Environmental Impacts, Mitigation Measures and Monitoring

4 ENVIRONMENTAL IMPACTS, MITIGATION MEASURES AND MONITORING

The implementation of the SRT may result in both positive and negative effects. Mitigation of negative effects has been considered through the course of the study, including preliminary planning screening of the corridor alternatives and the development of the preferred transit project. However, given that some negative effects cannot be totally avoided, mitigation measures are required during construction and operation of the SRT.

The Transit Projects Regulation (Ontario Regulation 231/08) Section 9 (2) requires the proponent to prepare an environmental project report that contains the following information, among other requirements:

- An assessment and evaluation of the impacts that the preferred method of carrying out the transit project and other methods might have on the environment.
- A description of any measures proposed by the proponent for mitigating any negative impacts that the preferred method of carrying out the transit project might have on the environment.
- A description of the means the proponent proposes to use to monitor or verify their effectiveness."

The purpose of this chapter is to document the above requirements for the SRT project.

4.1 Interactions between the Undertaking and the Environment

The environmental effects for the Scarborough RT are classified as follows:

Displacement of Existing Features by the SRT Facilities – Permanent impacts to existing features located within the footprint of the SRT as they are physically altered to accommodate works at Kennedy Station, the conversion of the existing line and the extension.

Construction Impacts – Temporary impacts, occurring only during construction activities.

Operations and Maintenance Impacts – Ongoing and long-term impacts occurring during operations and maintenance activities.

The level of interaction between an activity/component and an area of potential environmental effect includes: none, weak, moderate and strong. These terms were defined as follows:

- None (blank) = no probability of an interaction or the interaction has no significance. As a result, no additional discussion and documentation is required in support of this EPR.
- Weak (W) = a low probability of an interaction or the interaction has low significance. A general discussion is provided in this section, but given the anticipated low probability and/or significance, no additional commitments or follow up actions are required.
- Moderate (M) = a moderate probability of an interaction or the interaction has moderate significance. A more detailed discussion accompanied with supporting supplemental analysis and possible mitigating measures and commitments.
- Strong (S) = a high probability of an interaction or the interaction has a high level of significance. These issues are usually regulated or closely monitored by government agencies and will require detailed analysis to quantify the potential impact and the anticipated effect of mitigation measures. Future commitments for elements with strong interactions are addressed by this project.

The interactions matrix helped to establish the scope of the environmental assessment and reveal which project components have a significant interaction with environmental components. The interactions matrix is presented in Table 4-1 and considers all facets of the environment including:

- Natural Environment, including Designated Natural Areas, vegetation and vegetation communities, fisheries and aquatic habitat, wildlife and wildlife habitat, geology / soils, groundwater and surface water.
- Emissions, including air quality, noise and vibration
- Socio-Economic Environment, including land use / economics, local parks and community facilities, property, utilities, archaeology and built heritage
- Transportation

For each of the environmental effects identified in Table 4-1, the following sections:

- Describe the effects,
- Identify mitigation measures,
- Describe the monitoring program, and
- Recommend contingency measures, as required.

The results of the sections are summarized at the end of this chapter (see Table 4-9).

Each of the environment components are then further broken down into three sections, Kennedy, Conversion and Extension. Brimley Station, unless specifically identified as being an impact, is accounted for within the Conversion section while Bellamy station is accounted for within the Extension section.

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Table 4-1: SRT Interactions Matrix

		Natural Environment							Emissions				Socio-Economic						Transportation			
	Environmental Features / Facilities/Activities	Designated Natural Areas	Vegetation and Vegetation Communities	Fisheries and Aquatic habitat	Wildlife and Wildlife Habitat	Geology / Soils	Groundwater	Surface Water	Air Quality	Noise	Vibration	Stray Current	Land Use / Economic	Local Parks and Community Facilities	Property	Utilities	Archaeology	Cultural Heritage	Automobile Traffic and Transit Service	Pedestrians and Cyclists	Navigable Waterways	Emergency Services and Access
Displacement of Existing Features	Kennedy Station	-	W	-	-	W	-	-	-	-	-	-	-	-	S	-	M	-	-	-	-	-
	At Grade running structure	-	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Lawrence East Station	-	W	-	-	-	-	-	-	-	-	-	-	-	S	M	-	-	-	-	-	-
	Ellesmere Station	-	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Existing tunnel beneath GO Stouffville Line	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Midland Station	-	W	W	W	-	-	-	-	-	-	-	-	-	S	M	-	-	-	-	-	
	Existing Elevated Running Structure	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Scarborough Centre Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-
	McCowan Station	-	-	-	-	-	-	-	-	-	-	-	-	-	-	M	-	-	-	-	-	-
	McCowan Yard and Car house Decommissioning	-	-	-	-	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Running Structure – McCowan Station to Centennial College Station	-	M	M	W	-	-	-	-	-	-	-	-	-	S	M	M	-	-	-	-	-
	Centennial College Station	-	W	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
	Running Structure – Centennial College Station to Sheppard East Station	-	W	-	-	W	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
	Sheppard East Station, including bus terminal	-	-	-	-	-	-	-	-	-	-	-	W	S	S	S	M	-	-	-	-	-
	Service Connection – Progress Avenue	-	W	-	-	-	-	-	-	-	-	-	-	-	S	M	-	-	-	-	-	
	Phase 2 – running structure	-	W	M	-	W	-	-	-	-	-	-	-	-	S	S	M	-	-	-	-	-
	Phase 2 – Malvern Town Centre Station	-	W	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
	Future possible Bellamy Storage and Maintenance Facility	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
	Future possible Brimley Station	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
	Future possible Bellamy Station	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	-	-	-	-	-
Construction Impacts	Building Demolition	-	-	-	-	-	-	-	M	W	W	-	-	-	-	-	-	-	-	-	-	-
	Contaminated Site Clean up	-	-	-	-	W	W	W	M	-	-	-	-	-	-	-	-	-	-	-	-	-
	Surface Utility Relocation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	-	-	W	W	-	-
	Subsurface Utility Relocation	-	-	-	-	W	W	W	-	-	-	-	-	-	-	S	-	-	W	W	-	-
	Cut-and-cover Construction	-	W	-	-	M	S	M	M	-	-	-	-	-	-	M	-	-	S	S	-	W
	Soil Removal and Disposal	-	-	W	-	-	-	-	M	-	-		-	-	-	-	M	-	-	-	-	-
	Temporary Bus Terminals at Kennedy and SCC	-	W	-		-	-		-			-		S		-			S	S	-	-
	Dewatering	-	-	M	-	S	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Unwatering - (surface water)	-	-	-	-	W	M	W	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Erosion and Sedimentation Control	-	-	W	-	-	-	W	-	-	-	-	-	-	-	M	-	-	-	-	-	-
	Heavy Equipment Operations and Maintenance	-	W	W	-	-	-	-	M	M	M	-	-	-	-	M	-	-	-	-	-	
	Traffic Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	S	-	W
	Material Import/Storage/Stockpiling	-	-	W	-	-	-	-	-	-	-	-	-	-	S	M	-	-	W	W	-	
Operations and Maintenance	SRT Operations	-	-	-	-	-	-	W	-	M	M	W	-	-	-	-	-	-	M	M	-	W
	Track and Structure Maintenance	-	-	-	-	-	-	-	-	W	W	-	-	-	-	-	-	-	-	-	-	-
	Stormwater Management	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Bus Operations	-	-	-	-	-	-	-	M	S	-	-	-	-	-	-	-	-	M	W	-	-
	PPUDO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S	W	-	-
	Station Maintenance (Cleaning, Deliveries, State of Good Repair)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Testing of Emergency Equipment	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	W

4.2 Natural Environment: Designated Natural Areas

The project does not disburb any designated natural areas as identified in Chapter 3. Therefore, no impacts and mitigation are necessary for Kennedy, Conversion and Extension of the SRT.

4.3 Natural Environment: Vegetation and Vegetation Communities

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.

4.3.1 Displacement of Rare, Threatened or Endangered Vegetation or Significant Vegetation Communities

The study area contains twenty-one plant species that are considered regionally rare to uncommon in Toronto. Individual occurrences of these species are generally beyond the zone of influence of this project and therefore no displacement of rare, threatened or endangered vegetation or significant vegetation communities will result from this project.

4.3.2 Disturbance to Vegetation and Vegetation Communities by the SRT Facilities

Disturbance to vegetation as a result of this transit project is considered negligible since the majority of vegetation located adjacent to the right-of-way has been previously disturbed by urban development.

The following sections provide a narrative on where these localized impacts may occur. Proposed mitigation measures, where required, are detailed in the previous Table 4-1.

4.3.2.1 Kennedy Station

As mentioned in Section 3.2.1.2, three Ecological Land Classification (ELC) community types were identified as occurring in the Kennedy Station study area and these included cultural plantation (CUP3), cultural savannah (CUS), and cultural woodland (CUW).

The cultural plantation community located on the west side of the existing SRT will be affected by the removal of treed vegetation along the proposed alignment north of the Eglinton Crosstown LRT ‘portal’. The anticipated quantity of vegetation to be removed is expected to be minimal and will be confirmed during detail design. These trees were planted as a screening for the existing SRT and the resulting linear vegetation community is best described as a monoculture with minimal habitat value; therefore, the vegetation loss is not considered to be significant and can be replaced upon completion of the construction with better native, non-invasive species.

A second portal for the SRT alignment will be located in the vicinity of the TTC North parking lot (recognizing that surface disruption occurs during construction). This work will result in removal of the cultural savannah community at this location. Less than 0.05ha of vegetation will be removed and this loss is not considered to be significant.

4.3.2.2 Conversion

The existing SRT alignment has both ‘at grade’ and ‘elevated’ sections. The ‘at grade’ section extends from Kennedy Station to just north of Ellesmere Station and is bordered on the east side by the GO Transit corridor for the entire length. The SRT corridor averages ten metres in width and is comprised of the rail bed and adjacent shoulders that vary between 1.5m to 2.5m in width. These narrow strips of land that are adjacent to the tracks are partially vegetated with disturbance tolerant plant species. From an ecological perspective, the value of these habitat patches is minimal as they would provide temporary stop/resting areas for transient wildlife species at best.

Modifications to the general alignment and SRT corridor will not occur; consequently, major displacements of wildlife, wildlife habitat and vegetation are not anticipated.

Modifications at each of the five existing SRT stations will be required. Due to the urban nature of the right of way potential impacts to vegetation and vegetative communities are limited to the immediate vicinities of the Lawrence Avenue East and Midland Avenue stations.

Lengthening of the Lawrence East station platform to the north and south of the existing station is of little concern. The platform extensions would be built over the narrow strips of land that are adjacent to the tracks. At the Lawrence East Station these strips are mainly gravel with some disturbance tolerant plant species occurring in isolated patches. Loss of this vegetation and possible displacement to wildlife is not considered as significant.

Track realignment to the south of Lawrence East station will be required and as such, the west side of the SRT corridor will have to be widened through this section. Presently, the SRT corridor is separated from a neighbouring residential development by a 10m wide vegetated swale for a distance of approximately 200m. The strip is dominated by disturbance tolerant vegetation species such as: garlic mustard (Alliaria petiolata), common mullein (Verbascum thapsus) and awnless brome (Bromus inermis), and wildlife habitat is minimal as structural diversity is lacking. Wildlife utilizing this area would include species that are tolerant of human disturbance. Loss of this strip of land, in whole or in part, is not considered significant as the ecological value attributable to this isolated patch is low.

The north side of the Midland Avenue Station parallels the Bendale Branch of the West Highland Creek. The Bendale Branch is contained within a trapezoidal concrete channel through this section. Above the concrete, vegetated areas are dominated by grasses with some trees. Manitoba maple is the dominant tree species along the southern bank of the creek. The vegetation on the slope provides stability to the creek banks and its disturbance will be limited and minimal.

Modifications are required for the Ellesmere Station including the lengthening of the platform to the south, pedestrian fire exits at the southwest side of the station for the east platform, and installation of catenary overhead power lines for the trains. Adverse impacts resulting from any of these activities are not anticipated. The new extension to the station will not result in the displacement of any significant vegetation

or wildlife habitat.

Although the Scarborough Centre and McCowan stations require modifications, the totally urban environment associated with each of them precludes the occurrence of any natural features. This is similar in the case of Brimley Station. Consequently, the possibility of any natural environment impacts does not exist.

4.3.2.3 Extension

Displacement of some vegetation will occur along the alignment corridor. As listed in Chapter 3, a total of sixteen ELC community types have been identified within the study limits. These communities include: open beach/bar (BB01); mixed forest (FOM7-2); deciduous forests (FOD3-1, FOD5-3, FOD5-8, FOD7-2 and FOD7-3); cultural meadow (CUM1-1); cultural thickets (CUT1 and CUT1-1); cultural savannah (CUS1); cultural woodland (CUW1); deciduous swamp (SWD3-4); thicket swamp (SWT2-2), meadow marsh (MAM2-2) and shallow marsh (MAS2-1).

Of the 16 types of vegetation communities that were identified, only six different community types are at risk of encroachment. On the segment from McCowan station to Centennial College station, ten areas including three cultural meadows, two cultural woodlot, two cultural thickets, two deciduous woods and an area classified as open beach/bar will be impacted.

At the crossing of the Markham Branch of East Highland Creek west of Bellamy Road, one cultural meadow (CUM1-1) and one cultural thicket (CUT1) will be affected. The quantity of vegetation that will be displaced is directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared. Assuming four support structures are necessary to span the valley; 16m2 of vegetation will be displaced. Because these areas have been heavily modified by previous disturbance, removal of this small amount of vegetation at this location is considered minor.

A second crossing of the Markham Branch will occur approximately 550m east of Bellamy Road at the section where the creek turns and flows north-easterly toward Markham Road (location #2 – see Chapter 3). The exact crossing takes advantage of an opening in the steam-side vegetation that occurs at this location and some valley works being undertaken by Toronto Water in the same area.

The main issue at this crossing is with the mature trees that are present on the slopes of the creek. In order to construct the elevated structure for the SRT through this section of the alignment, these trees may be removed. In a worst case scenario this will result in a loss of less than 0.02 ha. of vegetation and this is not considered to be significant. Notwithstanding, there is restricted opportunity for development of the proposed SRT through this area because of the steep slopes and/or the banks of the creek. Removal of vegetation within these communities could cause severe erosion of the slopes. In order to successfully mitigate this potentially significant impact, a detailed erosion control plan will need to be prepared, in conjunction with TRCA, during the design phase of this project.

West of the creek, a cultural meadow and a cultural thicket are at risk. Because the SRT is elevated through this section, minimum vegetation cover will be lost with the exception of the area that is required for the support structures.

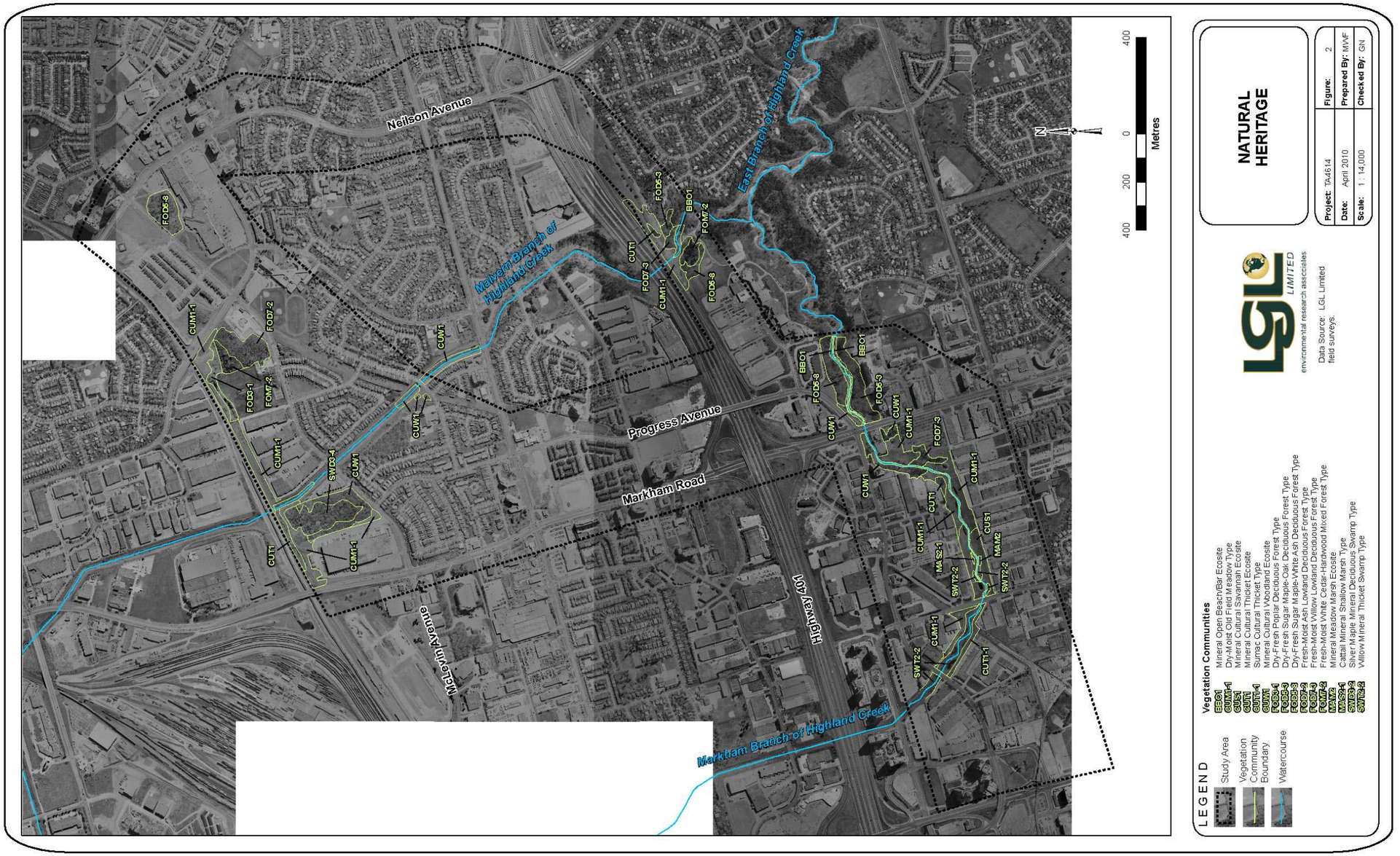
East of the second crossing, from the creek to Markham Road, three communities are at risk. Adjacent to the creek the alignment will cross a small parcel of FOD7-3 forest, then over an open cultural meadow and a small section of cultural woodlot before crossing Markham Road. Vegetation loss within the latter two communities will be minor as the actual loss will be directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared per structure. A quantitative amount will be determined during detail design and will be coordinated with Toronto Water's works for the area.

The third crossing of the Markham Branch occurs immediately east of Markham Road. The initial alignment through this section had a high probability of resulting in significant impacts to both the watercourse and the unstable slopes along the northern banks of the creek. Three ELC communities are at risk including: deciduous forest (FOD5-8), cultural woodlot (CUW) and open beach/bar (BBO1). Toronto Water, have had an ongoing project for rehabilitation of this section of the Highland Creek Valley. The creek will be realigned east of Markham Road for a distance of approximately 500m, banks will be stabilized and vegetation will be retained where possible. The SRT alignment through this section of Highland Creek will not result in any significant impacts over and above those resulting from the rehabilitation project.

On the north segment from Centennial College Station to Sheppard for Phase 1 there will be minimal loss of natural vegetation

For Phase 2 to the Malvern Centre Station there will be minimal loss of natural vegetation as the three forested areas will be avoided. Notwithstanding, a small quantity of thicket vegetation will need to be removed to accommodate the terminus section of the SRT. In addition, the manicured grass field located at the corner of McLevin Avenue and Tapscott Road will be affected as this parcel of land is required for the Malvern SRT station.

Exhibit 4-1: Vegetation Locations where impacts are anticipated



4.3.3 Mitigation for Displaced Vegetation and Vegetation Communities by the SRT Facilities

The following environmental protection measures will be implemented to minimize vegetation removals and minimize impacts to the vegetation:

- Minimize grading requirements to the extent possible;
- Where avoidance is not possible, trees will be replaced at a ratio of 3:1 with appropriate species that are tolerant of urban stresses such as air pollution, salt and soil compaction;

During later design phases, City of Toronto Urban Forestry will be consulted on all aspects of the proposed project that may have an impact on vegetation features and functions within the study area. Proposed destruction of trees and features within the study area will be reviewed and subject to approval by Urban Forestry. All proposed restoration, re-naturalization, edge management, or planting plans, where required, will also be reviewed and subject to approval by Urban Forestry and shall meet or exceed Urban Forestry standards.

Associated monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship.

With regards to the second crossing of Highland creek near the Markham/Progress intersection, in order to successfully mitigate this potentially significant impact, a detailed erosion control plan will need to be prepared, in conjunction with TRCA, during the design phase of this project.

