.133     1.67 |10.133     5.07 |16.133     2.69 | 22.13     1.43
   4.167     1.67 |10.167     5.07 |16.167     2.69 | 22.17     1.43
   4.200     1.67 |10.200     5.07 |16.200     2.69 | 22.20     1.43
   4.233     1.79 |10.233     5.61 |16.233     2.69 | 22.23     1.43
   4.267     1.79 |10.267     5.61 |16.267     2.69 | 22.27     1.43
   4.300     1.79 |10.300     5.61 |16.300     2.69 | 22.30     1.43
   4.333     1.79 |10.333     5.61 |16.333     2.69 | 22.33     1.43
   4.367     1.79 |10.367     5.61 |16.367     2.69 | 22.37     1.43
   4.400     1.79 |10.400     5.61 |16.400     2.69 | 22.40     1.43
   4.433     1.79 |10.433     6.27 |16.433     2.63 | 22.43     1.37
   4.467     1.79 |10.467     6.27 |16.467     2.63 | 22.47     1.37
   4.500     1.79 |10.500     6.27 |16.500     2.63 | 22.50     1.37
   4.533     1.79 |10.533     6.27 |16.533     2.63 | 22.53     1.37
   4.567     1.79 |10.567     6.27 |16.567     2.63 | 22.57     1.37
   4.600     1.79 |10.600     6.27 |16.600     2.63 | 22.60     1.37
   4.633     1.79 |10.633     7.16 |16.633     2.51 | 22.63     1.37
   4.667     1.79 |10.667     7.16 |16.667     2.51 | 22.67     1.37
   4.700     1.79 |10.700     7.16 |16.700     2.51 | 22.70     1.37
   4.733     1.79 |10.733     7.16 |16.733     2.51 | 22.73     1.37
   4.767     1.79 |10.767     7.16 |16.767     2.51 | 22.77     1.37
   4.800     1.79 |10.800     7.16 |16.800     2.51 | 22.80     1.37
   4.833     1.91 |10.833     8.12 |16.833     2.51 | 22.83     1.37
   4.867     1.91 |10.867     8.12 |16.867     2.51 | 22.87     1.37
   4.900     1.91 |10.900     8.12 |16.900     2.51 | 22.90     1.37
   4.933     1.91 |10.933     8.12 |16.933     2.51 | 22.93     1.37
   4.967     1.91 |10.967     8.12 |16.967     2.51 | 22.97     1.37
   5.000     1.91 |11.000     8.12 |17.000     2.51 | 23.00     1.37
   5.033     1.91 |11.033     9.73 |17.033     2.39 | 23.03     1.37
   5.067     1.91 |11.067     9.73 |17.067     2.39 | 23.07     1.37
   5.100     1.91 |11.100     9.73 |17.100     2.39 | 23.10     1.37
   5.133     1.91 |11.133     9.73 |17.133     2.39 | 23.13     1.37
   5.167     1.91 |11.167     9.73 |17.167     2.39 | 23.17     1.37
   5.200     1.91 |11.200     9.73 |17.200     2.39 | 23.20     1.37
   5.233     2.03 |11.233    12.06 |17.233     2.33 | 23.23     1.37
   5.267     2.03 |11.267    12.06 |17.267     2.33 | 23.27     1.37
   5.300     2.03 |11.300    12.06 |17.300     2.33 | 23.30     1.37
   5.333     2.03 |11.333    12.06 |17.333     2.33 | 23.33     1.37
   5.367     2.03 |11.367    12.06 |17.367     2.33 | 23.37     1.37
   5.400     2.03 |11.400    12.07 |17.400     2.33 | 23.40     1.37
   5.433     2.03 |11.433    21.07 |17.433     2.33 | 23.43     1.37
   5.467     2.03 |11.467    21.07 |17.467     2.33 | 23.47     1.37
   5.500     2.03 |11.500    21.07 |17.500     2.33 | 23.50     1.37
   5.533     2.03 |11.533    21.07 |17.533     2.33 | 23.53     1.37
   5.567     2.03 |11.567    21.07 |17.567     2.33 | 23.57     1.37
   5.600     2.03 |11.600    21.14 |17.600     2.33 | 23.60     1.37
   5.633     2.03 |11.633    74.03 |17.633     2.21 | 23.63     1.31
   5.667     2.03 |11.667    74.03 |17.667     2.21 | 23.67     1.31
   5.700     2.03 |11.700    74.03 |17.700     2.21 | 23.70     1.31
   5.733     2.03 |11.733    74.03 |17.733     2.21 | 23.73     1.31
   5.767     2.03 |11.767    74.03 |17.767     2.21 | 23.77     1.31
   5.800     2.03 |11.800    74.11 |17.800     2.21 | 23.80     1.31
   5.833     2.15 |11.833   138.62 |17.833     2.21 | 23.83     1.31
   5.867     2.15 |11.867   138.62 |17.867     2.21 | 23.87     1.31
   5.900     2.15 |11.900   138.62 |17.900     2.21 | 23.90     1.31
   5.933     2.15 |11.933   138.62 |17.933     2.21 | 23.93     1.31
   5.967     2.15 |11.967   138.62 |17.967     2.21 | 23.97     1.31
   6.000     2.15 |12.000   138.46 |18.000     2.21 | 24.00     1.31

     Unit Hyd Qpeak  (cms)=    0.747

     PEAK FLOW       (cms)=    0.501 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  80.119
     TOTAL RAINFALL   (mm)= 119.399
     RUNOFF COEFFICIENT   =    0.671

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0202) |    Area    (ha)=   1.37   Curve Number   (CN)= 82.0
|ID= 1 DT= 4.0 min |    Ia      (mm)=   5.50   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   0.29

        NOTE:  RAINFALL WAS TRANSFORMED TO   4.0 MIN. TIME STEP.


                        ---- TRANSFORMED HYETOGRAPH ----
    TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
     hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
   0.067     1.19 | 6.067     2.15 |12.067    21.27 | 18.07     2.09
   0.133     1.19 | 6.133     2.15 |12.133    21.25 | 18.13     2.09
   0.200     1.19 | 6.200     2.15 |12.200    21.25 | 18.20     2.09
   0.267     1.25 | 6.267     2.27 |12.267    15.88 | 18.27     2.09
   0.333     1.25 | 6.333     2.27 |12.333    15.88 | 18.33     2.09
   0.400     1.25 | 6.400     2.27 |12.400    15.88 | 18.40     2.09
   0.467     1.25 | 6.467     2.27 |12.467    10.87 | 18.47     1.97
   0.533     1.25 | 6.533     2.27 |12.533    10.87 | 18.53     1.97
   0.600     1.25 | 6.600     2.27 |12.600    10.87 | 18.60     1.97
   0.667     1.25 | 6.667     2.27 |12.667     9.19 | 18.67     1.97
   0.733     1.25 | 6.733     2.27 |12.733     9.19 | 18.73     1.97
   0.800     1.25 | 6.800     2.27 |12.800     9.19 | 18.80     1.97
   0.867     1.31 | 6.867     2.39 |12.867     7.88 | 18.87     1.85
   0.933     1.31 | 6.933     2.39 |12.933     7.88 | 18.93     1.85
   1.000     1.31 | 7.000     2.39 |13.000     7.88 | 19.00     1.85
   1.067     1.31 | 7.067     2.39 |13.067     6.93 | 19.07     1.85
   1.133     1.31 | 7.133     2.39 |13.133     6.93 | 19.13     1.85
   1.200     1.31 | 7.200     2.39 |13.200     6.93 | 19.20     1.85
   1.267     1.37 | 7.267     2.51 |13.267     6.33 | 19.27     1.79
   1.333     1.37 | 7.333     2.51 |13.333     6.33 | 19.33     1.79
   1.400     1.37 | 7.400     2.51 |13.400     6.33 | 19.40     1.79
   1.467     1.37 | 7.467     2.51 |13.467     5.61 | 19.47     1.67
   1.533     1.37 | 7.533     2.51 |13.533     5.61 | 19.53     1.67
   1.600     1.37 | 7.600     2.51 |13.600     5.61 | 19.60     1.67
   1.667     1.37 | 7.667     2.51 |13.667     5.13 | 19.67     1.61
   1.733     1.37 | 7.733     2.51 |13.733     5.13 | 19.73     1.61
   1.800     1.37 | 7.800     2.51 |13.800     5.13 | 19.80     1.61
   1.867     1.43 | 7.867     2.63 |13.867     4.66 | 19.87     1.61
   1.933     1.43 | 7.933     2.63 |13.933     4.66 | 19.93     1.61
   2.000     1.43 | 8.000     2.63 |14.000     4.66 | 20.00     1.61
   2.067     1.43 | 8.067     2.75 |14.067     4.36 | 20.07     1.55
   2.133     1.43 | 8.133     2.75 |14.133     4.36 | 20.13     1.55
   2.200     1.43 | 8.200     2.75 |14.200     4.36 | 20.20     1.55
   2.267     1.49 | 8.267     2.98 |14.267     4.12 | 20.27     1.55
   2.333     1.49 | 8.333     2.99 |14.333     4.12 | 20.33     1.55
   2.400     1.49 | 8.400     2.99 |14.400     4.12 | 20.40     1.55
   2.467     1.49 | 8.467     3.22 |14.467     4.00 | 20.47     1.49
   2.533     1.49 | 8.533     3.22 |14.533     4.00 | 20.53     1.49
   2.600     1.49 | 8.600     3.22 |14.600     4.00 | 20.60     1.49
   2.667     1.49 | 8.667     3.46 |14.667     3.88 | 20.67     1.49
   2.733     1.49 | 8.733     3.46 |14.733     3.88 | 20.73     1.49
   2.800     1.49 | 8.800     3.46 |14.800     3.88 | 20.80     1.49
   2.867     1.55 | 8.867     3.70 |14.867     3.64 | 20.87     1.49
   2.933     1.55 | 8.933     3.70 |14.933     3.64 | 20.93     1.49
   3.000     1.55 | 9.000     3.70 |15.000     3.64 | 21.00     1.49
   3.067     1.55 | 9.067     3.82 |15.067     3.52 | 21.07     1.49
   3.133     1.55 | 9.133     3.82 |15.133     3.52 | 21.13     1.49
   3.200     1.55 | 9.200     3.82 |15.200     3.52 | 21.20     1.49
   3.267     1.61 | 9.267     3.82 |15.267     3.28 | 21.27     1.49
   3.333     1.61 | 9.333     3.82 |15.333     3.28 | 21.33     1.49
   3.400     1.61 | 9.400     3.82 |15.400     3.28 | 21.40     1.49
   3.467     1.61 | 9.467     3.88 |15.467     3.16 | 21.47     1.49
   3.533     1.61 | 9.533     3.88 |15.533     3.16 | 21.53     1.49
   3.600     1.61 | 9.600     3.88 |15.600     3.16 | 21.60     1.49
   3.667     1.61 | 9.667     4.18 |15.667     3.04 | 21.67     1.43
   3.733     1.61 | 9.733     4.18 |15.733     3.04 | 21.73     1.43
   3.800     1.61 | 9.800     4.18 |15.800     3.04 | 21.80     1.43
   3.867     1.67 | 9.867     4.60 |15.867     2.81 | 21.87     1.43
   3.933     1.67 | 9.933     4.60 |15.933     2.81 | 21.93     1.43
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          4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
          4.067    1.67 |10.067    5.07 |16.067    2.69 | 22.07    1.43
          4.133    1.67 |10.133    5.07 |16.133    2.69 | 22.13    1.43
          4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20    1.43
          4.267    1.79 |10.267    5.61 |16.267    2.69 | 22.27    1.43
          4.333    1.79 |10.333    5.61 |16.333    2.69 | 22.33    1.43
          4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40    1.43
          4.467    1.79 |10.467    6.27 |16.467    2.63 | 22.47    1.37
          4.533    1.79 |10.533    6.27 |16.533    2.63 | 22.53    1.37
          4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60    1.37
          4.667    1.79 |10.667    7.16 |16.667    2.51 | 22.67    1.37
          4.733    1.79 |10.733    7.16 |16.733    2.51 | 22.73    1.37
          4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80    1.37
          4.867    1.91 |10.867    8.12 |16.867    2.51 | 22.87    1.37
          4.933    1.91 |10.933    8.12 |16.933    2.51 | 22.93    1.37
          5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
          5.067    1.91 |11.067    9.73 |17.067    2.39 | 23.07    1.37
          5.133    1.91 |11.133    9.73 |17.133    2.39 | 23.13    1.37
          5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20    1.37
          5.267    2.03 |11.267   12.06 |17.267    2.33 | 23.27    1.37
          5.333    2.03 |11.333   12.06 |17.333    2.33 | 23.33    1.37
          5.400    2.03 |11.400   12.06 |17.400    2.33 | 23.40    1.37
          5.467    2.03 |11.467   21.07 |17.467    2.33 | 23.47    1.37
          5.533    2.03 |11.533   21.07 |17.533    2.33 | 23.53    1.37
          5.600    2.03 |11.600   21.07 |17.600    2.33 | 23.60    1.37
          5.667    2.03 |11.667   74.02 |17.667    2.21 | 23.67    1.31
          5.733    2.03 |11.733   74.03 |17.733    2.21 | 23.73    1.31
          5.800    2.03 |11.800   74.03 |17.800    2.21 | 23.80    1.31
          5.867    2.15 |11.867  138.62 |17.867    2.21 | 23.87    1.31
          5.933    2.15 |11.933  138.62 |17.933    2.21 | 23.93    1.31
          6.000    2.15 |12.000  138.62 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.180

     PEAK FLOW       (cms)=   0.212 (i)
     TIME TO PEAK    (hrs)=  12.133
     RUNOFF VOLUME    (mm)=  76.453
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.640

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD   (0020) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0202):     1.37   0.212    12.13    76.45
        + ID2= 2 (0203):     1.76   0.501    12.00    80.12
          ===============================================
          ID = 3 (0020):     3.13   0.668    12.00    78.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0204) |   Area    (ha)=   1.18   Curve Number   (CN)= 82.0
|ID= 1 DT= 3.0 min |   Ia       (mm)=   5.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

         NOTE:  RAINFALL WAS TRANSFORMED TO   3.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
            TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
             hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
           0.050    1.19 | 6.050    2.15 |12.050   21.25 | 18.05    2.09
           0.100    1.19 | 6.100    2.15 |12.100   21.25 | 18.10    2.09
           0.150    1.19 | 6.150    2.15 |12.150   21.25 | 18.15    2.09
           0.200    1.19 | 6.200    2.15 |12.200   21.25 | 18.20    2.09
           0.250    1.25 | 6.250    2.27 |12.250   15.88 | 18.25    2.09
           0.300    1.25 | 6.300    2.27 |12.300   15.88 | 18.30    2.09
           0.350    1.25 | 6.350    2.27 |12.350   15.88 | 18.35    2.09
           0.400    1.25 | 6.400    2.27 |12.400   15.88 | 18.40    2.09
           0.450    1.25 | 6.450    2.27 |12.450   10.87 | 18.45    1.97
           0.500    1.25 | 6.500    2.27 |12.500   10.87 | 18.50    1.97
           0.550    1.25 | 6.550    2.27 |12.550   10.87 | 18.55    1.97
           0.600    1.25 | 6.600    2.27 |12.600   10.86 | 18.60    1.97
           0.650    1.25 | 6.650    2.27 |12.650    9.19 | 18.65    1.97
           0.700    1.25 | 6.700    2.27 |12.700    9.19 | 18.70    1.97
           0.750    1.25 | 6.750    2.27 |12.750    9.19 | 18.75    1.97
           0.800    1.25 | 6.800    2.27 |12.800    9.19 | 18.80    1.97
           0.850    1.31 | 6.850    2.39 |12.850    7.88 | 18.85    1.85
           0.900    1.31 | 6.900    2.39 |12.900    7.88 | 18.90    1.85
           0.950    1.31 | 6.950    2.39 |12.950    7.88 | 18.95    1.85
           1.000    1.31 | 7.000    2.39 |13.000    7.88 | 19.00    1.85
           1.050    1.31 | 7.050    2.39 |13.050    6.93 | 19.05    1.85
           1.100    1.31 | 7.100    2.39 |13.100    6.93 | 19.10    1.85
           1.150    1.31 | 7.150    2.39 |13.150    6.93 | 19.15    1.85
           1.200    1.31 | 7.200    2.39 |13.200    6.92 | 19.20    1.85
           1.250    1.37 | 7.250    2.51 |13.250    6.33 | 19.25    1.79
           1.300    1.37 | 7.300    2.51 |13.300    6.33 | 19.30    1.79
           1.350    1.37 | 7.350    2.51 |13.350    6.33 | 19.35    1.79
           1.400    1.37 | 7.400    2.51 |13.400    6.33 | 19.40    1.79
           1.450    1.37 | 7.450    2.51 |13.450    5.61 | 19.45    1.67
           1.500    1.37 | 7.500    2.51 |13.500    5.61 | 19.50    1.67
           1.550    1.37 | 7.550    2.51 |13.550    5.61 | 19.55    1.67
           1.600    1.37 | 7.600    2.51 |13.600    5.61 | 19.60    1.67
           1.650    1.37 | 7.650    2.51 |13.650    5.13 | 19.65    1.61
           1.700    1.37 | 7.700    2.51 |13.700    5.13 | 19.70    1.61
           1.750    1.37 | 7.750    2.51 |13.750    5.13 | 19.75    1.61
           1.800    1.37 | 7.800    2.51 |13.800    5.13 | 19.80    1.61
           1.850    1.43 | 7.850    2.63 |13.850    4.66 | 19.85    1.61
           1.900    1.43 | 7.900    2.63 |13.900    4.66 | 19.90    1.61
           1.950    1.43 | 7.950    2.63 |13.950    4.66 | 19.95    1.61
           2.000    1.43 | 8.000    2.63 |14.000    4.66 | 20.00    1.61
           2.050    1.43 | 8.050    2.75 |14.050    4.36 | 20.05    1.55
           2.100    1.43 | 8.100    2.75 |14.100    4.36 | 20.10    1.55
           2.150    1.43 | 8.150    2.75 |14.150    4.36 | 20.15    1.55
           2.200    1.43 | 8.200    2.75 |14.200    4.36 | 20.20    1.55
           2.250    1.49 | 8.250    2.99 |14.250    4.12 | 20.25    1.55
           2.300    1.49 | 8.300    2.99 |14.300    4.12 | 20.30    1.55
           2.350    1.49 | 8.350    2.99 |14.350    4.12 | 20.35    1.55
           2.400    1.49 | 8.400    2.99 |14.400    4.12 | 20.40    1.55
           2.450    1.49 | 8.450    3.22 |14.450    4.00 | 20.45    1.49
           2.500    1.49 | 8.500    3.22 |14.500    4.00 | 20.50    1.49
           2.550    1.49 | 8.550    3.22 |14.550    4.00 | 20.55    1.49
           2.600    1.49 | 8.600    3.22 |14.600    4.00 | 20.60    1.49
           2.650    1.49 | 8.650    3.46 |14.650    3.88 | 20.65    1.49
           2.700    1.49 | 8.700    3.46 |14.700    3.88 | 20.70    1.49
           2.750    1.49 | 8.750    3.46 |14.750    3.88 | 20.75    1.49
           2.800    1.49 | 8.800    3.46 |14.800    3.88 | 20.80    1.49
           2.850    1.55 | 8.850    3.70 |14.850    3.64 | 20.85    1.49
           2.900    1.55 | 8.900    3.70 |14.900    3.64 | 20.90    1.49
           2.950    1.55 | 8.950    3.70 |14.950    3.64 | 20.95    1.49
           3.000    1.55 | 9.000    3.70 |15.000    3.64 | 21.00    1.49
           3.050    1.55 | 9.050    3.82 |15.050    3.52 | 21.05    1.49
           3.100    1.55 | 9.100    3.82 |15.100    3.52 | 21.10    1.49
           3.150    1.55 | 9.150    3.82 |15.150    3.52 | 21.15    1.49
           3.200    1.55 | 9.200    3.82 |15.200    3.52 | 21.20    1.49
           3.250    1.61 | 9.250    3.82 |15.250    3.28 | 21.25    1.49
           3.300    1.61 | 9.300    3.82 |15.300    3.28 | 21.30    1.49
           3.350    1.61 | 9.350    3.82 |15.350    3.28 | 21.35    1.49
           3.400    1.61 | 9.400    3.82 |15.400    3.28 | 21.40    1.49
           3.450    1.61 | 9.450    3.88 |15.450    3.16 | 21.45    1.49
           3.500    1.61 | 9.500    3.88 |15.500    3.16 | 21.50    1.49
           3.550    1.61 | 9.550    3.88 |15.550    3.16 | 21.55    1.49
           3.600    1.61 | 9.600    3.88 |15.600    3.16 | 21.60    1.49
           3.650    1.61 | 9.650    4.18 |15.650    3.04 | 21.65    1.43
           3.700    1.61 | 9.700    4.18 |15.700    3.04 | 21.70    1.43
           3.750    1.61 | 9.750    4.18 |15.750    3.04 | 21.75    1.43
           3.800    1.61 | 9.800    4.18 |15.800    3.04 | 21.80    1.43
           3.850    1.67 | 9.850    4.60 |15.850    2.81 | 21.85    1.43
           3.900    1.67 | 9.900    4.60 |15.900    2.81 | 21.90    1.43
           3.950    1.67 | 9.950    4.60 |15.950    2.81 | 21.95    1.43
           4.000    1.67 |10.000    4.60 |16.000    2.81 | 22.00    1.43
           4.050    1.67 |10.050    5.07 |16.050    2.69 | 22.05    1.43
           4.100    1.67 |10.100    5.07 |16.100    2.69 | 22.10    1.43
           4.150    1.67 |10.150    5.07 |16.150    2.69 | 22.15    1.43
           4.200    1.67 |10.200    5.07 |16.200    2.69 | 22.20    1.43
           4.250    1.79 |10.250    5.61 |16.250    2.69 | 22.25    1.43
           4.300    1.79 |10.300    5.61 |16.300    2.69 | 22.30    1.43
           4.350    1.79 |10.350    5.61 |16.350    2.69 | 22.35    1.43
           4.400    1.79 |10.400    5.61 |16.400    2.69 | 22.40    1.43
           4.450    1.79 |10.450    6.27 |16.450    2.63 | 22.45    1.37
           4.500    1.79 |10.500    6.27 |16.500    2.63 | 22.50    1.37
           4.550    1.79 |10.550    6.27 |16.550    2.63 | 22.55    1.37
           4.600    1.79 |10.600    6.27 |16.600    2.63 | 22.60    1.37
           4.650    1.79 |10.650    7.16 |16.650    2.51 | 22.65    1.37
           4.700    1.79 |10.700    7.16 |16.700    2.51 | 22.70    1.37
           4.750    1.79 |10.750    7.16 |16.750    2.51 | 22.75    1.37
           4.800    1.79 |10.800    7.16 |16.800    2.51 | 22.80    1.37
           4.850    1.91 |10.850    8.12 |16.850    2.51 | 22.85    1.37
           4.900    1.91 |10.900    8.12 |16.900    2.51 | 22.90    1.37
           4.950    1.91 |10.950    8.12 |16.950    2.51 | 22.95    1.37
           5.000    1.91 |11.000    8.12 |17.000    2.51 | 23.00    1.37
           5.050    1.91 |11.050    9.73 |17.050    2.39 | 23.05    1.37
           5.100    1.91 |11.100    9.73 |17.100    2.39 | 23.10    1.37
           5.150    1.91 |11.150    9.73 |17.150    2.39 | 23.15    1.37
           5.200    1.91 |11.200    9.73 |17.200    2.39 | 23.20    1.37
           5.250    2.03 |11.250   12.06 |17.250    2.33 | 23.25    1.37
           5.300    2.03 |11.300   12.06 |17.300    2.33 | 23.30    1.37
           5.350    2.03 |11.350   12.06 |17.350    2.33 | 23.35    1.37
           5.400    2.03 |11.400   12.06 |17.400    2.33 | 23.40    1.37
           5.450    2.03 |11.450   21.07 |17.450    2.33 | 23.45    1.37
           5.500    2.03 |11.500   21.07 |17.500    2.33 | 23.50    1.37
           5.550    2.03 |11.550   21.07 |17.550    2.33 | 23.55    1.37
           5.600    2.03 |11.600   21.10 |17.600    2.33 | 23.60    1.37
           5.650    2.03 |11.650   74.03 |17.650    2.21 | 23.65    1.31
           5.700    2.03 |11.700   74.03 |17.700    2.21 | 23.70    1.31
           5.750    2.03 |11.750   74.03 |17.750    2.21 | 23.75    1.31
           5.800    2.03 |11.800   74.06 |17.800    2.21 | 23.80    1.31
           5.850    2.15 |11.850  138.62 |17.850    2.21 | 23.85    1.31
           5.900    2.15 |11.900  138.62 |17.900    2.21 | 23.90    1.31
           5.950    2.15 |11.950  138.62 |17.950    2.21 | 23.95    1.31
           6.000    2.15 |12.000  138.56 |18.000    2.21 | 24.00    1.31

     Unit Hyd Qpeak  (cms)=   0.205

     PEAK FLOW       (cms)=   0.217 (i)
     TIME TO PEAK    (hrs)=  12.100
     RUNOFF VOLUME    (mm)=  76.453
     TOTAL RAINFALL   (mm)= 119.400
     RUNOFF COEFFICIENT   =   0.640

