

Appendix A

High-level Traffic Impact Assessment Technical Memorandum





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Project name:

Region of Peel - Snow Storage Sites Analysis and
Conceptual Design

Project ref:

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Memo

Subject: High-Level Traffic Assessment for Snow Storage Sites in Peel Region

Introduction

AECOM has been retained by the Region of Peel (“The Region”) to conduct a preliminary high-level traffic impact assessment to support the development of the Environmental Assessment (EA) of five (5) shortlisted snow storage sites from an initial nine proposed sites distributed across the Region. As part of the Region’s winter road maintenance operations, the proposed Snow Removal Sites will operate as snow disposal facilities to store and manage the snowmelt. This proposed development aims to manage the level of service of the roads and active transportation network in the Region, keeping roads clear of snow during the winter months to ensure a reliable and safe transportation network.

The traffic impact assessment and site access review were performed independently of the other sites at each location. This analysis aims to identify high-level improvements to mitigate potential impacts at intersections within the vicinity of the snow storage sites. Traffic operations and geometric characteristics at these locations were reviewed at the traffic intersection and roadway access/egress points.

In June 2023, an additional site located at 7120 Hurontario Street (“New Site”) and one (1) intersection within its vicinity was requested by the Region to be investigated. The following report contains the findings from the supplemental work.

Study Area

The study area comprises five (5) sites distanced at a minimum of approximately 6 km apart in Peel Region municipalities of Caledon and Brampton, and a sixth (6th) additional site located in the City of Mississauga. The extent of the analysis at each site includes the immediate roadway access to the site and the site key intersection(s).

Existing site usage is summarized in **Table 1**, which provides a basic description of the site in its current state and notable on-site activities. The sites have been grouped into the following categories based on the facilities’ primary activity: Transportation, Water & Wastewater, Recreation, and Office.

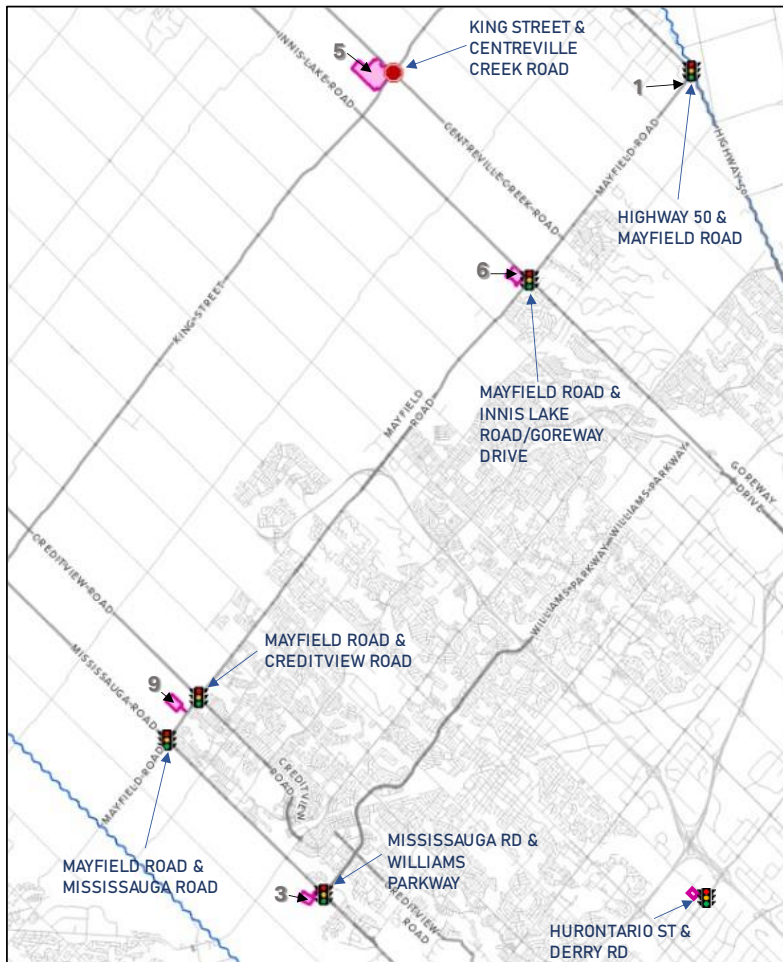
Table 1: Existing Site Usage

Type	No.	Site	Existing Site Usage
Transportation	1	Highway 50 Carpool Lot	Site 1 currently serves as a 24/7 commuter lot for carpooling and GO Bus Stop Park 'N Ride. Cars can park for free, there is also an on-site passenger pick-up/drop-off location. The bus stop is located south of the site and is serviced by the Bolton GO bus route to and from Malton GO Station.
Water & Wastewater	3	West Brampton Reservoir and Pumping Station	Site 3 is a lake-based water transmission facility part of the central trunk system providing direct supply to the local water distribution system.
	6	Tullamore Reservoir and Pumping Station	Site 6 is a lake-based water transmission facility part of the east trunk system providing direct supply to the local water distribution system. The Caledon Water Station is a water refilling stop located in the private roadway loop north of the site.
	9	Alloa Reservoir and Pumping Station	Site 9 is a lake-based water transmission facility part of the west trunk system providing direct supply to the local water distribution system.
Recreation	5	Johnston Sports Park	Site 5 is a community recreational outdoor field in the Town of Caledon. Accessible parking is located near the roadway entrance at King Street.
Office	New	7120 Hurontario Street	The study site is at the regional government office of the Region of Peel. There is a large parking lot to the west of the office building and vacant land parcels to the north, east, and west of the site.

Each site has current usage that generates site traffic from employees and/or visitors. These traffic streams could potentially conflict with on-site and off-site snow removal trucks. To reduce potential conflicts, snow operations are assumed to occur at night. Additional storage lanes or separate site access may be required to accommodate the snow removal truck traffic.

Presented in **Figure 1** is the distribution of the potential snow storage sites and the key intersections throughout the Peel Region.

Figure 1: Study Area - Sites and Key Intersections



PEEL REGION





DIAGRAMS NOT TO SCALE

STUDY AREA

TRAFFIC INTERSECTION CONTROL

-  STOP-CONTROLLED
-  SIGNALIZED

BOUNDARY

-  SNOW STORAGE SITE
-  SNOW STORAGE SITE

Existing Conditions

Evaluation of the snow removal truck impacts on the transportation network requires understanding the existing conditions at each site location. This includes activities maintained on-site and near the site, an inventory of traffic control, intersection geometry, active transportation, transit services, and traffic volume. The information documented in this section will be used to identify potential conflicts with other streams of traffic (such as pedestrians or existing site traffic).

Existing Road Network

Roadways within the study area fall within the jurisdiction of the Region. A description of each proposed snow storage site and their immediate roadways and key intersections are provided below, where road network and lane configurations are illustrated in **Figure 2**.

Site 1 - Highway 50 Carpool Lot

The Highway 50 and Mayfield Road intersection is the only intersection in the road network that is analyzed at the Highway 50 Carpool Lot. This intersection is located near the municipal boundary of Caledon and Brampton and the regional boundary of Peel and York. The nearest site access is approximately 120m from the intersection along Highway 50. Crosswalks are provided on all four approaches at the intersection.

Highway 50 is a north-south arterial road with posted speed limits of 60 km/hr and 70 km/hr north and south of the municipal boundary between Caledon and Brampton, respectively. This road also forms the east municipal boundary of Brampton. There is no existing infrastructure for active transportation along the road segment within the localized study area.

Mayfield Road is an east-west main arterial road with a posted speed limit of 60 km/hr. At this site, Mayfield Road terminates at the intersection and continues as Albion Vaughan road east of Highway 50. There is no existing infrastructure for active transportation along the road segment within the localized study area. Only the Malton Go and Bolton Go buses use Mayfield Road to service the bus stop *Mayfield Road at Highway 50 Park and Ride*.

Site 3 - West Brampton Reservoir and Pumping Station

The Mississauga Road and Williams Parkway is a T-intersection and is the only intersection in the road network that is analyzed at the *West Brampton Reservoir and Pumping Station*. This intersection is located within the City of Brampton. The nearest site access is approximately 198m from the intersection along Mississauga Road. Crosswalks are provided on all three (3) of the traffic approaches.

Mississauga Road is a north-south arterial road with a posted speed limit of 70 km/h. Paved sidewalks are provided on both sides of the road north of Williams Parkway. South of Williams Parkway, the sidewalks are paved on the right side of the road for the northbound traffic. The sidewalk is unpaved on the right side of the road for southbound traffic.

Williams Parkway is an arterial road with a posted speed limit of 60 km/h along this segment. Paved sidewalks are provided on both sides of the road.

Site 5 - Johnston Sports Park

King Street and Centreville Creek Road is the only intersection in the road network that is analyzed at *Johnston Sports Park*. This intersection is located within the Town of Caledon. The nearest site access is approximately 100m from the intersection along Centreville Creek Road. There are no existing crosswalks at the intersection.

