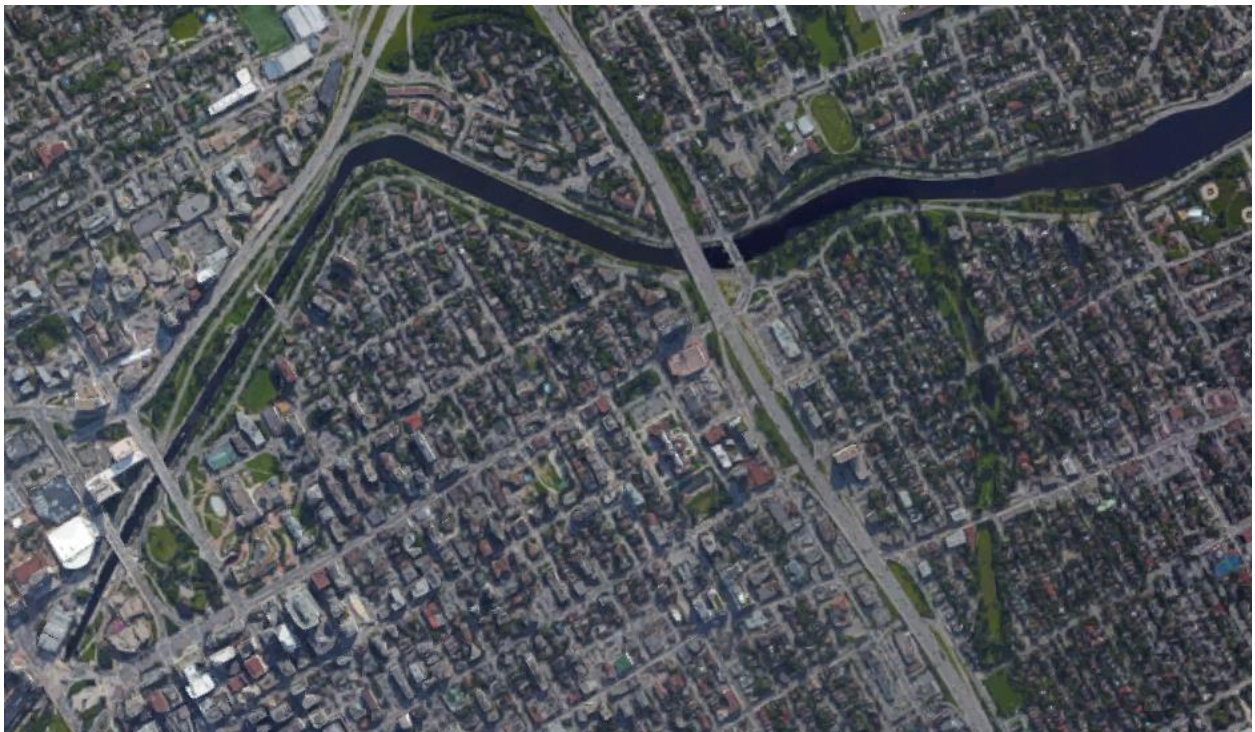


REPORT NO. 18M-00789-00

Rideau Canal Walls Rehabilitation Project

Transportation Management Plan

May 2018



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APPENDICES

Appendix A – Downtown Area Site Conceptual Staging Drawings

Appendix B – Clegg Street Area Site Conceptual Staging Drawings

Appendix C – Echo Drive Area Site Conceptual Staging Drawings

Appendix D – Multi-use Path Detour Route Drawings

Appendix E – Colonel By Drive / Main Street Synchro Results

Appendix F – Known Events on Colonel By Drive

1 INTRODUCTION

Public Service and Procurement Canada (PSPC) on behalf of Parks Canada Agency is carrying out the design and contract package preparation for the rehabilitation of the Rideau Canal Walls on the East Bank at three (3) Area Sites as shown in **Figure 1**.



Figure 1. Key Map

The **Downtown Area Site** is located along the Rideau Canal from the Plaza Bridge (Wellington Street) at the top of Lock 8 and south to approximately 50m south of the Corktown Bridge. All canal wall construction works within this Area will be located along the East Bank with a full closure of the canal bed. At this time, the construction timeframe is unknown. The Downtown Area Site is further discussed in **Section 6**.

The **Clegg Street Area Site** is located along the Rideau Canal from Herridge Street south to Clegg Street. All canal wall construction work will be located along the East Bank with a partial closure of the canal bed. The rehabilitation work will be impeded by a Hydro trunk line in the work area and Hydro Ottawa has restricted daylighting of the trunk line to 20m at a time. PSPC estimates that each 20m section will involve 40 days of work which impacts the length of time for the rehabilitation to be completed. Construction is expected to begin in Fall 2018 and continue until July 2020; approximately 21 months. The construction activities at the Clegg Street Area Site are expected to be carried out concurrently with the Echo Drive Area Site, but tendered as a separate contract. This Area Site is further discussed in **Section 7**.

The **Echo Drive Area Site** is located along the Rideau Canal from the NCC canal access north of the Conchord Skateway Stairs south to Main Street. The rehabilitation work will be located along the East Bank with a partial closure of the canal bed. The rehabilitation is to commence in Fall 2018 and is expected to take thirteen months to get to Substantial Performance with the final surface restoration in the Spring of 2020. The construction activities at the Echo Drive Area Site will be carried out concurrently with the Clegg Street Area Site. The Echo Drive Area Site is further discussed in **Section 8**.

The expected construction timelines for the three Area Sites are shown in **Figure 2**.

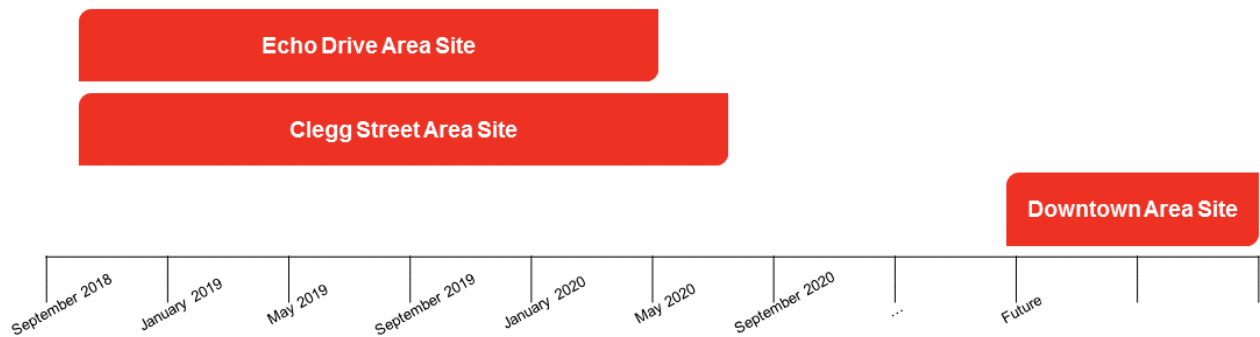


Figure 2. Canal Wall Rehabilitation Timeline by Area Site

PSPC requested the assistance of WSP Canada Group Ltd to confirm the traffic staging design requirements for the above noted rehabilitations, analyze the traffic of the resulting traffic staging and/or detours to provide guidance into the timing restrictions for lane closures, assess the impacts for other modes (i.e. pedestrians, cyclists, skaters) and prepare a Transportation Management Plan (TMP) to provide guidance to the Contractor. This TMP is based on pre-design information for the Area Sites shown in **Figure 1**.

The TMP provides guidance for the Contractor related to the traffic management, incident management and public information requirements needed prior to and during the construction process. The Contractor will be required to submit their own TMP to the City of Ottawa when applying for a road cut permit.

Proposed detour routes, timing for lane closures, staging requirements and special provisions have been developed in accordance with the Ontario Traffic Manual (OTM) Book 7 - Temporary Conditions and the Ontario Occupational Health and Safety Act, R.S.O. 1990.

The report will focus on the following traffic and incident management components:

- ▶ Construction Staging
- ▶ Traffic Control Plan
- ▶ Pedestrian and Cycling Access Plan
- ▶ Work Zone Approach Plan
- ▶ Communication Plan
- ▶ Incident Management Plan

2 COORDINATION WITH OTHER PROJECTS

There are three known City of Ottawa projects that will require coordination between PSPC and the City of Ottawa for the duration of this assignment. They include the Clegg Street Pedestrian Bridge project, the Elgin Street Renewal project, and the Greenfield/Main/Hawthorne Renewal project.

The ongoing **Clegg Street Pedestrian Bridge** construction will require coordination with the Clegg Street Area Site project. The Pedestrian Bridge Contract allows PSPC to take over the site to complete the Canal Walls Rehabilitation between October 2018 and April 2019. The Pedestrian Bridge Contractor is expecting to regain access to the site in Spring 2019 to complete landscaping and reinstatement requirements. With the anticipated Canal Wall construction continuing past Spring 2019, the ability of the Pedestrian Bridge Contractor to reinstate the landscaping and complete their Contract will be impacted. Coordination between PSPC and the City of Ottawa will be required for overlap with contracts.

The **Elgin Street Renewal** project will require coordination with both the Clegg Street and Echo Drive Area Sites. The Elgin Street Renewal project is a coordinated road, sewer, and water infrastructure renewal project between Gloucester Street and Isabella Street. The construction schedule indicates that there will be a full closure of Elgin Street from January 2019 through December 2019 with periodic road and lane closures in 2020. The closure of Elgin Street will impact traffic operations along Colonel By Drive during the canal wall rehabilitation. More information on the project can be found at the project website: <https://ottawa.ca/en/elgin-street-renewal>

The **Greenfield Road / Main Street / Hawthorne Avenue Renewal** is a coordinated road, sewer, and water infrastructure project that will require coordination with the Clegg Street Area Site. The City of Ottawa has indicated that the reconstruction work is expected to occur in 2020-2021. Road and lane restrictions on these roads could impact the traffic operations along Colonel By Drive at Clegg Street.

3 TIMING OF PHYSICAL MODIFICATIONS

All physical modifications required for the Multi-Use Path detours are to be constructed and available a minimum of two weeks before the detour is put into operation.

4 TRAFFIC CONTROL MEASURES

4.1 Lane Closure Timing Restrictions

The Contractor will be permitted to use lane reductions in order to improve access to work areas and increase productivity. Peak hours are 7:30am-9:00am and 3:00pm-6:00pm. Restrictions on lane closures have been identified in consultation with the Project Stakeholders (Parks Canada, PSPC, NCC, and the City of Ottawa) and include:

- ▶ Lane reductions are only permitted during weekday off-peak times between 9:00am and 3:00pm
- ▶ Closure of both lanes of traffic (8-12 hours) would be permitted with 2 weeks notice assuming no conflict with special events, see **Appendix F**. Full closures would be restricted to weekends outside of peak hours.
- ▶ Intermittent single lane closures exceeding 30 seconds during peak hours are not permitted
- ▶ A southbound left turn restriction from Colonel By Drive onto Main Street is permitted outside of peak hours during the Mobilization and Demobilization stages of the Echo Drive Area Site construction

The Contractor will be required to implement temporary conditions signing on this project in accordance with OTM Book 7 Temporary Layout 20A (Lane Closed, Traffic Control Persons, Two Lane, Short Duration). All signage will be provided in French and English.

4.2 Event Coordination

NCC hosts a number of events each year along Colonel By Drive that will require a complete stop of construction activities. The general list is shown in the following table and the detailed date list for 2018 is provided in **Appendix F**. It will be the responsibility of the Contractor to confirm the complete list of events and annual dates. The events that traditionally use the Rideau Canal Eastern Pathway have been identified in **Table 1**. Consultation with the event organizers will be needed to determine if the Multi-Use Path detour route is appropriate for the event.

Table 1. Annual Events Impacting Construction Activities

Annual Timing	Event Name	Segment	Area Site(s) Impacted
April	RCS Chalet Removal	Bronson to Hog's Back Road	N/A
	Our dreams matter	Pathway Corktown Bridge to Bank	Echo Drive, Clegg Street
	Alive to Strive	Hawthorne to Hog's Back Road	Clegg Street
May	CN cycle	Daly to Hog's Back Road	Downtown, Echo Drive, Clegg Street
	Steps for Life	Pathway - Laurier to Pretoria	Downtown, Echo Drive
	Tulip festival - fireworks	Bronson to Hog's Back Road	N/A
	Sporting Life	Pretoria to Hog's Back Road	Clegg Street
	Early Bird Triathlon	Clegg to Hog's Back Road	Clegg Street

Annual Timing	Event Name	Segment	Area Site(s) Impacted
	Ottawa Race Weekend	Daly to Pretoria	Downtown, Echo Drive
Sundays	Sunday Bikeday (Victoria Day to Labour Day)	Laurier to Hog's Back Road	Downtown, Echo Drive, Clegg Street
June	Ride for Dad	Daly to Hog's Back Road	Downtown, Echo Drive, Clegg Street
	World Partnership Walk	Pathway -Laurier to Daly	Downtown
July	National Capital Triathlon and Duathlon	Clegg to Hog's Back Road	Clegg Street
September	Canadian Triathlon and Duathlon	Daly to Hog's Back Road	Downtown, Echo Drive, Clegg Street
	Terry Fox Run	Pretoria and Hog's Back Road	Clegg Street
	Army run	Rideau to Hawthorne	Downtown, Echo Drive
	Hike for CHEO	Pathway Bank and Hog's Back Road	N/A
	Ottawa Fire Service Relay	Pathway Fifth to Hawthorne	Clegg Street
	Terry Fox- St Pius	Pathway Heron to Hog's Back Road	N/A
	National Peace Officer Memorial Run and Ride	Pretoria to Bronson	Clegg Street
October	Harvest Run	Pathway Clegg to Hog's Back Road	Clegg Street
November	RCS Chalet install	Bronson to Hog's Back Road Concord/Daly/Hawthorne/ NAC	N/A Downtown, Echo Drive

4.3 Posted Speed

As has been done with previous contracts, PSPC and the NCC will obtain a regulatory speed reduction through the Echo Drive and Clegg Street Area Site work zones which will reduce the speed limit from 60km/h to 40km/h.