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0021) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0204):     1.18   0.217    12.10    76.45
        + ID2= 2 (0050):    16.13   2.722    13.08    78.28
          ===============================================
          ID = 3 (0021):    17.31   2.745    13.05    78.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0022) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0020):     3.13   0.668    12.00    78.51
        + ID2= 2 (0021):    17.31   2.745    13.05    78.15
          ===============================================
          ID = 3 (0022):    20.44   2.817    13.00    78.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0026) |
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0022):    20.44   2.817    13.00    78.21
        + ID2= 2 (0024):    64.84   6.539    12.42    77.97
          ===============================================
          ID = 3 (0026):    85.28   8.154    12.60    78.02

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

--------------------
| ADD HYD   (0026) |
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
--------------------        (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0026):    85.28   8.154    12.60    78.02
        + ID2= 2 (0025):   100.29   4.387    12.33    78.22
          ===============================================
          ID = 1 (0026):   185.57  12.382    12.57    78.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------

 FINISH
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Appendix D

Hydraulic Calculations

Appendix D

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 0.920 cu.m/s

Design Flow: 1.790 cu.m/s

Maximum Flow: 2.740 cu.m/s

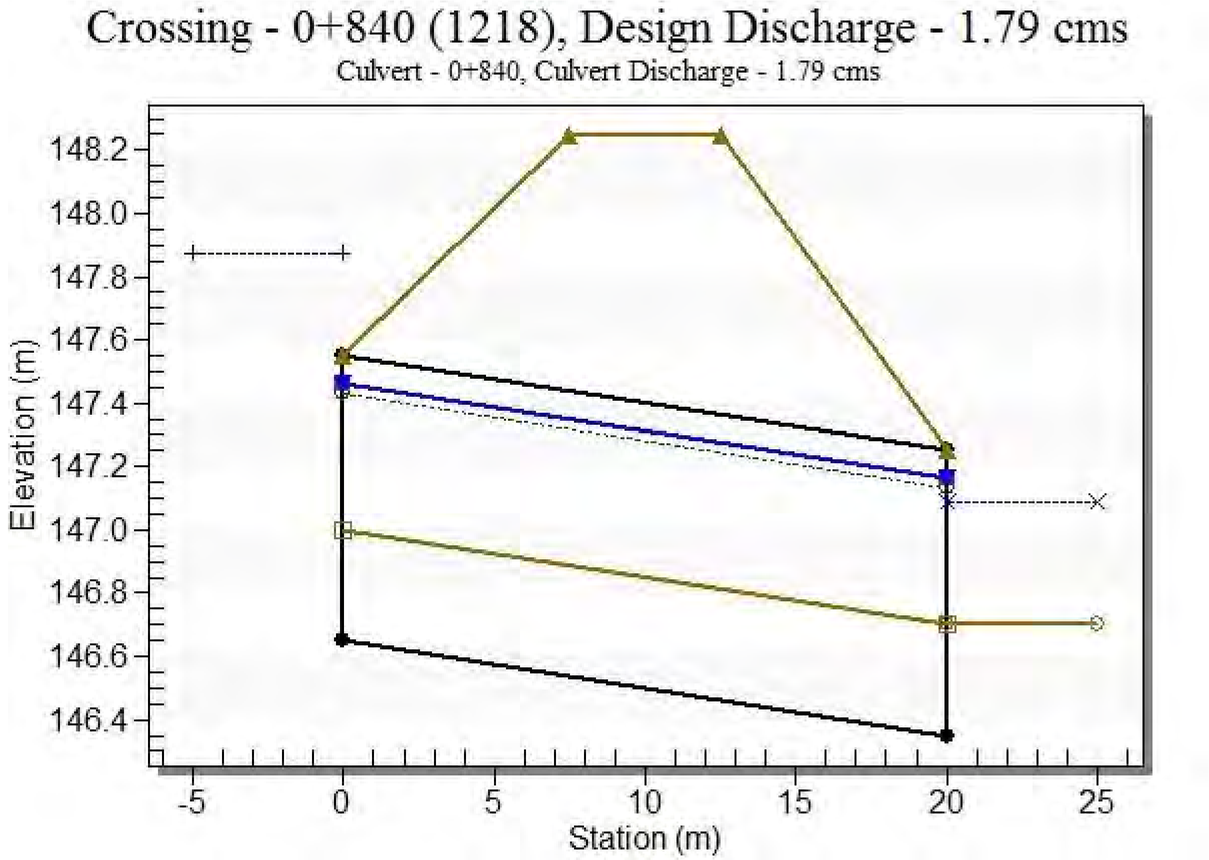
Table 1 - Summary of Culvert Flows at Crossing: 0+840 (1218)

Headwater Elevation (m)	Total Discharge (cms)	0+840 Discharge (cms)	Roadway Discharge (cms)	Iterations
147.49	0.92	0.92	0.00	1
147.56	1.10	1.10	0.00	1
147.63	1.28	1.28	0.00	1
147.71	1.47	1.47	0.00	1
147.79	1.65	1.65	0.00	1
147.87	1.79	1.79	0.00	1
148.00	2.01	2.01	0.00	1
148.14	2.19	2.19	0.00	1
148.27	2.38	2.35	0.03	10
148.32	2.56	2.40	0.15	6
148.36	2.74	2.45	0.29	5
148.25	2.32	2.32	0.00	Overtopping

Table 2 - Culvert Summary Table: 0+840

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.92	0.92	147.49	0.486	0.161	1-S2n	0.289	0.297	0.289	0.304	1.610	0.994
1.10	1.10	147.56	0.560	0.259	5-S2n	0.322	0.334	0.322	0.326	1.731	1.040
1.28	1.28	147.63	0.635	0.375	5-S2n	0.353	0.370	0.353	0.345	1.837	1.080
1.47	1.47	147.71	0.712	0.503	5-S2n	0.382	0.405	0.382	0.362	1.939	1.117
1.65	1.65	147.79	0.792	0.696	5-S2n	0.410	0.437	0.410	0.379	2.031	1.150
1.79	1.79	147.87	0.873	0.800	5-S2n	0.431	0.463	0.462	0.390	1.957	1.174
2.01	2.01	148.00	0.999	0.989	7-M2c	0.550	0.501	0.501	0.408	2.233	1.209
2.19	2.19	148.14	1.133	1.139	7-M2c	0.550	0.531	0.531	0.421	2.294	1.235
2.38	2.35	148.27	1.249	1.272	6-FFc	0.550	0.550	0.550	0.434	2.373	1.260
2.56	2.40	148.32	1.290	1.320	6-FFc	0.550	0.550	0.550	0.446	2.429	1.283
2.74	2.45	148.36	1.323	1.358	6-FFc	0.550	0.550	0.550	0.458	2.471	1.306

Water Surface Profile Plot for Culvert: 0+840



Site Data - 0+840

Site Data Option: Culvert Invert Data
Inlet Station: 0.00 m
Inlet Elevation: 146.65 m
Outlet Station: 20.00 m
Outlet Elevation: 146.35 m
Number of Barrels: 1

Culvert Data Summary - 0+840

Barrel Shape: Concrete Box
Barrel Span: 1800.00 mm
Barrel Rise: 900.00 mm
Barrel Material: Concrete
Embedment: 350.00 mm
Barrel Manning's n: 0.0130 (top and sides)
Manning's n: 0.0350 (bottom)
Culvert Type: Straight
Inlet Configuration: Thin Edge Projecting
Inlet Depression: NONE

Tailwater Channel Data - 0+840 (1218)

Tailwater Channel Option: Triangular Channel
Side Slope (H:V): 10.00 (_:1)
Channel Slope: 0.0150
Channel Manning's n: 0.0350
Channel Invert Elevation: 146.70 m

Roadway Data for Crossing: 0+840 (1218)

Roadway Profile Shape: Constant Roadway Elevation
Crest Length: 5.00 m
Crest Elevation: 148.25 m
Roadway Surface: Paved
Roadway Top Width: 5.00 m

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Appendix E

CVC/TRCA Low Impact Development Planning and Design Guide – Bioretention Fact Sheet

GENERAL DESCRIPTION

As a stormwater filter and infiltration practice, bioretention temporarily stores, treats and infiltrates runoff. Depending on native soil infiltration rate and physical constraints, the system may be designed without an underdrain for full infiltration, with an underdrain for partial infiltration, or with an impermeable liner and underdrain for filtration only (i.e., a biofilter). The primary component of the practice is the filter bed which is a mixture of sand, fines and organic material. Other elements include a mulch ground cover and plants adapted to the conditions of a stormwater practice. Bioretention is designed to capture small storm events or the water quality storage requirement. An overflow or bypass is necessary to pass large storm event flows. Bioretention can be adapted to fit into many different development contexts and provide a convenient area for snow storage and treatment.

Source: Minnesota Businesses for Clean Water

Source: City of Portland

DESIGN GUIDANCE

SOIL CHARACTERISTICS

Bioretention can be constructed over any soil type, but hydrologic soil group A and B are best for achieving water balance goals. If possible, bioretention should be sited in the areas of the development with the highest native soil infiltration rates. Bioretention in soils with infiltration rates less than 15 mm/hr will require an underdrain. Designers should verify the native soil infiltration rate at the proposed location and depth through measurement of hydraulic conductivity under field saturated conditions.

GEOMETRY & SITE LAYOUT

Key geometry and site layout factors include:

- The minimum footprint of the filter bed area is based on the drainage area. Typical drainage areas to bioretention are between 100 m2 to 0.5 hectares. The maximum recommended drainage area is 0.8 hectares. Typical ratios of impervious drainage area to treatment facility area range from 5:1 to 15:1.
- Bioretention can be configured to fit into many locations and shapes. However, cells that are narrow may concentrate flow as it spreads throughout the cell and result in erosion.
- The filter bed surface should be level to encourage stormwater to spread out evenly over the surface.

PRE-TREATMENT

Pretreatment prevents premature clogging by capturing coarse sediment particles before they reach the filter bed. Where the runoff source area produces little sediment, such as roofs, bioretention can function effectively without pretreatment. To treat parking area or road runoff, a two-cell design that incorporates a forebay is recommended. Pretreatment practices that may be feasible, depending on the method of conveyance and the availability of space include:

- *Two-cell design (channel flow):* Forebay ponding volume should account for 25% of the water quality storage requirement and be designed with a 2:1 length to width ratio.
- *Vegetated filter strip (sheet flow):* Should be a minimum of three (3) metres in width. If smaller strips are used, more frequent maintenance of the filter bed can be anticipated.
- *Gravel diaphragm (sheet flow):* A small trench filled with pea gravel, which is perpendicular to the flow path between the edge of the pavement and the bioretention practice will promote settling out of sediment and maintain sheet flow into the facility. A drop of 50-150 mm into the gravel diaphragm can be used to dissipate energy and promote settling.
- *Rip rap and/or dense vegetation (channel flow):* Suitable for small bioretention cells with drainage areas less than 100 square metres.

GRAVEL STORAGE LAYER

- DEPTH: Should be a minimum of 300 mm deep and sized to provide the required storage volume. Granular material should be 50 mm diameter clear stone.
- PEA GRAVEL CHOKING LAYER: A 100 mm deep layer of pea gravel (3 to 10 mm diameter clear stone) should be placed on top of the coarse gravel storage layer as a choking layer separating it from the overlying filter media bed.

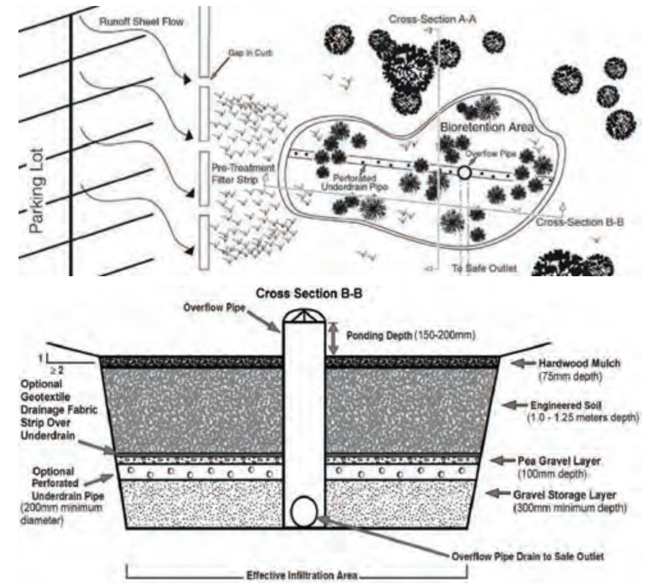
FILTER MEDIA

- COMPOSITION: To ensure a consistent and homogeneous bed, filter media should come pre-mixed from an approved vendor.
- DEPTH: Recommended depth is between 1.0 and 1.25 m. However in constrained applications, pollutant removal benefits may be achieved in beds as shallow as 500 mm. If trees are to be included in the design, bed depth must be at least 1.0 m.
- MULCH: A 75 mm layer of mulch on the surface of the filter bed enhances plant survival, suppresses weed growth and pretreats runoff before it reaches the filter bed.

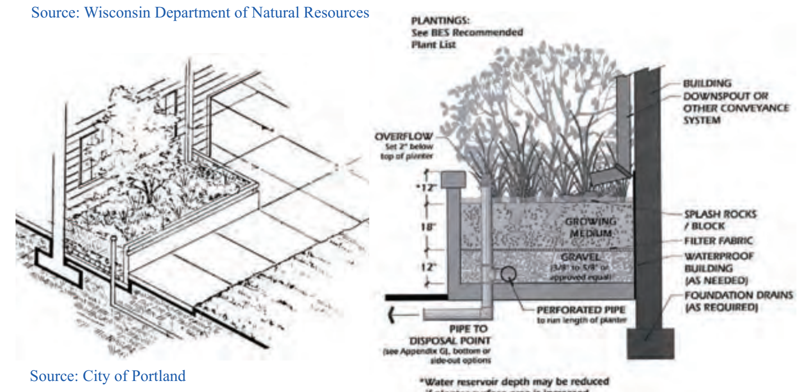
CONVEYANCE AND OVERFLOW

Bioretention can be designed to be inline or offline from the drainage system. Inline bioretention accepts all flow from a drainage area and conveys larger event flows through an overflow outlet. Overflow structures must be sized to safely convey larger storm events out of the facility. The invert of the overflow should be placed at the maximum water surface elevation of the bioretention area, which is typically 150-250 mm above the filter bed surface.

Offline bioretention practices use flow splitters or bypass channels that only allow the required water quality storage volume to enter the facility. This may be achieved with a pipe, weir, or curb opening sized for the target flow, but in conjunction, create a bypass channel so that higher flows do not pass over the surface of the filter bed. Using a weir or curb opening minimizes clogging and reduces maintenance frequency.



Source: Wisconsin Department of Natural Resources



Source: City of Portland

ABILITY TO MEET SWM OBJECTIVES

BMP	Water Balance Benefit	Water Quality Improvement	Stream Channel Erosion Control Benefits
Bioretention with no underdrain	Yes	Yes - size for water quality storage requirement	Partial - based on available storage volume and infiltration rates
Bioretention with underdrain	Partial - based on available storage volume beneath the underdrain and soil infiltration rate	Yes - size for water quality storage requirement	Partial - based on available storage volume beneath the underdrain and soil infiltration rate
Bioretention with underdrain and impermeable liner	Partial - some volume reduction through evapotranspiration	Yes - size for water quality storage requirement	Partial - some volume reduction through evapotranspiration

UNDERDRAIN

- Only needed where native soil infiltration rate is less than 15 mm/hr (hydraulic conductivity of less than 1x10-6 cm/s).
- Should consist of a perforated pipe embedded in the coarse gravel storage layer at least 100 mm above the bottom.
- A strip of geotextile filter fabric placed between the filter media and pea gravel choking layer over the perforated pipe is optional to help prevent fine soil particles from entering the underdrain.
- A vertical standpipe connected to the underdrain can be used as a cleanout and monitoring well.

MONITORING WELLS

A capped vertical stand pipe consisting of an anchored 100 to 150 mm diameter perforated pipe with a lockable cap installed to the bottom of the facility is recommended for monitoring drainage time between storms.

GENERAL SPECIFICATIONS

Material	Specification	Quantity
Filter Media Composition	Filter Media Soil Mixture to contain: • 85 to 88% sand • 8 to 12% soil fines • 3 to 5% organic matter (leaf compost) Other Criteria: • Phosphorus soil test index (P-Index) value between 10 to 30 ppm • Cationic exchange capacity (CEC) greater than 10 meq/100 g • Free of stones, stumps, roots and other large debris • pH between 5.5 to 7.5 • Infiltration rate greater than 25 mm/hr	Recommended depth is between 1.0 and 1.25 metres.
Mulch Layer	Shredded hardwood bark mulch	A 75 mm layer on the surface of the filter bed
Geotextile	Material specifications should conform to Ontario Provincial Standard Specification (OPSS) 1860 for Class II geotextile fabrics. Should be woven monofilament or non-woven needle punched fabrics. Woven slit film and non-woven heat bonded fabrics should not be used as they are prone to clogging. For further guidance see CVC/TRCA LID SWM Planning and Design Guide, Table 4.5.5.	Strip over the perforated pipe underdrain (if present) between the filter media bed and gravel storage layer (stone reservoir)
Gravel	Washed 50 mm diameter clear stone should be used to surround the underdrain and for the gravel storage layer Washed 3 to 10 mm diameter clear stone should be used for pea gravel choking layer.	Volume based on dimensions, assuming a void space ratio of 0.4.
Underdrain	Perforated HDPE or equivalent, minimum 100 mm diameter, 200 mm recommended.	• Perforated pipe for length of cell. • Non-perforated pipe as needed to connect with storm drain system. • One or more caps. • T's for underdrain configuration

CONSTRUCTION CONSIDERATIONS

Ideally, bioretention sites should remain outside the limit of disturbance until construction of the bioretention begins to prevent soil compaction by heavy equipment. Locations should not be used as sediment basins during construction, as the concentration of fines will prevent post-construction infiltration. To prevent sediment from clogging the surface of a bioretention cell, stormwater should be diverted away from the bioretention until the drainage area is fully stabilized.

For further guidance regarding key steps during construction, see the CVC/TRCA LID SWM Planning and Design Guide, Section 4.5.2 - Construction Considerations)

OPERATION AND MAINTENANCE

Bioretention requires routine inspection and maintenance of the landscaping as well as periodic inspection for less frequent maintenance needs or remedial maintenance. Generally, routine maintenance will be the same as for any other landscaped area; weeding, pruning, and litter removal. Regular watering may be required during the first two years until vegetation is established.

For the first two years following construction the facility should be inspected at least quarterly and after every major storm event (> 25 mm). Subsequently, inspections should be conducted in the spring and fall of each year and after major storm events. Inspect for vegetation density (at least 80% coverage), damage by foot or vehicular traffic, channelization, accumulation of debris, trash and sediment, and structural damage to pretreatment devices.

Trash and debris should be removed from pretreatment devices, the bioretention area surface and inlet and outlets at least twice annually. Other maintenance activities include reapplying mulch, pruning, weeding replacing dead vegetation and repairing eroded areas as needed. Remove accumulated sediment on the bioretention area surface when dry and exceeding 25 mm depth.

SITE CONSIDERATIONS

Wellhead Protection

Facilities receiving road or parking lot runoff should not be located within two (2) year time-of-travel wellhead protection areas.

Available Space

Reserve open areas of about 10 to 20% of the size of the contributing drainage area.

Site Topography

Contributing slopes should be between 1 to 5%. The surface of the filter bed should be flat to allow flow to spread out. A stepped multi-cell design can also be used.

Available Head

If an underdrain is used, then 1 to 1.5 metres elevation difference is needed between the inflow point and the downstream storm drain invert.

Water Table

A minimum of one (1) metre separating the seasonally high water table or top of bedrock elevation and the bottom of the practice is necessary.

Soils

Bioretention can be located over any soil type, but hydrologic soil group A and B soils are best for achieving water balance benefits. Facilities should be located in portions of the site with the highest native soil infiltration rates. Where infiltration rates are less than 15 mm/hr (hydraulic conductivity less than 1x10-6 cm/s) an underdrain is required. Native soil infiltration rate at the proposed facility location and depth should be confirmed through measurement of hydraulic conductivity under field saturated conditions.

Drainage Area & Runoff Volume

Typical contributing drainage areas are between 100 m2 to 0.5 hectares. The maximum recommended contributing drainage area is 0.8 hectares. Typical ratios of impervious drainage area to treatment facility area range from 5:1 to 15:1.

Pollution Hot Spot Runoff

To protect groundwater from possible contamination, runoff from pollution hot spots should not be treated by bioretention facilities designed for full or partial infiltration. Facilities designed with an impermeable liner (filtration only facilities) can be used to treat runoff from pollution hot spots.

Proximity to Underground Utilities

Designers should consult local utility design guidance for the horizontal and vertical clearances required between storm drains, ditches, and surface water bodies.

Overhead Wires

Check whether the future tree canopy height in the bioretention area will interfere with existing overhead phone and power lines.

Setback from Buildings

If an impermeable liner is used, no setback is needed. If not, a four (4) metre setback from building foundations should be applied.

TORONTO AND REGION Conservation for The Living City

CVC CREDIT VALLEY CONSERVATION

FOR FURTHER DETAILS SEE SECTION 4.5 OF THE CVC/TRCA LID SWM GUIDE

CVC/TRCA LOW IMPACT DEVELOPMENT PLANNING AND DESIGN GUIDE - FACT SHEET

BIORETENTION

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Appendix F

Flood Control Calculations

R.J. Burnside & Associates Limited 6990 Creditview Road, Unit 2 Mississauga ON L5N 8R9 CANADA
telephone (905) 821-1800 **fax** (905) 821-1809 **web** www.rjburnside.com

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Technical Memorandum

Date: January 17, 2018 **Project No.:** 300039474.0000

Project Name: Sheridan Park Drive Extension Municipal Class Environmental Assessment Flood Control Calculations

Client Name: City of Mississauga

Submitted By: Harold Faulkner, P.Eng.

Introduction

As noted in Section 3.0, Table 3-1, of the Credit Valley Conservation Stormwater Management Criteria (August 2012), the Flood Control criteria for new development in the Sheridan Creek watershed, is to control the 1:100-year post-development peak flow rate to the 1:2-year pre-development peak flow.

To address this criteria for the proposed extension of Sheridan Park Drive, the Modified Rational Method was used to determine the maximum required storage volume.

The proposed land-use changes are limited to an 850 m length of the road right-of-way (ROW). Over this length, the ROW width is approximately 35 m; therefore, the 29,750 m^2 (850 m x 35 m) drainage area will form the basis for comparing pre and post-development flows.

1:2-year Pre-Development Peak Flow

The pre-development condition represents the existing, vegetated state. The Rational Method was used to determine the 1:2-year pre-development target peak flow rate as follows:

Area = 29,750 m^2
Runoff coefficient = 0.25 (existing vegetated condition)
Rainfall intensity = 59.89 mm/hr (15-minute time of concentration)

Q = CIA/360
Q_2 = 0.25 x 59.89 x 29,750/360
Q_2 = 123.7 L/s

1:100-year Post-Development Peak Flow and Required Storage

The post-development condition includes the extended roadway. The table below provides the calculations for the proposed ROW runoff coefficient. These areas are based on the average

ROW cross-section, with 9 m of paved surface, and the remaining 26 m consisting of vegetated cover.

Land Use	**Area**	**Runoff Coefficient**	**C x A**
Paved	9 m x 850 m = 7,650 m^2	0.90	6,885
Grassed	26 m x 850 m = 22,100 m^2	0.25	5,525
Total	29,750 m^2	0.42	12,410

The Rational Method was used to determine the 1:100-year post-development peak flow rate as follows:

Area = 29,750 m^2
Runoff coefficient = 0.42
Rainfall intensity = 140.69 mm/hr (15-minute time of concentration)

Q = CIA/360
Q_{100} = 0.42 x 1.25 x 140.69 x 29,750 / 360
Q_{100} = 606.2 L/s

A Modified Rational Method spreadsheet was used to determine the maximum volume required to reduce the post-development 1:100-year peak flow to the pre-development 1:2-year rate. As demonstrated in the attached Excel table output, the resulting volume is 590 m^3.

These stormwater calculations are preliminary and will be finalized, together with the approach to storing/managing stormwater attributed to the road extension during the detailed design phase of the project.