For the third crossing of Highland creek, the project team will continue to coordinate design and construction efforts with Toronto Water in order to develop the optimal vegetation preservation and replacement strategy.

4.3.4 Construction Impacts to Vegetation and Vegetation Communities by the SRT Facilities

The potential long term environmental effects on communities and ecosystems are described above; however, at grade and below grade construction of the SRT has the potential to result in short term disturbance to vegetation that currently exists at Kennedy Station, along the existing and the extension of the SRT. Activities such as relocation of utilities, temporary access road construction, boulevard modifications, temporary staging areas for construction equipment or construction materials and maintaining access to side streets and entrances, can temporarily increase the overall project footprint size, and result in generally, short term disturbances.

4.3.4.1 Kennedy Station

Disturbance to vegetation as a result of this transit project is considered negligible since the majority of vegetation located adjacent to and within the study area has been previously disturbed by urban development. Construction access will be over existing paved areas that already exist at Kennedy Station and the adjacent commercial lots.

Temporary access roads on the 230 kV hydro corridor may be required to construct the underground section of the SRT. Vegetation within the hydro corridor is presently mown grass with a hedgerow of Austrian Pines along the west fence line of the GO rail.

The following environmental protection measures will be implemented to minimize vegetation removals and minimize impacts to the vegetation:

- Provide local tree protection where warranted
- Trees located within the vicinity of the construction zone should be preserved in accordance with the City of Toronto Urban Forestry Tree Protection Policy and Specifications for Construction Near Trees
- Delineate work areas with construction fencing to minimize the area of disturbance
- Place silt fence along margins in areas of soil disturbance
- Implement good housekeeping practices related to materials storage/stockpiling, equipment fuelling/maintenance, etc. during construction

4.3.4.2 Conversion

No additional impact to vegetation (beyond what is described above) is anticipated. The only exception to this is at the Midland Avenue Station.

The north side of the Midland Avenue Station parallels the Bendale Branch of the West Highland Creek. The vegetation on the slope provides stability to the creek banks and although it is anticipated disturbance along the creek bank will be limited and minimal, construction access to the Midland Avenue Station should be restricted to the south side of the station only.

4.3.4.3 Extension

Disturbance to vegetation as a result of construction activities is considered negligible since the majority of vegetation located adjacent to the right-of-way has been previously disturbed by urban development. For construction adjacent to and within the Highland Creek valley lands (see section 4.3.2 above) construction activity should be minimized to avoid additional impacts. Construction methodology including precast beams or segments that can be fabricated off site and installed by crane or gantry either above or outside the valley lands can reduce construction related effects. Where avoidance is not possible, trees should be replaced with appropriate species that are tolerant of urban stresses such as air pollution, salt, disturbance and soil compaction. Monitoring of planted trees should be undertaken for the duration of two years after construction is complete to maximize survivorship.At the detailed design, compensation will be calculated comprehensively to comply with applicable TRCA and the City of Toronto (Parks, Forestry and Recreation) requirements.

4.3.5 Operations and Maintenance Impacts

No impacts to vegetation are anticipated as a consequence of the operation and maintenance of the SRT.

4.4 Natural Environment: Fisheries and Aquatic Habitat

There are six watercourse crossings required along the SRT alignment and one situation where the alignment is adjacent to and parallel with a section of a watercourse. Two of these crossings occur on tributaries of West Highland Creek and four crossings occur on tributaries of East Highland Creek. The parallel occurrence is in the West Highland Creek watershed.

In general terms, any project that involves crossing a watercourse has the potential to result in a harmful alteration, disruption or destruction (HADD) of fish habitat due to the following effects:

- loss of site-specific fish habitat;
- changes to water quality and quantity;
- alterations to base flow;
- changes in water temperature; and,
- barriers to fish passage

This section discusses each of the watercourse crossings and identifies the likelihood of a HADD.

4.4.1 Displacement of Existing Aquatic Features by the SRT Facilities

4.4.1.1 Kennedy Station

No impacts to aquatic habitats or communities are anticipated, as there is no aquatic habitat present within the study limits of Kennedy station. Nonetheless, standard erosion and sedimentation control measures in accordance with the TRCA and City of Toronto guidelines should be implemented to prevent the migration of sediments to catch basins, storm sewers and open ditches located off-site (discussed in greater detail in section 4.7).

4.4.1.2 Conversion

Two watercourse crossings of West Highland Creek tributaries exist on the current line. The Dorset Park Branch flows in a southeast direction under the existing SRT alignment approximately 300m north of the Lawrence Avenue East Station. The second crossing is over the Bendale Branch, approximately 350m east of the Midland Avenue Station.

Remedial work on the culvert and running structure at each of these locations is not required as there is sufficient width to accommodate the SRT. It follows that there will not be any loss of site-specific habitat, changes to water quality or quantity, alterations to base flows, changes in water temperatures and creation of new barriers to fish passage.

4.4.1.3 Extension

The extension segment of the SRT alignment is located within the East Highland Creek sub-watershed. Four watercourse crossings are required: three crossings of the Markham Branch and one crossing of the Malvern Branch.

The Markham Branch has recently been engineered to reflect a naturally occurring watercourse having a channel morphology best described as a mix of riffles, runs and pools as well as having substrates being comprised of boulders, cobbles and gravel with some sand. The crossings of the Markham Branch will occur at one location adjacent to Bellamy Road, one location between Bellamy Road and Markham Road and at one location east of Markham Road.

Rehabilitation of the Highland Creek Valley is ongoing and is scheduled to occur along the reaches both east and west of Markham Road. The three watercourse crossings of the Markham Branch will be spanned and no support structures will be placed in the streams. It is anticipated that there will not be any loss of site-specific fish habitat, changes to water quality or quantity, alterations to base flows, changes in water temperatures or creation of new barriers to fish passage.

The Malvern Branch has been completely channelized with gabions both upstream and downstream of the proposed crossing. At this location the channel consists of one long run which is approximately 7 m wide and 15 cm - 20 cm deep. The SRT alignment from Milner Avenue to just west of Tapscott Road will be constructed below grade. Once constructed, there will be no interaction between the creek and the SRT (see below for a discussion on constructed related impacts).

4.4.2 Construction Impacts

4.4.2.1 Kennedy Station

No impacts to aquatic habitats or communities resulting from construction activities are anticipated, as there is no aquatic habitat present within the study limits of Kennedy station.

4.4.2.2 Conversion

The north side of the Midland Avenue Station parallels the Bendale Branch of the West Highland Creek. The Bendale Branch is contained within a trapezoidal concrete channel through this section. There is limited potential for alteration of fish habitat due to constructed related activity along the existing SRT facilities. To mitigate, access to the site should be restricted to the southeast and southwest sides of Midland station. When works on the guideway over the creek is required, netting and erosion control measures will be used to capture all construction related debris from entering the watercourse.

4.4.2.3 Extension

To reduce the potential for alteration of fish habitat, the following environmental mitigation measures will be implemented:

- Develop a preferred design that avoids in-water work;
- Delineate work areas with construction fencing to minimize the area of disturbance;
- Restrict the use of heavy equipment on watercourse banks;
- Prohibit the use of heavy equipment in the watercourse;
- Place silt fence at the limit of grading/disturbance;
- Monitor and maintain erosion and sedimentation control measures during construction to maximize their effectiveness;
- Apply seed and mulch, tackifier and/or erosion control blanket in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization; and
- Implement good housekeeping practices related to materials storage/stockpiling, equipment fuelling/maintenance, etc. during construction.

These environmental protection measures will greatly reduce the potential for adverse effects to fish and fish habitat located within the Study Area.

Employing the above measures should mitigate the potential for alteration of fish habitat associated with the three Markham Branch crossings. For the below grade segment of the alignment, the presence of water at the tunnel level will require dewatering to some extent. It follows that there may be loss of site-specific fish habitat, changes to water quality or quantity, alterations to base flows, changes in water temperatures on a temporary nature the Malvern Branch of Highland Creek. A more thorough investigation of the creek conditions and methods of construction to minimize impacts will be undertaken as part of future design phases. In addition, this would be applicable for the channelized portion of the Malvern reach of Highland Creek.

4.4.2.4 Mitigation

To reduce the potential for alteration of fish habitat the following environmental mitigation measures should be implemented:

- No in-water work should be permitted (along Markham reach of Highland Creek)
- Delineate work areas with construction fencing to minimize the area of disturbance;
- Restrict the use of heavy equipment on watercourse banks;
- Placing silt fence along stream margins in areas of soil disturbance;
- Monitoring and maintenance of erosion and sedimentation control measures during construction to ensure their effectiveness.
- Applying seed and mulch, tackifier and/or erosion control blanket in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization; and,
- Implement good housekeeping practices related to materials storage/stockpiling, equipment fuelling/maintenance, etc. during construction.

The TRCA has a Level III agreement with the Department of Fisheries and Oceans. TRCA staff will review the project in line with TRCA's Level III agreement with Fisheries and Oceans Canada as per Section 35 (1) of the Fisheries Act. TRCA's will assess all components of the project to determine whether there is a potential for the project to result in a Harmful Alteration, Disruption or Destruction of fish habitat (HADD). Where fisheries timing window restrictions apply, TRCA will provide TTC with the necessary information for construction staging purposes. TRCA staff will work with TTC to develop an appropriate mitigation and restoration strategy for construction related impacts.

4.4.3 Operations and Maintenance Impacts

No impacts to aquatic habitats or communities are anticipated as issues are expected to be resolved during detailed design and construction.

4.5 Natural Environment: Wildlife and Wildlife Habitat

Possible impacts on wildlife related to the SRT Transit Project can be categorized into five main areas of concern, including:

- Displacement of wildlife and wildlife habitat;
- Barrier effects on wildlife passage;
- Wildlife/vehicle conflicts;
- Disturbance to wildlife from noise, light and visual intrusion; and,
- Displacement of wildlife species at risk and significant wildlife habitat.

4.5.1 Displacement of Existing Wildlife/Wildlife Habitat Features by the SRT Facilities

4.5.1.1 Kennedy Station

The present land uses in the vicinity of Kennedy Station are primarily represented by utilities (GO Transit, CNR, SRT and a hydro transmission line corridor), commercial (strip malls), and residential development (single family, apartments and condominiums). As a result of past and present land uses, the amount of natural areas remaining in the study area that could provide wildlife habitat is minimal. In general terms and without exception, all of the available wildlife habitat in the study area can best be characterized as being of poor quality, low structural diversity, low habitat diversity and does not support a high diversity of resident wildlife species.

Common Grackle are not regulated under the *Migratory Birds Convention Act*; however, nests should not be removed (if removal is necessary) until the young have fledged. The same mitigation should be implemented in the event that other bird species are nesting in the rafters of the existing Kennedy Station, whether or not they are regulated under the *Migratory Birds Convention Act*.

The open, excavated channels required for the Eglinton Crosstown LRT (ECLRT) and (SRT portals into Kennedy Station will cross existing paved roads and paved parking lots. None of these areas provide wildlife habitat or passageway; consequently, the development of these two links will have no significant effect on wildlife and wildlife habitat.

No new barriers to wildlife passage will be created as a result of the Kennedy Station. The existing barriers posed by Eglinton Avenue, the CN, GO and SRT corridors as well as the existing Kennedy Station will not be permanently altered.

Noise, light and visual intrusion may alter wildlife activities and patterns. In urban settings, such as the study area, wildlife has become acclimatized to the urban conditions and only those fauna that are tolerant of human activities remain. Given the extent of urbanization in the study area, the tolerance of the wildlife assemblage to human activities and the limited zone of influence of the Kennedy Station, disturbance to wildlife from noise, light and visual intrusion will have no significant adverse effect.

No provincially or federally rare, threatened or endangered wildlife were recorded within the study area; therefore, there will be no displacement of rare, threatened or endangered species as a result of the Kennedy Station.

4.5.1.2 Conversion

In general, no modifications to the SRT alignment within the existing SRT corridor will occur; consequently, impacts on wildlife and wildlife habitat are not anticipated.

Track realignment on the south side of the Lawrence East station will be required and as such, the west side of the SRT corridor will have to be widened. Presently, the SRT corridor is separated from a neighbouring residential development by a 10m wide vegetated swale for a distance of approximately 200m. Wildlife utilizing this area would include species that are tolerant of human disturbance. Loss of this habitat is considered to be minimal.

Modifications are also required for the Midland Avenue Station including the lengthening of the platform on the east side of the station. Habitat is much degraded at this location; consisting of bare ground and a few disturbance tolerant shrubs. In spite of these poor conditions, a resident woodchuck (Marmota monax) has established a defined home range. Unfortunately, this mammal will be displaced by the station extension. However it is reasonable to assume that it will re-establish immediately downstream along the southern bank of the watercourse.

4.5.1.3 Extension

At the crossing of the Markham Branch valley at Bellamy Road, the only terrestrial habitat available is provided by a grassed cultural meadow community and a cultural thicket community with no arboreal vegetation. The quantity of small mammal habitat that will be displaced is directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared. Assuming four support structures are necessary to span the valley; 16m2 of wildlife habitat will be displaced. In addition, the area surrounding each support tower will be disturbed resulting from construction activities. The long term effects of this disturbance are considered to be minimal as cultural meadow habitat will re-establish in the disturbed area. The actual loss of 16m2 of habitat is also not viewed as significant.

A second crossing of the Markham Branch will occur approximately 550m east of Bellamy Road at the section where the creek turns and flows north-easterly toward Markham Road. The exact crossing takes advantage of an opening in the steam-side vegetation that occurs at this location.

West of the creek, a cultural meadow and a cultural thicket are at risk. Because the SRT is elevated through this section, minimum vegetation cover and associated wildlife habitat will be lost with the exception of the area that is required for the support structures.

East of the crossing, from the creek to Markham Road, three communities are at risk. Adjacent to the creek the alignment will cross a small parcel of FOD7-3 forest, then over an open cultural meadow and a small section of cultural woodlot before crossing Markham Road. Vegetation and wildlife habitat loss within these communities will be minor as the actual loss will be directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared per structure. A quantitative amount will be determined during detail design.

The majority of the wildlife recorded at this crossing area are considered opportunistic species and have adapted to an already disturbed habitat; consequently, further disturbance to the habitat in this area will result in displacement of wildlife to other parcels of suitable habitat.

The situation at the third Markham Branch watercourse crossing east of Markham Road is somewhat different than the Bellamy Road area. Toronto Water, a division of the Engineering Services-Works Facilities and Structures Department of the City of Toronto have had an ongoing project for rehabilitation of this section of the Highland Creek Valley. The creek will be realigned east of Markham Road for a distance of approximately 500m, banks will be stabilized and vegetation will be retained where possible.

The SRT alignment through this section of Highland Creek will not result in any habitat lost over and above those resulting from the rehabilitation project.

No new barriers to wildlife passage will be created as a result of the SRT. Consequently, the SRT will have no significant impact on wildlife movement through the area. The new structures proposed at the three crossings of Markham Branch will be designed to facilitate wildlife passage along the valley system.

Noise, light and visual intrusion may alter wildlife activities and patterns. In urban settings, such as the study area, wildlife has become acclimatized to the urban conditions and only those fauna that are tolerant of human activities remain. Given the extent of urbanization in the study area, the tolerance of the wildlife assemblage to human activities and the limited zone of influence of the SRT, disturbance to wildlife from noise, light and visual intrusion will have no significant adverse effect.

No provincially rare, threatened or endangered wildlife were recorded within the study area; therefore, there will be no displacement of rare, threatened or endangered species as a result of the Scarborough RT.

Along the north segment of the SRT alignment there is only one area that is at risk – a small thicket located immediately west of McLevin Woods. The thicket is disturbed and provides only minimal wildlife habitat, consequently, loss of this habitat is not considered to be significant. In the short term, wildlife will be displaced, but over time, the opportunistic nature of both the resident and transient wildlife will result in redistribution of these species to other areas of habitat.

4.5.2 Construction Impacts

Numerous birds located within the project limits are listed under the Migratory Birds Convention Act (MBCA). The MBCA prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests. To meet the requirements of the MBCA, no vegetation removals should occur during the nesting season. With several exceptions, this includes the period from April 1 to July 31. This timing restriction will also protect the birds listed under the Fish and Wildlife Conservation Act (FWCA).

4.5.2.1 Kennedy Station

As stated above, the open, excavated channels required for the Eglinton Crosstown LRT (ECLRT) and SRT portals into the Kennedy Station will cross existing paved roads and paved parking lots. Construction access will not be restricted by any natural features and as such, no wildlife habitat will be impacted as a result of construction activity at the Kennedy Station.

The link between the north SRT portal and Kennedy Station will require an open cut crossing of the hydro corridor for a length of approximately 500 m. The habitat through this section is mown grass and would only support small mammals such as mice and voles as well as providing movement/travel corridors for raccoons and skunks. Disturbance resulting from construction access to this area will be temporary and will have no significant, long term effect on wildlife.

In the short term, during construction, movement patterns of any resident wildlife occupying adjacent lands or transient wildlife that occasionally visit the proposed work area may be altered, but this not considered as significant.

4.5.2.2 Conversion

Modifications to the general SRT alignment and SRT corridor will not occur; consequently, impacts on wildlife and wildlife habitat resulting from construction access are not anticipated. Although modifications are required at each of the existing stations, construction access will be through existing paved areas and mown grass. Wildlife habitat is essentially lacking; consequently, impacts on wildlife are not anticipated.

4.5.2.3 Extension

The entire south segment of the SRT beyond the existing end of track will be constructed above grade. However, some vegetation at grade that is within the zone of influence under the elevated guideway will need to be removed for construction of the alignment. It is inevitable that some habitat will be lost. The overall limited capability of the wildlife habitat and the type of species supported reduces the level of significance attributable to the loss. Wildlife species present in these areas are represented primarily by small mammals and small, migratory and resident passerine birds; species that are tolerant of human disturbance. Minor habitat loss resulting from construction access will not have any significant long term effects on the existing populations as individuals will adapt and become tolerant of the new conditions.

4.5.2.4 Mitigation

The Migratory Birds Convention Act prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests. To meet the requirements of the Act, no vegetation removals should occur during the nesting season. With several exceptions, this includes the period from April 1 to July 31. This timing restriction will also protect the birds listed under the Fish and Wildlife Conservation Act. TTC will comply with the requirements of the Migratory Birds Convention Act and nesting season, and as a result, the LRT will have no significant adverse effects on avian wildlife species/populations. Mitigation measures for the disturbance to vegetation will be implemented to mitigate any impacts to wildlife habitat.

If vegetation clearing is required during the nesting season, 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. In the event that works must be undertaken within areas of communities / ecosystems,

TTC will monitor the health of the affected community during construction. Once all construction activities are complete, this monitoring program will continue into the following growing season. A monitoring plan will be developed during the design phase to measure the effectiveness of proposed mitigation measures.

A contingency plan will be developed during the design phase.

4.5.3 Operations and Maintenance Impacts

There are expected to be no impacts to wildlife or wildlife habitat during operations and maintenance.

4.6 Geology, Soils and Groundwater

The focus of the environmental effects and mitigation as it relates to geology and soils is focused on works significantly beyond the limits of the existing SRT where the undertaking may have an adverse effect on the surrounding areas. This could occur in two ways:

- Environmental contamination along the proposed route, which will require special handling and disposal
- Information concerning the anticipated subsurface soil that may influence the design and construction methods.

The preliminary information collected in support of this Transit Project Assessment concerning the groundwater conditions along the proposed transit route that may influence planning, design, and construction. Supplemental field investigations will be undertaken as part of the design phases.

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.

4.6.1 Displacement of Existing Features by the SRT Facilities

4.6.1.1 Kennedy Station

No impacts with respect to soils and geology are expected.

Where excavation depths are anticipated to extend below the groundwater table, an assessment of the soil and groundwater quality within the project footprint should be completed to confirm the presence/absence of environmental impacts from these adjacent properties.

This work should be done during detail design when information on construction methodology, tunnel depths and soil types has been confirmed.

4.6.1.2 Conversion

Recognizing that the conversion will be constructed along the existing right of way, potential environmental effects as they relate to soils, geology and groundwater can be considered so minor that they do not warrant further investigation and discussion.

4.6.1.3 Extension

Preliminary screening information on properties that may have contributed to or have the potential to contribute to environmental contamination along proposed roadway and rail routes was obtained from two Ecolog Environmental Risk Information Service (ERIS) Report on the Study Area. Properties within 200m of the proposed route were included in the reviewed databases and were contemplated in this preliminary screening exercise. Based on the information presented, properties within the 200m buffer zone were categorized as having low, moderate or high potential to contribute to environmental contamination to the properties along the proposed route. Detailed criteria for these categories as well as the databases used to obtain the property information are provided in Appendix H. Should subsequent phases of geotechnical investigations reveal contaminated soils within the footprint of the SRT, TTC will develop disposal strategy in accordance with MOE regulations.