5 CONSTRUCTION STAGES FOR ALL SITES

PSPC provided the location of all areas requiring wall rehabilitation work for each Area Site. Construction methods for completing the Work will be determined by the Contractor. It is anticipated that all construction will be undertaken on the canal bed; this includes storage of vehicles and materials (with the exception of fuel) and material delivery activities. Based on anticipated construction methods, two suggested traffic staging designs have been developed for each Area Site: a Mobilization / Demobilization stage and a Construction stage.

Mobilization / Demobilization Stage: This stage includes the mobilization of the contractor's workforce and equipment necessary for performing the work required under the contract. The activities impacting traffic operations include the construction of work area access points and large equipment delivery. The demobilization includes the deconstruction of the work area access points and reinstatement of the area to original conditions.

Construction Stage: This stage includes the Contractor undertaking the work required under the Contract to rehabilitate the Rideau Canal walls.

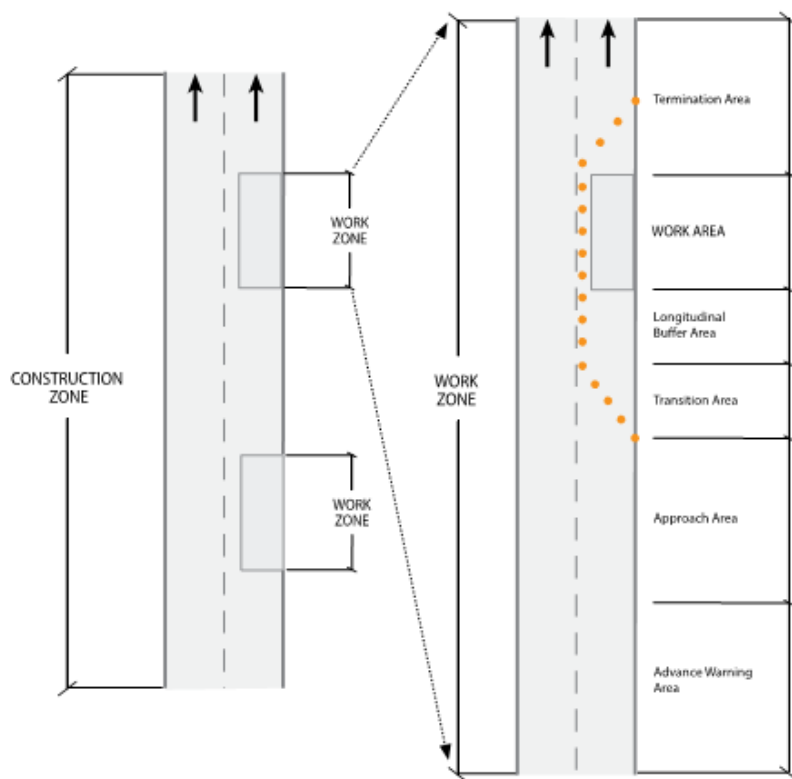


Figure 3. Construction Zone Component Areas (Source: OTM Book 7)

The Ontario Traffic Manual Book 7 (Temporary Conditions) identifies the component areas of a construction zone as shown in **Figure 3**. The three component areas frequently referenced in this TMP include:

- ▶ A *construction zone* encompasses the full length of the project and may have one or more work zones.
- ▶ A *work zone* is an area where traffic control devices have been set up to guide road users through a temporary situation.
- ▶ The *work area* is where the work takes place and/or equipment and material are stored.

6 DOWNTOWN AREA SITE TRANSPORTATION MANAGEMENT PLAN

The **Downtown Area Site** extends along the Rideau Canal from Plaza Bridge (Wellington Street) at the top of Lock 8 to approximately 50m south of the Corktown Bridge as shown in **Figure 4**. The construction work areas are to be located along the East Bank with an anticipated full closure of the canal for winter work. Construction dates are unknown at this time.

There is one proposed vehicle access to the work area from Colonel By Drive. It is located south of Laurier Avenue and will provide right-in / right-out access to the work area. There is an existing median at the proposed location that will provide access control. The location of the access point is shown on the conceptual construction staging drawings provided in **Appendix A**.

The work area is expected to be completely contained within the canal bed. Based on the available space within the canal bed, anticipated construction methods, and PSPCs previous rehabilitation experience, there should be no requirement for the Construction Stage work area to encroach on Colonel By Drive. However, with work being completed on the canal walls, the Rideau Canal Eastern Pathway will be unavailable along the entire work area.

PSPC noted that previous contracts have had 15-20 registered staff vehicles on site. At the Downtown Area Site staff parking could be accommodated on the canal bed. However, there is off-site parking available for use in the neighbouring communities.

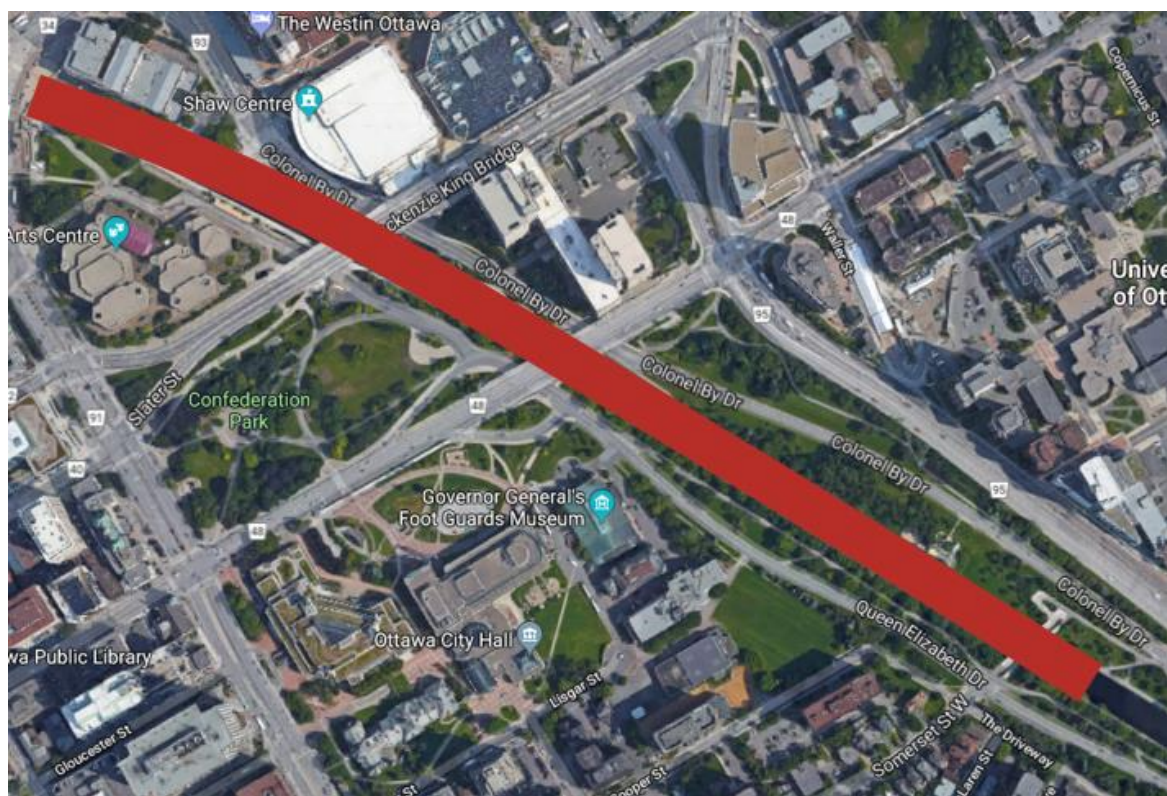


Figure 4. Downtown Area Site

6.1 Staging

As indicated in **Section 5**, the typical construction stages for the Downtown Area Site are for the mobilization / demobilization and construction. A description of the site-specific staging plans are provided below and the conceptual construction staging plans are provided in **Appendix A**.

Mobilization / Demobilization Stage: During the Mobilization / Demobilization stages it is expected that all lane closures will be Short Duration Work following the lane restriction requirements in **Section 4.1**. A single lane closure in the southbound lane will be required in accordance with OTM Book 7 for Short Duration Work (Temporary Layout-20A), to allow the Contractor to construct and deconstruct their site access. A single lane will be maintained with traffic operations controlled by Traffic Control Persons (TCPs).

The work area will be protected from traffic using Flexible Drums as specified in the contract. Flexible Drums will provide the Contractor with greater flexibility and access to the work area during off-peak periods by shifting the drums as required within the allowable times specified in the contract.

Construction Stage: During the Construction Stage it is anticipated that all Work will be accommodated within the work area outside the curb of the road requiring no lane closures or additional traffic control beyond signage, such as Temporary Construction Barriers or Flexible Drums. As a result, there is no impact to lane widths or traffic operations through this Area Site. The access location will be signed in accordance with OTM Book 7 requirements.

6.2 Traffic Analysis

PSPC indicated that the peak trip generation during construction is 15 trucks per day and would occur during the concrete pour activity. An additional 15-20 staff vehicles could access the site daily if staff parking is provided on the canal bed. It is expected that the arrival of staff would be in advance of the AM peak period (7:30am-9:00am) and not impact traffic operations at the site access. Departure of staff could occur during the PM peak period (3:00pm-6:00pm) however, with the right-in/right-out configuration of the site access and proximity to the signalized intersection at Daly Avenue there will be sufficient gaps in traffic for staff to exit without impacting traffic operations.

There are no lane closures or restrictions required during the Construction Stage as shown in the conceptual construction staging plans in **Appendix A**. The single lane operations of the Mobilization / Demobilization Stage are limited to off-peak times. Given the low anticipated trip generation and absence of peak hour lane closures/reductions, no traffic analysis was undertaken for the Downtown Area Site.

6.3 Multi-use Path Detour

During both the Mobilization and Construction Stages, the Rideau Canal Eastern Pathway will be unavailable for approximately 900m from Plaza Bridge to 50m south of Corktown Bridge. Pedestrians and cyclists will require a detour route with accessible connections to maintain Pathway connectivity.

At this Area Site there is an existing paved multi-use pathway (MUP) on the east side of Colonel By Drive that can be used as the detour route. The MUP is located between the University of Ottawa signalized crossing and Laurier Avenue West where it connects to a 1.5m sidewalk that continues north towards Rideau Street. Pathway users can cross Colonel By Drive at the existing University of Ottawa signalized crossing and at the Daly Avenue signalized intersection to access the detour route. The Contractor will be required to provide adequate detour signage in English and French. The proposed multi-use path detour drawings are provided in **Appendix D**.

Coordination between the NCC and the City of Ottawa will be required to allow for the continued use of the detour path during the winter season. The existing winter maintenance agreements will need to be amended to include the detour path instead of the Rideau Canal Eastern Pathway between Laurier Avenue and 50m south of Corktown Bridge.

The possibility of detouring MUP users along Pathways on the west bank was considered in consultation with the Project Stakeholders. A west bank route will not be signed or advertised to avoid maintenance concerns (snow and ice operations).

6.4 Rideau Canal Skateway Access

The NCC is providing an allowance for a full canal closure during the non-navigable season, which includes the Winterlude skating season. Chalets are expected to be relocated south of the Corktown Bridge. All canal stairs on the east and west banks (**Figure 5**) will be unavailable within the Downtown Area Site. The east bank stairs include Rideau, Mackenzie King East, and the Somerset East locations. The west bank stairs include the Queen, Mackenzie King West, Lisgar, and Somerset West locations. The Somerset East and West stairs can be relocated to the chalets to provide access to the Skateway.

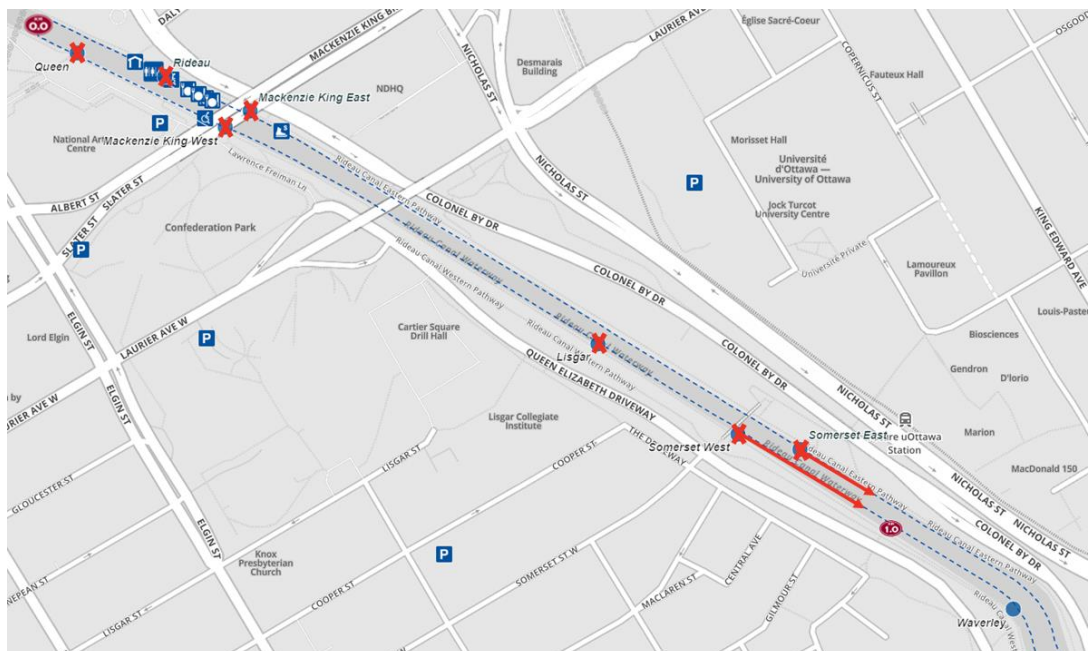


Figure 5. Rideau Canal Skateway Access in the Downtown Area Site

7 CLEGG STREET AREA SITE TRANSPORTATION MANAGEMENT PLAN

The **Clegg Street Area Site** extends from Herridge Street to Clegg Street as shown in **Figure 6**. The rehabilitation works are taking place on the east bank of the canal. Construction activities at this Site will be carried out concurrently with the Echo Drive Area Site beginning in Fall 2018 with an estimated completion of July 2020.