R.J. Burnside & Associates Limited

Harold Faulkner, P.Eng.
Project Engineer
HF:bs

MODIFIED RATIONAL METHOD - REQUIRED STORAGE VOLUME

Project: Sheridan Park Drive Extension EA

Project No: 300039474

1:100-year Post Development to 1:2-year Pre-Development

By: H.Faulkner

Date: 17-Jan-18

100-Year				
Time (min)	**Intensity (mm/hr)**	**Inflow (L/s)**	**Outflow (L/s)**	**Storage (m^3)**
15	141	606.2	123.73	434.25
17	131	562.6	123.73	455.07
19	122	525.5	123.73	472.90
21	115	493.6	123.73	488.30
23	108	465.8	123.73	501.72
25	102	441.3	123.73	513.46
27	97	419.6	123.73	523.78
29	93	400.1	123.73	532.89
31	89	382.6	123.73	540.93
33	85	366.8	123.73	548.06
35	82	352.4	123.73	554.36
37	79	339.2	123.73	559.94
39	76	327.1	123.73	564.87
41	73	315.9	123.73	569.22
43	71	305.6	123.73	573.03
45	69	296.0	123.73	576.37
47	67	287.0	123.73	579.27
49	65	278.7	123.73	581.76
51	63	270.9	123.73	583.88
53	61	263.5	123.73	585.67
55	60	256.7	123.73	587.14
57	58	250.2	123.73	588.31
59	57	244.0	123.73	589.21
61	55	238.2	123.73	589.86
63	54	232.7	123.73	590.26
65	53	227.5	123.73	**590.45**
67	52	222.6	123.73	590.42
69	51	217.9	123.73	590.19
71	50	213.4	123.73	589.78
73	49	209.1	123.73	589.20
75	48	205.0	123.73	588.44
77	47	201.1	123.73	587.53
79	46	197.3	123.73	586.47
81	45	193.7	123.73	585.26
83	44	190.3	123.73	583.92
85	43	187.0	123.73	582.45
87	43	183.8	123.73	580.85

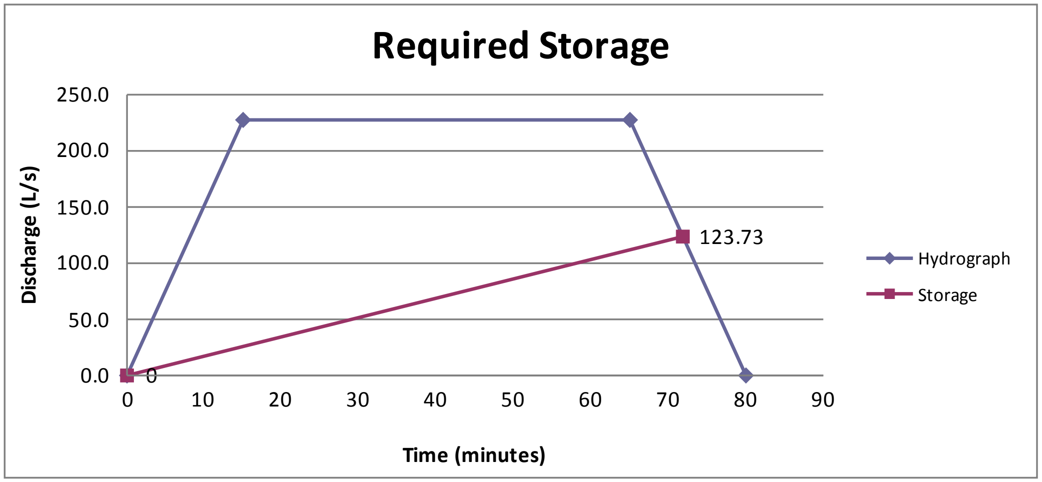
Catchment Area	29,750	m^2
Time of Concentration	15	minutes
Time Step	2	minutes
Post-Development Runoff Coefficient	0.42	

$Q = CIA/360$

$I = A/(T+B)^c$

Storage = $Q_{in} \times T - Q_{out} \times [(T_c + T) / 2]$

Storm Return Period (years)	A	B	c	Proposed Runoff Coefficient	Target Discharge (L/s)	Initial Time (min)
100	1450.0	4.900	0.780	0.52	123.73	15



Required storage to attain target discharge rate is equal to the area above the "storage" line.

Trapezoid Area	887,401	L/s * s
Triangle Area	296,955	L/s * s
Trapezoid - Triangle	**590.45**	**m^3**

Source: ASCE Manuals and Reports on Engineering Practice No. 28, Hydrology Handbook, Second Edition, Copyright 1996, ISBN 0-7844-0138-2

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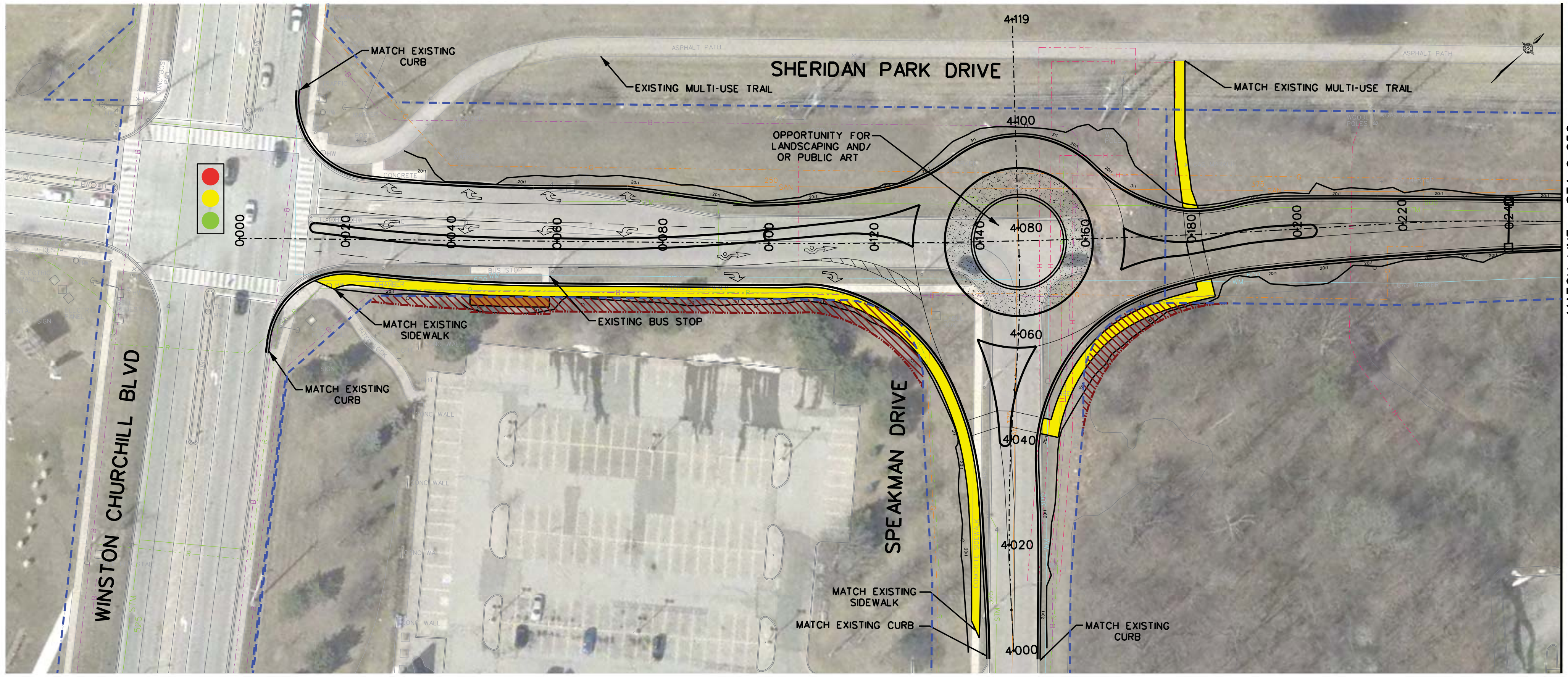
Plan C

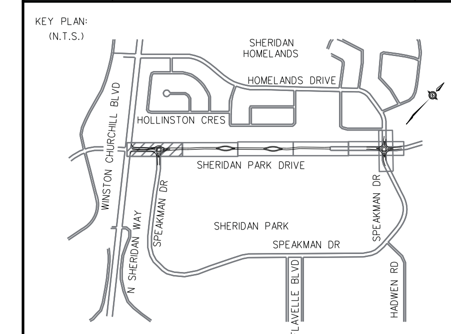
Drainage Management Plans

Plan C

SERVICE DATA					
SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS	________	______	GAS MAINS	________	______
STM. SEWERS	________	______	BELL U/G CABLE	________	______
WATERMAINS	________	______	HYDRO U/G CABLE	________	______
M.O.E.	________	______	ROGERS U/G CABLE	________	______

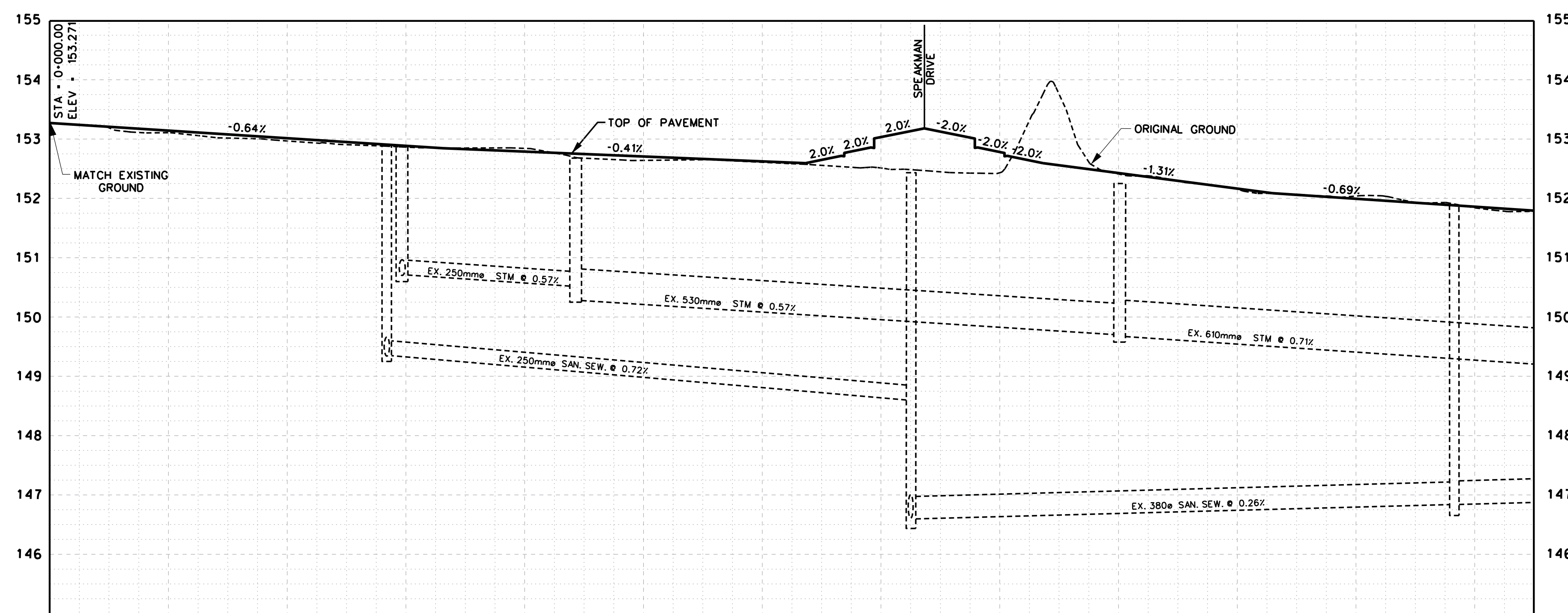
REVISIONS		
DATE	DETAILS	INIT.





LEGEND:

EXISTING ROAD RIGHT OF WAY
PROPOSED ROAD RIGHT OF WAY
PROPERTY REQUIRED FOR ROAD EXTENSION
GRADING LIMIT
WATERCOURSE
HEADWATER DRAINAGE FEATURE
PROPOSED SIDEWALK
PROPOSED BUS STOP
PROPOSED CATCH BASIN
PROPOSED MANHOLE CATCH BASIN
TRAFFIC SIGNAL
H HYDRO
G GAS
B BELL
SAN EXISTING SANITARY SEWER
STM EXISTING STORM SEWER
WM EXISTING WATERMAIN
R ROGERS



TOP OF PAV'T	153.27	153.11	152.97	152.87	152.84	152.64	152.61	152.51	152.43	152.41	152.16	152.04	151.84		TOP OF PAV'T
ORIG. GROUND	153.271	153.108	152.968	152.865	152.843	152.641	152.609	152.512	152.432	152.411	152.156	152.040	151.841		ORIG. GROUND
CHAINAGE	0+000	0+020	0+040	0+060	0+080	0+100	0+120	0+140	0+160	0+180	0+200	0+220	0+240	0+250	CHAINAGE

DESIGN BY	APPROVED BY
______________ C.E.T.	______________
DEPARTMENTAL APPROVAL	
SILVIO CESARIO P.ENG.	

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RJB Project No. 300039474

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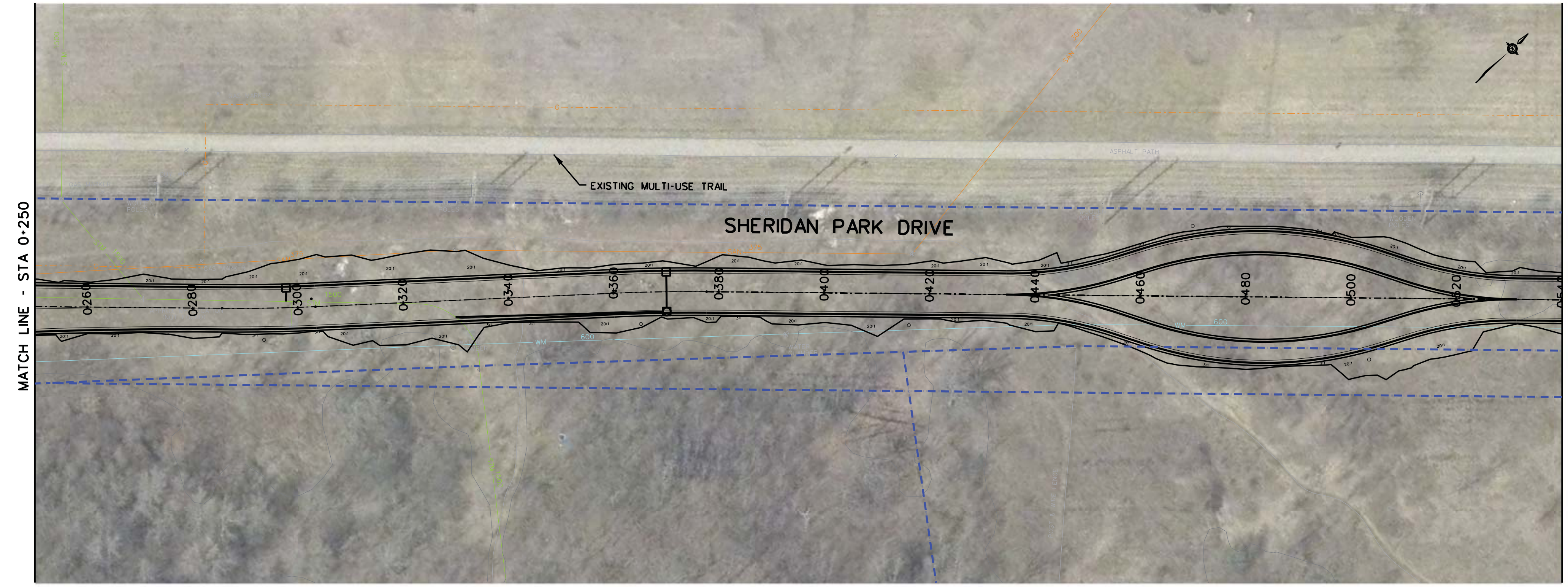
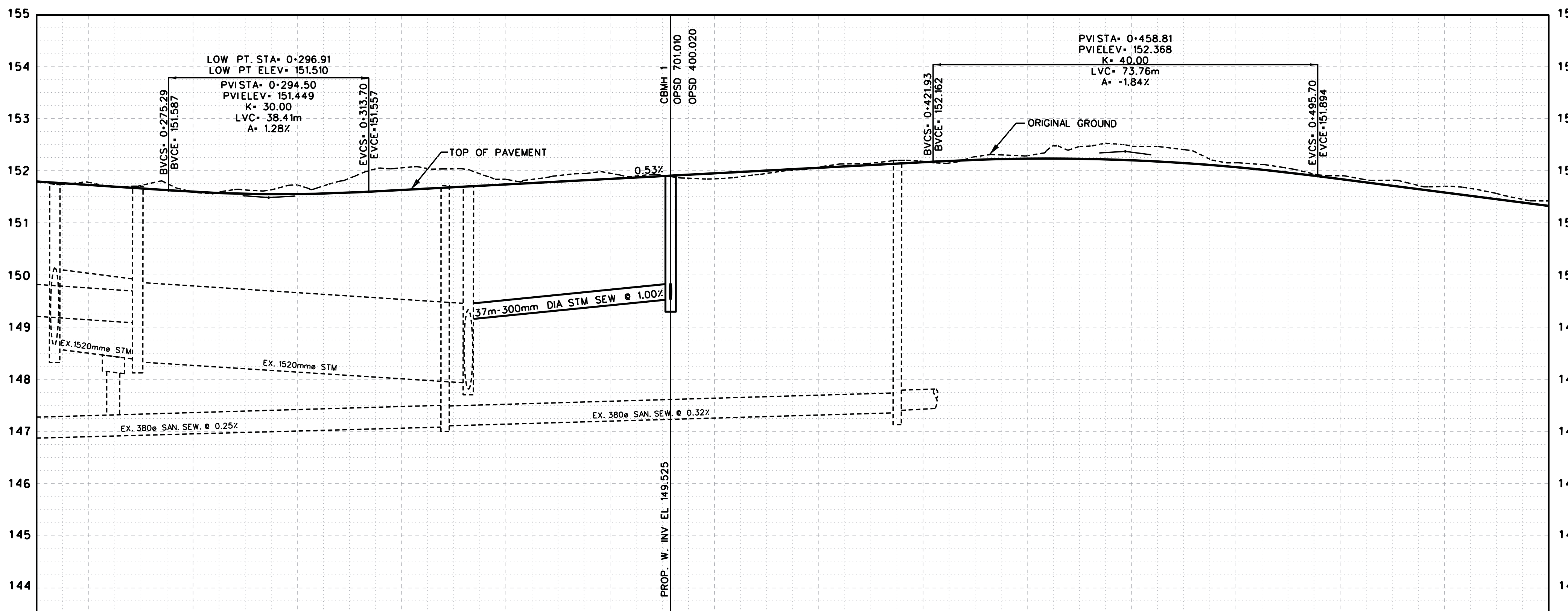
SHERIDAN PARK DRIVE EXTENSION

DRAINAGE MANAGEMENT PLAN

STA 0+000 TO STA 0+250

SCALE HOR. 1:1000 VERT. 1:100	AREA	PROJECT No.
DRAWN BY K.Y.	CHECKED BY H.F.	PLAN No.
DATE DECEMBER 2017	SHEET 1 OF 4	





151.80	151.77	151.59	151.72	152.05	151.83	151.95	151.84	152.06	152.18	152.29	152.47	152.15	151.90	151.70	151.42	TOP OF PAV'T
151.860	151.775	151.595	151.724	152.053	151.833	151.950	151.843	152.064	152.178	152.286	152.469	152.150	151.901	151.697	151.419	ORIG. GROUND
0+250	0+260	0+280	0+300	0+320	0+340	0+360	0+380	0+400	0+420	0+440	0+460	0+480	0+500	0+520	0+540	CHAINAGE

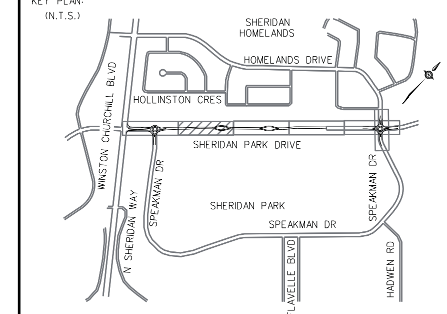
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN:
(N.T.S.)



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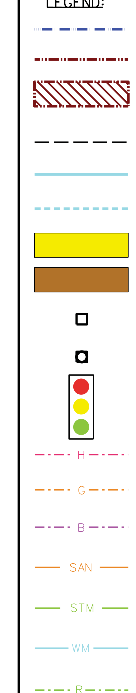

EXISTING ROAD RIGHT OF WAY
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PROPERTY REQUIRED FOR ROAD EXTENSION
GRADING LIMIT
WATERCOURSE
HEADWATER DRAINAGE FEATURE
PROPOSED SIDEWALK
PROPOSED BUS STOP
PROPOSED CATCH BASIN
PROPOSED MANHOLE CATCH BASIN
TRAFFIC SIGNAL
HYDRO
GAS
BELL
EXISTING SANITARY SEWER
EXISTING STORM SEWER
EXISTING WATERMAIN
ROGERS

DESIGN BY

C.E.T.

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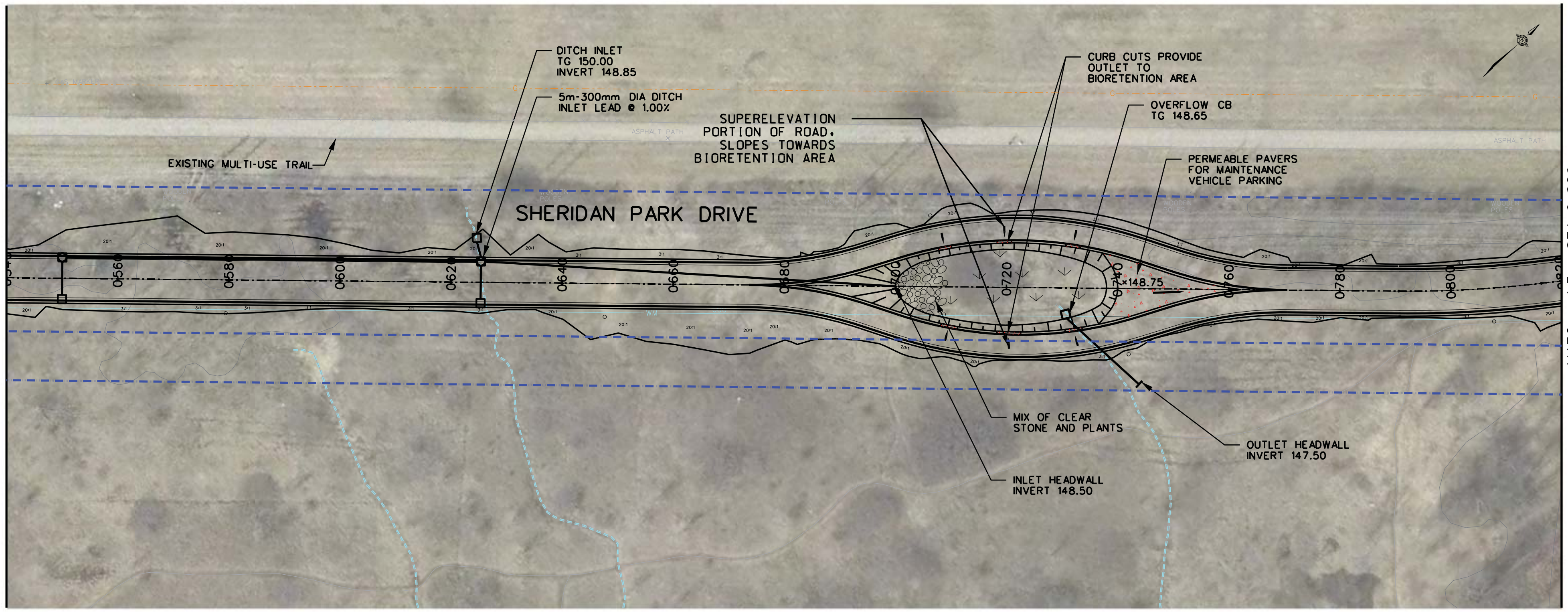
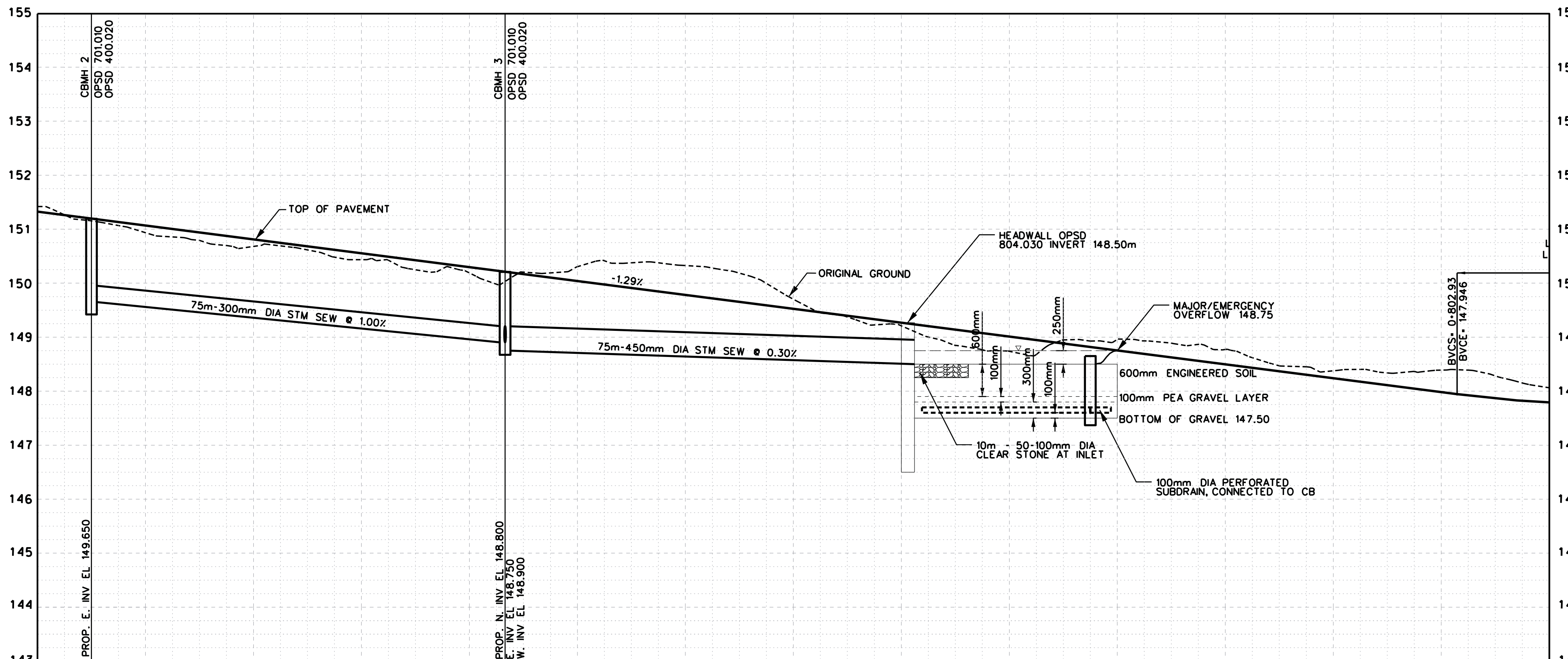
SHERIDAN PARK DRIVE EXTENSION
DRAINAGE MANAGEMENT PLAN
STA 0+250 TO STA 0+540

SCALE HOR. 1:1000 VERT. 1:100	AREA	PROJECT No.
DRAWN BY K.Y.	CHECKED BY H.F.	PLAN No.
DATE DECEMBER 2017	SHEET 2 OF 4	





TOP OF PAV'T	151.42	150.94	150.68	150.43	150.19	150.31	150.33	149.70	149.21	148.74	148.96	148.77	148.38	148.39	148.06
ORIG. GROUND	151.419	150.935	150.681	150.434	150.189	150.305	150.326	149.703	149.210	148.738	148.957	148.772	148.377	148.390	148.063
CHAINAGE	0+540	0+560	0+580	0+600	0+620	0+640	0+660	0+680	0+700	0+720	0+740	0+760	0+780	0+800	0+820

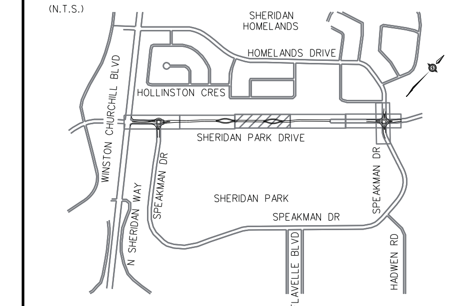
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN:
(N.T.S.)