For the SRT extension groundwater impacts are expected to occur primarily during construction (see discussion below).

4.6.2 Construction Impacts

4.6.2.1 Kennedy Station

The below grade section of the SRT and the associated underground works for the Eglinton Crosstown and Scarborough Malvern LRT's will require open cut construction. During construction, the ground surrounding excavations supported by soldier piles and lagging walls may deform up to about 0.2% of the excavation depth in both the horizontal and vertical directions. Ground displacements for secant pile walls or well-constructed soil-nail supported walls can be about half of this value, depending on design and workmanship. In general, the maximum displacements occur very near the edge of the excavation and dissipate to nominal values at distances ranging from approximately equal to the excavation depth, or about 30mm for a 15m deep excavation, could be damaging to buildings or utilities that are within the "zone of influence".

A detailed examination of the geometry of the site, ground conditions, and nearby structures should be completed if any buildings are within a distance of about 1.5 to 2.0 times the depth to the base of the excavation as per the requirements of the TTC Design Manual.

Use of cut and cover construction methods may necessitate groundwater control by active dewatering. The water-bearing granular soils, if exposed, will flow into excavations unless the water is removed. If active dewatering is not permitted, other measures may be necessary to facilitate construction. Continuous excavation support walls that fully penetrate the water-bearing soils around the excavation may be used to cut off groundwater flow (typically contiguous caissons, sometimes referred to as tangent or secant pile walls). Alternatively, ground improvement using grouts to effectively plug the pore space in the soil may be used to limit flows of water through the ground and into the excavation. Other groundwater control measures may be feasible depending on the details of the design and local subsurface conditions.

4.6.2.2 Conversion

No impacts are expected with regards to geology, soils and groundwater as study are is already built form and disturbed.

4.6.2.3 Extension

The impacts during construction will depend on the method of construction adopted for the underground section of the SRT (open cut/cut and cover construction), the workmanship, the proximity of construction to the adjacent site features, and the condition of the nearby structures or utilities. All the below-grade section of the alignment will require a significant degree of subsurface investigation conducted similar to other work for the TTC completed for prior subway projects. All such investigations should be carried out in accordance with the current TTC design standards.

Cut and Cover Construction

It is expected in most instances, vertical excavation sides will be required and that these excavations will require some form of temporary shoring. The shoring may take the form of soldier-piles and timber lagging walls, drilled secant pile (caisson) walls, or soil-nail ground support depending on the local soil and groundwater conditions. Horizontal support may be provided by internal braces or drilled anchors that extend into the ground behind the supporting walls. Where temporary or permanent easements can be obtained from neighbouring property owners, it may be assumed that ground anchors or soil nails will extend horizontally (or at some shallow angle) into the ground a distance of up to twice the depth of the excavation. For soil nail supported excavations, this distance may be less (on the order of equal to the excavation depth) but for planning purposes, the greater extent should be used since the actual or likely support systems are unknown at this time.

During construction, the ground surrounding excavations supported by soldier piles and lagging walls may deform up to about 0.2% of the excavation depth in both the horizontal and vertical directions. Ground displacements for secant pile walls or properly constructed soil-nail supported walls can be about half of this value, depending on design and workmanship. In general, the maximum displacements will occur very near to the edge of the excavation and will dissipate to nominal values at distances ranging from approximately equal to the excavation depth less up to twice this distance for relatively poor ground conditions. Displacements on the order of 0.2% of the excavation depth (or about 30 mm for a 15 m deep excavation), can be damaging to buildings or utilities that are within the "zone of influence". A detailed examination of the geometry of the site, ground conditions, and nearby structures should be completed if any buildings are within a distance of about 1.5 to 2.0 times the depth to the base of the excavation in accordance with the requirements of the TTC Design Manual.

The excavations for the underground section will extend into the granular deposits below the till and as such groundwater control measures will be required for cut and cover construction. One method of groundwater control is by lowering the groundwater table to below the base of the excavation prior to commencing the excavation. This groundwater lowering can cause consolidation settlement of the ground where there are loose/soft soils within the zone of influence of the groundwater lowering. As a consequence, settlement of utilities or structures that are founded above/within the compressible deposits could occur. Further assessment is required to determine the potential impact on adjacent utilities and structures.

Cut and cover construction of the underground section will affect the Malvern Branch of the East Highland Creek at the crossing location and the dewatering measures used for groundwater control. The East Highland Creek stream flow rate could realize a reduction that is equivalent to the groundwater pumping rate within the cut and cover excavation in the vicinity of the creek. The effects of this dewatering could be mitigated by the diversion of pumped groundwater back into the Highland Creek.

From a soils and geology perspective, existing features will be displaced through the construction of the stations, the elevated guideway foundations and the underground section of the SRT particularly if open cut methodology is used for construction of the underground section. In addition, the underground section crosses under East Highland Creek. The subsurface soil conditions encountered during a preliminary geotechnical compilation and investigation along the proposed SRT alignment generally consist of topsoil and fill materials overlying glacial till deposits ranging from clayey silt to sand and silt in turn underlain by extensive granular deposits. The data compilation indicated that these granular deposits extended to about Elevation 100 m without encountering bedrock.

During construction, large volumes of earth will be excavated and will require special handling. Clear pre-construction and field-sorting criteria, consistent with current regulations, will need to be developed to identify soils that will require disposal at licensed landfill sites. In general, management options for excavated soils may include re-use of excavated materials on-site, transfer of excess soils to a site requiring fill and/or disposal of excess material to authorized landfill or treatment facilities.

The majority of the fill materials and native soils at this site which are to be excavated and are free of petroleum hydrocarbons and aesthetic contaminants (i.e., staining, debris, odour) may be managed by re-using on site (i.e., site grading fill or backfill), from an environmental perspective. The excavated fill and native soils that are representative of the tested soil samples should generally be acceptable for use as infilling material at some private clean fill (land-based) sites and possibly as cover material at a licensed landfill; such use will be subject to the approval of the site owners or operators. The re-use of material at other sites, including topsoil, must meet the site's analytical requirements and MOE standard for imported material. On a site specific basis, the MOE does allow the transfer of material exceeding Table 1 standards for use at another site. This will have to be confirmed by the Contractor with the receiving Site operators.

Based on the variable nature of existing fill materials at the site (i.e., generally containing some organic matter and wood pieces, and the presence of petroleum hydrocarbons in the one tested fill samples), there is a possibility of encountering environmentally impacted materials during excavations at locations between the boreholes that were advanced for this investigation. In this regard, the fills materials encountered along portions of the alignment may need to be screened and sorted during excavation due to the heterogeneous nature that is typical of these materials.

Further investigation would need to be carried out prior to or during construction in order 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). Based on the Ontario Regulation 347 (as amended by Ontario Regulation 558/00) leachate analyses, the material would be classified as non-hazardous.

Materials with a high slump from the excavation portion of the station works may be considered a liquid waste and cannot be readily disposed of unless the slump is reduced by mixing or dewatering so that the materials are no longer classified as a liquid waste. The soil quality may be influenced by additives and other materials used / generated during construction.

It is recommended that exported materials be visually monitored on an ongoing basis during construction for evidence of visual or olfactory indications of environmental impact and to verify the materials are consistent with those encountered during the initial subsurface investigation completed to date.

If materials are encountered with visual and/or olfactory evidence of environmental impact, the materials should be separately stockpiled on site and re assessed to determine appropriate reuse and/or disposal options. Soils which are suspected to be impacted and are stockpiled will need to be tested for waste classification purposes, should they be required to be disposed of off site at a licensed facility. The testing frequency will be based on the volume, nature and origin of the soil (and should be in accordance with the requirements of Ont. Reg. 511/09).

Temporary Groundwater Control

Cut and cover construction for the underground section requires groundwater control measures such as groundwater lowering which will result in large quantities of groundwater to be handled during construction. Groundwater control measures are anticipated for shallow excavations within the Highland Creek valley land, the cut and cover stations or other cut and cover sections and the staging areas for the proposed tunnel

A groundwater pumping test should be carried out in the vicinity of the Sheppard Station in order to determine the transmissivity of the granular deposits encountered The results of this test could be used to refine predicted dewatering rates for the Sheppard Station (see Appendix H).

Groundwater seepage into a shallow excavation for foundations within the till deposits (assuming a maximum depth of 3 m below the till interface) is expected to be less than 50 m3/day. Removal of the groundwater seepage and/or direct precipitation into the excavation can likely be carried out by pumping from ditches or sumps within the excavation area.

Predicted dewatering rates required to support the installation of foundations are low (i.e., insignificant compared to the base flow of Highland Creek). As such, groundwater control measures discussed above are not anticipated to affect the quantity of flow in Highland Creek. This must be confirmed, however, with additional boreholes at the crossing locations to determine the subsoil conditions and confirm that there are no sand interlayers.

The Sheppard Station will be a below ground structure, with a base of track at about Elevation 147 m (approximately 15 to 20 m below ground surface). Excavations for the below grade section will be extended into the granular soils below the glacial till and will be up to 8 m below the groundwater table. Temporary dewatering of the granular deposit will be required to facilitate cut and cover construction of the station box and below grade section. As a guide, the steady state groundwater pumping rate for these conditions could be on the order of 1,500 m3/day for the Sheppard Station excavation. Additional quantities of pumping would be required at the launch and extraction shafts. It is expected that this dewatering would be carried out by deep wells and/or broadly spaced well point installations (e.g., an eductor dewatering system with well point spacing ranging from 10 to 20 m centres). Construction dewatering at this location will therefore require an Ontario Ministry of Environment (MOE) Permit To Take Water (PTTW).

For the purpose of the PTTW application, the dewatering rate for the proposed excavation must also consider the removal of stormwater from direct precipitation inflow. The use of the 5-year return period storm event is considered reasonable to evaluate the potential stormwater inflows that could occur during the construction period. The 5-year return period rainfall for a 24-hour duration storm at the nearest Environment Canada station (North York – Central) is 59.1 mm (based on data from Environment Canada, Atmospheric Environment Service). Therefore, for the purposes of this analysis, a 60 mm storm event is assumed. A 60 mm precipitation event in 24 hours would result in the accumulation of approximately 500 m3 of stormwater in the proposed station excavation. This does not consider any runoff inflow that could occur from adjacent areas subject to the construction management practices. Ditching and properly filtered pumping from sump wells within the excavation is recommended to remove the direct precipitation inflow. To remove overburden storage at the start of the dewatering program and direct stormwater inflow within a reasonable period of time (e.g., 4 hours) following a storm event, an additional pumping capacity of approximately 3,000 m3/day should be included within the PTTW. The dewatering system for the proposed station excavation should therefore be capable of removing up to 4,500 m3/day in order to maintain well drained overburden conditions.

It is anticipated that much of the groundwater flow in the granular soil near the Sheppard station would eventually discharge to Highland Creek and/or the Rouge River, downstream of the proposed construction area (i.e., where the aquifer is exposed to surface). The Highland Creek streamflow rate may realize a reduction that is equivalent to the groundwater pumping rate at the Sheppard Station over the period of construction. The effects of this dewatering could be mitigated by the diversion of pumped groundwater to Highland Creek.

Alternative forms of groundwater controls at the Sheppard Station could include the installation of a groundwater cut-off (e.g., contiguous secant caisson) along the perimeter of the excavation area. The groundwater cut-off would minimize groundwater flow into the excavation from the surrounding area. It is to be noted, however, that the groundwater cut-off would need to be anchored into a confining layer underlying the aquifer to be effective.

As noted previously, groundwater lowering can cause consolidation settlement of the ground where there are loose/soft soils within the zone of influence of the groundwater lowering. As a consequence, settlement of utilities or structures that are founded above/within the compressible deposits could occur. Further assessment is required to determine the potential impact on adjacent utilities and structures.

Management of Groundwater

During subsequent stages of subsurface investigation and evaluation, more detailed dewatering assessments should be completed to define anticipated extraction and discharge flows and develop the requirements for extraction and disposal. The applicable requirements should then be identified for Permits to Take Water (for water takings exceeding 50,000 litres/day), storm sewer disposal, and sanitary sewer disposal of discharge from dewatering and water collected from construction sites.

It is anticipated that groundwater from possible dewatering measures should be suitable for discharge to the sanitary sewer. If disposal to the storm sewer system is to be considered, additional sampling and analysis will be required to assess if the groundwater would be suitable for discharge to the storm sewer, as will consultation and liaison with the City of Toronto and/or the MOE.

For sanitary sewer discharges, approval and a Discharge Permit are required from the City of Toronto for any discharge of non-city water (i.e. groundwater) into the sanitary sewers. In addition, for water discharge to the sanitary sewer with an exceedance of a Bylaw criteria, a surcharge agreement with the City would be required.

The Contract Specifications should include requirements that dewatering wells be developed such that the total suspended solids (TSS) concentration meets the City of Toronto's Sanitary and Combined Sewer By-Law. Provided that TSS levels are satisfied, the groundwater from dewatering works for the proposed SRT site appears to be suitable for discharge to the sanitary sewer, and possibly the storm sewer.

It is recommended that a test of the water to be discharged to the municipal sewer system be completed before initial discharge to confirm the results of these analyses and that filtering activities being undertaken are appropriate. Regular sampling and testing of the actual discharge by the Contractor is recommended during construction to verify that the groundwater quality continues to comply with the sewer use by law requirements.

If visual or olfactory (i.e., sheen and/or odour) evidence of environmental impact is detected in construction dewatering discharge, the water will need to be temporarily stored and then assessed and possibly treated prior to discharge.

Organic Vapour Concentrations

Combustible gas readings were measured in the headspace of six (6) of the monitoring wells; elevated combustible gas reading was measured in the monitoring well installed in Borehole 10-2 (screen depth of about 17 m to 20 m below grade). While the presence of methane gas in the natural soil strata is not a typical occurrence, naturally occurring methane has been found in the Toronto Area although it is considered to be a very rare occurrence.

As noted above, methane has been recorded in soils in the Toronto area, typically in granular layers capped by cohesive soils (Coleman, 1932). Some elevated combustible gas headspace readings have recently been detected in other subsurface investigations in the northwest area of Toronto. Based on the available information to date, the combustible gases appear to predominantly exist at depths of more than 12 m below grade, and may be related to the biodegradation of ancient matter (i.e. fossils) in the lower deposits.

Both methane and gasoline vapours can form an explosive mixture with air should there be a sufficient accumulation of vapours, and hydrogen sulphide is toxic, which are a potential hazard for excavation (and tunnelling) and construction work. Care should be taken to avoid creating areas in temporary or permanent structures where there is no air movement, as this could lead to an accumulation of gases. Changes in groundwater pressure, which may be caused by dewatering or seepage into underground spaces, can lead to migration of gaseous or dissolved methane, hydrogen sulphide or hydrocarbons.

The current generally low level of organic/combustible vapours in a particular area should not be construed to indicate that there is no risk of its presence in the future. Air monitoring and adequate ventilation may be required during and after construction.

In order to assess the potential for the presence of methane gas along the proposed SRT alignment, the existing monitoring wells (and future drilling operations) should be monitored and screened for organic vapour (i.e., PID instrument) and combustible gas (i.e., Gastechtor instrument).

4.6.2.4 Mitigation

The proposed mitigation for removal of soil; potential for contamination includes

- Preparation of a site specific soil management plan.
- Manage on site, monitor for quality and test during construction.
- Additional site investigation to delineate extent of potential impacted material.
- Provision of a minimum toe erosion allowance of 6.5m (Highland Creek between Bellamy and Markham) in the absence of a dedicated/specialized fluvial-geomorphic study. Along the creek segment protected with armourstone, a 1 to 2m toe erosion allowance shall be considered at detailed design.

The proposed mitigation for dewatering includes

- Preparation of a site specific groundwater management plan.
- Permit To Take Water (PTTW).
- Assessment of potential for ground settlement due to dewatering and develop settlement monitoring program.

The proposed mitigation for Methane Gas/Organic vapour concentrations includes

- Provide air ventilation and conduct air monitoring during construction
- Monitor and screen the existing and future wells for organic vapours and combustible gas.

4.6.3 Operations and Maintenance Impacts

No impacts are expected as project would be built form and is no longer applicable.

4.7 Surface Water

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.

Environmental effects and mitigation for the SRT can be categorized into:

The existing line – for Kennedy Station and the conversion (up to and including McCowan Station). The conversion works will be to the greatest extent limited to the existing exclusive right-of-way alignment. Therefore, the proposed conversion of the existing tracks will introduce only insignificant changes in land use and percent impervious, with no changes in the existing drainage patterns.

The extension – for McCowan to Malvern Town Centre. Extension work will introduce new running tracks and stations, as well as other supporting infrastructure. The new construction will affect surface water to some extent. With entirely new construction, there will be some opportunities to implement best management practices.

4.7.1 Displacement of Existing Features by the SRT Facilities

4.7.1.1 Kennedy Station and Conversion

With respect to the existing TTC infrastructure (conversion section), surface water is directed to nearby creeks, either directly through a series of deck drains, or indirectly through the municipal storm system. There are currently no stormwater management practices implemented to service the existing line. The proposed conversion of the existing tracks will introduce only insignificant changes in land use and percent impervious, with no changes in the existing drainage patterns.

There are two existing crossings of West Highland Creek. The first crossing is in the form of culverts, just north of Lawrence East Station. The second crossing is in the form of an overpass, just east of Midland Station. The tracks run parallel to Highland Creek in the vicinity of Midland Station.

Stormwater run-off from newly paved areas will be managed following stormwater management practices including treatment to meet MOE and City of Toronto guidelines for Level 1 enhanced criteria. This would entail the increased impermeable surface along Eglinton Avenue as part of the ECLRT and SMLRT components of the Kennedy station works. Stormwater will continue to be collected through existing municipal infrastructure and therefore works on Eglinton will focus on quality only. Several Oil/Grit Separators (OGS) are proposed at the discharge points for water quality treatment. The detailed design of OGS will follow MOE Stormwater Management Planning and Design Manual (March, 2003) to provide the long-term average of removal of 80% Total Suspended Solids (TSS) on an annual loading basis.

4.7.1.2 Extension

The proposed extension of SRT will introduce new running tracks and stations, as well as other supporting infrastructure. For the purpose of stormwater consideration, the infrastructure associated with the running tracks is considered to be 100% impervious, with an average track width of 12 m. The above-grade and at-grade portions of the extension will result in approximately 3.64 ha of impervious areas. It is emphasized that this does not translate into a comparable increase in percent impervious, as the proposed alignment crosses a highly urbanized area with paved surfaces and very little vegetative cover. For the purpose of this Report, it has been estimated that 1/3 of the total track area (1.21 ha) represents new pervious areas. Additional consideration is given to the fact that 2.9 km of the future line will be above grade. This implies that some impervious areas will be nevertheless maintained below the elevated structure.

The proposed stations will be comprised of relatively small areas, generally less than 1.0 ha. Based on a preliminary design of the future stations, the total impervious area will be increased from 0.74 ha to 2.25 ha, resulting in an increase of approximately 1.5 ha. The largest increase in percent impervious will be related to Malvern Station.

The proposed maintenance yard just east of Bellamy Road is comprised of a much larger area (10 ha). The existing area is almost 100% impervious, so this development will not result in a significant increase in percent impervious. Furthermore, it is expected that the storage area will comprise mostly track in open ballast (granular material) and therefore imperviousness over existing conditions will be reduced in the future.

The below grade portion of the extension (1.8 km) is not expected to cause any changes in surface water quantity and quality beyond the construction period. The above-grade and at-grade portions of the proposed facilities (running tracks and stations) will result in some changes in stormwater quantity and quality.

The proposed SRT conversion and extension will rely on electric-powered trains. As such, the impacts related to stormwater quality are expected to be significantly lower than compared to other forms of public transport (e.g. buses). This is particularly true with respect to winter maintenance and the application of road salts, which will not occur along the running structure.

With respect to the SRT design, the following constraints have been identified:

- Fixed or relatively inflexible vertical and horizontal alignments of the running tracks needed to accommodate specific requirements of SRT trains;
- A significant portion (more than 50%) of the expansion length will be constructed above grade, with crossings of Highland Creek and Highway 401, making stormwater detention or retention highly impractical for those areas;
- Very limited opportunities to implement stormwater management practices (e.g. infiltration facilities) under the tracks due to the complexity associated with maintenance and potential disruptions to the public transport; and
- Very limited opportunities to implement stormwater management practice outside the right-of-way in a fully urbanized area.

In review of the opportunities and constraints of this project, the applicable design standard to be considerd at the detailed stage including Wet Weather Flow Management Gulidline (WWFMG). A Stormwater Management Conceptual Plan has been proposed as addressed in Appendix I. The proposed solutions are summarized as follows:

- OGSs provided for water quality control to the great extent possible;
- Additional opportunities to provide quality and quantity control will be investigated at the detailed design stage for the Sheppard East station and Centennial College Station at the Phase 1 and the proposed maintenance yard (future), as well as Malvern Station (Phase 2) to the north;
- The future yard can potentially accommodate a traditional stormwater management pond; and
- The area associated with Malvern Station is significantly larger than the other stations, and can potentially accommodate a bioretention facility or a similar feature. Opportunities for implementation of green roofs and rainwater re-use will be further investigated at the detailed design stage. The LID measuresments in other stations also will be investigated at the detailed design stage.

