Executive Summary

E.1 INTRODUCTION

The Toronto Transit Commission (TTC) and City of Toronto have undertaken a Transit Project Assessment study for the upgrading, capacity enhancement, and extension of the Scarborough Rapid Transit (SRT). This important transportation asset has reached the end of its service life and, at the same time, the demand for the service significantly exceeds its capacity and is projected to keep growing. Therefore, it is critical that measures be taken now so that it can continue to provide reliable service to the tens of thousands of people who use it everyday, and so that it can accommodate the ever-growing demand for travel in this corridor. Additionally, there is significant demand, both current and future, for this service from the area north and east of the current line and, in order to provide the benefit of this fast and reliable rapid transit service to a larger market area, the Transit Project Assessment also addresses the extension of the SRT to Malvern.

Related to these upgrade and extension initiatives, the Transit Project Assessment addresses three other important improvements to make the SRT more functional and attractive to users:

- A more-streamlined and efficient transfer connection between the SRT and the Bloor-Danforth Subway, to facilitate this high-volume transfer movement
- Modifications to Kennedy Station to accommodate the future implementation of two additional Transit City light rail lines: Eglinton Crosstown and Scarborough-Malvern; and
- Upgrading of the balance of the existing line's infrastructure to facilitate new larger vehicles and the construction of new infrastructure to allow storage and maintenance of the SRT vehicles.

Finally, the report speaks to the possibility of phased implementation of the overall project in response to possible funding constraints and any infrastructure needs associated with such phasing plans (see Section E.3 for details).

E.1.1 Policy and Context Planning

The recommended refurbishment and extension of the SRT is part of the state-of-good-repair requirements outlined in the TTC Scarborough RT Strategic Plan (2006) and supports and implements the key transportation plans and land-use visions contained in the City of Toronto Official Plan (2002), TTC Transit City LRT Plan (2007), and Metrolinx Regional Transportation Plan (2008).

E.1.2 State-of-Good-Repair

The existing SRT Mark I vehicles will reach the end of their economic life by 2015. In addition, the TTC does not have a sufficient fleet of these vehicles to accommodate current demand. To address these issues, and improve the quality of the service, the TTC endorsed the recommendations of the 2006 Scarborough RT Strategic Plan, including replacing the existing fleet, upgrading the line to accommodate larger-capacity trains, and improving the passenger connection between the SRT and Bloor-Danforth Subway at Kennedy Station.

E.1.2.1 City of Toronto Official Plan (2002)

The City of Toronto Official Plan presents a vision for a more liveable City where no new roads are built, future transportation demand is accommodated by transit and active transportation, transit is given priority over autos via an expanded network of right-of-ways, and new development is directed to locations with excellent transit service.

While the plan calls for significant expansion of higher-order transit, its core is the City's existing fully-exclusive subway/rapid transit lines, including the SRT. The plan identifies areas of future growth concentrated in existing "Centres", including Scarborough Centre, and on designated "Avenues". Ensuring that the SRT is maintained in a state-of-good-repair, and providing sufficient capacity for current and future demand in this corridor is, therefore, fundamental to the plan. Extending the SRT builds upon its existing role and provides one of the additional higher-order transit corridors envisioned in the plan for northeast Toronto. This corridor is also identified for a future rapid transit line in the Toronto Transit City Light Rail Transit Plan and Metrolinx Regional Transportation Plan (The Big Move).

E.1.2.2 Transit City Light Rail Plan (2007)

In 2007, the TTC adopted the Transit City Light Rail Plan which is a comprehensive, 120 kilometre, network of eight light-rail lines, each within its own right-of-way, stretching to all corners of the City. As shown in Exhibit E1-1, the Transit City LRT Plan included an extension of the SRT, with connections to three of the new LRT lines. The Transit City LRT Plan was included by Metrolinx in its 2008 Regional Transit Plan and the extension and upgrading of the SRT was identified as a priority project.

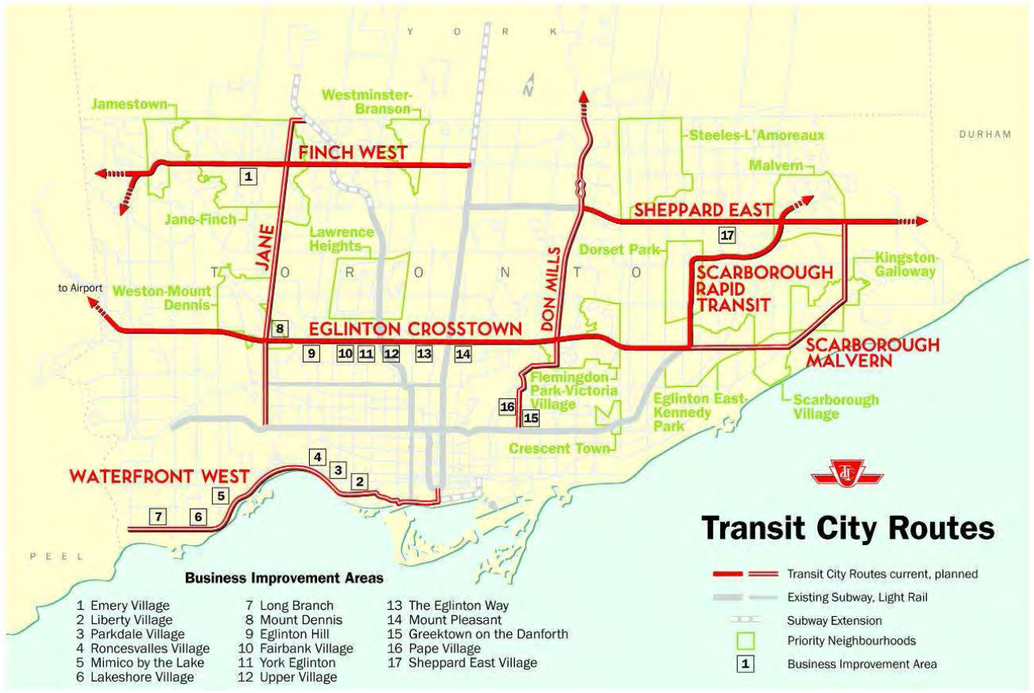
The undertaking supports these policies and plans by:

- Providing long-term capacity for the existing SRT by upgrading it to accommodate significantly larger trains and much more frequent service;
- Upgrading the line to operate with high quality, state-of-the-art, Light Rail Transit vehicles;
- Extending rapid transit to Centennial College and the Malvern community, and closer to the vast number of riders which come from communities beyond;
- Connecting the Sheppard East LRT to Scarborough City Centre, the Bloor-Danforth Subway, and all points beyond; and
- Greatly improving the passenger connection between the SRT and Bloor-Danforth Subway at Kennedy Station.

In addition to the above, this report builds upon, and is coordinated with, the:

- Original Scarborough RT Extension Environmental Assessment (1994);
- Sheppard East LRT Class EA (2008);
- Scarborough-Malvern LRT Transit Project Assessment (2009);
- Eglinton Crosstown LRT Transit Project Assessment (2010); and
- Sheppard East Maintenance and Storage Facility Transit Project Assessment (2010).

Exhibit E1-1: Transit City



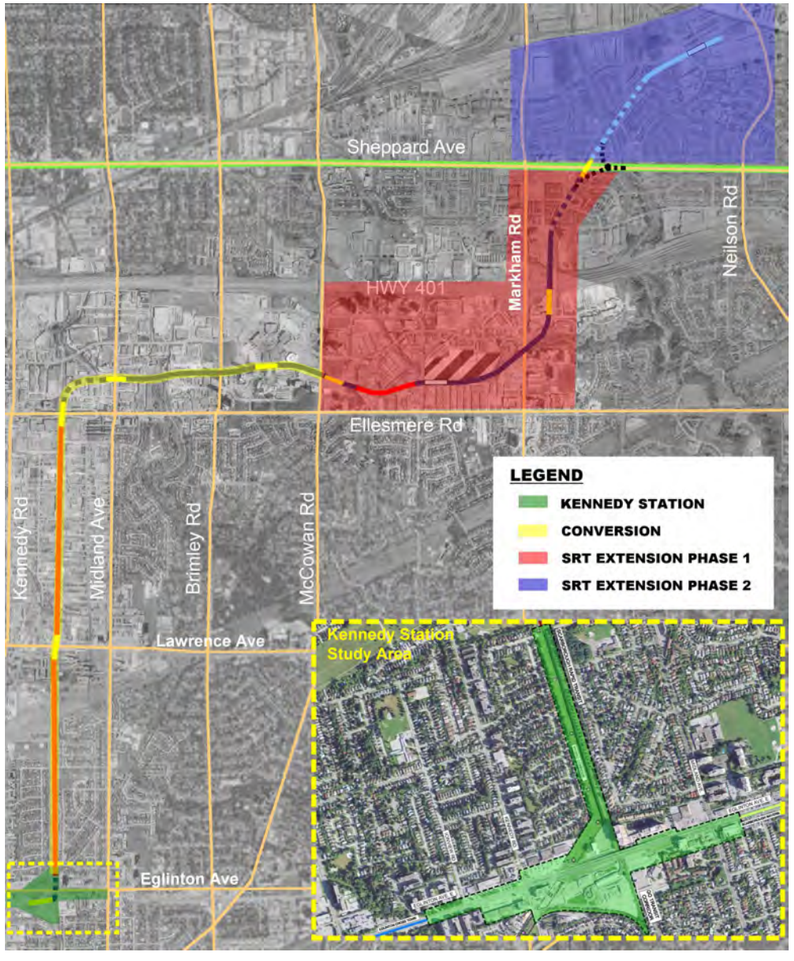
E.1.3 Study Area

The study area for the project is divided into three elements as shown in Exhibit E1-2. The first area consists of the environs surrounding Kennedy Station, which includes Eglinton Avenue from Birchmount Road to Midland Avenue, as well as north of Eglinton along the existing SRT corridor. The focus of this area was on an improved connection between the SRT and the Bloor-Danforth Subway and the planned connections of the Eglinton Crosstown and the Scarborough-Malvern LRT lines at Kennedy Station. The second area is the existing corridor from north of Kennedy Station to the existing end of line at McCowan Station and relates to the physical improvements to the existing SRT line for conversion to LRT operation. This area reflects the works required along the existing line and stations that are required to accommodate the new larger LRT vehicles. The third area relates to the extension of the SRT into the Malvern community and includes a wide area of northeast Toronto.

E.1.4 Study Process

A comprehensive planning and feasibility study was undertaken for each element of the work, involving a structured assessment of alternatives based on a wide range of planning, community, operations and cost criteria, as described in Section E.2. Public and stakeholder input were obtained throughout the process as described in Section E.5. The process fulfills the requirements of Ontario's Transit Project Assessment process (TPA) in accordance with Ontario Regulation 231/08 for Transit Projects and Greater Toronto Transportation Authority Undertakings (Transit Projects Regulation).

