Technical Memorandum: Review Alternative Truck Access Routes for Site 5 / Stanley Park

Ottawa Combined Sewer Storage Tunnel (CSST)

City of Ottawa Contract No. ISD14-2036

Prepared for:
City of Ottawa

Prepared by:

Stantec Consulting Ltd.

May 25, 2017

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Sign-off Sheet

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TECHNICAL MEMORANDUM: REVIEW ALTERNATIVE TRUCK ACCESS ROUTES FOR SITE 5 / STANLEY PARK

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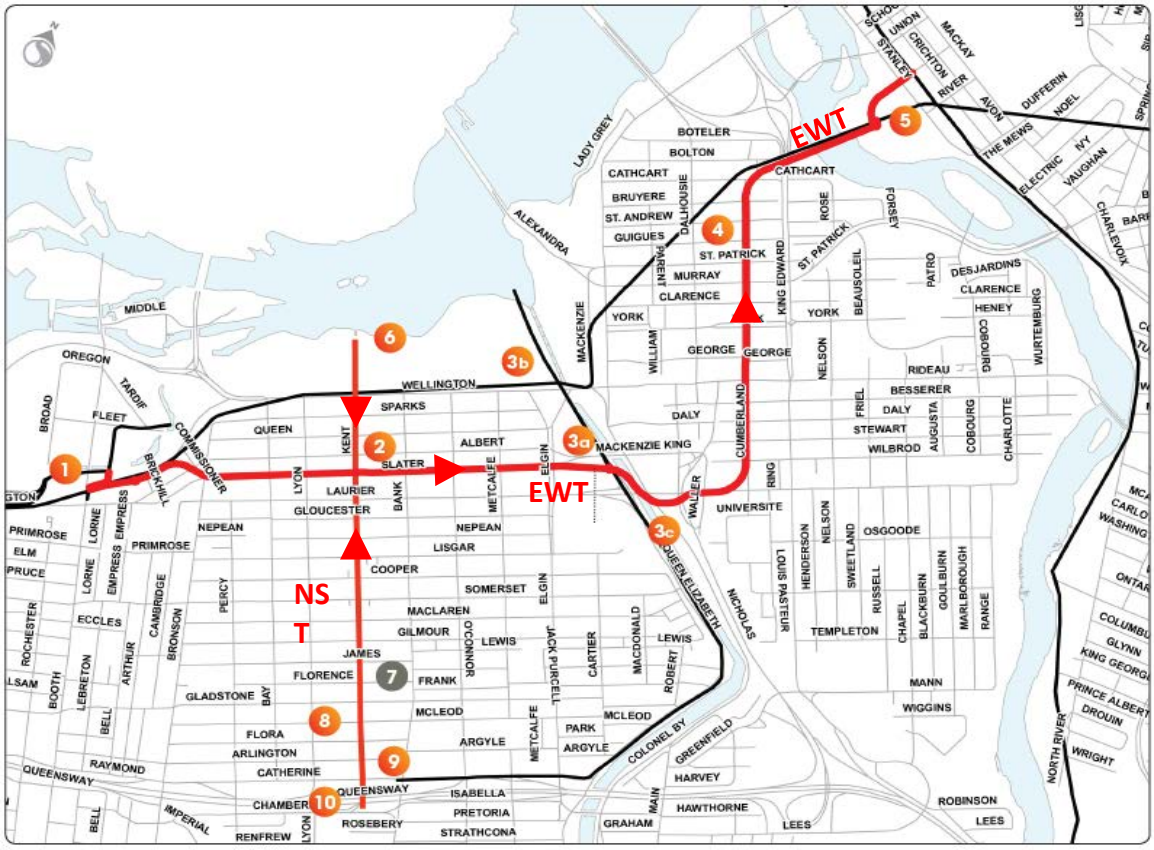
1.0 Introduction

The purpose of this technical memorandum is to review and evaluate the potential routes for construction vehicle access to Site 5 of the Ottawa Combined Sewer Storage Tunnel (CSST), which is located at Stanley Park in the New Edinburgh neighborhood. **Exhibit 1** illustrates the location of the CSST and the location of Site 5 at the east termination of the East-West Tunnel (EWT). This technical memorandum documents the review undertaken in assessing the potential truck access routes to and from Site 5, through the New Edinburgh neighborhood.

Exhibit 1: CSST Key Plan



2.0 Consultation

Since the commencement of the construction phase of the CSST project, the City of Ottawa met with the members of the New Edinburgh Community Alliance (NECA), individual members of the community, attended meetings hosted by NECA and the councilor, and hosted a meeting on February 22, 2017 to obtain input from the community on a preliminary analysis of alternative truck access route options.

Questionnaires and comment sheets were supplied by the City during the February 22 meeting as a means of obtaining feedback from the community. Members of the New Edinburgh community were invited to provide feedback by the following means:

- filling out questionnaires on the truck access routes
- filling out questionnaires on the evaluation criteria
- providing comments on general comment sheets
- providing comments directly to City of Ottawa staff and CSST consultant staff during the meeting
- providing comments via the CSST email inbox
- providing comments to the councilor's office

More than 115 members of the New Edinburgh community attended the open house meeting on February 22, 2017. Several community members contacted the City via the CSST inbox, indicating that they were unable to attend the open house meeting, but wanted to provide their feedback on the truck access routes. Overall, 120 members of the New Edinburgh community provided written feedback via one of the means outlined above. Section 9.0 of this report provides a description of how the feedback received from the New Edinburgh community on the truck access routes has been considered in this revised analysis.

Overall, 120 members of the New Edinburgh community provided written feedback. A summary of the written feedback pertaining to the truck access route options evaluated is provided below:

- Approximately 50% of the respondents preferred, or requested additional consideration of the western routes—of these approximately 60% preferred W2
- Approximately 50% of the respondents provided feedback on the northern and southern truck access route options
  - The northern routes were generally preferred over the southern routes
  - N1 was preferred as first choice and N2 was preferred as second choice
  - Of the southern routes, S1 was preferred as first choice and S4 was the least preferred access route

A summary of the positive and negative aspects of the northern and southern truck access route options is provided in **Exhibit 2.** Community input has been compiled, analyzes and has been integrated into this final trucking route technical memorandum. Key issues, comments, questions or concerns received from the community pertaining to the proposed truck access routes, along with how this feedback influenced the evaluation, are summarized in Section 9.0 of this report.

Exhibit 2: Summary of Comments on Northern and Southern Truck Access Route Options

Route	Comments		
	Pros	**Cons**	**Other**
N1	Uses existing roads, least traffic in neighbourhood, least impact on park, shortest distance and time, minimal effects on commuters, cyclists, pedestrians	Too much traffic, passes the most homes, new signals would be required at Stanley and Sussex	Some suggest this as inbound route only (S1, outbound), traffic control will be critical
N2	Fewest homes impacted with this route, good option but don't use bike path	Too much traffic, Sussex is not a heavy vehicle trucking road	
N3	Fewest homes impacted (5) with this route, shortest route, a new traffic signal would help this route	Too much loss of greenspace, loss of street parking	Consider as inbound route only
S1	Uses existing roads, minimal disruption of the park	High risk area as park is used by kids (playground) and community, Crichton was just redone	Some suggest this as outbound route only (N1, inbound)
S2		Park is used by kids (playground) and community, removes important greenspace, if this route is chosen, use existing roads instead of proposed pathway, loss of waterfront access	Consider as outbound route only
S3		Park is used by kids (playground) and community, too great a risk to children, too many homes; suggest trucks go onto Sussex	
S4	Avoids side streets, bypasses park	Very busy intersection as is; doesn't need more congestion, lots of sharp turns and least direct route, passes a lot of homes, school bus route, residents along this route were inconvenienced by the Keefer street regulator installation in 2008/2009, City crews need regular access to this street to maintain regulator, street parking on both sides of Keefer street: too narrow for large trucks	

3.0 Site 5 Staging Area

In order to meet the City Council's mandated Combined Sewer Overflow (CSO) control objectives, as well as meet Provincial policy objectives, the Combined Sewage Storage Tunnel (CSST) is designed to reduce the volume and frequency of combined sewer overflows at four existing combined sewer outfall locations within the urban core. This includes the control of CSOs from the Rideau River Collector (RRC) to the John Street outfall located on the east side of the Rideau River and within the New Edinburgh community.

The CSST project was tendered and awarded in 2016. Site 5 of the CSST project is the downstream end of the East-West Tunnel (EWT) and the location where combined sewer flows stored in the CSST during a storm event will flow back into the Interceptor Outfall Sewer (IOS), which conveys sewer flows to the Robert O. Pickard Environmental Centre (ROPEC). The IOS Connection Chamber at Site 5 is located within Stanley Park on the northeast shore of the Rideau River. In addition to the IOS Connection Chamber, Site 5 also includes the EWT Outlet Chamber (a surge attenuation tank), the Rideau River Collector Overflow Diversion Chamber (at Queen Victoria and River Lane), and the related diversion sewer (i.e. directing combined sewage from the RRC/John Street overflow pipe to the CSST). **Exhibit 3** presents an illustration of the new infrastructure and construction staging area at Site 5 within Stanley Park, along Queen Victoria, and at the intersection of Queen Victoria and River Lane.

Exhibit 3: Site 5 Staging Area

As tendered, and in accordance with the contractor's preliminary proposed construction sequencing, Site 5 is the launch site for the tunnel boring machine (TBM) that will excavate the EWT. The excavation shaft required to launch the TBM will be repurposed to form the EWT Outlet Chamber (surge attenuation tank) and IOS connection once the tunneling of the EWT is completed. A tunnel launch site is also the location from where the excavated material (tunnel spoils) is extracted. The material excavated at the face of the TBM comes out the back of the unit and is conveyed down the excavated tunnel in rail carts to the launch pit.

The CSST construction Contract was awarded in August 2016 and the contractor's schedule indicates a launch shaft construction at Site 5 commencing in March 2017 in preparation for a TBM launch in February 2018. The contractor reports that it will take the better part of a year to prepare the shaft, tail-tunnel, TBM assembly and supporting rail system in preparation for the launch.

After several months of agency consultations and negotiations throughout the design period (2013-2015), and preliminary land-owner approval during the Environmental Assessment (EA—2009-2013), all approvals are in place for the March 2017 commencement of launch shaft construction at Site 5.

4.0 Infrastructure Required at Site 5

Key Existing Infrastructure

The Rideau River Collector (RRC) is an existing trunk sewer that collects wastewater and some stormwater from local sewers and conveys the combined flows in a northerly direction along the east side of the Rideau River and the Riverside/Vanier corridor. When the RRC was first constructed, it conveyed untreated flows directly to the Ottawa River via an outfall sewer that crosses the New Edinburgh neighborhood along River Lane/John Street. In the mid-1960s, the Interceptor Outfall Sewer (IOS) was constructed in an east-west direction roughly parallel to the Ottawa River. The IOS was designed to intercept all of the wastewater and some of the stormwater from combined outfalls that previously discharged untreated to the river and convey these sewer flows easterly to a new waste water treatment facility—the Robert O. Pickard Environmental Centre (ROPEC) located on Shefford Road, near the Greenbelt. The IOS is a large diameter trunk sewer that intercepts the RRC at the intersection of River Lane/Keefer Street at an underground facility called the Keefer Regulator.

During dry weather flows or modest wet weather flows, the IOS has capacity to intercept all of the flow from the RRC and convey it to the treatment facility at ROPEC. However, during large rain events, the IOS reaches capacity and the Keefer Regulator directs the balance of the flow as a combined sewer overflow (CSO) to the Ottawa River via the old RRC overflow along River Lane/John Street. It acts like a relief valve to mitigate the risk of sewer backups and basement flooding. The overflow is one of the four large CSO outfall locations in the core area of the City where CSOs are to be captured in order to attain the mandated control objectives.