King Street is an east-west arterial road with a posted speed limit of 80 km/h and 70 km/h east and west of Centreville Creek Road. There are no sidewalks and the shoulders of the road are unpaved.

Centreville Creek Road is a collector road with a posted speed limit of 60 km/h and 80 km/h north and south of King Street. There are no sidewalks and the shoulders of the road are unpaved.

Site 6 - Tullamore Reservoir and Pumping Station

Mayfield Road and Goreway Drive is the only intersection in the road network that is analyzed at the *Tullamore Reservoir and Pumping Station*. This intersection is located along the municipal boundary shared by the City of Brampton and the Town of Caledon. The nearest site access is approximately 252 m from the intersection along Innis Lake Road. The existing crosswalks at this intersection are unmarked.

Mayfield Road is an east-west arterial road with a posted speed limit of 60 km/h and 80 km/h east and west of Innis Lake Road/Goreway Drive, respectively. There are paved sidewalks near the intersection. The sidewalks transition to unpaved roadway shoulders with distance from the intersection.

Innis Lake Road is a north-south collector road that transitions to Goreway Drive, an arterial road south of the municipal boundary between Caledon and Brampton. The posted speed limits are 80 km/h and 70 km/h north and south of Mayfield Road, respectively. The sidewalks are unpaved north of Mayfield Road but are continuously paved on both sides of the road south of Mayfield Road.

Site 9 - Alloo Reservoir and Pumping Station

The road network at the *Alloo Reservoir and Pumping Station* consists of the intersections Mississauga Road and Mayfield Road (located approximately 865m from the nearest existing site access along Mayfield Road) and Creditview Road and Mayfield Road (located approximately 506m from the nearest existing site access along Mayfield Road). Both intersections are located along the municipal boundary shared by the City of Brampton and the Town of Caledon. Crosswalks are provided on all four (4) approaches at both intersections.

Mississauga Road is a north-south collector road that transitions to an arterial road south of the municipal boundary between Caledon and Brampton. The posted speed limits are 60 km/hr and 80 km/hr north and south of Mayfield Road, respectively. There are no sidewalks and the shoulders of the road are unpaved.

Creditview Road is a north-south collector road that transitions to an arterial road south of the municipal boundary between Caledon and Brampton. This road has a speed limit of 60 km/hr. Sidewalks are provided on both sides of the road south of Mayfield Road. There are no sidewalks north of Mayfield Road and the shoulders of the road are paved.

Mayfield Road is an east-west arterial road with a posted speed limit of 80 km/h west of Mississauga Road and east of Creditview Road. The roadway between Mississauga Road and Creditview Road has a posted speed limit of 60 km/h. There are no sidewalks and the shoulders of the road are paved.

New Site – 7120 Hurontario Street

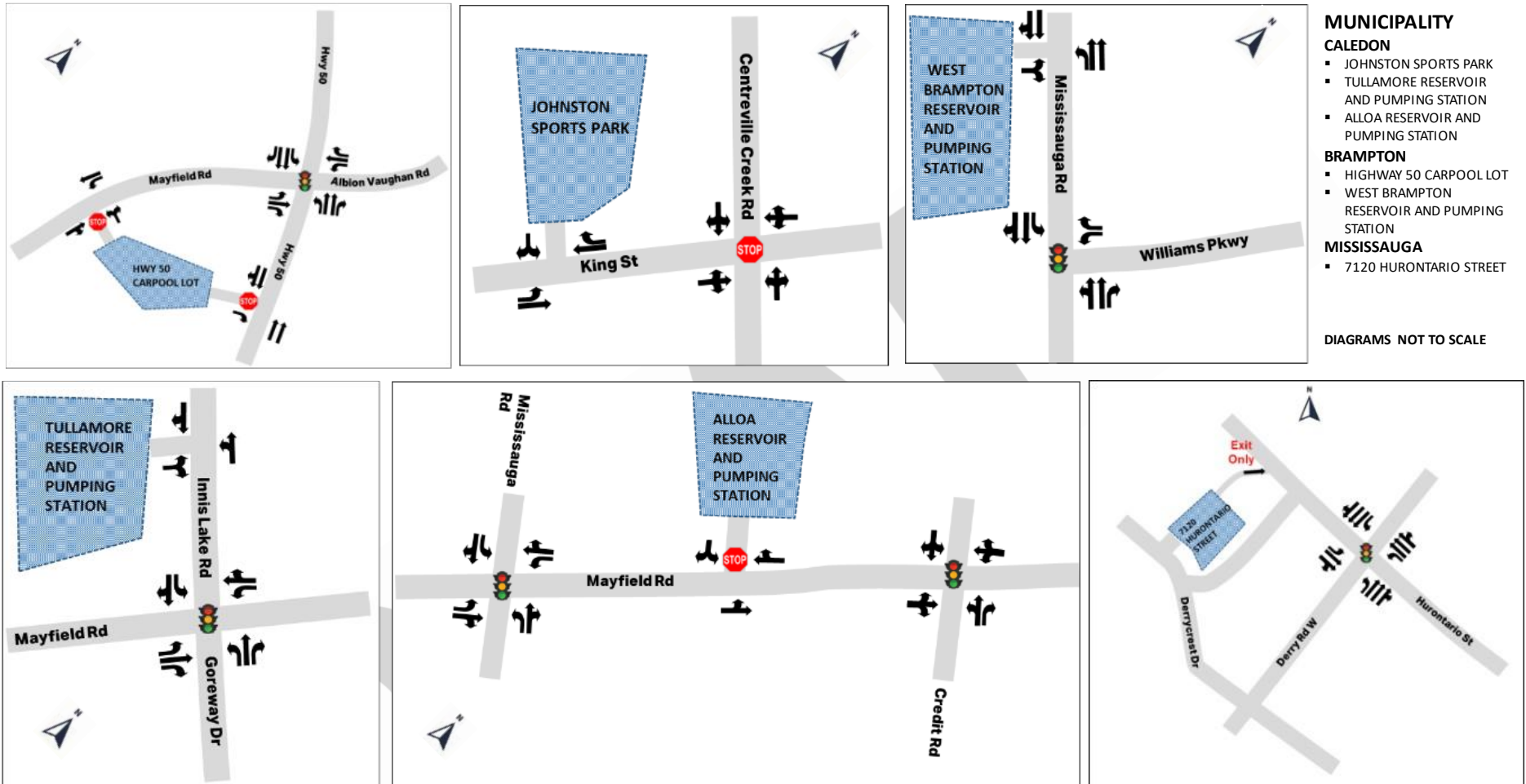
7120 Hurontario Street is located in the City of Mississauga, south of Highway 407 and just west of Hurontario Street. Hurontario Street and Derry Road is the major intersection analyzed at this site. The site has two possible access points, at Kingsway Drive located about 185 meters north of the intersection and at Derrycrest Drive located about 320 meters west of the intersection. Crosswalks are provided on all four (4) approaches at both intersections.

Hurontario Street is a north-south arterial road and the site of the ongoing Hazel McCallion Light Rail Transit (LRT) construction. Due to construction, there are ongoing lane reductions for each direction and the current posted speed limit is adjusted to 50 km/hr. Prior to construction, Hurontario Street had a speed limit of 80 km/hr. Paved sidewalks are provided on both sides of the road.

Derry Road, or Peel Regional Road 5, is a regional arterial road running east-west across the Region of Peel. It has a posted speed limits of 70 km/h and sidewalks on both sides of the road.

The local road lane configurations at all six (6) snow storage sites are summarized in **Figure 2**, showing the number of lanes and lane groups at the key traffic intersection(s) and site access/egress locations.

Figure 2: Road Network Lane Configurations



* Note that due to ongoing construction on Hurontario Street, the lane configuration and speed limit is taken as of November 2020 (before construction began) and shown in the figure and used for the analysis.