Exhibit E1-2: Study Area



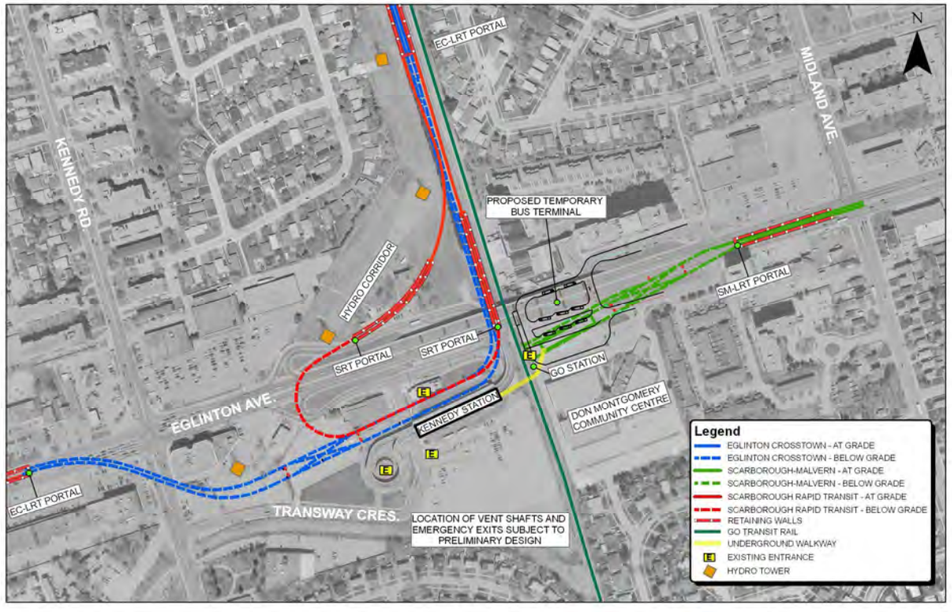
E.2 EVALUATION OF MAJOR FUNCTIONAL DESIGN ALTERNATIVES

E.2.1 Kennedy Station

Improving the facilities and passenger connection between the SRT and Bloor-Danforth Subway at Kennedy Station was identified as a high priority during the public consultation, and in the recommendations of the SRT Strategic Plan. In addition, changes to Kennedy Station must also conveniently accommodate connections to the existing GO Rail line and the planned Eglinton Crosstown and Scarborough-Malvern Transit City LRT lines. The site is physically constrained and, given all the planned connections and uses for the site, the station design is complex. Numerous concepts were identified that included combinations of elevated, at-grade and below-grade connections for each of the three new connections.

The recommended alternative involves the SRT connection underground at the mezzanine level of the current subway station and the Eglinton Crosstown and Scarborough-Malvern LRT lines underground at the subway level. This option provides the best combination of efficient passenger transfer between lines and connections to the surface bus terminal and pedestrian access to future developments in the area.

Exhibit E1-3: Kennedy Station



E.2.2 Extension to Malvern Town Centre

For the extension, four broad corridors, multiple alignments within them, and options related to the level of exclusivity provided for transit (i.e. partial or full) were evaluated as part of an extensive preliminary planning phase. A formal, staged, and iterative, screening process was applied.

Partially-exclusive, on-street options were assessed, including options where some trains on the existing SRT would continue to seamlessly operate on the extension. It was expected that on-street facilities would be significantly less expensive to build than fully grade-separated ones. However, due to the physical terrain of the corridor, and the capacity requirements of the existing line and the extension, the cost savings were small compared to the detrimental effect a partially-exclusive option would have on transit service capacity and reliability. As such, a fully grade-separated facility is recommended.

Between McCowan Station and Centennial College / Highway 401, the preferred alignment, follows Highland Creek (see Exhibit E1-4). This routing was selected as it had the least community impacts and is the most cost-effective. North of Centennial College / Highway 401, the preferred alignment was selected to provide the fastest and most direct transit service to the Malvern community, and to the large number of SRT riders who live to the north and east of Malvern who would take buses to the SRT. The preferred option travels diagonally through a former railway corridor to Malvern Town Centre. In addition to residential streets and creek crossings, there are numerous residential properties which back on to this corridor. Therefore, to mitigate the impacts of the line in this section, it is recommended that the line be underground. The preferred alignment is illustrated in Exhibit E1-5.

Exhibit E1-4: Preferred Alignment – McCowan Road to Markham Road

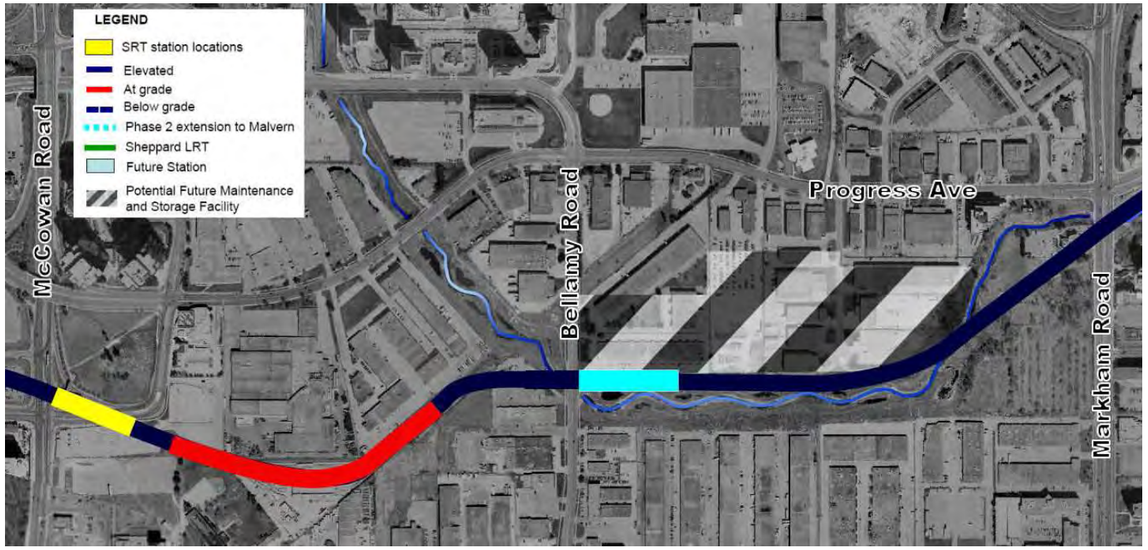
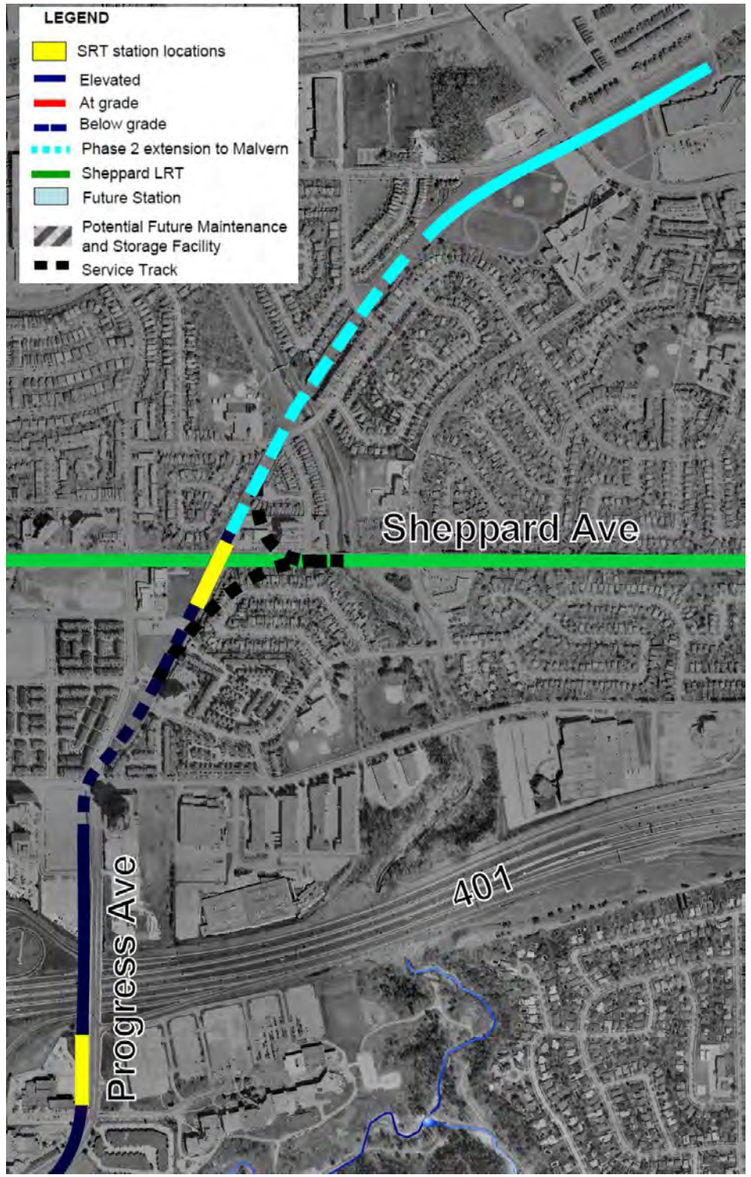


Exhibit E1-5: Preferred Alignment – Progress Avenue to Malvern Town Centre



E.2.3 Sheppard Bus Terminal

Because of funding constraints, the SRT extension will initially terminate at Sheppard Avenue, and require a bus terminal to provide a fast and convenient connection between the buses serving northeast Scarborough and the SRT (see Section E.3 for details). Two possible locations (Exhibit E1-6) were considered. It was determined that the north option is preferred because of the superior passenger connections between the bus terminal, Sheppard East LRT and SRT for the north option and because of the direction routing for buses travelling from the east to access the station.

Exhibit E1-6: Sheppard Bus Terminal Options

E.2.4 Service Connection to Maintenance and Storage Facility

The LRT vehicles which will operate on the SRT will initially be stored and maintained at the Sheppard East Maintenance and Storage Facility – which is the subject of a separate Transit Project Assessment. For this reason, a non-revenue service connection will be required between the Sheppard East LRT tracks and the SRT tracks. A range of alternatives, including underground and surface connections, were assessed related to community impacts, transit and traffic operations, and cost. In June 2010, the City of Toronto Council directed staff to complete the TPA on the basis of the provision of an underground non-revenue track from Sheppard Avenue.

E.3 PROJECT DESCRIPTION

The SRT includes the following key design components:

- A complete reconstruction of the SRT connection at Kennedy Station that provides a more convenient transfer from the SRT to the Bloor-Danforth Subway and provides connections for the future Eglinton Crosstown and Scarborough-Malvern LRT lines;
- Modifications to the existing SRT stations of Lawrence East, Ellesmere, Midland, Scarborough Centre and McCowan Stations to accommodate longer trains as well as the platform height and overhead power requirements of LRT vehicles;
- Extension of the SRT from McCowan Station to Malvern Town Centre with stations at Centennial College, Sheppard Avenue and Malvern Town Centre;
- Protection for future SRT stations at Bellamy Road and Brimley Road;
- Bus terminals and passenger pick-up and drop-off facilities at Sheppard Avenue and Malvern Town Centre;
- Provision of an underground non-revenue service connection from Sheppard;
- Protection for a future maintenance and storage facility at Bellamy Road and Progress Avenue; and,
- Supporting structures including traction power substations, emergency exit buildings and ventilation shafts in underground sections from Milner Avenue to McLevin Avenue along the abandoned rail corridor.

Due to funding constraints, the extension of the SRT into Malvern will be undertaken in two phases:

- Phase 1: the SRT will be extended from McCowan Station to Sheppard Avenue and will include new stations at Centennial College and Sheppard Avenue. The station at Sheppard Avenue will include a bus terminal and passenger pick -up and drop-off and a high quality transfer from the Sheppard East LRT to the SRT.
- Phase 2: the SRT will be extended further from Sheppard Avenue to Malvern Town Centre, when funding becomes available.

