

5. IMPACT ASSESSMENT, MITIGATION AND MONITORING

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:

- “6. The proponent’s assessment and evaluation of the impacts that the preferred method of carrying out the transit project and other methods might have on the environment, and the proponent’s criteria for assessment and evaluation of those impacts.
7. 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.
8. If mitigation measures are proposed under paragraph 7, 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 potential impacts of the Eglinton Crosstown LRT, to identify mitigation measures and to recommend monitoring activities.

5.1 Interactions Between the Undertaking and the Environment

The environmental factors that may be affected by project facilities/activities were identified using an interactions matrix. The interactions matrix is designed to scope the types and level of significance of environmental effects that may be encountered for this project and the level of detail that may be necessary to address those environmental effects. The interactions matrix considered site-specific environmental conditions and project-specific facilities and activities.

The environmental effects of the Undertaking can be classified under three categories:

1. **Footprint Impacts** – These are existing environmental features located within the study area that will potentially be displaced or lost through the introduction of the LRT facility;
2. **Construction Impacts** – These are potential short-term disruption effects resulting from construction of the LRT facility; and
3. **Operation and Maintenance Impacts** – These are potential long-term disruption effects resulting from the operation and maintenance of the LRT facility.

The level of interaction between a facility/activity and an environmental factor can be classified as: “none,” “weak,” “moderate” and “strong.” These terms were defined as follows:

1. **None** (blank) - no probability of an interaction or the interaction has no significance to society. As a result, no additional discussion and documentation is required in support of this Transit Project Assessment.
2. **Weak** (W)- a low probability of an interaction or the interaction has low significance to society. 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.
3. **Moderate** (M) - a moderate probability of an interaction or the interaction has moderate significance to society. A more detailed discussion accompanied with supporting supplemental analysis and possible mitigation measures and commitments.

4. **Strong** (S) - a high probability of an interaction or the interaction has a high level of significance to society. 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.

The interactions matrix helped to establish the scope of the environmental assessment and reveal which project facilities/activities have a significant interaction with environmental factors. The interactions matrix is presented in **Exhibit 174**. The subsequent sections will discuss for each of the environmental effects identified in **Exhibit 174**, the following topics:

1. Describe the potential impacts;
2. Identify mitigation measures and residual impacts;
3. Describe the monitoring program; and
4. Recommend contingency measures, as required.

Exhibit 174 presents a summary of Eglinton Crosstown LRT potential impacts, mitigation measures, monitoring, future work, and contingency plan.

5.2 Monitoring

A monitoring plan will be prepared in accordance with Subsection 9(2)(8) of Ontario Regulation 231/08. The objectives of the monitoring plan will be as follows:

1. To augment existing information and databases, where required;
2. To determine the accuracy of impact predictions and the effectiveness of environmental protection measures;
3. To ensure compliance with federal, provincial and local legislation and regulations; and,
4. To ensure that EA commitments, plans and programs are carried out as planned.

These objectives help to determine the types of monitoring to be used including baseline monitoring, implementation monitoring, effectiveness monitoring and compliance monitoring.

5.2.1.1 Baseline Monitoring

A considerable amount of baseline information has been collected for the Study Area. At the same time, the level of detail of information and the timeframe involved presents only a snapshot of conditions as they are today. For these reasons, an ongoing monitoring program is required to gain a fuller understanding of baseline conditions within the Study Area.

5.2.1.2 Implementation Monitoring

A plan for implementing prescribed mitigation measures and environmental commitments will be prepared during design. The plan will include a schedule, resources and priorities for implementation. The plan will also serve as a baseline for monitoring the completion of tasks. A review to determine the success of implementation will be conducted on a regular basis. An annual report will be prepared to document the degree of implementation of prescribed measures and set priorities for the following year.

5.2.1.3 Effectiveness Monitoring

Effectiveness monitoring will be performed at regular intervals to determine if impact predictions were accurate and if environmental protection measures are effective. If the results of effectiveness monitoring reveal unanticipated effects, contingency measures will be implemented to correct the situation.

Environmental commitments and mitigation measures will usually form the basis of contract documents for construction.

5.2.1.4 Compliance Monitoring

Compliance monitoring will be conducted to ensure that construction activities do not contravene legislation and regulations and are in accordance with contract provisions.

Where standard monitoring procedures are known, they are identified in the following sections. A detailed monitoring plan will be prepared once the design for the Eglinton Crosstown LRT is advanced. Contingency measures, where appropriate, will be addressed as part of the detailed monitoring plan.

Exhibit 174: Interaction Matrix

Environmental Factors		Natural Environment					Emissions					Socio-Economic				Culture		Transportation				
		Terrain and Soils	Groundwater	Surface Water	Communities/ Ecosystems	Population/Species	Electromagnetic Interference	Air Pollution	Noise	Vibration	Stray Current	Parks and Open Space	Utilities	Businesses Operations	Land Use	Property	Archaeology	Cultural Heritage	Traffic Operations	Transit Service	Cyclists	Pedestrians
Facilities/Activities																						
Footprint Impacts	LRT Runningway			S								S										
	New Bridge Over Highway 401			S																		
	Bridge/Culvert Improvements			S	S	S																S
	Intersection Improvements			S	S	S						S			S							
	Road Improvements			S	S	S						S										
	Stations	S	S			S					S	S		S	S		S					
	Stops			W								S										
	Traction Power Substation			W		S					S			S	S		S					
	Emergency Exit Buildings			W		S					S			S	S		S					
	Ventilation Shafts			W		S					S						S					
	Portals	S	S		S	S																
	Work Yards			S	S	S					S											
	Tunnel	S	S									S										
Bus Terminals			S		S									S								
Construction Impacts	Tunnelling/Work Yards	S	S	W				W	W		S	S										
	Cut and Cover Construction	S	S				S	S	S			S					S	S	S	S		
	Surface Excavation	S	S	S			S	S	S													
	Clearing and Grubbing			S	S	S	S	S	S													
	Utility Relocation											S					W			W		
	Roadwork						S	S	S				M				S					
	Building Demolition						W	W	W				W			S				W		
	Soil Removal and Disposal	S		W			W				S						S					
	Dewatering		S	W		M						S										
	Reinforcement of Existing Buildings	W				M			S													
	Erosion and Sedimentation Control	S		S			W				S											
Heavy Equipment Operations and					M	M	S	S		S												

Facilities/Activities	Environmental Factors	Natural Environment					Emissions				Socio-Economic				Culture		Transportation						
		Terrain and Soils	Groundwater	Surface Water	Communities/ Ecosystems	Population/Species	Electromagnetic Interference	Air Pollution	Noise	Vibration	Stray Current	Parks and Open Space	Utilities	Businesses Operations	Land Use	Property	Archaeology	Cultural Heritage	Traffic Operations	Transit Service	Cyclists	Pedestrians	Navigation
	Maintenance																						
	Traffic Management																	S	S	S	S		
	Material Import/Stockpiling						W				S							S					
	Trackwork							W	W				S					S					
	Concrete Forming			S		M																	
Operations and Maintenance Impacts	LRT Operations						M		M	W	M							S	S	M			
	Track and Structure Maintenance																	M	M				
	Stormwater Management			S	W	W																	
	Bus Operations							M	M	M										M			
	Station Maintenance																			M	W		
	Stop Maintenance																			M	W		
	Testing of Emergency Equipment								S														
	Snow Removal					W												W					

Level of Interaction: "-" = None "W" = weak "M" = Moderate "S" = Strong

5.3 Displacement of Existing Features by LRT Facilities

Development of the Eglinton Crosstown LRT will result in the permanent displacement or loss of the existing features found within the footprint of the new facility. The Eglinton Crosstown LRT will be developed for the most part within the centre median along the existing rights-of-way of Silver Dart Drive, Convair Drive, Commerce Drive and Eglinton Avenue. Where the existing roadway is too narrow to accommodate LRT facilities and potential widening is constrained by development, the LRT will travel underground. The central underground section extends from west of Keele Street to east of Brentcliffe Road. There is a second underground section at the intersection with Don Mills Road and the Don Mills LRT. In the underground sections, footprint impacts are associated with LRT surface facilities including station entrances, traction power substations, ventilation shafts and emergency exit buildings.