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- PROPOSED MANHOLE CATCH BASIN
- TRAFFIC SIGNAL
- HYDRO
- GAS
- BELL
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- ROGERS

DESIGN BY

C.E.T.

APPROVED BY

DEPARTMENTAL APPROVAL

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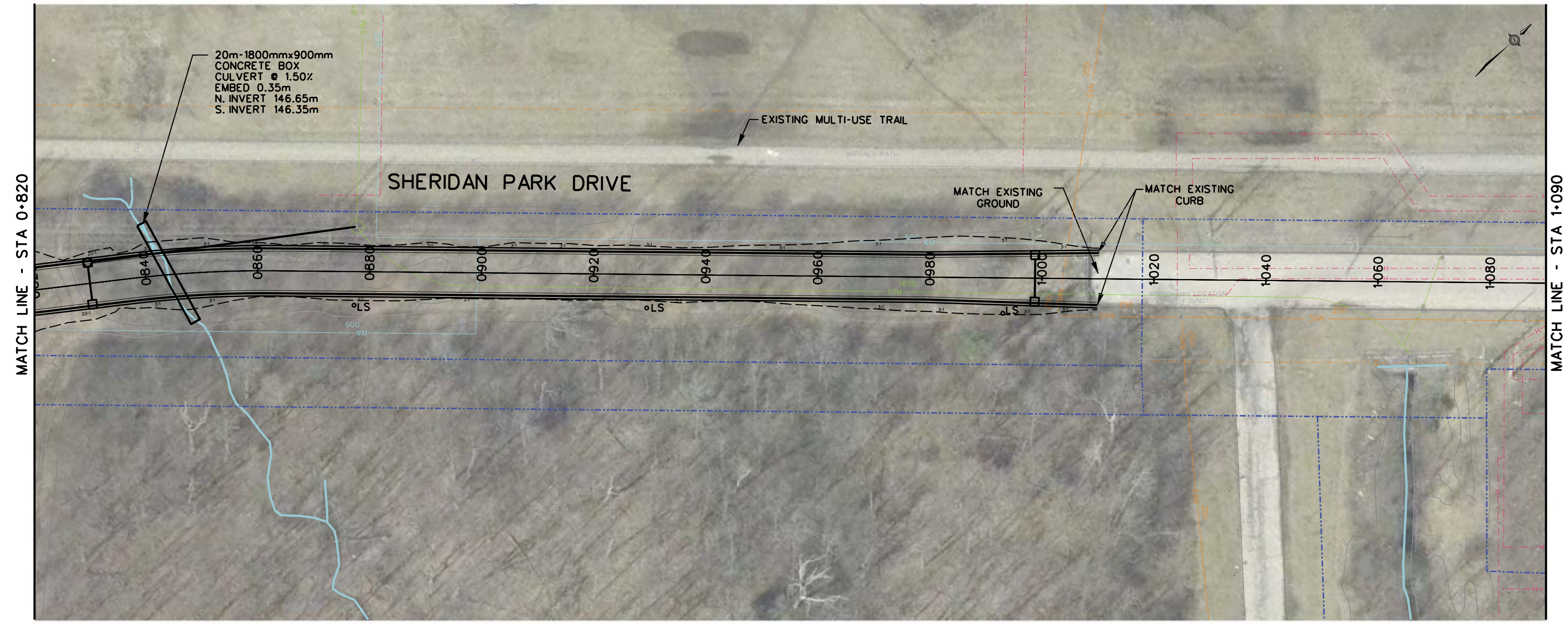
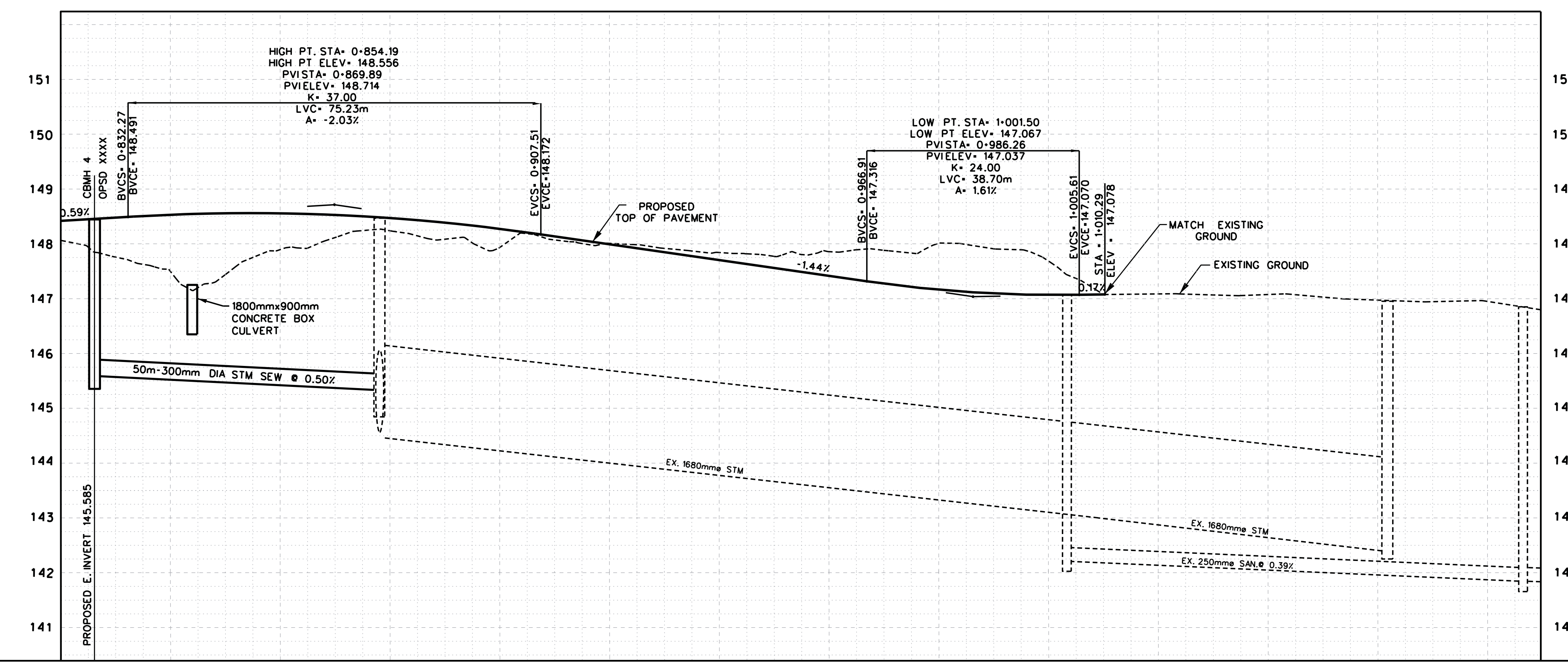
SHERIDAN PARK DRIVE EXTENSION

DRAINAGE MANAGEMENT PLAN

STA 0+540 TO STA 0+820

SCALE HOR. 1:1000 VERT. 1:100	AREA	PROJECT No.
DRAWN BY K.Y.	CHECKED BY H.F.	PLAN No.
DATE DECEMBER 2017	SHEET 3 OF 4	





TOP OF PAV'T	148.06	147.50	147.89	148.24	147.93	148.01	147.84	147.86	148.01	147.69	147.09	147.08	146.97	146.95	TOP OF PAV'T
ORIG. GROUND	148.063	147.497	147.895	148.239	147.933	148.009	147.842	147.857	148.010	147.687	147.087	147.076	146.973	146.949	ORIG. GROUND
CHAINAGE	0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080	CHAINAGE

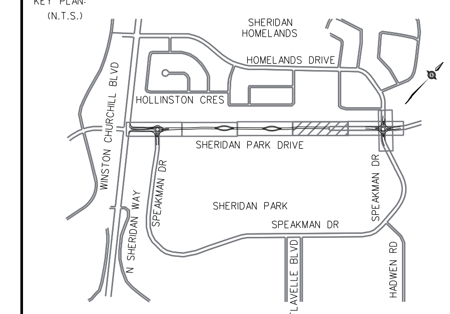
SERVICE DATA

SERVICE	DATE	INIT.	SERVICE	DATE	INIT.
SAN. SEWERS			GAS MAINS		
STM. SEWERS			BELL U/G CABLE		
WATERMAINS			HYDRO U/G CABLE		
M.O.E.			ROGERS U/G CABLE		

REVISIONS

DATE	DETAILS	INIT.

KEY PLAN: (N.T.S.)



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- HYDRO
- GAS
- BELL
- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATERMAIN
- ROGERS

DESIGN BY

C.E.T.

APPROVED BY

DEPARTMENTAL APPROVAL

SILVIO CESARIO P.ENG.

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SHERIDAN PARK DRIVE EXTENSION

DRAINAGE MANAGEMENT PLAN

STA 0+820 TO STA 1+090

SCALE	HOR. 1:1000 VERT. 1:100	AREA		PROJECT No.	
DRAWN BY	K.Y.	CHECKED BY	H.F.	PLAN No.	
DATE	DECEMBER 2017	SHEET	4 OF 4		

Appendix P

THE DIFFERENCE IS OUR PEOPLE

Appendix P

Geotechnical Investigation Report

Peto MacCallum Ltd.
CONSULTING ENGINEERS

GEOTECHNICAL INVESTIGATION
SCHEDULE "B" CLASS ENVIRONMENTAL ASSESSMENT
SHERIDAN PARK DRIVE EXTENSION
MISSISSAUGA, ONTARIO

for

R.J. BURNSIDE & ASSOCIATES LIMITED

PETO MacCALLUM LTD.
165 CARTWRIGHT AVENUE
TORONTO, ONTARIO
M6A 1V5
Phone: (416) 785-5110
Fax: (416) 785-5120
Email: toronto@petomaccallum.com

Distribution:
3 cc: R.J. Burnside & Associates Limited
1 cc: PML Toronto

PML Ref.: 17TF012
January 2, 2018

January 2, 2018 PML Ref.: 17TF012

Ms. Jennifer Vandermeer, P.Eng.
R. J. Burnside and Associates Limited
292 Speedvale Avenue West, Unit 20
Guelph, Ontario
N1H 1C4

Dear Ms. Vandermeer

Geotechnical Investigation
Schedule "B" Class Environmental Assessment
Sheridan Park Drive Extension
City of Mississauga, Ontario

Peto MacCallum Ltd (PML) is pleased to submit our geotechnical investigation report for the above-referenced project. Authorization to proceed with this assignment was provided through email by Ms. Vandermeer on April 05, 2017. Our services were provided in accordance with our Proposal No. FQT8714 dated August 18, 2016.

It is our understanding that plans include construction of the Sheridan Park Drive extension, reconstruction of both the east and west segments of Sheridan Park Drive, construction of new utilities and replacement of underground utility services within the road segments. At the time of this report, road profile drawings showing road grades and utility invert levels were not available.

The purpose of this investigation is to provide geotechnical comments and recommendations for the Sheridan Park Drive extension which will connect the east and west sections of Sheridan Park Drive as well as reconstruction of limited sections of the east and west portion of Sheridan Park Drive. The scope of work for this study included limited chemical testing of selected soil samples to provide options for soil disposal.

The comments and recommendations provided in this report are based on site conditions at the time of this investigation, and are applicable only to the proposed construction project as described in the report. Any changes in the project information will require review by PML to assess the validity of the report and may require modified recommendations, additional investigation and/or analysis.

STREET DESCRIPTION

The existing Sheridan Park Drive is a two-lane undivided road section approximately 10 m wide, and extends from Winston Churchill Boulevard to Speakman Drive. The length of the proposed Sheridan Park Drive extension is approximately 880 m (between the dead ends at west of Speakman Drive/Homelands Drive and east of Winston Churchill Boulevard). The road extension grade slopes downward toward the east with grades varying between elevation 152.8 m and 146.5 m, with topographic relief of approximately 6.0 m. Underground utility services, such as water, storm and sanitary sewers are present along the proposed extension and existing segments of Sheridan Park Drive.

Currently Sheridan Park Drive terminates at Speakman Drive/Homelands Drive on the east and at Speakman Drive just east of Winston Churchill Boulevard on the west. As identified in Mississauga Official Plan, the road is classified as a Major Collector in the City of Mississauga. The traffic data provided by RJ Burnside for the subject road is as below:

TABLE 1

TRAFFIC DATA

		DAILY			PERCENT
STREET	**SECTION**	**EXISTING**	**2021**	**2031**	**TRUCKS**
Sheridan Park	Winston Churchill to Speakman	6700	9800	10400	2%
	Speakman to Speakman / Homelands	0	2600	2100	2%
	Speakman / Homelands	7100	9300	9500	1%
Speakman (west)	East of South Sheridan Park	6700	7700	8900	2%
Speakman (east)	South Sheridan Park	5200	5200	5700	1%
Homelands	North Sheridan Park	5500	5300	5600	3%

It is assumed that the road extension will match the elevation of Sheridan Park Drive at the west end (elevation 152.7 m) and closely follow the existing site topography to match the elevation of Sheridan Park Drive at the east end (elevation 146.5 m).

INVESTIGATION PROCEDURES

The field work for this investigation was carried out between September 11 and 13, 2017. Prior to the field work, the site was cleared for the presence of underground services and utilities. A total of eighteen boreholes, labelled BH1 through BH18, were drilled as part of this investigation. The boreholes were advanced to depths ranging from 2.8 to 4.7 m. The approximate locations of the boreholes are shown on the borehole location plan, Drawing 1, appended. The boreholes were located using a Garmin GPSMAP 64 GPS (Global Positioning System) receiver using NAD 83 datum (North American Datum). The geodetic elevation of the boreholes locations was determined by PML's field personnel using the following geodetic benchmark.

> City of Mississauga Bench Mark Number 601 Located on the North Face at the Main Entrance of Homelands Senior Public School on the South Side of Homelands Dr., 440 ft. West of the W. Branch of Pyramid Cres". Geodetic elevation 152.685 m.

The boreholes were advanced using a combination of truck mounted drill rig B53 and rubber track drill (similar to CME 55) equipped with 150 mm diameter continuous flight solid stem augers supplied and operated by a specialist drilling contractor.

Representative soil samples were taken at regular depth intervals using a conventional split spoon sampler in conjunction with Standard Penetration Tests. The groundwater conditions in the open boreholes were assessed during drilling by visual examination of the soil, the split spoon sampler and drill rods as the samples were being retrieved and, where encountered, by measuring the groundwater level in the open boreholes.

The recovered samples were returned to our laboratory for detailed visual examination and routine testing to confirm visual field classifications. Moisture content determination tests were conducted on all retrieved samples. Grain size analyses were conducted on ten selected samples. The results of the moisture content determinations are reported on the borehole logs. The results of the grain size analyses are shown on Figures GS-1 to GS-3.

SUMMARIZED SUBSURFACE CONDITIONS

Published Geology

A review of surficial geology maps provided by Department of Energy, Mines and Resources Canada suggest that the surficial geological soil deposits underlying the proposed street are composed of clay to silt textured till, derived from glaciolacustrine deposits or shale. The bedrock formation belongs to the Queenston Formation which typically comprises shale, limestone, siltstone and dolomite.

Summarized Subsurface Conditions

Reference is made to the appended Log of Borehole sheets for details of the field work including soil classification, inferred stratigraphy, standard penetration resistance N values, groundwater observations and laboratory test results.

Due to the soil sampling procedures and limited sample size, the depth/elevation demarcations on the borehole logs must be viewed as “transitional” zones between layers, and cannot be construed as exact geologic boundaries between layers.

It should be noted that a limited number of boreholes were advanced in pavement area, and the contractor must be aware that variations in the thickness of the asphalt and granular base and subbase should be expected. The contract documents should incorporate an allowance for such variations which may impact removal of existing pavement or additional requirement for new pavement materials.

A description of the pavement structure and subgrade conditions is provided in the following paragraphs. Table A1 included in Appendix A shows the pavement structure thickness encountered in boreholes BH1 to BH6 and BH13 to BH18 advanced on the existing pavement structures within the project limits.

The pavement structure and topsoil thicknesses are approximate field measurements. They should not be used for determining exact removal quantities as the thicknesses may vary at locations away from boreholes.

Asphalt

An asphalt layer 100 to 200 mm in thickness was encountered in boreholes BH1 to BH6 and BH13 to BH18 overlying granular base/subbase. The median thickness of asphalt layer was about 150 mm.

Granular Base/Subbase

Below the asphalt, a granular base/subbase consisting of sand and gravel was observed within the boreholes advanced on the existing road. The thickness of the granular base/subbase ranged from 400 to 500 mm with a median thickness of 450 mm. Moisture contents of the granular base/subbase ranged from 4 to 15%.

The total pavement structure thickness including asphalt and granular base/subbase ranged from 500 mm (BH3) to 700 mm (BH6).

Fill

Underlying the pavement structure, fill consisting of sand-silt-clay, trace to some gravel was encountered in all boreholes, advanced on the existing road, except BH14 and 18. About 0.6 m of surficial fill was encountered in borehole BH12. Occasional pockets of organics were found in fill material in boreholes BH2 and 13. The fill extended to depths ranging from 0.5 to 2.7 m depth in BH3 and 6 respectively. N values in the fill ranged from 9 to 22 indicating a very loose to compact relative density.

Topsoil

Surficial topsoil 100 and 150 mm thick was encountered in boreholes BH10 and 11, respectively. The topsoil is generally described as being black mixed with some organics, rootlets and some soil at lower parts.

Silty Clay to Clayey Silt

Silty clay was encountered underneath the fill in BH1 and BH13, and topsoil in BH10 to depths ranging from 0.6 to 1.4 m. Brownish red silty clay to clayey silt was encountered at the ground surface in boreholes BH8 and BH9, and extended to depth ranged from 0.6 to 1.0 m. Underneath the pavement structure in borehole BH14, brownish grey to light grey silty clay to clayey silt was contacted to a depth of 1.4 m.

N values in the silty clay to clayey silt stratum ranged between 11 and 29, indicating a stiff to very stiff consistency. The natural moisture content varied between 8 and 14%, indicating a moist condition.

Silty Clay Till

Underlying the silty clay, a deposit of silty clay till was encountered in BH1 to a depth of 3.8 m.

N value in this stratum was greater than 50, indicating a hard consistency. The natural moisture content of the silty clay till sample ranged from 6 to 8%, indicating a slightly moist to moist condition.

Clayey Silt Till

A very stiff to hard, brownish red surficial clayey silt till deposit was encountered in borehole BH7 and extended to depth 4.7 m. Underneath the fill in boreholes BH2, 3, 4, 5, 6, 12, 15, 16 and 17; topsoil in borehole BH11, silty clay in boreholes BH10 and 13, silty clay to clay silt in boreholes BH8, 9 and 14, and pavement structure in borehole BH18, brownish red to brownish grey clayey silt till deposit was contacted to depths ranging from 2.4 to 4.6 m. N values in this stratum ranged from 8 to greater than 50, indicating the deposit is stiff to hard in consistency. The natural moisture content of the clayey silt till sample ranged from 5 to16%, indicating slightly moist to very moist condition.

Shale Bedrock

Refusal over inferred shale bedrock was encountered at depths ranging from 2.5 m or elevation 145.1 m (BH12) to 4.6 m or elevation 148.1 m (BH4).

Bedrock at east segment of the Sheridan Park Drive extension, especially near the intersection of Homelands Drive/Speakman Drive is anticipated to be shallow, depths ranging from 2.7 to 4.6 m as encountered in boreholes BH15, 16, 17 and 18.

Based on the available geologic information the shale bedrock underlying the site belongs to the Queenston Formation.

Groundwater Conditions

Ground water was not encountered in the boreholes during field drilling. It should be noted that sufficient time did not elapse between the drilling and backfilling of boreholes for the groundwater to stabilize due to which the groundwater conditions at the end of drilling are not representative of stabilized groundwater levels. Groundwater levels could fluctuate with seasonal weather conditions, (i.e. rainfall, droughts, spring thawing).

ASPHALT VISUAL CONDITION SURVEY

A visual condition survey was carried out during field drilling operations between September 11 and 13, 2017 on the west segment (length approximately 150 m) and east segment of Sheridan Park Drive (length approximately 270 m up to the intersection with Homelands Drive/Speakman Drive). The visual survey was conducted using the guidelines provided by the Ministry of Transportation’s Manual for Condition Rating of Flexible Pavements (August 1989), SP-024. It should be noted that the condition survey reflects general surface and cracking distress observed at the time of the investigation and not a comprehensive pavement condition survey. Photographs of typical distress manifestations are referenced in Table 2. The typical pavement distress observed on the existing road segments consisted of the following:

TABLE 2

TYPICAL DISTRESS MANIFESTATIONS

	TYPE OF DEFECT	DISTRESS MANIFESTATION	SEVERITY	DENSITY	PHOTOGRAPH NO.
	Surface	Coarse aggregate loss and crack	Slight to Moderate	Intermittent	P1
	Surface	Coarse aggregate loss and crack	Moderate	Intermittent	P2
	Surface	Distortion, cracks and patching	Moderate	Intermittent	P3
	Surface	Distortion from frost heaving	Severe	Intermittent	P4
	Surface	Distortion from frost heaving	Severe	Intermittent	P5
Cracking	Longitudinal and Transverse crack	Single, Multiple (along curb line)	Slight to moderate	Intermittent	P6
	Longitudinal and Transverse cracks	Single to Multiple	Slight	Intermittent	P7
	Transverse and Longitudinal cracks	Single to Multiple	Slight	Intermittent	P8
	Transverse and Longitudinal	Single, Multiple	Slight	Frequent	P9
	Pavement Edge	Single, Multiple	Moderate	Frequent	P10
	Pavement Edge	Cracks	Slight to moderate	Frequent	P11
	Pavement Edge	Cracks	Slight	Few	P12
	Longitudinal to Transverse	Cracks	Moderate	Intermittent	P13
	Pavement edge crack	Cracks	Slight	Frequent	P14

Distortion is caused by differential frost heave or lack of subgrade support. Longitudinal and transverse cracks can occur due to frost action, natural shrinkage caused by low temperature and may also be age-related.

ENGINEERING DISCUSSION AND RECOMMENDATIONS

Existing Pavement Structure

The subsurface investigation indicates the following pavement structure at the existing road segments at east and west sides of Sheridan Park Drive as shown in Table 3.

TABLE 3

EXISTING PAVEMENT STRUCTURE

Pavement Component	Minimum	Maximum	Median	Average
Asphalt Concrete (mm)	100	200	150	150
Base /Subbase (mm)	400	500	450	465
Total Pavement Structure (mm)	500	700	600	615

The existing Granular Base Equivalency based on median thickness of pavement components is 410. In general, the subsurface investigation indicates uniform asphalt and granular base/subbase conditions at the tested areas. The moisture content determinations on recovered subgrade soil samples indicates relatively higher moisture contents in localized areas such as borehole 5, 13 14, 15 and 17, likely indicating poor drainage conditions in these areas.

Traffic Loading

The equivalent single axle loads (ESAL) for the design lanes were calculated using traffic data provided by the client. Based on the provided traffic data, the maximum cumulative ESALs correspond to an AADT of 5,500 with truck traffic of 3% assuming a growth rate of 3% and a 20 year design life. The input parameters for the design lane ESAL calculation were obtained from the AASHTO Guide for Design of Pavement Structure (1993).

Recommended Pavement Structure Thicknesses

New Road Extension

The pavement structure was designed based on the calculated cumulative ESALs estimated from the provided AADT and subsurface conditions encountered during this investigation. The following references and guidelines were used for pavement design.