E.3.1 Design Development for Conversion of Existing Line and Stations

The recommended light rail transit vehicles have differing characteristics from the current Mark I vehicles. The existing line, from Kennedy Station to McCowan Station, must be modified to accommodate these characteristics. Specifically:

- New trains will operate with 3-car consist (approximately 96 metres) - existing trains are 51 metres;
- The new vehicles have lower floor heights; and
- Traction power - replace 3rd rail with overhead catenary – increasing overhead clearance requirements.

E.3.2 Runningway

E.3.3 Kennedy Station

From the west of Kennedy Station on Eglinton Avenue East, the Eglinton Crosstown LRT will operate at surface in a dedicated centre median right-of-way, including a stop at Ionview Road, and then transition to a portal east of Ionview Road. The alignment will continue underground into Kennedy Station.

From the east of Kennedy Station on Eglinton Avenue East, the Scarborough-Malvern LRT will also operate at surface in a dedicated centre median right-of-way, including a stop at Midland Avenue, and then transition to a portal west of Midland Avenue.

E.3.4 SRT Conversion

The SRT includes the ongoing use of the existing dedicated right-of-way comprising at-grade, below-grade and elevated sections from Kennedy Station to McCowan Station. The entire SRT project will be based upon a fully exclusive right-of-way alignment and will follow the existing alignment.

E.3.5 SRT Extension

For the extension, the new exclusive right-of-way will also utilize below-grade, at-grade and elevated running structure. The preferred alignment connects to the existing McCowan Station, runs at-grade to just west of Bellamy Road, rises over Bellamy Road and is elevated to north of Highway 401. The alignment then transitions to below-grade via a portal before Milner Avenue, passes under Sheppard Avenue East and proceeds under Highland Creek at Mammoth Hall Trail. After crossing under Highland Creek, the alignment then transitions through a portal into an elevated structure near McLevin Avenue (see Exhibit E1-7 for details).

Exhibit E1-7: SRT Extension Alignment

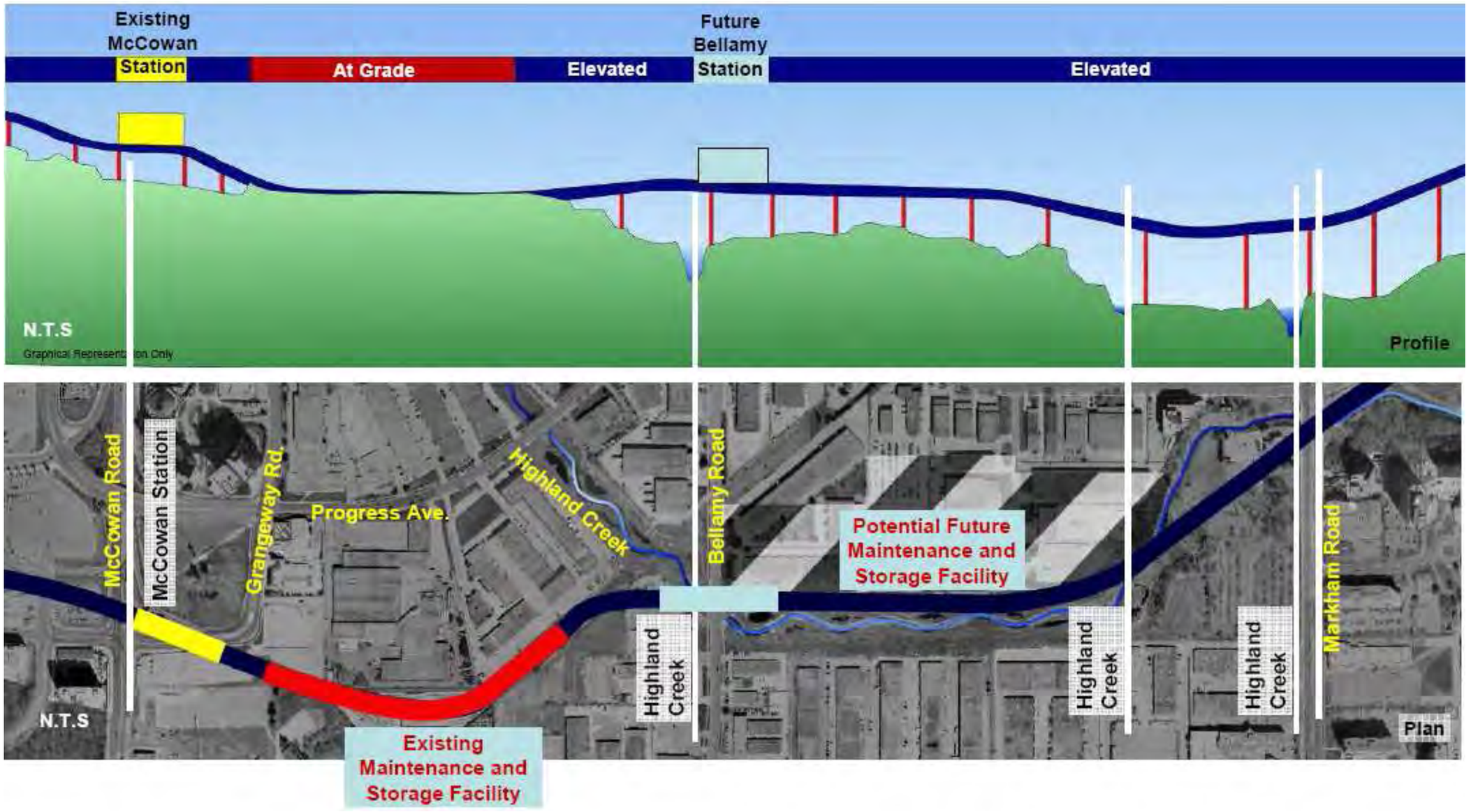


Exhibit E1-7: SRT Extension Alignment (Continued)

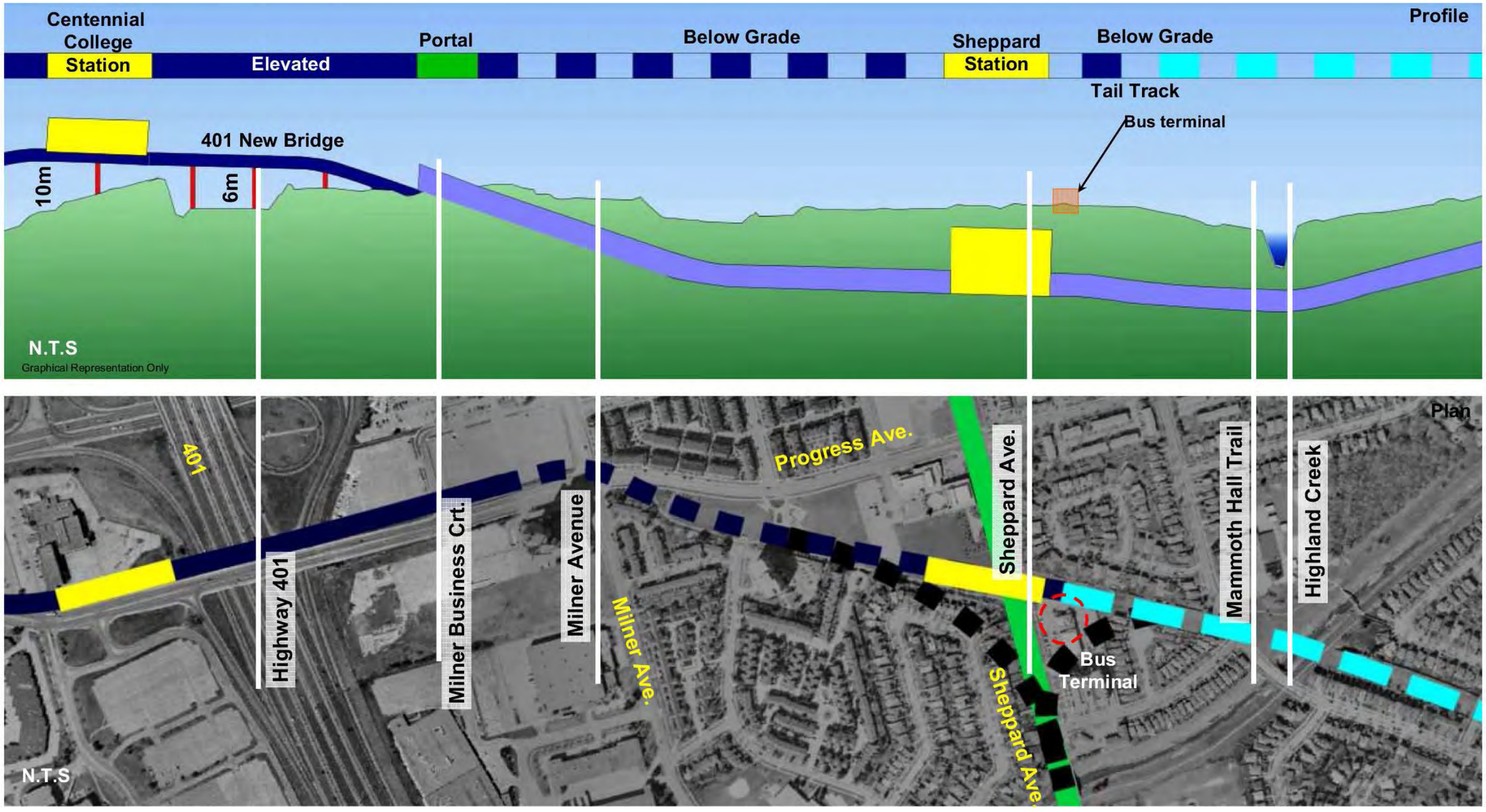
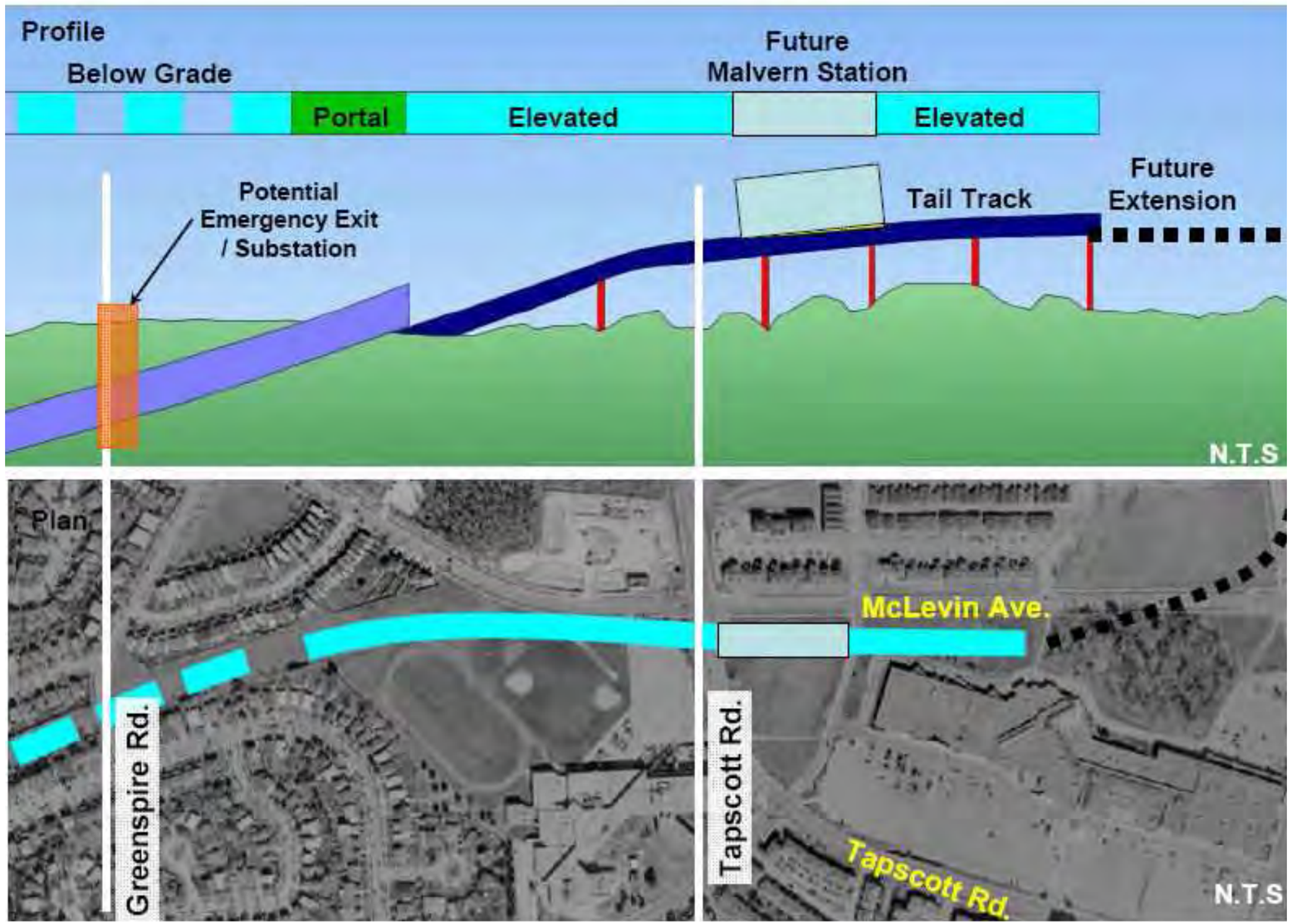