Rationale for CSST Infrastructure Requirement at Site 5

The CSST's primary purpose is to intercept and provide additional storage for combined sewage during wet weather events and thus prevent CSOs from reaching the Ottawa River. It is critical that the four

primary CSO locations in the urban core be intercepted by the CSST to achieve the mandate of the project. In addition to three CSO outfall locations west of the Rideau River (i.e. Ottawa River outfalls at LeBreton Flats, and Rideau Canal), this includes the RRC/John St. Overflow (i.e. CSO outfall) on River Lane, north of Keefer Street.

The East-West Tunnel (EWT) of the CSST roughly parallels the IOS and connects to the IOS at the upper and lower ends of the EWT. The CSST will provide an opportunity for the City to occasionally divert flows from the IOS to the CSST in order to do inspections, repair and maintenance along the IOS—something that has not been possible since the IOS was constructed in the mid-1960s due to the amount of flow in the IOS. Part of the mandate of the CSST project is to provide redundancy to the IOS in the most critical areas, which especially include the watercourse crossings (Rideau Canal and Rideau River). A failure of the IOS under the Rideau River could be catastrophic. Consequently, the City has deemed that providing redundancy to the Rideau River crossing (i.e. extending the CSST across the Rideau River) is a priority to mitigate this risk.

In addition to providing this system reliability, the CSST infrastructure is primarily required in the New Edinburgh area because that is where the existing critical infrastructure is located. This is where the IOS intercepts the RRC and where the RRC/John St. Overflow needs to be intercepted by the CSST. The closest area that has sufficient open space to allow the staging area requirements is Stanley Park.

Infrastructure Required at Site 5

Site 5 is the location where the CSST reconnects to the IOS and also the location where the RRC Overflow needs to be intercepted. Infrastructure required at Site 5 as part of the CSST project include:

- CSST/IOS Connection Chamber in Stanley Park
- CSST Outlet Chamber in Stanley Park—the purpose of this tank is to attenuate and dissipate the energy from the forward and backward waves of water that can materialize as the tunnel fills and water at this downstream location meets with a closed outlet to the IOS
- RRC Overflow Chamber at Queen Victoria and River Lane (on the RRC/John St. Overflow Sewer north of Keefer along River Lane)
- New activated-carbon Odour Control Facility to replace the existing biofilter

5.0 Truck Access Route Descriptions

There are a number of potential truck access route options that could be considered. For the purpose of this review, a finite number of reasonable and representative routing options need to be identified, understanding that the list is not exhaustive and that there could be several potential modifications that could be applied to most of these considered options. It should also be noted that these routes could be considered as providing bi-directional access to Stanley Park, or it may be preferable to come in along one route and leave along a different route.

The truck access routes being considered for the purpose of this review are grouped into three categories based on the direction of travel leaving Stanley Park. The three categories are south, north and west.

The south routes are directed to the intersection of Vanier Parkway/St. Patrick Street, the north routes to Sussex Drive, while the west routes cross the Rideau River. There are four potential south routes considered in this review, three potential north routes considered, and two potential west routes considered. A description of the routes is provided below and the routes are illustrated on **Exhibit 4**.

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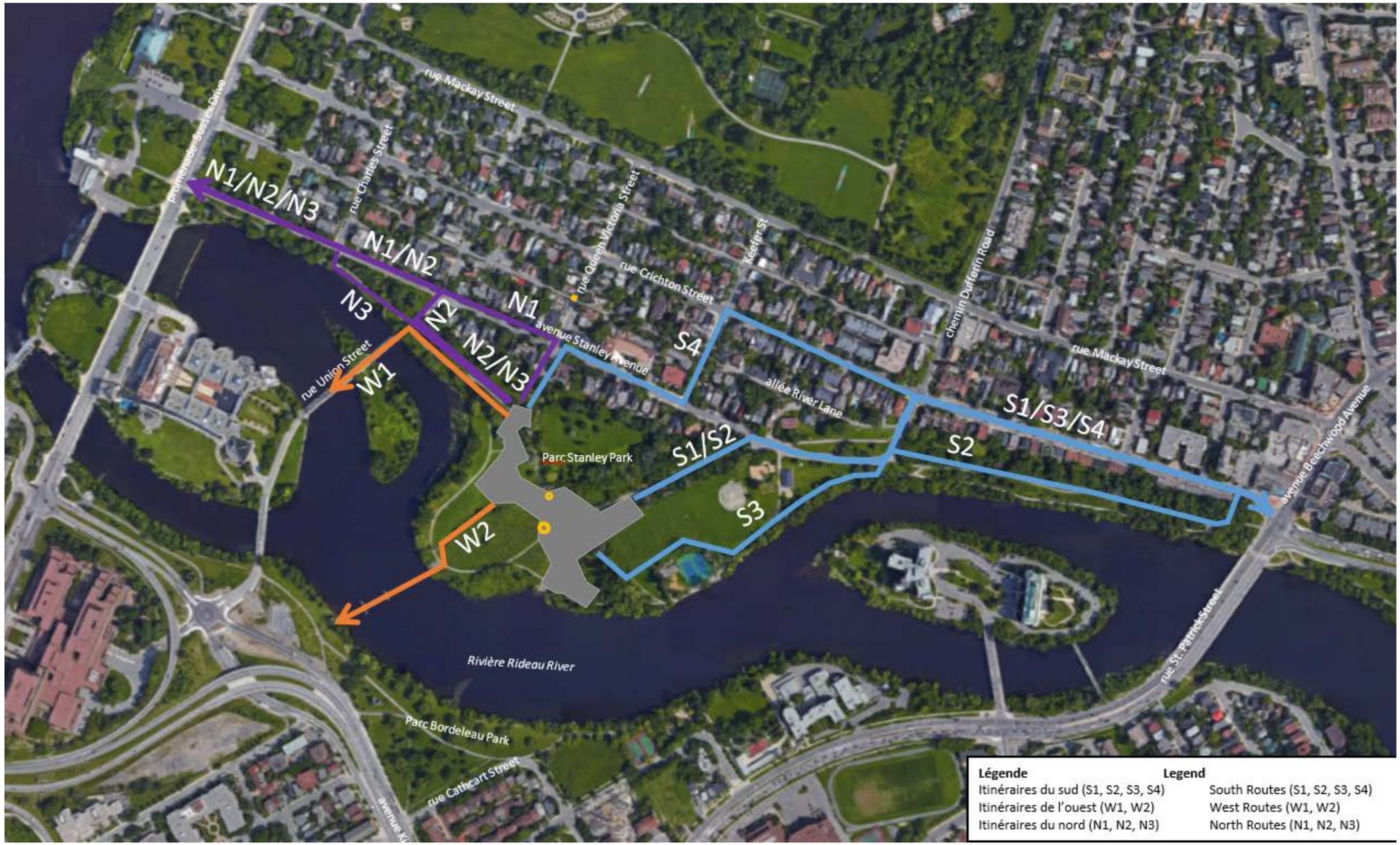
Exhibit 4: Considered Potential Truck Access Routes



5.1 SOUTH 1

From Stanley Park, the truck access route would head northeast along the Rideau River Pathway, continue east and then north on Stanley Avenue, east onto Crichton Street to the intersection of Vanier Parkway/St. Patrick Street. The route extends over approximately 650 m of roadway within the neighborhood and in front of approximately 60 properties, including some institutional and commercial properties. A 170 m section of the multi-use pathway would be temporarily eliminated and reconstructed into a trucking road. At the St. Patrick/Vanier/Beechwood intersection, the only route out of the neighborhood would be turn right on St. Patrick at Crichton. It should also be noted that left turns from St. Patrick to Crichton are not permitted for access into the site. As such, trucks would need to use Beechwood or the Vanier Parkway (currently not permitted) to enter Site 5 from this location.

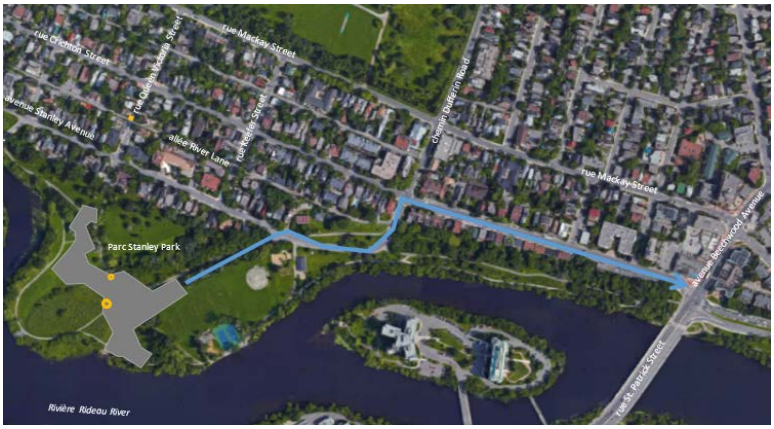


Exhibit 4a: Considered Potential Truck Access Route South 1

5.2 SOUTH 2

From Stanley Park, the truck access route would head northeast along the Rideau River Pathway, turn east onto Stanley Avenue for a short distance before continuing east along the Rideau River Pathway to the intersection of Vanier Parkway/St. Patrick Street. The route extends over approximately 130 m of roadway within the neighborhood but does not front any private properties. Subject to NCC approval, an additional 460 m (total of 630 m) of the multi-use pathway would be temporarily eliminated and reconstructed into a trucking road. At the St. Patrick/Vanier/Beechwood intersection, the only route out of the neighborhood would be turning right on St. Patrick at Crichton. It should also be noted that left turns from St. Patrick to Crichton are not permitted for access into the site. As such, trucks would need to use Beechwood or the Vanier Parkway (currently not permitted) to enter Site 5 from this location.

Exhibit 4b: Considered Potential Truck Access Route South 2

5.3 SOUTH 3

From Stanley Park, the truck access route would head east through the New Edinburgh Park, between the tennis courts and other sports fields, to meet the intersection of Stanley Ave and Dufferin Rd. From there the Route would follow the same alignment as S1 along Dufferin and Crichton. Another possibility could be that the remainder of the S3 route follow the same route as S2 along the multi-use pathway adjacent to the river, but this would be subject to the same constraints as S2. Once at Crichton, the only route out of the neighborhood would be turn right on St. Patrick at Crichton. It should also be noted that left turns from St. Patrick to Crichton are not permitted for access into the site. As such, trucks would need to use Beechwood or the Vanier Parkway (currently not permitted) to enter Site 5 from this location.

Exhibit 4c: Considered Potential Truck Access Route South 3

5.4 SOUTH 4

From Stanley Park, the route would head north along Queen Victoria Street, east onto Stanley Avenue, north on Keefer Street, and east along Crichton Street to the intersection of Vanier Parkway/St. Patrick Street. The route extends over approximately 1000 m of roadway within the neighborhood and in front of approximately 150 properties, including a few institutional and retirement properties, and some commercial properties. There would be no impact to pathways other than the modifications already required at the end of Queen Victoria for construction movements between Sites 5b and 5c. Once at Crichton, the only route out of the neighborhood would be turning right on St. Patrick at Crichton. It should also be noted that left turns from St. Patrick to Crichton are not permitted for access into the site. As such, trucks would need to use Beechwood or the Vanier Parkway (currently not permitted) to enter Site 5 from this location.

Exhibit 4d: Considered Potential Truck Access Route South 4

5.5 NORTH 1

From Stanley Park, the route would head north along Queen Victoria Street, and west onto Stanley Avenue to Sussex Drive. This route (N1) would also provide a viable means to enter the site. The route extends over approximately 500 m of roadway within the neighborhood and in front of approximately 35 properties, including at least one embassy. There would be no impact to pathways other than the modifications already required at the end of Queen Victoria for construction movements between Sites 5b and 5c. At the Sussex intersection, it is expected that trucks would be turning left to leave the neighborhood. For use as an exit route, the City may consider vehicle-actuated signalization due to the heavy traffic along Sussex during peak hours. Such a decision would be subject to an intersection performance analysis and review with the City's traffic group.