There is one proposed vehicle access to the work area from Colonel By Drive. It is located south of Clegg Street and will provide full movement access to the work area. The location of the access point is shown on the conceptual construction staging drawings provided in **Appendix B**.

The work area is expected to be completely contained within the canal bed which will consist of a perimeter coffer dam and a level work platform constructed with rock fill and granular material. PSPC has indicated that there will be sufficient space in the canal bed for trucks to undertake turning movements, Based on the available space within the canal bed, available space between the canal and Colonel By Drive, potential construction methods, and PSPCs previous rehabilitation experience, there should be no requirement for the Construction Stage work area to encroach on Colonel By Drive beyond the installation of Temporary Construction Barriers. However, with work being completed on the canal walls, the Rideau Canal Eastern Pathway will be unavailable from Herridge Street to Mutchmor Road.

PSPC noted that previous contracts have had 15-20 registered staff vehicles on site. At the Clegg Street Area Site it is likely that staff parking will be on neighboring streets on either side of the Rideau Canal and will not impact traffic operations on Colonel By Drive.

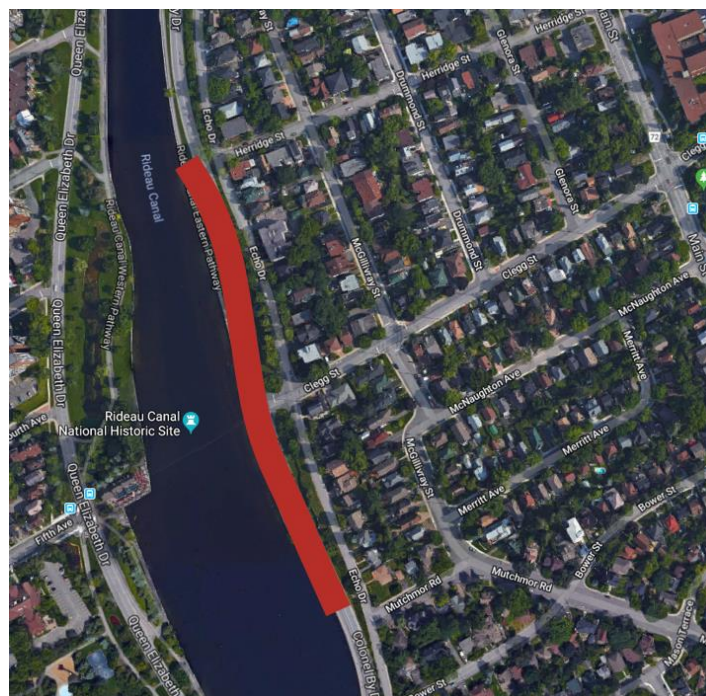


Figure 6. Clegg Street Area Site

7.1 Staging

Mobilization / Demobilization Stage: During the Mobilization / Demobilization stages it is expected that all lane closures will be Short Duration Work following the lane restriction requirements in **Section 4.1**. A single lane closure will be required in accordance with OTM Book 7 for Short Duration Work with Traffic Control Persons (Temporary Layout-20A), to allow the Contractor to construct and deconstruct their site access point. It is expected that traffic will be reduced to a single lane (4.2m wide) operation in the off-peak hours during this phase and will be for a maximum of 10 days per stage. The work area will be protected from traffic using Flexible Drums as specified in the Contract. Flexible Drums will provide the Contractor with greater flexibility and access to the work area during off-peak periods by shifting the drums as required within the allowable times specified in the contract. The conceptual construction staging plans are provided in **Appendix B**.

Construction Stage: During the Construction Stage it is anticipated that all Work will be accommodated within the work area outside the curb of the road requiring no lane closures. The work area will be protected from roadway traffic through the use of Temporary Concrete Barriers (TCBs). The suggested end treatment is flaring the barrier end beyond the edge of the clear zone in accordance with OTM Book 7 and the Transportation Association of Canada's Geometric Design Guide for Canadian Roads, Chapter 7 – Roadside Design (June 2017).

To accommodate the TCBs, the traveled lane widths will be reduced to 3.25m. This minimum lane width was accepted by the City of Ottawa at the March 2018 Stakeholder Meeting. Due to width constraints within the corridor, there will be no shoulder on either side of the roadway through the work zone. A regulatory speed reduction from 60km/h to 40 km/h will be requested by the NCC through this Area Site (**Section 4.3**). All access locations will be signed in accordance with OTM Book 7 requirements.

7.2 Traffic Analysis

PSPC indicated that the peak trip generation during construction is 15 trucks per day and would occur during the concrete pour activity. PSPC noted that previous contracts have had 15-20 registered staff vehicles on site. At the Clegg Street Area Site it is likely that staff parking will be on neighbouring streets on either side of the Rideau Canal (access via the new Pedestrian Bridge between Clegg Street and Fifth Avenue) and will not impact traffic operations at the site access.

The conceptual construction staging plans indicate that there are no lane closures or restrictions required during the Construction Stage and that the single lane operations of the Mobilization / Demobilization stage are limited to off-peak times. Given the low anticipated trip generation and absence of peak hour lane closures/reductions, no traffic analysis was undertaken for the Clegg Street Area Site.

7.3 Multi-use Path Detour

During both the Mobilization and Construction stages, the Rideau Canal Eastern Pathway will be unavailable for approximately 360m between Herridge Street and Mutchmor Road. Pedestrians and cyclists will require a detour route with accessible connections to maintain Pathway connectivity.

The proposed detour route is along Echo Drive between Herridge Street and Bank Street. Along Echo Drive, a 1.5m existing sidewalk is available for pedestrians on the east side of the road. Echo Drive for the length of the detour is 6.2m wide with no painted centre line and no available space for dedicated bike lanes. Bikes will travel in the shared travel lanes; temporary sharrows should be considered to indicate to drivers that the lanes are shared between vehicles and bicycles.

At the north end of the site, Temporary Pedestrian Signals (TPS) are recommended opposite Herridge Street to cross MUP users from the Pathway to the proposed signed detour route. This is the same location that the Clegg Street Pedestrian Bridge project installed TPS for their pathway detour. The Clegg Street Pedestrian Bridge TPS, shown in **Figure 7**, will be removed in July 2018 and will not be available for reuse as part of the Clegg Street Area Site project. New TPS will need to be installed. Based on experience from the Clegg Street Pedestrian Bridge project, the TPS should be hardwired to mitigate the noise impact to nearby residents. Furthermore, the TPS will not need to be coordinated with the Clegg Street traffic signals due to the distance between signals.



Figure 7. Clegg Street Pedestrian Bridge Temporary Pedestrian Signal (TPS)

There is a retaining wall along the east side of Colonel By Drive beginning 50m north of Mutchmor Road and continuing south until Bank Street. The north end of the retaining wall is opposite the site access and limits the available south pedestrian crossing locations. There are existing stair accesses through the retaining wall along Echo Drive, however they are not accessible and not appropriate for the signed detour route.

The closest available location that can be modified to be accessible is the Colonel By Drive / Echo Drive intersection west of Bank Street. This is a detour of approximately 1600m. Asphalt modifications can be made to the existing stairs on the pathway on Echo Drive between Bank Street and Colonel By Drive to

make them accessible. The City of Ottawa's Accessibility Design Standards (Second Edition, November 2015) note that a running slope greater than 5% is allowed along an exterior path of travel as long as it is not greater than the slope of the adjacent roadway. It is recommended that a temporary cycling lane be implemented along Echo Drive between Bank Street and Colonel By Drive to provide a continuous cycling connection through the detour route. This approach has been taken by PSPC on previous projects as shown in **Figure 8**.

Temporary Pedestrian Signals (TPS) are recommended as the southern Colonel By Drive crossing of the MUP detour given the anticipated number of MUP users during the summer months. The proposed multi-use path detour drawings are provided in **Appendix D**.



Figure 8. Bank Street Accessibility Modifications (Source: PSPC)

A secondary detour option is available through the use of the Rideau Canal Western Pathway by crossing the Canal at Bank Street and the new Clegg Street Pedestrian Bridge which will be open to the public in Summer 2019. This route is appropriate for through traffic, but does not provide access to the neighbourhoods or amenities to the east of the canal.

7.4 Rideau Canal Skateway Access

The proposed construction work area will require the closure of the Clegg Stairs. The Herridge Stairs are 200m to the north and provide convenient access to the Skateway in advance of the Multi-Use Path closure. They are located opposite Herridge Street at the proposed TPS crossing location and would provide Skateway access at the north end of the detour. The Skateway Stair locations are shown in **Figure 9**.

The NCC has confirmed that the full closure of the Clegg Stairs would be acceptable for one skating season. An alternative access at the north end of the detour are the Fifth Rest Area Stairs on the west bank which will be easily accessed from the east bank once the Clegg Street Pedestrian Bridge (**Section 2**) is open in July 2019.

The Bank South Stairs are located at the south end of the proposed multi-use path detour to provide access to the Skateway at the south limit of the detour.

The Avenue Stairs could remain in place to provide access to the local neighbourhood however, there is no accessible access between Colonel By Drive and Echo Drive. Clear signage would be required to indicate that the Rideau Canal Eastern Pathway is closed and that either the Herridge Stairs or the Bank South Stairs are the closest accessible accesses to the Multi-Use Path and detour.

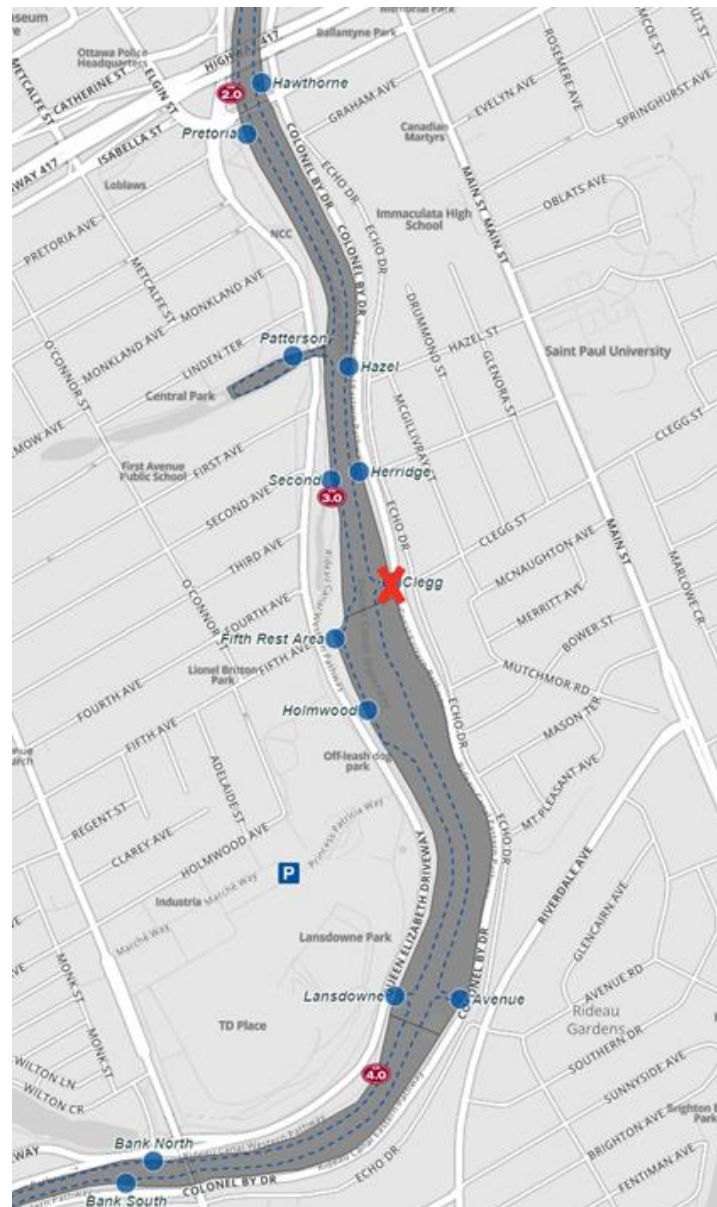


Figure 9. Rideau Canal Skateway Access in the Clegg Street Area Site

8 ECHO DRIVE AREA SITE TRANSPORTATION MANAGEMENT PLAN

The **Echo Drive Area Site** extends from the NCC canal access ramp to Main Street as shown in **Figure 10**. The construction activities at this Area Site are to be completed concurrently with the Clegg Street Area Site with construction beginning in Fall 2018 with an estimated completion of Spring 2020.