Exhibit E1-7: SRT Extension Alignment (Continued)



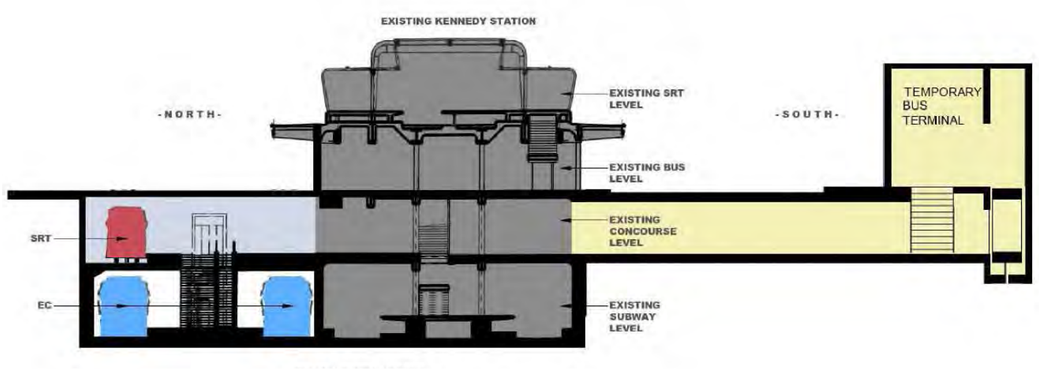
E.3.6 Stations

E.3.6.1 Kennedy Station

Kennedy Station will serve as the eastern terminus of the future Eglinton Crosstown LRT, the western terminus of the future Scarborough-Malvern LRT and the southern terminus of the Scarborough Rapid Transit (SRT), while continuing to be a GO Rail station stop and the end of the Bloor-Danforth Subway.

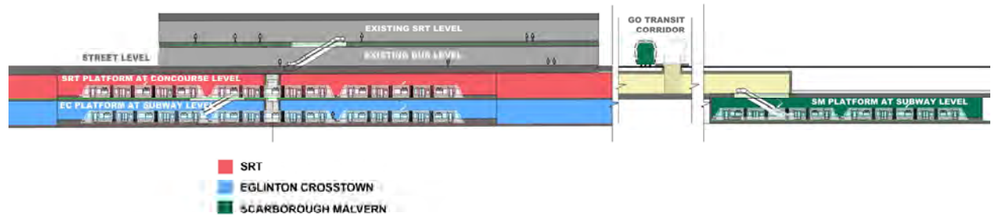
Eglinton Crosstown LRT will enter the station below ground and have a platform at the existing subway level. Scarborough-Malvern LRT will enter the station on the same level (existing subway), but will end on the east side of the GO Rail tracks. The SRT will enter the station at the existing concourse level from the north via a loop using the hydro corridor on the north side of Eglinton Avenue and exit at the same location as the existing SRT. The new SRT platform will be designed to accommodate 3-car LRT trains. A conceptual cross-section of the future Kennedy Station (facing east) is shown in Exhibit E1-8.

Exhibit E1-8: Kennedy Station – Cross-Section



TTC buses will continue to use the existing bus level. GO Rail connections (on the east side of the station) will continue to be provided as shown on Exhibit E1-9.

Exhibit E1-9: Kennedy Station – East-West Section



E.3.6.2 SRT Conversion (Lawrence East to McCowan Stations)

Modifications to the other existing stations on the SRT (Lawrence East, Ellesmere, Midland, Scarborough Centre and McCowan) are addressed by this project including:

- Extending the existing passenger platform lengths;
- Raising tracks or lowering platforms to accommodate low-floor LRT vehicles;
- Increasing the clearance height inside the stations to accommodate overhead catenary; Reinforcing the structures to accommodate increased LRT vehicle loading requirements; and
- Revising structured underpasses to accommodate a new, larger vehicle.

In addition to the conversion modifications, renovations will include alterations to provide barrier-free access at Lawrence East, Ellesmere, Midland, and McCowan Stations (Scarborough Centre Station is now equipped with elevators).

E.3.6.3 SRT Extension

Requirements for the new stations at Centennial College, Sheppard Avenue and Malvern Town Centre were based on existing conditions, travel demand forecasts, transit network connection needs and space availability. The concepts for these stations are illustrated in Exhibits E1-10, E1-11 and E1-12.

Because of phasing requirements, the preferred design will include a 7-bay bus terminal at Sheppard Avenue and an 11-bay bus terminal at Malvern Town Centre as well as passenger pick-up and drop-off facilities at each location. Once the line is extended to Malvern, terminal requirements at Sheppard Avenue will be re-evaluated. With regard to Centennial College, it is expected that the existing on-campus bus loop will be maintained and, as a consequence, that there is no immediate need for a new off-street bus terminal here.

Exhibit E1-10: Centennial Station

Exhibit E1-11: Sheppard East Station

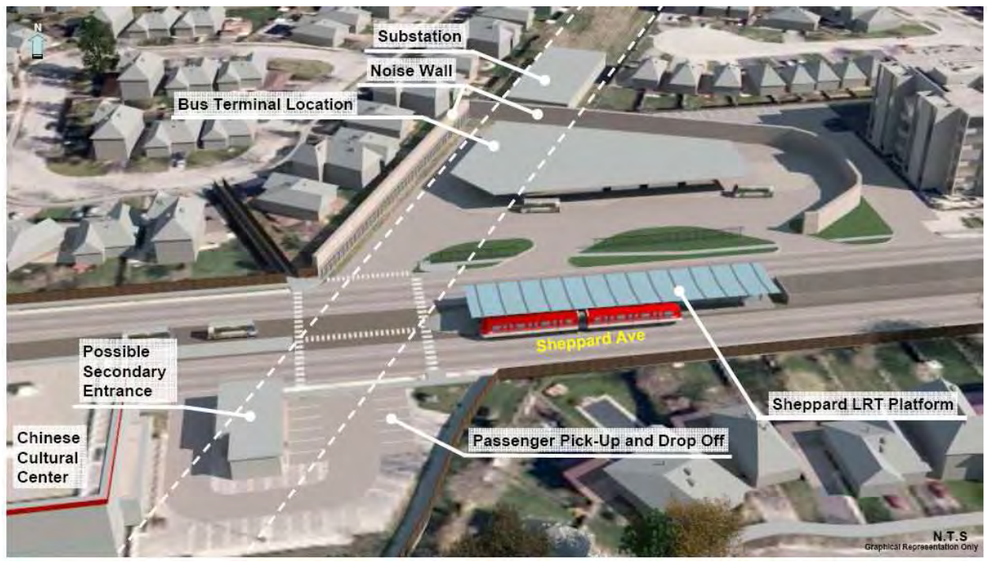
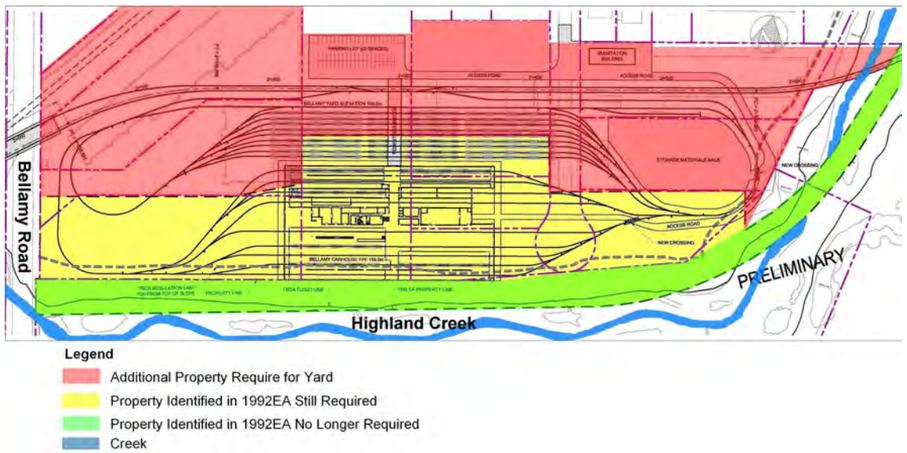


Exhibit E1-12: Malvern Town Centre Station

E.3.7 Maintenance and Storage Requirements for the SRT

SRT vehicles will initially operate from the proposed Sheppard East Maintenance and Storage Facility. However, as full build-out of the Transit City network approaches, the Sheppard East Maintenance and Storage facility will be unable to accommodate the additional fleet. As shown in Exhibit E1-13, the Bellamy Maintenance and Storage facility continues to be a possible option for a future location. As such, the SRT Transit Project Assessment will reference the potential future requirement for this location.

Exhibit E1-13: Future Potential Maintenance and Storage Facility



E.3.8 Ancillary Facilities

E.3.8.1 Special Track Work

Special trackwork is required at six locations along the line to allow a change in direction of an SRT vehicle or storage of an SRT vehicle. The special trackwork is located at:

- Kennedy Station,
- McCowan Station,
- Bellamy Road,
- Sheppard Avenue, and
- Malvern Town Centre.