Exhibit 4e: Considered Potential Truck Access Route North 1

5.6 NORTH 2

From Stanley Park, the route would head west along the reconstructed Rideau River Pathway, north onto Union Street, and west onto Stanley Avenue to Sussex Drive. This route (N2) would also provide a viable means to enter the site. The route extends over approximately 380 m of roadway within the neighborhood and in front of approximately 10 properties, including at least one embassy. Subject to NCC approval, a 170 m section of the multi-use pathway would be temporarily eliminated and reconstructed into a trucking road. A temporary pathway would be configured between Queen Victoria and Union. At the Sussex intersection, it is expected that trucks would be turning left to leave the neighborhood. For use as an exit route, the City may consider vehicle-actuated signalization due to the heavy traffic along Sussex during peak hours. Such a decision would be subject to an intersection performance analysis and review with the City's traffic group.

Exhibit 4f: Considered Potential Truck Access Route North 2

5.7 NORTH 3

From Stanley Park, the route would head west along the reconstructed Rideau River Pathway, to form a fourth leg to the intersection of Stanley Avenue/Charles Street. From this intersection, the route would continue west along Stanley Avenue to Sussex Drive. This route (N3) would also provide a viable means to enter the site. The route extends over approximately 180 m of roadway within the neighborhood and in front of approximately 5 properties. Subject to NCC approval, a 300 m section of the multi-use pathway would be temporarily eliminated and reconstructed into a trucking road. A temporary pathway could be configured between Queen Victoria and Union. At the Sussex intersection, it is expected that trucks would be turning left to leave the neighborhood. For use as an exit route, the City may consider vehicle-actuated signalization due to the heavy traffic along Sussex during peak hours. Such a decision would be subject to an intersection performance analysis and review with the City's traffic group.

Exhibit 4g: Considered Potential Truck Access Route North 3

5.8 WEST 1

From Stanley Park, the route would head west along the reconstructed Rideau River Pathway, south onto Union Street to cross the Minto Bridges to reach King Edward. The route would avoid passing in front of houses on the neighborhood streets. Subject to NCC approval, a 170 m section of the multi-use pathway would be temporarily eliminated and reconstructed into a trucking road. A temporary pathway could be configured between Queen Victoria and Union.

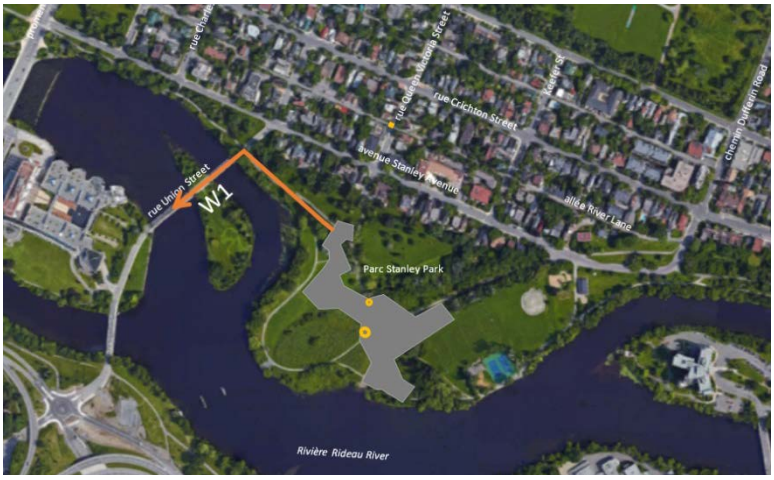


Exhibit 4h: Considered Potential Truck Access Route West 1

5.9 WEST 2

From Stanley Park, a temporary bridge would be constructed near the abandoned piers from the former railway bridge crossing to convey construction traffic to King Edward. The bridge could either be constructed to support truck traffic or a conveyor system to transfer excavated materials across the river. Trucking roadways would be required to be built across Stanley Park and Bordeleau Park to reach the temporary bridge along with the approvals and permits for constructing a bridge across the Rideau River within limited windows of opportunity.

Exhibit 4i: Considered Potential Truck Access Route West 2

6.0 Peak Construction Trucking Volumes in Context of Existing Traffic Conditions

For the purpose of this analysis, it is considered that the primary access and egress routes in/out of the neighborhood from Stanley Park would be via the intersections of Stanley/Sussex to the north and Crichton/Beechwood/St.Patrick/Vanier to the south. In accordance with City of Ottawa traffic counts, the existing background traffic is as follows:

- Stanley at Sussex
  - Daily AM Peak Hour: 176 vehicles (87 leaving / 89 incoming)
  - Daily Midday Hour: 104 vehicles (60 leaving / 44 incoming)
  - Daily PM Peak Hour: 217 vehicles (134 leaving / 83 incoming)
- Crichton at Beechwood/St.Patrick/Vanier
  - Daily AM Peak Hour: 412 vehicles (244 leaving / 168 incoming)
  - Daily Midday Hour: 318 vehicles (148 leaving / 170 incoming)
  - Daily PM Peak Hour: 492 vehicles (261 leaving / 231 incoming)

There is a bus route traversing the neighborhood along Crichton. At the north end of Crichton, the bus accesses and egresses the neighborhood via John and Alexander respectively. At the south end, the bus accesses/egresses via the Vanier Parkway. The bus frequency along Crichton is as follows.

- AM Peak Hour: 9-12 buses (intervals of 15-20 minutes northbound and 8-10 minutes southbound)
- Midday Hour: 6-7 buses (intervals of 20 minutes northbound and 15-20 minutes southbound)
- PM Peak Hour: 9-10 buses (intervals of 10 minutes northbound and 15-20 minutes southbound)

The largest volume of construction related trucking will occur during the 10-month period that the EWT will be constructed and tunnel spoils (muck) will be removed from Stanley Park. During this 10-month tunnel construction and mucking period, it is estimated that 2 to 4 triaxles (dump trucks) per hour will be required to support the tunneling operations. For the remaining 20 months (11 months before tunneling and 9 months after tunneling), the trucking volumes will generally be much lower and will be highly variable; from long periods with no noticeable trucking, to short duration peaks of 3-4 trucks per hour while hauling soil and granular material or concrete deliveries. These peaks will be of short duration due to the modest amount of soil to haul. These are non-coinciding activities and thus non-coinciding trip generations.

During tunnel construction activities, the variation in trucking (2-4 trucks per hour) reflects the variable tunneling production to be expected. As such, the site-generated hauling trips during tunneling are estimated to peak at approximately 4 to 8 trips per hour (half of the trips are empty trucks incoming/half of the trips are full trucks leaving).

If the worst case scenario is considered and that 8 trips (in or out) are generated by the construction within an hour and that all 8 trips use the same route in & out of the neighborhood, it would be no greater than the existing bus volume on Crichton, and it would represent an impact as follows on background traffic:

- Stanley at Sussex
  - AM Peak: 4.5% increase over existing conditions
  - Midday: 7.7% increase over existing conditions
  - PM Peak: 3.7% increase over existing conditions
- Crichton at Beechwood/St. Patrick/Vanier
  - AM Peak: 2% increase over existing conditions
  - Midday: 2.5% increase over existing conditions
  - PM Peak: 1.6% increase over exiting conditions

If the access and egress to/from the neighborhood are from different routes (for example, come in from Sussex and leave via St. Patrick), this impact would be divided by two.

7.0 Analysis of the Potential Routes

As described in the previous section, nine (9) potential truck access route options are being considered for the purpose of this review. They are as follows:

- North 1 (Queen Vic/Stanley)
- North 2 (Pathway/Union/Stanley)
- North 3 (Pathway/Stanley)
- West 1 (Pathway/Union/Minto Bridges)
- West 2 (Temp Bridge/Bordeleau Park)
- South 1 (Stanley/Crichton)
- South 2 (Stanley/Pathway)
- South 3 (Park/Pathway)
- South 4 (Queen Vic/Stanley/Keefer/Crichton)

7.1 TRUCK ACCESS ROUTE ANALYSIS METHODS

The analysis of the potential alternate truck access routes was completed following a method known as multi-criteria analysis [1](MCA). MCA is a method used to evaluate alternatives based on multiple criteria to ensure reasonable and robust selection of the preferred alternative(s).

MCA is a well-developed and widely-used method in applications such as this one, and is described below.[2] Because MCA is a quantitative method, and some of the factors used in the analysis can be characterized only qualitatively, the numerical results of the MCA are approximate.

1. Identify alternatives that are reasonable, conceivable, realistic and feasible (see Section 5.0 for a description of the alternative truck access routes)
2. Screening of alternatives to exclude those that do not meet minimum requirements, or for which there are "show-stoppers" that would eliminate that alternative as feasible option
3. Establish criteria—technical, environmental, socio-cultural and economic—to characterize the alternatives
4. Weighting criteria to assign relative importance of one criterion over another
5. Characterize the alternatives based on the established criteria
6. Score the alternatives for each criterion using qualitative value scales
7. Ranking of the alternatives by multiplying the criterion scores by the criterion weights

7.2 SCREENING OF POTENTIAL TRUCK ACCESS ROUTE OPTIONS

Prior to subjecting all of the above options to a review, a verification is made to assess whether some of these are not feasible or acceptable. The screening below includes options that were presented in the draft trucking memo, as well as additional options investigated further to requests from the community during the consultation period.

Option West 1a (W1a) – Trucking on Minto Bridge

Option West 1a would see hauling trucks passing over the Minto Bridges. Two independent cursory reviews of the feasibility of this option were conducted by structural engineers at CH2M and Parsons. The Detailed Design Report for the bridge rehabilitation project (Parsons, 2015) stipulates that due to the proximity of the Bytown Bridges on Sussex Drive, there was no need for the Minto Bridges to be strengthened to accommodate large vehicles and remove the load limit posting. According to the report, occasional large vehicles may drive on the bridge, such as small delivery trucks to the John G. Diefenbaker building at 111 Sussex Drive, the occasional school bus, snow clearing equipment, and possibly emergency vehicles. CH2M bridge engineers conducted a review of Parson's reports in 2017 and supported the recommendations. In theory, the load limit of the bridge of 20 tonnes would permit an empty dump truck to pass, but not a full one. The vertical clearance limitations and knee braces on the portal frame also present a restricted clearance for larger vehicles and strike risk for a high volume of trips.

[1] Multi-criteria analysis is also known as multi-criteria decision analysis (MCDA)
[2] For a detailed description of MCA methods, there are many publications, such as *Multi-criteria analysis: a manual* published by the Department for Communities and Local Government: London (2009)

Both structural engineers recommended against the use of the bridges as a haul route. The CH2M engineer provided the following reasons:

1. The geometry of the structure is not conducive for safe passage of large vehicles.
2. There is a risk of load strike on the knee brace on the portal frame.
3. High pedestrian use: report indicates deflection/vibration limit marginal under existing conditions.
4. Marginal capacity: 20 tonne limit. Even if specified that only empty trucks take this route there is a risk of driver error once the route has been implemented (i.e. a driver could mistakenly go over with a partial or full load).
5. The design criteria for the rehab assumed 75% of CL3 loading (CL3 loading is for urban buses, milk trucks and single-unit trucks). The volume of trucks that would need to cross the bridge could also subject this historic and recently renovated structure to fatigue and early distress.

Option West 1a is not carried forward to the analysis.

Option West 1b (W1b) – Rail on Minto Bridge

During consultation with the community, a variation of option W1 was proposed by some residents. It would consist of configuring rails from Site 5, extending north along the Rideau River Eastern Pathway, turning 90 degrees onto Union Street, crossing over the Minto Bridges and turning 90 degrees again on the west shore to a new staging area in Bordeleau Park. It is referred to as Option W1b.

Operation with this option would be summarized as follows:

- Rail carts would be extracted from the launch pit by a crane and their content would be dumped in a stockpile (similar to trucking option).
- A loader would load the material from the stockpile onto rail carts at surface (similar operation to loading trucks).
- An engine-powered train would haul the material along the pathway and across the Minto Bridges, to Bordeleau Park.
- A second crane would dump the rail carts on a second stockpile in a second (west shore) staging area.
- Another loader would load trucks for hauling away.

This rail alignment would require full security fencing and full closure of all three segments of the Minto Bridges to vehicles, cyclists and pedestrians for over a year (including time to install and remove the rails) due to the very high safety concern with operating a railway within a park environment. It would imply cutting off any access to water, or the stone dust path, or the west dog park from Queen Victoria or Union. The only means to reach the above would be from new Edinburgh Park (by the soccer field and tennis court).