The proposed alignment for SRT extension will introduce several crossings of East Highland Creek. There will be three above-grade crossings near Bellamy Road and Markham Road, as well as one below-grade crossings near Mammoth Hall Trail, just north of Sheppard Avenue. Three above-grade crossings will have piers in the valley lands. A preliminary assessment of the hydraulic impact addressed in Appendix I has determined that the SRT will have insignificant impacts on creek hydraulics and as such will not adversely affect flood levels during the 100-year and regional storm events. The track level and station amenities are much higher than the regulatory water elevation, so flooding of the SRT and hydraulic impacts from running structure are not anticipated. City of Toronto will be contacted to ensure that any proposed channel works fit into the intent of the Highland Creek Master Plan, and will not prohibit/limit future channel restoration plans.

In addition to these watercourse crossings, the proposed alignment will also pass beneath an existing dry stormwater management pond (in Rosebank Park). Since this section is below grade, the impacts on the facility are expected only during the construction period. The impacts during the construction period will be addressed in section 4.7.2.3.

The crossing below grade towards the north end of the study area will require consideration with respect to the watercourse dynamics and fluvial characteristics, as the current TRCA standards.

In locations where the SRT is below grade, existing storm sewers that collect and discharge surface runoff will have to be relocated. This project will replicate the function of the current system, based on the design parameters set when the storm sewer in question was designed. The exception to this rule will be in the situation whereby a nearby development or another City initiative warrants a change in the operating parameters.

4.7.2 Construction Impacts

4.7.2.1 Kennedy Station and Conversion

Erosion and Sedimentation - Standard erosion and sedimentation control measures in accordance with the TRCA and City of Toronto guidelines should be implemented to prevent the migration of sediments to catch basins, storm sewers during construction.

Surface Water Contamination and Debris Accumulation - As noted in section 4.4, erosion controls will be in place during construction to minimize surface water contamination. Excess materials and debris accumulation will be dealt with in accordance with provincial standards during construction.

4.7.2.2 Extension

Erosion and Sedimentation - SRT construction-generated dust may result in the release of sediment to East Highland Creek. Exposed soils and/or stockpiles of excess material located adjacent to the creek may result in sediment transport to this watercourse during rain events.

Surface Water Contamination and Debris Accumulation - Construction activities, such as refuelling, may increase the potential for accidental fuel or lubricant spillage, and subsequent contamination to surface water. They also have the potential to result in litter and debris accumulation within the Highland Creek.

4.7.2.3 Mitigation

“Erosion and Sediment Control Guidelines for Urban Construction Sites” developed for Greater Golden Horseshoe Area Conservation Authorities (December 2006) will be followed to determine erosion control plan.

The sediment and erosion control measures will be implemented during LRT construction described as follows:

- A sediment and erosion control plan will be developed during the detailed design stage utilizing Best Management Practices.
- Any required structure work will be isolated from the open watercourse and conducted “in the dry”.
- Any required dewatering operations for structure work should outlet onto a grassed area at least 30m from the watercourse, a settling pond, and/or wetland filter bag.
- Options for dewatering the site should be based on recommendations provided in TRCA’s Erosion and Sediment Control for Urban Construction.
- Following the completion of final site grading and topsoil application, a roadside seed mixture (Ontario Provincial Standard Specification, OPSS 572) and perennial rye grass nurse crop seed should be applied to all exposed soils. For exposed soils located adjacent to Highland Creek, immediately following seed application a straw erosion control blanket (installed as per OPSS 572.05.07, 572.05.08 and 572.07.04.04) should also be installed along the embankment slopes.
- All necessary steps should be taken to prevent dust nuisance resulting from the Contractor’s work. Dust suppression will be undertaken as per OPSS 501 and 506.
- In order to mitigate the potential impacts associated with excess material storage, no stockpiles shall be located closer than 30m from water features, in accordance with OPSS 180... Waste and excess materials will be dealt with in accordance with OPSS 180, General Specification for the Management and Disposal of Excess Material. Waste generated on-site, which requires off-site removal should be in accordance with Ontario Regulation 347 under the Environmental Protection Act which provides for the transportation and processing of hazardous and non hazardous waste.
- To prevent surface water contamination during construction, care will be taken to avoid accidental spillage or discharge of chemical contaminants (i.e. gasoline, oils and lubricants). Refuelling should take place no closer than 30m from water features. Furthermore, proper containment, clean up and reporting, in accordance with provincial requirements, should be completed in the event of a spill.
- All exposed slopes shall be treated with topsoil and seeding, mulching or sodding.
- A significant step towards controlling erosion during construction is to minimize the amount of disturbed ground cover particularly near watercourses.
- Exposed areas should not be left uncovered longer than necessary and ground cover should be re-established as quickly as possible.
- Sediment control measures will be installed prior to construction, monitored during the construction and replaced as necessary.
- During construction, an environmental inspector will make frequent random site visits for the duration of work. The environmental inspector will be responsible for delineating work areas, monitoring that erosion and sedimentation control measures are functional, and that the provisions of the contract related to fisheries and watercourse protection are met.
- In order to prevent surface water contamination during construction, care will be taken to avoid accidental spillage or discharge of chemical contaminants (e.g. gasoline, oils and lubricants). Equipment refuelling will take place no closer than 30 m from any watercourse to prevent water contamination due to accidental fuel spills. All equipment operating near any watercourses shall be properly maintained to avoid contaminant leakage and will be free of excess oil/grease. In the event that a spill occurs, proper containment, clean up and reporting, in accordance with provincial requirements, will be completed. The contractor will also take all necessary precautions to prevent the accumulation of litter and construction debris within the watercourse.

At the Mammoth Hall Trail crossing of Highland creek, options will be explored in creating a new flow diversion so that construction can be done on dry facility. If not possible, instream works will then be completed with aappropriate isolation measures.

Construction in the vicinity of Rosebank Park – The southern half of Rosebank Park is a dry stormwater management facility designed to accept the over land flow from the 100-yr storm event for the greater area. During a major storm event, this depressed area is designed to fill with water and then dissipate through a control structure at the north end of the facility. During construction of the below grade section through Rosebank Park, this facility will be taken out of operation for an extended period of time to excavate to the bottom of the structure, construct the tunnel and then backfill to original grade.

Although the likelihood that this facility will required as designed during construction, there is a possibility that a 100-yr storm event (or greater) can occur. Without mitigation, the construction site could be flooded which would cause damage to works completed to date. A detailed construction staging / contingency plan will be developed during detailed design to ensure stormwater management criteria will still be achieved. The general approach would be as follows:

- Construct a temporary berm which divides the SWM facility in half.
- Create a temporary swale able to direct the overland flow from the street's low point (approximately at Rosebank Drive and Progress Avenue) to the southern half of the SWM facility.
- Undertake and complete all below grade construction through the northern half of the SWM
- Redirect the temporary swale to the northern half of the SWM so that construction on the southern half can be undertaken.

As this process will reduce the overall storage capacity of the SWM facility during construction, emergency back up pumps will be required. The pumps will direct surplus water from the SWM facility to the Highland Creek, via pipes run along the surface, via Burrows Hall Trail or another public road right of way between the area in question and the Highland Creek. The sizing of the pumps and pipes will be determined during detailed design.

With regards to temporary removal of Rosebank Park SWM facility (Exhibit 4-2), the mitigation strategy includes the construction of a below grade tunnel in sections so that some stormwater storage capacity is retained. Additionally, emergency pumps with discharges to Highland Creek, via pipes along surface of existing roads can be employed. The team is committed to work with Toronto Water and TRCA during the design to refine strategy.

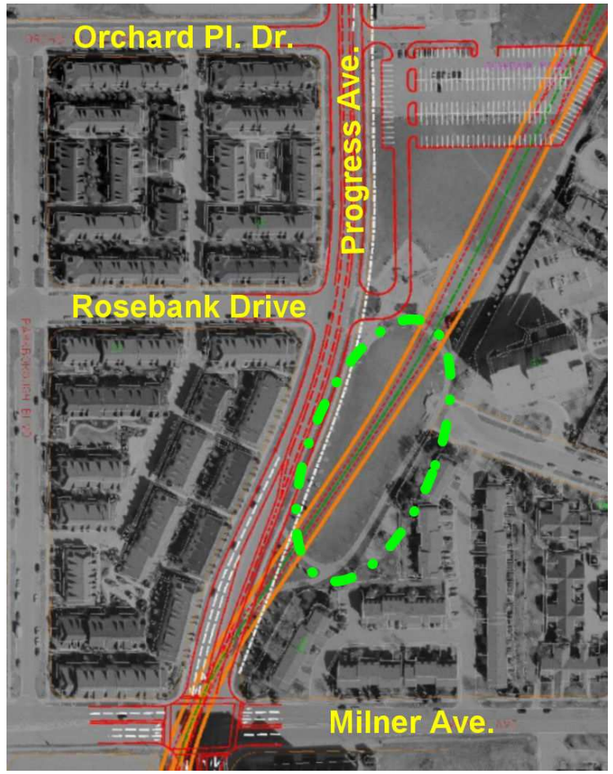
In coordination with TRCA, the TTC will also develop a flood contingency plan (Chapter 5, Item 1.5.3) consisting of the following:

- Integration of the site into TRCA's flood warning system. TTC's Project Manager and Site Foreman/Contract Administrator will be required to sign a copy of TRCA's Flood Warning Messaging Integration Protocal;
- Identification and development of site evacuation "triggers";
- Identify roles and responsibilities, from a flood emergency and evacuation perspective for specific staff; and
- Evacuation protocol

The following figures should be appended/attached to the report:

- Existing conditions plan, of appropriate scale, clearly indicating existing grades, and flood lines (20, 50,100 year, and regional)
- A construction site plan, of appropriate scale, clearly indicating any proposed grade changes, shaft locations, equipment storage location, general areas to be used fo stock piling, construction trailers, and floor lines (25,50,100 year, and Regional); and
- Evacuation plan, clearly indicating primary and emergency assess routes.

Exhibit 4-2: Existing dry SWM facility in Rosebank Park



4.7.3 Operations and Maintenance Impacts

Stormwater will continue to collected and treated through existing municipal infrastructure. Impact (if any) will be confirmed and addressed during detail design.

4.8 Air Quality

On a global perspective, transit improves air quality by reducing the emissions associated with personal transportation. The SRT itself is electrically powered and therefore has no impact on the local air quality within the Study Area. However, localized adverse conditions can occur from transit projects. This includes:

- Transit can create situations where localized increases in bus and car activity can adversely affect air quality around stations
- Construction can cause temporarily deteriorated air quality

4.8.1 Displacement of Existing Features by the SRT Facilities

The introduction of the SRT line in the study is generally expected to create positive air quality changes as a result of the potential reduction in background traffic on the study area road network.

4.8.2 Construction Impacts

The impact from construction activities related to the Transit Project will be associated primarily with emissions of Suspended Particulate Matter (SPM) in the air, and dust fall on objects such as cars and windows resulting from open-pit and cut-and-cover construction techniques, demolition, and carryout by construction vehicles, leading to grinding and re-suspension of construction dust by regular traffic on public roads. If uncontrolled, these emissions could result in off-site concentrations that exceed the Ministry of Environment (MOE) standards and affect nearby residences and commercial establishments, as well as pedestrians. In order to meet the provincial standards, control efficiencies ranging up to 70% and 95% respectively, may be required.

Although emissions typically occur over short periods of time, they may have a substantial temporary impact on local air quality, especially during dry conditions and/or low wind speed events.

4.8.2.1 Mitigation

To reduce emissions, a number of control measures are available, depending on the sources. A detailed description of appropriate measures are provided in the document Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities, March, 2005 (BPREA), prepared by Cheminfo Services Inc. for Environment Canada.

Since construction activities are generally of short duration, the use of approved dust suppressant (such as water) during construction is a viable option, to be considered for efficiency and cost.

The MOE expects that construction operations will meet Regulation 419/05 requirements. For this reason, a work plan should be required in the contract specifications to ensure that the required control measures are carried out diligently. These measures should reduce emissions to a level that minimizes the impact of dust on the areas surrounding the construction site. When construction and/or demolition activities are likely to cause dust emission, air monitoring must be conducted prior to beginning activities to establish a baseline value for the quantity of SPM in the air.

In response, to promote compliance with MOE's criteria, the TTC Master Specifications requires that contractors incorporate mitigation or control measures into construction activities. The MOE expects that emission from construction operations comply with the O. Reg. 419/05 SPM criteria, therefore, control measures articulated in the Controls and Methods Plan will need to be carried out diligently under contractual specifications. A list of typical measures and criteria are available in Appendix E.

During construction and/or demolition operations where dust is being created, air quality monitoring must be conducted to establish the level of particulate matter in the air. Following construction and/or demolition operations where dust was created, confirmatory tests must be conducted to quantify the level of particulate matter in the air.

The conditions under which monitoring will be conducted, as well as mitigation measures that will be implemented if high SPM concentrations are identified, must be specified in the Controls and Methods Plan.

4.8.3 Operations and Maintenance Impacts

No changes are planned for any of the existing stations, including Kennedy which will result in an increase of vehicular activity. However, the extension proposes two stations with surface facilities that will accommodate cars and buses (Phase 1 - Sheppard East station, Phase 2 – Malvern Centre Station).

To compare the future air quality with and without the SRT construction, a pollutant burden analysis within the Study Area was undertaken. Modeling for the Future No-Build scenario was performed at the existing traffic intersections based on projected traffic increases. Modeling for the Future Build scenario was based on the projected traffic increase plus traffic accessing the station, vehicles idling in the parking facility, and idling buses providing public transit links at the on-site bus terminal. Background pollutant concentrations were included in the modeling results for both the Future No-Build and Future Build Scenarios.

Specifically, a comparison of the predicted maximum pollutant concentrations as a percentage of the applicable criteria for $PM_{2.5}$, CO and NO_2 of all the model runs based on the worst-case conditions discussed above are presented below for the locations near the Sheppard East station. The incremental change is the increase or decrease in pollutant concentrations from the Future No-Build scenario to the Future Build scenario, which is considered to be directly attributable to the undertaking.

The predicted maximum CO concentration would reach 18% of the criteria under the Future Build Scenario with an incremental change of-2% over the No-Build Scenario.

The predicted maximum $PM_{2.5}$ concentration would reach 31% of the criteria under the Future Build Scenario with an incremental change of 0% over the No-Build Scenario.

The predicted Maximum NO_2 concentration would reach 41% of the criteria if it is assumed that all NOx emissions are emitted in the form of NO_2 under the Future Build Scenario with an incremental change of -3% over the No-Build Scenario. This is a conservative assumption. A corresponding value of 31% of the criteria with an incremental change of -2% over the No-Build Scenario resulting from the application of the Ambient Ratio Conversion Method (ARM) would be more realistic.

These results suggest that the operation of the proposed Sheppard East station would improve air quality at the local level (see Appendix E).

4.9 Noise and Vibration

To safeguard the environment due to future transportation projects, the Ministry of the Environment and the Toronto Transit Commission developed a set of "Noise Protocols" to address the acceptable sound and vibration levels at the noise-sensitive receptors which include residential, institutional and certain noise-sensitive buildings. In addition, the TTC also accepted the use of supplementary noise/vibration criteria to deal with the potential impacts on other commercial and industrial land uses.

4.9.1 Displacement of Existing Features by the SRT Facilities

The facility/structure of the SRT itself is not a contributor of noise and vibration. All issues of concern with noise/vibration are, in order of their importance, the operational and construction noise impact.

4.9.2 Construction Impacts

During the construction of the SRT extension, there will be noise and vibration impacts from the construction equipment that will be used. Sound levels generated by construction equipment are assessed against the Ontario Ministry of the Environment Publication NPC-115 "Construction Equipment" and Publication NPC-118, "Motorized Conveyances". These publications do not set overall combined sound level limits due to construction sites, but set limits for noise generated by the individual pieces of equipment used on construction sites. MOE approval will be based on whether or not the equipment used on site meets their requirements. If the construction work assessment predicts the potential for high sound levels at the receptors.

The City of Toronto By-Law 591-2.1.B allows the operation of construction equipment in a quiet zone or residential area during the hours of 07:00 to 19:00 during the working week (Monday to Friday), and during the hours of 09:00 to 19:00 on Saturday. The operation of construction equipment in a quiet zone or residential area is prohibited outside of these hours and on statutory holidays. However, should construction be required outside of the hours prescribed by the City of Toronto By-Law 591, an exemption to this by-law should be sought.

In addition, it is important for the Contractors to abide by the terms and conditions of the City of Toronto By-Law Number 514-2008 regulating building construction and demolition with respect to vibrations from construction activities. The Contractor will be required to abide by the details included in this by-law and in particular, pre-submission, monitoring during construction and mitigation options.

4.9.3 Mitigation

A detailed construction noise and vibration assessment is recommended during the detailed design process. Provisions should be made for noise mitigation measures to minimize the construction noise and vibration impact. Noise mitigation could include, but is not limited to:

- Temporary wood hoarding barriers
- Operational duty cycles on construction equipment
- Noise emissions from construction equipment meeting NPC-115, or quieter
- Maximizing distance between the construction equipment operations and the residences
- Minimizing the concurrent use of construction equipment
- Use of equipment or construction methods with lower noise/vibration emissions
- Operate in compliance with NPC-207
- Operate in compliance with City of Toronto By-Law 591 and Toronto By-Law #514-2008.

The TTC is to develop a construction noise/vibration control program during the detail design stages in accordance with the MOE EA procedures and the City of Toronto Noise and Vibration Codes.

4.9.4 Operations and Maintenance Impacts

4.9.4.1 Kennedy Station

No adverse noise or vibration effects are anticipated with the SRT modifications at Kennedy station.

The Facility will be designed to meet NPC-205 as per City of Toronto By-Laws. The details of the noise mitigation measures to be incorporated into the design of the Facility will be determined during the detailed design phase of this project.

The noise impact assessment indicates that the noise impact on identified Points of Receptors (PORs), by the operation of the LRTs on the above ground route portions within the study area, will be insignificant. The vibration impact assessment indicates that the vibration impact on identified PORs, due to the operation of the LRTs on the above ground route portions within the study area, will be insignificant.

4.9.4.2 Conversion

The only station that is likely to be of concern is the Lawrence Avenue East station and in particular the south opening of the platform in view of its proximity to existing residences and also due to the potential for adding a small curved track section closer to the residences.

The existing SRT sound levels at the closest receptor is approximately Leq1hr 68 dBA, which when the station is extended would increase marginally by 1 dB only to Leq1hr 69 dBA. With the addition of the new curved sections and the potential for some wheel squeal, the overall worst case level is predicted to be Leq1hr 79 dBA, i.e. a significant increase of 10 dB. With the introduction of the new LRT vehicles, it is

expected that the overall level would be up to Leq1hr 74 dBA with a residual impact of 6 dB, which is considered noticeable to significant without any noise control measures. The resulting vibration levels will still be below the criteria.