There are two proposed vehicle access points to the work area from Colonel By Drive. The ingress is located at the north end of the work area beside the NCC canal access ramp. Vehicles will enter (right-in only) at this access and drive through the site exiting at the egress located at the south end of the work area opposite Main Street (right-out only). All site circulation will be one-way southbound. The location of the access points are shown on the conceptual construction staging drawings provided in **Appendix D**.

The work area is expected to be completely contained within the canal bed. Based on the available space within the canal bed, available space between the canal and Colonel By Drive, anticipated construction methods, and PSPCs previous rehabilitation experience, there should be no requirement for the Construction Stage work area to encroach on Colonel By Drive. However, with work being completed on the canal walls, the Rideau Canal Eastern Pathway will be unavailable between the NCC access ramp and Main Street.

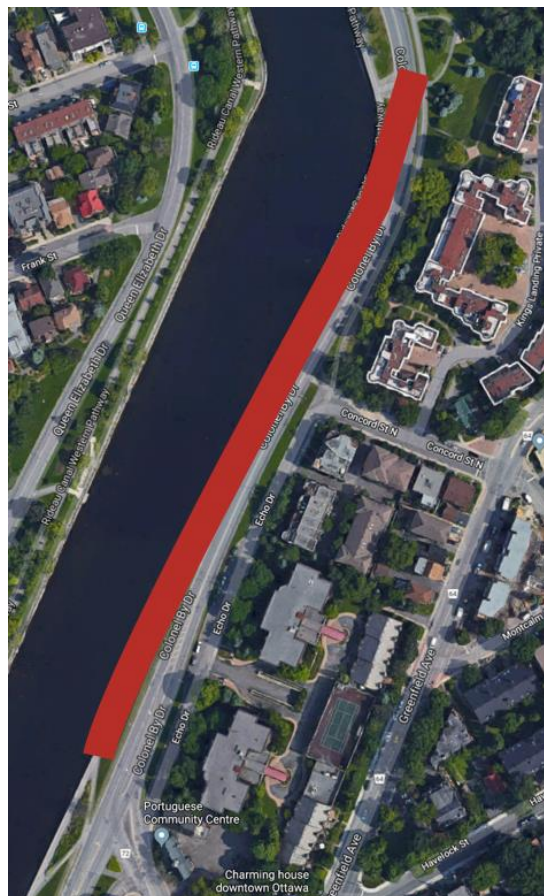


Figure 10. Echo Drive Area Site

8.1 Staging

Mobilization / Demobilization Stage: During the Mobilization / Demobilization stages it is expected that all lane closures will be Short Duration Work following the lane restriction requirements in **Section 4.1**. At the north end access, a single lane closure will be required in accordance with OTM Book 7 for Short Duration Work with Traffic Control Persons (Temporary Layout-20A). It is expected that traffic will be reduced to a single northbound lane (5.2m wide) operation in the off-peak hours during this phase and will be for a maximum of 10 days per stage. Traffic operations will be controlled by Traffic Control Persons (TCPs).

During this stage there will be a temporary shift of traffic from the southbound through lane on Colonel By Drive approaching Main Street into the southbound left turn lane on Colonel by Drive at the Main Street intersection. The shift of traffic is required at the construction work area egress to maintain two lanes of through traffic (northbound and southbound). With the lane shift there will be a reduction in the width of the southbound through lane to 3.5m. The northbound lane will be unaffected. A traffic analysis was undertaken to determine the impact of the lane shift (**Section 8.2**).

The work area will be protected from traffic using Flexible Drums as specified in the Contract. Flexible Drums will provide the Contractor with greater flexibility and access to the work area during off-peak periods by shifting the drums as required within the allowable times specified in the contract. The conceptual construction staging plans are provided in **Appendix C**.

Construction Stage: During the Construction Stage it is anticipated that all Work will be accommodated within the work area outside the curb of the road requiring no lane closures. The temporary removal of the Colonel By Drive median near Main Street will be required to accommodate truck turning movements exiting the work area. The median will be temporarily reinstated with paint for the duration of the construction and completely reinstated following completion of the construction. This was accepted by the Project Stakeholders. Traffic control devices such as Temporary Concrete Barriers or Flexible Drums are not required on the roadway during the Construction Stage given the distance of the work area from the traveled lane.

8.2 Traffic Analysis

A traffic analysis was completed to identify the impact of shifting the southbound through traffic on Colonel By Drive into the southbound left turning lane at the Colonel By Drive / Main Street intersection during the Mobilization / Demobilization stages at the Colonel By Drive and Main Street intersection. The analysis was undertaken using Synchro-9 software for three scenarios.

Scenario One: Southbound left turning traffic is detoured from the Main Street / Colonel By Drive intersection to the Colonel By Drive / Hawthorne Avenue intersection. The detour route was identified based on a worst case scenario that all detoured traffic is traveling towards the Highway 417 westbound on-ramp accessed from Greenfield Avenue. The detour route includes the following signalized intersections and lane arrangements:

- ▶ Southbound left turn from Colonel By Drive onto Hawthorne Avenue. The existing southbound lane arrangement includes a single southbound through/right lane. The southbound left turning movement is currently prohibited at this intersection.
- ▶ Eastbound left turn from Hawthorne Avenue onto Main Street. The existing lane arrangement includes an eastbound left/through lane and an eastbound right lane.
- ▶ Northbound right turn from Main Street onto Greenfield Avenue. The existing lane arrangement includes a northbound through lane and a northbound right lane.

The total detour length is 820m compared to the direct route from Colonel By Drive to Greenfield Avenue of 90m. In addition to the increased travel distance, this detour would require the removal of the southbound left turn prohibition at the Colonel By Drive and Hawthorne Avenue intersection and modifications to all signal timing plans.

The Synchro analysis indicated that a reasonable level of service could be maintained at the intersections in the detour route. However, the eastbound queues on Hawthorne Avenue at the Main Street intersection would extend to (or spill back beyond) the Colonel By Drive / Hawthorne Avenue intersection. The City of Ottawa has indicated that the negative impact to eastbound traffic along Hawthorne Avenue would not be accepted. Therefore, scenario one is not considered a viable option for the Mobilization and Demobilization stages.

Scenario Two: Southbound left turning traffic is detoured from the Colonel By Drive / Main Street intersection to the Colonel By Drive / Clegg Street intersection. The detour route was identified based on the worst case scenario that all detoured traffic is traveling towards the Highway 417 westbound on-ramp accessed from Greenfield Avenue. The detour route includes the following signalized intersections and lane arrangements:

- ▶ Southbound through at the Colonel By Drive / Hawthorne Avenue intersection. The existing southbound lane arrangement includes a single southbound through/right lane.
- ▶ Southbound left turn from Colonel By Drive onto Clegg Street. The existing southbound lane arrangement is single southbound left/through lane. The southbound left turning movement is currently prohibited from 7:00am to 9:00am and from 3:30pm to 5:30pm.
- ▶ Eastbound left turn from Clegg Street onto Main Street. The existing eastbound lane arrangement is a shared left/through/right lane.
- ▶ Northbound through at the following intersections on Main Street: Hazel Street, Oblate Avenue, Evelyn Avenue, Lees Avenue, and Hawthorne Avenue.
- ▶ Northbound right turn from Main Street onto Greenfield Avenue. The existing lane arrangement includes a northbound through lane and a northbound right lane.

The total detour length is 2560m compared to the direct route from Colonel By Drive to Greenfield Avenue of 90m. In addition to the increased travel distance, this detour would pass through the Clegg Street Area Site work zone.

The Synchro analysis indicated that a reasonable level of service could be maintained at the intersections on Colonel By Drive in the detour route; however, the southbound queues on Colonel By Drive at the Clegg Street intersection would experience a significant increase to 520m although the queue would not impact the Colonel By Drive / Hawthorne Avenue intersection. The City of Ottawa has indicated that the negative impact to southbound traffic along Colonel By Drive would not be accepted. Therefore, scenario two is not considered a viable option for the Mobilization and Demobilization stages.

Scenario Three: Accommodating the southbound left turning traffic at the Colonel By Drive / Main Street intersection in a shared southbound left/through lane and restricting the lane shift to off-peak hours (9:00am – 3:00pm). The highest off-peak hour at this intersection is mid-day from 12:00pm – 1:00pm. A comparison between the traffic operations at the Colonel By Drive / Main Street intersection under existing conditions and the southbound shared lane scenario indicate that there will be little impact to traffic. The average delay experienced by drivers travelling southbound is expected to remain below 10s. **Therefore, scenario three is the preferred option for the Mobilization and Demobilization stages.**

The Synchro results are summarized below and the full analysis is provided in **Appendix E**.

Table 2. Mid-day Peak Hour (12:00pm - 1:00pm) Capacity Results at Colonel By Drive / Main Street Intersection

Lane Arrangement	Criteria	Intersection	NB	SB	WB
EXISTING DEDICATED LEFT TURN LANE	Delay	4.0s	0.0s	9.1s (SBT)	15.9s
	LOS	A	A	A	B
	95 th Queue	-	0.0m	3.8m (SBT)	18.7m
SHARED THROUGH AND LEFT TURN	Delay	2.8s	0.0s	2.7s	11.4s
	LOS	A	A	A	B
	95 th Queue	-	0.0m	2.3m	5.3m
RESULT		No Impact	No Impact	No Impact	No Impact

8.3 Multi-use Path Detour

During both the Mobilization and Construction stages, the Rideau Canal Eastern Pathway will be unavailable for approximately 370m between the NCC canal access and Main Street. Pedestrians and cyclists will require a detour route with accessible connections to maintain pathway connectivity.

The proposed detour route is along the east side of Colonel By Drive between the University of Ottawa signalized pedestrian crossing and Main Street. To reduce the number of crossing locations across Colonel By Drive and to reduce the need for temporary infrastructure, the existing University of Ottawa Pedestrian signalized crossing will be used as the northern crossing. Pedestrians and cyclists will travel on

the existing 2.0 to 2.5m wide multi-use path (MUP) on the east side of Colonel By Drive between the University of Ottawa signalized crossing and Echo Drive.

The MUP ends at Echo Drive and the detour will continue along the west side of the roadway with the installation of a new bidirectional MUP. Echo Drive is a one-way northbound local street in this location with a varying width of 5.5m to 6.0m. The parking lane on the west side of the road is 75m in length and increases the available width of pavement to 7.5m. There is an existing sidewalk on the east side of Echo Drive.

Two detour options were considered on Echo Drive between Conchord Avenue North and Main Street:

- ▶ Using the existing sidewalk for pedestrians and introduce a painted bike lane
- ▶ Creating a temporary MUP on the west side of Echo Drive defined by Temporary Construction Barriers and in conjunction with parking restrictions and local access only

The recommendation following consultation with the Project Stakeholders is to implement the temporary MUP on the west side Echo Drive. Benefits of this option include protection to all MUP users and no crossing of Echo Drive required at the north end to connect to the existing MUP. The City of Ottawa indicated that the reduction in effective lane width from 5.5m to 3.5m would be acceptable for the duration of the rehabilitation project.

The NCC has proposed a permanent PXO across Colonel By Drive on the south leg of the intersection at Main Street as shown in **Figure 11**. The construction of a permanent or temporary PXO at this location as part of the Canal Walls Rehabilitation project would reduce the overall length of the pathway detour. To access the proposed PXO from the Echo Drive temporary MUP, a pedestrian crosswalk is needed at the existing westbound stop control on Main Street at Colonel By Drive. The pedestrian crosswalk should be painted according to the Ontario Traffic Manual Book 11 (Pavement, Hazard and Delineation Markings), Figure 31.

If a permanent PXO across Colonel By Drive is not implemented prior to the detour requirements then the option of installing a temporary PXO will be discussed with the City of Ottawa. If the temporary PXO is not feasible then MUP users will be detoured along the east side of Colonel By Drive to the Hawthorne Avenue traffic signals. This Pathway has a variable width between 1.8m and 2.6m and is not wide enough to accommodate the two directional travel of cyclists and pedestrians.

The proposed multi-use path detour drawings are provided in **Appendix D**.

A secondary detour option is available through the use of the Rideau Canal Western Pathway by crossing the Canal at the Corktown Pedestrian Bridge and Pretoria Bridge. This route is appropriate for through traffic, but does not provide access to the neighbourhoods or amenities to the east of the canal.