Where the existing roadway is currently three lanes wide in each direction, the centre two lanes will be converted to LRT runningway and two lanes of traffic will be maintained in each direction. The sections where road widening will not be required extends from Weston Road to Black Creek Drive and from east of Brentcliffe Road to Kennedy Road. Through these sections, footprint impacts are associated with minor intersection improvements and traction power substations.

Where the roadway is currently two lanes wide in each direction, the roadway will be widened by two lanes to accommodate the LRT runningway within the median and to maintain two lanes of traffic in each direction. The section where road widening is required extends from Pearson International Airport to Weston Road and from Black Creek Drive to west of Keele Street. Through these sections, footprint impacts are associated with new traffic lanes and intersection improvements.

Several bridge/culverts will also be widened to accommodate LRT facilities. Bridge/culvert widening is required at Mimico Creek, Black Creek, West Don River, East Don River and Wilson Brook. No bridge/culvert widening is required at Silver Creek, Humber River and Massey Creek. Footprint impacts are associated with bridge/culvert widening, although no encroachment into the wetted channel is anticipated at bridge/culvert sites. A new bridge will also be constructed over Highway 401 to accommodate the LRT runningway only.

No displacement of existing features will occur during the operations and maintenance phase.

5.3.1 Terrain and Soils

Potential Impacts

The Eglinton Crosstown LRT will have minimum permanent impacts on terrain as LRT facilities will be located primarily within the right-of-way and the vertical profile of Silver Dart Drive, Convair Drive, Commerce Drive and Eglinton Avenue will be maintained. Minimum impact on terrain will occur in underground sections.

A large volume of soil will be displaced by tunnelling and cut-and-cover activities to be carried out at the portal, tunnel and stations. Approximately 1.8 million m³ of soils are expected to be removed. Excavations may generate excess soil that cannot be reused within the project. Excess soil that is stained, odorous, contains debris or has been analysed and found to be contaminated will require management as a waste.

Mitigation

Excess soil will require waste classifications in accordance with regulatory requirements. Regulatory requirements in place at the time of construction and excess materials management guidelines and specifications (e.g. OPSS180) will be used when developing an excess materials management plan.

A Soil and Groundwater Management Strategy will be developed during the design phase.

Monitoring

If excavations or property acquisitions are planned in areas of known or high potential for environmental impacts, additional environmental investigations (e.g. Phase 1 Environmental Site Assessments and Phase 2 Environmental Soil & Groundwater Investigations) will be conducted in accordance with provincial regulatory requirements to assess the environmental site conditions, disposal requirements for soil as well as health and safety requirements. Contaminated soils will be managed in accordance with provincial legislation and regulations including the Ministry of the Environment's Guidelines for Use at Contaminated Sites in Ontario (MOE 1997). This may include management within the right-of-way depending on circumstances.

A monitoring program will be included in the Soil and Groundwater Management Strategy which will be developed during the design phase.

Contingency

A contingency plan will be developed during the design phase where appropriate.

5.3.2 Groundwater

Potential Impacts

It is anticipated that Eglinton Crosstown LRT facilities will not interrupt existing groundwater migration pathways and permanent groundwater dewatering systems will not be used.

Mitigation

Contaminated groundwater will be managed in accordance with provincial legislation and regulations including the Ministry of the Environment's Guidelines for Use at Contaminated Sites in Ontario (MOE 1997). A Soil and Groundwater Management Strategy will be developed during the design phase.

Monitoring

If excavations or property acquisitions are planned in areas of known or high potential for environmental impacts, additional environmental investigations (e.g. Phase 1 Environmental Site Assessments and Phase 2 Environmental Soil & Groundwater Investigations) will be conducted in accordance with provincial regulatory requirements to assess the environmental site conditions, disposal requirements for soil as well as health and safety requirements. Groundwater will be managed in accordance with provincial legislation and regulations including the Ministry of the Environment's Guidelines for Use at Contaminated Sites in Ontario (MOE 1997). This may include management within the right-of-way depending on circumstances.

A monitoring program will be included in the Soil and Groundwater Management Strategy which will be developed during the design phase.

Contingency

A contingency plan will be developed during the design phase where appropriate.

5.3.3 Surface Water

Potential Impacts

At two locations, Humber River and Black Creek, it was determined that the Eglinton Crosstown LRT will be affected by the regional storm event (1 in 500 years) but operations will not be affected by the 100 year storm event. The east and west portal are both located above the flood elevation for the regional storm; therefore, minimum risk of flooding within the portal or tunnel are predicted.

A small drainage channel that originates west of the West Don River Bridge on the north side of Eglinton Avenue and flows easterly into the West Don River will be displaced by the proposed LRT facilities.

Stormwater runoff within most of the Eglinton Avenue right-of-way is conveyed by storm sewers. However, roadway runoff at the west section of the project is conveyed by roadside ditches. Storm runoff from these areas is eventually conveyed to 8 watercourse crossings with the exception of drainage area 1. Storm runoff from the drainage area 1 (west project limit) is collected by storm sewers and conveyed to Renforth Creek /Etobicoke Creek located outside the project limits, and as such there is no creek crossing within this segment (Renforth Drive to Silver Dart) of the project.

Under proposed conditions, the existing storm sewers will continue to discharge to current cross-culverts and trunk sewer systems within the Eglinton Avenue right-of-way, as presently occurs. It is assumed that the proposed roadway drainage within Mimico Creek and Silver Creek watersheds will continue to be conveyed by roadside ditches. The general direction of roadway flow will not be altered and drainage pattern will be maintained. In the west section (west of Martin Grove Road), catchbasins / storm sewers may require relocation as a result of proposed Eglinton Avenue widening. The storm sewers located between Royal York and Weston Road may require hydraulic capacity assessment to ensure that the capacities of these receiving storm sewers are not compromised due to proposed increase in pavement area. At other locations where increase in pavement area is nominal, it is anticipated that the existing storm sewers capacities will not be impacted.

A pavement area analysis was performed to determine the increase in impervious surface as a result of the roadway improvements. It was determined that the proposed roadway improvements will result in a 15-percent increase in pavement area within the study corridor. As a result, the project will not significantly add impermeable areas in the east section of the project. Also, at underground sections there will be no significant increase in the pavement with the exception to portal locations where some roadway widening is anticipated. As such no water quality control measures are warranted on these segments of the LRT.