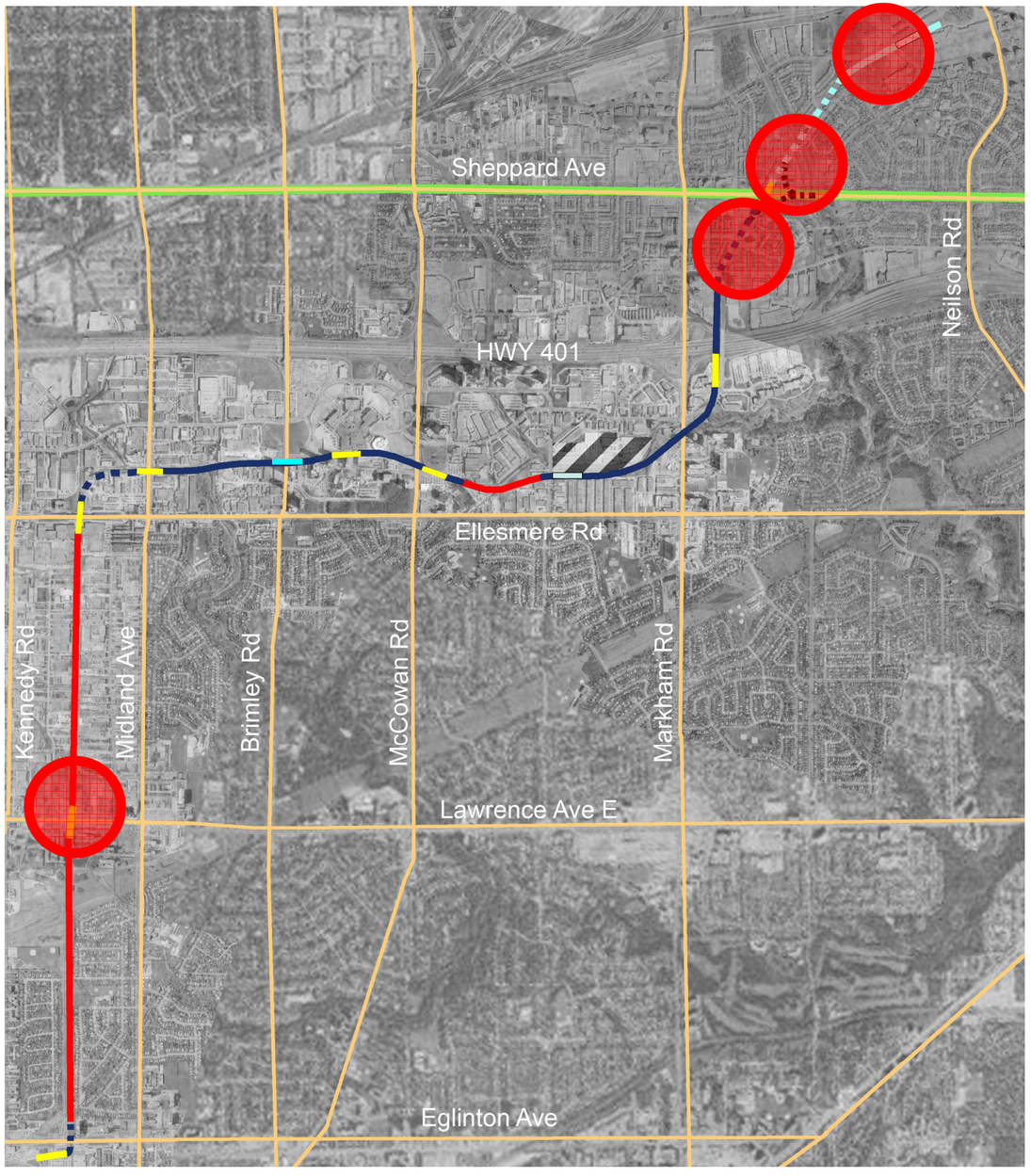
During detailed design, refinements to track geometry will be explored in an attempt to reduce the shift of the tracks towards the townhouses thereby reducing the adverse noise impacts. Furthermore, noise predictions will be updated once the specifications for the new Light Rail Transit vehicles are known. In the event that this cannot eliminate the predicted exceedences, TTC will consider alternate solutions to mitigate the increased noise, such as short noise barriers.

4.9.4.3 Extension

For noise modeling and assessment purposes, it is important to have adequate information on the noise level potential of the SRT vehicle itself, following which, the cumulative noise impact is predicted at the receptors.

At the outset of the project, extensive empirical data gathered in the field around two specific test locations near the existing SRT line helped to develop a model for predicting the sound levels. The model was tested in the field to produce fairly reliable sound levels. With TTC's announcement of changing the current SRT vehicle technology to that of LRT vehicles, additional detailed assessments of the noise potential due to such vehicles was undertaken. This lead to the selection of a typical LRT vehicle that is approximately 5 dB quieter than the current SRT vehicle as a conservative assumption by comparison with the TTC's suggested LRT vehicle noise specifications. Accordingly, the analysis presented in this Environmental Assessment should be considered as a conservative approach.

Exhibit 4-3: Location of possible noise exceedances where mitigation may be required



Vibration Impact of Above Ground SRT Alignment

The predicted ground-borne vibration levels due to the current SRT vehicles above ground show that the applicable vibration level criteria of 0.1 mm/s could be met at a distance setback of more than 6 metres. Therefore, since all buildings are located more than 6m, there is no impact from the above ground SRT alignments.

Noise Impact of Above Ground SRT Alignment

Vehicular traffic on the near-by public roads and highways create a noticeable to significant ambient/background sound levels at most of the receptors with the exception of several neighbourhoods that are not directly exposed to traffic noise where the ambient sound levels are relatively low.

Impact assessment of the above-ground SRT alignment relative to the MOE-TTC Protocol criteria indicates that at four (4) groups of receptors the MOE-TTC Protocol sound level criteria is likely to be exceeded; however, these receptors are industrial and are generally considered as non-critical uses. The only potential noise-sensitive land use is the Students Residence Building of Centennial College (if the building is centrally air conditioned, then the predicted impact is expected to be of no concern).

For information purposes, as the resulting SRT outdoor sound levels at the building facades are predicted to be acceptable for indoor office use. With open windows, the expected indoor sound levels may cause interference with typical indoor activities.

Vibration Impacts of Below Ground (Tunnel) SRT

From the results, it is concluded that the Singles House South of Mammoth Hall Trail, West and East of Hydro Corridor may experience significant impacts due to a combination of reduced distance setbacks and proximity to track switches/crossovers.

Mitigation of this impact is possible through the implementation of special ties that include rubber dampening in between the rail and the tie, plus a second rubber pad between the ties and the tunnel structure. Based on previous installations (for TTC subway projects) ground borne noise and vibration can be mitigated for the above locations.

All other receptors are predicted to receive no impact up to insignificant impact.

Sheppard East Station Bus Terminal

Assessment of the potential noise impact was conducted at locations representing the entire area surrounding the station. Impact assessments during the two station's peak activity hours (am and pm peaks) showed the sound levels ranging from no impact on the south side (i.e. south of Sheppard Avenue) and significant impact at the houses on the west side of the station.

Of particular concern is the potential impact on the existing condominium apartment building on the east side of the facility with its wider exposure to the station from the top floors and the fact that sound barriers may not be acoustically effective for the higher floors.

Non-Revenue Service Tracks – Underground Sheppard Connection

The use of this track is limited to SRT vehicles moving to and from the Sheppard East Maintenance and Storage Facility during a limited number of hours during the day and night, of which two hours occur during critical hours of the night.

Noise analysis has also been conducted at the vacant school site fronting Progress Avenue (South-East of Markham Road and Progress Avenue). Refer to Appendix C.

Assessment based on MOE/TTC Protocol yields negligible impacts.

4.9.5 Mitigation

4.9.5.1 Kennedy Station

Provisions should be made for noise mitigation measures which could include, but are not limited to:

- Selection of equipment with lower sound emissions
- Construction of noise barriers
- Installation of silencers on equipment
- Installation of acoustical louvers
- Outdoor sound enclosures
- Layout of Facility

4.9.5.2 Conversion

For SRT Conversion, Lawrence and Existing Stations, mitigation includes

- Application of sound absorbing to the interior station wall finishes close to the entrance/exit from the extended station buildings.
- Where realignments are sought for the SRT tracks near the entrance/exit structures, the track curvature could be reduced in addition to the potential for using low height sound absorbing barrier walls.

4.9.5.3 Extension

For the SRT extension, mitigation for the alignment includes

- Distance setback
- SRT vehicle noise/vibration specifications for quieter vehicles
- The use of acoustic shielding by the topography and/or sound barriers

- The use of parapet wall sound barriers
- The use of sound absorbing material on the parapet walls, the ballast or at the entrance to the underground tunnel section
- Vibration isolation of the underground tracks in the tunnels

For the Sheppard Bus terminal, mitigation includes

- Distance setback
- The use of acoustic shielding by sound barriers as high as 5m to be placed as close as possible to the driving lanes around the bus station
- Construction of partial or full enclosure over the bus station property, if technically, economically and administratively possible

For the Non-Revenue Service Connection, mitigation includes

- Increase the height of the proposed concrete retaining walls, and/or
- Apply sound absorbing material facing to the inner sides of the retaining walls
- Vehicle speed reduction when they enter or prior to leaving the portal opening concrete structure

The TTC is to continue to implement its tracks and wheels grinding programs with the objective of reducing noise and vibration on a continuous basis.

4.10 Stray Current

Stray current corrosion, which is a form of electrolytic corrison, occurs on buried metallic structures and differs from other forms of corrison damage in that the current, which cause the corrosion, has a source external to the affected structure. Stray current is caused by a portion of the negative return current which leaks into the ground and returns to the traction power substation through parallel paths provided by the ground and by any other metallic structures. For a non-metallic structure, such as plastic or concrete pipe and plastic coated cables, stray current is a non-issue.

4.10.1 Mitigation

In order to minimize uncontrolled stray current, a umber of measures shall be used in connection with measures applied to the traction power return system:

1) Lower linear rail resistance;
2) High rail-to-earth resistance, including insulated trackwork mounted fittings and appurtenances;
3) Good rail bonding, both longitudinal and track cross-bonding;
4) Parallel connected negative reinforcing feeder cables, insulated and cross-bonded to the return rails;
5) Good water drainage;
6) Structural steel-work and reinforcing isolation/separation;
7) Utility structure to be electrically insulated, bonded, coated and cathodically protected as required; and
8) Reduced substation spacing

The running rails shall be insulated from earth with the use of insulating pads and hardware, and by the isolation of all rail associated metal ware from earth. The negative running rails shall be connected to the AC ground system through a floating negative automatic grounding switch (FNAGS). The FNAGS operates (and alarms) only on an abnormally high return rail to ground voltage.

The insulating pads under the rails shall have the following provisions:

1) Be capable of shedding water;
2) Resist the accumulation of airborne dirt;
3) Discourage DC current tracking over the surfaces of the insulation;
4) Have a high surface finish; and
5) Have high insulation levels from earth when installed and maintain an insulation level of at least 300 Ohms - km per rail during the design life.

4.11 Socio–Economic Environment: Land Use

4.11.1 Displacement of Existing Features by the SRT Facilities

Although the transit project may displace some existing land uses (e.g. strip plaza on Sheppard where new bus terminal will be constructed) the overall impact of the SRT line will create new opportunities for transit-supportive development which is promoted by both city and provincial policies.

4.11.2 Construction Impacts

The City of Toronto and TTC are committed to accelerating construction as much as possible to reduce the construction period, in order to minimize construction-related impacts to residents and businesses.

The City of Toronto and TTC will undertake, prior to each phase of construction, a public awareness campaign. Keeping the area up to date and well informed in advance of construction can dramatically reduce the inevitable disruption brought about by this project.

4.11.2.1 Mitigation

A public consultation plan, including information on how the public can raise issues/concerns, will be developed during the design phase. Any complaints received will be investigated and resolved in an effective and efficient manner.

4.11.3 Operations and Maintenance Impacts

No impacts anticipated and is not applicable.

4.12 Socio-Economic Environment: Local Parks and Community Facilities

Within the study area, there are many parks and community facilities which may be affected.

4.12.1 Displacement of Existing Features by the SRT Facilities

4.12.1.1 Kennedy Station and Conversion

No parks or community facilities affected. The SMLRT platform will be located beneath the Don Montgomery Community Recreation Centre but does not represent a permanent displacement (see Construction Impacts for further discussion).

4.12.1.2 Extension

The Burrows Hall Community Centre and Library plus Chinese Cultural Centre are located at the intersection of Sheppard Avenue East and Progress Avenue, and are used for a variety of programs or activities involving the arts or other endeavours. The introduction of the PPUDO displaces approximately 40 parking spaces as well as possible adverse impacts to the delivery areas for the Chinese Cultural Centre. In response, the south lot will be expanded to replace the lost parking on a space-by-space basis. The PPUDO layout will be refined to preserve the functionality of the delivery area.

Lastly, the proposed Chinese Cultural Centre is planning a garden on the lands immediately south of the existing building. The alignment will be below grade through this section and therefore will not displace this proposed amenity (see Construction Impacts for further discussion).

4.12.2 Construction Impacts

4.12.2.1 Kennedy Station

In order to accommodate the high volume of SRT replacement service buses, which will operate between Scarborough Centre Station and Kennedy Station during the three-year shutdown of the existing SRT line, it may be necessary to provide temporary bus terminals on both the existing Kennedy Station lands and the adjacent City of Toronto Don Montgomery Community Centre (located east of Kennedy Station at 2467 Eglinton Avenue East). During design, TTC will refine plans for the temporary bus terminal(s) at Kennedy Station, which may include a temporary facility on the 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.

4.12.2.2 Conversion

No impacts anticipated as there are no parks or community centre within study area.

4.12.2.3 Extension

During Construction, Rosebank Park, the Burrows Hall Community Centre / Library and the Chinese Cultural Centre will be affected. TTC will work with the affected parties during the design phase to minimize impacts during construction. This includes:

- replacement parking strategy
- service and delivery accommodations
- timing / coordination of Chinese Garden construction with Phases 1 and 2 construction

4.12.3 Operations and Maintenance Impacts

Improved accessibility to the Burrow Hall Community Centre/Library will provide more travel options for patrons wishing to use these amenities.

4.13 Property

As summarized in Table 4-2, and described below, a total of 20 full and 106 partial permanent property acquisitions will be required for the for the SRT Conversion and Extension (including properties on Sheppard Avenue between Progress Avenue and Washburn Way required for the SRT and Sheppard East LRT projects), Scarborough Malvern LRT and Eglinton Crosstown LRT (in the vicinity of Kennedy Station only) and the future Bellamy Yard.

Property acquisition required for this project will be undertaken by the City of Toronto on behalf of the TTC. For the permanent property requirements, the City will purchase the entire property or portion of the property.

In addition, 1 full and 216 partial temporary property takings are required to facilitate construction. These are required for the duration of construction only and are returned to the owner upon completion of construction.

Table 4-2: Summary of Permanent and Temporary Property Requirements

	Permanent (Displacement of Existing Features)		Temporary (Construction Impacts)	
	Full	Partial	Full	Partial
Kennedy Station – SRT	2	1	0	1
Kennedy Station – Scarborough-Malvern LRT	0	3	0	17
Kennedy Station – Eglinton Crosstown LRT	1	4	0	10
SRT Conversion – Kennedy to McCowan	0	13	1	24
SRT Extension – Phase 1 - Main Alignment	4	27	0	52
SRT Extension – Phase 1 - Sheppard Avenue	1	50	0	49
SRT – Phase 2	3	6	0	60
Bellamy Yard	10	1	0	0
Total	**21**	**105**	**1**	**213**

Locations of the impacted properties identified to date are described below and are shown in Appendix K.

4.13.1 Kennedy Station

In the vicinity of Kennedy Station, property requirements have been identified in this Transit Project Assessment for three separate projects, including:

- SRT – These properties are required for the SRT and Eglinton Crosstown LRT platforms, relocated surface facilities (entrances and traction power substation) and the new underground SRT loop (for turn back of SRT trains);
- Eglinton Crosstown LRT – These are properties required for the Eglinton Crosstown LRT portal and underground tunnel into Kennedy Station, which are located between Ionview Road and immediately east of Kennedy Road);
- Scarborough-Malvern LRT – These are properties required for the Scarborough-Malvern LRT, underground tunnel, and station platform (located between Midland Avenue and the GO Transit rail right-of-way.

4.13.1.1 SRT

As detailed in Table 4-3, full acquisition of two publicly-owned properties (2439 and 2444 Eglinton Avenue East) is required for the SRT project at Kennedy Station. Permanent and temporary partial acquisition is required for one additional publicly-owned property.

These requirements do not include a potential location for the Kennedy Station temporary bus terminal at the City of Toronto Don Montgomery Community Centre (located east of Kennedy Station at 2467 Eglinton Avenue East). The need for temporary property for on the Community Centre lands will be determined during design, in consultation with City of Toronto Parks and Recreation.

Table 4-3: SRT - Kennedy Properties

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1	2439	EGLINTON AVE E	CANADA POST CORPORATION	N	F	P	KENNEDY STATION
2	2444	EGLINTON AVE E	CITY OF TORONTO	N	F	P	KENNEDY STATION
3		KENNEDY RD / EGLINTON AVE E (HYDRO CORRIDOR-1)	HYDRO ONE / ONTARIO REALTY CORPORATION	N	P	P, T	ALIGNMENT

4.13.1.2 Eglinton Crosstown LRT

As described in Table 4-4, the permanent property required for Eglinton Crosstown underground tunnels includes full acquisition of one private property (751 Kennedy Road), partial acquisition of 9 private properties and partial acquisition of 1 publicly-owned property. The remaining properties identified will be impacted by partial temporary takings (along the north and south side of Eglinton Avenue). These temporary takings are required for temporary widening of Eglinton Avenue to provide a work zone for construction of the Eglinton Crosstown LRT portal and tunnel (to be constructed by cut and cover method) under Eglinton Avenue.

Table 4-4: Eglinton Crosstown LRT Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	PERMANENT (P) OR TEMPORARY (T)	REASON FOR IMPACT
1	2360	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
2	10	IONVIEW RD	PRIVATE	Y	P	T	ALIGNMENT
3	2372	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
4	2374	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
5	2376	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
6	2378	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
7	2391	EGLINTON AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
8	2425	EGLINTON AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
9	751	KENNEDY RD	PRIVATE	Y	F	P	ALIGNMENT
10		KENNEDY RD / EGLINTON AVE E (HYDRO CORRIDOR-1)	HYDRO ONE / ONTARIO REALTY CORPORATION	N	P	P, T	ALIGNMENT
11	2433	EGLINTON AVE E	PRIVATE	Y	P	P, T	ALIGNMENT

4.13.1.3 Scarborough-Malvern LRT

As detailed in Table 4-5, the implementation of the Scarborough-Malvern LRT will require permanent partial acquisition of 1 publicly-owned and 2 privately-owned properties. A further 17 partial temporary property takings are required. These temporary takings are required for temporary widening of Eglinton Avenue to provide a work zone for construction of the Scarborough-Malvern LRT portal and tunnel (to be constructed by cut and cover method) under Eglinton Avenue.

Table 4-5: Scarborough-Malvern LRT Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	PERMANENT (P) OR TEMPORARY (T)	REASON FOR IMPACT
1	2467	EGLINTON AVE E	CITY OF TORONTO	N	P	P, T	ALIGNMENT
2	2480	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
3	2493	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
4	2499	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
5	2500	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
6	2501	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
7	2503	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
8	2507	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
9	815	MIDLAND AVE	PRIVATE	Y	P	P, T	ALIGNMENT
10	2555	EGLINTON AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
11	2510	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
12	2516	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
13	2518	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
14	2520	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
15	2522	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
16	2524	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT
17	2563	EGLINTON AVE E	PRIVATE	Y	P	T	ALIGNMENT

4.13.2 Conversion

Along the existing SRT line, north of Kennedy Station to McCowan Station, minor partial permanent takings are required for changes in track geometry (south of Lawrence East Station and north of Ellesmere Station) and longer station platforms to accommodate 3-car LRT trains. Minor permanent takings are also required to provide new elevators and/ or emergency egress routes from the existing stations. Property has also been identified for a future Brimley Station.

As summarized in Table 4-6, permanent partial acquisition of 4 privately-owned and 8 publicly-owned properties is required. As well, temporary acquisition of one full privately-owned property (25 Borough Drive) is required for the temporary bus terminal at Scarborough City Centre. Lastly, several temporary partial takings are required for construction staging and work areas.

Table 4-6: Conversion Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1	86-154	JENKINSON WAY	PRIVATE	Y	P	T	ALIGNMENT
2		KENNEDY RD / LAWRENCE AVE E	METROLINX	N	P	P, T	LAWRENCE STATION
3	2430	LAWRENCE AVE E	CITY OF TORONTO	N	P	P, T	LAWRENCE STATION
4	1001	ELLESMERE RD	PRIVATE	Y	P	P, T	ELLESMERE STATION
5		KENNEDY RD / ELLESMERE RD	METROLINX	N	P	P, T	ELLESMERE STATION
6		KENNEDY RD / ELLESMERE RD	CITY OF TORONTO	N	P	T	UNDERGROUND ALIGNMENT
7		KENNEDY RD / ELLESMERE RD	CITY OF TORONTO	N	P	T	UNDERGROUND ALIGNMENT
8	1000	ELLESMERE RD	PRIVATE	Y	P	T	UNDERGROUND ALIGNMENT
9	45	PROGRESS AVE	PRIVATE	Y	P	T	UNDERGROUND ALIGNMENT
10		KENNEDY RD / ELLESMERE RD	METROLINX	N	P	T	UNDERGROUND ALIGNMENT
11	111	PROGRESS AVE	PRIVATE	Y	P	T	UNDERGROUND ALIGNMENT
12		KENNEDY RD / ELLESMERE RD	CITY OF TORONTO	N	P	T	UNDERGROUND ALIGNMENT
13	65	PROGRESS AVE	PRIVATE	Y	P	T	UNDERGROUND ALIGNMENT
14	1076	ELLESMERE RD	CITY OF TORONTO	N	P	P, T	UNDERGROUND ALIGNMENT / MIDLAND STATION
15		MIDLAND AVE / PROGRESS AVE	CITY OF TORONTO	N	P	P	MIDLAND STATION
16		ELLESMERE RD / MIDLAND AVE (WEST HIGHLAND CRK-1)	CITY OF TORONTO	N	P	T	MIDLAND STATION

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
17	1600	BRIMLEY RD	PRIVATE	Y	P	T	BRIMLEY STATION
18	333	PROGRESS AVE	PRIVATE	Y	P	P, T	BRIMLEY STATION
19	83	BOROUGH DR	PRIVATE	Y	P	P, T	BRIMLEY STATION
20	5	TRITON RD	PRIVATE	Y	P	P, T	BRIMLEY STATION
21		BOROUGH DR / TRITON GATE	CITY OF TORONTO	N	P	P	SCARBOROUGH CENTRE STATION
22	300	BOROUGH DR	PRIVATE	Y	P	T	SCARBOROUGH CENTRE STATION
23	160	BOROUGH DR	CITY OF TORONTO	N	P	T	SCARBOROUGH CENTRE STATION
24	220	TOWN CENTRE CRT	CITY OF TORONTO	N	P	T	SCARBOROUGH CENTRE STATION
25	25	BOROUGH DR	PRIVATE	Y	F	T	TEMPORARY BUS TERMINAL
26	1275	MC COWAN RD	CITY OF TORONTO	N	P	P	MC COWAN STATION
27	101	GRANGEWAY AVE	CITY OF TORONTO	N	P	P, T	MC COWAN STATION

4.13.3 Extension – Phase 1 – Main Line

Phase 1 of the extension includes the alignment between McCowan Station and Mammoth Hall Trail. Property is required for the LRT elevated guideway (between McCowan Road and Progress Avenue, north of Highway 401), underground tunnels for the main line SRT and connection to the Sheppard East LRT (for a connection to the Sheppard East Maintenance and Storage Facility) between Milner Avenue and Mammoth Hall Trail, Centennial Station, Sheppard East Station and a future Bellamy Station.