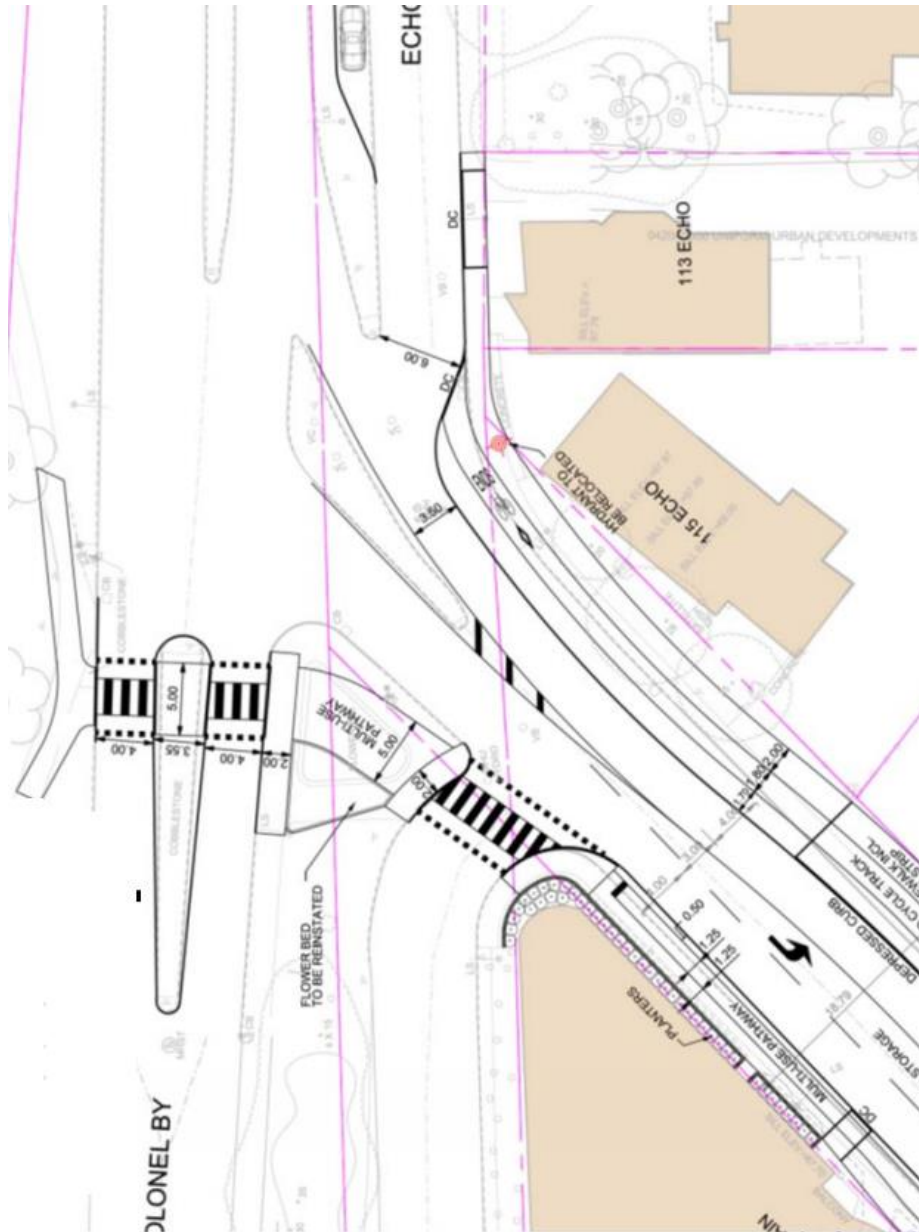


Figure 11. NCC PXO Crossing Colonel By Drive at Main Street Concept

8.4 Rideau Canal Skateway Access

The proposed construction work area will encompass the Concord Stairs. The Somerset East Stairs are approximately 475m to the north and located at the beginning of the proposed pathway closure. The Hawthorne Stairs are approximately 600m to the south and located just north of the Pretoria Bridge. If a permanent or temporary PXO is constructed across Colonel By Drive at Main Street then the relocation of the Concord Stairs to this general area would provide continuous access to the Skateway as shown in the following figure.

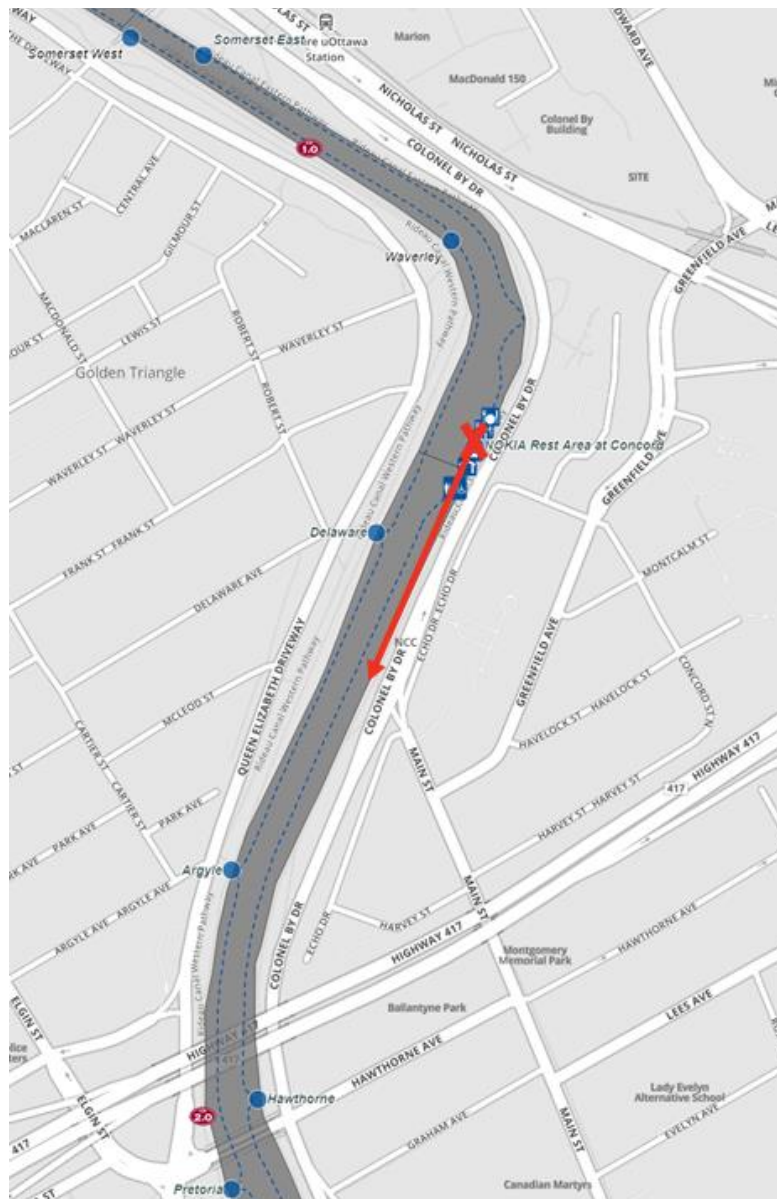


Figure 12. Rideau Canal Skateway Access in the Echo Drive Area Site

9 WORK ZONE APPROACH PLAN

The appropriate design, signing and management of the work zone approaches are important considerations in minimizing sudden changes in driving conditions. The Contractor will provide a Work Zone Approach Plan to provide clear, positive guidance to motorists, to avoid confusion caused by changing operating conditions, and to enhance the safe travel through the work zone. The approach design will achieve the following key objectives:

- ▶ Create situations that will increase the motorists' level of attention to imminent driving conditions;
- ▶ Create conditions that encourage drivers to slow down to an appropriate speed which maximizes safety through the approach and work zones; and
- ▶ Create conditions that minimizes speed variations between drivers (main issue in work zones and approaches is not necessarily speed itself but significant variations in speed).

The Contractor will maintain all temporary conditions signage in accordance with the Ontario Traffic Manual (OTM) Book 7-Temporary Conditions. Properly maintained signs are essential to uphold the objectives of the Approach Design discussed above. Signs which are not updated to reflect current conditions often lose credibility with motorists and eventually become ignored. Similarly, signs in poor condition will also be overlooked by motorists if not repaired or replaced in a timely manner.

10 COMMUNICATION PLAN

10.1 Public Information

The primary objectives of the public information component of the Communication Plan is to improve public awareness and understanding of the project, promote support for the project, and encourage motorists to choose an alternative travel route whenever possible during construction.

Project information, construction status, traffic conditions, and detour route information will be communicated to the general public via the following means:

- ▶ Media Releases and Public Notices
- ▶ Bilingual media releases and public notices (ad space) should be prepared by PSPC, Parks Canada, and the NCC as required. All closures (planned or unforeseen) will be communicated to the City of Ottawa's Traffic Incident Management Group. Partial/full closures due to unforeseen circumstances will be communicated to the general public via local media and temporary conditions signing (i.e. PVMS and ANS).
- ▶ NCC Website
- ▶ The NCC Website (<http://ncc-ccn.gc.ca/posts/>) provides public bulletins of known closures and construction work along NCC infrastructure.
- ▶ City of Ottawa Interactive Traffic Map (Web Portal)
- ▶ The City of Ottawa Interactive Traffic Map (<http://traffic.ottawa.ca>) provides real-time notification of construction zones, events, traffic incidents, and live feeds to the City's network of intersection cameras.

10.2 Motorist Information

Delivering complete and timely information about work zone conditions to motorists are key objectives to promoting safe and efficient operation of vehicles approaching and traveling through the work zone.

11 INCIDENT MANAGEMENT PLAN

11.1 Purpose

The purpose of the Incident Management Plan (IMP) is to provide a systematic approach to dealing with traffic incidents; provide clear, positive guidance to motorists approaching and travelling through work zones; and present contingencies to minimize risk of project delays.

11.2 Contractor Responsibility

The Contractor will organize an Incident Management Team (IMT) which will include members from Public Service and Procurement Canada, Parks Canada, the National Capital Commission, the City of Ottawa's Traffic Incident Management Group (TIMG)¹, and the Contractor's key staff.

Following contract award, the Contractor will be responsible to coordinate a meeting with the IMT and prepare the following items:

- ▶ Project contact list which includes each team members' name, affiliation, role, and contact information
- ▶ Incident reporting procedures
- ▶ Emergency response vehicle access plan
- ▶ Procedure for changes to temporary conditions signage (PVMS, ANS/AWS, etc.), including notification between PSPC, the NCC and City of Ottawa Traffic & Operations
- ▶ Incident response plan for each of the four incident levels identified in Section 5.3

Throughout the duration of the Contract, the Contractor will schedule additional meetings with the IMT as follows:

- ▶ Start of Construction
- ▶ Just prior to start of each Winter Season
- ▶ End of each Winter Season in the following spring

Key additional external contacts to the IMT will include 911 Emergency Dispatch, towing and recovery operators, hazardous material contractors, utility companies, and the local media (as required).

11.3 Incident Levels

Incident levels are defined by the extent and duration of the anticipated impact on the freeway/roadway.

¹ The TIMG includes members from the City of Ottawa Traffic Operations, Ottawa Community and Protective Services (Fire, Police, and Paramedics), OC Transpo, Ontario Provincial Police, Royal Canadian Mounted Police, and various emergency services representatives from the City of Gatineau.

Classifying incident levels will help the IMT take appropriate action should an incident occur. The incident levels for this project are classified into four categories and are shown in Table 2.

Table 3: Incident Levels

Level	Impact
I	Impact less than 30 minutes with/without blockage - Debris on roadway
II	Impact greater than 30 minutes but less than 2 hours, with lane blockages - Vehicle breakdown or minor collision
III	Impact greater than 2 hours or roadway fully closed in any single direction - Multi-vehicle or collision with injuries
IV	Extended closure of roadway - requires media alert and extensive long-term detours - Structural failure of any type

11.4 Incident Management

Traffic incidents will be promptly addressed to facilitate the continuous flow of traffic. The Contractor will coordinate as necessary with any recovery operations. Recovery operations must be executed quickly as any further reduction in capacity caused by incidents such as collisions or vehicular breakdowns can lead to extreme delays to motorists.

The four components of incident management are: incident detection, emergency response, incident clearance, and motorist information. These are discussed below.

11.4.1 Incident Detection

Incident detection will capture the event in progress and trigger the remaining components of the IMP. Police and City of Ottawa surveillance cameras, and motorists are considered to be the key means of incident detection.

The primary source of incident detection will be from motorists who are either involved in the incident and/or appear on site prior to the Police. During working days this detection may also come from the Contractor's staff.

A secondary means of incident detection is the monitoring of traffic cameras from the City of Ottawa Traffic Management Centre on Loretta Avenue.

11.4.2 Emergency Response

Emergency response will depend on the incident level of the event in progress – refer to Table 2 above. Police and tow trucks will handle Level I or II incidents without too much difficulty. The same would apply to similar incidents occurring on City streets.

Level III incidents will require action from the RCMP, Ottawa Police, Fire Services, and Ottawa Paramedic Service. City of Ottawa Emergency Services will only dispatch as many vehicles as required to provide medical aid, manage traffic safely, and to complete a thorough investigation of the incident.

A Level IV incident which involves a major structural failure that prevents the roadway from carrying traffic will require long-term closures and detours. PSPC and the NCC will determine the extent and duration of the closure, notify the media, and update temporary conditions signing accordingly.

The Contractor will provide access for all emergency services as required and will assist the RCMP and/or Ottawa Police with incident management.

11.4.3 Motorist Information

Should an incident occur on the roadway or along a detour route, the extent, expected duration, and impact will be communicated to motorists. This information will notify motorists to expect a minor delay or to seek an alternative route in case of a major incident.

Local media will be notified should a long-term closure be required.