The rail would also result in eliminating access to the underground parking at the John G. Diefenbaker Building at 111 Sussex Drive since all three bridges would need to be shut down. This would be an untenable situation and a key reason why the Minto Bridges restoration project was completed in two phases (to always maintain access to 111 Sussex Drive from Union Street).

A high level technical review of this option was conducted. In order to keep up with the tunnel excavation, it is estimated that approximately 18 trains pulling four to six carts would be required each day

(depending on the size of the carts). As hauling is expected to take place over approximately 12 hours, this would result in a round trip every 40 minutes (a train in one direction every 20 minutes), just to keep up with daily tunneling progress. This represents a very aggressive schedule to upkeep for the train. It is expected that the locomotive, carts and hauled material would weigh in excess of 110T for the loaded trip and in excess of 70T for an empty return trip. As indicated further above, the bridge has a rated capacity of 20T. The estimated load in excess of 110 tonne for trains far exceeds the 20 tonne suggested posting for the bridges. There would be a high probability of damages during the operations to the newly rehabilitated historic bridges.

A rail system would also be a very noisy and dusty operation and would also have diesel train engines running constantly for approximately 12 hours per day.

The radii required to turn the rails 90 degrees, the loss of access to 111 Sussex Drive and the weight of the high frequency loaded carts and rail on the historic bridges render this option unacceptable. Option W1b (rails on Minto Bridges) is therefore not carried forward to the analysis.

Option West 1c (W1c) – Conveyor on Minto Bridge

Another variation of option W1 was proposed by some residents. Instead of installing a rail system, Option W1c would consist of installing a conveyor system from Site 5, extending north along the Rideau River Eastern Pathway, turning 90 degrees onto Union Street, crossing over the Minto Bridges and turning again on the west shore to a new staging area at the north end of Bordeleau Park. A conceptual layout revealed that six separate conveyor belts would be required along the 750-m length between the main shaft in Stanley Park and the west shore stockpile, with one belt dumping onto the next belt at every bend in the alignment. Material transfer between belts would be done with a hopper installation (7 hoppers in total).

A conveyor belt to transport excavated material is typical of industrial and mining applications. It is a significantly noisy and dusty operation with considerable vibration, as well as being a substantial safety hazard and is therefore typically well contained and protected to mitigate potential incidents. It is an incompatible system with park environments and adjacent residences. Consequently, only a fully-enclosed conveyor system would be deemed appropriate for consideration for this location, due to proximity of residences, park users, noise, dustiness safety and the passage over a key waterway. The conveyor system would still need to be powered by diesel engines resulting in constant emissions for approximately 12 hours per day.

Similar to the rail option, full security fencing would be required along the length of this conveyor and full closure of all three segments of the Minto Bridges to vehicles, cyclists and pedestrians for over a year (including time to install and remove the system). It would imply cutting off any access to water, or the stone dust path, or the off-leash area of the park from Queen Victoria or Union. The only means to reach the above would be from new Edinburgh Park (by the soccer field and tennis court).

The conveyor system would also result in eliminating access to the underground parking at the John G. Diefenbaker Building at 111 Sussex Drive since all three bridges would need to be shut down.

As indicated for the rail option, this would be an untenable situation and a key reason why the Minto Bridges restoration project was done in two phases (to always maintain access to 111 Sussex Drive from Union Street).

In order to keep up with the daily tunneling progress, it is estimated that the conveyor system would need to move between 60-80 metric tonnes of material each hour for approximately 12 hours each day. The conveyor system would need to run constantly over this period. This is a mechanical system that is typically messy and often subject to shut-downs due to maintenance needs and/or unanticipated break-downs. In the event of a shut-down, the conveyor system would not likely be able to catch-up to the tunneling production unless it ran overnight. Alternatively, trucking would be required in such cases. If the tunneling production is impacted, it would have an additional cost of approximately $150,000/day in lost production for the contractor, which will be borne by the City, in addition to the cost of the repair and trucking.

Additional subcontractors/specialists would be required for approximately one year to operate and maintain the conveyance system. Spare parts would also need to be produced and stored locally for this specialty installation to minimize downtime to a few days instead of a few weeks.

The second staging area required on the west shore of the Rideau River would result in the removal of the new basketball court, berming, trees, new walkways, lighting, and all associated landscaping that was completed in 2016. Full reinstatement/reconstruction and re-landscaping and re-planting of trees would be required.

Opinion of Probable Costs

Anticipated cost impacts to the CSST project have been estimated based on a high-level assessment of design changes and construction requirements for the option of configuring a conveyor system on the existing Minto Bridges. They are presented in **Exhibit 5**. It should be noted that there are unknown costs at this time as this estimate of probable costs is prepared at a conceptual level with limited knowledge of details. It must be considered to represent a minimum cost impact to the project. There are many factors related to the contractor's planned construction methods that the design team and the City are not yet party to and/or aware of at this time to allow for a more accurate assessment of the cost impacts. **There is a considerable risk that cost escalation beyond this high-level opinion of probable costs may occur.**

Exhibit 5: Opinion of Probable Costs for Conveyor System on Minto Bridges

Item	Estimated Cost
Mobilization, Insurance, Contractor Change Management	$0.2M
Changes to Staging at Stanley Park and along Pathway, New Maintenance Road, Temp Pathway, Security Fencing, Soil Removal, Additional Environmental Protection, etc (east of river)	$0.6M
Second Staging Area: Removals and Restoration of Basketball Court, Parking Lot, Berms, Lighting, Pathway, Trees, Landscaping, Security Fencing, Environmental Protection, etc (west of river)	$0.4M
Supply, Construction & Removal of Conveyor System (enclosed w/hoppers, etc)	$3.9M
Operation and Maintenance of Conveyor System for a year	$0.8M
Additional Material Handling Costs (two staging areas, loading twice) for 10 months	$0.6M
Additional Costs for Contingency Trucking or Tunneling Delays resulting from Shut-Downs in Belt ($150,000 per day if tunnel production impacted)*	**TBD**
General Contractor Setup Assistance + Overhead and Markup	$2.4M
Subtotal (Including Overhead and Profit and Excluding Project Allowances) *	**$8.9M**
Project Allowances (Engineering (20%), Utilities (5%), Property (8%), City Internal Costs (7%) & Miscellaneous (5%)) – calculated based on the City of Ottawa Cost Estimate Classification System	$4.0M
Subtotal (Capital Cost + Project Allowances)	**$12.9M**
Class D OPC Contingency 45% of Subtotal (Capital Cost + Project Allowances)**	$5.9M
TOTAL Opinion of Probable Cost (OPC)*** * *Does not include cost allowance for shut-downs, which are challenging to estimate, but which are very likely to happen occasionally.* ***These would be in addition to the cost presented in this table.*** ** *Assumes no contract delays, implying that the contractor would commence trucking on roads if conveyor system not ready in time.* *** *Class 'D' OPC considered to have an accuracy of +25% to -25%.*	**$18.8M**

Timelines and Approvals

Adding this conveyor system and new staging area west of the Rideau River would result in **significantly different** social and natural impact to other receptors (an additional community and 111 Sussex Drive) that were not previously directly impacted during the EA completed in 2013. This results in a need to prepare an amendment to the EA, which would be subject to public consultation and engagement of the affected community on the west shore of the river and 111 Sussex Drive.

Order and delivery of the specialized conveyance system is expected to take 6-8 months, with an additional 2 months for installation and commissioning, preceded by 2 months of design and scope change preparation and sign-off by City, and another 2 months of change management (contractor developing quote, submitting quote, review, negotiation, acceptance, contract change, etc). This 12-14 month period would only commence after the proposed conveyance system has cleared the EA Amendment, funding approval, and preliminary environmental approvals.

The following outlines some of the approvals that are anticipated to be required prior to securing permission to install a conveyor system on the Minto Bridges and along NCC pathways and a new staging area west of the river.

- Municipal Budget Approval
- EA Amendment, complete with consultation with the communities on both sides of the Rideau River
- City of Ottawa Parks and Recreation
- City of Ottawa Transportation and Parking
- National Capital Commission (NCC)
  - Approval for an increase in the impact to Stanley Park (additional trees, park, pathways)
  - Environmental Effect Evaluation (EEE) Report
  - Federal Land Use Design and Transactions Approval (FLUDTA)
  - Easements Agreements
- Rideau Valley Conservation Authority (RVCA)
- Ministry of Natural Resources and Forestry (MNRF)
- Aboriginal Consultation (Rideau River has Aboriginal heritage significance)
- Ministry of Tourism, Culture and Sports (Heritage Considerations)

Negotiation and approval periods for some of the above can be highly variable. Since there is no in-water works, it is expected that RVCA and MNRF approvals for work in proximity to shorelines would not be too onerous to secure. However, although most can proceed in parallel, it is expected that the whole process would likely extend over a period of several months. It has taken close to two years to finalize the agreement with the NCC for the current sites, and this followed years of monthly discussions and negotiations.

The tunnel construction will commence in February 2018. A 14-month design, change management, supply, installation and commissioning period, in addition to the approvals period of several months would result in the conveyor system potentially being ready for use by late 2018. The tunnel mucking is scheduled to be completed by December 2018. **There is a significant risk if this infrastructure was built, it may be used only very little and possibly not at all.**

In addition to the significant additional costs consideration and the untenable loss of access to 111 Sussex Drive for over a year, the timelines outlined above highlight that there is insufficient time for the conveyor system option to be implemented in a manner that would provide an opportunity to significantly reduce the duration of the trucking related to tunnel construction along the preferred route(s) within New Edinburgh. As a result, Option West 1c (conveyor on Minto Bridges) is not carried forward to the analysis.

Option West 2 (W2) – New Bridge Across Rideau River

Option West 2 would see a temporary bridge being constructed across the Rideau River in order to direct hauling trucks to King Edward Avenue. As previously discussed, the bridge could be either designed to support truck traffic or a conveyor system that would require handling the materials at each end of the river. Structural engineers at CH2M were consulted and prepared a feasibility review for this option of constructing and removing a temporary bridge. Two options for accommodating the bridge across the river were considered:

- Reusing the existing/abandoned piers and abutments from the former rail bridge (**Option W2a**)
- Installing new temporary piers and abutments by the existing/abandoned ones (**Option W2b**)

Given that the existing piers have been abandoned for over 40 years, it is very likely that the construction of new temporary bridge piers will be required. Either way, in-river construction work requiring a number of approvals would be required before this option could be implemented.