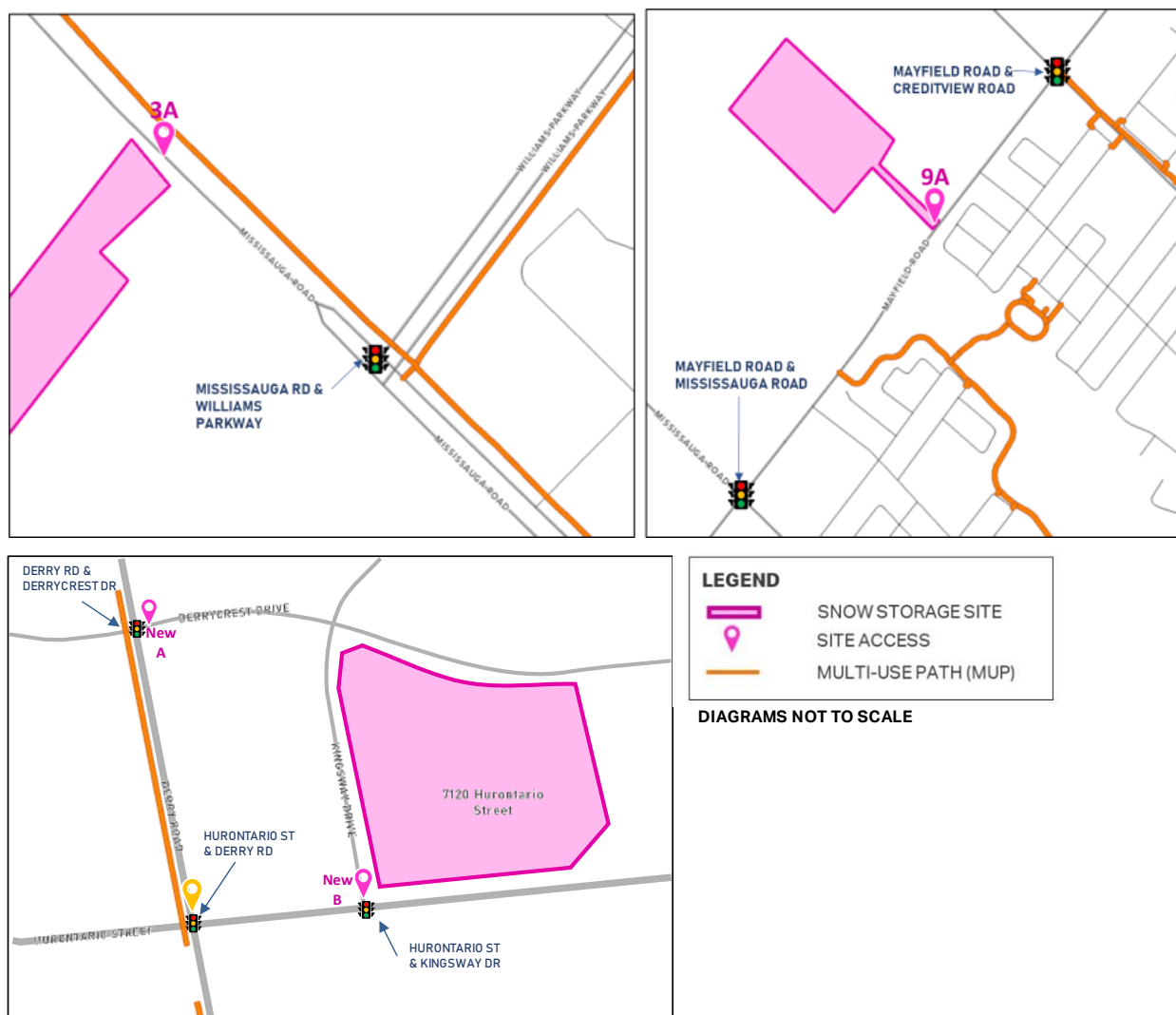
Active Transportation

Few pedestrian and bicycle facilities are provided within the vicinity of the sites. Most sites are in rural settings near the municipal boundaries of Brampton or beyond the urban boundary (Site 5 - Johnston Sports Park). Only multi-use paths (MUP) were provided near the key intersections and access/egress points at Site 3 and 9. Crosswalks are provided at the intersections of *Mississauga & William Parkway*, *Mayfield & Creditview Road*, and *Mayfield & Highway 50*. Note that future condition MUPs have not been considered in this study.

Figure 3 shows all the MUPs within the vicinity of the study areas. At Site 3, MUP is provided along the shoulder of the northbound traffic. Paved sidewalks are provided on both sides of Mississauga Road at the bus stops near the intersection at Williams Parkway. There are no paved sidewalks along the access/egress point on Mayfield Road at Site 9; however, a MUP is provided along the shoulder of Creditview Road in the direction of northbound traffic, which terminates at the Mayfield & Creditview Road intersection.

For the new site at 7120 Hurontario Street, paved sidewalks are provided on both Hurontario Street and Derry Road. Additionally, there is a small stretch of multi-use paths (MUP) on Derry Road, to the east and west of Hurontario Street. Hurontario Street does not have any existing cycling facilities. However, the City of Mississauga Cycling Master Plan indicates plans to deliver a cycle track/separated bike lane on Hurontario Street between Derry Road and Britannia Road.

Figure 3: MUP Network within Study Areas



Transit Services

The Region has three public transit services operating across the municipalities: Brampton Transit, MiWay (Mississauga Transit), and the Greater Toronto and Hamilton Area (GTHA) regional GO transit. With the snow removal traffic and winter road conditions, transit operations may be hindered by the additional traffic volumes. Transit services that operate along the snow removal truck routes, routing through the key intersections and near the site access/egress points have been identified and documented in this section.

The following transit routes have been identified for each site and are summarized in **Table 2**. A brief description of transit routing through the intersections and near the site access/egress is also provided. For additional information regarding assumed site access/egress points, refer to **Appendix A**.

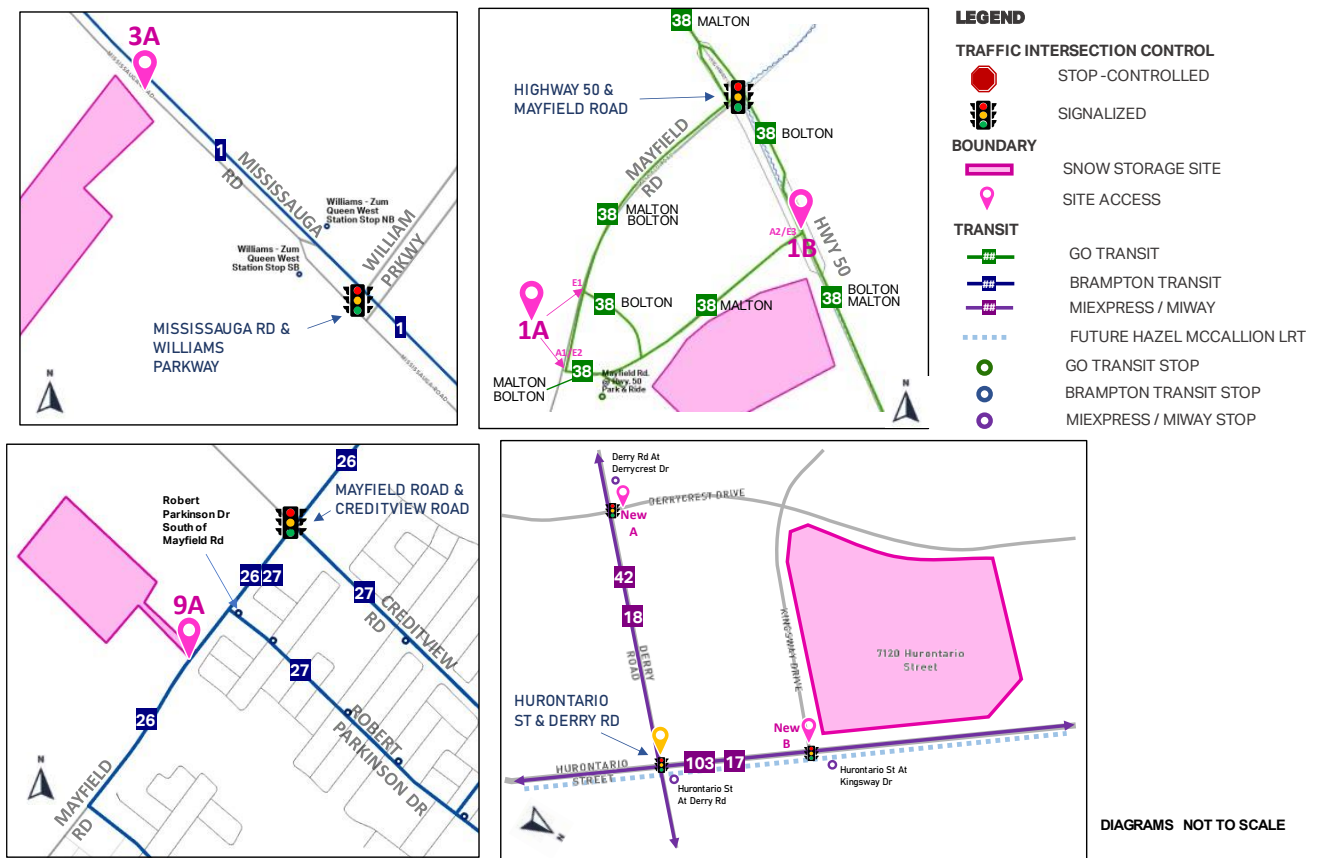
Table 2: Transit Routes along Snow Removal Truck Routes