All special trackwork comprise a series of switches within the right-of-way that allows trains to reverse direction, either at the end of the line or for short turning activities.

E.3.8.2 Service Connection to Maintenance and Storage Facility

A non-revenue service connection is required to transfer SRT vehicles between the Sheppard East Maintenance and Storage Facility and the SRT, via the Sheppard East LRT mainline tracks. The service connection will consist of a single track in a dedicated right-of-way that connects from the centre of Sheppard Avenue to the tail tracks north of the Sheppard East station. As part of Phase 2, a connection to the south will be added. The service connection will include a portal in between the mainline tracks fro the Sheppard East LRT. Due to geometric constraints, the portal will be situated within the Sheppard Avenue / Gateforth Avenue intersection. As a result, the Gateforth intersection signals will be removed and operations will be reduced to right-in / right-out.

The service connection will be used in the following manner:

- From approximately 4:45am to 6:15am up to 17 trains will run along Sheppard and then down Progress and enter into passenger service at Centennial Station;
- During the day, a small number of trains will use the Progress connection as trains are taken in and out of service around the rush hours; and
- From approximately 1:45am to 2:45am up to 11 trains remaining on the line will reverse the process of the morning.

The timing of operation of the non-revenue service connection may be subject to change during operation.

E.3.8.3 Emergency Exit Buildings

Emergency Exit Buildings (EEBs) extend from the underground tunnel to grade and are designed to provide an emergency exit for passengers and an emergency access for firefighting crews. An underground station, such as what is proposed at Sheppard Avenue, can serve as a means of underground egress. At-grade, the structures are approximately 3 metres in height and 10 square metres in area, as illustrated in Exhibit E1-14.

Exhibit E1-14: Typical Emergency Exit Building – Sheppard Subway

The SRT alignment includes an underground section of approximately 1.6 km (for Phases 1 and 2 combined). Based on the current preliminary design, the distance from the south portal to the south limit of the Sheppard Station is approximately 630 metres and therefore an EEB will not be required. The preliminary distance from the north limit of Sheppard Station to the north portal (Phase 2) is approximately 820 metres. Because this distance exceeds the maximum allowable distance between emergency exits, potential locations for an EEB are explored. The possible location is in the corridor on Greenspire Road or in the corridor on Mammoth Hall Trail.

Also, where the proposed tunnel is lower than any available sewer (as proposed in the vicinity of Mammoth Hall Trail), a pumping station will be required to drain the lowest point within the tunnel. The pumping station will comprise a small building at the surface that will house the mechanical and electrical equipment for the pumping system and can be combined with other buildings, such as an emergency exit building or a station. Given the need for a pumping station in the vicinity of Mammoth Hall Trail, the pumping station and EEB can be combined into a single building.

The final need will be determined during the detailed design phase. TTC will report back to the community during the detailed design phase. Commitments on consultation are outlined in Section E.6.

E.3.8.4 Traction Power Substations

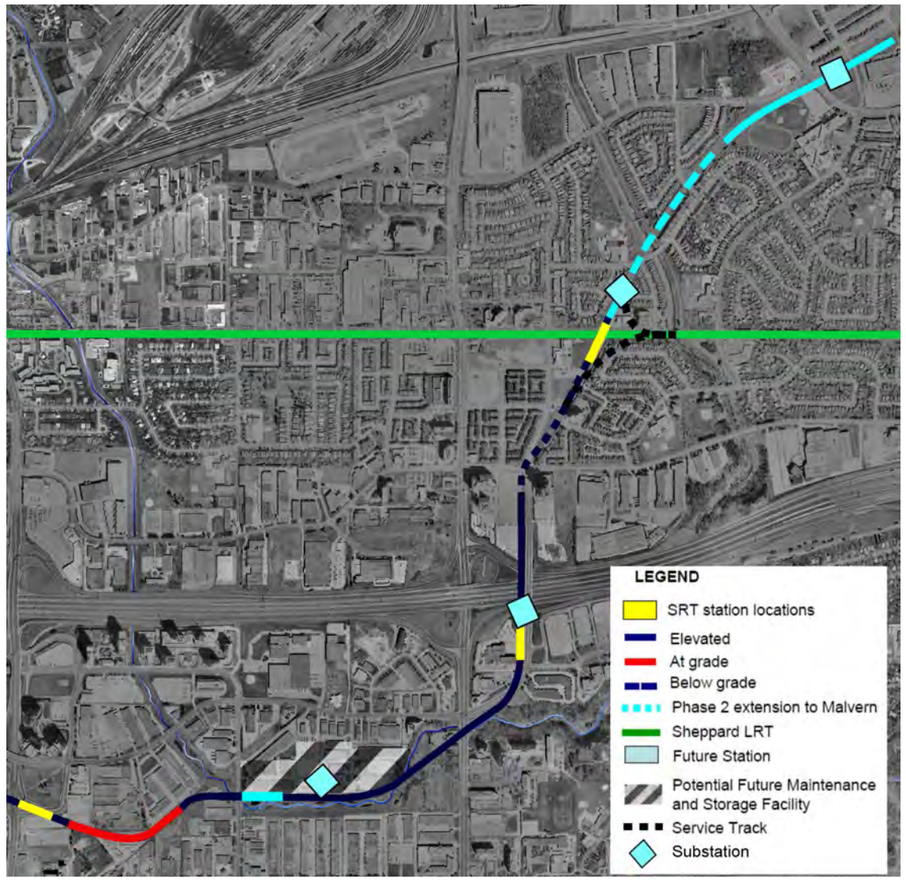
The existing traction power substations at Kennedy, Lawrence East, Ellesmere, Scarborough Centre and McCowan Stations will remain part of each station but will undergo changes to accommodate the new vehicle requirements.

New substations are proposed along the extension with an average of 1.5 kilometre spacing. Exhibit E1-15 presents the proposed location of the traction power substations:

- Production Drive;
- Centennial College;
- Sheppard Avenue; and
- Malvern Town Centre.

The typical substation structures are proposed to be approximately 11 metres by 4.6 metres and 4 metres high. Additional length and width may be required for providing access for maintenance and an attractive façade. These structures will be carefully sited so that they do not obstruct existing and future developments along the SRT corridor. The final locations of the electrical substations will be further investigated in the detailed design stage.

Exhibit E1-15: Potential Substation Locations for SRT Extension



E.3.9 Roadway Modifications

Changes to the road network associated with this project are limited to:

- Eglinton Avenue, between Birchmount Avenue and Midland Avenue – The connection to Eglinton Crosstown LRT requires a slight shift in roadway alignment to the north. The Eglinton Crosstown LRT portal will be located east of Ionview Road and the platform/LRT stop will be located west of Ionview Road. East of Kennedy Station, the portal for the Scarborough-Malvern LRT will be west of Midland Avenue and the platform/LRT stop will be located east of Midland Avenue.
- Milner Business Court – Between Highway 401 and Milner Avenue, Milner Business Court intersects with Progress Avenue. Through this block, the alignment is transitioning from elevated to below-grade and is at-grade in the general vicinity of the aforementioned intersection. As an at-grade crossing cannot be supported by the operations of the SRT, Milner Business Court will be closed at Progress Avenue. As traffic will then be concentrated onto Milner Avenue, a new set of traffic signals is proposed at the intersection of Milner Business Court and Milner Avenue.

E.3.10 Construction Methods

The following sections describe the construction methods carried forward for this undertaking.

E.3.10.1 Elevated Section

For the elevated portions of the alignment (between McCowan Station to Highway 401), piers are generally cast in place. The running way sections are pre-cast and installed either as a single piece or in a segmental nature.

Beams can be transported to the site on a truck and then lifted into place with a crane

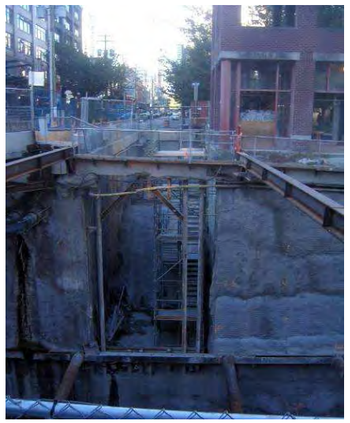
Beams can be assembled in segments on site and put into place using precast segmental construction method.

E.3.10.2 Below-Grade Sections

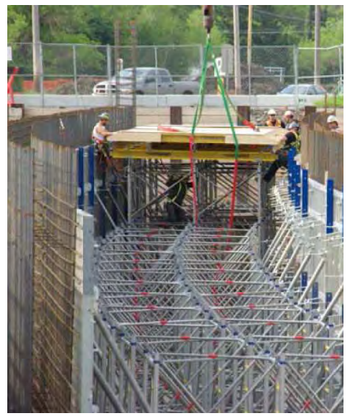
For the below-grade sections of the alignment (Milner Avenue to Malvern Town Centre), a cut-and-cover construction method has been proposed. The below-grade section to be constructed as part of Phase 1 is approximately 900 metres long with a considerable amount of special structural needs (station and special trackwork). Furthermore, tunnelling would not be economical for the short distance. Therefore, all below-grade construction is proposed to be undertaken using a cut-and-cover approach.

This method involves excavating the ground surface to a sufficient depth to construct the tunnel structure and ancillary facilities. The sides of the excavation are usually supported by vertical temporary walls to

minimize the volume of material excavated and to protect adjacent facilities and buildings. The walls require cross-bracing or tiebacks for support. Construction crew and equipment will be protected by shoring during construction. Once the construction excavation is complete, the contractor builds the structure from the bottom to the top of the structure. Once the structure is complete, the remaining excavation is backfilled and the surface is reinstated.



Area is excavated down to track level. To minimize impacts, soil retention systems are used.



The concrete tunnel is poured and then the surface is reinstated.

Major utilities that are found to be within the right-of-way can be relocated prior to excavation to maintain service, whereas minor utilities will be temporarily suspended through the open cut.

E.3.10.3 Decommissioning of Existing McCowan Maintenance and Storage Facility

The existing McCowan yard is too small to accommodate the long-term requirements of the extended SRT, is not equipped to service Light Rail Transit vehicles, and is directly in the path of the extension. Therefore, as part of this project, the existing tracks and buildings will be removed and, as noted in Section E.2.3, SRT vehicles will be maintained at the Sheppard East Maintenance and Storage Facility.

E.3.10.4 Replacement Service during SRT Shutdown

During reconstruction of the SRT, train service will not operate. TTC customers will be accommodated by very frequent express bus service between Scarborough Centre Station and Kennedy Station. It is expected that some bus routes that now terminate at Scarborough Centre Station would be extended to operate to Kennedy Station, and that service would be increased on other bus routes in north-east Scarborough that operate to the Yonge and Sheppard Subways.

The temporary service changes and the temporary terminals are expected to be required for up to three years.

Temporary bus terminals will be required at Scarborough Centre Station and at Kennedy Station to accommodate the additional bus service, and to permit construction to take place at the existing facilities.

E.3.10.5 Temporary Construction Sites and Easements

Construction of this magnitude requires additional working space. Heavy equipment maintenance, storage/ material lay-down areas and temporary easements for elements like temporary road diversions or temporary replacement parking are a requirement of construction.

During construction areas immediately adjacent to the SRT are required for the removal of excavated material as well as the delivery of material and equipment for the construction of the proposed works.