<u>Opinion of Probable Costs</u>

Anticipated cost impacts to the CSST project have been estimated based on a high-level assessment of design changes and construction requirements for both temporary bridge options (W2a and W2b). They are presented in the **Exhibit 6** and **Exhibit 7**. It should be noted that there could be numerous unknown costs at this time as these estimates of probable costs are prepared at a conceptual level with limited knowledge of details. It represents a minimum cost impact to the project. There are many factors related to the contractor's planned construction methods that the design team and the City are not yet party to and/or aware of at this time to allow for a more accurate assessment of the cost impacts. **There is a considerable risk that cost escalation beyond this high-level opinion of probable costs may occur.**

Exhibit 6: Opinion of Probable Costs for Temporary Bridge using Existing Piers (Option W2a)

Item	Estimated Cost
Mobilization, Insurance, Contractor Change Management	$0.2M
In-Water Berm Installation and Removal, Environmental Mitigations and Compensations	$0.9M
Approach Roads and Staging, Soil Removal, Shoreline Working Platform, Pathway Modifications, Fencing, etc	$0.6M
Temporary Bridge Structure & Bridge Prefabrication (Incl. Installation, Removal and Markup)	$1.6M
Removals and Restoration & Tree Plantings	$0.3M
Restoration and refurbishing of existing piers and abutments – Heritage Restauration	$1.5M
General Contractor Setup Assistance, Subcontractor Management + Overhead and Markup	$1.7M
Subtotal (Including Overhead and Profit and Excluding Project Allowances)	**$6.8M**
Project Allowances (Engineering (20%), Utilities (5%), Property (8%), City Internal Costs (7%) & Miscellaneous (5%)) – calculated based on the City of Ottawa Cost Estimate Classification System	$3.1M
Subtotal (Capital Cost + Project Allowances)	**$9.9M**
Class D OPC Contingency 45% of Subtotal (Capital Cost + Project Allowances) *	$4.4M
TOTAL Opinion of Probable Cost (OPC)** * *Assumes no contract delays, implying that the contractor would commence trucking on roads if bridge not ready in time.* ** *Class 'D' OPC considered to have an accuracy of +25% to -25%.*	**$14.3M**

Exhibit 7: Opinion of Probable Costs for Temporary Bridge using New Piers (Option W2b)

Item	Estimated Cost
Mobilization, Insurance, Contractor Change Management	$0.2M
In-Water Berm Installation and Removal, Environmental Mitigations and Compensations	$0.9M
Approach Roads and Staging, Soil Removal, Shoreline Working Platform, Pathway Modifications, Fencing, etc	$0.6M
Temporary Bridge Structure & Bridge Prefabrication (Incl. Installation, Removal and Markup)	$1.6M
Removals and Restoration & Tree Plantings	$0.3M
Installation of New Piers and Abutments	$0.7M
General Contractor Setup Assistance, Subcontractor Management + Overhead and Markup	$1.5M
Subtotal (Including Overhead and Profit and Excluding Project Allowances)	**$5.8M**
Project Allowances (Engineering (20%), Utilities (5%), Property (8%), City Internal Costs (7%) & Miscellaneous (5%)) – calculated based on the City of Ottawa Cost Estimate Classification System	$2.6M
Subtotal (Capital Cost + Project Allowances)	**$8.4M**
Class D OPC Contingency 45% of Subtotal (Capital Cost + Project Allowances) *	$3.8M
TOTAL Opinion of Probable Cost (OPC)** * *Assumes no contract delays, implying that the contractor would commence trucking on roads if bridge not ready in time.* ** *Class 'D' OPC considered to have an accuracy of +25% to -25%.*	**$12.2M**

Required Approvals for Temporary Bridge

The following outline some of the approvals that are anticipated to be required prior to securing permission to install a temporary bridge across the Rideau River.

- Municipal Budget Approval
- EA Amendment, complete with consultation with the communities on both sides of the Rideau River
- National Capital Commission (NCC)
  - Approval for impact on a second NCC park (Bordeleau) and an increase in the impact to Stanley Park (additional trees, park, pathways)
  - Environmental Effect Evaluation (EEE) Report
  - Federal Land Use Design and Transactions Approval (FLUDTA)
  - Easements Agreements
- Transport Canada – Navigation Protection

- Department of Fisheries and Oceans (DFO)
- Rideau Valley Conservation Authority (RVCA)
- Ministry of Natural Resources and Forestry (MNRF)
- Aboriginal consultation (Rideau River has Aboriginal heritage significance)
- Ministry of Tourism, Culture and Sports (Heritage Considerations)

Negotiation and approval periods for some of the above can be highly variable. Although most can proceed in parallel, it is expected that the whole process would likely extend over a period greater than a year. It has taken close to two years to finalize the agreement with the NCC for the current sites, and this followed years of monthly discussions and negotiations. It is improbable that these approvals would be secured prior to early spring 2018, at which point the design and construction of the bridge would need to commence. In-water works could not commence before July due to fisheries restrictions. It is highly improbable that the bridge could be constructed and ready for use before mid/late fall 2018. In accordance with the contractor's submitted schedule, mobilization to Stanley Park for pre-tunneling activities and preparations is planned for March 2017, and the tunnel mucking operation for the East-West tunnel is planned between February-December 2018. **There is a significant risk if this infrastructure was built, it may be used only very little and possibly not at all.**

In addition to the significant costs consideration, with these approval requirements, there is insufficient time for either Option W2a or W2b (new temporary bridge) to be implemented in a manner that would provide an opportunity to significantly reduce the duration of the trucking related to tunnel construction along the preferred route(s) within New Edinburgh. As a result, neither Option W2a nor W2b is carried forward to the analysis.

Option West 3 (W3) – Barging Across Rideau River

During consultation with the community, a new West option was proposed by some residents. It would consist of crossing the river near the W2 alignment but by using barges in lieu of a bridge. This alternative option is labeled W3.

The geologic profile across the river was reviewed. The west shore (Bordeleau Park) slopes into the water very gently and this gentle slope extends partly across the Rideau River. This implies that the depth of water near the west shore is very shallow and could not accommodate loaded barges, especially when considering the highly variable water elevation controlled by the downstream dam. The water levels can change significantly in a very short duration when water is released at the dam, often without notice. This occurred during the geotechnical borehole drilling operation, tilting the drill barge and damaging the drill core. Dredging of the river bottom would be required in order to accommodate barges. However, rock is close to the bottom of the river and it is unlikely that dredging would achieve much depth improvement. Alternatively, a causeway would need to be build partway across the river from the west bank, in order to get deep enough to build the docking facility for the barge.

Filling a portion of the river to create a causeway to a dock may result in upstream flooding in an area already susceptible to flooding as evidenced by the yearly ice breaking operation. Barge crossings during winter and ice conditions would be significantly problematic and highly undesirable.

As indicated above, a barge would still require work in water and would require most of the approvals outlined for the new bridge option as it is still necessary to build docks and partially fill the river. The same constraints outlined for W2 will therefore apply to W3. **There is a significant risk if this infrastructure was built, it may be used only very little and possibly not at all.**

There is insufficient time for Option West 3 (barge) to be implemented in a manner that would provide an opportunity to significantly reduce the duration of the trucking related to tunnel construction along the preferred route(s) within New Edinburgh. As a result, Option West 3 is not carried forward to the analysis.

Option South 2 (S2)

Option South 2 presents some functional/operational challenges at the Beechwood/Vanier/St. Patrick intersection. As trucks approach St. Patrick from within the park, there are three turning options that were considered:

1. *Turning right onto St. Patrick:* Representing a very sharp turn with limited visibility within the Vanier/Crichton/St. Patrick intersection. This would require making changes to signalization to accommodate a fifth leg to the intersection to allow truck movements. This change could not be done in a safe enough manner to consider this option as being feasible.
2. *Trucking through intersection to Vanier Parkway (currently not permitted)*: Even if trucking were permitted along the Vanier Parkway, making changes to signalization to accommodate a fifth leg to the intersection to allow truck movements between Route S2 and the Vanier Parkway. This change could not be done in a safe enough manner to consider this option as being feasible.
3. *Routing temporary road to Crichton at St. Patrick:* The temporary access road would turn to the east as it approaches St. Patrick and connect to Crichton immediately north of the intersection. Additional mature trees adjacent to the intersection would need to be removed in order to accommodate this route. While this turn onto Crichton is deemed feasible, it will require the use of both the through-right hand and the left turn lanes to make the manoeuver onto Crichton. This may create delays for traffic exiting Crichton. Furthermore, the contractor may be required to flag the truck exits on to Crichton due to poor sight distance and utilization of both lanes to make the manoeuver.

Option South 2 is thus carried forward for evaluation under the configuration of routing temporary road to Crichton at St. Patrick

Other Options

Upon initial screening of the other seven options, there do not appear to be critical constraints that would impact their feasibility. As such, they appear to warrant additional consideration and are therefore carried for further analysis into the evaluation in Section 7.4. All of these other options feature routes along existing roadways and/or along pathways and through parks. The Environmental Assessment (EA) has established that the works and hauling from the site are acceptable activities; this evaluation considers various hauling routing options.

7.3 CRITERIA

The criteria were selected to be consistent with that used in the original CSST Environmental Assessment Report, with some modifications to remove those criteria that are not relevant to this truck access route review.

As presented in the following exhibits, the criteria include:

Technical
T1 – Traffic Management
T2 – Geometry
T3 – Infrastructure
T4 – Safety
T5 – Operation
T6 – Schedule

Socio-Cultural
S1 – Urban Green Space / Open Space
S2 – Cultural Heritage Values and Features
S3 – Disruption to Community
S4 – Consistency with Planning Policies
S5 – Property Issues

Economy
E1 – Impact on Businesses / Land Owners
E2 – Affordability

Natural Environment
N1 – Significant Natural Features

7.4 EVALUATION

The evaluation consists of the following two exhibits. **Exhibit 8** is the Pairwise Comparison of the criteria. Each criterion is compared to each other criterion in an attempt to assign relative importance or criticality in order to create a weighting of criteria (i.e. make some criterion more important than others in the evaluation). Further details and explanations are included below the exhibit table.

Exhibit 9 consists of the evaluation matrix. Considerations, advantages, disadvantages and impacts of each options are presented in **Exhibit 9**. Each option is assigned a High/Medium/Low impact rating for each criterion. There is a scoring system associated with these High/Medium/Low ratings. These scores are then multiplied by the weighting developed in Exhibit 6 in order to reflect the variable criticality of the various criteria.

May 25, 2017

Exhibit 8: Pairwise Comparison of Evaluation Criteria

CRITERIA	T1 - Traffic Management	T2 - Geometry	T3 - Infrastructure	T4 - Safety	T5 - Operation	T6 - Schedule	N1 - Impact on Significant Natural Features	S1 - Impact on Green Space/Open Space	S2 - Cultural Heritage Values or Features	S3 - Disruption to Community	S4 - Consistency with Planning Policies	S5 - Property Issues	E1 - Impact on Businesses and/or Land Owners	E2 - Affordability	Sum	Weighted
T1 - Traffic Management		4	4	0	4	3	4	4	3	0	4	4	3	2	39	7.1%
T2 - Geometry	2		4	0	3	2	2	2	2	0	4	4	2	2	29	5.3%
T3 - Infrastructure	2	2		0	3	2	2	2	2	0	3	3	1	1	23	4.2%
T4 - Safety	6	6	6		6	6	6	6	6	6	6	6	6	6	78	14.3%
T5 - Operation	2	3	3	0		2	2	2	1	0	3	2	2	1	23	4.2%
T6 - Schedule	3	4	4	0	4		3	3	2	1	5	5	3	3	40	7.3%
N1 - Impact on Significant Natural Features	2	4	4	0	4	3		3	2	0	4	4	2	2	34	6.2%
S1 - Effects on Green Space/Open Space	2	4	4	0	4	3	3		2	1	4	4	2	2	35	6.4%
S2 - Cultural Heritage Values or Features	3	4	4	0	5	4	4	4		1	4	4	3	3	43	7.9%
S3 - Disruption to Community	6	6	6	0	6	5	6	5	5		6	6	4	5	66	12.1%
S4 - Consistency with Planning Policies	2	2	3	0	3	1	2	2	2	0		2	1	1	21	3.8%
S5 - Property Issues	2	2	3	0	4	1	2	2	2	0	4		1	1	24	4.4%
E1 - Impact on Businesses and/or Land Owners	3	4	5	0	4	3	4	4	3	2	5	5		3	45	8.2%
E2 - Affordability	4	4	5	0	5	3	4	4	3	1	5	5	3		46	8.4%
										TOTALS					546	100.0%

Prioritized Ranking of Criteria and Weightings

CRITERIA	WT
T4 - Safety	14.3%
S3 - Disruption to Community	12.1%
E2 - Affordability	8.4%
E1 - Impact on Businesses and/or Land Owners	8.2%
S2 - Cultural Heritage Values or Features	7.9%
T6 - Schedule	7.3%
T1 - Traffic Management	7.1%
S1 - Effects on Green Space/Open Space	6.4%
N1 - Impact on Significant Natural Features	6.2%
T2 - Geometry	5.3%
S5 - Property Issues	4.4%
T3 - Infrastructure	4.2%
T5 - Operation	4.2%
S4 - Consistency with Planning Policies	3.8%

Table Notes:

1) In the "pairwise comparison", each criterion is compared to each other criterion in an attempt to assign relative importance or criticality. For each comparison, there are 6 points available. If two criteria are deemed to have comparable criticality, they will each be assigned 3 points (out of six available points). If one is deemed more critical than the other, the more critical criterion may get 4 or 5 of the six available points, with the less critical criterion getting 2 or 1 point. The criteria (or rows) with the higher percentage of overall points are assigned a higher weighting, which will be applied to the evaluation matrix.
For example, the comparison between criteria T1 and T2 resulted in a 4-2 split in favor of T1, implying that T1 is deemed to be somewhat more critical than T2.