APPENDIX

A

DOWNTOWN
AREA SITE
CONCEPTUAL
STAGING
DRAWINGS



Rideau Canal Walls
Rehabilitation Project

Transportation Management Plan

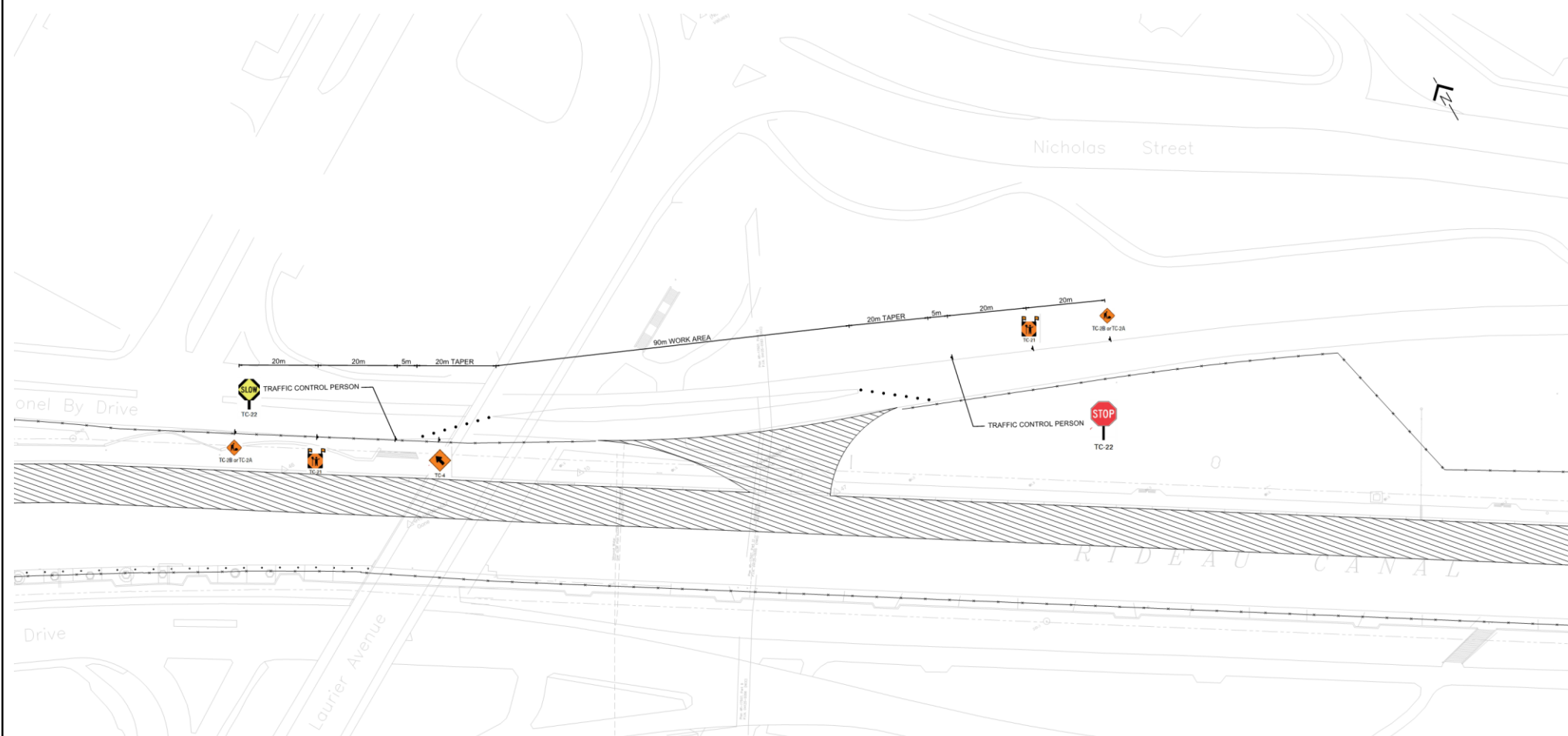
Conceptual Staging
Drawing

Downtown Area Site

*Mobilization
Demobilization
Stage*

May 2018

WSP Canada Ltd.
1145 Hunt Club Road, Suite 200
Ottawa, ON K1V 0Y3





Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

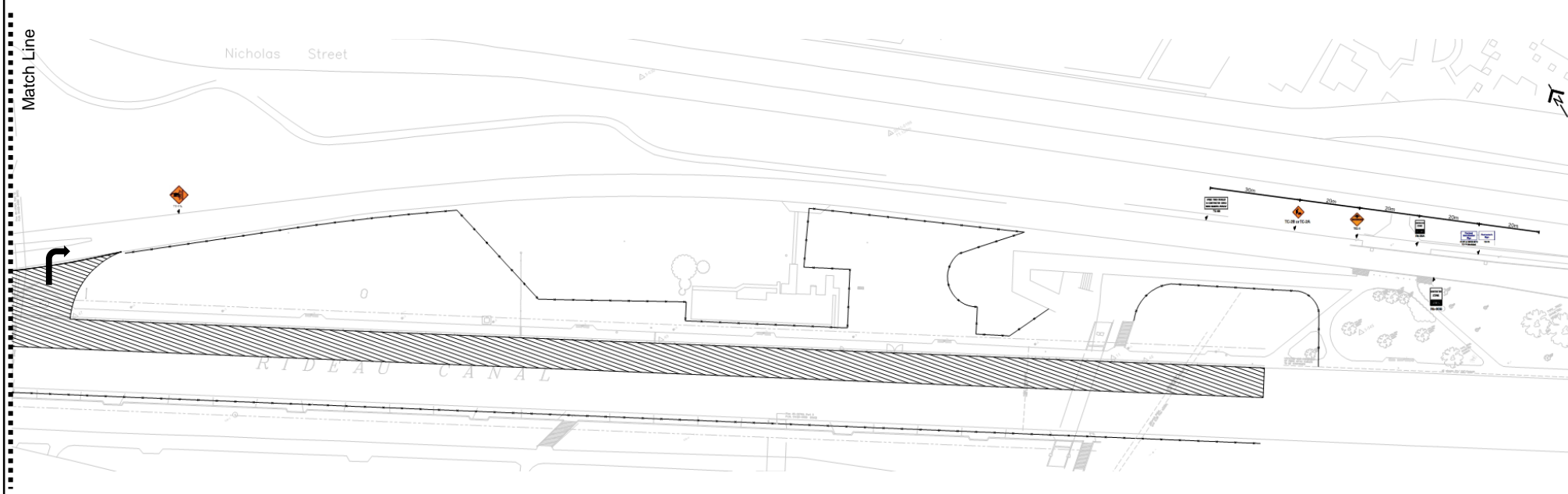
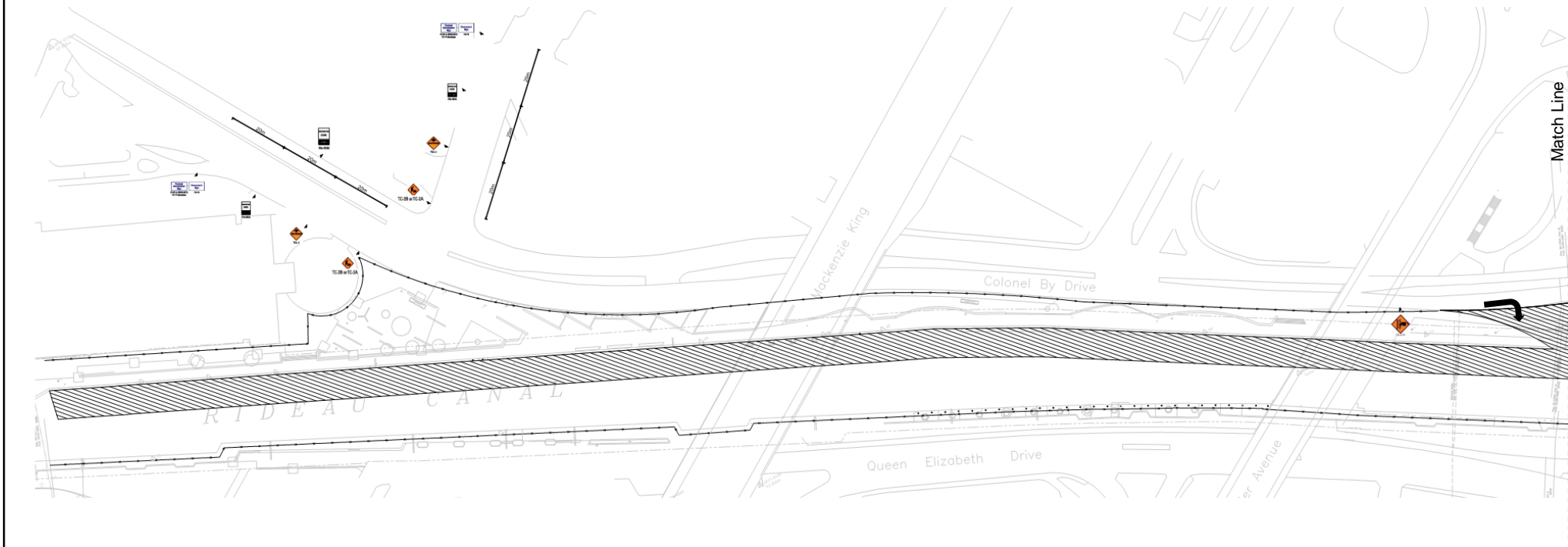
Conceptual Staging
Drawing

**Downtown Area
Site**

*Construction
Stage*

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APPENDIX

B

CLEGG
STREET AREA
SITE
CONCEPTUAL
STAGING
DRAWINGS



Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

Conceptual Staging
Drawing

**Clegg Street Area
Site**

*Mobilization
Demobilization
Stage*

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Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