- American Association of State Highway and Transportation Officials, "AASHTO Guide for Design of Pavement Structures", 1993.
- MTO's "Adaptation and Verification of AASHTO Pavement Design Guide for Ontario Conditions", March 19, 2008.
- Mississauga Transportation and Works Standard, Pavement and Road Design Base Requirements, 2002.

The AASHTO design parameters used are shown in Table 4.

TABLE 4

SUMMARY OF PARAMETERS USED IN THE PAVEMENT DESIGN

DESIGN PARAMETERS	VALUES
Initial Serviceability Index for New Construction	4.4
Terminal Serviceability Index	2.2
Reliability Level (%)	88
Standard Deviation	0.45
Drainage Coefficient for Granular base and Subbase	1.0
Layer Coefficient of new Hot-mixed Asphaltic Concrete	0.42
Layer Coefficient of Granular Base material (OPSS Granular A)	0.14
Layer Coefficient of Granular Subbase material (OPSS Granular B)	0.09

The modulus of subgrade resilient is estimated to 20 MPa for a subgrade consisting of fine grained soil (silty clay). Based on above references, the thickness of the pavement structure for a major collector with an AADT of 5500 including 3% Truck traffic is shown in Table 5 below:

TABLE 5

RECOMMENDED PAVEMENT STRUCTURE THICKNESS

PAVEMENT COMPONENT	AASHTO 1993	CITY OF MISSISSAUGA 2002[1]
Surface Course Asphalt	40 mm	40 mm
Base Course Asphalt	100 mm	100 mm
Granular A Base course	150 mm	200 mm
Granular B Subbase course	300 mm	400 mm
Total Pavement Structure	**590 mm**	**740 mm**
GBE*	630 mm	748 mm

*GBE factor: Asphalt: 2, Granular Base: 1, Granular Subbase: 0.67

[1] Based on collector road and a frost susceptibility factor of 11 which consists of a soil with maximum of 55% silt.

Based on the above, the City of Mississauga pavement section is recommended for the new road extension as the City of Mississauga method addresses local conditions, such as the frost susceptibility of the road subgrade.

Pavement Structure for Existing Road

Based on the observed pavement distresses along with the pavement structure encountered in the boreholes, three options are provided for rehabilitation/reconstruction of both the west and east segments of Sheridan Park Drive including Homelands Drive/Speakman Drive intersection.

1. Full Depth Reconstruction which consists of removal of asphalt and granular base and replacement.

2. Partial removal of asphalt and granular and resurfacing with new granular and asphalt.

3. Do Nothing, i.e. Leave the pavement structure as it is.

The advantages and disadvantages of each option are discussed in the Table 6 below:

TABLE 6

ADVANTAGE AND DISADVANTAGES OF REHABILITATION OPTIONS

OPTION	ADVANTAGES	DISADVANTAGES
Option 1: Full Depth Reconstruction	• Minimizes frost action effects due to provision of uniform non-frost susceptible materials. • Longer Service Life • Allows for incorporation of other improvements such as drainage, utilities. • Lower maintenance costs over service life of pavement • Allows for remediation of any subgrade issues due to moisture infiltration.	• High initial cost due to removal and disposal of existing pavement structure and incorporation of new pavement structure. • More Traffic Disruption due to more time required for construction. • Removal/or relocation of utilities would disrupt road traffic.
Option 2: Resurfacing	• Relatively lower initial cost due to less requirements for excavation and materials. • Less traffic disruption as it reduces amount of excavation required.	• Shorter service life since existing granular materials do not meet performance standards and are not of uniform depth across the length of the road. • Need for disposal of removed asphalt and granular materials. • Higher maintenance costs as compared to Option 1. • Does not allow for remediation or inspection of the soil subgrade.
Option 3: Do Nothing	• No excavation and removal of pavement structure required thereby reducing disruption of traffic operations. • No initial construction costs.	• Higher maintenance costs as compared to Options 1 and 2. • Shorter service life of less than 3 years.

All the options are discussed in details in the following paragraphs.

Option 1: Reconstruction

The reconstruction option would consist of the City of Mississauga pavement section similar to the pavement section of the road extension. The pavement section would be reconstructed as follows:

Remove the existing asphaltic concrete and granular fill to accommodate a new hot mix asphalt (HMA) over Granular A base and Granular B subbase. The reconstructed pavement structure would consist of the following elements.

Surface Course HMA, Superpave 12.5, OPSS 1151 or equivalent	40 mm
Base Course HMA, Superpave 19.0, OPSS 1151 or equivalent HMA	100 mm
Granular A Base, OPSS 1010	200 mm
Granular B Base, OPSS 1010	400 mm
Total Pavement Thickness	740 mm
Granular Base Equivalency Thickness	748 mm
Minimum Excavation Required	740 mm
Grade Raise	None
Estimated Design Life	20 years

The design life provided assumes routine maintenance is performed over the life of the pavement.

Option 2: Resurfacing with New Asphalt and Granular

Remove existing asphalt concrete and underlying granular fill to depths required to accommodate new HMA and 200 mm of new Granular A base as follows:

Surface Course HMA, Superpave 12.5, OPSS 1151 or equivalent	40 mm
Base Course HMA, Superpave 19.0, OPSS 1151 or equivalent HMA	100 mm
Granular A Base, OPSS 1010	200 mm
Existing Granular based on median values	250 mm
Total Pavement Thickness	590 mm
Granular Base Equivalency Thickness	605 mm
Excavation Required	340 mm
Grade Raise	None
Estimated Design Life	12 years

Option 3: Do Nothing

In this case the existing pavement will be left in place and will have the following section.

Surface and Base Course HMA,	150 mm
Old Existing Granular based on median thickness	450 mm
Total Pavement Thickness	600 mm
Granular Base Equivalency Thickness	410 mm
Excavation Required	None
Estimated Design Life	Less than 3 years

RECOMMENDED PAVEMENT REHABILIATION OPTION

It is recommended that Option 1, Full Depth Reconstruction be considered for the existing road segments since with the exception of one sample, the tested /existing granular base and subbase materials contain fines ranging from 13 to 27%.

Based on OPSS.MUNI 1010 (2013), the percentage of material passing the 75 μm sieve (silt and clay sized particles) should be less than 8% for Granular A and Granular B Type 1 materials.

The excessive content of fines in the existing granular materials renders the pavement structure susceptible to the damaging effects of frost action. Differential frost heave creates a hazard for the driving public and, during the thawing period, the pavement structure is subjected to a reduction in the support strength of the granular materials leading to deterioration of the overall pavement structure. The distress manifestations associated with damage due to frost action and reduced subgrade/granular material support strength were evident in existing pavement in the form of severe cracks and distortion of the pavement surface. Thus, if the existing granular material is left in place, the overall performance of pavement structure will be severely compromised resulting in higher maintenance costs and shortened service life.

Based on our findings, the existing pavement has out lived its useful service life; full-depth reconstruction is recommended.

Material Types

All pavement materials should be in accordance with relevant OPSS specifications. The new Granular A base course should be placed in 200 mm loose lifts and also compacted to a minimum 100% SPMDD within ±2% of its optimum moisture content. All compaction operations should be supervised by geotechnical personnel from PML. Frequent inspection, sampling and testing by PML personnel is recommended to approve the granular compaction and the design properties and placement of the asphalt. Reference is made to OPSS 330 for In-Place Full Depth Reclamation of Bituminous Pavement and Underlying Granular and OPSS 310, for asphalt compaction requirements.

Superpave 9.5 or equivalent is recommended as padding for the pavement. It should be placed in maximum lifts of 50 mm.

Tack coat (SS-1) should be applied to construction joints prior to placing hot mix asphalt to create an adhesive bond. Prior to placing hot mix asphalt, SS1 tack coat must be applied to all existing milled surfaces and between new lifts. Application of tack coat shall be in accordance with OPSS 310 requirements. The tack coat should meet OPSS 1103 requirements.

Reuse of Existing Granular Materials

Grain size analyses were carried out on eight granular base and subbase materials and two subgrade materials consisting of fine grained soil. The grain size distribution results of tested samples of the base, subbase and subgrade materials are shown below.

TABLE 7

GRAIN SIZE DISTRIBUTION RESULTS

SAMPLE IDENTIFICATION	% GRAVEL	% SAND	% SILT & Clay
BH1, SS1	30	52	18
BH1, SS2	2	10	88
BH 4, SS1	23	56	21
BH5, SS1	13	60	27
BH6, SS1	40	47	13
BH13, SS1	27	60	13
BH14, SS1	27	70	3
BH14, SS2	9	15	76
BH15, SS1	25	57	18
BH18, SS1	40	41	19

The test results indicate that the tested granular samples do not meet the OPSS. PROV 1010 Granular A and Granular B specifications, except for one sample retrieved from borehole BH14, which meets requirements for Granular B Type I.

The test results indicate that, in general, granular material removed from the existing base and subbase layers cannot be used as base or subbase in a new pavement structure where free-draining granular base/subbase materials meeting OPSS.PROV 1010 requirements are specified. However, this material can be used as fill, in select applications approved by the design engineer, provided it is free of topsoil, organic and any deleterious materials.

Asphalt Cement Grade

The recommended (minimum) asphalt grade for both surface and base course hot mix asphalt is PGAC 64 - 28 meeting OPSS MUNI 1101 November 2016 requirements.

Drainage

For the pavement to function properly, provision must be made for water to drain out of, and not collect in, the granular courses. It is recommended that full-length perforated sub-drain pipes of 150 mm diameter be installed along both sides of the road extension and the reconstructed pavement below the roadbed level, to ensure effective drainage in accordance with OPSD 216.021. The sub-drain pipes should be surrounded by 20 mm size clear stone drainage zone of minimum 150 mm thickness, which should have suitable non-woven geotextile wraparound to minimize infiltration of fines in pipes which would reduce their effectiveness. A minimum slope of 2% should be maintained throughout the paved sections to ensure proper surface drainage.

Frost Susceptibility

The subgrade soil mainly comprised of sand-silt-clay fill and silty clay to clayey silt till. Silt and clay is considered as highly frost susceptible material and shall not be used for backfilling the utility trenches or raising the grade within the frost depth. A frost depth of 1.2 m is recommended for this site for design purposes.

OTHER CONSIDERATIONS

Excavation

According to information provided by R.J Burnside, a 500/600 mm diameter watermain, 250/375 mm diameter sanitary sewer and a 250/525/600/1500 mm diameter storm sewer pipe are planned along the proposed road extension. It is anticipated that the excavation for the replacement/installation of the proposed sanitary sewer pipes will extend to about 3.0 m depth below the existing ground surface.

The overburden soils encountered across the site consist of the pavement structure, fill, and silty clay to clayey silt till. Conventional open cut excavation methods should be feasible for the construction of the utilities and road extension. Construction excavation must be carried out in accordance with the Occupational Health and Safety Act (OHSA), Ontario Regulations 213/91, amended to Reg. 628/05. According to OHSA, the existing fill and stiff silty clay to clayey silt till encountered at this site can be classified as Type 3, very stiff and hard silty clay to clayey silt till can be classified as Type 2 and Type 1 soil, respectively. The OHSA stipulates an excavation to be cut at a specified inclination based on soil types. Therefore, shallow temporary excavations in overburden soil for this project should be cut at an inclination of 1 horizontal to 1 vertical (1H:1V) for a temporary excavation starting at the base of the excavation. It may be necessary to further flatten the trench side slopes if excessively soft conditions or concentrated seepage zones are encountered locally.

In the event that the aforementioned slopes are not possible to achieve due to space restrictions, the excavation shall be shored according to OHSA O. Reg. 213/91 and its amendments.

Trench side slopes should be continuously examined for evidence of instability, particularly following periods of heavy rain, thawing or when the trench has been left open for extended periods of time. When required, appropriate remedial action must be taken to ensure the continued stability of the trench slope and the safety of workers in the trench.

A trench box may be used in excavations less than 6.0 m deep in Type 1 to Type 3 soils only and provided the groundwater is lowered below the depth of the excavation. The trench box should be placed immediately after the excavation is completed and the excavation backfilled immediately after the trench box is removed. No loads should be placed on the trench boxes. PML should be consulted to evaluate the soil conditions during construction to determine the suitability of the excavation support method.

Foundations of heavily loaded/settlement sensitive structures and/or utilities located within close proximity to the excavation may require underpinning to preserve the integrity of these structures. Further comments and general recommendations in this regard are presented in Figure 1.

Earth Pressure Parameters

In areas where open cut excavations with 1H : 1V side slope are not feasible due to space limitations a shoring system should be used to support the walls of the excavation in accordance with the Occupational Health and Safety Act, 1990 and Regulation 213/1991 for construction projects.

The recommended design earth pressure distribution for single and multi-braced walls for the general soil types encountered in the boreholes are presented on Figures 2 and 3. Recommendations concerning design and construction of the excavation support system are also presented on the Figures. It is recommended that PML be contacted during construction to evaluate subsurface conditions within excavations and provide recommendations based on site observations. Soil parameters to be used in conjunction with Figures 2 and 3 are provided in the Table below:

For the on-site soil, the following geotechnical parameter may be assumed as summarized in Table 8.

TABLE 8

SOIL PARAMETERS FOR SHORING SUPPORT

TYPE OF MATERIAL	BULK DENSITY (kN/m^3)	ANGLE OF INTERNAL FRICTION	PRESSURE COEFFICIENT		
			AT REST (K_0)	ACTIVE (K_A)	PASSIVE (K_P)
OPSS Granular A	23	35	0.43	0.27	3.69
OPSS Granular B, Type II	23	32	0.47	0.31	3.25
Silty clay	17.5	27	0.54	0.37	2.66
Silty clay to Clayey silt Till	18.0	31	0.48	0.32	3.12

Notes:

1. Active pressures can be used when ground movements can be tolerated. Ground movements should be in accordance with applicable codes and standards.
2. At-rest pressures can be used when no ground movements can be tolerated.
3. The full coefficient of passive pressure may require large movements to mobilize, which may not be tolerated by the structure. No passive resistance should be considered for the fill materials.
4. Appropriate surcharge pressure should be considered to account for traffic loading, construction equipment etc.
5. Sloping backfill is not considered in the above Table.
6. Soil Parameters are based on empirical correlations with SPT N values from published literature such as the Canadian Foundation Engineering Manual 2006.

Groundwater Control

The anticipated excavation depths for replacing/installing the underground services are considered to be less than 3.0 m below ground surface and temporary in nature.

Perched water trapped in the fill may be encountered depending on the season and rainfall patterns when the work is conducted. It is anticipated that ground water seepage or surface water that enters excavations can be adequately handled by conventional sump pumping techniques.

Surface water runoff into the excavation should be avoided and diverted away from the excavation.

Pipe Bedding Requirements

It is anticipated that the underground services required as part of this project will be founded over undisturbed native silty clay to clayey silt till.

Pipe bedding thickness, composition and compaction should conform to OPSD 802.03, Class B or local standards. As a general guideline, a minimum 150 mm thick layer of OPSS Granular A material is recommended for pipes 450 mm diameter or less. If the subgrade becomes unduly wet during construction, additional bedding material should be provided. The granular bedding material should be placed in thin lifts not more than 150 mm thick and compacted to at least 98% standard Proctor maximum dry density. The bedding requirement should also satisfy local standards and regulations. In areas where the subgrade is considered suitable for support of the utility, the minimum bedding thickness will apply.

As an alternative, 19 mm clear crushed stone or High Performance Bedding Material (HPBM) may be used as pipe bedding. The 19 mm clear crushed stone or HPBM must be wrapped with an approved synthetic fabric (Terrafix 270R or equivalent) particularly where the subgrade is predominantly silt or fine sand below the groundwater table. Otherwise, the soil fines from the subgrade could infiltrate into the voids of the bedding materials, causing potential loss of subgrade support and subsequent failure of the pipe.

Sand cover material should be carried up as backfill at least 300 mm above the top of the pipe or as per local practice. The material should be placed in thin lifts not more than 300 mm thick and compacted to at least 95% of the standard Proctor maximum dry density.

Trench Backfilling

It is anticipated that the excavated material for utility trenches will mainly comprise minor amounts of mixed fil, silty clay till or clayey silt till. Organic soil, topsoil, deleterious or excessively wet material should not be used as backfill. Should construction extend to the winter season, particular attention must be given to ensure that frozen material is not used as trench backfill.

Reuse of the excavated materials may be possible if they are free of deleterious materials and do not need excessive drying to achieve the required moisture content for effective placement. The suitability of the excavated materials for reuse should be further evaluated by conducting standard Proctor test (ASTM D698), to determine the extent of moisture content adjustment that will be required and its impact on construction operations. The reuse of excavated on-site soil is subject to geotechnical review and confirmatory testing by geotechnical personnel during construction.

The industry standard calls for service trenches to be backfilled with approved material placed in uniform 200 to 300 mm thick lifts within ±2% of the optimum moisture content and compacted to at least 98% of SPMDD. All service trenches shall be backfilled using compactable material, free of organic, debris and large cobbles or boulders. Within the top 1.2 m below proposed paved areas, the material shall consist of material similar to that excavated from the trenches in order to prevent differential frost heave. The trenching and backfilling operations should be carried out in a manner which minimizes the length of trench left open yet accommodates efficient pipe laying and compaction activities. Reference is made to Appendix A for Engineered Fill Placement Guidelines. The trench backfilling procedure should be supervised by PML.

Subgrade Preparation After Utility Installation

On completion of the pipes installation works, and following the backfilling and satisfactory compaction of any underground service trenches up to the subgrade level, the subgrade shall be shaped, crowned and proof-rolled. A “Tandem Axle, dual wheel dump truck shall be used for proof-rolling operations. Any resulting soft areas should be sub-excavated down to competent soil and replaced with approved backfill in accordance with the recommendations provided in this report. Although not anticipated, proper treatments of frost transition between two soils shall be as per OPSD 205.01 to OPSD 205.05 and OPSD 204.01.

The preparation of subgrade shall be scheduled and carried out in a manner so that a protective cover of overlying granular material is placed as quickly as possible in order to avoid deterioration of the subgrade by construction traffic. Frost protection of the surface shall be implemented, if works are carried out during the winter months. Otherwise, all frozen soil must be identified and removed or fully thawed prior to the next stage of construction.

SOIL DISPOSAL OPTIONS

As mentioned earlier, the current sampling and chemical testing program was conducted in conjunction with a geotechnical investigation. For off-site disposal options, soil samples were selected for chemical analyses. During, appropriate precautions were taken to minimize potential cross-contamination between samples.

A total of nine soil samples were selected for chemical analyses

Samples obtained during the field work were immediately placed in glass jars and plastic bags. Observations of visible foreign materials and odors were recorded during the sampling operations. The plastic bag samples were brought to Peto MacCallum Ltd. laboratory for detailed visual examination.

The jar samples were stored at low temperature at the site in a cooler provided by the chemical analytical laboratory. Prior to submission to the chemical analytical laboratory, the jar samples were stored in Peto MacCallum Ltd. laboratory at low temperature.

Applicable Regulatory Standards for Chemical Analyses

In general, the standards of applicable environmental quality depend on the location, land use, and source of potable water at the location of disposal and/or re-use of the excess soils. Regarding off-site disposal, the following provincial Standards are applicable for this project:

- Ontario Regulation 153/04; *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* for residential/parkland and/or industrial/commercial land uses in both potable and non-potable ground water condition (Tables 2 and 3) dated March 9, 2004 as amended by Ontario Regulation 511/09 dated July 27, 2009.

Chemical Analyses

Based on the visual examination of soils in the boreholes and the site background information, the retrieved soil samples were submitted to AGAT Laboratories Inc. (AGAT), located in Mississauga, Ontario for chemical testing. AGAT is accredited by the Canadian Association for Laboratory Accreditation (CALA). The soil samples were analyzed for the following parameters.

- Nine soil samples were analyzed for sodium absorption ratio (SAR) parameter listed in the Ontario Regulation 153/04 as amended by Ontario Regulation 511/09.
- Five samples were analyzed for F2 through F4 petroleum hydrocarbons (PHCs) parameters as listed in the Ontario Regulation 153/04 as amended by Ontario Regulation 511/09.

Findings of Chemical Analyses

The results of chemical analyses carried out by AGAT in accordance with the protocol described above are attached in Appendix B and are outlined below.

For on-site reuse and off-site disposal, the results of the soil chemical analyses were compared with the Ontario Regulation 511/09 Standards for residential/parkland and industrial/commercial Property Uses in both potable and non-potable ground water situations (Tables 2 and 3).

Based on the chemical test results the analyzed soil samples complied with the Tables 2 and 3 Site Condition Standards for residential/parkland and industrial/commercial land uses Standards with the following exceptions.

- The soil samples analyzed from BH14 and BH18 exceeded the SAR values for Tables 2 and 3 residential/parkland standards but complied with the industrial/commercial standards, respectively.
- The soil samples analyzed from BH1, BH3 and BH16 exceeded the SAR values for Tables 2 and 3 residential/parkland and industrial/commercial standards, respectively.
- The soil sample analyzed from BH5 exceeded the F3 PHCs value for Tables 2 and 3 residential/parkland standards but complied with the industrial/commercial standards, respectively.

Conclusions and Recommendations

Based on the results of the current sampling and chemical testing program regarding the environmental quality of the soils analysed from the subject site, the following conclusions and recommendations are made.

- Considering the above-noted findings, majority of the soils analyzed exceeded the Ontario Regulation 153/04 (amended) and the analyzed soils are impacted with salt (elevated levels of SAR). The elevated levels of SAR are most likely related to the winter de-icing activities.

- The soils from the BH5 are impacted with F3 PHCs exceeding the Tables 2 and 3 residential/parkland standards but complied with the industrial/commercial standards.

- The impacted soils can be disposed of off-site to industrial/commercial construction sites, such as roadway construction sites where landscaping and plant growth are not considered. The salt impacted soil should not be disposed of to any environmentally sensitive sites, such as within close proximity of water bodies, and the disposed materials should not be in contact with the surface runoff and/or ground water table.

- It should be noted that the acceptance of soils solely depends on the discretion of the receiving sites authorities.

- It is recommended that the site earthwork operations, reuse and/or disposal of the excess soils be monitored under full-time inspection and review of our field staff to ensure that the removed soils are consistent with the sampling and testing program recently carried out and presented in this report.

- If indications of questionable materials or evidence of higher concentrations or other contaminants, and/or other deleterious materials are observed during site removal, the soils should be segregated for further assessment.

CLOSURE

The recommendations in this report have been based on the findings in the borehole locations. Soil conditions may vary between and beyond the boreholes. Variations in conditions, especially the quality and thickness of fill, identified during construction may necessitate modifications in design and construction.

It should be noted that the pavement construction, reconstruction/rehabilitation options submitted in this report were not designed to provide pavements with significantly increased structural/load-bearing capacity, beyond the capability of the existing structural/thickness design observed at the borehole locations. Accordingly, should additional structural capacity be required, additional analysis, that takes into account the new traffic load requirements would be required. PML would be pleased to assist in this regard.

We trust that the information presented in this report is sufficient for your present purposes. Please do not hesitate to contact our office should you have any question regarding the information submitted.

Sincerely

Peto MacCallum Ltd.