Transit Agency	Site	Routes
GO Transit	1	<p>38 Malton (South) routes southbound along HWY 50 and turns right onto Mayfield Road and left into the Mayfield 50 commuter lot to service the <i>Mayfield Road at Hwy 50 Park & Ride</i> stop. The bus routes back onto HWY 50, exiting the facility at point 1B (refer to Appendix A) and turning right onto HWY 50 to continue southbound.</p> <p>38 Bolton (North) routes northbound along HWY 50, turning left onto Mayfield Road and left into the Mayfield 50 commuter lot to service the <i>Mayfield Road at Hwy 50 Park & Ride</i> stop. The bus then routes back onto HWY 50, exiting the facility at point 1A (refer to Appendix A), using the most north egress point, turning right onto Mayfield Road and turning left at Mayfield and HWY 50 to continue northbound.</p>
Brampton Transit	3	<p>1 Queen routes northbound and southbound along a section of Mississauga Road between Bovaird Drive West and Queen Street West for the following routes:</p> <p>Weekday Routes:</p> <ul style="list-style-type: none"> ▪ 1 Queen East and West to Flower City Community Campus (FCCC) <p>Weekend Routes:</p> <ul style="list-style-type: none"> ▪ 1 Queen East to Downtown Terminal ▪ 1 Queen East and West
	9	<p>26 Mount Pleasant (North and South) routes eastbound and westbound along Mayfield Road between Veterans Drive and Edenbrook Hill Drive.</p> <p>27 Robert Parkinson routes eastbound and westbound along a section of Mayfield Road between Robert Parkinson Drive, turning right from Mayfield Road onto Creditview Road and turning left from Creditview Road onto Mayfield Road. The buses that turn left from Mayfield Road onto Robert Parkinson do not impede eastbound and westbound through traffic on Mayfield Road as there is a left-turn storage lane provided at this intersection.</p>
MiWay	New	<p>103 MiExpress routes northbound and southbound along Hurontario Street between Trillium Health Partners Hospital and Brampton Gateway. This route has a stop on Hurontario Street at Derry Road.</p> <p>17 Hurontario routes northbound and southbound along Hurontario Street between City Centre Transit Terminal and the Hurontario/407 Park and Ride lot. This route has a stop on Hurontario Street at Derry Road and on Hurontario Street at Kingsway Drive.</p> <p>42 Derry routes eastbound and westbound along Derry Road between Westwood Square and Meadowvale Town Centre. This route has a stop on Hurontario Street at Derry Road.</p> <p>18 McLaughlin-Derry routes eastbound and westbound along Derry Road between Westwood Square and Sheridan College. This route has a stop on Hurontario Street at Derry Road.</p>

Transit Agency	Site	Routes
Metrolinx	New	The Hazel McCallion LRT , once constructed, will operate along Hurontario Street providing service between Port Credit GO Station and Brampton Gateway Terminal. A stop is currently planned at Derry Road.

The transit route interaction with key elements in the study area can be seen in **Figure 4**. The figure also depicts the segment of the transit routes that pass through the site study areas, including transit stops. Each route segment is labelled by the route number. Access/egress points are denoted by a location marker at each site and labelled alphanumerically according to the site number, and are arbitrarily assigned a letter to distinguish between multiple access/egress points. In the case of 38 Bolton and Malton, additional labelling is provided to differentiate between route segments shared with Malton or Bolton in either direction.

Figure 4: Public Transit Routes



Four (4) sites (Site 1, Site 3, Site 9, New Hurontario Site) are found to have a potential operational conflict between the snow removal trucks and public transit routes.

At Site 1, multiple streams of traffic circulate the commuter lot—public transit, cars entering/exiting the parking lot, and passenger pick-up/drop-off activity. Site circulation can be an issue if trucks, private vehicles, and buses cannot be processed fast enough to prevent off-site queues. This location would require an understanding of the site vehicle circulation and bus operations.

At Site 3, the 1 Queen transit route adds to the through volume at the intersection with no notable conflicts with the snow removal trucks. There are also two lanes provided per the direction of traffic and a bus bay at the northbound Williams ZUM Queen West Station Stop on Mississauga Road. If southbound left-turn traffic spills into the median lane north of the

intersection, the buses will not contribute to the spillover traffic since no transit routes are turning left onto William Parkway. The 1 Queen bus travelling southbound on Mississauga Road could potentially block traffic at the bus stop to board/alight passengers in the case where lanes are reduced due to on-road snow storage in the rightmost lane.

At Site 9, Mayfield Road has only one lane per direction; snow removal trucks that need to turn left at 9A could potentially delay bus 26, Mount Pleasant North. At the intersection of Mayfield Road & Creditview Road, additional green time may need to be allotted to turning movements part of the snow removal truck routes. The number of vehicles processed at the intersection may be reduced because of additional vehicles with greater lengths operating at slower speeds elongating headways at the intersection. With a greater demand for northbound left-turning traffic at Mayfield Road & Creditview Road, the northbound right-turn storage lane can be blocked, requiring the storage lane to be extended to allow vehicles to enter the lane. However, this may require the MUP to be demolished, shifted, or reduced in width.

For the new site at 7120 Hurontario Street, there are multiple routes that stop on street at Hurontario Street and Derry Road. Southbound left turning snow trucks egressing the site from Kingsway Drive may impede southbound bus routes on Hurontario Street, particularly if a build-up of queue spills over to the through lane. Southbound right turning snow trucks may be blocked by Route 42 Derry or 18 McLaughlin stopping at Hurontario Street and Derry Drive. Similarly, eastbound right turning (egress from Derrycrest Drive) and westbound right turning (access at Kingsway) snow trucks may also conflict with Route 42 or 18. Additionally, it is expected that the completion of the Hazel McCallion LRT, with a stop at Derry Road, will drive significantly more traffic, both pedestrian and vehicular modes, to the intersection. As such, a re-optimization of the signal timing and potential redesign of intersection geometry could be considered for further investigation.

Existing Traffic Volumes

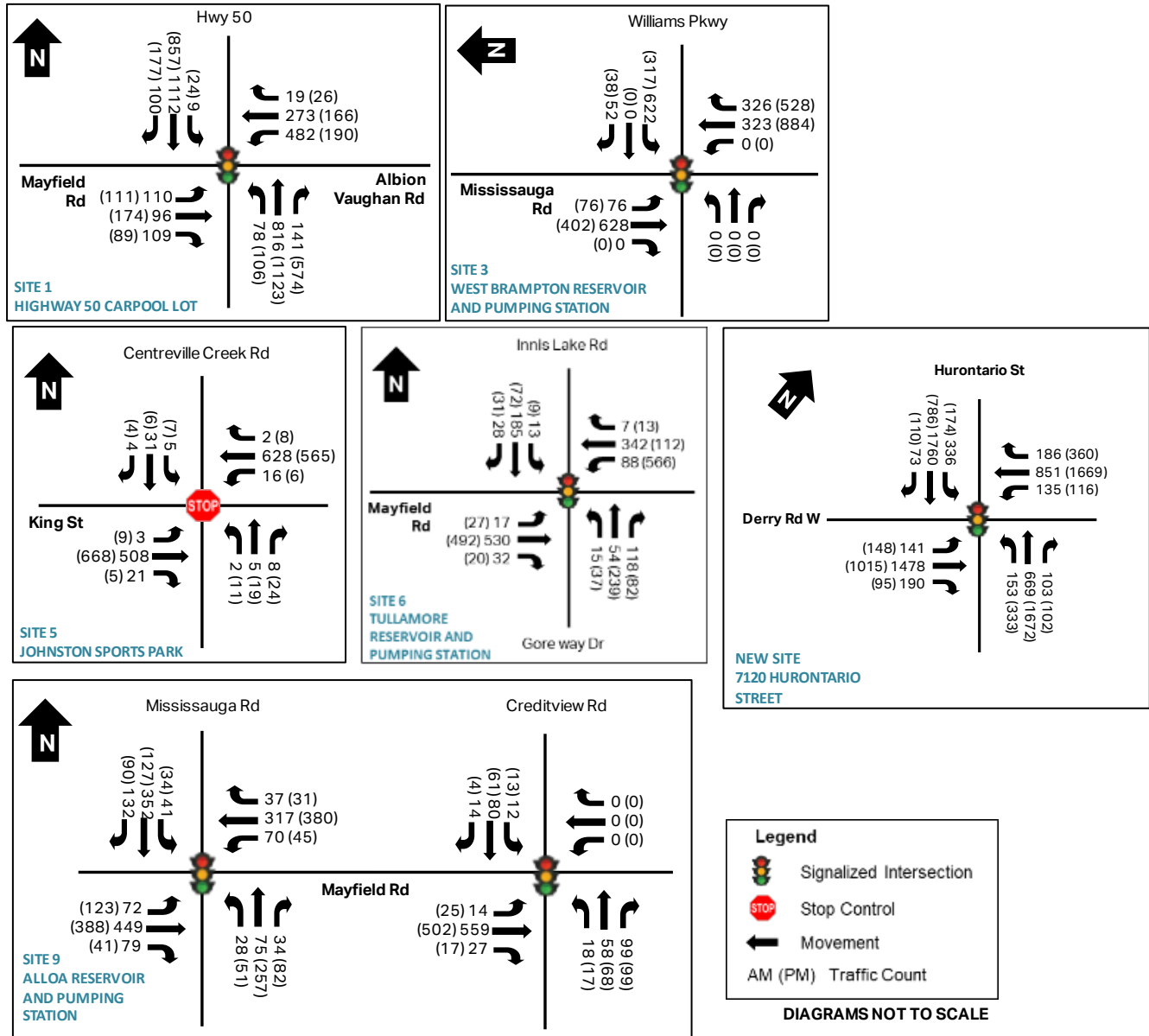
Turning movement counts (TMC) and signal timing plans (STP) for the study area intersections were provided by the Region. The STPs were generated for the year 2020 and TMCs were collected in October 2019, June 2017, and March 2018 for the AM, Midday, and PM peak periods. An inventory of TMC and STP data for each key intersection can be found in **Table 3**. Out of a collection of TMC data, the counts chosen were those that could best depict the winter conditions. In the case where there was no other option, the available counts were taken.