Conceptual Staging
Drawing



**Clegg Street Area
Site**

*Construction
Stage*

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APPENDIX

C

ECHO DRIVE
AREA SITE
CONCEPTUAL
STAGING
DRAWINGS



Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

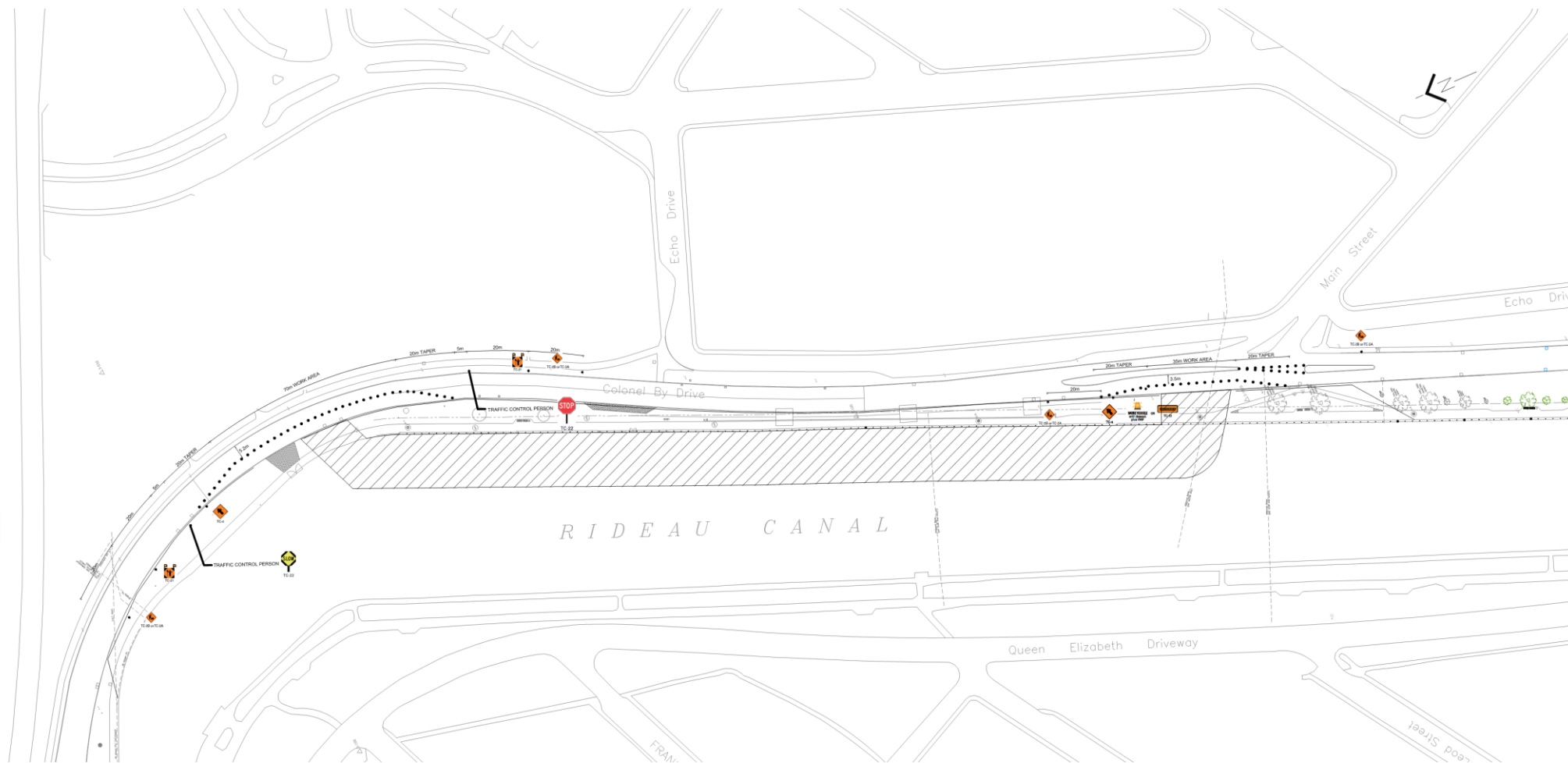
Conceptual Staging
Drawing

Echo Drive Area Site

*Mobilization
Demobilization
Stage*

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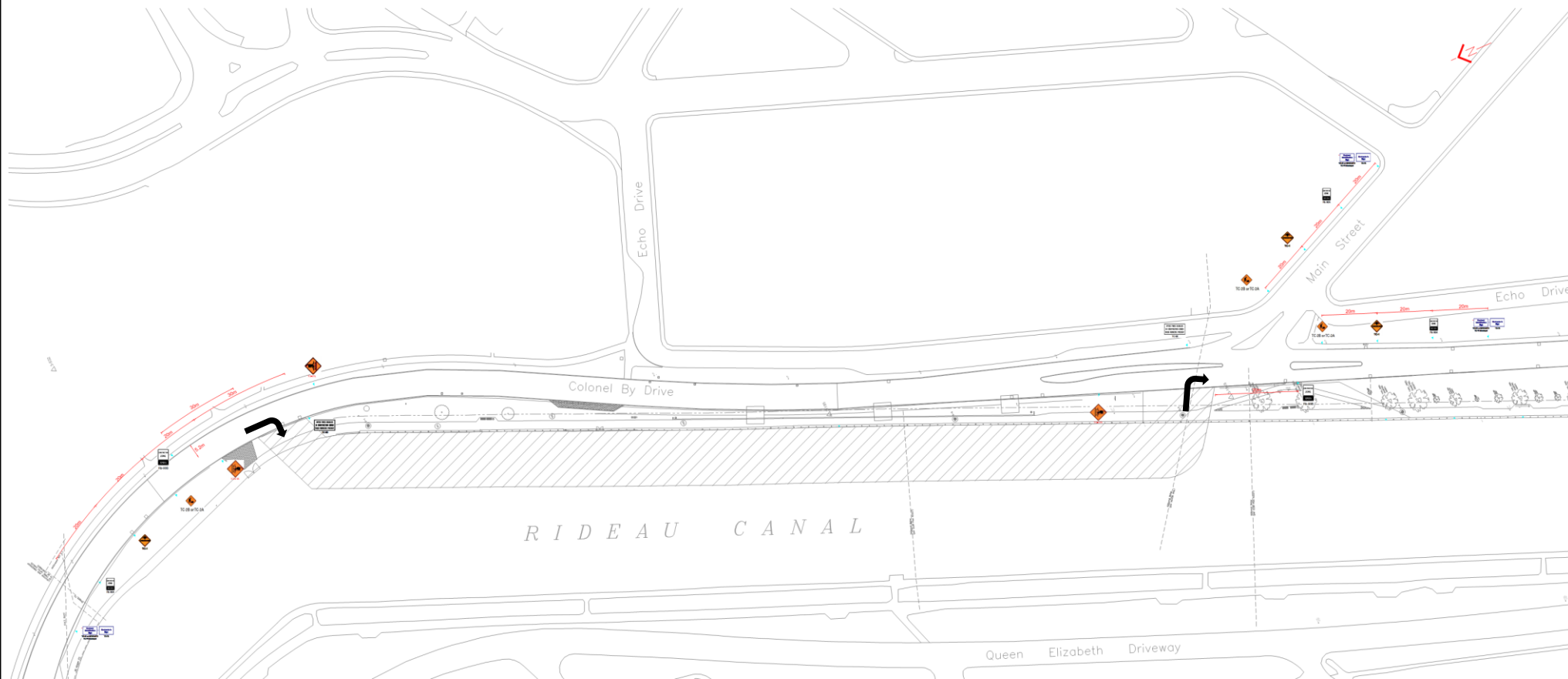




Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

Conceptual Staging
Drawing



Echo Drive Area Site

*Construction
Stage*

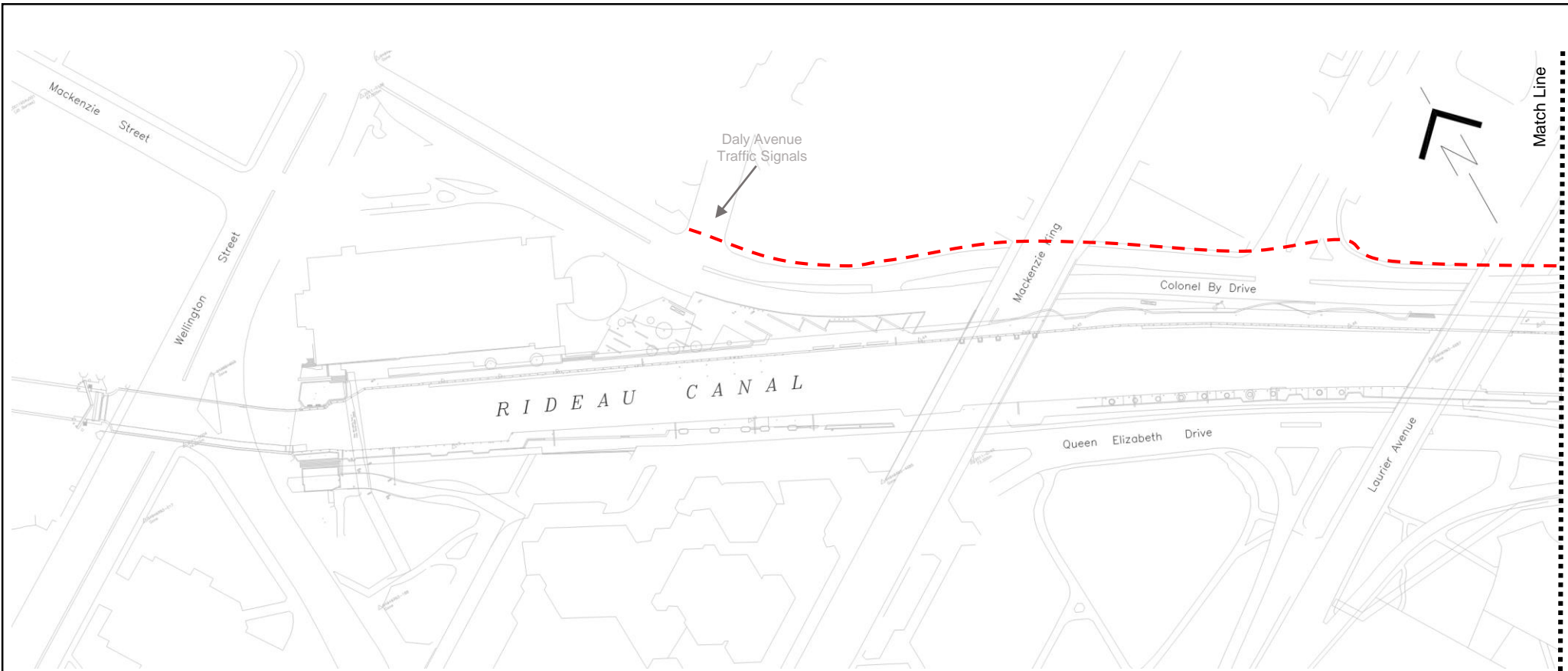
May 2018

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APPENDIX

D

MULTI-USE
PATH DETOUR
ROUTE
DRAWINGS

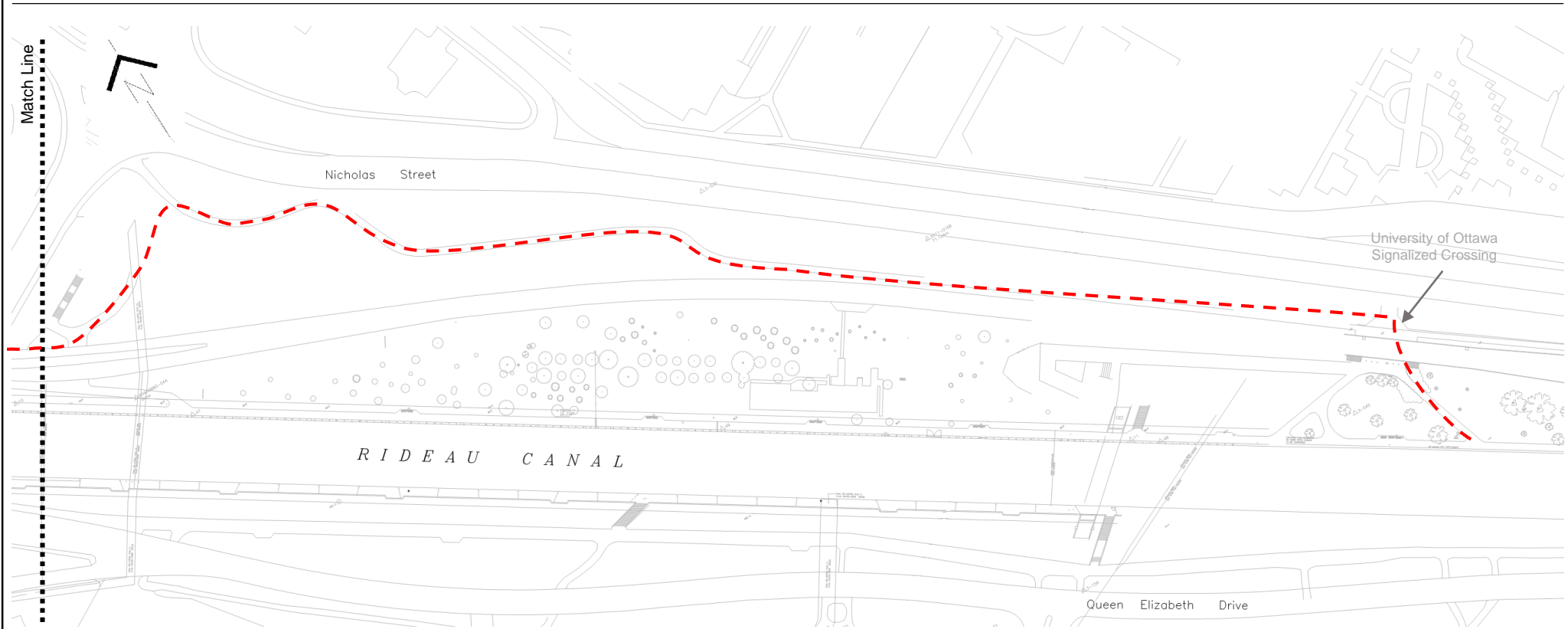


Rideau Canal Walls
Rehabilitation Project

Transportation Management Plan

Downtown Area Site

*Multi-Use Path
Detour*



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Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

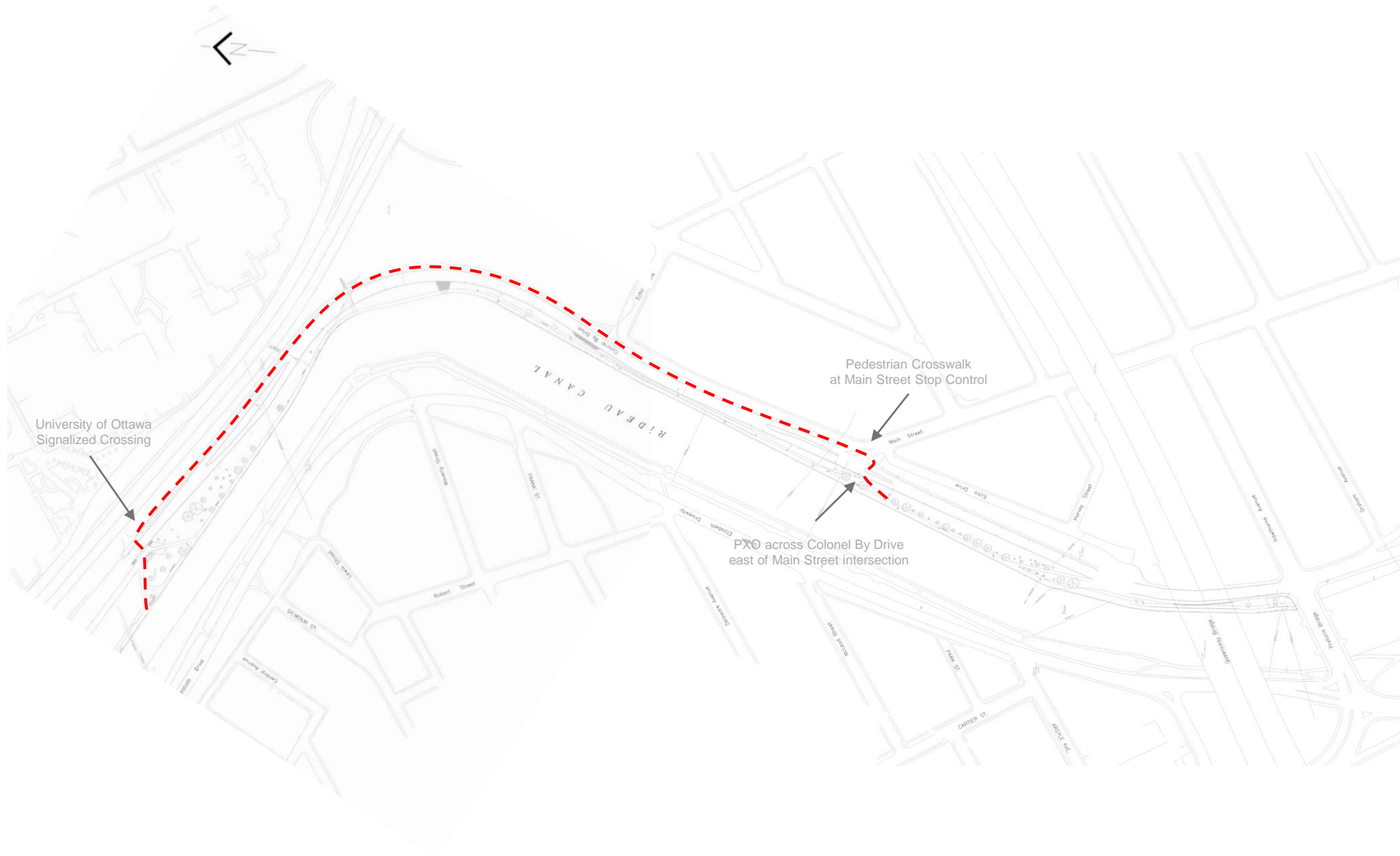
Echo Drive Area Site

Multi-Use Path Detour



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Rideau Canal Walls
Rehabilitation Project