However, according to the Ministry of the Environment (MOE), any new construction/development must address existing situations and provide the necessary measures to achieve an 'enhanced' level of water quality treatment of stormwater converging into the watercourses that are located within the project area. Due to the limitation of space, it is recommended to provide oil/grit separator (OGS) units to improve the existing situation at all watercourses where water quality is impaired. Where feasible, the project should incorporate water quality control measures by means of permeable paving on future bike lanes/sidewalks and creating more green spaces within the right-of-way.

In the west section, a number of stormwater quality control practices were reviewed and assessed for their applicability on this project. Due to the nature of this facility (i.e. linear transportation corridor), limited space within the roadway right-of-way, it was determined that two possible stormwater management measures were applicable for use, namely oil/grit separator systems and grassed swales. The possibility of using wet ponds located in adjacent lands outside the right-of-way (existing /future) should be explored to ensure that the stormwater objectives are effectively addressed. A more detailed evaluation of these measures is required during the design phase.

It is assumed that existing water quality control measures (i.e. roadside ditches within the project corridor) will be maintained. Wherever feasible, opportunities to enhance existing stormwater measures will be explored. Currently water quality controls at Mimico Creek and Silver Creek are achieved by roadside ditches. Where space constraints allow, these roadside ditches should be enhanced by providing a flat bottom width of 0.75 metres. Details including location, length and size of swales will be determined during the design phase.

The drainage system at east Don River Bridge consists of deck drains located at certain intervals on the bridge deck. Stormwater is collected into a single pipe and then discharged through outfall below the deck into the river. It is recommended to modify the current drainage system by directing outlet pipe from deck drain to soak pits. The soak pits can be placed at the bottom of piers. These soak pits will prevent erosion and filter runoff before discharging to the river system. The possibility of installing OGS before discharging to soak pits should be explored during the design phase.

It should be noted that no deck drains exist on other bridges including west Don River Bridge. Storm water drains to catch basins at the abutments and outlet to adjacent roadside ditches before reaching the river. Erosion protection is required at the catch basin outlets to protect the embankment and prevent potential sediments from reaching the river.

Mitigation

LRT operations will be suspended during the regional storm event to prevent potential risks to human health and safety and damage to LRT facilities and vehicles.

The small drainage channel west of the West Don River Bridge on the north side of Eglinton Avenue will need to be realigned or enclosed as it is currently confined by Eglinton Avenue and the adjacent embankment. The treatment for this drainage channel will be determined during the design process in consultation with the TRCA.

Eglinton Crosstown LRT facilities will be located within the TRCA Regulation Limit; therefore, a permit(s) under Ontario Regulation 166/06 – Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses will be secured from TRCA during the design phase.

A stormwater management plan will be developed during the design phase in accordance with the City of Toronto, city of Mississauga, TRCA and the Ministry of the Environment requirements. Stormwater Control, Mitigation, Erosion and Sediment Control measures shall be enumerated as per Ministry of the Environment's Stormwater Management Design Manual 2003 and City of Toronto's Wet Weather Flow Management Guidelines 2007.

Water quality control for the Eglinton Avenue widening should meet the following stormwater management criteria:

- Provide water quality treatment to offset, as a minimum, the increase in roadway pavement area as a result of roadway widening;
- Any proposed control measures should be sized to provide Level 1 treatment and meet the design requirements of the Ministry of the Environment's Stormwater Management Planning and Design (MOE Manual, 2003); and,
- Provide erosion control, if feasible (Detention runoff for 24 hours from 25 mm storm).

Monitoring

The City of Toronto operates and maintains a network of rainfall gauges. The information is used to determine sewer sizes and the influence of storms of various sizes on the existing sewer system and on streams (floods).

The City collects and analyses water samples from sewers at sewer outfalls, in stream and at the lakefront for a variety of management reasons. Sample results from sewer outlets are used to determine trace and correct the discharge of prohibited pollutants to its sewer systems.

5.3.4 Communities/Ecosystems

An ecological community is composed of a group of organisms or a population of different species, both plant and animal, occupying a particular area. The species present often interact with one another, affecting each other's distribution, abundance, diversity and existence. Human interference can also greatly affect these four interdependent components of a community.

5.3.4.1 Terrestrial

Vegetation communities were classified according to the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998). A total of twenty-five different ecological land classification (ELC) vegetation community types have been identified by LGL along Eglinton Avenue. These communities include: mixed forest (FOM6-1); deciduous forest (FOD2-1, FOD3-1, FOD4, FOD5-1, FOD5-2, FOD5-3, FOD5-8, FOD6-1, FOD6-4, FOD7, FOD7-3 and FOD8); cultural plantation (CUP3); cultural meadow (CUM1-1); cultural thicket (CUT1); cultural savannah (CUS1); cultural woodland (CUW1); deciduous swamp (SWD2-2, SWD4 and SWD4-1); swamp thicket (SWT2-2); meadow marsh (MAM2 and MAM2-2); and, shallow marsh (MAS2-1). The above vegetation communities are considered widespread and common in Ontario and secure globally.

Potential Impacts

The Eglinton Crosstown LRT runningway includes dedicated light rail tracks travelling in both directions along the centreline of Eglinton Avenue, Commerce Boulevard, Convoir Drive and Silver Dart Drive between the Pearson International Airport and Kennedy Road. Because the LRT will operate in a dedicated right-of-way in the centre of the road on Eglinton Avenue; the ELC communities will only be impacted along the edge of the vegetation community that is adjacent to the existing road alignment and fragmentation of any ELC community will not occur.

The LRT will be underground through the central section of the overall alignment, from Keele Street to Brentcliffe Road; consequently, vegetation communities along this section will not be affected.

A total of 1.357 hectares of vegetation will be removed along the Eglinton Crosstown LRT corridor. Deciduous forests account for 42.7% (0.579 hectares) of this total. The majority of forest cover to be

removed (0.554 hectares) occurs along the west section of the alignment between Martin Grove Road and Keele Street. The forest parcels that will be affected are generally linear in extent, relatively isolated, and are bordered on their interior side by residential or industrial/commercial development.

The forest communities associated with the Humber River, Black Creek, the West Don, and East Don Rivers are natural, contiguous vegetation communities defined by the valley systems of each of the watercourses. The existing bridge structures at each of the river crossings span the associated watercourse and have sufficient vertical clearance over the vegetation communities that are present under the bridge structure; as a result, impacts to the forest vegetation communities at each of these watercourses are not anticipated.

The remaining vegetation communities to be affected are culturally based and account for 59.6% (0.741 hectares) of the total area lost. The community type and quantity of area to be affected includes: cultural meadows, CUM1-1, 0.469 hectares; cultural woodlands, CUW1, 0.197 hectares; cultural thickets (CUT1) 0.075 hectares; and cultural savannah (CUS1) 0.034 hectares. Thirty-eight individual cultural vegetation communities will be affected; however the quantity of vegetation removal at each community is generally less than 500 square metres. The communities will only be impacted along the edge of the vegetation community that is adjacent to the existing road alignment, and in general, fragmentation of the communities will not occur. All of the vegetation communities that will be affected are presently in a disturbed state as a result of past human disturbances.

Several wetland communities were identified within the Eglinton Crosstown LRT corridor including deciduous swamps, swamp thickets, meadow marshes and shallow marshes; however only two areas are at risk. A small meadow marsh (MAM2) is situated on the north side of Eglinton Avenue, west of Victoria Park Avenue and a linear shallow marsh is located on the south side of Eglinton Avenue immediately west of Renforth Drive. In both situations, the amount of area affected is less than 10 square metres.