Cells highlighted in yellow indicate where feedback from the New Edinburgh community has altered the weighting of the criteria.

Exhibit 9: Evaluation Matrix

		SOUTH ROUTES				NORTH ROUTES		
Criteria		S1	S2	S3	S4	N1	N2	N3
Technical								
T1	Traffic management	Medium	Medium	Medium	Medium	Medium	Medium	Medium
		- Level of Service of Intersection of St. Patrick/Vanier/Beechwood is at LOS F (very poor) and D (heavy) for AM peak and PM peak hours respectively, but is LOS B (good) & C (decent) off-peak. - The additional 3-4 trucks per hour will typically occur during off peak hours. This represents one truck every 15 min (or one every 8 or 9 signal cycles). - Left turn from St. Patrick to Crichton is not permitted. - additional traffic along Stanley & passing in front of New Edinburgh Park access (play structure, field house, sports field, bus stop, etc)	- same comments as for S1 except that impact on Crichton will be at the intersection St. Patrick/Vanier/Beechwood - turn onto Crichton will require use of both the through-right hand and the left turn lane to make the manoeuver onto Crichton. - May create delays for traffic exiting Crichton. - Contractor may be required to flag the truck exits on to Crichton due to poor sight distance and utilization of both lanes to make the manoeuver.	- same comments as for S1 except that it avoids passing in front of New Edinburgh Park north-east access (play structure, field house, sports field, bus stop, etc), however, could impact on access to tennis courts	- Same comments as for S1 except that - avoids passing in front of New Edinburgh Park north-east access (play structure, field house, sports field, bus stop, etc) - would also impact considerably more streets and driveways than S1.	- Intersection of Stanley at Sussex is unsignalized (currently has pedestrian signals only). - intersection operates at LOS F (very poor) during AM and PM peak hours and LOS C or better (good/decent) off-peak. Right turns from Sussex significantly easier than left turns from Stanley. - the additional 3-4 trucks per hour will typically occur during off peak hours. - introduction of vehicle signals at this location is not recommended as it would encourage new out through traffic during peak hours and additional traffic on Stanley Ave.	- comments for N1 also apply here. - passage of truck along pathway would reduce truck traffic on Stanley but force cycle traffic to relocate to Stanley from the pathway.	- comments for N1 and N2 also apply here. - shorter section of Stanley would be impacted by truck traffic, but would result in longer impact on the pathway and relocation of cyclists.
		5	5	5	5	5	5	5
		7.1%	7.1%	7.1%	7.1%	7.1%	7.1%	7.1%
		0.36	0.36	0.36	0.36	0.36	0.36	0.36
T2	Geometry	Medium	High	Medium	Medium	Low	High	Medium
		- appear to be no issues with turning movements, no tight corners - some pathway modifcations required - modification likely required where pathway connects to Stanley to enhance safety	- geometry at Crichton and St. Patrick's / Beachwood / Vanier intersection is functional but more complicated - Contractor may be required to flag the truck exits on to Crichton due to poor sight distance and utilization of both lanes to make the manoeuver. - most extensive pathway modifcations required - modification likely required where pathway connects to Stanley to enhance safety	- modification likely required where pathway connects to Stanley to enhance safety	- tight corners along local streets; potential to conflict with oncoming traffic and parked vehicles for turning movements	- appear to be no issues with turning movements, no tight corners - the fewest turning movements	- Stanley/Union turn is sharper than 90° - likely too tight for hauling trucks turning right - Will require pathway modifications and some tree removal	- special attention required at Stanley/Charles intersection to create third leg - Will require pathway modifications and some tree removal
		5	0	5	5	10	0	5
		5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
		0.27	0.00	0.27	0.27	0.53	0.00	0.27
T3	Infrastructure	Low	High	Medium	Low	Low	Medium	Medium
		- predominantly along existing roads - access road construction to replace pathway required to support truck traffic; followed by reconstruction of pathway	- extensive pathway modifications required to support truck traffic	- pathway modifcations required to support truck traffic around the sports field - tennis courts impacted, and potential other recreational spaces	- along existing roads, no modifications required (other than minor pathway modification for trucks)	- along existing roads, no modifications required (other than minor pathway modification for trucks)	- access road construction to replace pathway required to support truck traffic; followed by reconstruction of pathway and reinstatement of park - requires replacement pathway during construction	- significant access road construction to replace pathway required to support truck traffic; followed by reconstruction of pathway and reinstatement of park - requires replacement pathway during construction
		10	0	5	10	10	5	5
		4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
		0.42	0.00	0.21	0.42	0.42	0.21	0.21

TECHNICAL MEMORANDUM: REVIEW ALTERNATIVE TRUCK ACCESS ROUTES FOR SITE 5 / STANLEY PARK

May 25, 2017

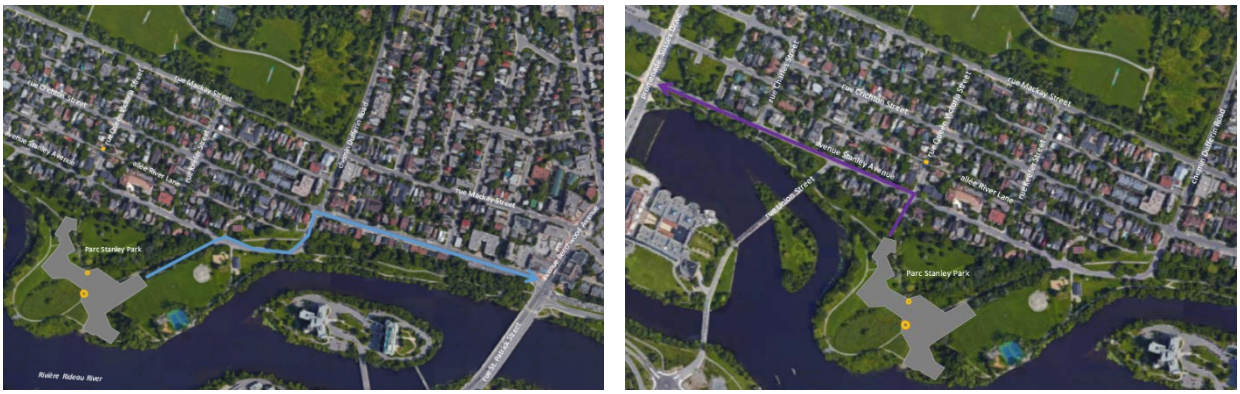
		SOUTH ROUTES				NORTH ROUTES		
Criteria		S1	S2	S3	S4	N1	N2	N3
T4	Safety	Medium	Medium	Low	Medium	Low	Low	Medium
		- portion of pathway closed during construction for safety - truck access connects with Stanley at location busy with pedestrian crossings, bus stop, and close to play structure	- significant pathway closure - Visibility may be an issue for truck turns onto Crichton, contractor may be required to flag the truck exits on to Crichton due to poor sight distance and utilization of both lanes to make the manoeuver.	- portion of pathway closed during construction for safety - avoids passing in front of New Edinburgh Park north-east access (play structure, field house, sports field, bus stop, etc), however, could impact on access to tennis courts	- along narrower local streets with pedestrian traffic and parked cars - fronts the most properties - need to create ped crossing location at Queen Vic extension - avoids play structure proximity	- need to create ped crossing location at Queen Vic extension	- will require parallel temp pathway between Queen Victoria and Union and ped crossing for dog park access	- will require parallel temp pathway between Queen Victoria and Union and ped crossing for dog park access - north of Union, no space for temp path (cyclists on Stanley Ave)
		5	5	10	5	10	10	5
		14.3%	14.3%	14.3%	14.3%	14.3%	14.3%	14.3%
		0.71	0.71	1.43	0.71	1.43	1.43	0.71
T5	Operation	Low	Medium	Medium	Low	Low	Medium	Medium
		- high-maintenance granular route is short - Stanley is a local residential, Crichton is a local collector	- high-maintenance granular route is the longest of all the options - regular dust control along the temporary granular trucking route may be required to mitigate excessive dust	- high-maintenance granular route is long - Stanley is a local residential, Crichton is a local collector - regular dust control along the temporary granular trucking route may be required to mitigate excessive dust	- high-maintenance granular route is short - Stanley, Queen Victoria & Keefer are local residential, Crichton is a local collector	- shortest path to access truck route - Stanley is a local residential road	- shortest path to access truck route - Stanley is a local residential road - high-maintenance granular route is relatively short - regular dust control along the temporary granular trucking route may be required to mitigate excessive dust	- high-maintenance granular route is longer - Stanley is a local residential road - regular dust control along the temporary granular trucking route may be required to mitigate excessive dust
		10	5	5	10	10	5	5
		4.2%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
		0.42	0.21	0.21	0.42	0.42	0.21	0.21
T6	Schedule	Low	High	Medium	Low	Low	Medium	Medium
		- pathway modification approved - on roadways for most part	- Additional NCC negotiations and approvals likely required (significant impacts to pathways and more tree cutting) - Longer to construct and to reinstate post-construction	- NCC negotiation and approval for connection to Stanley may be required - Considerable length of temporary road to construct and to reinstate post-construction	- pathway modification approved - on roadways for most part	- pathway modification approved - on roadways for most part	- NCC negotiation and approval required, some tree cutting - Longer to construct and to reinstate post-construction	- NCC negotiation and approval required, some tree cutting - Longer to construct and to reinstate post-construction
		10	0	5	10	10	5	5
		7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%
		0.73	0.00	0.37	0.73	0.73	0.37	0.37
Natural Environment								
N1	Impact on Significant Natural Features (Terrestrial/Aquatic)	Low	High	Medium	Low	Low	Medium	Medium
		tree branch trimming required	- most extensive tree removals required - proximity to river or riparian area	- more extensive tree removals required - proximity to river or riparian area	- no additional vegetation impact on top of what's already required to access Site 5c from 5b	- no additional vegetation impact on top of what's already required to access Site 5c	- one or two additional tree removals required - proximity to river or riparian area	- four or five additional tree removals required - proximity to river or riparian area
		10	0	5	10	10	5	5
		6.2%	6.2%	6.2%	6.2%	6.2%	6.2%	6.2%
		0.62	0.00	0.31	0.62	0.62	0.31	0.31
Socio-Cultural								
S1	Effect on urban green space/open space (impact on park users)	Low	High	Medium	Low	Low	Medium	Medium
		- marginal fragmentation of park space when compared to other options	- loss of waterfront access to properties along Crichton - most extensive tree removals	- impact on park space / bisecting park - tree removals	- no additional park space or tree impact on top of what's already required to access Site 5c from Site 5b	- no additional park space or tree impact on top of what's already required to access Site 5c from Site 5b	- loss of waterfront access to properties along Stanley - one or two additional tree removals required - impacts on residents' use of park	- marginally more extensive loss of waterfront access along Stanley - four or five additional tree removals required - impacts on residents' use of park
		10	0	5	10	10	5	5
		6.4%	6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
		0.64	0.00	0.32	0.64	0.64	0.32	0.32