Through the design stage the number and size of work zones will be confirmed. Some possible sites include:

- The north and south parking lot at Kennedy Station;
- The existing TTC maintenance and storage facility east of McCowan Station; or
- Existing parking lots and open spaces north and south of Highway 401.

E.4 EXISTING CONDITIONS, IMPACTS ASSESSMENT AND PROPOSED MITIGATION MEASURES

This section outlines the existing natural, cultural and transportation conditions within the SRT corridor and identifies potential impacts and mitigation measures.

E.4.1 Existing Natural Environment

E.4.1.1 Aquatic, Vegetation and Wildlife

The natural environment includes species of special concern and their habitat, a wetland, woodlands, habitat of wildlife or other natural heritage area, or a stream, creek, river or lake containing fish and their habitats.

The SRT extension study area can be classified as being mostly urban. There are no areas of natural and scientific interest (ANSIs), environmentally sensitive areas (ESAs) or provincially significant wetlands (PSWs) located in the study area. The most significant natural heritage features are associated with the East Highland Creek area. According to the Natural Heritage Information Centre (NHIC) database, no aquatic species at risk have been found within or adjacent to the study area.

None of the wildlife species recorded in the study area are designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), the Committee on the Status of Endangered Wildlife in Ontario (COSSARO) nor regulated under the Canadian Species at Risk Act or the Ontario Endangered Species Act, 2007. According to historical records, such as the Natural Heritage Information Centre (NHIC) database, no sensitive species have been recorded in the study area. However, 31 of the 37 bird species recorded are protected under the Migratory Birds Convention Act (MBCA). The Fish and Wildlife Conservation Act (FWBA) protects one bird species and eight of the eleven mammal species recorded. Five of the migratory bird species recorded in the study area are also recognized as priority species of conservation concern by Bird Studies Canada for the Metropolitan Toronto region. To meet the

requirements of the MBCA and the FWBA, no vegetation removals should occur during the nesting season (April 1 to July 31), subject to several exceptions.

A review of historical records identified several areas to have potential soil or groundwater contamination from previous and current operations.

Toronto Water, in consultation with the TRCA will be undertaking works within the Highland Creek valley (east of Markham Road). Intended works and restoration plans have been co-ordinated with this project.

E.4.2 Emmissions

E.4.2.1 Air Quality

The existing ambient air quality conditions for the project area are based on the most recently available data published by the MOE, Air Quality Report (2007) from the closest monitoring stations to the project area for which data was available. The closest monitoring station which provided NO2 and PM2.5 is the Toronto East Station located on Lawrence Avenue East, near Kennedy Road. Data for CO concentrations are based on the measurements at the Toronto Downtown Station. A review of data for the project area indicates that CO and NO2 concentrations are well below the Ontario AAQC. Ambient PM2.5 concentrations, at the 90th percentile level are at 57% of the proposed federal standard that will come into effect in 2010. However, maximum PM2.5 concentrations have exceeded the proposed limit on seven occasions.

The SRT project will have an overall positive impact on air quality on a regional scale. As part of this study, an investigation of potential impacts on air quality in the local area surrounding the proposed bus terminals has been conducted for the preferred design. This analysis has concluded that the proposed bus terminals will not have a significant impact on air quality at the local level.

For construction-related air quality, the Toronto Transit Commission requires that contractors submit a comprehensive Environmental Control and Methods Plan to address, among other elements, dust control.

E.4.2.2 Noise and Vibration

New track features including rubber pads in structures that reduce the transmission of vibrations to the ground, continuously welded rail and ongoing maintenance of tracks and vehicles all reduce the potential for vibration. Observed vibration is minimal at distances greater than 15 metres from the tracks.

There are several major and moderate sources of ambient noise in the study area depending on their volume of traffic, traffic mix, speed and proximity to the points of reception. The following is a list of the sources of ambient noise considered in this study:

- Existing rail corridors, including the existing SRT;
- Highway 401;
- Other major arterial roads including Markham Road, Milner Avenue, Tapscott Road, Sheppard Avenue East and others; and
- Existing industrial and commercial activities throughout the study area.

Ambient noise levels in the majority of the SRT study area are influenced by one or more sources of noise and vibration. In most locations along the proposed extension, the introduction of the SRT will result in negligible changes to ambient noise levels. To identify where major changes in ambient noise levels may occur, an extensive investigation of potential noise impacts was undertaken along the existing SRT and the SRT extension.

The noise and vibration investigation identified the following areas where potential adverse effects may occur as a result of the project:

- Changes to the track associated with improvements for Lawrence East Station;
- The running structure immediately adjacent to the Centennial College residence;
- The bus terminal at Sheppard Avenue; and
- The future station and bus terminal at Malvern Town Centre.

Mitigation for each of these four locations is discussed in Section E.4.4.

E.4.3 Socio-Economic Environment

Land uses within the SRT study area range from high-rise residential and commercial; low-rise residential and commercial/industrial and institutional uses (e.g. schools and libraries) and open space uses (e.g. parks and recreation centres).

Areas of archaeological potential have been identified within the study area. A Stage 2 Archaeological Assessment will determine if any artefacts remain in these potential areas. No cultural heritage landscape features are within the limits of proposed works for the SRT project.

There are a number of large diameter utilities and pipelines within the road rights-of-way throughout the extent of the SRT corridor. In addition, there is an extensive system of minor storm sewers and watermains crossing the SRT corridor.

Along the west side of the existing SRT right-of-way (north of Eglinton) there are Hydro towers. Toronto Hydro has poles located along the roads within the SRT study area corridor and has an extensive system of buried conduit throughout.

Rogers and Telus utility plants are located in shared buried conduit and Enbridge Gas has 100 millimetres and 150 millimetres gas main throughout the SRT study area. Bell Canada has an extensive conduit system in the study area.

E.4.4 Transportation System

A large number of TTC bus routes, the existing Scarborough RT, the Bloor-Danforth Subway, GO Rail and GO Bus inter-regional services, private inter-regional bus services and freight rail operations are located within the study area. As well, in the future, it is expected that the Eglinton Crosstown and Scarborough-Malvern LRT lines, and bus services from York Region and Durham Region, will also serve the study area.

Most of the road network in the study area operates at capacity during the morning and afternoon peak hours. With the notable exception of minor operational changes to Progress Avenue and Milner Business Court (see Section E.3.4 above) the introduction of the SRT will not affect the existing road network system.

The Highland Creek and its associated branches within the study area are not considered navigable. Final confirmation of this determination is pending with Transport Canada.

E.4.5 Impact Assessment and Mitigation

The environmental effects for the SRT are classified as follows:

- Displacement of Existing Features– Permanent impacts to existing features located within the footprint of the SRT as they are physically altered to accommodate the planned facility.
- Construction Impacts – Temporary impacts, occurring only during construction activities.
- Operations and Maintenance Impacts – Ongoing and long-term impacts occurring during operations and maintenance activities.

These impacts and proposed measures to mitigate any negative effects are summarized below.

E.4.5.1 Displacement of Existing Features

To execute the project, approximately 21 full and 105 partial acquisitions will be required. In addition, there will be temporary property requirements to facilitate construction. These requirements will be confirmed during detailed design.

The City of Toronto (on behalf of TTC) will acquire these properties and provide compensation through either a negotiated settlement or, in the event that expropriation is required, in accordance with the *Ontario Expropriation Act.*

TTC and the City of Toronto are committed to the following process/principles for these impacted properties:

- Early notification to property owners;
- Ongoing meetings and discussions with property owners concerning property impacts to minimize property takings and identify mitigation measures;
- Further investigations of alternative site locations and configurations for surface facilities; and,
- Uniform and equitable treatment, in accordance with the *Ontario Expropriation Act.*

Other features located within the footprint of the SRT that may be affected include:

- Rosebank Park – Existing playground equipment and court areas will be temporarily displaced during construction of the below-grade section of the alignment. The preferred location, configuration and design of replacement equipment will be determined in consultation with City of Toronto Parks, Forestry and Recreation.
- Burrows Hall / Library / Chinese Cultural Centre – Impacts include the relocation of parking to adjacent property, modifications to deliveries for the Chinese Cultural Centre (on the east side of the building) and co-ordination with the long term plans for a Chinese garden.
- Several vegetation communities will be displaced during modifications to the existing line as well as for the extension. The impacts on vegetation will be mitigated to the extent possible through avoidance, minimizing the extent of vegetation removals, protecting vegetation to remain and restoring vegetation that is removed.
- The TRCA regulated area of Highland Creek will be affected by the SRT. All crossings will be designed and located, where feasible, to minimize effects on flooding and are being coordinated with stream improvements already planned by Toronto Water (in the vicinity of Markham Road and Progress Avenue). A permit under the Ontario Regulation 166/06 – Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses will be secured from the Toronto and Region Conservation Authority.
- Several properties within the study area have been identified for potential soil or groundwater contamination. A Phase 2 Environmental Site Assessment will be conducted for these properties if acquisition is required. Contaminated soils and groundwater will be managed in accordance with provincial legislation and regulations.
- A number of large diameter utilities and pipelines conflict with the SRT. These utilities will be relocated prior to construction, where necessary. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers.
- No harmful alteration of fish habitat will result from the SRT.

E.4.5.2 Construction Impacts

The runningway through underground sections, including stations and special track work areas, will be constructed by cut-and-cover method. Stations, elevated runningway, emergency exit buildings, emergency ventilation shafts, and traction power substations will be constructed following standard at surface construction methods with excavation activities for connection to the underground sections. Construction of new or modification of existing elevated running structures will not involve in-water construction work.

Measures will be implemented during construction to avoid, minimize or mitigate adverse environmental impacts including:

- Erosion and sedimentation control measures will be implemented to prevent the potential migration of sediments off site;
- Best management practices will be implemented to prevent the potential release of dust and other airborne pollutants off site;
- Good housekeeping practices will be implemented to prevent the potential migration of mud and litter off site;

- The temporary work site located at the dry stormwater management facility at the south limit of Rosebank Park will be flood-proofed to prevent the potential flooding of the construction site during a possible 100-year storm event;
- Underpinning will be implemented to minimize the potential for building settlement/structural stress due to excavation, piling and dewatering, where necessary;
- Traffic management will be implemented to reduce the potential for disruption of existing vehicle circulation patterns due to road and lane closures and temporary traffic detours and diversions;
- Bike and pedestrian management will be implemented to reduce the potential for disruption of existing pedestrian circulation due to road diversions and detours;
- Decking will be installed at cut-and-cover excavations within road rights of way to minimize the duration of disturbance;
- Truck haul of construction materials, equipment and tunnelling spoils will be limited to major access roads to avoid neighbourhoods;
- Noise and vibration control measures will be implemented to prevent the potential disturbance from construction equipment and activities to nearby receptors; and,
- Impacts to local business operations due to: modified vehicle and pedestrian circulation patterns; reduced visibility of store fronts and signs; reduction in on-street parking; less convenient access to off-street parking; and customer inconvenience due to temporary construction debris, noise and dust; will be managed as required.

Mitigation methods will include detailed engineering studies and ongoing management and monitoring of construction activities.

E.4.5.3 Operations and Maintenance Impacts

Measures will be implemented during operations and maintenance to avoid, minimize or mitigate adverse effects.

Stormwater run-off from the SRT facilities will be addressed in accordance with the City of Toronto's Wet Weather Flow Management Plan.