The proposed realignment of Wynford Drive to remove the existing grade separation and create a new at grade intersection to the east will result in an encroachment into the East Don River valleylands. The vegetation community in this area is comprised of a high quality dry fresh sugar maple – beech deciduous forest (FOD5-2) that provides slope stabilization and a natural migration corridor along the East Don River. The proposed encroachment will extend over the top of bank in this location and will require a retaining wall or fill slope to support the Wynford Drive road platform. Given the significance of impact in this location, including an encroachment into areas regulated by Toronto and Region Conservation Authority (TRCA) under Ontario Regulation 166/06 and Toronto Ravine and Natural Feature Protection By-law, the realignment of Wynford Drive should be investigated further during design.

The total loss of 1.357 ha of vegetation as a result of this project is considered minor given the disturbed condition of the vegetation, the limited encroachment that will occur in each instance and the magnitude of the project. However, in the cities of Mississauga and Toronto, where vegetation cover is at a premium, every effort must be made to avoid vegetation loss where possible.

Mitigation

Further opportunities to reduce the physical extent of natural areas impacted by the LRT will be investigated during the design process. Notwithstanding, the cumulative total loss of vegetation does represent a significant loss of natural area cover and needs to be addressed. A suitable restoration/compensation plan to accurately reflect this loss will be developed with TRCA and Urban Forestry (RNFP) to address this concern.

The following environmental protection measures designed to reduce or minimize vegetation removals will be considered on a site-specific basis during the design phase:

- Reduce grading requirements to the minimum extent possible;
- Implement local protection measures including guide rails, retaining walls and ditches, where warranted to avoid vegetation removals;
- Identify and protect trees to be retained during construction using a temporary tree protection barrier in accordance with OPSS 565 and the City's Tree Protection Policies. Work zones will be isolated using construction fencing, barrier fencing and silt fencing to avoid accidental vegetation removal;
- Prepare arborist reports, tree protection plans, edge management plans and restoration plans during design to identify site-specific impacts, mitigation and compensation measures to offset vegetation losses and to achieve a net gain in vegetation area, attributes and functions; and,
- Prepare restoration and enhancement plans that will meet or exceed both TRCA and Urban Forestry standards that will offset vegetation losses and achieve a net gain in vegetation area, attributes and functions.

In addition, the City of Toronto Tree Protection Policy and Specifications for Construction Near Trees prohibits the following activities in protection zone areas which are outside the work zones during construction to avoid accidental removal of vegetation:

- No altering of grade by adding fill, excavating, trenching, scraping, dumping or disturbance of any kind within a protection zone area;
- No storage (pocket) of construction materials, equipment, soil, construction waste or debris within a protection zone area;
- No disposal of any liquids e.g. concrete slurry, gas, oil, paint within a protection zone area;
- No movement of vehicles, equipment or pedestrians within a protection zone area; and
- No parking of vehicles or machinery within a protection zone area.

Protection of natural areas is in part provided by the Ravine & Natural Feature Protection By-law that is defined by and administered through City of Toronto's Urban Forestry. Proposed removal of trees and features within protected areas will be reviewed and subject to approval by City of Toronto's Urban Forestry.

5.3.4.2 Aquatic

Potential Impacts

There are eight watercourses located along the Eglinton Crosstown LRT. In general terms, any project that involves road widening and associated bridge/culvert improvements over a watercourse, drainage

modifications or generation of stormwater runoff has the potential to result in a harmful alteration, disruption or destruction (HADD) of fish habitat.

The Mimico Creek Bridge will be widened by 5.5 metres on each side to accommodate the LRT. This widening can be achieved with no encroachment into the wetted stream channel; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The Silver Creek Culvert is wide enough to accommodate the Eglinton Crosstown LRT; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The Humber River Bridge is wide enough to accommodate the Eglinton Crosstown LRT; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The Black Creek Bridge will be widened by 1.5 metres on each side to accommodate the LRT. This widening can be achieved with no encroachment into the wetted stream channel; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The West Don River Bridge will be widened by 1.0 metre on each side to accommodate the LRT. This widening can be achieved with no encroachment into the wetted stream channel; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The East Don River Bridge will be widened by 1.2 metres on each side to accommodate the LRT. This widening can be achieved with no encroachment into the wetted stream channel; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

The Wilson Brook Culvert will be extended by 3.5 metres to the north to accommodate the LRT. This extension can be achieved with no encroachment into the wetted stream channel; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices. Wilson Brook is enclosed downstream of Eglinton Avenue for a distance of approximately 750 metres so a 3.5 metres extension is considered negligible.

The Massey Creek Bridge is wide enough to accommodate the Eglinton Crosstown LRT; therefore, alteration of fish habitat is not anticipated with the implementation of best management practices.

Mitigation

To reduce the potential for alteration of fish habitat, the following best management practices will be implemented:

- Delineate work areas with construction fencing to minimize the area of disturbance;
- Restrict the use of heavy equipment in the watercourse and on watercourse banks;
- Prohibit the use of heavy equipment in the watercourse;
- Place silt fence along stream margins in areas of soil disturbance;
- Monitor and maintain erosion and sedimentation control measures during construction to ensure 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 (pocket)/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 along the Eglinton Avenue LRT. 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. Staff will work with TTC to ensure appropriate mitigation and restoration is achieved during construction.

5.3.5 Populations/Species

A population is a group of individuals of the same species located in a particular time and place. Species are of related plants or animals all sharing common attributes. Streetscape trees are included under this environmental factor.

Potential Impacts

The existing land use along the Eglinton Avenue corridor is primarily industrial, commercial, residential or educational/institutional. With the exception of the valley corridors along the Humber River, Black Creek, the West and East Don Rivers, terrestrial wildlife habitat is minimal and the habitat that is present is provided by cultural meadows, cultural thickets, cultural woodlots and isolated forested parcels. Most of the available wildlife habitat that is adjacent to Eglinton Avenue can best be characterized as being of poor quality, low structural diversity and low habitat diversity.

A number of streetscape trees and trees within private properties identified for acquisition may be affected by the placement of fire ventilation shafts, station entrances, emergency exit buildings, traction power substations, bus terminals and the widening of roads to accommodate the LRT.

It is inevitable that some habitat will be lost. A total of 1.357 hectares of habitat will be removed along the Eglinton Crosstown LRT corridor. Deciduous forests account for 42.7% (0.579 hectares) of the total while cultural woodlots, thickets and meadows account for 59.6% (0.741 hectares) of the total area affected. Because the LRT will operate in a dedicated right-of-way in the centre of the road on Eglinton Avenue, only edge habitat will be affected. Fragmentation of any wildlife habitat areas will not occur.

The overall limited capability of the wildlife habitat and the type of species supported by these isolated patches of vegetation 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 will not have any significant long term effects on the existing populations as individuals will adapt and become tolerant of the new conditions.

There are two plant species of concern: Honey locust (*Gleditsia triacanthos*) and Virginia bluebells (*Mertensia virginica*). Honey locust was found within the FOD3-1 vegetation community, in the northwest quadrant of the Islington Avenue/Eglinton Avenue intersection. Honey Locust is ranked as S2 (Imperilled) by the Ministry of Natural Resources. Virginia bluebells was found within a FOD4 vegetation community, south of Eglinton Avenue and Leslie Street. Virginia bluebells is ranked as S3 (Vulnerable) by the Ministry of Natural Resources. However, both honey locust and Virginia bluebells are considered to be non-native in the TRCA watershed (TRCA, April 2003) consequently their significance is reduced.