		SOUTH ROUTES				NORTH ROUTES		
	Criteria	S1	S2	S3	S4	N1	N2	N3
S2	Cultural heritage values or features	Medium	Low	Medium	High	High	Medium	Medium
		Runs through New Edinburgh HCD. Four contributing properties along route.	Not part of New Edinburgh HCD. No Part IV designated properties along route.	Similar impact as S1	Runs through New Edinburgh HCD. Thirty-seven contributing properties along route. Three buildings were Part IV designations prior to HCD designation.	Runs through New Edinburgh HCD. Twenty-seven contributing properties along route. Two buildings were Part IV designations prior to HCD designation.	Runs through New Edinburgh HCD. Nine contributing properties along route. One building was a Part IV designation prior to HCD designation.	Runs through New Edinburgh HCD. Two contributing properties along route.
		5	10	5	0	0	5	5
		7.9%	7.9%	7.9%	7.9%	7.9%	7.9%	7.9%
		0.39	0.79	0.39	0.00	0.00	0.39	0.39
S3	Disruption to community (impact on local residents)	Medium	Low	Medium	Medium	Medium	Low	Low
		- route adjacent to recreational area access with some potential conflicting movements requiring mitigation - along residential properties on Crichton and by church and school - dust generation from granular route	- route adjacent to recreational area access with some potential conflicting movements requiring mitigation - not passing in front of private properties - higher potential for dust generation with longer granular road	- route adjacent to recreational area access with some potential conflicting movements requiring mitigation (avoids north-east entrance to park) - along residential properties on Crichton and by church and school - dust generation from longer granular route	- route avoids proximity to recreational area but highest number of residential and institutional properties impacted, including retirement home, school of dance, in addition ot other school and church on Crichton	- route avoids proximity to recreational area, but high number of residential properties along route, including embassies	- route avoids proximity to recreational area, but still impacts some residential properties along route - dust generation from granular route	- minimal proximity to private properties - higher potential for dust generation with longer granular road
		5	10	5	5	5	10	10
		12.1%	12.1%	12.1%	12.1%	12.1%	12.1%	12.1%
		0.60	1.21	0.60	0.60	0.60	1.21	1.21
S4	Consistency with planning policies/processes	Low	High	Medium	Low	Low	Medium	High
		- moderately long access to City streets - having vehicles on streets is most compatible with zoning and other regulatory practices and policies	- very long access to City streets - not having vehicles on streets is not compatible with zoning and other regulatory practices and policies	- longer access to City streets - having vehicles on streets is most compatible with zoning and other regulatory practices and policies	- shortest access to City streets - having vehicles on streets is most compatible with zoning and other regulatory practices and policies	- shortest access to City streets - having vehicles on streets is most compatible with zoning and other regulatory practices and policies	- longer access to City streets - having vehicles on streets is most compatible with zoning and other regulatory practices and policies	- very long access to City streets - not having vehicles on streets is not compatible with zoning and other regulatory practices and policies
		10	0	5	10	10	5	0
		3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
		0.38	0.00	0.19	0.38	0.38	0.19	0.00
S5	Property Issues	Low	High	Medium	Low	Low	High	High
		- partially on NCC property - but already approved	- NCC property for extensive length and within floodplain; no negotiations or approvals commenced	- Additional NCC property may be required at connection at Stanley - additional approavals for work within floodplain; - no negotiations or approvals commenced	- smallest impact on NCC property	- smallest impact on NCC property	- NCC property for extensive length and within floodplain; discussions with NCC initiated, but no approvals reached	- NCC property for extensive length and within floodplain; discussions with NCC initiated, but no approvals reached
		10	0	5	10	10	0	0
		4.4%	4.4%	4.4%	4.4%	4.4%	4.4%	4.4%
		0.44	0.00	0.22	0.44	0.44	0.00	0.00
Economy								
E1	Impact on businesses and/or land owners	Medium	Low	Medium	Medium	Medium	Medium	Low
		- trucking could be on same routes as trips generated by businesses	- trucking would not interfere with trips generated by local community businesses	- trucking could be on same routes as trips generated by businesses	- trucking could be on same routes as trips generated by businesses	- trucking could be on same routes as trips generated by businesses	- trucking could be on same routes as trips generated by businesses	- trucking could be on same route as trips generated by businesses, but only short distance
		5	10	5	5	5	5	10
		8.2%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%
		0.41	0.82	0.41	0.41	0.41	0.41	0.82
E2	Affordability	Low	High	Medium	Low	Low	Low	Medium
		- no additional cost	- considerable and highest additional cost	- additional cost for longer temporary Road	- no additional cost	- no additional cost	- marginal additional cost	- considerable additional cost
		10	0	5	10	10	10	5
		8.4%	8.4%	8.4%	8.4%	8.4%	8.4%	8.4%
		0.84	0.00	0.42	0.84	0.84	0.84	0.42

		SOUTH ROUTE				NORTH ROUTE		
High	Highest Impact - least Desirable	S1	S2	S3	S4	N1	N2	N3
Medium	Medium Impact - Neutral	7.25	4.10	5.71	6.86	7.84	6.25	5.60
Low	Lowest Impact - Most Desirable	✓	☒			✓		

The evaluation matrix (**Exhibit 9**) shows that two potential routes (S1, N1) score higher than the others based on the criteria. These two routes are deemed to be "most preferred" options. Their scores are relatively similar, they are consistent with compiled preferences expressed by the community with regards to the routes considered in the analysis and, based on this initial assessment, they would be deemed by the evaluation to be equally acceptable. The two options that scored the highest (S1, N1) are illustrated in **Exhibit 10** (refer to section 4 for larger images).

Exhibit 10: Truck Access Route Options with Highest Scores in Evaluation



These options make the best use of existing infrastructure, roadways, properties and approvals/permitting. The project team recognizes that directing trucks through the neighborhood results in disruptions to the community. It should be kept in perspective that in the worst case scenario (all trucks utilizing the same route for in and out), the trucking would result in an increase of 5 to 7% to existing traffic on Stanley Avenue at Sussex Drive, or an increase of 2% to existing traffic on Crichton Street approaching the intersection of Crichton/Beechwood/Vanier/St. Patrick. These increases would be halved if separate routes are adopted for access and egress.

One of the potential routes (S2) scored considerably lower with several criteria being red (high impact – least desirable). In addition to greater impacts on the park space and trees, there are some significant challenges with functionality and safety at the intersection of St. Patrick/Vanier/Beechwood. The connection to Crichton immediately north of the intersection would likely result in the removal of mature trees adjacent to the intersection and will require the use of both the through/right-turn and the left-turn lanes to make the manoeuver onto Crichton. This is expected to result in compounding delays for traffic exiting Crichton as it is likely that traffic on Crichton would need to be stopped by flag people to accommodate the truck manoeuver over both lanes.

Amongst the remaining South egress/access routes, options S3 and S4 did not score as high as the above two, but also did not score as low the least desirable one (S2). Similarly, route options N2 and N3 that would see the construction of a truck access route along the Eastern River Pathway north of Stanley Park did not score as high as the above two, but also did not score as low the least desirable one (S2). These options were still presented to the community for consideration and review of the criteria pairwise comparison, as well as the evaluation and ratings, and the evaluation was adjusted accordingly.

Compilation of comments received from the community reinforced the identification of the preferred routes.

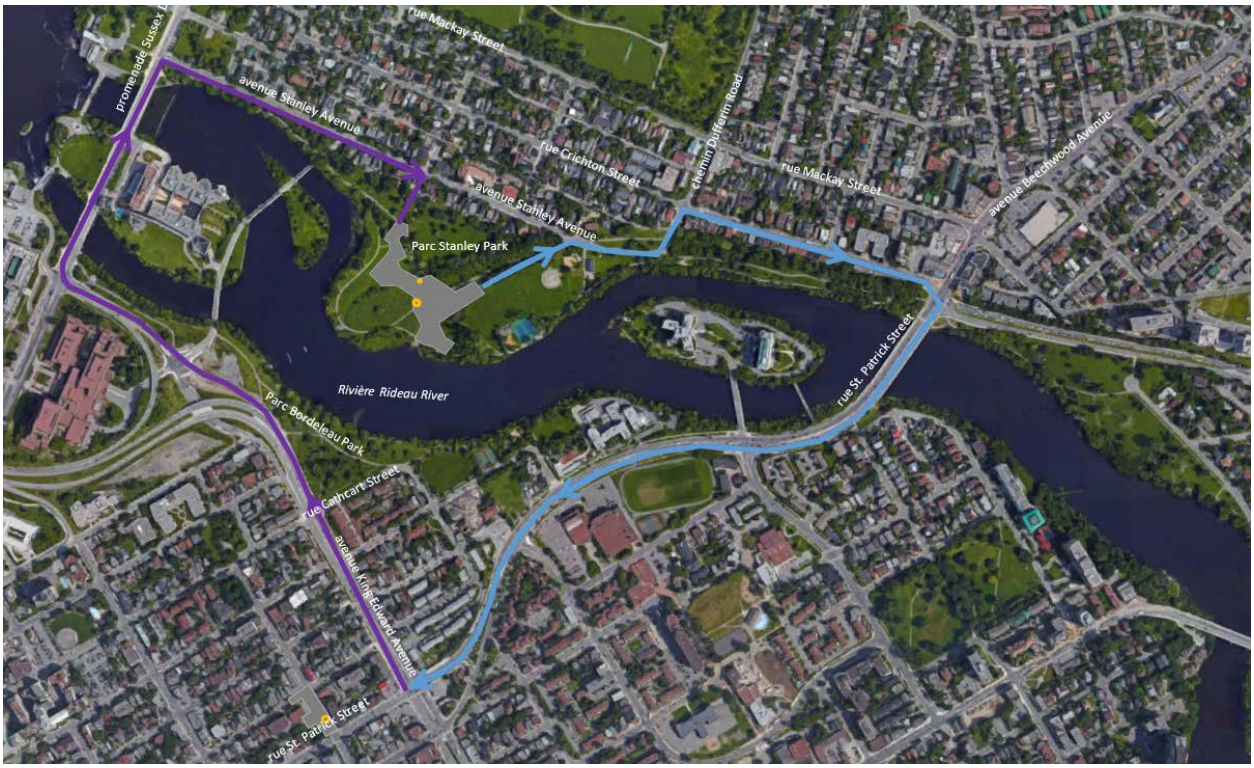
7.5 RECOMMENDATION

Based on the analysis results and comments received from the community, N1 and S1 are the top scoring options. Route N1 could be used for access or egress. Since trucking along Vanier Parkway is not permitted and left turns from St. Patrick to Crichton are not permitted, route S1 is considered appropriate for egress only (out route). The analysis and community feedback suggests a lesser impact through distribution of the movements, therefore it is recommended that the preferred truck access routes be a combination of S1 and N1. N1 is recommended for access (in route) and S1 is recommended for egress (out route).

Exhibit 11 provides an illustration of the recommended truck movement for access/egress to Site 5 at Stanley Park. The key benefits of identifying these separate preferred routes for access and egress include:

- Dividing in half the trucking impact in front of any property on truck access routes. This implies that during the peak trucking period, there would be on average 4 trucks per hour passing in front of any home on a truck access route in one direction only (no return trip).
- Right-turn movements reduce the number of conflicting movements with other vehicles and mitigate delays. This also results in the best use of the staging area when there can be a separate in and out.

Exhibit 11: Recommended Truck Access Routes



8.0 Mitigation

All routes considered have advantages and disadvantages. Efforts are applied here to the recommended routes to mitigate some of the disadvantages or less desirable aspects. The recommended routes can be improved by applying mitigation measures to address concerns identified during the review process. These mitigation measures are outlined below.