Table 3: TMC and STP Data Inventory

Municipality	Site	Intersection Name	Type	TMC Dates [DD-MM-YYYY]	STP Dates [DD-MM-YYYY]
Brampton	1 - Hwy 50 Carpool Lot	Highway 50 and Mayfield Road	Signalized Fully Actuated	20-03-2018	15-12-2020
	3 - West Brampton Reservoir and Pumping Station	Mississauga Road and Williams Parkway	Signalized Semi-actuated	29-06-2017	10-12-2020
Caledon	5 - Johnston Sports Park	King Street and Centreville Creek Road	Unsignalized	03-10-2019	N/A
	6 - Tullamore Reservoir and Pumping Station	Mayfield Road and Goreway Drive	Signalized Fully Actuated	02-10-2019	11-12-2020
	9 - Alloa Reservoir and Pumping Station	Mississauga Road and Mayfield Road	Signalized Fully Actuated	03-10-2019	10-12-2020
Mississauga	New Site – 7120 Hurontario Street	Mayfield Road and Creditview Road	Signalized Semi-actuated	03-10-2019	17-12-2020
		Hurontario Street and Derry Road	Signalized Semi-Actuated	18-10-2017	28-11-2022

Existing traffic volumes at the key site intersections are shown in a set of schematics in **Figure 5** for the weekday AM and PM peak hours.

Figure 5: Turning Volumes



Methodology

To assess each site and identify areas of improvement to accommodate the snow removal truck volumes, a high-level transportation analysis has been performed at the traffic intersection and the roadway used to access the sites.

The Poisson process was used to estimate the build-up-of-queue for the lane movement during the red-light indication using the hourly demand for each traffic stream—total vehicles (auto and trucks) and snow removal trucks.

Two assessments were conducted at the traffic intersection to determine if adequate storage lanes are provided and if the existing signal timings plans require adjustments to process the snow removal truck volumes.

It should be noted that traffic intersections are examined in isolation with no coordination or downstream/upstream impacts. The road geometry at the intersections and at the site access will be assessed to determine if adequate storage lanes capacities are provided to support both existing operations (such as transit services) and the snow removal operation.

An in-depth safety review of the internal circulation and access/egress points at each site could not be conducted at this stage. In lieu of developed site plans, commentary based on a broad review of aerial imagery is provided.

The assumptions used for the transportation assessments are compiled in the following section.

Assumptions

Traffic Vehicles

- Typical auto vehicles are assumed to be 4.5m in length.
- Heavy vehicles are assumed to be 12m in length.
- There was no consideration for bus transit operations.

Snow Removal Truck Fleet

- Snow removal trucks are assumed to be medium single-unit trucks with dimensions of a standard dump/haul truck with a carrying capacity of 40 tons (36287.40 kg) and 25 ft (762 cm) in length.
- All snow removal trucks are assumed to arrive at the snow storage areas at full capacity.
- The operational speed of the snow removal trucks is assumed to be 20 km/hr for left-turn movements and 15 km/hr for right-turn movements on cleared roads.

Snow Removal Operation

- The snow removal operations are assumed to occur within an 8 hour period after a snow event.
- The snow removal truck hauling material is assumed to be new uncompacted top snow with a density of 200 kg/m³.

Snow Removal Truck Routing

- Internal site circulation and site access are assumed to take the most efficient route to the snow storage area while making use of much of the existing roadways and access/egress points.
- Key intersections are assumed to be a part of the snow removal truck routing and are the start and endpoints for the assumed snow removal truck routes.

Trip Generation and Distribution

The truck trip to/from the snow storage sites is estimated based on existing snow removal operations and using a standard dump truck capacity. The Region provided snow removal volumes for five sites (separate from the proposed sites for this project). Since snow removal routes for the proposed sites are unknown at this time, for conservativeness, the maximum total snow removal volume for the existing sites was used in the calculations and applied to all proposed snow storage sites.

Snow Removal Operation

The snow removal operation for each municipality is expected to take place after a snowfall event during the nighttime hours. Within the operational time frame, the snow removal activity is assumed to be completed within the span of 8 to 16 hours. An 8 hour period was used in the calculations to generate a greater estimate of trips.

Snow Removal Volume and Truck Trips Estimation

Snow removal volumes are estimated from the Brampton snow storage site 2 Copper Road. A total volume of 37,577 m³ of snow to remove, combining primary and secondary snow removal volume, was used to determine an hourly truck volume. It is reasonable to assume that snow removal trucks are evenly distributed throughout the operational period since snow removal truck-generated trips are not influenced by the time periods in the day, and temporary snow storage locations on the side of roads are typically evenly dispersed. Since the snow removal operations occur after a snowfall event, the properties of the snow material are assumed to be uncompacted fresh-powdered top snow with a density of 200 kg/m³. The total volume is converted to kilograms using the selected snow density, yielding 7,515,400 kg of snow to be hauled within 8 hours using trucks with a capacity of 40 tons (36,287 kg). This calculation estimates that approximately 26 trips per hour will be required to achieve this operation. To be conservative, the estimated number of trips was rounded to 30 trips per hour.

Site Functional Design Review

A preliminary assessment of the snow storage sites and generated truck traffic in the surrounding area was conducted. The surrounding area includes the site, roadway to the site access, and key intersection(s). Through a review of the site locations, six (6) intersections have been identified within the vicinity of the shortlisted locations that have been reviewed at this stage. High-level improvements will be identified to mitigate potential impacts on the intersections in the vicinity of the storage sites. Additionally, this preliminary assessment identified potential safety and operational challenges that may face trucks and the general traffic in the surrounding area of the storage sites.

Snow Removal Truck Partial Routes

The full routes for the snow removal trucks were unknown when this memorandum was prepared. Presented in **Appendix A** are the assumed routes to/from each site's key intersection(s). Snow removal trucks routes are assumed to travel through the key intersections, to/from the existing site access, and take the most efficient path accessing/egressing the site. The partial routes were used to identify potential snow removal truck movements at the intersection and site access points.

Traffic Impact on Surrounding Areas

The traffic intersections and site access/egress locations were reviewed within the surrounding area for adequate storage lanes to support the snow removal operations without degrading existing traffic operations by preventing spillbacks and blocking general traffic from accessing the sites. Additionally, a review of the signal timing plan was conducted to determine if sufficient green time is allotted to process the general traffic and snow removal trucks. High-level improvements were identified to mitigate potential impacts on the intersections and site access within the vicinity of the storage sites.

It is estimated that snow removal trucks arriving at an intersection during a red-light signal are between 1 to 3 vehicles. Although it is more likely that one snow removal truck arrives at a time, it is not typical for snow removal trucks to arrive as a platoon. All site access/egress points appear visible with no significant obstructions based on aerial and street view imagery.

At the Traffic Intersections

At the intersections, most existing storage lanes were found to be adequate to accommodate the additional snow removal trucks with minor spillbacks (observed at Mississauga Road & Mayfield Road southbound left movement) that do not impede on adjacent lanes. The intersection of Highway 50 & Mayfield Road may require additional green time for the northbound left and eastbound left movements and Mayfield Road & Creditview Road westbound through and southbound right to process general traffic and the snow removal trucks. At Site 5, the key intersection of King Street & Centreville Creek Road may require a left turn lane in the north and east approach (northbound left and eastbound left) of the traffic intersection to accommodate the snow removal trucks based on the assumed routes (refer to **Appendix A**). At the new site (7120 Hurontario Street), the northbound left turn storage lane at Hurontario Street and Derry Road may be extended to reduce spillback from the additional snow removal traffic. Furthermore, additional green time is recommended to be explored for all through signal cycles.

At the Site Access

Existing storage lanes are adequate to accommodate the additional snow removal trucks at the site accesses. It is assumed that the median lane at Site 3 could be used for left-turning vehicles into the site. At this location, there are two concerns: either the median lane cannot be used for left-turning vehicles or spillbacks from the southbound left storage lane at Mississauga Road & William Parkway extend into the median lane blocking site left turning vehicles.

Site 6 and Site 9 do not have storage lanes before the site access points. At Site 6, the roadway may require widening to include a left-turn storage lane to prevent vehicles turning left into the site from blocking the road. However, since the site is rural, there may not be significant impacts on northbound traffic along Innis Lake Road. Also, there are two possible routing options at Site 6, both accessing the site via Innis Lake Road, which could increase snow dumping processes at the site if operating in parallel. Site 9 access point is along a regional road (Mayfield Road) with transit operating in both directions along the roadway to the site access point. A left turn lane may be required to prevent bus services and general traffic delays. As there is only one lane in each direction, there may be a need for road widening.