The study area does, however, contain **thirty-seven** plant species that are rare to uncommon in the City of Toronto and in the TRCA watershed, including: balsam fir (*Abies balsamea*), black maple (*Acer nigrum*), smooth juneberry (*Amelanchier laevis*), wild columbine (*Aquilegia canadensis*), Pennsylvania bitter-cress (*Cardamine pensylvanica*), fibrous rooted sedge (*Carex communis*), broad-leaved sedge (*Carex platyphylla*), stellate sedge (*Carex rosea*), blue cohosh (*Caulophyllum thalictroides*), Virginia spring beauty (*Claytonia virginica*), round-leaved hawthorn (*Crataegus chrysoarpa*), Cockspur thorn (*Crataegus crus-galli*), marginal wood fern (*Dryopteris marginalis*), running strawberry-bush (*Euonymus obovata*), woodland strawberry (*Fragaria vesca* ssp. *americana*), cleavers (*Galium aparine*), spotted crane's-bill (*Geranium maculatum*), witch-hazel (*Hamamelis virginiana*), cow-parsnip (*Heracleum maximum*), common juniper (*Juniperus communis*), eastern red cedar (*Juniperus virginiana*), tamarack (*Larix laricina*), moonseed (*Menispermum canadense*), common evening-primrose (*Oenothera biennis*), ninebark (*Physocarpus opulifolius*), white spruce (*Picea glauca*), red pine (*Pinus resinosa*), old-field cinquefoil (*Potentilla simplex*), white rattlesnake-root (*Prenanthes alba*), white oak (*Quercus alba*), smooth rose (*Rosa blanda*), swamp rose (*Rosa carolina*), marsh rose (*Rosa palustris*), common elderberry (*Sambucus nigra* ssp. *canadensis*), early goldenrod (*Solidago juncea*), marsh fern (*Thelypteris palustris* var. *pubescens*), and white trillium (*Trillium grandiflorum*). Measures will be taken during detail to design to avoid these rare to uncommon plants to the extent possible. Where avoidance is not achievable, plants will be removed from the impact area and transplanted into nearby areas that will be protected from construction.

Three wildlife species recorded in the Eglinton Avenue study area are listed by Committee on the Status of Endangered Wildlife in Canada and regulated under the Canadian *Species at Risk Act*. The Chimney Swift (*Chaetura pelagica*) is recognized as a Threatened Species, whereas the milk snake (*Lampropeltis triangulum*) and map turtle (*Graptemys geographica*) are listed as Special Concern, Schedule 1. The habitats where these three species were observed are not located in areas that will be affected by this project and as a result, displacement of or disturbance to these species is not anticipated.

The Fish and Wildlife Conservation Act protects three bird species, twelve mammal species and four of the herpetofauna species recorded. Most of the bird species are also protected under the Migratory Birds Convention Act. Eight of the migratory bird species recorded in the study area are also recognized as priority species of conservation concern by Bird Studies Canada for the Toronto region.

All fish species historically recorded within or near the study area are considered to be either very common in Ontario (provincial rank of S5), common (provincial rank of S4) or non-native (provincial rank of SE). One aquatic species, redbelt dace (*Clinostomus elongate*) that is classified as Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO) and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has been observed in the Humber and Don River watersheds. However, none of the historic records for redbelt dace occur in the vicinity of Eglinton Avenue. Since no in-water work is required at this time, there will be no impact on fish species or populations.

Mitigation

The impacts on wildlife, wildlife habitat resulting from this project are generally considered to be of minor significance; however habitat loss will be required to construct the LRT along the preferred transit alignment. The following environmental protection measures designed to reduce or minimize vegetation removals/wildlife habitat will be considered on a site-specific basis during the design process:

- Reduce grading requirements to the minimum extent possible;
- Implement local protection measures including guide rails, retaining walls and ditches, where warranted to avoid vegetation removals;

- Work zones will be isolated using construction fencing, barrier fencing and silt fencing to avoid further encroachment to wildlife habitat;
- Prepare restoration, enhancement and streetscape plans to offset vegetation/habitat losses and to achieve a net gain in vegetation/habitat area, attributes and functions;
- Prepare edge management plans for areas where encroachment on vegetation communities/habitat will occur;
- Bird friendly lighting and design will be incorporated where the LRT crosses valley and stream corridors to reduce the potential for birds to impact buildings; and
- Perform good housekeeping practices related to materials storage (pocket)/stockpiling, equipment fuelling/maintenance, etc. will be implemented during construction.

In addition, the City of Toronto Tree Protection Policy and Specifications for Construction Near Trees prohibits the following activities in the protection zone areas which are outside the work zones during construction:

- No altering of grade by adding fill, excavating, trenching, scraping, dumping or disturbance of any kind within a protection zone area;
- No storage (pocket) of construction materials, equipment, soil, construction waste or debris within a protection zone area;
- No disposal of any liquids e.g. concrete slurry, gas, oil, paint within a protection zone area;
- No movement of vehicles, equipment or pedestrians within a protection zone area; and
- No parking of vehicles or machinery within a protection zone area.

A total of forty-one plant species that are rare to uncommon were recorded in the study area. Individual occurrences of these species are generally beyond the zone of influence of this project and it is unlikely that they will be disturbed. During the design phase, precise locations for all species located in areas of potential disturbance will be determined and site-specific measures such as avoidance, design modifications, installation of construction fencing and transplanting where appropriate, will be identified to minimize displacement or disturbance effects.

During the design phase, design and construction of underground support columns and retaining wall structures will be considered to facilitate adequate continuous soil trenches within the road right-of-way. Also streetscape tree plantings in continuous soil trenches will be considered during the design phase.

Implementation of the mitigation measures outlined above will minimize or reduce the potential effects and as a result, the Eglinton Crosstown LRT will have no significant adverse effects on wildlife, wildlife habitat or vegetation species/populations.

5.3.6 Parks and Open Space

Potential Impacts

Construction of fire ventilation shafts, station entrances, emergency exit buildings and traction power substations along the Eglinton Crosstown LRT corridor will result in minor encroachment at five parks/parkettes including: St. Hilda's parkette; Ben Nobleman Park; Chaplin parkette; Eglinton Park; and, Howard Talbot Park. The LRT facilities proposed at each park/parkette are presented in **Exhibit 175**.

Exhibit 175: LRT Facilities Proposed Within Parks and Open Space

Park/Parkette	LRT Facility
St. Hilda's Parkette	Dufferin Station Main Entrance
Ben Nobleman Park	Allen Station Vent Shaft
Chaplin Parkette	Chaplin Station Double Vent Shaft
Eglinton Park	Emergency Exit Building #3
Howard Talbot Park	Traction Power Substation #13, Bayview Station Secondary Entrance, Bayview Station Vent Shaft

Eglinton Avenue will be widened by one lane in each direction to maintain two lanes of traffic in each direction and to accommodate LRT facilities. Between Martin Grove Road and Scarlett Road, Eglinton Avenue will be widened on the north side within the Richview Corridor. The existing recreational trail located on the south side of Eglinton Avenue between Martin Grove Road and Scarlett Avenue will be maintained in place.