Approximately 25% of the SRT Extension – Phase 1 right of way is in public ownership and will require partial acquisition on 13 properties under municipal or provincial jurisdiction, including the Toronto Catholic District School Board lands on Progress Avenue, north of Milner Avenue.

During the Transit Project Assessment, TTC and the Toronto Catholic District School Board have entered into discussions about property requirements for the SRT underground tunnels on the School Board's future elementary school site located on the east side of Progress Avenue, north of Milner Avenue. The School Board has raised concerns, and has written to TTC indicating that the tunnels "would severely compromise its ability to construct the planned elementary school at the Progress Avenue site". The TTC will conduct a further review of the future 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.

The following permanent property requirements have been identified for private properties:

- Full acquisition of 4 private properties (60 Production Drive, 11 and 12 Rayward Court and 56 Gateforth Drive) ; and
- Partial acquisition on 16 other properties.

Two private properties (1145 Bellamy Road and 70 Production Drive) for which a partial taking only is required for the SRT extension, will become full takings in the event that the Bellamy Maintenance and Storage Facility is implemented.

Lastly, temporary partial takings are required on 40 private properties to facilitate construction of Phase 1 of the SRT Extension.

Table 4-7: Extension Phase 1 – Main Line Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1	675	PROGRESS AVE	PRIVATE	Y	P	P, T	ALIGNMENT
2	705	PROGRESS AVE	THE CORPORATION OF THE CITY OF SCARBOROUGH, THE BOARD OF EDUCATION FOR THE CITY OF SCARBOROUGH	N	P	P, T	ALIGNMENT
3		PROGRESS AVE / BELLAMY RD N	THE MUNICIPALITY OF METROPOLITAN TORONTO	N	P	P, T	ALIGNMENT
4	1100	BELLAMY RD	PRIVATE	Y	P	P, T	ALIGNMENT
5	1140	BELLAMY RD	PRIVATE	Y	P	P, T	ALIGNMENT
6	1144	BELLAMY RD N	THE CORPORATION OF THE TOWNSHIP OF SCARBOROUGH	N	P	P, T	ALIGNMENT
7	1145	BELLAMY RD N	PRIVATE	Y	P	P, T	ALIGNMENT/ YARD
8	831	PROGRESS AVE	PRIVATE	Y	P	P, T	ALIGNMENT/ YARD
9	60	PRODUCTION DR	PRIVATE	Y	F	P	ALIGNMENT/ YARD
10	70	PRODUCTION DR	PRIVATE	Y	P	P, T	ALIGNMENT/ YARD
11		BELLAMY RD N / PROGRESS AVE (EAST HIGHLAND CRK-1)	TOWNSHIP OF SCARBOROUGH	N	P	P, T	ALIGNMENT
12		PROGRESS AVE / MARKHAM RD (EAST HIGHLAND CRK-2)	TORONTO AND REGION CONSERVATION AUTHORITY	N	P	P, T	ALIGNMENT
13	1250	MARKHAM RD	PRIVATE	Y	P	P, T	ALIGNMENT
14	1280	MARKHAM RD	PRIVATE	Y	P	P, T	ALIGNMENT
15		MARKHAM RD / PROGRESS AVE (TRCA)	TORONTO AND REGION CONSERVATION AUTHORITY	N	P	P, T	ALIGNMENT

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
16	921	PROGRESS AVE	PRIVATE	Y	P	P, T	ALIGNMENT
17	930	PROGRESS AVE	PRIVATE	Y	P	P, T	ALIGNMENT
18	940	PROGRESS AVE	PRIVATE	Y	P	P, T	CENTENNIAL COLLEGE STATION
19	941	PROGRESS AVE	PRIVATE	Y	P	P, T	ALIGNMENT
20		PROGRESS AVE / HIGHWAY 401	HER MAJESTY THE QUEEN IN RIGHT OF PROVINCE OF ONTARIO AS REPRESENTED BY MINISTER OF HIGHWAYS	N	P	P, T	ALIGNMENT
21	305	MILNER AVE	PRIVATE	Y	P	P, T	ALIGNMENT
22		PROGRESS AVE / MILNER AVE	PRIVATE	Y	P	P, T	ALIGNMENT
23		PROGRESS AVE / MILNER AVE	CITY OF TORONTO	N	P	P, T	ALIGNMENT
24		PROGRESS AVE / MILNER AVE	CITY OF TORONTO	N	P	P, T	ALIGNMENT
25	380	MILNER AVE	PRIVATE	Y	P	P, T	ALIGNMENT
26		PROGRESS AVE / MILNER AVE	TORONTO CATHOLIC DISTRICT SCHOOL BOARD	N	P	P, T	ALIGNMENT
27	5183	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
28	80	PURVIS CRES	PRIVATE	Y	P	T	ALIGNMENT
29	82	PURVIS CRES	PRIVATE	Y	P	T	ALIGNMENT
30	33	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
31	31	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
32	29	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
33	27	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
34	25	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
35	23	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
36	21	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
37	19	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
38	17	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
39	15	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
40	11	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
41	9	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
42	7	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
43	5	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
44	3	SUNBURST SQ	PRIVATE	Y	P	T	ALIGNMENT
45	73	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT, CONSTRUCTION EASEMENTS, TIEBACKS
46	11	RAYWARD CRT	PRIVATE	Y	F	P	SHEPPARD STATION / ALIGNMENT
47	15	RAYWARD CRT	PRIVATE	Y	P	T	SHEPPARD STATION / ALIGNMENT
48	17	RAYWARD CRT	PRIVATE	Y	P	T	CONSTRUCTION EASEMENTS, TIEBACKS
49	12	RAYWARD CRT	PRIVATE	Y	F	P	ALIGNMENT
50	14	RAYWARD CRT	PRIVATE	Y	P	T	CONSTRUCTION EASEMENTS, TIEBACKS
51	56	GATEFORTH DR	PRIVATE	Y	F	P	ALIGNMENT
52	54	GATEFORTH DR	PRIVATE	Y	P	T	CONSTRUCTION EASEMENTS, TIEBACKS
53	52	GATEFORTH DR	PRIVATE	Y	P	T	CONSTRUCTION EASEMENTS, TIEBACKS
54	59	GATEFORTH DR	PRIVATE	Y	P	T	CONSTRUCTION EASEMENTS, TIEBACKS
55		GATEFORTH DR / MAMMOTH HALL TRL (EAST HIGHLAND CRK-4)	THE CORPORATION OF THE CITY OF SCARBOROUGH	N	P	P, T	ALIGNMENT
56		GATEFORTH DR / MAMMOTH HALL TRL (EAST HIGHLAND CRK-5)	THE CORPORATION OF THE BOROUGH OF SCARBOROUGH	N	P	T	CONSTRUCTION EASEMENT

4.13.4 Extension – Phase 1 - Sheppard Avenue

Between Progress Avenue and Washburn Way, the widening of the Sheppard Avenue East road allowance is required to accommodate the Sheppard East LRT tracks, provide for the future platform for the Sheppard LRT (which will include connections to the underground Scarborough RT station) and to protect for a portal to connect the underground Scarborough RT to the surface LRT so that Scarborough RT vehicles will have access to the Sheppard East Maintenance and Storage facility.

Permanent partial property acquisition is required on 44 private properties and on 6 properties under municipal or provincial jurisdiction. Temporary partial property takings are required on 43 private and 6 properties under municipal or provincial jurisdiction for temporary widening of Sheppard Avenue to provide

a work zone for construction of the SRT portal and tunnel (to be constructed by cut and cover method) under Sheppard Avenue and the Sheppard East LRT stop platform. In addition to road widening, a portion of 5780-5800 Sheppard Avenue East is required for the future Scarborough RT bus terminal.

Permanent full acquisition of the Hydro One lands between Sheppard and Mammoth Hall Trail is required.

Table 4-8: Extension – Phase 1 – Sheppard Avenue Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1	5670	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
2	5672	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
3	5674	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
4	5676	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
5	5678	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
6	5680	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
7	5682	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
8	5684	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
9	5686	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
10	5688	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
11	5690	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
12	5692	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
13	47	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
14	45	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
15	43	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
16	41	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
17	39	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
18	37	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
19		SHEPPARD AVE E / MALVERN ST (PUBLIC WALKWAY - 1)	THE CORPORATION OF THE BOROUGH OF SCARBOROUGH	N	P	P, T	ALIGNMENT
20	35	SUNBURST SQ	PRIVATE	Y	P	P, T	ALIGNMENT
21		SHEPPARD AVE E / MALVERN ST (HYDRO CORRIDOR)	THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO	N	F	P, T	ALIGNMENT
22	5780/5800	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT, SHEPPARD STATION
23	5810	SHEPPARD AVE E	PRIVATE	Y	P	P, T	ALIGNMENT
24		SHEPPARD AVE E / WASHBURN WAY (EAST HIGHLAND CRK - 1)	TORONTO AND REGION CONSERVATION AUTHORITY	N	P	P, T	ALIGNMENT
25		SHEPPARD AVE E / WASHBURN WAY (EAST HIGHLAND CRK - 2)	TORONTO AND REGION CONSERVATION AUTHORITY	N	P	P, T	ALIGNMENT
26	10	WASHBURN WAY	PRIVATE	Y	P	P, T	ALIGNMENT
27	1081	PROGRESS AVE	THE CORPORATION OF THE CITY OF SCARBOROUGH	N	P	P, T	ALIGNMENT
28	5183	SHEPPARD AVE E	PRIVATE	Y	P	P	ALIGNMENT
29	84	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
30	86	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
31	88	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
32	90	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
33	92	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
34	94	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
35	96	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
36	98	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
37	100	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
38	102	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
39	104	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
40	106	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
41		SHEPPARD AVE E / GATEFORTH DR (PUBLIC WALKWAY - 2)	THE CORPORATION OF THE BOROUGH OF SCARBOROUGH	N	P	P, T	ALIGNMENT
42	108	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
43	110	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
44	112	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
45	114	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
46	116	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
47	118	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
48	120	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
49	122	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
50	124	PURVIS CRES	PRIVATE	Y	P	P, T	ALIGNMENT
51		SHEPPARD AVE E / WASHBURN WAY (EAST HIGHLAND CRK – 3)	TORONTO AND REGION CONSERVATION AUTHORITY	N	P	P, T	ALIGNMENT

4.13.5 Extension - Phase 2

As shown in Table 4-9, the following permanent property requirements have been identified:

- Partial acquisition of 5 private properties; and
- Full or partial acquisition of 3 properties under municipal or provincial jurisdiction.

The Phase 2 property requirements include partial acquisition on the Toronto District School Board lands at 150 Tapscott Road, which is the site of three schools: Lester B. Pearson Collegiate Institute, Dr. Marion Hillard Senior Public School and Berner Trail Junior Public School.

Further temporary takings are required for the construction of the underground tunnels (by cut and cover method) between Mammoth Hall Trail and Greenspire Road.

Property impacts of the Extension – Phase 2 will be confirmed during design.

Table 4-9: Phase 2 Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1		MAMMOTH HALL TRL / GATEFORTH DR (HYDRO CORRIDOR – 1)	HYDRO ONE NETWORKS INC	N	F	P	ALIGNMENT
2	96	MAMMOTH HALL TRL	PRIVATE	Y	P	P, T	ALIGNMENT
3	98	MAMMOTH HALL TRL	PRIVATE	Y	P	P, T	ALIGNMENT
4	100	MAMMOTH HALL TRL	PRIVATE	Y	P	P, T	ALIGNMENT
5	102	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
6	104	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
7	106	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
8	108	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
9	110	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
10	112	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
11	114	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
12	116	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
13	118	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
14	120	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
15	122	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
16	124	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
17	126	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
18	128	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
19	130	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
20	132	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
21	134	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
22	136	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
23	138	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
24	140	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
25	142	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
26	144	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
27	152	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
28	154	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
29	156	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
30	158	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
31	160	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
32	162	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
33	164	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
34	166	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
35	168	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
36	170	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
37	172	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
38	174	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
39	176	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
40	178	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
41	180	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
42	182	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
43	184	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
44	186	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
45	188	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
46	190	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
47	192	MAMMOTH HALL TRL	PRIVATE	Y	P	T	ALIGNMENT
48	22	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
49	20	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
50	18	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
51	16	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
52	14	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
53	12	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
54	10	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
55	8	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
56	6	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
57	4	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
58	2	LITTLELEAF DR	PRIVATE	Y	P	T	ALIGNMENT
59		GREENSPIRE RD / MAMMOTH HALL TRL	CITY OF TORONTO	N	P	T	ALIGNMENT
60		GREENSPIRE RD / MAMMOTH HALL TRL (HYDRO CORRIDOR - 2)	ONTARIO HYDRO	N	F	P	ALIGNMENT
61	150	TAPSCOTT RD	THE BOARD OF EDUCATION FOR BOROUGH OF SCARBOROUGH	N	P	P, T	ALIGNMENT
62		TAPSCOTT RD / MC LEVIN AVE	PRIVATE	Y	F	P	BUS TERMINAL
63	31	TAPSCOTT RD	PRIVATE	Y	P	P, T	ALIGNMENT

4.13.6 Bellamy Maintenance and Storage Facility

As summarized in Table 4-10, the implementation of the Bellamy Maintenance and Storage Facility will require acquisition of 10 full properties and one partial private property, including two properties for which partial acquisition is required for implementation of Phase 1 of the SRT Extension (1145 Bellamy Road and 70 Production Drive).

TTC will provide regular updates of the status of the Bellamy Maintenance and Storage Facility to the affected property owners.

Table 4-10: Bellamy Maintenance and Storage Facility Property Requirements

ID #	STREET #	STREET NAME	OWNER	PRIVATE PROPERTY (Y/N)	FULL (F) OR PARTIAL (P)	TEMPORARY (T) OR PERMANENT (P)	REASON FOR IMPACT
1	1145	BELLAMY RD N	PRIVATE	Y	F	P	ALIGNMENT
2	831	PROGRESS AVE	PRIVATE	Y	P	P	ALIGNMENT
3	70	PRODUCTION DR	PRIVATE	Y	F	P	ALIGNMENT
4	1149	BELLAMY RD	PRIVATE	Y	F	P	BELLAMY YARD
5	1147	BELLAMY RD	PRIVATE	Y	F	P	BELLAMY YARD
6	20	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD
7	30	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD
8	40	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD
9	50-52	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD
10	90	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD
11	80	PRODUCTION DR	PRIVATE	Y	F	P	BELLAMY YARD

4.13.7 Mitigation

In acquiring either temporary or permanent property, the City of Toronto balances community need and the rights of the property owner. The objective is to ensure that individual rights are respected and protected and to provide fair compensation within the framework of the Expropriations Act for any property acquired or affected by civic projects. The acquisition process emphasizes negotiation and the achievement of a mutually satisfactory agreement between the City and the owner. If necessary, in order to protect the ability to proceed with the project, expropriation may be required to acquire the necessary property. In general, property acquisition uses the following steps:

- The City of Toronto contacts the property owner to indicate its interest in the property and to identify issues and concerns;
- The City conducts legal surveys, appraisals, environmental site assessments and other property-related assessments;
- An offering price is discussed. If a tentative agreement is reached, an Offer to Sell (for permanent takings) or Lease (for temporary takings) is signed by the owner. The Offer is then sent to City of Toronto Council for approval and acceptance;
- If discussions do not result in an agreement, the City initiates the expropriations procedures. The expropriation process may be initiated while negotiations are occurring;
- If expropriation is pursued, the owner has a right to an independent inquiry called a Hearing of Necessity, which determines whether the property requirements are fair, sound and reasonably necessary;
- The City approves the settlement/expropriation, and acquires the property; and
- If expropriated, the owner has the right to have compensation payable referred to arbitration at the Ontario Municipal Board.

The objective of the Expropriations Act is to put tenants and property owners in the same position that they were in prior to the beginning of the civic project directly affecting their properties. Compensation is determined having regard for the Expropriations Act by experienced, qualified appraisers and other experts. Compensation is generally based on three factors:

- **Market Value** – Market value is defined as "the amount that the land will be expected to realize if sold on the open market by a willing seller to a willing buyer." The date of expropriation is usually determined as the date to determine market value.
- **Damages Attributable to Disturbance** – These refer to the economic loss suffered by an owner as a result of having to vacate expropriated property. This can include moving costs, temporary accommodation, redundant furnishings, or loss of business revenues and profitability. Compensation for damages of this type is determined after expropriation.
- **Damages for Injurious Affection** – Injurious affection is sometimes referred to as "consequential damages." It has very precise and limited applications according to the law and can include items such as reduced market value and increased business operating expenses. Injurious affection is usually determined after expropriation.

The total property acquisition process and resulting compensation is intended to leave the affected owner "whole" and thereby mitigating the negative impact.

The property requirements identified in this study are preliminary and subject to change as the design of the SRT, Eglinton Crosstown LRT, Sheppard East LRT, Scarborough-Malvern LRT and Bellamy Yard projects proceed. During the early stage of design, TTC and the City of Toronto will conduct a Property Protection Study will confirm detailed permanent and temporary property requirements. Property requirements for heavy equipment maintenance, storage / material lay-down areas and temporary easements for elements like temporary road diversions will also be identified during design.

For any buildings or structures which required demolition following acquisition, a Designated Substances Survey will be undertaken.

During the Transit Project Assessment, TTC and the Toronto Catholic District School Board have entered into discussions about property requirements for the SRT underground tunnels (Extension – Main Line – Phase 1) on the School Board's future elementary school site located on the east side of Progress Avenue, north of Milner Avenue. The School Board has raised concerns, and has written to TTC indicating that the tunnels "would severely compromise its ability to construct the planned elementary school at the Progress Avenue site". The TTC will conduct a further review of the future 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 to enter into further discussions with the School Board to achieve a mutually acceptable agreement.

TTC and the Toronto District School Board have also entered into preliminary discussions for property requirements for Phase 2 of the SRT Extension.

For properties that are owned by the province or federal level, the expropriation process cannot be used. Property acquisition must be through a negotiated settlement. For provincially owned lands, specifically the various Hydro One Networks Inc. corridors (active or unused), the disposal of the lands by the province require an ORC Class EA. This process is described in Chapter 5.

4.14 Utilities

4.14.1 Displacement of Existing Features by the SRT Facilities

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.

4.14.1.1 Kennedy Station

The new underground connections to Kennedy Station are expected to impact utilities. The names of owners (public or private) and extent of impacts will be confirmed during the design process. All utility owners will be contacted and discussions will be held to resolve conflicts prior to construction. Detailed utility conflict can be found in Appendix J.

As previously noted, current minimum line clearances at the Hydro One corridor north of Eglinton Avenue will be respected and access to Hydro One facilities will be maintained. Any grading, excavating, filling or other civil work close to the structures will employ appropriate measures to maintain the integrity of the structures/foundations. The proponent will continue to consult with Hydro One during detail design to address concerns identified.

4.14.1.2 Conversion

In general the impact to the site utility requirements for the stations is limited to the following:

The addition of the elevators will necessitate the relocation of the sanitary sewer on the north side of the structure at McCowan, and the addition of oil water separators at Midland and McCowan. An oil water separator exists at Scarborough Town Centre; further investigation is required to determine what the structure is serving.