Traction power stray current will be controlled using isolated and insulated power supplies. The SRT traction power distribution system will be ungrounded and shall have no direct connection to the earth. The running rails will be insulated from the earth with the use of insulating pads and hardware and by the isolation of all rail-associated metal ware from the earth. Where applicable, the negative running rails shall be connected to the AC ground system through a floating negative automatic ground switch. Utility structures will be electrically insulated, bonded, coated and cathodically-protected as required.

Although no special consideration for air emissions generated by bus terminal operations is required, standard TTC operating policies and procedures with regards to idling buses shall apply to this project.

Noise generated by SRT vehicles and by bus terminal operations will be attenuated in accordance with MOE noise protocols. This includes the following treatments:

- General Operating Practices: New vehicles will be subjected to rigorous testing of prototypes and new features which reduce noise and vibration are being pursued. New track will be installed with rubber pads in structures, continuously welded rail will be used and ongoing maintenance of tracks and vehicles will all contribute to the reduction the transmission of vibrations to the ground. The result will be the reduction of vibration to minimal levels at distances greater than 15 metres.
- Lawrence East Station Modifications: The changes at Lawrence East Station may require a shift of the track alignment towards the townhouses. This may increase noise level. If necessary, TTC will consider alternate solutions to mitigate the increased noise, such as short noise barriers.
- Bus Terminal at Sheppard Avenue: A sound barrier up to 6 metres high is proposed at the Sheppard East bus terminal on the west, north and east sides to mitigate noise associated with the proposed bus terminal. A sound barrier up to 6 metres high will mitigate noise for the lower floors of the condominium. There is currently no recommended practical solution for noise mitigation for the upper floors. TTC is committed to working with the owners of the condominium to develop an optimal solution for this specific location.
- Future Bus Terminal and Station at Malvern Town Centre (Phase 2): Potential noise impacts have been identified around the future station at Malvern Town Centre similar to those associated with the station at Sheppard Avenue. Noise mitigation treatments as discussed for the Sheppard Avenue station may be employed. TTC is committed to update the noise and vibration analysis prior to implementing Phase 2.

E.5 CONSULTATION PROCESS

A consultation program was conducted under the Transit Project Assessment process as specified under Ontario Regulation 231/08. Key components of the consultation program included consultation with agencies, the public and the aboriginal community, and public review of the Environmental Project Report.

E.5.1 Stakeholder Agency Consultations

The following stakeholder agencies were actively engaged (through meetings, email and letter correspondence) during the Transit Project Assessment process:

- City of Toronto (City Planning, Emergency Medical Services, Fire Services, Heritage Preservation Services, Parks Forestry and Recreation, Police Services, Transportation, Services)
- Hydro One
- Canada Post
- Metrolinx
- Ministry of the Environment (Environmental Assessment Approvals Branch, Noise and Vibration Section, Regional office)
- Ministry of Transportation
- Toronto District School Board

- Toronto Catholic District School Board
- Toronto and Region Conservation Authority
- GO Transit
- Centennial College
- Toronto Public Library

Additional consultation with external agencies included notification of Public Open Houses. Each external agency was also sent a Notice of Commencement via e-mail message. Table E-1 shows the Federal and Provincial agencies that were notified.

Table E-1: Contact with External Agencies

Federal Agency	Provincial Agency
Canadian Environmental Assessment Agency	Ministry of Aboriginal Affairs
Indian and Northern Affairs Canada	Ministry of Agriculture, Food and Rural Affairs
Environment Canada	Ministry of Citizenship and Immigration
Department of Fisheries and Oceans	Ministry of Culture
Transport Canada	Ministry of Municipal Affairs and Housing
Transport Canada - Ontario Region	Ministry of Natural Resources
Infrastructure Canada	Ministry of Public Infrastructure Renewal
Industry Canada	Ministry of the Attorney General
Health Canada	Ministry of Tourism and Recreation
	Ontario Realty Corporation
Transportation Stakeholders	Ministry of Transportation
Canadian National Railway	Ministry of Education
Canadian Pacific Railway	Ministry of Health
Toronto Cycling Committee	Ministry of the Environment
Toronto Pedestrian Committee	Ministry of Training, Colleges & Universities
Utilities	Ministry of Small Businesses and Consumer Services
Bell Canada	Ministry of Community Safety and Correctional Services
Enbridge Gas Distribution	Ontario Power Generation
Enbridge Pipelines	**Other Stakeholders**
Rogers Cable	Conseil Scolaire de district Catholique Centre-Sud
Sarnia Products Pipeline Company, Inc.	Conservation Ontario
Sun-Canadian Pipeline Company, Inc.	Ontario Provincial Police
Toronto Hydro	
Trans-Northern Pipeline	
Hydro One Networks Inc.	

E.5.2 Public Consultation

Public notification methods have included the following:

- formal notices in the Scarborough Mirror and The Metro;
- bulk mailings to local residents to announce the open houses;
- mailings to ratepayers groups;
- a project website;
- dedicated 24/7 phone line;
- dedicated fax line;
- dedicated TTY line;
- dedicated e-mail address (SRT@toronto.ca);
- dedicated postal address through the City's Public Consultation Unit; and,
- Notice of Commencement.

This work has also included the following public consultation events:

Table E-2: Public Consultation Events Summary

Public Information Event and Date	Number of Attendees
PIC #1 – April 15th, 2008	300
PIC #2 – June 4th and June 5th, 2008	46
Community Meeting – July 31st, 2008	30
PIC #3 – June 2nd, 2009	200
PIC #4 – March 8th and March 11th, 2010	443
PIC #5 – April 12th and 15th, 2010	356

Notice of Commencement under Ontario Regulation 231/08 was issued on April 6, 2010 and appeared in the *Scarborough Mirror and The Metro*. A Notice of Completion was issued on August 4, 2010.

E.5.3 Aboriginal Communities Consultation

As per the City of Toronto and Indian and Northern Affairs Canada (INAC) protocol for First Nations consultation for EAs, INAC Specific Claims, Litigation Management and Resolution, and Comprehensive Claims are required to be notified of all of EAs conducted by the City of Toronto and no written response is expected unless there are issues with the project as proposed (Note: none have been identified to date).

The aboriginal consultation process included notifying the following of public open houses and the Notice of Commencement:

- INAC Specific Claims;
- INAC Litigation Management and Resolution;
- INAC Comprehensive Claims;
- Ontario Ministry of Aboriginal Affairs; and,
- Mississaugas of the New Credit First Nation.

Following recent guidance received from the Ministry of Environment, Aboriginal Consultation process, the bands involved in the Williams Treaty were notified of the Notice of Commencement individually.

E.6 COMMITMENTS TO FUTURE WORK

During the Transit Project Assessment Process, TTC and the City of Toronto have worked closely with key stakeholders to address and resolve any issues or concerns. In addition, the TTC's and City of Toronto's commitments to future work include the following:

1. NATURAL ENVIRONMENT
   - 1.1. Vegetation and Vegetation Communities
     - 1.1.1. For TRCA regulated areas:
       - 1.1.1.1. Prepare an inventory of the vegetation (trees and shrubs) to be removed;
       - 1.1.1.2. For rare or uncommon plant species identified in the inventory, develop site-specific measures to minimize displacement or disturbance effects;
       - 1.1.1.3. Design environmental protection measures to reduce vegetation removals;
       - 1.1.1.4. Prepare a detailed landscaping plan to address vegetation and vegetation community impacts; and
       - 1.1.1.5. Prepare a restoration landscape plan showing how TTC intends to implement the proposed vegetation compensation.
     - 1.1.2. Identify opportunities to incorporate TRCA natural environment restoration projects into the overall natural heritage improvements activities for the project.
     - 1.1.3. Prepare construction access and staging plan associated with the proposed Highland Creek crossings (three locations) and an assessment of the temporary construction impacts on vegetation communities.
     - 1.1.4. Prepare detailed erosion control plan for Highland Creek crossing (second crossing located west of Markham Road).
     - 1.1.5. Prepare and implement vegetation protection, restoration, compensation, edge management and streetscape plans for approval. Determine areas where compensation for vegetation loss will be required. Determine quantity and type of species to be used and identify sites where compensation efforts would be maximized. Compensation will be calculated comprehensively in accordance with applicable TRCA and City of Toronto (Parks, Forestry and Recreation) requirements.
     - 1.1.6. Obtain permits and approvals for tree protection and removal/injury.
     - 1.1.7. Comply with City of Toronto Ravine and Natural Feature Protection By-law, as applicable.
     - 1.1.8. Conduct supplemental planning to determine the corridor for a possible future extension of the SRT beyond the planned terminus at Malvern Town Centre. Finalize alignment of current Undertaking at Malvern Town Centre to minimize potential impacts of future extension on the community woodlot.

   - 1.2. Fisheries and Aquatic Habitat
     - 1.2.1. In consultation with TRCA, determine any potential for a Harmful Alteration, Disruption or Destruction of fish habitat (HADD) in line with TRCA's Level III agreement with Fisheries and Oceans Canada as per the Fisheries Act.
     - 1.2.2. Investigate Higland Creek (Malvern Branch) conditions and develop construction methods to minimize fish habitat impacts.

   - 1.3. Wildlife and Wildlife Habitat
     - 1.3.1. If vegetation clearing is required during the nesting season (as defined under the Migratory Birds Convention Act), TTC will retain a qualified avian biologist to conduct a nesting survey. If active nests are found, TTC will prepare a site-specific mitigation plan in consultation with the Canadian Wildlife Service.

   - 1.4. Geology, Soils and Groundwater
     - 1.4.1. Provide dewatering plans to TRCA for review and approval. Prepare an environmental monitoring plan for mitigating the natural environment during dewatering, if needed.
     - 1.4.2. Develop procedures for disposal of excavated materials, including excess soils and contaminated soils, in accordance with applicable legislation.
     - 1.4.3. Prepare and implement a Soil and Groundwater Management Strategy, including:
       - 1.4.3.1. water treatment methods, which results in discharge water quality complying with prevailing TRCA and City of Toronto water guidelines and requirements. and,
       - 1.4.3.2. contaminated soils management, in accordance with environmental legislation, regulations and guidelines.
     - 1.4.4. Prepare an erosion and sedimentation control plan, which complies with prevailing TRCA and City of Toronto water guidelines and requirements.
     - 1.4.5. Conduct a Phase 2 Environmental Site Assessment for any areas of existing contamination prior to property acquisition.
     - 1.4.6. Obtain Permit(s) to Take Water (from Ministry of the Environment) for locations where dewatering exceeds 50,000 litres per day.
     - 1.4.7. Conduct further soils investigations to delineate the extent of the potentially impacted materials (i.e., with debris / aesthetic contaminants and/or petroleum hydrocarbon impact), and to determine if segregation is required for reuse or whether they will need to be handled as waste material and disposed of off-site at a landfill facility authorized to receive this material (pending approval of receiving site authorities).
     - 1.4.8. Conduct further assessment to determine if dewatering will adversely affect adjacent utilities, structures and watercourses.
     - 1.4.9. If potential adverse effects are identified (as part of 1.4.8) undertake buildings and structures monitoring (associated with settlement) during construction.
     - 1.4.10. Execute Surcharge Agreement with City of Toronto, if water discharge to sanitary sewer exceeds City of Toronto Sanitary and Combined Sewer By-Law.
     - 1.4.11. Develop during detailed design appropriate mitigation measures in the event of dewatering discharge to combined sewer systems.
     - 1.4.12. Conduct further assessment of localized sections of Highland Creek slopes (between Bellamy Rd. and Markham Rd.) where inclinations are steeper than 2H; 1V during preliminary design to provide recommendations based on additional geotechnical investigation.
     - 1.4.13. Address potential toe erosion allowance issues (Highland Creek between BellamyRd. and Markham Rd.) during preliminary design.