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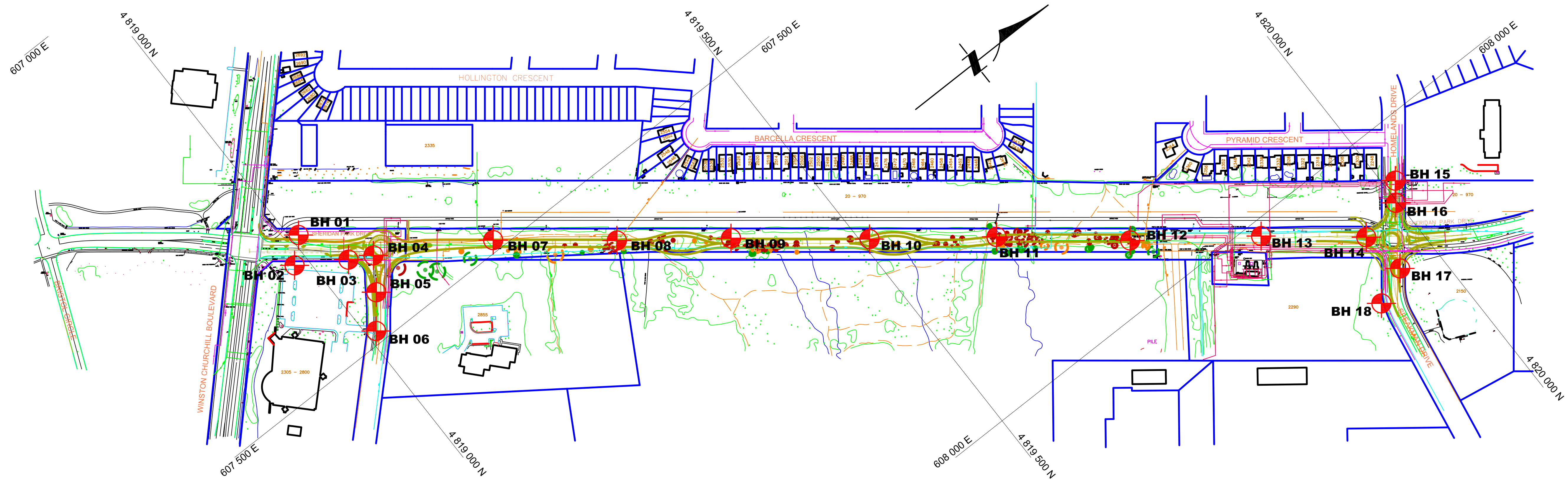
Associate
Manager, Geotechnical Engineering Services

MZ/HG:mm

<u>Attachments</u>:
Drawing 1 – Borehole Location Plan
List of Abbreviations Sheet
Log of Borehole Sheets BH1 to BH18
Figures GS-1 to GS-3 – Particle Size Distribution Charts
Figure 1 – General Guidelines Regarding Underpinning of Utilities Located Close to Excavation
Figures 2 and 3 – Recommendations for Design of Shoring System
Appendix A – Table A1 – Existing Pavement Structure
Appendix B – Findings of Chemical Analyses
Appendix C – Photographs of Pavement Distress
Appendix D – Engineered Fill



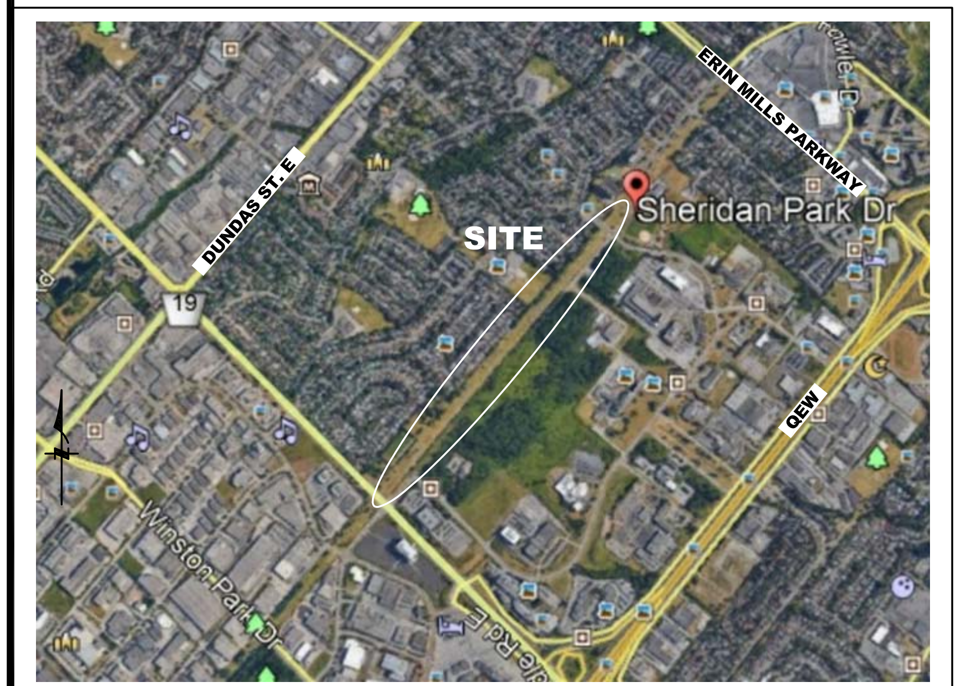
BOREHOLE #	NORTHINGS	EASTINGS	ELEVATION
BH-01	4 819 009.1	607 348.5	152.7
BH-02	4 818 984.6	607 372.4	152.6
BH-03	4 819 036.0	607 404.8	152.8
BH-04	4 819 060.9	607 418.4	152.7
BH-05	4 819 037.9	607 452.8	152.1
BH-06	4 819 010.9	607 486.7	151.7
BH-07	4 819 177.0	607 487.9	152.0
BH-08	4 819 285.7	607 574.0	151.7
BH-09	4 819 387.7	607 651.3	151.2
BH-10	4 819 509.2	607 748.0	150.2
BH-11	4 819 622.7	607 834.1	147.5
BH-12	4 819 737.8	607 929.9	147.6
BH-13	4 819 856.2	608 016.9	146.5
BH-14	4 819 948.0	608 090.8	146.1
BH-15	4 820 012.9	608 061.2	145.7
BH-16	4 819 998.1	608 081.2	145.6
BH-17	4 819 951.4	608 141.8	145.4
BH-18	4 819 915.5	608 159.7	144.9

LEGEND:

BH 18 — BOREHOLE UNDER PRESENT INVESTIGATION

NOTES:

1. THE INFERRED STRATIGRAPHY REFERRED TO IN THIS REPORT IS BASED ON DATA FROM THESE BOREHOLES, SUPPLEMENTED BY GEOLOGICAL EVIDENCE. THE ACTUAL STRATIGRAPHY AT OTHER POINTS BETWEEN THE BORINGS MAY VARY FROM THAT SHOWN.
2. THIS DRAWING WAS REPRODUCED FROM A PLAN DRAWING ***'Sheridan Park Drive Basemap.dwg'*** PROVIDED BY THE CLIENT.



KEY MAP
SCALE 1 : 25,000

No.	REVISIONS	DATE	BY

R. J. BURNSIDE & ASSOCIATES LIMITED

CLASS B ASSESSMENT - SHERIDAN PARK DRIVE
WINSTON CHURCHILL BOULEVARD TO HOMELAND DRIVE
MISSISSAUGA, ONTARIO

BOREHOLE LOCATION PLAN

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN: N.A. / CHECKED: M.Z. / APPROVED: H.G.	DATE	SCALE	JOB NO.	DRAWING NO.
	DEC. 2017	1 : 5,000	17TF012	1

LIST OF ABBREVIATIONS

PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 12 in. into the subsoil. Driven by means of a 140 lb. hammer falling freely a distance of 30 in.

Dynamic Penetration Resistance: - The number of blows required to advance a 2 in., 60 degree cone, fitted to the end of drill rods, 12 in. into the subsoil. The driving energy being 350 foot pounds per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

CONSISTENCY	N (blows/ft.)	c (psf)	DENSENESS	N (blows/ft.)
Very Soft	0 - 2	0 - 250	Very Loose	0 - 4
Soft	2 - 4	250 - 500	Loose	4 - 10
Firm	4 - 8	500 - 1000	Compact	10 - 30
Stiff	8 - 15	1000 - 2000	Dense	30 - 50
Very Stiff	15 - 30	2000 - 4000	Very Dense	> 50
Hard	> 30	>4000		

WTPL	Wetter Than Plastic Limit
APL	About Plastic Limit
DTPL	Drier Than Plastic Limit

TYPE OF SAMPLE

SS	Split Spoon	TW	Thinwall Open
WS	Washed Sample	TP	Thinwall Piston
SB	Scraper Bucket Sample	OS	Oesterberg Sample
AS	Auger Sample	FS	Foil Sample
CS	Chunk Sample	RC	Rock Core
ST	Slotted Tube Sample		

- PH Sample Advanced Hydraulically
- PM Sample Advanced Manually

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-1

PROJECT Rehabilitation of Sheridan Park Drive
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
BORING METHOD Solid Stem Augers
CO-ORDS: 4 819 009.1 N; 607 348.5 E
BORING DATE 12/09/2017
PML REF. 17TF012
ENGINEER M.Z.
TECHNICIAN M.F.

SOIL PROFILE

DEPTH / ELEV (metres)	DESCRIPTION
	SURFACE ELEVATION 152.7
0.65	PAVEMENT STRUCTURE: 150 mm asphalt over 500 mm granular material (sand and gravel)
0.90 / 151.80	FILL: mixture of grey sand, silt and clay, moist
1.4 / 151.3	SILTY CLAY: stiff greyish red silty clay, moist
3.8 / 148.8	SILTY CLAY TILL: hard greyish red silty clay, trace fine gravel, moist
	SHALE BEDROCK: hard grey weathered shale bedrock, moist
	BOREHOLE TERMINATED AT 3.9m DEPTH

SAMPLES

NUMBER	TYPE	"N" VALUES	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
1	SS	21	30 52 (18)
2	SS	11	2 10 (88)
3	SS	50/13cm	
4	SS	50/8cm	
5	SS	50/5cm	
6	SS	50/8cm	

ELEVATION SCALE: 152, 151, 150, 149

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q — 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%) 10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS

Upon completion of augering, borehole caved-in to a depth of 2.3m, no free water

Depth scale (m): 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

LOG OF BOREHOLE NO. BH-2

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 818 984.6 N; 607 372.4 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 12/09/2017
TECHNICIAN M.F.

SURFACE ELEVATION 152.60

DEPTH / ELEV (metres)	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS
0.0	PAVEMENT STRUCTURE: 150 mm asphalt over 500 mm granular material (sand and gravel)	1	SS	16	
0.65 / 0.80 / 151.80	FILL: mixture of brown sand, silt, clay, trace to some gravel, pockets of organics, moist	2	SS	50/13cm	
	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	3	SS	50/5cm	
		4	SS	50/15cm	
		5	SS	50/3cm	
4.5 / 148.1	SHALE BEDROCK: hard grey weathered shale bedrock, moist	6	SS	50/3cm	
4.6 / 148.0	BOREHOLE TERMINATED AT 4.6 m DEPTH				Upon completion of augering, borehole caved-in to a depth of 3.7 m, no free water

SHEAR STRENGTH (kPa): + FIELD VANE, △ TORVANE, ○ Qu, ▲ POCKET PENETROMETER, O Q — 50, 100, 150, 200

DYNAMIC CONE PENETRATION × / STANDARD PENETRATION TEST ● — 20, 40, 60, 80

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L

WATER CONTENT (%) — 10, 20, 30, 40

UNIT WEIGHT kN/m³

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

ELEVATION SCALE: 152, 151, 150, 149, 148

Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-3

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 036.0 N; 607 404.8 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 12/09/2017
TECHNICIAN M.F.

SURFACE ELEVATION 152.80

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS
0.50	PAVEMENT STRUCTURE: 100 mm asphalt over 400 mm granular material (sand and gravel)	1	SS	21	
0.60 / 152.20	FILL: mixture of grey sand, silt, clay, moist	2	SS	47	
	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	3	SS	50/8cm	
		4	SS	50/5cm	
		5	SS	50/5cm	
3.8 / 148.8		6	SS	50/3cm	
3.9 / 148.9	SHALE BEDROCK: hard grey weathered shale bedrock, moist				Upon completion of augering, borehole caved-in to a depth of 3.7 m, no free water
	BOREHOLE TERMINATED AT 3.9 m DEPTH				

Column headings: SOIL PROFILE (DEPTH / ELEV (metres), DESCRIPTION, STRAT PLOT); SAMPLES (NUMBER, TYPE, "N" VALUES); ELEVATION SCALE; SHEAR STRENGTH (kPa): +FIELD VANE △TORVANE ○ Qu ▲POCKET PENETROMETER ○ Q (50, 100, 150, 200); DYNAMIC CONE PENETRATION ×, STANDARD PENETRATION TEST ● (20, 40, 60, 80); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) (10, 20, 30, 40); UNIT WEIGHT kN/m³; GROUND WATER OBSERVATIONS AND REMARKS; GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Depth scale: 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0
Elevation scale: 152 151 150 149

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-4

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 060.9 N; 607 418.4 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 12/09/2017
TECHNICIAN M.F.

SURFACE ELEVATION 152.70

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES	WATER CONTENT	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	GROUND WATER OBSERVATIONS AND REMARKS
0.0	PAVEMENT STRUCTURE: 150 mm asphalt over 500 mm granular material (sand and gravel)	1	SS	18	○	23 56 (21)	
0.65 / 0.80 / 151.90	FILL: mixture of grey sand, silt, clay, moist	2	SS	50/13cm	○		
	CLAYEY SILT TILL: hard brownish red to grey clayey silt, trace gravel, moist	3	SS	50/13cm	○		
		4	SS	50/10cm	○		
		5	SS	50/5cm	○		
4.5 / 148.2	SHALE BEDROCK: hard grey weathered shale bedrock, moist	6	SS	50/3cm			
4.6 / 148.1	BOREHOLE TERMINATED AT 4.6 m DEPTH						Upon completion of augering, borehole caved-in to a depth of 3.7 m, no free water

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50, 100, 150, 200)
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20, 40, 60, 80)
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30 40
UNIT WEIGHT kN/m³
ELEVATION SCALE: 152, 151, 150, 149
Depth scale: 0.0 – 15.0

NOTES

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-5

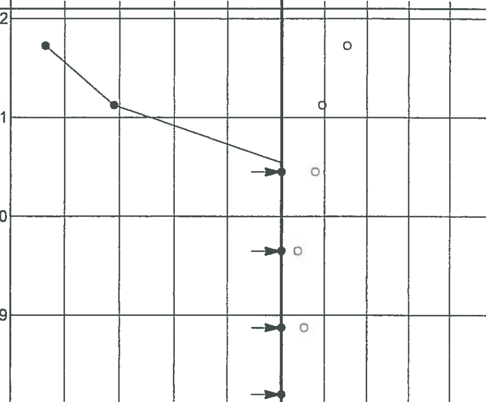
PROJECT Rehabilitation of Sheridan Park Drive
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
BORING METHOD Solid Stem Augers
CO-ORDS: 4 819 037.9 N; 607 452.8 E
BORING DATE 12/09/2017
PML REF. 17TF012
ENGINEER M.Z.
TECHNICIAN M.F.

SURFACE ELEVATION 152.10

DEPTH / ELEV (metres)	DESCRIPTION
	PAVEMENT STRUCTURE: 150 mm asphalt over 450 mm granular material (sand and gravel)
0.60	FILL: brown sand, trace silt, trace clay, trace to some gravel, pockets of organics, moist
0.80 / 151.30	CLAYEY SILT TILL: hard brownish red to grey clayey silt, trace sand, trace gravel, moist
3.9 / 148.2	SHALE BEDROCK: hard dark grey weathered shale bedrock, moist
4.0 / 148.1	BOREHOLE TERMINATED AT 4.0 m DEPTH

SAMPLE NUMBER	TYPE	"N" VALUES
1	SS	13
2	SS	38
3	SS	50/8cm
4	SS	50/8cm
5	SS	50/8cm
6	SS	50/3cm

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q — 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%) 10 20 30 40
UNIT WEIGHT kN/m³
ELEVATION SCALE: 152, 151, 150, 149



GROUND WATER OBSERVATIONS AND REMARKS

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
Sample 1: 13 60 (27)

Upon completion of augering, borehole caved-in to a depth of 2.5m, no free water

Depth scale (m): 0.0 – 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-6

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 010.9 N; 607 486.7 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 12/09/2017
TECHNICIAN M.F.

DEPTH / ELEV (metres)	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	GROUND WATER OBSERVATIONS AND REMARKS
0.0	SURFACE ELEVATION 151.70					
	PAVEMENT STRUCTURE: 200 mm asphalt over 500 mm granular material (sand and gravel)	1	SS	22	40 47 (13)	
0.70 / 151.00	FILL: mixture of grey sand, silt, gravel, moist	2	SS	22		
		3	SS	9		
2.4						
2.7	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	4	SS	50/15cm		
2.8 / 148.9	SHALE BEDROCK: hard grey weathered shale bedrock, dry					Upon completion of augering, borehole caved-in to a depth of 1.3m, no free water
	BOREHOLE TERMINATED AT 2.8 m DEPTH					

Chart headings: SHEAR STRENGTH (kPa): + FIELD VANE, △ TORVANE, ○ Qu, ▲ POCKET PENETROMETER, ○ Q (50, 100, 150, 200); DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ● (20, 40, 60, 80); ELEVATION SCALE (151, 150, 149); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT W_L; WATER CONTENT (%) (10, 20, 30, 40); UNIT WEIGHT kN/m³

Depth scale: 0.0 – 15.0 m

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-7

PROJECT Rehabilitation of Sheridan Park Drive
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
BORING METHOD Solid Stem Augers
CO-ORDS: 4 819 177.0 N; 607 487.9 E
BORING DATE 11/09/2017
PML REF. 17TF012
ENGINEER M.Z.
TECHNICIAN M.F.

SOIL PROFILE

DEPTH / ELEV (metres)	DESCRIPTION
	SURFACE ELEVATION 152.00
0.0	CLAYEY SILT TILL: very stiff brownish red clayey silt, trace fine gravel, moist
4.6	becoming hard
147.3	BOREHOLE TERMINATED AT 4.7 m DEPTH

SAMPLES

NUMBER	TYPE	"N" VALUES
1	SS	18
2	SS	27
3	SS	29
4	SS	16
5	SS	50/10cm

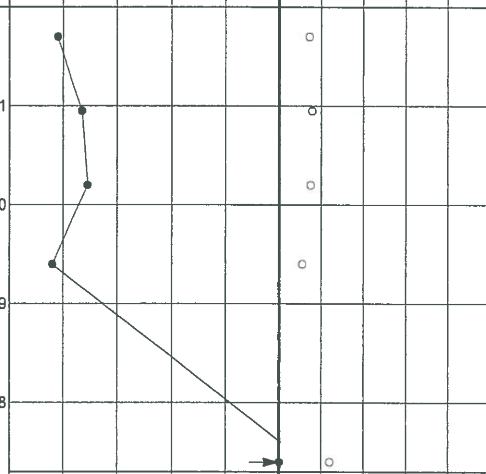
ELEVATION SCALE: 151, 150, 149, 148

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%): 10 20 30 40

UNIT WEIGHT kN/m³

GRAIN SIZE DISTRIBUTION (%): GR SA SI CL



GROUND WATER OBSERVATIONS AND REMARKS

Upon completion of augering, no free water no cave-in

Depth scale (m): 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-8

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 285.7 N; 607 574.0 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 11/09/2017
TECHNICIAN M.F.

SOIL PROFILE | SAMPLES | ELEVATION SCALE | SHEAR STRENGTH (kPa): +FIELD VANE △TORVANE ○ Qu ▲POCKET PENETROMETER ○ Q (50 100 150 200) | DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80) | PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L | WATER CONTENT (%) (10 20 30 40) | UNIT WEIGHT kN/m³ | GROUND WATER OBSERVATIONS AND REMARKS | GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES
0.0	SURFACE ELEVATION 151.70			
	SILTY CLAY TO CLAYEY SILT: stiff brownish red silty clay to clayey silt, rootlets, moist	1	SS	11
0.90	occasional sand seams	2	SS	50/5cm
150.70	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	3	SS	50/15cm
		4	SS	50/15cm
3.5		5	SS	50/5cm
3.7 / 148.0	SHALE BEDROCK: inferred shale bedrock/boulder	6	SS	50/1cm
	BOREHOLE TERMINATED AT 3.7 m DEPTH			

Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0
Elevation scale: 151, 150, 149, 148

GROUND WATER OBSERVATIONS AND REMARKS:
Upon completion of augering, borehole caved-in to a depth of2.2 m, no free water

NOTES

![PML] **Peto MacCallum Ltd.**
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-9

PROJECT Rehabilitation of Sheridan Park Drive

PML REF. 17TF012

LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario

CO-ORDS: 4 819 387.7 N; 607 651.3 E

ENGINEER M.Z.

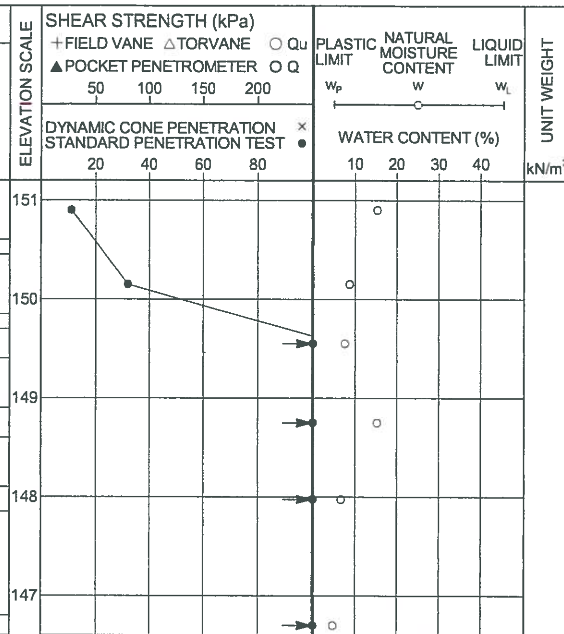
BORING METHOD Solid Stem Augers

BORING DATE 11/09/2017

TECHNICIAN M.F.

SURFACE ELEVATION 151.20

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS
0.0 / 151.20	SILTY CLAY TO CLAYEY SILT: stiff brownish red silty clay to clayey silt, trace to rootlets, moist	1	SS	11	
0.60 / 150.60	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	2	SS	32	
		3	SS	50/15cm	
		4	SS	50/13cm	
		5	SS	50/5cm	
		6	SS	50/5cm	
4.6 / 146.6	BOREHOLE TERMINATED AT 4.6 m DEPTH				Upon completion of augering, no free water no cave-in



NOTES

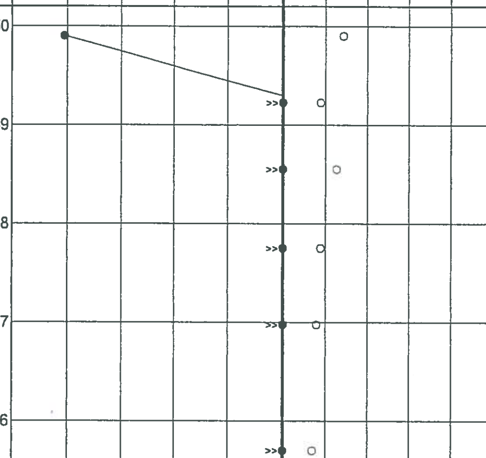
Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-10

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 509.2 N; 607 748.0 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 11/09/2017
TECHNICIAN M.F.

DEPTH / ELEV (metres)	SOIL PROFILE – DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS
	SURFACE ELEVATION 150.20				
150.10	TOPSOIL: about 100 mm thick				
0.60 / 149.60	SILTY CLAY: very stiff brownish red silty clay, trace sand, moist	1	SS	19	
	CLAYEY SILT TILL: hard brownish red clayey silt, trace gravel, moist	2	SS	65/25cm	
		3	SS	50/13cm	
		4	SS	50/5cm	
		5	SS	50/5cm	
4.4					
4.6 / 145.6	occasional shale partings	6	SS	50/3cm	
	BOREHOLE TERMINATED AT 4.6 m DEPTH				Upon completion of augering, borehole caved-in to a depth of 3.0m, no free water

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q — 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80
PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 10 20 30 40
UNIT WEIGHT kN/m³
GRAIN SIZE DISTRIBUTION (%) GR SA SI CL



DEPTH scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-11

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 622.7 N; 607 834.1 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 11/09/2017
TECHNICIAN M.F.

SOIL PROFILE

SURFACE ELEVATION 147.50

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES
0.15 / 147.35	TOPSOIL: about 150 mm thick, trace to some rootlets	1	SS	19
	CLAYEY SILT TILL: very stiff brownish red clayey silt, trace fine gravel, moist	2	SS	20
1.8 / 145.7	occasional gravel sized stones	3	SS	22
		4	SS	28
3.5 / 144.0	some medium grained sand	5	SS	8
4.4 / 4.6 / 142.9	occasional shale partings	6	SS	50/5cm
	BOREHOLE TERMINATED AT 4.6 m DEPTH			

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER O Q — 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80
PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L — WATER CONTENT (%) 10 20 30 40
UNIT WEIGHT kN/m³
ELEVATION SCALE: 147, 146, 145, 144, 143
GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUND WATER OBSERVATIONS AND REMARKS:
Upon completion of augering, no free water no cave-in

Depth scale (m): 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0

NOTES

LOG OF BOREHOLE NO. BH-12

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012

LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 737.8 N; 607 929.9 E
ENGINEER M.Z.

BORING METHOD Solid Stem Augers
BORING DATE 11/09/2017
TECHNICIAN M.F.

SHEAR STRENGTH (kPa): + FIELD VANE, △ TORVANE, ○ Qu, ▲ POCKET PENETROMETER, O Q (scale 50, 100, 150, 200)
DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ● (scale 20, 40, 60, 80)
PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L; WATER CONTENT (%) (scale 10, 20, 30, 40)
UNIT WEIGHT kN/m³
GROUND WATER OBSERVATIONS AND REMARKS; GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

DEPTH / ELEV (metres)	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	GROUND WATER OBSERVATIONS AND REMARKS
0.0	SURFACE ELEVATION 147.60					
	FILL: mixture of sand, silt, clay, trace gravel, moist	1	SS	12		
0.60 / 147.00	CLAYEY SILT TILL: hard greyish brown clayey silt, trace fine gravel, moist	2	SS	70/25cm	147	
		3	SS	50/5cm	146	
2.1						
2.3	brownish red					
2.5	occasional shale partings	4	SS	50/8cm		
145.1	BOREHOLE TERMINATED AT 2.5 m UPON AUGER REFUSAL					Upon completion of augering, no free water no cave-in

Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-13

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 856.2 N; 608 016.9 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 13/09/2017
TECHNICIAN M.F.

SURFACE ELEVATION 146.50

DEPTH / ELEV (metres)	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	WATER CONTENT (%) / REMARKS	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.60	PAVEMENT STRUCTURE: 150 mm asphalt over 450 mm granular material (sand and gravel)	1	SS	13		27 60 (13)
0.80 / 145.70	FILL: mixture of sand, silt, clay, pockets of black organics, moist					
1.4	SILTY CLAY: stiff brownish grey silty clay, trace sand, moist	2	SS	13		
145.1	CLAYEY SILT TILL: hard brownish grey clayey silt, trace sand, trace fine gravel, moist	3	SS	50/13cm		
		4	SS	50/13cm		
3.3 / 143.2	occasional shale partings	5	SS	50/10cm		
4.6		6	SS	50/13cm		
4.7 / 141.8	SHALE BEDROCK: hard grey shale bedrock, moist				Upon completion of augering, borehole caved-in to a depth of 4.0m, no free water	
	BOREHOLE TERMINATED AT 4.7m DEPTH					

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q (50 100 150 200)
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20 40 60 80)
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT W_L
WATER CONTENT (%) 10 20 30 40
UNIT WEIGHT kN/m³
GROUND WATER OBSERVATIONS AND REMARKS

Depth scale: 0.0 – 15.0 m; Elevation scale: 146, 145, 144, 143, 142

NOTES

PML Peto MacCallum Ltd. CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-14

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012

LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 948.0 N; 608 090.8 E
ENGINEER M.Z.