Mitigation

The LRT facilities will be positioned and configured to minimize intrusion into the parks to the extent possible. The LRT facilities will be designed to blend into their surroundings using a context sensitive solution. TTC will consult with City of Toronto Parks, Forestry and Recreation Division during design to mitigate impacts on City of Toronto parks and parkettes located along Eglinton Avenue.

5.3.7 Utilities

Potential Impacts

There are a number of large diameter utilities and pipelines located within the Eglinton Avenue right-of-way. There are also numerous large underground utility chambers throughout, with the majority located at the major intersections. In addition, there is an extensive system of minor storm sewers and combination storm/sanitary sewers along Eglinton Avenue. Similarly, there are watermains located along Eglinton Avenue from 150 millimetre diameter up to 600 millimetre diameter.

Along the north and south sides of Eglinton Avenue, there are Hydro towers west of Martin Grove Road and west of the Highway 427 overpass. Toronto Hydro has poles located along the roads within the LRT corridor and has an extensive system of buried conduit throughout, with large underground chambers at numerous major intersections. Hydro One Networks Inc (Ontario Hydro) has a 115 kV transmission line crossing Eglinton Avenue just east of Yonge Street. Rogers and Telus utility plants are located in shared buried conduit and Enbridge Gas has 100 millimetres and 150 millimetres gas main throughout the LRT corridor. There are also gas mains crossing Eglinton Avenue at various intersections. Bell Canada has an extensive conduit system along Eglinton Avenue, with double conduit systems at a number of locations as well as crossing ducts at intersections.

Many of these utilities and pipelines will be impacted by the Eglinton Crosstown LRT.

Mitigation

Utilities and pipelines located within the underground section of the Eglinton Crosstown LRT will be avoided to the extent possible through tunneling. In areas of cut and cover construction, small utilities that are not in direct conflict with the LRT facility will be supported and protected during construction. For utilities that are in direct conflict with the LRT facility, or for large utilities that cannot be temporarily supported, relocation will occur. Services will be maintained to the extent possible during relocation and notice of planned service interruptions will be provided to service users prior to interruptions. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers during design.

For all utilities that will be relocated, relocation plans and construction activities will be undertaken in accordance with the *Road Rights of Way Act* and with the City's Requirements for the Installation of Services within the City of Toronto Road Allowance or its equivalent in Mississauga.

5.3.8 Property

Potential Impacts

A total of 149 properties are required to accommodate road widening/realignment, LRT alignment, station entrances, emergency exit buildings, vent shafts, and traction power substations. Of the 149 property acquisitions, 45 are full acquisitions and 104 are partial acquisitions, while 88 acquisitions occur of private property and 61 acquisitions occur of public property. The 88 acquisitions of private property include 45 partial acquisitions and 43 full acquisitions. The list of property takings are summarized in **Exhibit 176**.

Exhibit 176: List of Property Acquisitions

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
1	--	Silver Dart Rd	P	Substation - TPSS 02	Public
2	--	Silver Dart Rd	P	Road widening	Public
3	--	Convair Dr	P	LRT alignment	Public
4	--	Convair Dr	P	LRT alignment	Public
5		Hwy 401	P	New bridge	Public
6	2882	Matheson Blvd E	P	LRT alignment	Private
7	2845	Matheson Blvd E	P	Road widening	Private
8	2901-2911	Matheson Blvd E	P	Road widening	Private
9	5090	Commerce Blvd	P	Road widening	Private
10	5080	Commerce Blvd	P	Road widening	Private
11	--	Citation Place West edge of Citation Place ROW	P	Road widening	Public
12	5015	Commerce Blvd	P	Road widening	Private
13	2780-2800	Skymark Ave	P	Road widening	Private
14	2885	Eglinton Ave	P	Road widening	Public

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
15	--	NW corner of Renforth Dr and Eglinton Ave	P	Road widening	Public
16	--	North of Eglinton Ave between Renforth Dr and Matheson Blvd	P	Road widening	Public
17	--	South of Eglinton Ave between Renforth Dr and Matheson Blvd	P	Road widening / TPSS 03	Public
18	--	South of Eglinton Ave between Eglinton Ave and Hardwick Crt	P	Road widening	Public
19	128	Rangoon Rd	P	Road widening	Private
20	130	Rangoon Rd	P	Road widening	Private
21	132	Rangoon Rd	P	Road widening	Private
22	--	Open space near Rangoon	P	Road widening	Public
23	--	SW corner of Hwy 427 Southbound lane and Eglinton Ave	P	Road widening	Public
24	--	SW corner of Martin Grove Rd / Eglinton Ave	P	Diversion lane	Public
25	--	SW corner of Martin Grove Rd / Eglinton Ave	P	Diversion lane	Public
26	--	NW corner of Martin Grove	P	Road widening	Public
27	--	NE corner of Martin Grove	P	Road widening	Public
28	55	Martin Grove North side of Eglinton, between Martin Grove Rd and Widdicombe Hill Blvd	P	Road widening	Public
29	--	North side of Eglinton, between Widdicombe Hill Blvd and Kipling Ave	P	Road widening	Public
30	--	North side of Eglinton, between Kipling Ave and Wincott Dr	P	Road widening	Public

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
31	--	North side of Eglinton, between Wincott Dr and Islington Ave	P	Road widening	Public
32	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
33	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
34	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
35	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
36	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
37	--	North side of Eglinton, between Islington Ave and Russell Rd	P	Road widening	Public
38	4400	Eglinton Ave	P	Road widening	Public
39	--	SE corner of Islington Ave and Eglinton Ave W	P	Substation - TPSS 06	Public
40	--	SE corner of Eglinton Ave and Eden Valley Dr	P	Road widening	Public
41	--	SW corner of Eglinton Ave and Royal York Rd	P	Road widening	Public
42	4200	Eglinton Ave	P	Road widening	Public
43	--	NW corner of Richview Rd and Eglinton Ave	P	Road widening	Public
44	--	Entrance to Plant World Wedge of land between Richview Rd and Eglinton Ave	P	Road widening	Public
45	125	La Rose Ave	P	Road widening	Public
46	3588	Eglinton Ave	F	Road widening	Private
47	3586	Eglinton Ave	F	Road widening	Private
48	3584	Eglinton Ave	F	Road widening	Private

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
49	3582	Eglinton Ave	F	Road widening	Private
50	3580	Eglinton Ave	F	Road widening	Private
51	3578	Eglinton Ave	F	Road widening	Private
52	3576	Eglinton Ave	F	Road widening	Private
53	3574	Eglinton Ave	F	Road widening	Private
54	3570	Eglinton Ave	F	Road widening	Private
55	3568	Eglinton Ave	F	Road widening	Private
56	3566	Eglinton Ave	F	Road widening	Private
57	3564	Eglinton Ave	F	Road widening	Private
58	3562	Eglinton Ave	F	Road widening	Private
59	3560	Eglinton Ave	F	Road widening	Private
60	3558	Eglinton Ave	F	Road widening	Private
61	3556	Eglinton Ave	F	Road widening	Private
62	1	Bijou Walk	F	Road widening	Private
63	3	Bijou Walk	F	Road widening	Private
64	5	Bijou Walk	F	Road widening	Private
65	7	Bijou Walk	F	Road widening	Private
66	9	Bijou Walk	F	Road widening	Private
67	11	Bijou Walk	F	Road widening	Private
68	--	NE corner of Pearen St and Eglinton Ave	P	Road widening	Private
69	--	NE corner of Pearen St and Weston Rd	P	Road widening	Private
70	3561	Eglinton Ave	P	Road widening	Private
71	3559	Eglinton Ave	P	Road widening	Private
72	3549	Eglinton Ave	P	Road widening	Private
73	3547	Eglinton Ave	P	Road widening	Private
74	3543	Eglinton Ave	P	Road widening	Private
75	3533	Eglinton Ave	F	Road widening	Private
76	3531	Eglinton Ave	P	Road widening	Private
77	1148	Weston Rd	F	Road widening	Private
78	1	Hollis St	P	Road widening	Public
79	1156-1160	Weston Rd	F	Road widening	Private
80	1162	Weston Rd	F	Road widening	Private