   - 1.5. Surface Water
     - 1.5.1. Provide design of crossings of Highland Creek to TRCA for review (due to the potential hydraulic impacts associated with the proposed crossings of Highland Creek) (see 1.1.4)
     - 1.5.2. Conduct a hydraulic assessment of the new Highland Creek structures during the design stage using the latest floodplain mapping and model provided by TRCA with adjustments to account for creek changes to be undertaken by Toronto Water. The details of the required analysis will be discussed with TRCA during the design stage. This will include detailed hydraulic calculations for all reaches where impacts on hydraulics are expected as a result

of the proposed undertaking, including the Bellamy Road and markahm Creek crossings (Phase 1), as well as the mammoth Hall Trail crossing (Phase 2)

1.5.3. Develop a flood response contingency plan for each of the Highland Creek crossing locations for activities within the floodplain (during construction)..

1.5.4. During design and construction of the SRT, coordinate with the City of Toronto for ongoing City Projects within the proposed Highland Creek area (including Taylor Creek realignment and Taylor Hydro Corridor multi-use pathway).

1.5.5. Prepare an erosion and sediment control plan, which complies with prevailing TRCA and Toronto Water guidelines and requirements will be prepared;

1.5.6. Conduct stormwater management, in accordance with City of Toronto, TRCA and MOE requirements (including MOE Certificate of Approval for any new stormwater management system)

1.5.7. Obtain sewer discharge permits and approvals, in accordance with City of Toronto (Discharge Permit) and TRCA requirements.

1.5.8. Obtain permits and approvals in accordance with Ontario Regulation 166/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses) within TRCA-regulated areas (Highland Creek valley lands)

1.5.9. Prepare a construction staging and contingency plan for Rosebank Park dry stormwater management facility.

1.5.10. Conduct supplemental hydrogelogic testing (to be used to refine range of anticipated pumping rates and hydraulic connection to the watercourse)

1.5.11. Look for opportunities to create over-control runoffs to compensate for the uncontrolled portions of the systems within the Bellamy Station yard during detailed design. The LID measuresments in other stations also will be investigated at the detailed design stage.

1.5.12. Consider the applicable design standard at the detailed stage including Wet Weather Flow Management Gulidline (WWFMG).

1.5.13. Develop a detailed construction staging / contingency plan during detailed design to ensure stormwater management criteria will still be achieved.

1.5.14. To conduct appropriate fluvial/geomorphic assessment in the future during detailed design specifically to ensure adequate depth beween the creek and obvert of the SRT tunnel.

1.5.15. Restore a reasonable section of the channel affected by the construction of the SRT with regards to the Channel Cleanout Maintenance Program (to occur prior to start of the construction of the crossing)

2. EMISSIONS

2.1. Air Quality

2.1.1. Include air quality monitoring and mitigation measures and construction site maintenance/upkeep requirements in construction contract documents.

2.1.2. Obtain Certificate of Approval for Air Quality, in accordance with the Environmental Protection Act (through MOE).

2.2. Noise and Vibration

2.2.1. Conduct additional noise studies, as required, in accordance with existing MOE/ TTC protocols.

2.2.2. Finalize location of the traction power substations and undertake additional noise and vibration analysis to determine the impacts and the associated mitigation measures if required.

2.2.3. Refine track geometry for the runningway immediately south of Lawrence East Station and conduct a follow-up noise predictions. In the event that predicted noise levels exceed MOE/TTC Protocol criteria, develop solutions to mitigate increased noise (such as noise barriers).

2.2.4. Include noise and vibration monitoring and mitigation measures and construction site maintenance/upkeep requirements in construction contract documents.

2.2.5. Construct a noise barrier around the west, north and east sides of the Sheppard East station bus terminal to mitigate noise.

2.2.6. Construct all underground track work using rubber pads between rail and tie and tie and tunnel to mitigate ground borne vibration.

2.2.7. Obtain MOE Certificate of Approval for ventilation shafts and traction power substations.

3. SOCIO-ECONOMIC

3.1. Land Use/ Economic Impacts

3.1.1. Participate in Metrolinx Mobility Hub Study for the Kennedy Station lands.

3.1.2. Work with the City of Toronto for selected locations for station entrances, vent shafts, traction power substations and Emergency Exit Buildings (EEBs) in order to meet established urban design and community planning policies and guidelines, limit impact, and provide opportunities for enhancements of the sites and pedestrian access.

3.1.3. Obtain Site Plan Approval for above grade structures and facilities including Kennedy Station, Lawrence East Station, Ellesmere Station, Centennial College Station and Sheppard East Station. Stand alone support structures, including emergency exit buildings, new substations and pumping stations will also be included in the list of facilities requiring Site Plan.

3.1.4. Obtain building permits for the stations (including ancillary facilities) and stand alone support structures.

3.2. Local Parks and Community Facilities

3.2.1. Develop plans for compensation parking and delivery access for Chinese Cultural Centre/ Burrows Hall Community Centre and Library (displaced by Sheppard East Station main entrance building and Passenger Pick-up and Drop-off).

3.2.2. Refine plans for a temporary bus terminal at Kennedy Station, which may include a temporary facility on the Don Montgomery Community Centre lands. If TTC determines that a portion of the Community Centre parking lot is required for the temporary bus terminal, TTC will develop plans for compensation parking for review and approval by City Parks and Recreation.

3.2.3. Obtain park access permits for access to parks for construction and staging activities.

3.3. Property

3.3.1. Conduct a Property Protection Study to confirm property requirements.

3.3.2. For privately-owned properties acquire property by negotiation or expropriation.

3.3.3. Conduct ongoing communications with property owners potentially impacted property by the proposed future Bellamy Yard regarding implementation timing and status.

3.3.4. Initiate or continue property acquisition negotiations with Canada Post, Hydro One Networks Inc., Ontario Realty Corporation, the Toronto and Region Conservation Authority, the Toronto District School Board, the Toronto Catholic District School Board and the Toronto and Region Conservation Authority for publicly-owned property;

3.3.5. Secure Toronto District School Board trustee approvals, as applicable under Regulation 444/58.
3.3.6. Conduct a further review of the future Toronto Catholic District School Board elementary school site on Progress Avenue to determine the potential impacts of the SRT underground tunnels on a future school. If it is determined that as a result of the proposed alignment it is not feasible for a school to be developed on these lands, the TTC and the City of Toronto will enter into further discussions with the School Board to achieve a mutually acceptable agreement.
3.3.7. Obtain Cabinet Order-in-Council for Provincially-owned lands, as applicable.
3.3.8. Assist ORC in the completion of the ORC Consultation and Documentation Report in accordance with the MEI Class EA process for Realty Activities Other Than Electricity Projects (approved April 2004, amended September 11, 2008) using the work completed in support of this EPR as the basis.
3.3.9. Undertake Designated Substances Surveys for any buildings or structures which require demolition and to reflect the findings in construction contract documents.

3.4. Utilities
3.4.1. Submit design and construction plans to Hydro One Network Incorporated for the proposed LRT alignment within active hydro corridors to address line clearances and access to Hydro One's facilities, electrical clearances from the transmission line conductors during construction (per the Ontario Health and Safety Act and maintaining the integrity of structure foundations. for review/ approval)
3.4.2. Develop utility and municipal servicing relocation plans with service providers. Contact utility companies (Bell Canada, Rogers Cable, Enbridge Gas, Hydro One, Telus, Allstream Enterprise Solutions, Cogeco Data Service, and City of Toronto (watermains, storm water and sanitary sewers) early during design to confirm plant location and discuss relocation strategies / cost sharing.
3.4.3. Conduct further investigations of clearances between new overhead catenary and existing high voltage power lines crossing the existing SRT right-of-way (Kennedy Station to McCowan Station).
3.4.4. Undertake stray current protection (if applicable) and monitoring for pipelines and other utilities.
3.4.5. Assure that applicable Ontario Energy Board approvals are obtained for utility relocations.

4. CULTURE
4.1. Archaeology
4.1.1. Conduct a Stage 2 archaeological assessment in areas where ground disturbance will occur during construction and which have archaeological potential.
4.1.2. For lands under TRCA ownership, TRCA will conduct archaeological investigations in accordance with TRCA and Ministry of Culture requirements
4.1.3. Ministry of Tourism and Culture must concur with all recommendations made in both Stage 1 reports and any Stage 2 assessments that are required prior to commencement of construction.
4.1.4. Built Heritage Resource and Cultural Landscape
4.1.5. Bethel Cemetery – if detailed designs for Kennedy Station result in direct impacts to the resource, TTC will prepare a heritage impact assessment, including a conservation strategy.

5. TRANSPORTATION
5.1. Develop traffic, transit, cycling and pedestrian management strategies to be included in construction contract documents.
5.2. Develop railway protection and monitoring plans for GO Stouffville Subdivision during construction.
5.2.1. Obtain Railway Crossing Agreement at the GO Stouffville subdivision.
5.2.2. Submit Highway 401 bridge design for review including:
5.2.3. 401 Progress Road Bridge pier placements,
5.2.4. 401 Progress Road Bridge Structural elements,
5.2.5. 401 Progress Road Bridge clearances and aesthetics and
5.2.6. Traffic management plan for construction
5.3. Obtain Ministry of Transportation permits and approvals for Highway 401 bridge. Possible permits and approvals include Encroachment Permit, Building and Land Use Permit (for Centennial Station due to close proximity to 401); Legal Agreement and Sign Permit (for all signs visible to Highway 401 within 400 metres of highway right-of-way)
5.4. Obtain permits for construction within the existing road allowances (through the City of Toronto);
5.5. Obtain Highway Alteration By-law approval for alterations to Eglinton Avenue.
5.6. Conduct consultations with Metrolinx (bus operations) re: layout of temporary bus terminal at Scarborough City Centre.
5.7. Obtain By-law approval for closure of Milner Business Court (Municipal Class EA approvals normally undertaken in support of retirement of roadway is obviated by this Transit Project Assessment).

6. CONSULTATION
6.1. Hold further consultations would be held with Fire/Emergency services on the SRT facility design details (for example, fire routes for stations) as part of the overall Transit City program.
6.2. Develop emergency response plans with emergency service providers to maintain fire, police and emergency medical services during construction;
6.3. Develop a public consultation plan, which will include a strategy for public participation during design and to address community issues, such as traffic and site access, during construction (see 6.5)
Conduct communications with businesses along existing SRT line to advise of SRT shutdown timing, duration and replacement bus services.
6.4. Strike a Construction Liaison Committee, in consultation with the Toronto Transit Commission, appropriate City staff and local City Councillors, to deal with any construction deficiencies, or nuisances brought forward by local residents.

E.7 ADDENDUM PROCESS

TTC will prepare an addendum, if changes to the project occur after the Notice of Completion is issued, in accordance with Section 15 of the Transit Projects Regulation, including:

- Preparation of an addendum to the Environmental Project Report;
- Preparation of a Notice of Addendum to the Environmental Project Report; and,
- Distribution of the Notice of Addendum to relevant stakeholders and the Ministry of the Environment.