BORING METHOD Solid Stem Augers
BORING DATE 13/09/2017
TECHNICIAN M.F.

SURFACE ELEVATION 146.10

DEPTH / ELEV (metres)	DESCRIPTION (SOIL PROFILE)
0.0 / 146.10	PAVEMENT STRUCTURE: 150 mm asphalt over 500 mm granular material (sand and gravel)
0.65 / 145.45	SILTY CLAY TO CLAYEY SILT: hard light grey to brownish grey silty clay to clayey silt, trace sand, moist
1.4 / 144.7	CLAYEY SILT TILL: hard grey clayey silt, trace gravel, moist
1.8 / 144.3	occasional shale partings
2.4 / 143.7	brownish grey
4.6	SHALE BEDROCK: hard grey to brownish grey shale bedrock, wet
4.7 / 141.4	BOREHOLE TERMINATED AT 4.7m DEPTH

SAMPLE NUMBER	TYPE	"N" VALUES	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
1	SS	21	27 70 (3)
2	SS	29	9 15 (76)
3	SS	50/13cm	
4	SS	50/13cm	
5	SS	50/13cm	
6	SS	50/10cm	

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q — 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT W_L

WATER CONTENT (%) 10 20 30 40

ELEVATION SCALE: 146, 145, 144, 143, 142

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS

Upon completion of augering, no free water, no cave-in

Depth scale: 0.0 – 15.0 m

NOTES

LOG OF BOREHOLE NO. BH-15

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 820 012.9 N; 608 061.2 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 13/09/2017
TECHNICIAN M.F.

DEPTH / ELEV (metres)	DESCRIPTION	NUMBER	TYPE	"N" VALUES	WATER CONTENT (%)	GROUND WATER OBSERVATIONS AND REMARKS	GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SURFACE ELEVATION 145.70						
0.60 / 145.10	PAVEMENT STRUCTURE: 150 mm asphalt over 450 mm granular material (sand and gravel)	1	SS	14			25 57 (18)
1.4 / 144.3	FILL: mixture of sand, silt, clay, moist	2	SS	9			
2.8	CLAYEY SILT TILL: stiff browmish grey to grey clayey silt, trace gravel, moist	3	SS	12			
		4	SS	50/15cm			
2.9 / 142.8	SHALE BEDROCK: hard grey shale bedrock, moist	5	SS	50/5cm		Upon completion of augering, no free water, no cave-in	
	BOREHOLE TERMINATED AT 2.9 m DEPTH						

Chart headings: SOIL PROFILE; SAMPLES; STRAT PLOT; ELEVATION SCALE (145, 144, 143); SHEAR STRENGTH (kPa): + FIELD VANE, △ TORVANE, ○ Qu, ▲ POCKET PENETROMETER, ○ Q; 50 100 150 200; DYNAMIC CONE PENETRATION ×; STANDARD PENETRATION TEST ●; 20 40 60 80; PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L; WATER CONTENT (%) 10 20 30 40; UNIT WEIGHT kN/m³.

Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-16

PROJECT Rehabilitation of Sheridan Park Drive
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
BORING METHOD Solid Stem Augers
CO-ORDS: 4 819 998.1 N; 608 081.2 E
BORING DATE 13/09/2017
PML REF. 17TF012
ENGINEER M.Z.
TECHNICIAN M.F.

SOIL PROFILE

DEPTH / ELEV (metres)	DESCRIPTION
0.0 / 145.60	SURFACE ELEVATION 145.60
0.60 / 145.00	PAVEMENT STRUCTURE: 125 mm asphalt over 450 mm granular material (sand and gravel)
1.4 / 144.2	FILL: mixture of sand, silt, clay, trace to some gravel, moist
2.6	CLAYEY SILT TILL: very stiff brownish grey clayey silt, trace gravel, moist
2.8 / 142.8	hard
	SHALE BEDROCK: hard grey weathered shale bedrock, moist
	BOREHOLE TERMINATED AT 2.8 m DEPTH

SAMPLES

NUMBER	TYPE	"N" VALUES
1	SS	9
2	SS	13
3	SS	26
4	SS	50/13cm
5	SS	50/3cm

ELEVATION SCALE: 145, 144, 143

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q; 50 100 150 200
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ●; 20 40 60 80

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT W_L
WATER CONTENT (%): 10 20 30 40

UNIT WEIGHT kN/m³

GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GROUND WATER OBSERVATIONS AND REMARKS

Upon completion of augering, borehole caved-in to a depth of 1.8m, no free water

DEPTH scale (metres): 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

Peto MacCallum Ltd.
CONSULTING ENGINEERS

LOG OF BOREHOLE NO. BH-17

PROJECT Rehabilitation of Sheridan Park Drive
PML REF. 17TF012
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
CO-ORDS: 4 819 951.4 N; 60841.8 E
ENGINEER M.Z.
BORING METHOD Solid Stem Augers
BORING DATE 13/09/2017
TECHNICIAN M.F.

SOIL PROFILE — SURFACE ELEVATION 145.40

DEPTH / ELEV (metres)	DESCRIPTION
	PAVEMENT STRUCTURE: 150 mm asphalt over 450 mm granular material (sand and gravel)
0.60 / 144.70	FILL: mixture of brown sand, silt, clay, trace gravel, moist
	CLAYEY SILT TILL: very stiff grey clayey silt, trace gravel, moist
1.8 / 143.6	hard, occasional gravel sized stones
2.7 / 142.7	occasional shale partings
3.8 / 141.5	SHALE BEDROCK: hard grey weathered shale bedrock, moist
	BOREHOLE TERMINATED AT 3.9 m DEPTH

SAMPLES

NUMBER	TYPE	"N" VALUES
1	SS	11
2	SS	23
3	SS	78/28cm
4	SS	50/15cm
5	SS	50/10cm
6	SS	50/13cm

ELEVATION SCALE: 145, 144, 143, 142

SHEAR STRENGTH (kPa): + FIELD VANE △ TORVANE ○ Qu ▲ POCKET PENETROMETER ○ Q — 50 100 150 200

DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● — 20 40 60 80

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT W_L

WATER CONTENT (%) — 10 20 30 40

UNIT WEIGHT kN/m³

GROUND WATER OBSERVATIONS AND REMARKS — GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

Upon completion of augering, borehole caved-in to a depth of 3.6 m, no free water

Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

LOG OF BOREHOLE NO. BH-18

PROJECT Rehabilitation of Sheridan Park Drive
LOCATION Sheridan Park Drive and Winston Churchill Road, Mississauga, Ontario
BORING METHOD Solid Stem Augers
CO-ORDS: 4 819 915.5 N; 608 159.7 E
BORING DATE 13/09/2017
PML REF. 17TF012
ENGINEER M.Z.
TECHNICIAN M.F.

SHEAR STRENGTH (kPa): +FIELD VANE △TORVANE ○ Qu ▲POCKET PENETROMETER O Q (50, 100, 150, 200)
DYNAMIC CONE PENETRATION × STANDARD PENETRATION TEST ● (20, 40, 60, 80)
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L; WATER CONTENT (%) (10, 20, 30, 40)
UNIT WEIGHT kN/m³

DEPTH / ELEV (metres)	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER OBSERVATIONS AND REMARKS / GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
0.0	SURFACE ELEVATION 144.90				
0.60 / 144.30	PAVEMENT STRUCTURE: 150 mm asphalt over 450 mm granular material (sand and gravel)	1	SS	14	40 41 (19)
	CLAYEY SILT TILL: hard light grey clayey silt, trace sand, trace gravel, moist	2	SS	31	
		3	SS	70/25cm	
2.3 / 142.6	occasional gravel sized stones	4	SS	50/5cm	
2.7		5	SS	50/5cm	
2.8 / 142.1	SHALE BEDROCK: hard grey weathered shale bedrock, moist				Upon completion of augering, borehole caved-in to a depth of 2.2 m, no free water
	BOREHOLE TERMINATED AT 2.8 m DEPTH				

Elevation scale: 144, 143
Depth scale: 0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0, 15.0

NOTES

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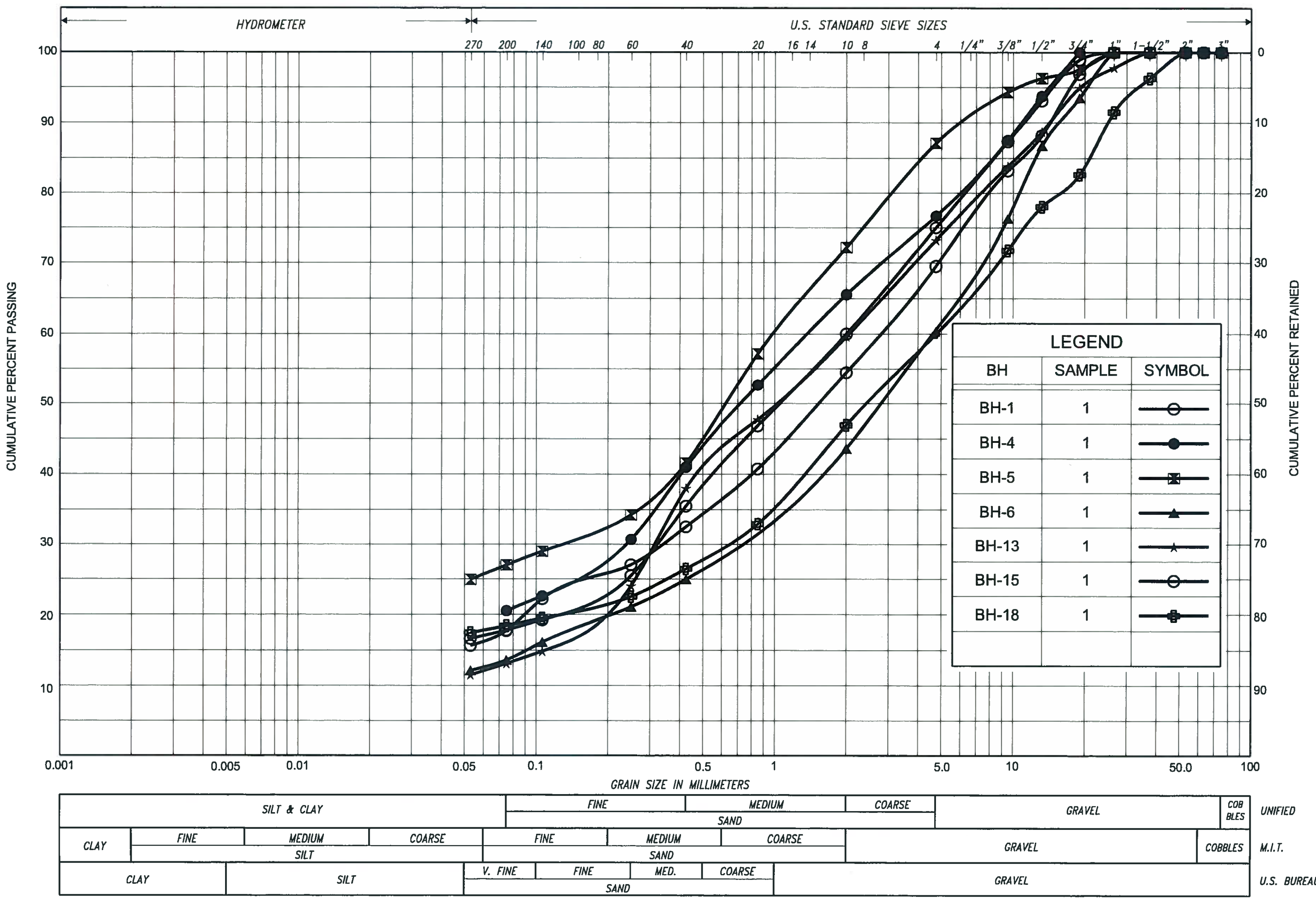
PROJECT NO. 17TF012

FIGURE NO. GS-1

PARTICLE SIZE DISTRIBUTION CHART



REMARKS: SAND: Sand, some gravel to gravelly, trace to some silt (FILL)

PML Peto MacCallum Ltd.
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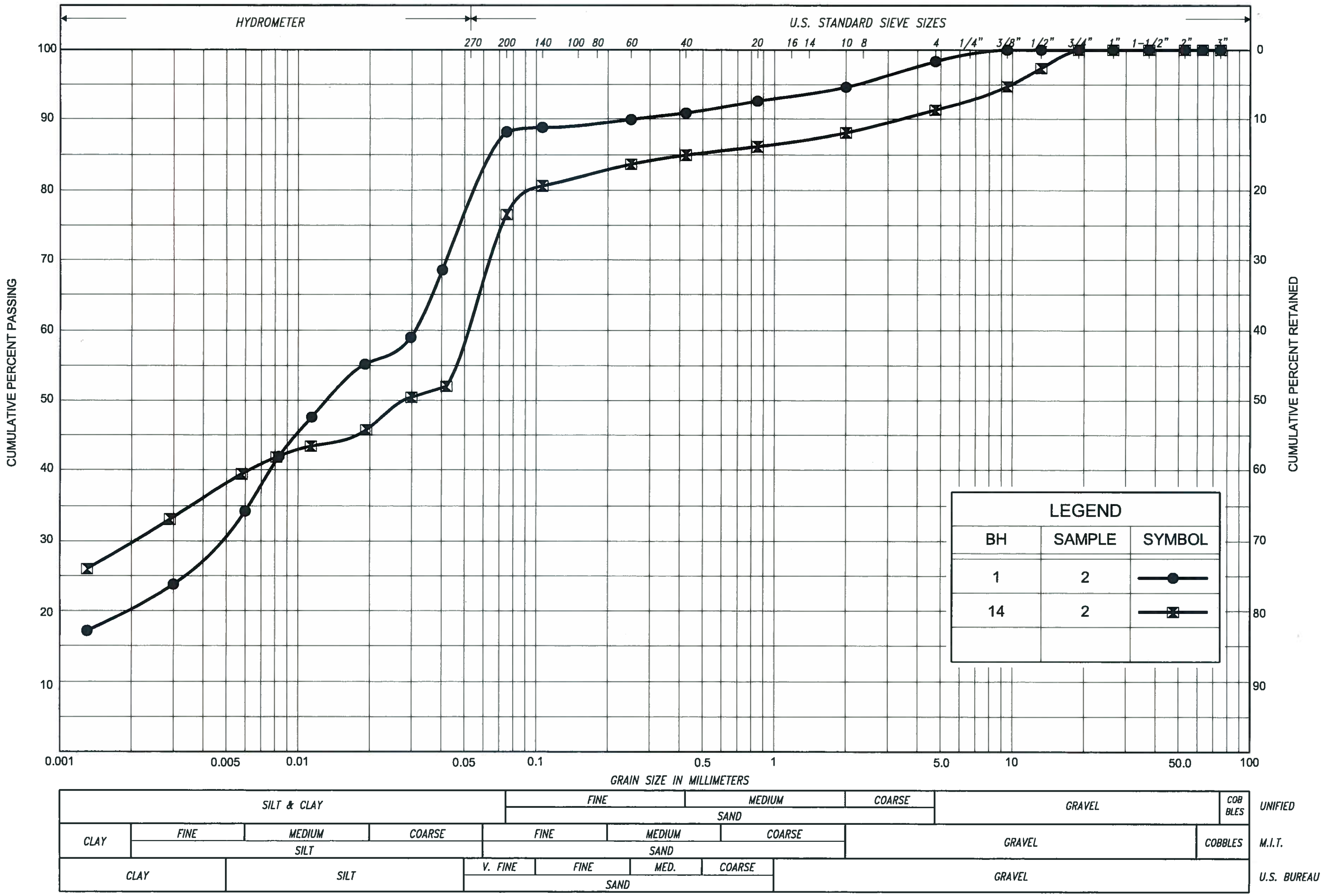
PROJECT NO. 17TF012

FIGURE NO. GS-2

PARTICLE SIZE DISTRIBUTION CHART

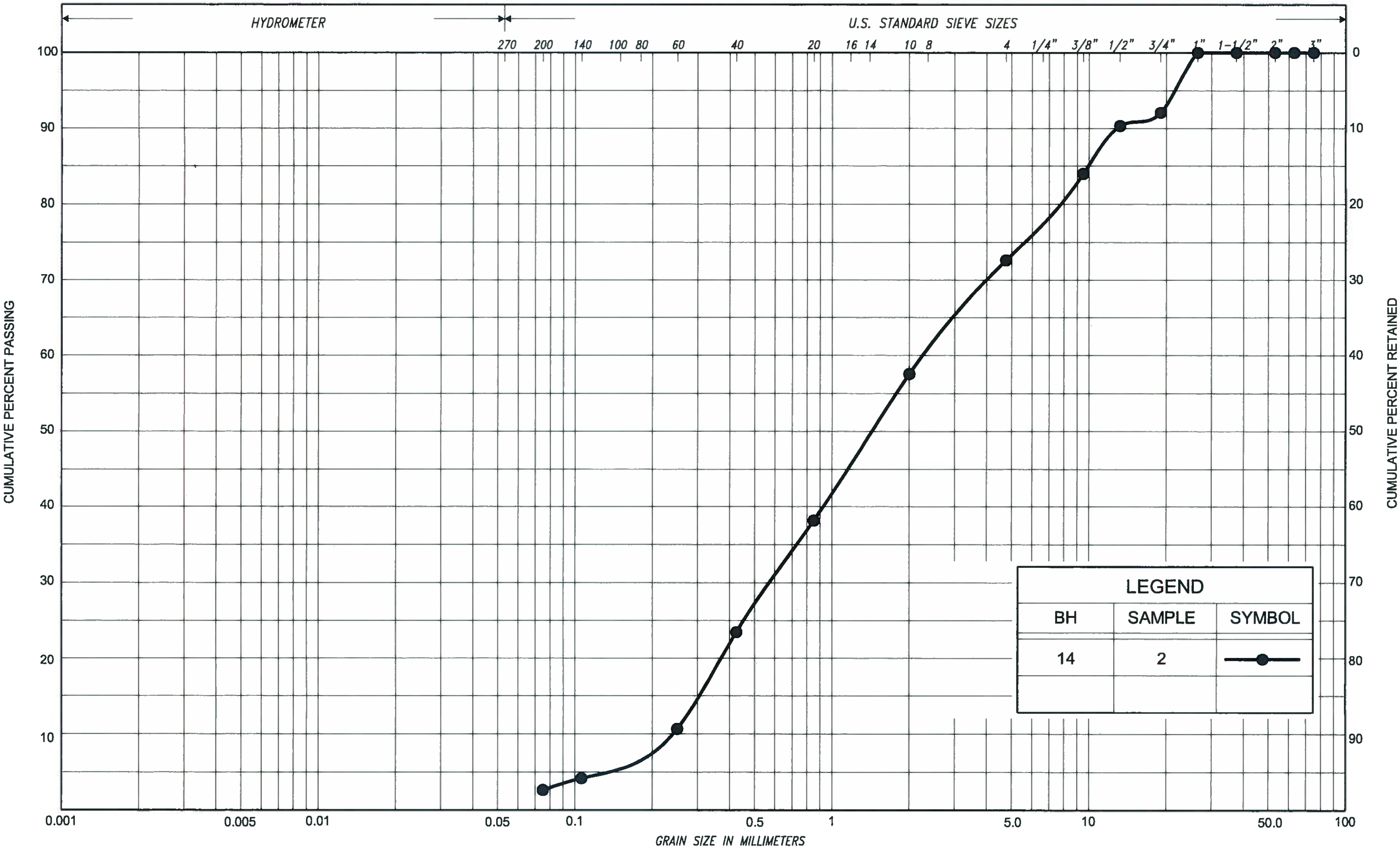


REMARKS: CLAYEY SILT: Clayey silt, some sand, trace gravel (FILL)

Peto MacCallum Ltd.
CONSULTING ENGINEERS

PROJECT NO. 17TF012
FIGURE NO. GS-3

PARTICLE SIZE DISTRIBUTION CHART



SILT & CLAY		SAND: FINE	SAND: MEDIUM	SAND: COARSE	GRAVEL	COBBLES	UNIFIED
CLAY	SILT: FINE, MEDIUM, COARSE	SAND: FINE	SAND: MEDIUM	SAND: COARSE	GRAVEL	COBBLES	M.I.T.
CLAY	SILT	SAND: V. FINE, FINE	SAND: MED.	SAND: COARSE	GRAVEL		U.S. BUREAU

REMARKS: SAND: Sand, some gravel (FILL)

NOTES

1. The need to underpin existing footings/utilities is dependent upon soil type, proximity of the existing facility to the face of the excavation, loads imposed on the foundation and permissible movements.

   ZONE A:
   Foundations of relatively heavy and/or settlement sensitive structures/ utilities located in Zone A generally require underpinning.

   ZONE B:
   Foundations of structures located within Zone B generally do not require underpinning. Consideration should be given to underpinning of settlement sensitive utilities or heavy foundation units located in this zone.

   ZONE C:
   Utilities and foundations located within Zone C do not normally require underpinning.

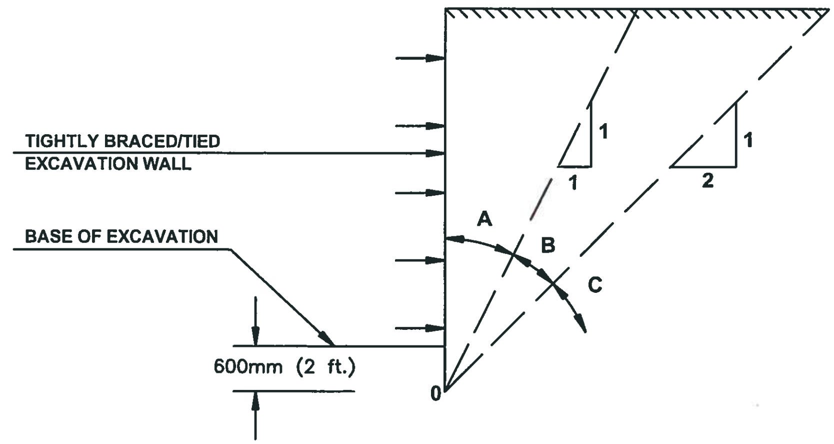
   Underpinning of foundations located in Zones A and B should extend at least into Zone C.

2. As an alternative to underpinning, it may be possible to control movement of existing utilities and foundations by supporting the face of the excavation with bracing/tiebacks or a rigid (caisson) wall. Horizontal and vertical earth pressures imposed on the excavation wall by non—underpinned foundations must be considered in the design of the support system.

3. A condition survey should be conducted prior to construction and appropriate monitoring (surface and insitu) carried out during construction to monitor any movement which may occur.

4. All work should be carried out in accordance with the Occupational Health and Safety Act and local regulations. Good quality workmanship and construction practices are to be employed.

5. This sheet is to be read in conjunction with text of report for this project. Additional comments and recommendations concerning these general guidelines will be provided if required.



If the base of the excavation is in bedrock, point "0" is drawn through the intersection point of the wall and the surface of sound bedrock

STANDARD DRAWING

GENERAL GUIDELINES REGARDING UNDERPINNING OF FOUNDATIONS / UTILITIES LOCATED CLOSE TO EXCAVATION

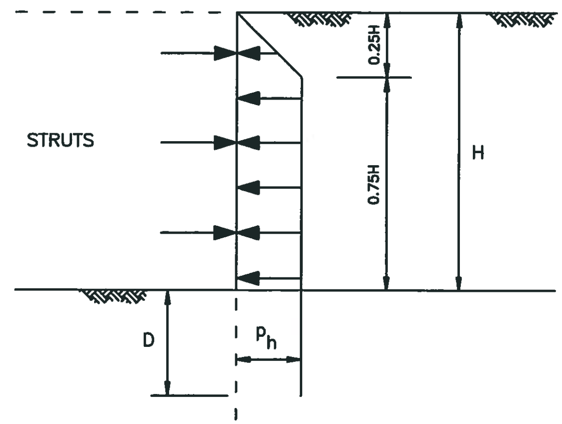
PML Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN:	N.A.	DATE	SCALE	JOB NO.	FIGURE NO.
CHECKED:	M.Z.	OCT. 2017	N.T.S.	17TF012	1
APPROVED:	H.G.				

NOTES

1. The actual magnitude and distribution of the horizontal earth pressures which will act on the bracing system are dependent upon the permissible lateral/vertical movements adjacent to the excavation, the soil type, groundwater conditions, drainage provisions, temporary/permanent surcharge loads, the type of bracing system adopted, weather conditions, quality of workmanship and length of time the excavation will be supported. Hence, the recommended pressure diagram and design parameters should be reviewed when construction details, schedule and type of support system are established.
2. Stability of base of excavation must be confirmed when bracing system design, excavation geometry and surcharge loads are established.
3. Earth pressure diagram is applicable to maximum depth of cut of 12m (40 ft.).
4. Structural components of bracing system should be confirmed adequate for each level of excavation.
5. If sheeting will not permit drainage, bracing system must be designed to resist water pressure.
6. Surcharge loads such as street/construction traffic, supported utilities, adjacent foundations, temporary stockpiles and other loads carried by bracing system are not included in earth pressure diagram.
7. Temporary surcharge loading should not be closer to the face of the excavation than half the depth of excavation unless accounted for in bracing design.
8. If settlement sensitive structures are located near the excavation, special measures should be undertaken to control settlements. A condition survey should be conducted prior to construction and apppropriate monitoring (surface and insitu) carried out during construction.
9. Earth pressure diagram is applicable for relatively short construction periods. If excavation is to be open for long periods, monitoring of deformation is essential, the earth pressure diagram must be reviewed, and remedial works may be required.
10. Earth pressure diagram does not account for extended periods of exposure of the excavation to freezing temperatures.
11. Bracing system should be regularly examined for signs of distress.
12. All work should be carried out in accordance with the Occupational Health and Safety Act and local regulations. Good quality workmanship and construction practices are to be employed.
13. This sheet should be read in conjunction with text of report for this project. Additional comments and recommendations concerning these general guidelines will be provided if required.