**Transportation
Management Plan**

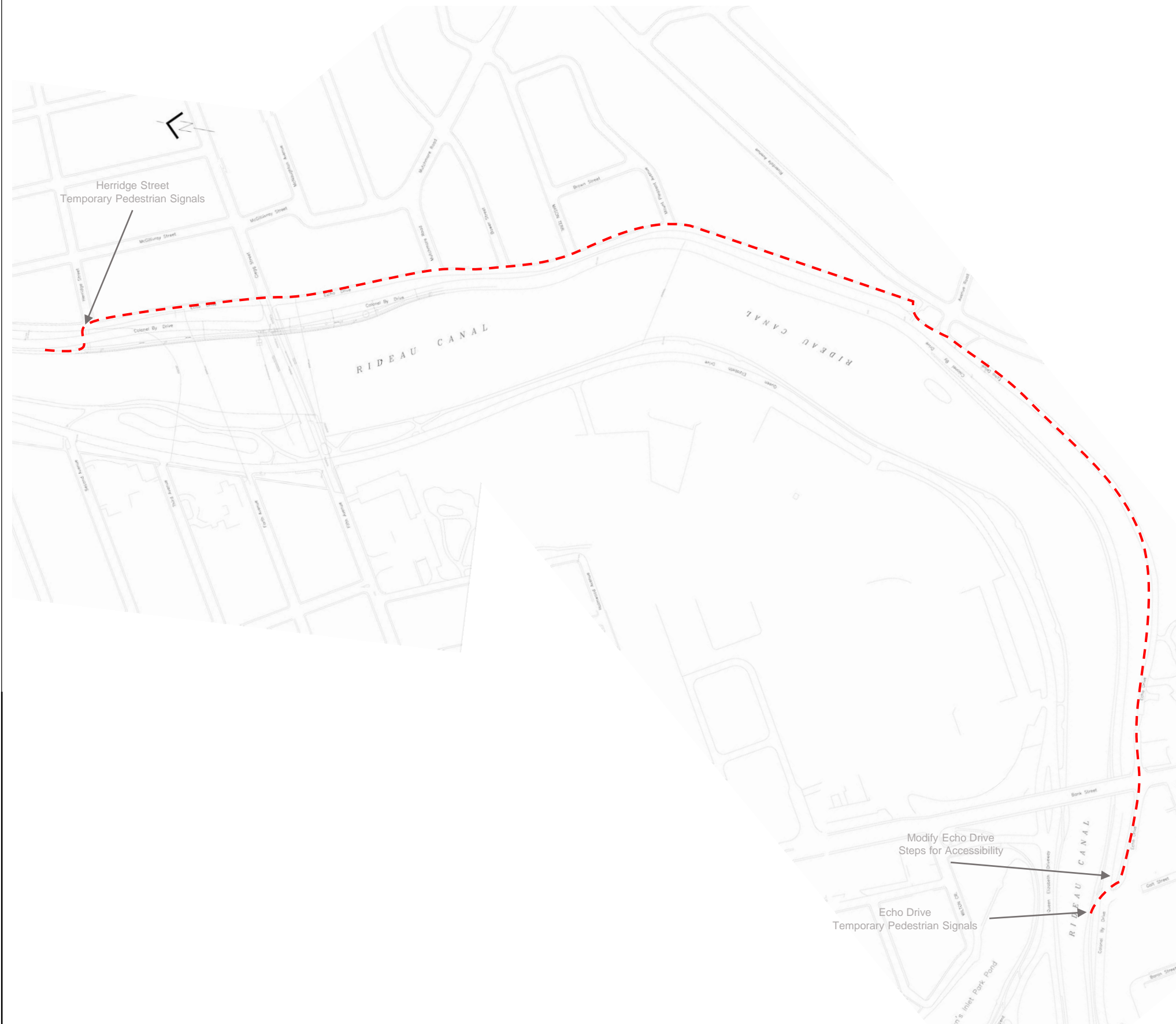
**Clegg Street Area
Site**

Multi-Use Path Detour



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APPENDIX

E

COLONEL BY
DRIVE / MAIN
STREET
SYNCHRO
RESULTS

APPENDIX E

During the Mobilization / Demobilization stage of the Echo Drive Area Site project, modifications to the existing lane arrangement on Colonel By Drive at Main Street are required to accommodate construction of the work zone egress (**Figure 1**). A traffic analysis was completed to identify the impact of having the southbound through and left turning traffic on Colonel By Drive share a single lane during off-peak hours (9:00am – 3:00pm). The highest volume of mid-day traffic was experienced from 12:00pm – 1:00pm; this was the analysis hour used for the Synchro analysis.

The following are the reports generated by the Synchro version 9 software for the existing conditions and the shared lane conditions. Reports were generated following the Highway Capacity Manual (HCM) 2000 methodology and the HCM2010 methodology since they calculation delay at stop controlled intersections differently. The HCM2000 results were presented in the main report since they show an increase in southbound delay from the existing conditions to the shared lane arrangement. The HCM2010 results show no change in southbound delay between two lane configurations which is unlikely.

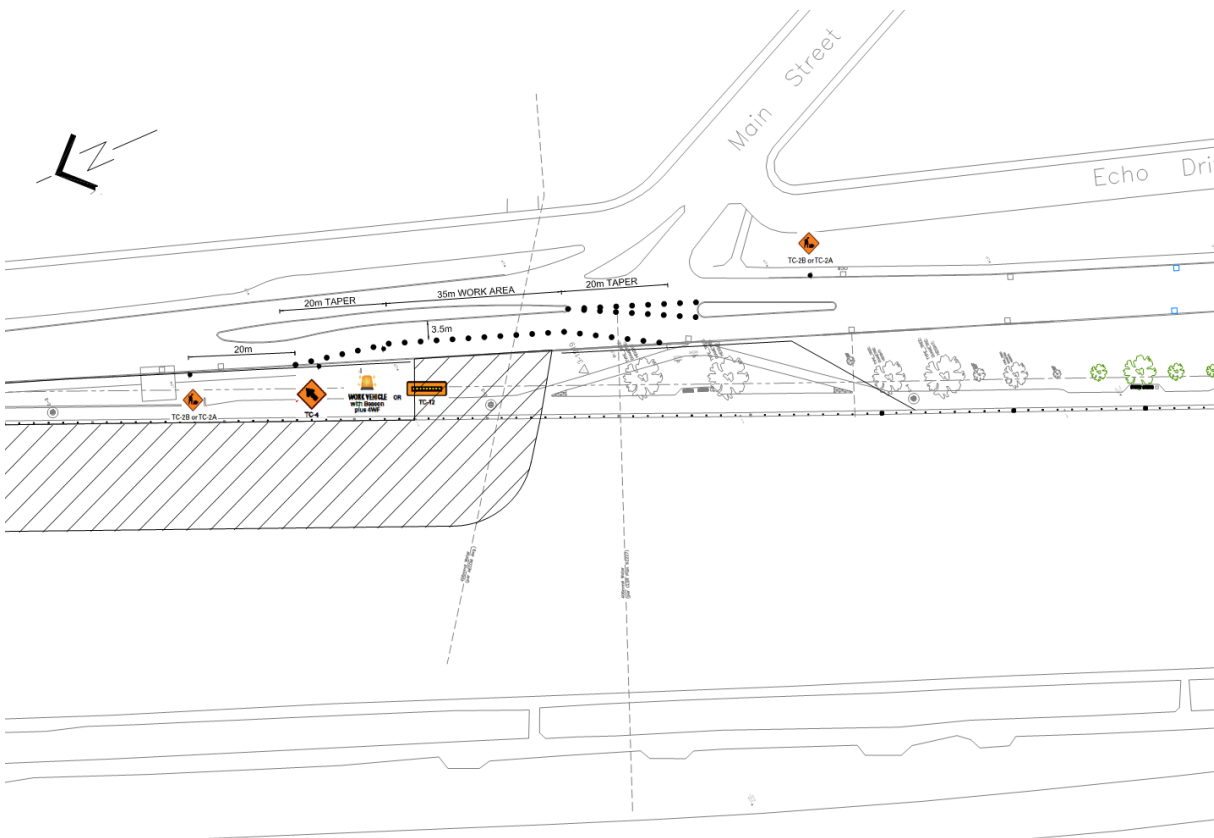












Figure 1. Echo Drive Area Site Egress - Staging during Mobilization / Demobilization – Shared Southbound Left/Through Lane Arrangement

HCM Unsignalized Intersection Capacity Analysis

13: Colonel By & Main










Canal Walls TMP - Echo Drive
04/03/2018





						
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	296	52	94	293	0	113
Future Volume (Veh/h)	296	52	94	293	0	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	329	58	104	326	0	126
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)	399					
pX, platoon unblocked						
vC, conflicting volume			387		892	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			387		892	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		100	82
cM capacity (veh/h)			1183		287	691
Direction, Lane #	NB 1	SB 1	SB 2	NW 1		
Volume Total	387	104	326	126		
Volume Left	0	104	0	0		
Volume Right	58	0	0	126		
cSH	1700	1183	1700	691		
Volume to Capacity	0.23	0.09	0.19	0.18		
Queue Length 95th (m)	0.0	2.3	0.0	5.3		
Control Delay (s)	0.0	8.3	0.0	11.4		
Lane LOS		A		B		
Approach Delay (s)	0.0	2.0		11.4		
Approach LOS				B		
Intersection Summary						
Average Delay			2.4			
Intersection Capacity Utilization			33.8%	ICU Level of Service	A	
Analysis Period (min)			15			




HCM Unsignalized Intersection Capacity Analysis

13: Colonel By & Main

Canal Walls TMP - Echo Drive
04/03/2018

						
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	296	52	94	293	0	113
Future Volume (Veh/h)	296	52	94	293	0	113
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	329	58	104	326	0	126
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	399					
pX, platoon unblocked						
vC, conflicting volume			387		892	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			387		892	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		100	82
cM capacity (veh/h)			1183		287	691
Direction, Lane #	NB 1	SB 1	NW 1			
Volume Total	387	430	126			
Volume Left	0	104	0			
Volume Right	58	0	126			
cSH	1700	1183	691			
Volume to Capacity	0.23	0.09	0.18			
Queue Length 95th (m)	0.0	2.3	5.3			
Control Delay (s)	0.0	2.7	11.4			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.7	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization			48.2%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection						
Int Delay, s/veh	2.4					
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	296	52	94	293	0	113
Future Vol, veh/h	296	52	94	293	0	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	500	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	329	58	104	326	0	126
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	387	0	-	358
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	-	3.3
Pot Cap-1 Maneuver	-	-	1183	-	0	691
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1183	-	-	691
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	NB		SB		NW	
HCM Control Delay, s	0		2		11.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBT	NBR	NWLn1	SBL	SBT	
Capacity (veh/h)		-	-	691	1183	-
HCM Lane V/C Ratio		-	-	0.182	0.088	-
HCM Control Delay (s)		-	-	11.4	8.3	-
HCM Lane LOS		-	-	B	A	-
HCM 95th %tile Q(veh)		-	-	0.7	0.3	-

Intersection						
Int Delay, s/veh	2.4					
Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	296	52	94	293	0	113
Future Vol, veh/h	296	52	94	293	0	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Stop
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	329	58	104	326	0	126
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	387	0	-	358
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.1	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.2	-	-	3.3
Pot Cap-1 Maneuver	-	-	1183	-	0	691
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1183	-	-	691
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	NB	SB	NW			
HCM Control Delay, s	0	2	11.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	NWLn1	SBL	SBT	
Capacity (veh/h)	-	-	691	1183	-	
HCM Lane V/C Ratio	-	-	0.182	0.088	-	
HCM Control Delay (s)	-	-	11.4	8.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-	

APPENDIX

F

KNOWN
EVENTS ON
COLONEL BY
DRIVE

Colonel By Drive 2018 Events

Event Name	Segment	Date
RCS Chalet Removal	Bronson to Hog's Back Road (HBR)	April 6,7 or 13,14
Our dreams matter	Pathway Corktown bridge to Bank	April 25
Alive to Strive	Hawthorne to Hog's Back Road (HBR)	April 29
CN cycle	Daly to (HBR)	May 6
Steps for Life	Pathway - Laurier to Pretoria	May 5
Tulip festival - fireworks	Bronston to Hog's Back Road (HBR)	May 20
Sporting Life	Pretoria to Hog's Back Road (HBR)	May 13
Early Bird Triathlon	Clegg to Hog's Back Road (HBR)	May 19
Sunday Bikeday	Laurier to Hog's Back Road (HBR)	Every Sunday from May 20 to Sep 2
Ottawa Race Weekend	Daly to Pretoria	May 26, 27
Ride for Dad	Daly to Hog's Back Road (HBR)	June 2
World Partnership Walk	Pathway -Laurier to Daly	June 3
National Capital Triathlon and Duathlon	Clegg to Hog's Back Road (HBR)	July 28
Canadian Triathlon and Duathlon	Daly to Hog's Back Road (HBR)	Sep 1
Terry Fox Run	Pretoria and Hog's Back Road (HBR)	Sep 16
Army run	Rideau to Hawthorne	Sep 23
Hike for CHEO	Pathway Bank and Hog's Back Road (HBR)	Sep 23
Ottawa Fire Service Relay	Pathway Fifth to Hawthorne	Sep 23
Terry Fox- St Pius	Pathway Heron to Hog's Back Road (HBR)	Sep 28
National Peace Officer Memorial Run and Ride	Pretoria to Bronson	Sep 28
Harvest Run	Pathway Clegg to Hog's Back Road (HBR)	Oct 4
RCS Chalet install	Bronson to Hog's Back Road (HBR) Concord/Daly/Hawthorne/ NAC	Nov 2, 3 or Nov 9, 10

Source: National Capital Commission