For the new site, both access points are also along an arterial or major regional road with transit operating in both directions along the roadway to the access point. Left turning lanes are provided, however, they may require extension to prevent bus services and general traffic delays.

Internal Site Circulation

In lieu of developed site plans, only commentary based on a broad review of the current condition of the proposed sites from aerial imagery can be provided when this memorandum was prepared.

Given that all sites are operating facilities, the general concern is the potential conflict between typical site traffic and the snow removal truck traffic. Snow removal truck routing to/from the site snow storage areas is currently unknown, with no roadway infrastructure provided to the snow storage areas. Existing site access/egress points are also assumed to be shared with the snow removal truck operation.

At this stage, only Site 1 has a greater likelihood of traffic conflict with the bus and private vehicles that circulate this site. The location near the bus bay and the circulation road to the proposed snow storage site and the parking lot are areas of concern. This circulation road connects to the bus bay area and Highway 50 southbound. Traffic management at this site may need to be assessed to ensure sufficient capacity to circulate vehicles at this site without generating long off-site queues.

Key Findings

For all sites, there is no identifiable conflict with pedestrians at the site access/egress points since the snow removal truck routes do not coincide with the pedestrian network. There is a potential conflict with site traffic on-site and at access/egress locations, requiring measures to separate traffic streams.

There are a number of considerations for the number and placement of site access points to the snow storage areas, including but not limited to, site geometry, site resilience, and operation needs. In general, site access point location(s) should accommodate the frequency and volume of snow trucks without impeding traffic flow, especially during peak snow removal periods. Site access points should also take into account the unique geographical characteristics of each site such as elevation changes, drainage patterns, and other environmental features to minimize disturbances to adjacent land uses and site activities. Finally, redundancy of site access points should be ensured to maintain continuous site access, particularly for emergency vehicles.

The traffic assessments' site-specific key findings are summarized below to be transferred to the Issues Maps for various sites as information is consolidated for the assessment.

Site 1 - Highway 50 Carpool Lot

- Potential conflict with the bus and private vehicles near the bus bay and the circulation road to the proposed snow storage site and the parking lot. On-site traffic management may need to be considered.
- There is more than one access/egress point where vehicles can access/egress the site using either Mayfield Road or southbound Highway 50.
- Potentially a high truck volume area at the traffic intersection of Mayfield Road & Highway 50.
- There is limited space for pedestrians waiting to cross the Mayfield Road & Highway 50 intersection.
- Additional green time for the northbound left and eastbound left movements at Highway 50 & Mayfield Road may be required.

Site 3 - West Brampton Reservoir and Pumping Station

- Potential conflict with transit route in the southbound direction of Mississauga Road in the event of reduced lanes.
- If the median lane on Mississauga Road can be used for left turning vehicles, spillbacks from the southbound left storage lane at Mississauga Road & William Parkway could extend into the median lane, blocking site left turning vehicles.

Site 5 - Johnston Sports Park

- King Street & Centreville Creek Road may require a left turn lane in the north and east approach (northbound left and eastbound left) of the traffic intersection to accommodate the snow removal trucks.

Site 6 - Tullamore Reservoir and Pumping Station

- Potential widening of Innis Lake Road to include a left turn storage lane for left-turning vehicles into the site to prevent blocking northbound traffic.
- Two possible routing options via Innis Lake Road to the site snow storage area. This could increase snow dumping processes at the site if operating in parallel. The route to access the site snow storage area using the private road loop is separate from the site access/egress used by the existing site traffic.
- There is limited space for pedestrians waiting to cross the Mayfield Road & Goreway Drive intersection.

Site 9 - Alloa Reservoir and Pumping Station

- Potential widening of Mayfield Road to include a left turn storage lane for vehicles turning left into the site to prevent blocking eastbound traffic.

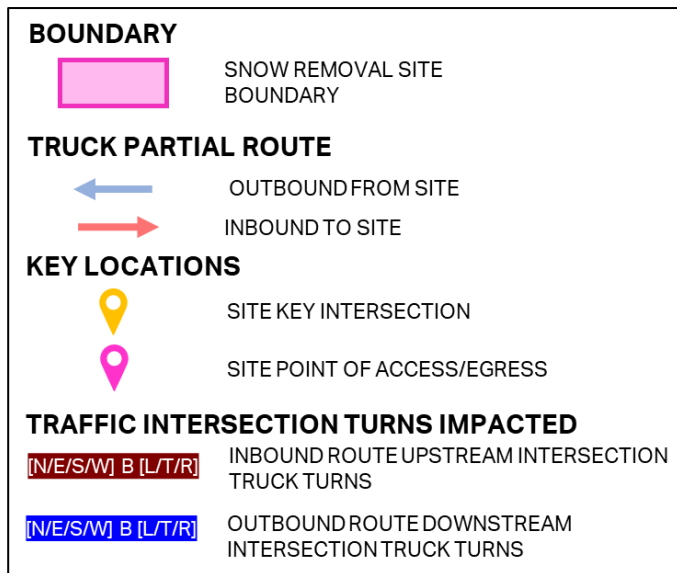
New Site – 7120 Hurontario Street

- Increase the left turn storage lane length in the northbound direction at Hurontario Street and Derry Road to minimize potential blocking of the northbound through traffic.
- Additional green time may be needed for the southbound left turn and all through traffic approaches.
- There are two possible routing options via Hurontario Street to the site snow storage area (i.e., from Kingsway Drive and Derrycrest Drive). This could increase snow dumping processes at the site if operating in parallel.
- Increased pedestrian and vehicular traffic are anticipated with the completion of the Hazel McCallion LRT and the City of Mississauga's future cycling network. Additional and more granular traffic impact studies are recommended once traffic volumes from new infrastructure reaches equilibrium.

Appendix A – Partial Truck Routes to and from the Key Intersection(s)

Appendix A documents the assumed truck routes between the key intersection(s) and the site. The diagrams depict the inbound routes from the key intersection to the site access points, and the potential outbound route turns at the traffic intersection. Below in **Figure 6** is a diagram key representing the routing elements in the diagrams. These diagrams show the relationship between the turning movements at the key intersections and the snow removal site. Turning movements labelled for each route are movements where truck volumes are expected to increase with the site-generated snow trucks.

Figure 6: Partial Route Map Key

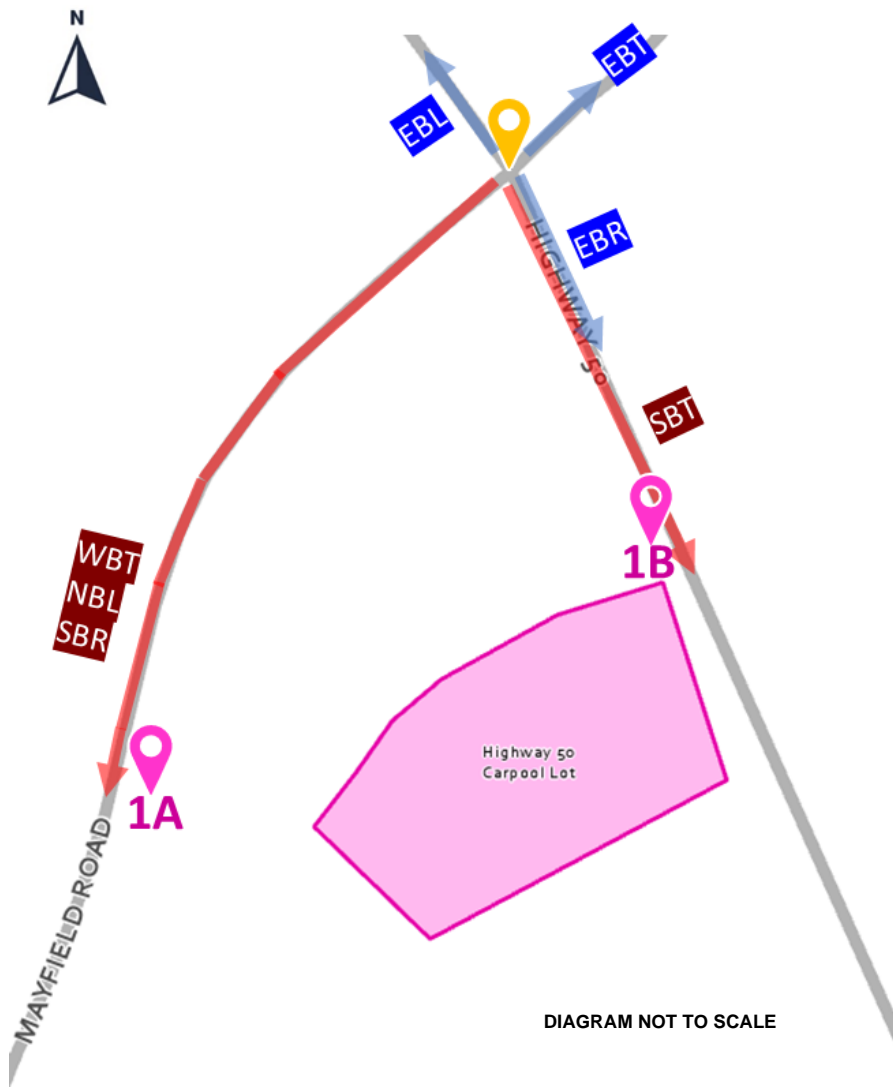


Snow removal truck routings, both inbound and outbound, at each snow storage site are described below.