EARTH PRESSURE DIAGRAM



p_h = design lateral earth pressure
= $\gamma H - 1.6\ c_s \geq 0.4\ \gamma H$

where

c_s = average undrained shear strength of clay along face of excavation

m = dimensionless coefficient

γ = unit weight of soil

H = depth of excavation

D = depth of embedment of soldier piles (if used).

For soil parameters, refer to Table in Report.

LATERAL EARTH PRESSURE DISTRIBUTION

MULTI-BRACED CUTS IN STIFF CLAYS OR CLAYEY SOILS

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN:	N.A.	DATE	SCALE	JOB NO.	FIGURE NO.
CHECKED:	M.Z.	OCT. 2017	N.T.S.	17TF012	2
APPROVED:	H.G.				

NOTES

1. The actual magnitude and distribution of the horizontal earth pressures which will act on the bracing system are dependent upon the permissible lateral/vertical movements adjacent to the excavation, the soil type, groundwater conditions, drainage provisions, temporary/permanent surcharge loads, the type of bracing system adopted, weather conditions, quality of workmanship and length of time the excavation will be supported. Hence, the recommended pressure diagram and design parameters should be reviewed when construction details, schedule and type of support system are established.

2. Stability of base of excavation must be confirmed when bracing system design, excavation geometry and surcharge loads are established. If groundwater table is well above base of excavation and/or artesian conditions exist, local lowering of the groundwater level will be necessary to prevent bottom heave/piping of the base of the excavation.

3. Earth pressure diagram is applicable to maximum depth of cut of 12m (40 ft.).

4. Structural components of bracing system should be confirmed adequate for each level of excavation.

5. If sheeting will not permit drainage, bracing system must be designed to resist water pressure.

6. Surcharge loads such as street/construction traffic, supported utilities, adjacent foundations, temporary stockpiles and other loads carried by bracing system are not included in earth pressure diagram.

7. Temporary surcharge loading should not be closer to the face of the excavation than half the depth of excavation unless accounted for in bracing design.

8. If settlement sensitive structures are located near the excavation, special measures should be undertaken to control settlements. A condition survey should be conducted prior to construction and apppropriate monitoring (surface and insitu) carried out during construction.

9. Earth pressure diagram is applicable for relatively short construction periods. If excavation is to be open for long periods, monitoring of deformation is essential, the earth pressure diagram must be reviewed, and remedial works may be required.

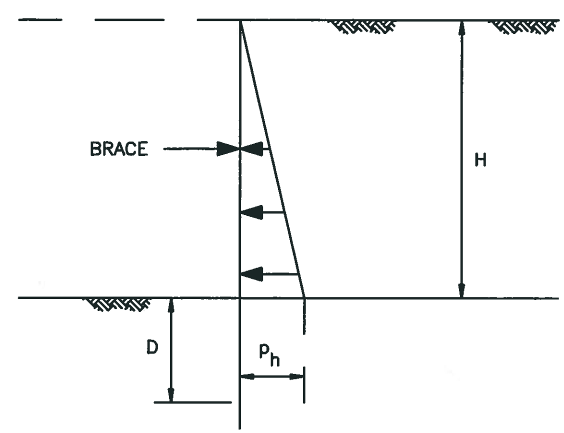
10. Earth pressure diagram does not account for extended periods of exposure of the excavation to freezing temperatures.

11. Bracing system should be regularly examined for signs of distress.

12. All work should be carried out in accordance with the Occupational Health and Safety Act and local regulations. Good quality workmanship and construction practices are to be employed.

13. This sheet should be read in conjunction with text of report for this project. Additional comments and recommendations concerning these general guidelines will be provided if required.

EARTH PRESSURE DIAGRAM



P_h = design lateral earth pressure
= $K\gamma H$

K = lateral earth pressure coefficient

γ = unit weight of soil

H = depth of excavation

D = depth of embedment of soldier piles (if used).

For soil parameters, refer to Table in Report.

LATERAL EARTH PRESSURE DISTRIBUTION

SINGLY-BRACED CUTS IN COHESIVE OR COHESIONLESS SOILS

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN: N.A.	DATE	SCALE	JOB NO.	FIGURE NO.
CHECKED: M.Z.	OCT. 2017	N.T.S.	17TF012	3
APPROVED: H.G.				

APPENDIX A

Table A1 – Existing Pavement Structure

Table A1 below present existing pavement structure data obtained from twelve boreholes (six from east end and six from west end of Sheridan Park Drive) drilled along the proposed Sheridan Park Drive with the project limit.

TABLE A1
EXISTING PAVEMENT STRUCTURE

BOREHOLE LOCATION	ASPHALT THICKNESS (mm)	GRANULAR BASE/SUB-BASE (mm)	PAVEMENT STRUCTURE (mm)
BH1	150	500	650
BH2	150	500	650
BH3	100	400	500
BH4	150	500	550
BH5	150	450	600
BH6	200	500	700
BH13	150	450	600
BH14	150	500	550
BH15	150	450	600
BH16	125	450	575
BH117	150	450	600
BH118	150	450	600

APPENDIX B

Findings of Chemical Analyses

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: PETO MACCALLUM LIMITED
165 CARTWRIGHT AVENUE
TORONTO, ON M6A1V5
(416) 785-5110

ATTENTION TO: Mahaboob Alam

PROJECT: 17TF012

AGAT WORK ORDER: 17T261647

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Sep 27, 2017

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Mahaboob Alam

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2017-09-18

DATE REPORTED: 2017-09-27

			SAMPLE DESCRIPTION:	BH1,SS2	BH3,SS3	BH5,SS1	BH8,SS2	BH10,SS2	BH12,SS2	BH14,SS2	BH16,SS1
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2017-09-14	2017-09-14	2017-09-14	2017-09-14	2017-09-14	2017-09-14	2017-09-14	2017-09-14
Parameter	Unit	G / S	RDL	8735985	8735993	8735994	8735996	8736020	8736021	8736022	8736024
Sodium Adsorption Ratio	NA	2.4	NA	19.9	14.1	3.25	0.220	0.141	0.191	7.54	32.4

			SAMPLE DESCRIPTION:	BH18,SS3
			SAMPLE TYPE:	Soil
			DATE SAMPLED:	2017-09-14
Parameter	Unit	G / S	RDL	8736025
Sodium Adsorption Ratio	NA	2.4	NA	8.77

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8735985-8736025 SAR was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

Certified By: Amanjot Bhela

Results relate only to the items tested and to all the items tested

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17T261647
PROJECT: 17TF012

CLIENT NAME: PETO MACCALLUM LIMITED
ATTENTION TO: Mahaboob Alam
SAMPLING SITE:
SAMPLED BY:

O. Reg. 153(511) - PHCs F2 - F4 (Soil)

DATE RECEIVED: 2017-09-18
DATE REPORTED: 2017-09-27

			SAMPLE DESCRIPTION:	BH1,SS2	BH5,SS1	BH8,SS2	BH12,SS2	BH18,SS3
			SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
			DATE SAMPLED:	2017-09-14	2017-09-14	2017-09-14	2017-09-14	2017-09-14
Parameter	Unit	G / S	RDL	8735985	8735994	8735996	8736021	8736025
F2 (C10 to C16)	µg/g	10	10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	240	50	<50	690	<50	<50	<50
F4 (C34 to C50)	µg/g	120	50	<50	1600	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	120	50	NA	NA	NA	NA	NA
Moisture Content	%		0.1	7.5	2.5	9.9	15.8	4.6
Surrogate	Unit	Acceptable Limits						
Terphenyl	%	60-140		84	82	98	70	86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8735985-8736025 Results are based on sample dry weight.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By: NPopukolof

Results relate only to the items tested and to all the items tested

Guideline Violation

AGAT WORK ORDER: 17T261647

PROJECT: 17TF012

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: PETO MACCALLUM LIMITED

ATTENTION TO: Mahaboob Alam

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8735985	BH1,SS2	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	19.9
8735993	BH3,SS3	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	14.1
8735994	BH5,SS1	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	3.25
8735994	BH5,SS1	ON T1 S RPI/ICC	O. Reg. 153(511) - PHCs F2 - F4 (Soil)	F3 (C16 to C34)	µg/g	240	690
8735994	BH5,SS1	ON T1 S RPI/ICC	O. Reg. 153(511) - PHCs F2 - F4 (Soil)	F4 (C34 to C50)	µg/g	120	1600
8736022	BH14,SS2	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	7.54
8736024	BH16,SS1	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	32.4
8736025	BH18,SS3	ON T1 S RPI/ICC	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	2.4	8.77

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: PETO MACCALLUM LIMITED | AGAT WORK ORDER: 17T261647

PROJECT: 17TF012 | ATTENTION TO: Mahaboob Alam

SAMPLING SITE: | SAMPLED BY:

Soil Analysis

RPT Date: Sep 27, 2017			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - ORPs (Soil)															
Sodium Adsorption Ratio	8735985	8735985	19.9	20.6	3.5%	NA	NA			NA			NA		

Comments: NA signifies Not Applicable.

Certified By: Amanjot Bhela

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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CANADA L4Z 1Y2
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Quality Assurance

CLIENT NAME: PETO MACCALLUM LIMITED
AGAT WORK ORDER: 17T261647
PROJECT: 17TF012
ATTENTION TO: Mahaboob Alam
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 27, 2017			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F2 - F4 (Soil)															
F2 (C10 to C16)	8736347		< 10	< 10	NA	< 10	94%	60%	130%	96%	80%	120%	74%	70%	130%
F3 (C16 to C34)	8736347		< 50	< 50	NA	< 50	113%	60%	130%	93%	80%	120%	80%	70%	130%
F4 (C34 to C50)	8736347		< 50	< 50	NA	< 50	106%	60%	130%	106%	80%	120%	95%	70%	130%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: NPopukolof

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Method Summary

CLIENT NAME: PETO MACCALLUM LIMITED
AGAT WORK ORDER: 17T261647
PROJECT: 17TF012
ATTENTION TO: Mahaboob Alam
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES
Trace Organics Analysis			
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID

Results relate only to the items tested and to all the items tested

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

15 ~

Laboratory Use Only

Work Order #: 17T261647

Cooler Quantity:

Arrival Temperatures: 4.6 | 5.4 | 5.6

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: PETO MACCAllum Ltd

Contact: M. ALAM

Address: 165 CARTWRIGHT AVE TORONTO, ONT

Phone: 416 785 5110 Fax: 416 785 5120

Reports to be sent to:

1. Email: malam@Petomaccallum.com
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☑ Regulation 153/04

Table (Indicate One): ☐ Ind/Com ☑ Res/Park ☐ Agriculture

Soil Texture *(Check One)*: ☐ Coarse ☐ Fine

☐ Sewer Use: ☐ Sanitary ☐ Storm

Region ______ (Indicate One)

☐ MISA

☐ Regulation 558

☐ CCME

☐ Prov. Water Quality Objectives (PWQO)

☐ Other ______ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply): 5 DAYS TAT

Please provide prior notification for rush TAT

**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 17TF012

Site Location:

Sampled By:

AGAT Quote #: PML RATE PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company:

Contact:

Address:

Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	☐ All Metals ☐ 153 Metals (excl. Hydrides)	☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions ~~1 to 4~~ F2-F4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	SAR				
BH1, SS2	09/14		1	SOIL											✓							✓				
BH3, SS3	"		1	"																		✓				
BH5, SS1	"		1	"											✓							✓				
BH8, SS2	"		1	"											✓							✓				
BH10, SS2	"		1	"																		✓				
BH 12, SS2	"		1	"											✓							✓				
BH 14, SS2	"		1	"																		✓				
BH 16, SS1	"		1	"																		✓				
BH18, SS3	"		1	"											✓							✓				

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	
Nerrd Rahman	Sep 14/17	10:20	Sine Z	17/9/18	10:20	
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	Page ___ of ___
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	Nº: T 050546

APPENDIX C

Photographs of Pavement Distress

Photograph 1: Minor coarse aggregate loss and random crack near Winston Churchill Boulevard.

Photograph 2: Moderate longitudinal crack segregating and coarse aggregate loss.

Photograph 3: Distortion from frost heaving and localized patching.

Photograph 4: Severe distortion from frost heaving near BH2.

Photograph 5: Distortion from frost heaving near BH4.

Photograph 6: Longitudinal and transverse cracks near BH1.

Photograph 7: Random Minor Crack at west end of Sheridan Park Drive.

Photograph 8: Transverse and longitudinal crack near BH3 at west section of Sheridan Park Drive.

Photograph 9: Slight longitudinal and transverse crack near BH5 on Speakman Drive.

Photograph 10: Cracks along curbline near BH15.

Photograph 11: Wheel track crack at north and longitudinal crack along curbline near BH15.

Photograph 12: Crack along curbline near BH17.

Photograph 13: Coarse aggregate loss, moderate longitudinal cracking.

Photograph 14: Minor coarse aggregate loss and longitudinal crack along curbline near BH18.

APPENDIX D

Engineered Fill

ENGINEERED FILL

The information presented in this appendix is intended for general guidance only. Site specific conditions and prevailing weather may require modification of compaction standards, backfill type or procedures. Each site must be discussed, and procedures agreed with Peto MacCallum Ltd. prior to the start of the earthworks and must be subject to ongoing review during construction. This appendix is not intended to apply to embankments. Steeply sloping ravine residential lots require special consideration.

For fill to be classified as engineered fill suitable for supporting structural loads, a number of conditions must be satisfied, including but not necessarily limited to the following:

1. Purpose

The site specific purpose of the engineered fill must be recognized. In advance of construction, all parties should discuss the project and its requirements and agree on an appropriate set of standards and procedures.

2. Minimum Extent

The engineered fill envelope must extend beyond the footprint of the structure to be supported. The minimum extent of the envelope should be defined from a geotechnical perspective by:

- at founding level, extend a minimum 1.0 m beyond the outer edge of the foundations, greater if adequate layout has not yet been completed as noted below; and
- extend downward and outward at a slope no greater than 45° to meet the subgrade

All fill within the envelope established above must meet the requirements of engineered fill in order to support the structure safely. Other considerations such as survey control, or construction methods may require an envelope that is larger, as noted in the following sections.

Once the minimum envelope has been established, structures must not be moved or extended without consultation with Peto MacCallum Ltd. Similarly, Peto MacCallum Ltd. should be consulted prior to any excavation within the minimum envelope.

3. Survey Control

Accurate survey control is essential to the success of an engineered fill project. The boundaries of the engineered fill must be laid out by a surveyor in consultation with engineering staff from Peto MacCallum Ltd. Careful consideration of the maximum building envelope is required.

During construction it is necessary to have a qualified surveyor provide total station control on the three dimensional extent of filling.

4. Subsurface Preparation

Prior to placement of fill, the subgrade must be prepared to the satisfaction of Peto MacCallum Ltd. All deleterious material must be removed and in some cases, excavation of native mineral soils may be required.

Particular attention must be paid to wet subgrades and possible additional measures required to achieve sufficient compaction. Where fill is placed against a slope, benching may be necessary and natural drainage paths must not be blocked.

5. Suitable Fill Materials

All material to be used as fill must be approved by Peto MacCallum Ltd. Such approval will be influenced by many factors and must be site and project specific. External fill sources must be sampled, tested and approved prior to material being hauled to site.

6. Test Section

In advance of the start of construction of the engineered fill pad, the Contractor should conduct a test section. The compaction criterion will be assessed in consultation with Peto MacCallum Ltd. for the various fill material types using different lift thicknesses and number of passes for the compaction equipment proposed by the Contractor.

Additional test sections may be required throughout the course of the project to reflect changes in fill sources, natural moisture content of the material and weather conditions.

The Contractor should be particularly aware of changes in the moisture content of fill material. Site review by Peto MacCallum Ltd. is required to ensure the desired lift thickness is maintained and that each lift is systematically compacted, tested and approved before a subsequent lift is commenced.

7. Inspection and Testing

Uniform, thorough compaction is crucial to the performance of the engineered fill and the supported structure. Hence, all subgrade preparation, filling and compacting must be carried out under the full time inspection by Peto MacCallum Ltd.

All founding surfaces for all buildings and residential dwellings or any part thereof (including but not limited to footings and floor slabs) on structural fill or native soils must be inspected and approved by PML engineering personnel prior to placement of the base/subbase granular material and/or concrete. The purpose of the inspection is to ensure the subgrade soils are capable of supporting the building/house foundation and floor slab loads and to confirm the building/house envelope does not extend beyond the limits of any structural fill pads.

8. Protection of Fill

Fill is generally more susceptible to the effects of weather than natural soil. Fill placed and approved to the level at which structural support is required must be protected from excessive wetting, drying, erosion or freezing. Where adequate protection has not been provided, it may be necessary to provide deeper footings or to strip and recompact some of the fill.

9. Construction Delay Time Considerations

The integrity of the fill pad can deteriorate due to the harsh effects of our Canadian weather. Hence, particular care must be taken if the fill pad is constructed over a long time period.

It is necessary therefore, that all fill sources are tested to ensure the material compactability prior to the soil arriving at site. When there has been a lengthy delay between construction periods of the fill pad, it is necessary to conduct subgrade proof rolling, test pits or boreholes to verify the adequacy of the exposed subgrade to accept new fill material.

When the fill pad will be constructed over a lengthy period of time, a field survey should be completed at the end of each construction season to verify the areal extent and the level at which the compacted fill has been brought up to, tested and approved.

In the following spring, subexcavation may be necessary if the fill pad has been softened attributable to ponded surface water or freeze/thaw cycles.

A new survey is required at the beginning of the next construction season to verify that random dumping and/or spreading of fill has not been carried out at the site.

10. Approved Fill Pad Surveillance

It should be appreciated that once the fill pad has been brought to final grade and documented by field survey, there must be ongoing surveillance to ensure that the integrity of the fill pad is not threatened.

Grading operations adjacent to fill pads can often take place several months or years after completion of the fill pad.

It is imperative that all site management and supervision staff, the staff of Contractors and earthwork operators be fully aware of the boundaries of all approved engineered fill pads.

Excavation into an approved engineered fill pad should never be contemplated without the full knowledge, approval and documentation by the geotechnical consultant.

If the fill pad is knowingly built several years in advance of ultimate construction, the areal limits of the fill pad should be substantially overbuilt laterally to allow for changes in possible structure location and elevation and other earthwork operations and competing interests on the site. The overbuilt distance required is project and/or site specified.

Iron bars should be placed at the corner/intermediate points of the fill pad as a permanent record of the approved limits of the work for record keeping purposes.

11. Unusual Working Conditions

Construction of fill pads may at times take place at night and/or during periods of freezing weather conditions because of the requirements of the project schedule. It should be appreciated therefore, that both situations present more difficult working conditions. The Owner, Contractor, Design Consultant and Geotechnical Engineer must be willing to work together to revise site construction procedures, enhance field testing and surveillance, and incorporate design modifications as necessary to suit site conditions.

When working at night there must be sufficient artificial light to properly illuminate the fill pad and borrow areas.

Placement of material to form an engineered fill pad during winter and freezing temperatures has its own special conditions that must be addressed. It is imperative that each day prior to placement of new fill, the exposed subgrade must be inspected and any overnight snow or frozen material removed. Particular attention should be given to the borrow source inspection to ensure only nonfrozen fill is brought to the site.

The Contractor must continually assess the work program and have the necessary spreading and compacting equipment to ensure that densification of the fill material takes place in a minimum amount of time. Changes may be required to the spreading methods, lift thickness, and compaction techniques to ensure the desired compaction is achieved uniformly throughout each fill lift.

The Contractor should adequately protect the subgrade at the end of each shift to minimize frost penetration overnight. Since water cannot be added to the fill material to facilitate compaction, it is imperative that densification of the fill be achieved by additional compaction effort and an appropriate reduced lift thickness. Once the fill pad has been completed, it must be properly protected from freezing temperatures and ponding of water during the spring thaw period.

If the pad is unusually thick or if the fill thickness varies dramatically across the width or length of the fill pad, Peto MacCallum Ltd. should be consulted for additional recommendations. In this case, alternative special provisions may be recommended, such as providing a surcharge preload for a limited time or increase the degree of compaction of the fill.

Appendix Q

Preliminary Cost Estimate

Sheridan Park Drive Municipal Class Environmental Assessment
Preliminary Cost Estimate

Table 1: Roadway Construction

Item	Description	Quantity	Unit	Unit Price	Amount
1	**General**				
1.01	Mobilization and Demobilization	1	LS	$10,000.00	$ 10,000.00
1.02	Provide All Required Traffic Control Devices, Flagmen, Delineators, Signage, Miscellaneous Pedestrian / Vehicular Signage, Pavement Markings, and all Other Required Materials Throughout te Entire Duration of the Construction Phase	1	LS	$10,000.00	$ 10,000.00
1.03	Erosion and Sediment Control	1	LS	$2,000.00	$ 2,000.00
1.04	Provide Dust Suppression	1	LS	$2,000.00	$ 2,000.00
1.05	Construction Layout including Locates	1	LS	$5,000.00	$ 5,000.00
1.06	Coordination with Miway for Bus Stop Relocation	1	LS	$1,000.00	$ 1,000.00
1.07	As-built Drawings	1	LS	$3,000.00	$ 3,000.00
	Subtotal Item 1				**$33,000.00**
2	**Removals**				
2.01	Removed existing trees	114	each	$200.00	$23,000.00
2.02	Remove traffic signals and handholes	1	LS	$10,000.00	$10,000.00
2.03	Remove street lighting	8	each	$500.00	$4,000.00
2.04	Removal and Disposal Existing Pavement	5429	sq. m	$10.00	$54,000.00
2.05	Topsoil Stripping / Excavation and Disposal Off-Site	12000	cu. m	$25.00	$300,000.00
2.06	Removal and Disposal of existing Concrete Curbs	1012	m	$10.00	$10,000.00
2.07	Removal of Catchbasins	6	each	$600.00	$4,000.00
2.08	Removal and Disposal of Concrete Sidewalk	793	sq. m	$15.00	$12,000.00
	Subtotal Item 2				**$417,000.00**

Sheridan Park Drive Municipal Class Environmental Assessment
Preliminary Cost Estimate

Table 1: Roadway Construction

Item	Description	Quantity	Unit	Unit Price	Amount
3	**Road**				
3.01	Hot mix HL3 friction course asphalt 40mm compacted thickness	1360	t	$100.00	$136,000.00
3.02	Hot mix HL8 friction course asphalt 100mm compacted thickness	3399	t	$90.00	$306,000.00
3.03	OPSS Granular 'A' 200mm compacted thickness	7167	t	$22.50	$161,000.00
3.04	OPSS Granular 'B' 400mm compacted thickness	11946	t	$20.00	$239,000.00
3.05	Tack Coat	13875	sq. m	$1.00	$14,000.00
3.06	150mm Subdrains in filter sock	2800	m	$50.00	$140,000.00
3.07	Concrete Sidewalk including base	1157	sq. m	$70.00	$81,000.00
3.08	Concrete Island Pad	1455	sq. m	$80.00	$116,000.00
3.09	Supply and Install Concrete Curb and Gutter, All Types	3941	m	$50.00	$197,000.00
3.10	Concrete Bus Pad	1	each	$2,500.00	$3,000.00
3.11	Pavement Markings	1	LS	$10,000.00	$10,000.00
3.12	Supply and install tactile warning strips	1	LS	$9,000.00	$9,000.00
3.13	Relocation of existing utilities	1	LS	$50,000.00	$50,000.00
	Subtotal Item 3				**$1,462,000.00**
4	**Storm**				
4.01	Catch basins	9	ea	$2,500.00	$23,000.00
4.02	Maintenance hole catch basins	4	ea	$4,500.00	$18,000.00
4.03	Head wall	2	ea	$6,000.00	$12,000.00
4.04	Catch basin lead	42	m	$425.00	$18,000.00
4.05	Box culvert	20	m	$1,000.00	$20,000.00
4.06	100mm dia. subdrain pipe	18	m	$200.00	$4,000.00
4.07	300mm dia. storm sewer	237	m	$500.00	$119,000.00
	Subtotal Item 4				**$214,000.00**

Sheridan Park Drive Municipal Class Environmental Assessment
Preliminary Cost Estimate

Table 1: Roadway Construction

Item	Description	Quantity	Unit	Unit Price	Amount
5	**Streetscaping**				
5.01	Top Soil	4453	m2	$8.00	$36,000.00
5.02	Top Soil and Hydroseed	4926	m2	$5.00	$25,000.00
	Subtotal Item 5				**$61,000.00**
6	**Electrical**				
6.01	Modification to traffic signals	1	LS	$50,000.00	$50,000.00
6.02	Concrete poles	26	ea	$2,400.00	$62,000.00
6.03	LED luminaires	29	ea	$900.00	$26,000.00
6.04	Mast arm	26	ea	$325.00	$8,000.00
6.05	Streetlighting wiring	4500	m	$10.00	$45,000.00
	Subtotal Item 6				**$141,000.00**
	Total Items 1 - 6				**$2,328,000.00**

R.J. Burnside & Associates Limited