Electrical site improvement requirements cannot be determined until additional power consumption information is received.

The preliminary utilities survey identifies existing underground gas pipelines located adjacent to the at grade stations: Lawrence East and Ellesmere. Those utilities lines will need to be protected during construction. An overhead existing hydro/phone line will need to be verified for interference with the overhead catenary system.

The existing high voltage power lines crossing the SRT ROW above the new overhead catenary system will need to be investigated for potential interferences.

4.14.1.3 Extension

Utility impacts by the SRT structure were identified at 5 major areas:

- Markham and Progress
- Progress Avenue and Milner Avenue (South of Sheppard Avenue) and Storm Pond (within Rosebank Park – see Surface Water)
- Sheppard SRT Station
- Mammoth Hall Trail
- Greenspire Road

Each of these areas have multiple utility conflicts due to its permanent structure. A preliminary identification and proposed mitigation are outlined in Appendix J. All details of proposed mitigation will be finalized during detailed design.

4.14.2 Construction Impacts

Disruption of service will be minimized during construction. It is expected that existing utilities will either be re-rerouted or protected during construction to provide continued service. All utility work will be coordinated with the affected utility agency and will be coordinated with other works through the Toronto Public Utility Coordinating Committee.

The new underground connections to Kennedy Station are expected to impact utilities. The names of owners (public or private) and extent of impacts is being confirmed during the design process. All utility owners will be contacted and discussions will be held to resolve conflicts prior to construction.

4.14.3 Operations and Maintenance Impacts

No impact expected as all utility relocations are expected to be finalized after construction.

4.15 Socio-Economic Environment: Archaeology

4.15.1 Displacement of Existing Features by the SRT Facilities

4.15.1.1 Kennedy Station

A Stage 2 assessment is recommended on any lands within the study area where there is potential for archaeological sites (namely in the hydro corridor), in accordance with Ministry of Tourism and Culture's Draft Standards and Guidelines for Consultant Archaeologists (MTC, 2009).

4.15.1.2 Conversion

No potential for archaeological sites identified as study area is all within disturbed lands.

4.15.1.3 Extension

Within the south section of the preferred alignment (between McCowan Station and Centennial College Station), there is a partial open area and woodlot that has not been developed at the intersection of Markham Road and Progress Avenue. A historic map of this branch of Highland Creek shows a homestead was located south of the creek. A newly developed building was constructed overlooking the river on the west side of Markham Road; however, some of the land may have retained some of its natural integrity, even after the creek was channelized. The open area and wooded area should be subjected to a Stage 2 archaeological assessment in order to determine the degree of disturbance. As the lands in question are owned by the Toronto Regional

Conservation Authority (TRCA), TRCA has advised TTC that they will undertake the Stage 2 investigations using their own forces. All other sections of the south section of the alignment have been severely impacted by developments in the area and do not maintain any natural integrity. As a result, these sections do not require further archaeological assessment and are clear of further archaeological concern.

Within the north section of the preferred alignment (from Centennial College Station to Malvern Centre Station), there are three sites that will require a Stage 2 archaeological assessment. These sites include:

- South side of Mammoth Hall Trail, where the abandoned rail corridor connects with the street – It is required in order to assess the disturbance caused by the railway because of the proximity to Highland Creek and the historic crossroad community of Malvern.
- North side of Mammoth Hall Trail, where the preferred alignment intersects with lots associated with the historic community of Malvern – It is required in order to determine the

degree of disturbance that the channelization of the creek and residential development has caused.

- The segment along McLevin Avenue to Neilson Road, where the proposed Malvern Station will impact a mature deciduous woodlot, but is also in close proximity to the archaeological registered site AkGt-3 (see Appendix D).

Aside from these three sites, there are no areas that exhibit archaeological concern in the north section of the preferred alignment, and are therefore clear of further archaeological concern.

4.15.2 Construction

Any potential archaeological concerns will be addressed prior to construction phase. However, should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Tourism and Culture will be notified. In the event that human remains are encountered during construction, the Ontario Ministry of Culture and the Registrar or Deputy

Registrar of the Cemeteries Regulation Unit of the Ontario Ministry of Government Services will be contacted.

4.15.3 Operations and Maintenance Impacts

No impact due to operations is expected.

4.16 Socio-Economic Environment: Built Heritage Resource and Cultural Landscape

4.16.1 Displacement of Existing Features by the SRT Facilities

4.16.1.1 Kennedy Station

One cultural heritage resource was identified adjacent to the southern edge of the study area, on Kennedy Road, south of Eglinton Avenue. Given that this resource consists of a pioneer cemetery, is designated under Part V of the Ontario Heritage Act, and serves as the last aboveground reminder of nineteenth century settlement patterns in this part of the City of Toronto, the proposed re-development should be designed to fully avoid direct impacts to the cemetery, which may include encroachment, disruption, or displacement.

However, it is not expected that the redevelopment of Kennedy Station will directly affect the Bethel Cemetery, given that this resource is located south of the CN line. Indirect impacts such as the introduction of visual, audible, or atmosphere elements not in keeping with the resource's setting are unlikely given that the proposed undertaking will not result in significant changes to the existing character and landscape context of the surrounding area. However, should it be determined that the detailed designs for the undertaking will result in direct impacts to the resource; a heritage impact assessment should be prepared to develop a conservation strategy for the resource. The heritage impact assessment should be prepared in accordance with City of Toronto guidelines.

4.16.1.2 Conversion

No built heritage and cultural landscape identified as study area is all within disturbed lands.

4.16.1.3 Extension

Historic research reveals that while the study area has origins in nineteenth century survey and settlement, most of it has been greatly altered by late twentieth century development. Contact with the City of Toronto reveals that one Cultural Landscape Unit (CLU) was part of the cities inventory of heritage properties. The Malvern Primitive Methodist Cemetery was designated as a heritage property in 1998 under Part IV of the Ontario Heritage Act (2005). However, SRT alignment is significantly removed from this location and therefore will not impact the Malvern Primitive Methodist Cemetery, given its location. Indirect impacts such as the introduction of visual, audible, or atmosphere elements not in keeping with the resource's setting are unlikely given that the proposed undertaking will not result in significant changes to the existing character and landscape context of the surrounding area.

4.16.2 Construction Impacts

No Impacts as it is not expected that there will be built heritage and cultural landscape within the construction area.

4.16.3 Operations and Maintenance Impacts

No Impacts as it is not expected that there will be built heritage and cultural landscape within the built form

4.17 Transportation: Automobile Traffic and Transit Service

In general, the benefits of a well-developed transit system for the health and vitality of big cities are well-documented. Transit helps cities become more liveable and enhances the transportation network by:

- Providing alternative travel choices for non-drivers, including transit and enhanced environments for cycling and walking;
- Providing premium quality service – The exclusive right of way as proposed for the SRT provides the fastest and most reliable form of transit (comparable to subway), which encourages people to ride transit;
- Providing competitive travel times when compared with other modes of transportation, comfort, and reliability of service;
- Increasing the people movement capacity in all corridors, without the widening of roadways, and in an environmentally sound manner, so that the population can take advantage of the employment, educational, recreational, and many other opportunities that cities offer; and

- Freeing up road space for movement of goods and services and reducing the wear-and-tear on city roads and the need to spend tax dollars on repairing and expanding road infrastructure.

The long term impact of the SRT project on the transportation network will be positive. The following discusses localized changes and temporary conditions that result from the project.

4.17.1 Displacement of Existing Features by the SRT Facilities

4.17.1.1 Kennedy Station

The completion of the works on Eglinton associated with the Eglinton Crosstown LRT and Scarborough Malvern LRT will result in a number of changes to site access for those properties along Eglinton that current have uncontrolled all movement driveways.

4.17.1.2 Conversion

There is no identified displacement of existing features within the existing modification of the SRT.

4.17.1.3 Extension

In general, this Transit Project is not expected to impact traffic, since all roadways will remain as is, with the exception of the following:

- Closure of Milner Business Court at Progress Avenue and reassignment of traffic on Milner Business Court to Milner Avenue.
- Associated with the Progress Avenue non revenue service connection, reduction of Orchard Place Drive to right in / right out ,Burrows Hall / Chinese Cultural Centre reduced accessibility and reduced accessibility and on street parking along Progress Avenue, from Sheppard Avenue to Milner Avenue due to service track

Supplemental traffic analysis for the contemplated changes on Progress Avenue and Milner Business Court has determined that no residual adverse effects are anticipated once all recommended changes are in place.

4.17.1.4 Mitigation

For the access impacts along Eglinton, the mitigation approach is similar to the balance of the Eglinton corridor (for ECLRT and SMLRT) these uncontrolled access points will be reduced to right-in / right-out movements only. The proposed mitigation is to allow U-turns at signalized intersections.

With regards to the closure of Milner Business court at Progress Avenue, the proposed mitigation would be to convert the intersection of Milner Business Court / Milner into a full moves signalized intersection. Final intersection configuration and design of the new intersection will be developed as part of detailed design. The affected section of Milner Business Court will be stopped up and closed as public rights of way legislation. This EPR is considered to address the EA requirements which would normally be undertaken through a Municipal Class EA process.

The City of Toronto currently has plans to remove the parking along Progress Avenue from Sheppard to Milner Avenue to implement bike lanes. In addition, introduction of rapid transit provides greater travel choice, thereby reducing the reliance on private automobile for access to community facility. Surplus parking in the greater community obviates the need to construct replacement parking for on street condition. Additional parking within the immediate vicinity may also accommodate for this need for parking.

4.17.2 Construction Impacts

Vehicular and pedestrian traffic will be maintained throughout the construction period, but minimal detours may be experienced. Short term parking loss for individual homes and businesses will be managed on a case-by-case basis.

4.17.2.1 Kennedy Station

The amount of construction work and area required for construction at Kennedy Station will be quite significant. The main challenge will be to minimize disruption to existing transit services through the Station during the construction period.

The most significant challenge will be to accommodate the volumes of people who currently use the SRT while it is under construction (for conversion) through Kennedy Station. In addition, subway service on the Bloor Danforth line will continue, as will GO Transit Service on the Union Station to Stouffville rail corridor, with stops at Kennedy Station during construction.

During construction, the existing bus terminal will remain open. However bus bays may be modified or relocated (to an adjacent temporary facility) to suit construction requirements. The shutdown of the SRT will require additional bus bay capacity, which may be provided in the form of one or two temporary bus terminals. (see chapter 2.0 for details) There will be no terminal buildings at either of the temporary bus terminals; only shelters and/or canopies.

Every effort will be made to minimize inconvenience to the public and to minimize disruption of transit operations during construction.

Some traffic impacts on surrounding roads will be experienced during construction. These will include temporary delays resulting from temporary lane closures etc. during construction of the portal areas.

Traffic impacts will be minimized on adjacent roads during construction. Construction staging and the sequence of temporary lane closures etc. will be confirmed during detail design and with input from City of Toronto staff.

Construction related traffic will result in more truck activity within the Study Area. However, relative to the total traffic on the road network, the resulting impact is considered negligible. The temporary bus service

during construction, however, may increase the volume of buses on local streets, specifically Brimley Road and Midland Road.

4.17.2.2 Conversion

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.

Similar to Kennedy Station, a temporary bus terminal will be required at Scarborough Centre Station to accommodate the replacement service for the SRT but also to allow the reconstruction of the Scarborough Centre Station itself. This temporary bus location is located at the vacant parcel on Brimley Road and Triton road. There will be no new terminal building at the temporary bus terminals. There may be some shelters and canopies.

Traffic impacts will be minimized on adjacent roads during construction. Construction staging and the sequence of temporary lane closures etc. will be confirmed during detail design and with input from the public and City of Toronto staff.

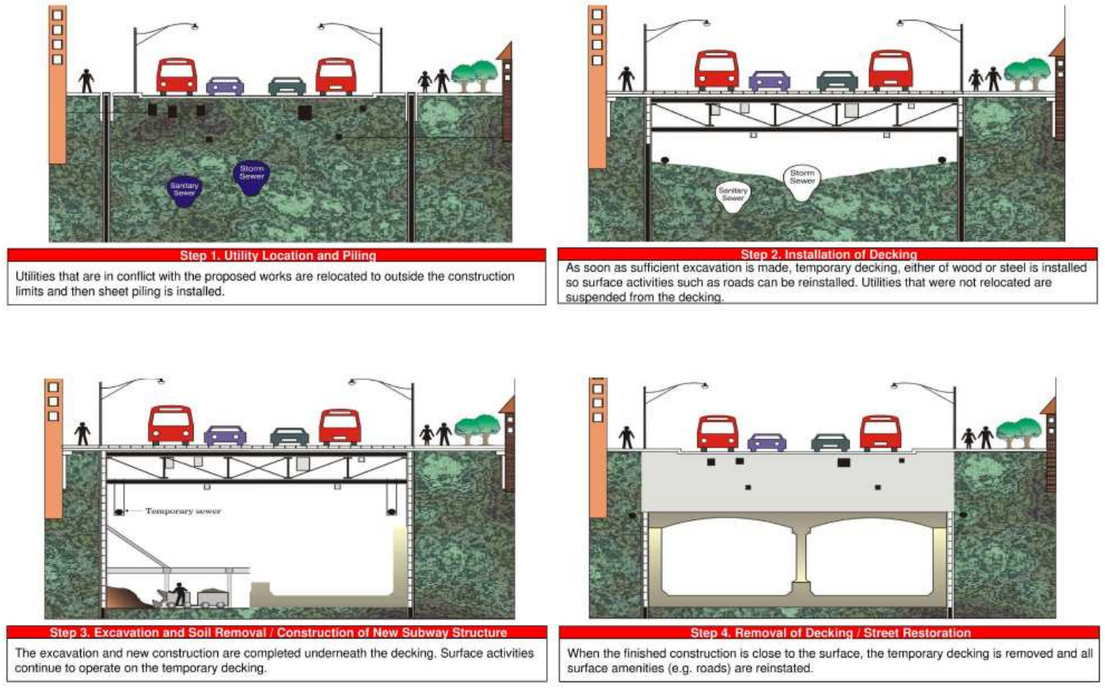
Construction related traffic will result in more truck activity within the Study Area. However, relative to the total traffic on the road network, the resulting impact is considered negligible.

4.17.2.3 Extension

The extension of the SRT requires the construction of new overpasses across existing roads. Traffic impacts will be minimized on adjacent roads during construction. Construction staging and the sequence of temporary lane closures etc. will be confirmed during detail design and with input from the public and City of Toronto staff.

For where the extension is below grade and must pass under existing roads, decking can be used to allow construction to proceed while maintaining traffic. These intersections include Milner Avenue, Sheppard Avenue East and potentially Mammoth Hall Trail. This methodology is graphically depicted in Exhibit 4-4.

Exhibit 4-4: Cut and Cover construction methodology for road rights of way



4.17.2.4 Mitigation

The impacts to service due to construction within Kennedy may be mitigated by preparation of a service plan and notify traveling public of changes in advance of any service change to minimize negative effects. In the later stages, a temporary bus terminal will also be constructed to provide continuation of service.

With regards to the loss of service, Replacement service through the use of buses operating within the limits of the existing SRT, with consideration for other interacting routes will be provided. This will also be included in the service plan proposed by TTC. Replacement bus service with sufficient capacity to effectively replace capacity lost when SRT is shut down. This will increase bus traffic on arterials running between the SCC and Kennedy stations.

Once the replacement routing and scheduling plan is developed, TTC and Toronto Transportation will work together to optimize traffic signals and implement localized improvements (if required) at key intersections. All affected communities (including transit users) will be notified of changes prior to taking effect.

TTC and Toronto Transportation will monitor operations and make refinements through the course of the replacement service operations.

With regards to the impacts on service during the construction of Scarborough City Centre station, a temporary Bus Terminal in the immediate vicinity of the Scarborough Town Centre mall will be constructed in order to maintain transit service into this general area. The goal is to reinstate bus service into existing station as soon as construction permits (independent of SRT bus service replacement).

The mitigation for construction impacts relating to open cut construction methodology includes the establishment of a traffic management plan / construction staging which will be developed during detailed design that minimizes both duration and significance of construction activities on existing transportation corridors. This includes decking for below grade construction within road rights of way, implementing lane closures during off peak times.

Traffic management and construction staging will be subject to approvals by the appropriate road authority (Toronto Transportation for city roads and the Ministry of Transportation for the Highway 401 crossing). These plans will be included in the contract document.

4.17.3 Operations and Maintenance Impacts

4.17.3.1 Kennedy Station and Conversion

There are no identified operations or maintenance impacts with regards to transportation in the existing SRT corridor as it is an existing and operational connection.

4.17.3.2 Extension

The new Sheppard East Station on Sheppard Avenue East (east of Progress Avenue) incorporates a bus terminal and PPUDO facility. An analysis of surrounding intersections using Synchro and HCS traffic analysis software shows that the intersections are expected to operate at acceptable levels of service during peak hours. Details of this analysis can be found in Appendix G. Therefore, the new station is not anticipated to have adverse traffic impacts on traffic operations at the adjacent intersections.

With regards to the intersection of Milner/Progress intersection, it is found that there are no significant impacts to the intersection with the proposed designs.

As part of Phase 2, the proposed Malvern Station at Malvern Town Centre is proposed to have a PPUDO facility and a bus terminal. An analysis of surrounding intersections using Synchro and HCS traffic analysis software shows that the intersections are expected to operate at acceptable levels of service during peak hours. Details of this analysis can be found in Appendix G. Traffic volumes at the intersection of McLevin Avenue and Pinery Trail show that a traffic signal is not warranted. However, traffic volumes were found to be approaching traffic signal warrant criteria, and therefore this location should be monitored once the station is operational.

For planning purposes, TTC staff has developed a preliminary bus plan to help guide discussion about potential bus connections. The preliminary bus plan includes a formal analysis of bus routing changes, including public consultation, will be undertaken between 12 and 18 months prior to the opening of the SRT Extension line.

4.18 Transportation: Pedestrian and Cyclists

The incorporation of pedestrian and cycling amenities into the station designs will be finalized during the Site Plan process.

4.19 Transportation: Navigable Waterways

There are no impacts identified for Navigable Waterways for the entire project.

4.20 Transportation: Emergency Services and Access

The built forms on all stations and facilities will have provisions for Emergency Services and Access.