Site 1 - Highway 50 Carpool Lot

The Highway 50 Carpool Lot has two points of access and egress where trucks routing from the intersection of Highway 50 & Mayfield Road can access the site from Mayfield Road at location 1A or continue south along Highway 50 and turn right at location 1B as shown in **Figure 7**. Due to the physical barrier along Highway 50, trucks travelling in the northbound direction along Highway 50 will need to turn left at Highway 50 & Mayfield Road and access the site at 1A. Trucks can egress at locations 1A and 1B; however, trucks egressing at location 1B are restricted to only trucks travelling southbound on Highway 50.

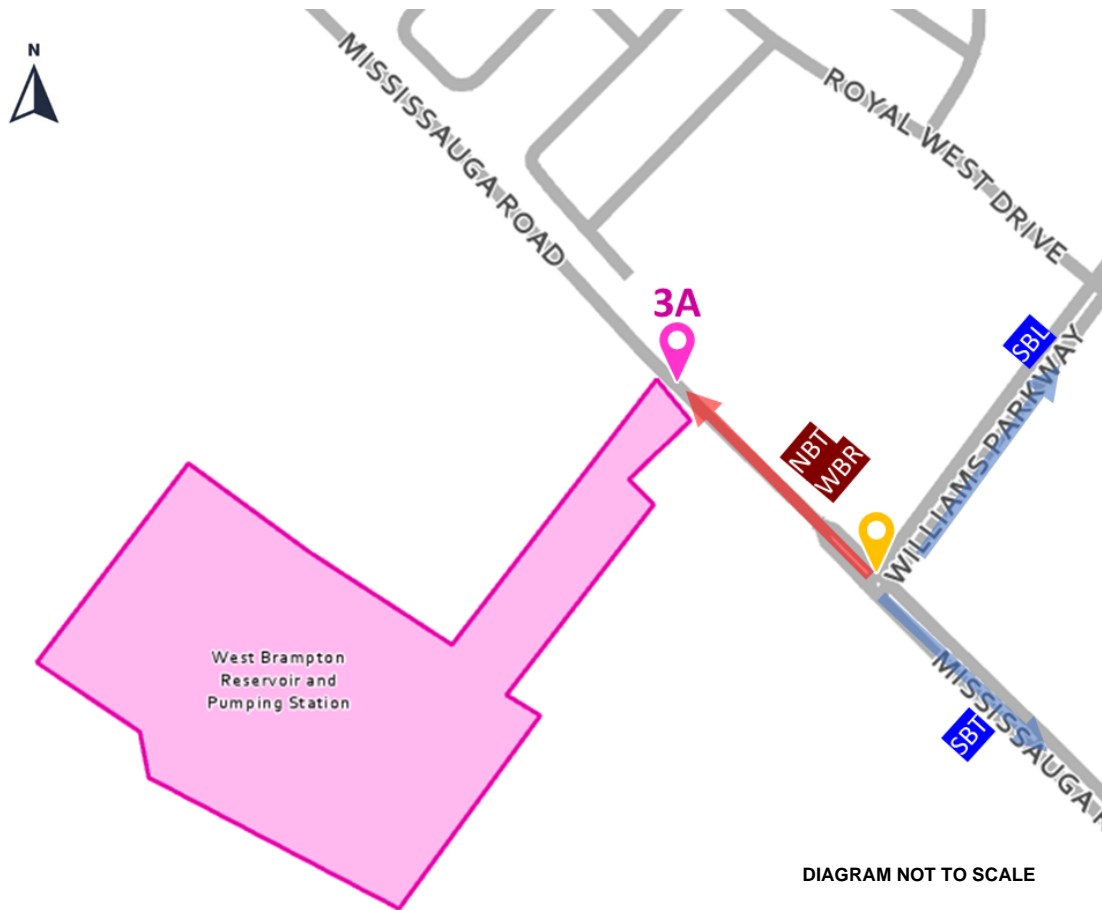
Figure 7: Site 1 - Highway 50 Carpool Lot Truck Partial Route(s)



Site 3 - West Brampton Reservoir and Pumping Station

West Brampton reservoir and pumping station have a single site access/egress located on Mississauga road North of the intersection at Williams Parkway at location 3A, as shown in **Figure 8**. Truck routing inbound to the site from Mississauga Road & Williams Parkway is assumed to travel northbound on Mississauga Road and turn left into the site from the median lane. Outbound trucks are assumed to turn left or continue southbound at Mississauga Road & Williams Parkway.

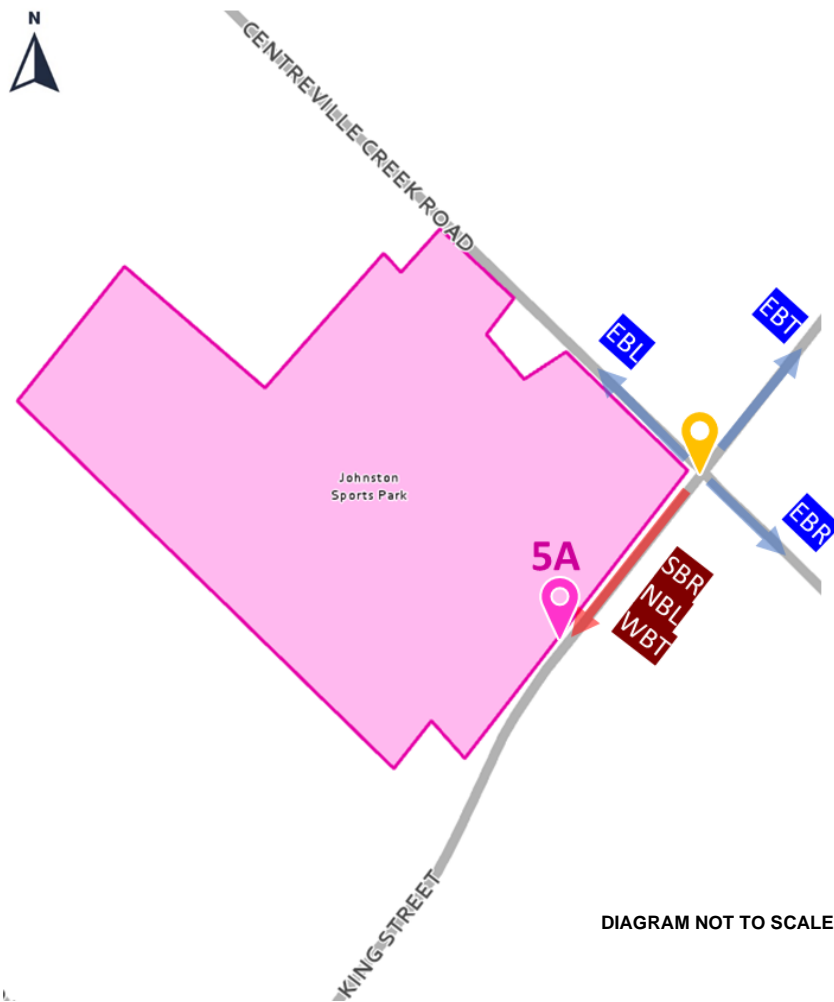
Figure 8: Site 3 – West Brampton Reservoir and Pumping Station Truck Partial Route(s)



Site 5 – Johnston Sports Park

The Johnston Sports Park site has a single point of access/egress located on King Street west of the intersection of King Street & Centreville Creek Road at location 5A, as shown in **Figure 9**. Inbound routes from King Street & Centreville Creek Road are assumed to travel westbound and turn right into the site at location 5A. Outbound trucks routed towards King Street & Centreville Creek Road are assumed to make all turns in the eastbound approach.