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
81	1168	Weston Rd	P	Road widening	Private
82	1151	Weston Rd	P	Road widening	Private
83	2800	Eglinton Ave	P	Widening due to portal	Public
84	2700	Eglinton Ave	P	Widening due to portal	Public
85	2690	Eglinton Ave W	P	Secondary Entrance / Fire Vent	Public
86	111	Yore Rd	F	Main Entrance / Substation - TPSS 09 Bus terminal	Private
87	2660	Eglinton Ave W	P	Fire Vent	Public
88	2615	Eglinton Ave W	P	Secondary Entrance / Fire Vent	Private
89	2330	Eglinton Ave W	P	2 Fire Vents Secondary Entrance Station box	Private
90	--	Rail Corridor	P	Main Entrance (partial) plus Tunnel between Main Entrance and Station	Public
91	--	NW corner of Croham Rd & Eglinton Ave W	F	Main Entrance and Bus loop	Public
92	1854	Eglinton Ave W	F	Fire Vent	Private
93	1804-1808	Eglinton Ave W	P	Substation - TPSS 10 / 2 Fire Vents	Private
94	1815 - 1817	Eglinton Ave W	P	Main Entrance (partial)	Private
95	1606	Eglinton Ave W	F	Fire Vent	Private
96	1574	Eglinton Ave W	F	Secondary Entrance	Private
97	1609	Eglinton Ave W	P	Secondary Entrance / Fire Vent	Public

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
98	1573-1575	Eglinton Ave W	F	Main Entrance	Private
99	1557	Eglinton Ave W	F	Fire Vent	Private
100	--	NE corner of Park Hill Rd & Eglinton Ave W	P	Fire Vent	Public
101	--	NW corner of Allen Rd W & Eglinton Ave W	P	Emergency Exit	Public
102	1435	Eglinton Ave W	P	Automatic Entrance / Fire Vent	Public
103	1435	Eglinton Avenue West		Automatic Entrance	
104	--	SE corner Everden Ave & Eglinton Ave W	P	Fire Vent	Public
105	--	SW corner Glen Cedar & Eglinton Ave W	F	Emergency exit building (# 2)	Public
106	880	Eglinton Ave W	F	Fire Vent	Private
107	842	Eglinton Ave W	F	Main Entrance / Substation - TPSS 11 / Fire Vent	Private
108	823-825	Eglinton Ave W	P	Secondary Entrance	Private
109	821	Eglinton Ave W	F	Fire Vent	Private
110	576	Eglinton Ave W	P	2 Fire Vents	Public
111	574	Eglinton Ave W	F	Main Entrance	Private
112	550	Eglinton Ave W	P	Secondary Entrance / 2 Fire Vents	Private
113	--	SE corner of Chaplin Cres and Eglinton Ave W	P	Secondary Entrance	Public
114	643	Eglinton Ave W	P	Secondary Entrance (partial)	Public
115	1024 + 1024A	Avenue Rd.	F	Main Entrance / Fire Vent	Private
116	284	Eglinton Ave W	F	Fire Vent	Private
117	1021	Avenue Rd.	P	Secondary Entrance	Private

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
118	275	Eglinton Ave W	P	Fire Vent	Private
119	180	Eglinton Ave W	P	Emergency exit building (# 3)	Public
120	1 to 73	Eglinton Ave W	P	Substation - TPSS 12 / 2 Fire Vents / Emergency Exit	Public
121	30	Eglinton Ave E	F	2 Fire Vents	Private
122	123	Eglinton Ave E	P	Emergency exit building (# 4) – parking	Public
123	223	Eglinton Ave E	P	Fire Vent	Public
124	256	Eglinton Avenue East	F	Main Entrance	Private
125	280	Eglinton Ave E	F	Secondary entrance	Private
126	282	Eglinton Ave E	F	2 Fire Vents	Private
127	485	Eglinton Ave E	P	Emergency exit building (# 5) – parking	Private
128	656	Eglinton Ave E	P	Main Entrance / 2 Fire Vents	Private
129	660	Eglinton Ave E	P	Secondary entrance / Fire Vent	Private
130	635	Eglinton Ave E	P	Secondary entrance / Substation - TPSS 13 / Fire Vent	Public
131	276	Rumsey Road	P	Emergency Exit building (#6) - parking	Private
132	250-256	Laird Dr	F	Main Entrance / 2 Fire Vents	Private
133	825 to 845	Eglinton Ave E	P	Secondary entrance / 2 Fire Vents	Private
134	939	Eglinton Ave E	P	Road widening	Private

	Address	Street Name	Full (F) or Partial (P)	Reason for Property Impact	Public or Private Property
135	--	SW corner of Eglinton Avenue and Don River West Branch	P	Launch shaft & Work zone	Public
136	15	Gervais Dr	P	Road widening	Private
137	1200	Eglinton Ave E	P	Road widening	Private
138	--	NE corner of Eglinton Ave and Don Mills Rd	P	Bus terminal	Public
139	35	Wynford Heights Crt	P	Wynford Dr re-alignment	Private
140	-	Wynford Heights Crt	P	Wynford Dr re-alignment	Public
141	1880	Eglinton Ave E	P	Road widening & North side U-turn	Private
142	1891	Eglinton Ave E	P	South side U-turn	Private
143	1896	Eglinton Ave E	P	Road widening	Private
144	1897	Eglinton Ave E	P	Road widening	Private
145	1900	Eglinton Ave E	P	Road widening	Private
146	1960	Eglinton Ave E	P	Substation - TPSS 18	Private
147	2206	Eglinton Ave E	P	RT alignment	Private
148	2201	Eglinton Avenue East	P	Right turn lane	Private
149	2222	Eglinton Ave E	P	Right turn lane	Public

Mitigation

Property acquisition required for this project will be undertaken by the City of Toronto on behalf of the TTC. In acquiring 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 Eglinton Crosstown LRT 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 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.

Partial takings have been identified for a further 49 properties. These include underground easements and surface facilities such as station entrances. TTC and the City of Toronto will conduct a Property Protection Study during the design of the Eglinton Crosstown LRT, which will determine detailed property requirements, including temporary construction easements. The acquisition of these properties will follow the same principles described above.

Where properties to be displaced form a continuous development of retail/business streetscape, the displacement TTC facility will ensure the continuation of the existing street wall (with respect to height setback and general architectural characteristics).

Any brownfield sites will be managed in accordance with the Ontario Regulation 153/04 and Ontario Regulation 511/09 once it comes into force. A Designated Substances Surveys for any buildings or structures which require demolition will be undertaken during the design phase.