Table 4-11: Impacts and Mitigation

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
Natural Environment – Vegetation and Vegetation Communities				
Displacement of Existing Features	General Impacts to vegetation features	Loss or Disturbance of vegetation	Protection measures will be implemented to minimize vegetation removals and minimize impacts to the vegetation. Where avoidance is not possible, trees will be replaced at a ratio of 3:1 with appropriate species that are tolerant of urban stresses such as air pollution, salt and soil compaction.	During later design phases, Urban Forestry will be consulted on all aspects of the proposed project that may have an impact on vegetation features and functions within the study area. Proposed destruction of trees and features within the study area will be reviewed and subject to approval by Urban Forestry. All proposed restoration, re-naturalization, edge management, or planting plans, where required, will also be reviewed and subject to approval by Urban Forestry and shall meet or exceed Urban Forestry standards. Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	Kennedy Station - Construction of SRT portal may affect a small cultural savannah vegetation community located adjacent to the TTC North parking lot	Less than 0.05ha of vegetation will be removed and this loss is not considered to be significant.	Compensation vegetation plantings at site.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	Kennedy Station - Impacts to Trees within project area	Loss of Trees	Where avoidance is not possible, trees will be replaced at a ratio of 3:1 with appropriate species that are tolerant of urban stresses such as air pollution, salt and soil compaction.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	SRT Conversion - Track realignment to the south of Lawrence East station will be required and as such a 10m wide vegetated swale, approximately 200m long will be affected	The strip is dominated by disturbance tolerant vegetation species and wildlife habitat is minimal. Loss of this strip of land, in whole or in part, is not considered significant as the ecological value attributable to this isolated patch is low	Compensation vegetation plantings at site as per above.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	SRT Extension - At the Markham Branch crossing west of Bellamy Road, one cultural meadow (CUM1-1) and one cultural thicket (CUT1) will be affected.	The quantity of vegetation that will be displaced is directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared. Assuming four support structures are necessary to span the valley; 16m2 of vegetation will be displaced. Because these areas have been heavily modified by previous disturbance, removal of this small amount of vegetation at this location is considered minor. Because these areas have been heavily modified by previous disturbance, removal of this small amount of vegetation at this location is considered minor	Compensation vegetation plantings at site as per above.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	SRT Extension - The second crossing of the Markham Branch will occur approximately 550m east of Bellamy Road. The main issue at this crossing is with the mature trees that are present on the slopes of the creek.	The majority of these trees will have to be removed. In a worst case scenario this will result in a loss of less than 0.02 ha. of vegetation and this is not considered to be significant. However, removal of vegetation within, these communities could cause severe erosion of the slopes.	In order to successfully mitigate this potentially significant impact, a detailed erosion control plan will need to be prepared, in conjunction with TRCA, during the design phase of this project.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	SRT Extension -The third crossing of the Markham Branch occurs immediately east of Markham Road. Slope stability is the major concern at this crossing.	The initial alignment through this section had a high probability of resulting in significant impacts to both the watercourse and the unstable slopes along the northern banks of the creek.	The Toronto Water Department of the City of Toronto have had an ongoing project for rehabilitation of this section of the Highland Creek Valley. The creek will be realigned east of Markham Road for a distance of approximately 500m, banks will be stabilized and vegetation will be retained where possible. The SRT alignment through this section of Highland Creek will not result in any significant impacts over and above those resulting from the rehabilitation project.	Continue to coordinate design and construction efforts with Toronto Water in order to develop the optimal vegetation preservation and replacement strategy.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
	SRT Extension - On the north segment, there will be minimal loss of natural vegetation as the three forested areas will be avoided. Notwithstanding, a small quantity of thicket vegetation will need to be removed to accommodate the terminus section of the SRT. In addition, the manicured grass field located at the corner of McLevin Avenue and Tapscott Road will be required for the Malvern SRT station.	Removal of small amount of vegetation is considered minor.	Compensation vegetation plantings at site as per above.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	The tail tracks to the east of Malvern Town Centre station suggest a future extension through the community woodlot.	If not mitigated, would result in potential loss of vegetation.	Prior to the implementation of Phase 2, supplemental planning should be undertaken to determine if and where a future extension to the north and east may go so that the final alignment at the Malvern station (and its associated tail tracks) can be planned in order to minimize the potential future impacts to the community woodlot.	
Construction Impacts	At grade and below grade construction of the SRT has the potential to result in short term disturbance to vegetation	Activities such as relocation of street lighting and utilities, temporary or access road construction, boulevard modifications, temporary staging areas for construction equipment or construction materials, and maintaining access to side streets and entrances, can temporarily increase the overall project footprint size, and result in generally, short term disturbances.	The following environmental protection measures will be implemented to minimize vegetation removals and minimize impacts to the vegetation: • provide local tree protection where warranted; • trees located within the vicinity of the construction zone should be preserved in accordance with the City of Toronto Urban Forestry Tree Protection Policy and Specifications for Construction Near Trees; • delineate work areas with construction fencing to minimize the area of disturbance; • place silt fence along margins in areas of soil disturbance; • Implement good housekeeping practices related to materials storage/stockpiling, equipment fuelling/maintenance, etc. during construction.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship
	SRT Conversion - The north side of the Midland Avenue Station parallels the Bendale Branch of the West Highland Creek. The vegetation on the slope provides stability to the creek banks.	It is anticipated disturbance along the creek bank will be limited and minimal.	Construction access to the Midland Avenue Station should be restricted to the south side of the station only.	
	SRT Extension - Disturbance to vegetation as a result of construction activities	Additional loss of vegetation due to construction related activities.	Explore less intrusive construction methods during design. Where avoidance is not possible, trees should be replaced at a ratio of 3:1.	Monitoring of planted trees will be undertaken for the duration of two years to maximize survivorship.
Natural Environment – Fisheries and Aquatic Habitat				
Displacement of Existing Features	Alteration of fish habitat at three crossings of the Markham Branch of the East Highland Creek	It is anticipated that there will not be any loss of site-specific fish habitat, changes to water quality or quantity, alterations to base flows, changes in water temperatures or creation of new barriers to fish passage.	No support structures for the elevated section of the SRT will be placed within the defined channel of the watercourse.	
Construction Impacts	The north side of the Midland Avenue Station parallels the Bendale Branch of the West Highland Creek. Main concern is possible degradation of fish habitat downstream resulting from sediment entering the watercourse.	Significant impacts not anticipated	Construction access should be restricted to the southeast and southwest sides of the station. The work area should be delineated with construction fencing to minimize the area of disturbance; Netting and silt fences should be employed to minimize the potential of construction related debris from entering the watercourse.	During construction, an environmental inspector will make frequent random site visits for the duration of work at the Midland Station. The environmental inspector will be responsible for delineating work areas, ensuring that erosion and sedimentation control measures are functional and that the provisions related to fisheries and watercourse protection are met.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
	Construction of runningway where SRT crossed Highland Creek.	Possible HADD resulting from uncontrolled construction activities.	To reduce the potential for alteration of fish habitat the following environmental mitigation measures should be implemented: • no in-water work should be permitted • delineate work areas with construction fencing to minimize the area of disturbance; • restrict the use of heavy equipment on watercourse banks; • placing silt fence along stream margins in areas of soil disturbance; • Monitoring and maintenance of erosion and sedimentation control measures during construction to ensure their effectiveness. • applying seed and mulch, tackifier and/or erosion control blanket in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization; and, Implement good housekeeping practices related to materials storage/stockpiling, equipment fuelling/maintenance, etc. during construction.	The TRCA has a Level III agreement with the Department of Fisheries and Oceans. TRCA staff will review the project in line with TRCA's Level III agreement with Fisheries and Oceans Canada as per Section 35 (1) of the Fisheries Act. TRCA's will assess all components of the project to determine whether there is a potential for the project to result in a Harmful Alteration, Disruption or Destruction of fish habitat (HADD). Where fisheries timing window restrictions apply, TRCA will provide TTC with the necessary information for construction staging purposes. TRCA staff will work with TTC to develop an appropriate mitigation and restoration strategy for construction related impacts.
	Alteration of fish habitat with respect to dewatering for the below grade section.	Site-specific habitat, changes to water quality or quantity, alterations to base flows or changes in water temperatures.	Additional investigations and the development of dewatering strategies to mitigate impacts.	The TRCA has a Level III agreement with the Department of Fisheries and Oceans. TRCA staff will review the project in line with TRCA's Level III agreement with Fisheries and Oceans Canada as per Section 35 (1) of the Fisheries Act. TRCA's will assess all components of the project to determine whether there is a potential for the project to result in a Harmful Alteration, Disruption or Destruction of fish habitat (HADD). Where fisheries timing window restrictions apply, TRCA will provide TTC with the necessary information for construction staging purposes. TRCA staff will work with TTC to develop an appropriate mitigation and restoration strategy for construction related impacts.
Natural Environment – Wildlife and Wildlife Habitat				
Displacement of Existing Features	Loss of wildlife habitat at three crossing of Markham Branch tributary of East Highland Creek	SRT Extension is elevated at all three crossing locations. Permanent loss of habitat will be minor as the actual loss will be directly proportional to the basal area of the concrete support columns, this amount being less than two metres squared per structure. Quantitative amounts will be determined during detail design. The majority of wildlife recorded are considered opportunistic species and have adapted to an already disturbed habitat. Consequently further disturbances to the habitat in this area will result in displacement of wildlife to other parcels of suitable habitat.	None required.	
Construction Impacts	Loss of bank vegetation along Markham Branch of East Highland Creek at Midland Station	Loss of wildlife habitat along creek bank	Restrict construction access to south side of Midland Station	During construction, an environmental inspector will make frequent random site visits for the duration of work at this location. The environmental inspector will be responsible for delineating work areas and construction access.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
	Destruction/ disturbance of wildlife habitat in general during construction.	Construction of the LRT and associated facilities will result in the removal of vegetation and the wildlife habitat that it supports.	Impacts are considered minimal. Standard care during construction can minimize disruption.	During construction, an environmental inspector will make frequent random site visits for the duration of work at the water crossing locations. The environmental inspector will be responsible for delineating work areas and monitoring vegetation/habitat removal
	Impacts on wildlife mortality during construction	Removal of wildlife habitat may result in wildlife mortality. Loss of nest or disturbance to young birds during nesting activity.	The Migratory Birds Convention Act prohibits the killing, capturing, injuring, taking or disturbing of migratory birds (including eggs) or the damaging, destroying, removing or disturbing of nests. To meet the requirements of the Act, no vegetation removals should occur during the nesting season. With several exceptions, this includes the period from April 1 to July 31. This timing restriction will also protect the birds listed under the Fish and Wildlife Conservation Act. TTC will comply with the requirements of the Migratory Birds Convention Act and nesting season, and as a result, the LRT will have no significant adverse effects on avian wildlife species/populations. Mitigation measures for the disturbance to vegetation will be implemented to mitigate any impacts to wildlife habitat	If work is required during nesting season, 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.
Geology, Soils and Groundwater				
Construction Impacts	Removal of soil; potential for contamination	Disposal of soil if contaminated. Special handling and disposal procedure for contaminated soils.	Prepare a site specific soil management plan. Manage on site, monitor for quality and test during construction. Adhere to relevant Ontario Regulations, Records of Site Condition	Additional site investigation to delineate extent of potential impacted material.
	Dewatering	Groundwater pumping and disposal. Lowering of groundwater table in general area. Potential for Settlement of adjacent utilities and structures. Reduction in streamflow rate in East Highland Creek.	Prepare a site specific groundwater management plan. Diversion of pumping water to East Highland Creek.	Permit To Take Water (PTTW). Assessment of potential for ground settlement due to dewatering and develop settlement monitoring program.
	Methane Gas/Organic vapour concentrations	Potential hazard for excavation.	Provide air ventilation and conduct air monitoring during construction.	Monitor and screen the existing and future wells for organic vapours and combustible gas.
Surface Water				
Displacement of Existing Features	Impacts to stormwater quantity and quality	Impacts to quantity are considered negligible. Minor potential for adverse quality impacts.	Incorporate SWM best management practices into designs where space permits.	Work with Toronto Water and MOE to identify practical solutions for stormwater quality.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
Construction Impacts	Erosion and Sedimentation	Loss of property due to erosion. Degraded water quality in watercourses.	In order to prevent and minimize the release of sediment to East Highland Creek, various sediment and erosion control measures will be implemented during LRT construction. These are as described as follows: A sediment and erosion control plan will be developed during the detailed design stage utilizing Best Management Practices. Any required structure work will be isolated from the open watercourse and conducted “in the dry”. Any required dewatering operations for structure work should outlet onto a grassed area at least 30m from the watercourse, a settling pond, and/or wetland filter bag. Following the completion of final site grading and topsoil application, a roadside seed mixture (Ontario Provincial Standard Specification, OPSS 572) and perennial rye grass nurse crop seed should be applied to all exposed soils. For exposed soils located adjacent to Highland Creek, immediately following seed application a straw erosion control blanket (installed as per OPSS 572.05.07, 572.05.08 and 572.07.04.04) should also be installed along the embankment slopes. All necessary steps should be taken to prevent dust nuisance resulting from the Contractor’s work. Dust suppression will be undertaken as per OPSS 501 and 506. In order to mitigate the potential impacts associated with excess material storage, no stockpiles shall be located closer than 30m from water features, in accordance with OPSS 180... Waste and excess materials will be dealt with in accordance with OPSS 180, General Specification for the Management and Disposal of Excess Material. Waste generated on-site, which requires off-site removal should be in accordance with Ontario Regulation 347 under the Environmental Protection Act which provides for the transportation and processing of hazardous and non hazardous waste. To prevent surface water contamination during construction, care will be taken to avoid accidental spillage or discharge of chemical contaminants (i.e. gasoline, oils and lubricants). Refuelling should take place no closer than 30m from water features. Furthermore, proper containment, clean up and reporting, in accordance with provincial requirements, should be completed in the event of a spill. All exposed slopes shall be treated with topsoil and seeding, mulching or sodding. A significant step towards controlling erosion during construction is to minimize the amount of disturbed ground cover particularly near watercourses. Exposed areas should not be left uncovered longer than necessary and ground cover should be re-established as quickly as possible. Sediment control measures will be installed prior to construction, monitored during the construction and replaced as necessary.	During construction, an environmental inspector will make frequent random visits for the duration of the work. The environmental inspector will be responsible for delineating work areas, monitoring that erosion and sediment control measures are functional and that the provisions of the contract related to fisheries and watercourse protection are met.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
	Surface Water Contamination and Debris Accumulation	Degraded water quality in watercourses.	In order to prevent surface water contamination during construction, care will be taken to avoid accidental spillage or discharge of chemical contaminants (e.g. gasoline, oils and lubricants). Equipment refuelling will take place no closer than 30 m from any watercourse to prevent water contamination due to accidental fuel spills. All equipment operating near any watercourses shall be properly maintained to avoid contaminant leakage and will be free of excess oil/grease. In the event that a spill occurs, proper containment, clean up and reporting, in accordance with provincial requirements, will be completed. The contractor will also take all necessary precautions to prevent the accumulation of litter and construction debris within the watercourse.	During construction, an environmental inspector will make frequent random visits for the duration of the work. The environmental inspector will be responsible for delineating work areas, monitoring that erosion and sediment control measures are functional and that the provisions of the contract related to fisheries and watercourse protection are met.
	Temporary elimination of Rosebank Park SWM facility	Flooding of construction site during a 100-yr (or greater) storm event.	Construct below grade tunnel in sections so that some storm water storage capacity is retained.	Employ emergency pumps with discharges to Highland Creek, via pipes along surface of existing roads. Work with Toronto Water and TRCA during the design to refine strategy.
Air Quality				
Construction Impacts	Suspended Particulate Matter (SPM) in the air, and dust fall on objects such as cars and windows resulting from open-pit and cut-and-cover construction techniques, demolition, and carryout by construction vehicles, leading to grinding and re-suspension of construction dust by regular traffic on public roads.	Short-term ambient impact of particulate matter on people and the environment in the vicinity of the stations. This could lead to short-term health effect, nuisance and damage to the environment.	To reduce emissions, a number of control measures are available, depending on the sources. A detailed description of appropriate measures are provided in the document Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities, March, 2005 (BPREA), prepared by Cheminfo Services Inc. for Environment Canada. Since construction activities are generally of short duration, the use of wet suppression and wind speed reduction are generally the most common, efficient and cost effective approaches; however, other control technologies are often used for specific situations. The efficiency of these control methods can vary significantly. In addition, to promote compliance with MOE's criteria, the TTC Master Specifications requires that contractors incorporate mitigation or control measures into construction activities. The MOE expects that emission from construction operations comply with the O. Reg. 419/05 SPM criteria, therefore, control measures articulated in the Controls and Methods Plan will need to be carried out diligently under contractual specifications. A list of typical measures and criteria are available in Appendix H.	The MOE expects that construction operations will meet Regulation 419/05 requirements. For this reason, a work plan should be required in the contract specifications to ensure that the required control measures are carried out diligently. These measures should reduce emissions to a level that minimizes the impact of dust on the areas surrounding the construction site. When construction and/or demolition activities are likely to cause dust emission, air monitoring must be conducted prior to beginning activities to establish a baseline value for the quantity of SPM in the air. During construction and/or demolition operations where dust is being created, air quality monitoring must be conducted to establish the level of particulate matter in the air. Following construction and/or demolition operations where dust was created, confirmatory tests must be conducted to quantify the level of particulate matter in the air. The conditions under which monitoring will be conducted, as well as mitigation measures that will be implemented if high SPM concentrations are identified, must be specified in the Controls and Methods Plan.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
Noise and Vibration				
Construction Impacts	Construction Noise Impacts	Noise/Vibration Impact on residences/businesses	A detailed construction noise and vibration assessment is recommended during the detailed design process. Provisions should be made for noise mitigation measures to minimize the construction noise and vibration impact. Noise mitigation could include, but is not limited to: • Noise emissions from construction equipment meeting NPC-115, or quieter • Maximizing distance between the construction equipment operations and the residences • Minimizing the concurrent use of construction equipment • Use of equipment or construction methods with lower noise/vibration emissions • Operate in compliance with NPC-207 • Operate in compliance with City of Toronto By-Law 591 and Toronto By-Law #514-2008.	The TTC is to develop a construction noise/vibration control program during the detail design stages in accordance with the MOE EA procedures and the City of Toronto Noise and Vibration Codes.
Operations and Maintenance Impacts	SRT Conversion - Lawrence Station	Noise impact on adjacent townhouse residents	Explore opportunities to reduce the track curvature in addition to the potential for using low height sound absorbing barrier walls.	Reassess noise impacts once sound generating parameters become known for the new Transit City LRT vehicles.
	SRT Extension – Noise along Alignment (Elevated)	Increases of noise for Centennial College residences	The use of sound absorbing material on the parapet walls.	Reassess noise impacts once sound generating parameters become known for the new Transit City LRT vehicles.
	SRT Extension – Vibration along Alignment (below grade)	Potential to feel ground borne vibration	Application of rubber dampening between rail and tie, plus rubber pads between tie and tunnel will eliminate the transmission of ground borne vibration.	
	SRT Extension – Sheppard Bus Terminal	Noise/Vibration Impacts	The use of acoustic shielding by sound barriers.	
	SRT Extension – Non-Revenue Service Connection	Noise/Vibration Impacts	Use of sound absorptive materials on portal walls.	Reassess noise impacts once sound generating parameters become known for the new Transit City LRT vehicles.
Operatiom Impacts	Stray Current	Corrosion of underground metallic structures such as utilities.	Insulating and grounding can mitigate this issue.	
Land use / Economics				
Local Parks and Community Facilities				
Displacement of Existing Features	Impact to parking and delivery area for Burrows Hall Community Centre and Chinese Cultural Centre.	Reduced functionality for facility	Accommodate service area in PPUDO design for Sheppard East station. Replace parking facilities in other areas.	
Construction Impacts	Loss of parkland Rosebank Park Kennedy Station temporary bus terminal	Reduction of local community amenities during construction	Decrease construction time.	Work with Toronto Parks, Recreation and Forestry to develop construction staging plan.
Properties				
Displacement of Existing Features	Displacement of Properties	Displacement of Properties	Negotiations with City of Toronto Property/other agencies as required	
Construction Impacts	Displacement of Properties	Displacement of Properties	Negotiations with City of Toronto Property/other agencies as required	
Utility				
Displacement of Existing Features	Utility Conflicts	Loss of Service	Re-routing of service prior to construction.	Work with affected utility companies through the design stage.
Construction Impacts	Utility Conflicts	Loss of Service	Protect through construction or re-routing of service.	

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
Archaeology				
Displacement of Existing Features	Areas of potential identified through Phase 1 Archaeological Site Assessment	Loss of Archaeological resources	Undertake Phase 2 to confirm potential for remains.	In the event that Phase 2 confirms remains, undertake Phase 3.
Construction	Dis covery of Archaeological remains during construction.	Loss of Archaeological resources.	Any potential archaeological concerns will be addressed prior to construction phase.	Should deeply buried archaeological remains be found during construction activities, the Heritage Operations Unit of the Ontario Ministry of Tourism and Culture will be notified. In the event that human remains are encountered during construction, the Ontario Ministry of Culture and the Registrar or Deputy
Transportation				
Displacement of Existing Features	Milner Business Court	Reduced accessibility for businesses	Conversion of Milner Business Court / Milner into a full moves signalized intersection	Final intersection configuration and design to be developed as part of detailed design. Affected section of Milner Business Court to be stopped up and closed as public rights of way legislation. This EPR is considered to address the EA requirements which would normally be undertaken through a Municipal Class EA process.
	Reduced accessibility along Eglinton and Sheppard (movements reduced to right-in / right-out.	Reduced accessibility to existing neighbourhood and future development	Introduction of traffic signals and the use of U-turns will indirectly reinstate full movement activities for the local community.	
Construction Impacts	Kennedy Bus Terminal Shutdown	Loss of Service	Construct temporary bus terminal	Prepare service plan and notify traveling public in advance of any service change to minimize negative effects.
	Transit interruptions during construction	Loss of Service	Replacement service through the use of buses operating within the limits of the existing SRT, with consideration for other interacting routes.	Prepare service plan and notify traveling public in advance of any service change to minimize negative effects.
	Scarborough City Centre Bus Terminal Shutdown	Loss of Service	Temporary Bus Terminal in the immediate vicinity of the Scarborough Town Centre mall in order to maintain transit service into this general area. Reinstate bus service into existing station as soon as construction permits (independent of SRT bus service replacement).	Prepare service plan and notify traveling public in advance of any service change to minimize negative effects.
	SRT Shutdown for 3 years	Loss of service Impacts on road network	Replacement bus service with sufficient capacity to effectively replace capacity lost when SRT is shut down. This will increase bus traffic on arterials running between the SCC and Kennedy stations.	Once the replacement routing and scheduling plan is developed, TTC and Toronto Transportation will work together to optimize traffic signals and implement localized improvements (if required) at key intersections. All affected communities (including transit users) will be notified of changes prior to taking effect. TTC and Toronto Transportation will monitor operations and make refinements through the course of the replacement service operations.
	Construction over / under existing roads	Impacts to capacity	Traffic management plan / construction staging will be developed during detailed design that minimizes both duration and significance of construction activities on existing transportation corridors. This includes decking for below grade construction within road rights of way, implementing lane closures during off peak times.	Traffic management and construction staging will be subject to approvals by the appropriate road authority (Toronto Transportation for city roads and the Ministry of Transportation for the Highway 401 crossing).