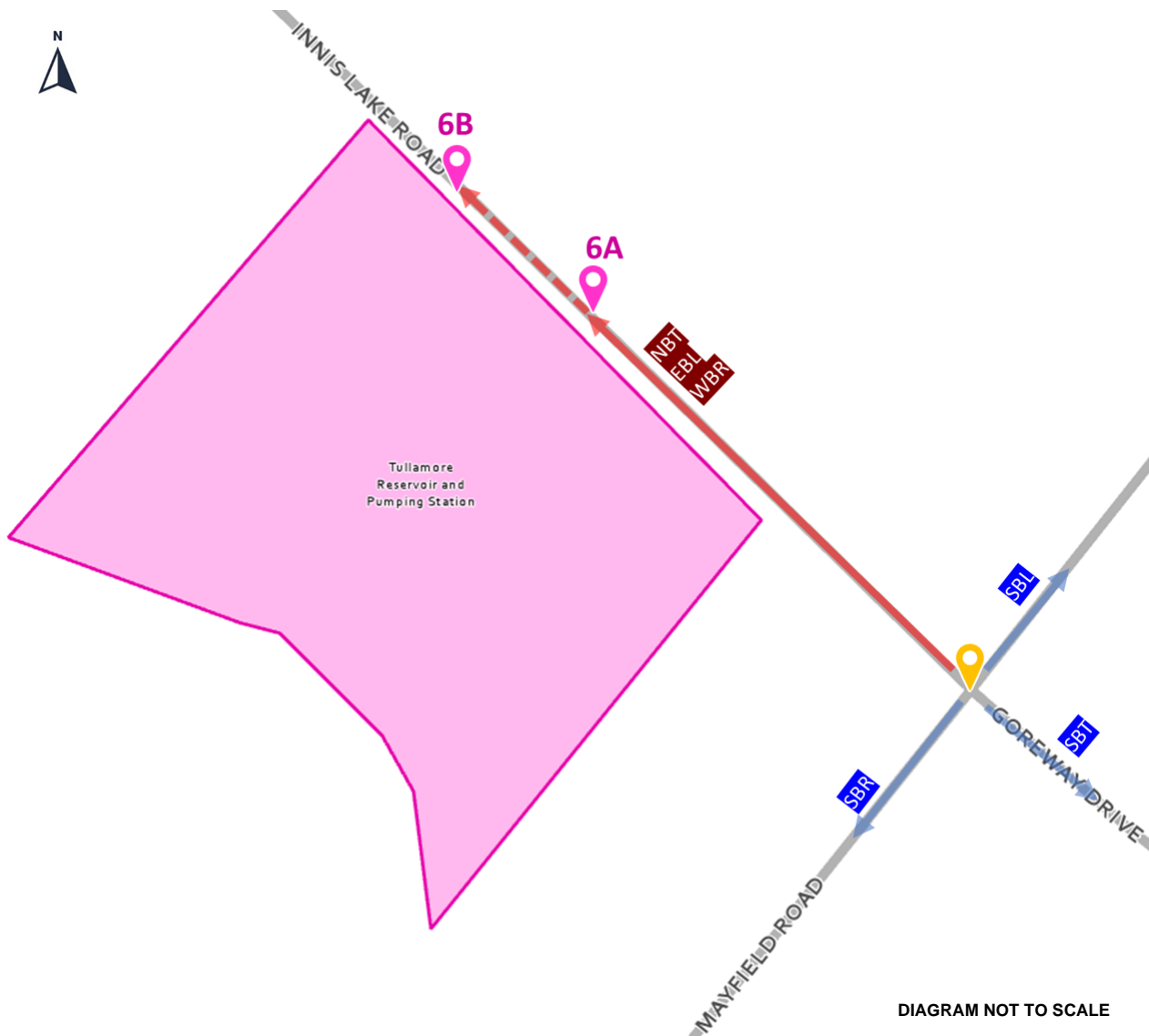
Figure 9: Site 5 – Johnston Sports Park Truck Partial Route(s)



Site 6 - Tullamore Reservoir and Pumping Station

The Tullamore Reservoir and Pumping Station site has two points of access/egress located on Innis Lake Road, North of the intersection of Mayfield Road & Goreway Drive at locations 6A and 6B, as well as shown in **Figure 10**. Inbound routes from Mayfield Road & Goreway Drive are assumed to travel northbound along Innis Lake Road and turn left into the site at locations 6A or 6B. Outbound trucks routed towards Mayfield Road & Goreway Drive are assumed to make all turns in the southbound approach.

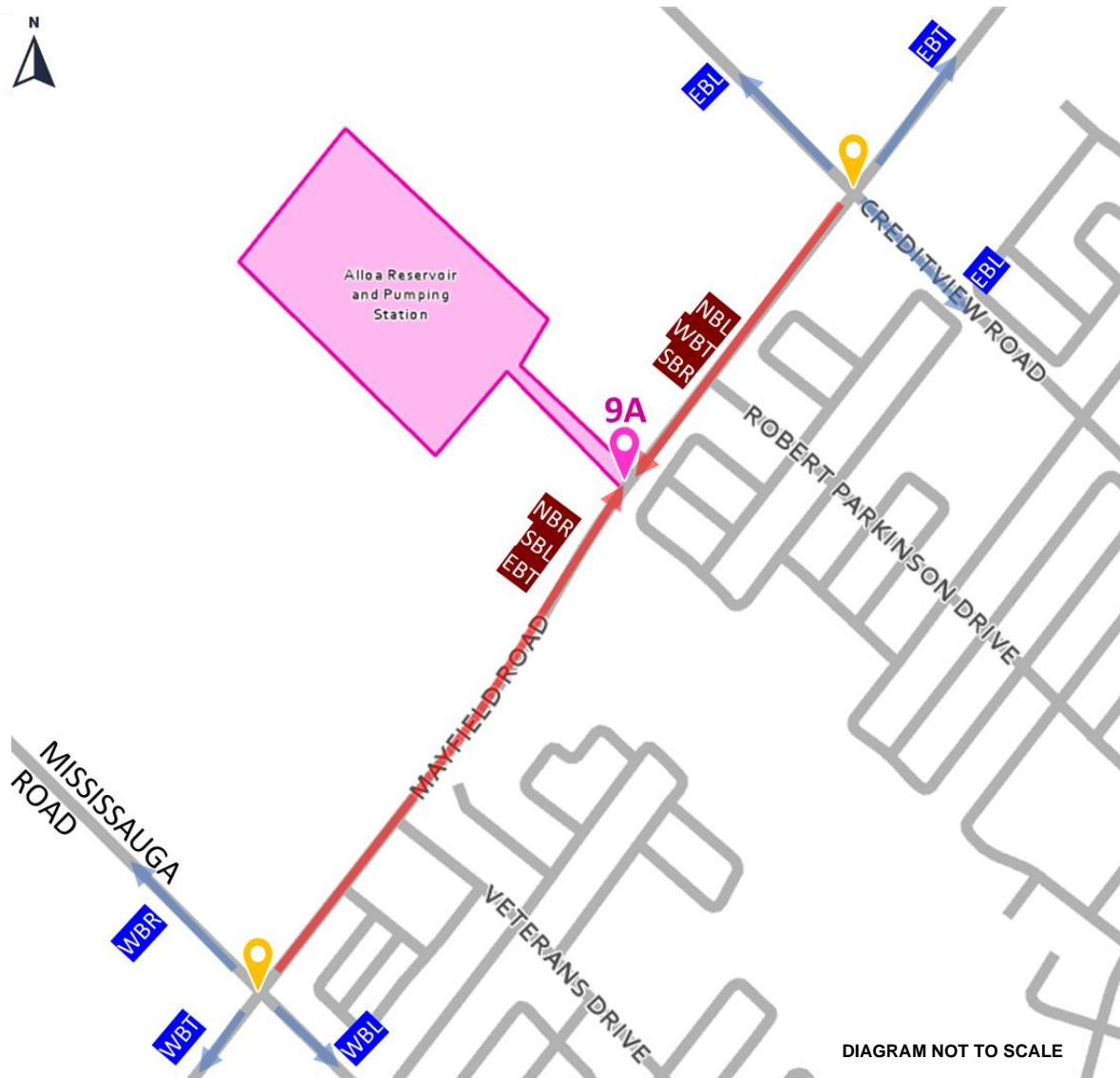
Figure 10: Site 6 – Tullamore Reservoir and Pumping Station Truck Partial Route(s)



Site 9 - Alloo Reservoir and Pumping Station

The Alloo Reservoir and Pumping Station site has a single point of access/egress located on Mayfield Road east of the intersection of Mayfield & Mississauga Road and west of the intersection of Mayfield & Creditview Road at location 9A, as shown in **Figure 11**. Inbound routes are assumed to come from the east from Mayfield & Creditview Road, turning left into the site and from the west from Mayfield & Creditview Road, turning right into the site at location 9A. Outbound trucks route eastbound and westbound are assumed to make all turns in the eastbound approach at Mayfield & Creditview Road and the westbound approach at Mayfield & Mississauga Road.

Figure 11: Site 9 – Alloo Reservoir and Pumping Station Truck Partial Route(s)



New Site – 7120 Hurontario Street

The 7120 Hurontario Street site has two points of access and egress where snow trucks routing from the intersection of Hurontario Street & Derry Road can access the site: turning right at Derrycrest Drive shown by location 'New A' or turning left at Kingsway Drive shown by location 'New B.' Snow trucks can also egress the site at both locations A and B. Outbound trucks are assumed to only route through Hurontario Street & Derry Road in the eastbound and southbound direction. The routing described above is illustrated in **Figure 12**.

Figure 12: New Site - 7120 Hurontario Partial Snow Truck Route(s)