8.1 SITE ACCESS VIA ROUTE N1

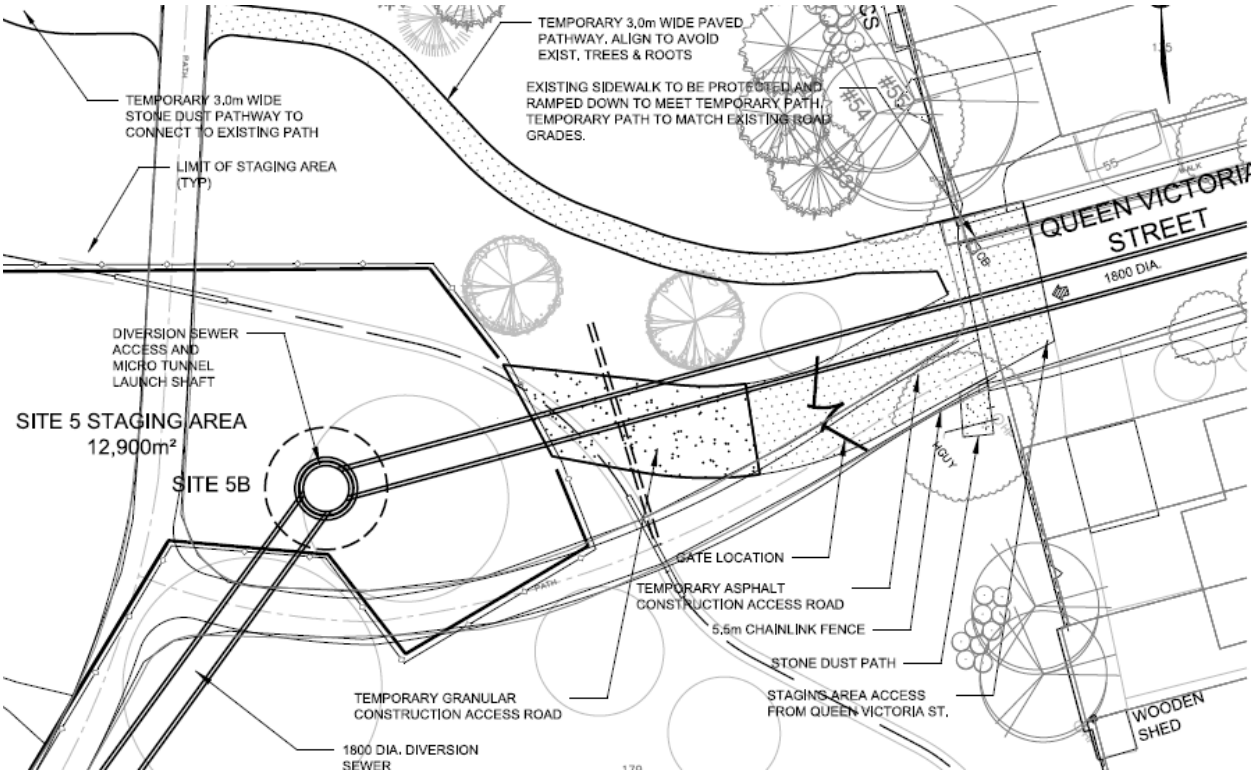
The route N1 access to the Site 5a/b staging area is an extension of Queen Victoria Street. The northernmost portion of this staging area is the closest to residences.

Access route N1, as an extension of Queen Victoria, will bisect north and south sections of Stanley Park. To improve safety, a portion of the access road would be lined with fencing and a designated crossing location would be configured at the end of the fence to channel park users to cross the truck path at a single location. Fencing along both sides of the access road would mitigate conflicting movements (including children or dogs) along the truck access, until reaching the designated crossing location – a significant safety mitigation. The fencing in proximity to the crossing location will be chain link, in order to provide line of sight for both pedestrians and truck drivers.

The design team has reviewed opportunities to mitigate impacts to the existing trees and park space. It was determined that the alignment of the access road could be shifted to avoid several trees that had been previously identified as removals. These changes reduce the number of trees to be removed by seven.

A sketch of the proposed configuration is presented in **Exhibit 12**.

Exhibit 12: Proposed Modifications to Site Access from Queen Victoria



8.2 SITE EGRESS VIA ROUTE S1

The evaluation identified concerns with the truck access route passing by the access to the existing play structure on Stanley Avenue. There is a large paved area with cars parked and an angled connection to Stanley Avenue from the site access. Pedestrian movement is not channeled in any way at this location. In fact, the sidewalk along the southwest edge of Stanley ends several meters before this area. Pedestrian movements were witnessed to spread all over the available space.

To improve safety in this area, it is proposed that the truck access route would be configured as a temporary 90˚ three-way intersection with Stanley with stop control. This configuration would eliminate the angled approach, and force trucks to reduce speed and come to a full stop before turning onto Stanley Avenue. A 90˚ intersection also improves the line of sight when compared to roads that intersect on a skew. The intersection will also include an extension of the existing concrete sidewalk on the southwest side of Stanley Avenue and extend it across the site access to provide priority to pedestrians along a designated corridor. Chain link fencing (and concrete barriers at some locations) is proposed to prevent cut-through movements and channelize pedestrian movements onto the sidewalks and proposed cross-walks. A temporary parking arrangement is proposed in order to maintain community access to the park. Two temporary parking areas with 5 spaces and 7 spaces have been proposed for consideration.

A sketch of the proposed configuration is included in **Exhibit 13**.

Exhibit 13: Proposed Modifications to Site Egress to Stanley Avenue

9.0 Influence of Consultation on the Evaluation

As outlined in Section 2.0, 120 members of the New Edinburgh community provided written feedback. Some of the issues, comments, questions or concerns raised during the open house, and provided in written comments from the community, ranged beyond matters pertaining to the proposed truck access routes for the CSST project construction at Site 5. A summary of the key issues, comments, questions or concerns received from the community pertaining to the proposed truck access routes are summarized in **Exhibit 14**.

Exhibit 14: Summary of Key Issues or Concerns Raised by New Edinburgh Community during Open House to Consult on Truck Access Route Options for CSST Construction at Site 5

Key Questions, Comments or Issues Raised	Response	Section of Report Addressing Question, Comment or Issue
Re-consider access route option W1, in particular conveying tunnel spoils across bridges using a conveyor or rail system	Rail system not acceptable due to bends and weight. Conveyor system would prove to be impractical and very costly, and more importantly, timing would not work out.	Section 7.2
Re-consider access route option W2, in particular barging tunnel spoils across the Rideau River	Barging is not a viable option as the water level is too shallow on the west side of the river. Would require construction of a causeway partway across the river to be deep enough for a dock, with significant approvals requirements that are not expected to be secured in time, and issues with upstream flooding and winter/ice conditions.	Section 7.2
Comments regarding the ability of the routes to be used for both inbound and outbound trucks—the intersections have access restrictions and are congested during peak traffic hours	The preliminary truck access route evaluation considered the worst case scenario of having all trucks utilizing the same route for in and out; under this scenario, the trucking would result in an increase of 5 to 7% to existing traffic on Stanley Avenue at Sussex Drive, or an increase of 2% to existing traffic on Crichton Street approaching the intersection of Crichton/Beechwood/Vanier/St. Patrick. These increases would be halved if separate routes are adopted for access and egress. The recommendation following the re-evaluation is to use a northern route for inbound trucks and a southern route or outbound trucks.	Sections 7.4 and 7.5
Questions regarding ranking of the criteria and methods for evaluation—it was found to be complicated and confusing	Further description of the methods has been provided	Section 7.1
Comments regarding evaluation questionnaires and perception that the format pits neighbour against neighbour	One of the objectives of the open house meeting was to obtain input from the community on constraints associated with each route and to determine whether the community had a preference or comments with respect to the routes analyzed. Overall, valuable input was received from participating members of the community; several respondents stated a preference for a route that passes by their homes, recognizing that the burden on an individual may not outweigh the burden on the community.	No change in report
Comments regarding weighting of criteria—safety and disruption to community should be assigned a greater weight than affordability	Weighting of safety and disruption to community has been increased.	Section 7.3/7.4, Exhibit 8

Key Questions, Comments or Issues Raised	Response	Section of Report Addressing Question, Comment or Issue
Question about how heritage was considered	Heritage considerations were factored into the evaluation of each route based on the extent of the route passing through the New Edinburgh Heritage Conservation District (HCD), the number of designated buildings passed and the number of contributing properties passed.	No change in report; however, see Section 7.4, Exhibits 8 & 9
Question about how disruption to community was considered	Disruption to community was factored into the analysis based on the number of residential and institutional properties passed with associated noise, dust impacts from the type of access route, and disruption or impediment to vehicle or pedestrian access to facilities (note that road and pedestrian safety was considered under the Safety criterion).	No change in report; however, see Section 7.4, Exhibits 8 & 9
Concern regarding truck traffic on narrow streets and tight corners for the some of the on-street truck access route options	Tight corners for some of the on-street routes factored in the evaluation, especially for Option N2 (making it red) and to a slightly lesser extent for Option S4 (making it yellow).	Section 7.4, Exhibit 9
Safety of residents with increased truck traffic in the neighbourhood—particularly a concern for children, seniors and people with mobility issues	Safety is always of primary concern, and all options were reviewed with this perspective. However, weighting of safety and disruption to community has still been increased. To address concerns for public safety regarding the use of the truck access routes, several mitigation measures are suggested, including the following: • A portion of the access road would be lined with fencing • A designated crossing location would be configured • Fencing in proximity to the crossing location will be chain link, in order to provide line of sight for both pedestrians and truck drivers • The truck access route intersection with Stanley would be configured as a temporary 90˚ three-way intersection with stop control • The intersection will include an extension of the existing sidewalk to provide priority to pedestrians along a designated corridor • Chain link fencing (and concrete barriers at some locations) is proposed to prevent cut-through movements and channelize pedestrian movements onto the sidewalks and proposed cross-walks • A temporary parking arrangement is proposed in order to maintain community access to the park	Section 7.3/7.4, Exhibit 8 Sections 8.1 and 8.2

Key Questions, Comments or Issues Raised	Response	Section of Report Addressing Question, Comment or Issue
Concern regarding increased diesel emissions and possibility of health effects on residents	The quantity of diesel exhaust emitted during the 30-months work in Stanley Park and the 12-months work at Queen Victoria and River Lane is small relative to the total emissions of same in the National Capital Region in those same periods. Diesel emissions released during construction activities in the New Edinburgh Community disperse under most atmospheric conditions. Ambient concentrations caused by construction activities are unlikely to exceed the ambient air quality criteria. Ongoing construction monitoring will take place. Additional monitoring is being considered.	No change in report
Request for noise assessment of truck access route	A noise analysis completed by Hugh Williamson Associates Inc. (March 8, 2017) included consideration of truck movements within Stanley Park.	No change in report
Concern regarding increased disruption of park associated with some of the truck access route options	The recommended truck access routes balance avoiding disruption of park use with disruption to community, recognizing that the community feedback on the criteria assigns greater weight to safety and disruption to community than disruption to park users. The recommended truck access routes allow continued use of the park and limit disruption (from truck access/egress) to the existing paved pathways.	No change in report; however, see Section 7.4, Exhibit 8, Section 7.5 and Exhibit 11
Request to consider time of day restriction on trucking and options to address or reduce trucking during peak traffic hours	Construction traffic is subject to time-of-day restrictions under the City of Ottawa Noise By-law.	No change in report; however, see Section 7.5
Consider snow removal options along trucking routes	It is understood that roadways can become narrow when snow is piled along each edge. The City is looking into options for snow removal along the recommended truck access routes during winter construction of the CSST project	No change in report
Consider rotating the truck access route (e.g., five months on one route and five months on another)	Based on the analysis results and comments received from the community, the recommended truck access routes divide the truck volume between two routes, effectively halving the truck volume on each route.	No change in report; however, see Section 7.5
Consider full cost of trucking impacts, such as cost of repairs to roads	The cost of resurfacing/repairing the roads used in the community, if required, would be marginal in comparison to the costs of the W options. Every project includes contingencies for repairs, regardless of the site or access route (would also apply to W-options).	No change in report
Comment that the costs of W1 and W2 would be offset by the cost of not repairing roads in New Edinburgh	The cost of resurfacing/repairing the roads used in the community, if required, would be marginal in comparison to the costs of the W options.	No change in report

Key Questions, Comments or Issues Raised	Response	Section of Report Addressing Question, Comment or Issue
Consider consulting with other stakeholders such as Global Affairs Canada and the school board	Stakeholders that may be directly affected by the truck access route, such as the Ottawa Student Transportation Authority (OSTA) and the Consortium de transport scolaire d'Ottawa (CTSO), have been contacted for input into the route selection and proposed mitigation measures.	No change in report
Request for images of trucks that will be used	Photographs of trucks similar to those proposed to be used by the contractor for the CSST construction can be provided	No change in report
Question regarding how the input will be used and what the next steps are	This section, and Section 2.0, summarize the results of the consultation and how the community input has been considered in this evaluation	Section 2.0 and Section 9.0