5.3.9 Archaeology

Potential Impacts

A Stage 1 and 2 archaeological assessment was conducted in accordance with the Ministry of Culture’s Archaeological Assessment Technical Guidelines (MCzCR 1993).

The Stage 1 archaeological assessment involved an evaluation of archaeological potential based on a review of geographic, land use and historical information and a field inspection of the Eglinton Crosstown LRT corridor. The Stage 1 Archaeological Assessment indicated high potential for the recovery of archaeological material along the Eglinton Crosstown LRT corridor. This was based on the confirmed presence of nine listed² and designated heritage properties along the corridor. Additionally, a total of five registered archaeological sites had been encountered within a one-kilometre radius of the Eglinton Crosstown LRT corridor, and four registered archaeological sites within a two-kilometre radius of the Airport Link study area, indicating that significant archaeological resources could be encountered within their limits.

The subject lands are bisected by Mimico Creek, the Humber River, Black Creek, the West Don River, the East Don River, and Massey Creek, further supporting the potential for locating Aboriginal artifactual remains within undisturbed portions of the study area limits. A review of the subject lands within the Tremaine’s Map of the County of York, Canada West, 1860 and The 1878 Illustrated Historical Atlas of York County and the township of West Gwillimbury & Town of Bradford in the County of Simcoe indicated that approximately 90 properties and between 15 to 23 homesteads and structures are illustrated within or directly adjacent to its limits. The subject lands encompasses the sites of several historic railroads, one historic post office, two historic school houses, one urban concentration, a church and many orchards. Two historic cemeteries, Richview Memorial Cemetery (also known as, Union Chapel Cemetery plus Willow Grove and McFarlane Cemeteries) established in 1853 and Prospect Cemetery established 1890, are situated alongside the Eglinton Crosstown LRT study corridor. As such, the research supported high potential for locating Euro-Canadian artifactual remains within undisturbed portions of the subject lands. In light of all of this information, it was recommended that a Stage 2 archaeological assessment be undertaken in all undisturbed locations.

Consequently, a Stage 2 archaeological assessment was conducted and consisted of a test-pit survey as well as the identification of disturbed locations within the footprint of the Eglinton Crosstown LRT. Encountered disturbances included paved roadways and highway intersections, paved sidewalks and bicycle paths, paved and gravel shoulders, paved driveways, grading from previous and recent development activities, wet drainage ditches, sloping terrain from embankment constructions, and underground utilities. Physiographic factors affecting archaeological potential consisted of sloping terrain. Due to the low archaeological potential classification of these areas, systematic survey was not warranted nor was it undertaken. Furthermore, two portions of the proposed alignment along Commerce Drive and Convoir Drive, specifically from north of STA 53+180 to 53+340, and STA 53+520 to 53+600, fell within private ownership and permission to enter was not granted. As such, these lands will require assessment prior to any intrusive activity.

² “Listed” is a term used for properties for which the Toronto City Council has adopted a recommendation to be included on the Inventory. The recommendations are based on criteria that relate to architecture, history, and neighbourhood context. Their inclusion on the Inventory is a clear statement that the City would like to see the heritage attributes of these properties preserved. If designated, these structures must be preserved (www.toronto.ca)

The remaining undisturbed portions of the subject lands that could be tested were comprised of grass and fallow margins. Test-pit survey was undertaken at five metre intervals, based on the established high potential for the recovery of archaeological resources. Despite careful scrutiny, no archaeological resources were encountered during the Stage 2 field assessment and, thus, with the exception of the unassessed segments, the remainder of the Eglinton Crosstown LRT is considered clear of further archaeological concern.

Mitigation

No mitigation measures are proposed since no archaeological resources are known to occur within the footprint of Eglinton Crosstown LRT facilities. The Stage 1 and 2 Archaeological Assessment reports were filed with the Ministry of Culture in compliance with Section 65 (1) of the *Ontario Heritage Act*. The Ministry reviews reports to ensure that the licensee has met the terms and conditions of the licence and archaeological resources have been identified and documented according to the standards and guidelines set by the ministry, ensuring the conservation, protection and preservation of the heritage of Ontario. Confirmation that the Ministry of Culture has entered these reports into the provincial register of reports and that the Ministry of Culture has no further archaeological concerns with this project was received on December 21, 2009.

A Stage 2 archaeological assessment will be conducted on properties where permission to enter were not obtained during the Transit Project Assessment.

Monitoring and Contingency

The following monitoring and contingency measures are recommended by the Ministry of Culture:

1. Should previously unknown or unassessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*. The office of the Heritage Operations Unit, Ministry of Culture (416-314-7146) should be contacted immediately.
2. Any person discovering human remains must immediately notify the office of the Heritage Operations Unit, Ministry of Culture (416-314-7146), the police or coroner, and the Registrar of Cemeteries, Cemeteries Regulation Unit, Ministry of Government Services (416-326-8404).

Consultation with stakeholders, including First Nations, will be initiated in the event that archaeological resources or human remains are discovered in accordance with Ministry of Culture practices.

5.3.10 Cultural Heritage

Potential Impacts

Generally changes due to transit infrastructure projects have the potential to adversely affect cultural heritage landscapes and built heritage resources by displacement and/or disruption during and after construction. Built heritage and/or cultural heritage landscapes may experience displacement or direct impacts, i.e., removal, if they are located within the rights-of-way of the undertaking. There may also be potential for disruption or indirect impacts to cultural heritage resources by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and, or setting. Both direct and indirect effects will occur as a result of the Eglinton Crosstown LRT.

The potential impacts of the Eglinton Crosstown LRT on cultural heritage resources are presented in **Exhibit 180**. The Eglinton Crosstown LRT will not encroach on either of the two cemeteries located within the project limits, the Richview Cemetery or the Prospect Cemetery. Station entrances will displace 1950's commercial buildings at Oakwood Station and the 20th Century commercial buildings at Mount Pleasant Station. Placement of station entrances at Keele Station, Mount Pleasant Station and Bayview Station will indirectly affect the cultural heritage landscape around the York Memorial School, 300 Eglinton Avenue East (a Uno Prii designed building) and Sunnybrook Plaza, the first strip mall built in the City of Toronto.

Mitigation

Transit improvements should be managed in such a way that its impact is sympathetic with the value of the resources. When the nature of the undertaking is such that adverse impacts are unavoidable it may be necessary to implement management or mitigation strategies that alleviate the deleterious effects to cultural heritage resource. Mitigation is the process of lessening or negating anticipated adverse impacts to cultural heritage resources, It may include such actions as avoidance, monitoring, protection, relocation, documentation, salvage, remedial landscaping, etc., and may be a temporary or permanent action.

The measures identified to mitigate potential impacts of the Eglinton Crosstown LRT on cultural heritage resources are presented in **Exhibit 177**. Documentation through the use of historical mapping and photography of the affected buildings will be conducted prior to removal in accordance with the requirements of the City of Toronto Heritage Preservation Services requirements. LRT Station entrances will be designed using context sensitive solutions in consultation with the City of Toronto, Heritage Preservation Services.

Exhibit 177: Cultural Heritage Impacts and Mitigation Measures

Location and Potential Impact	Mitigation Recommendation
<p>Weston Road</p> <p>1) Displacement: Row of residences, N. Side of Eglinton Ave. West 3556-3588</p> <p>2) Disruption: 1151 Weston Road, Bank of Nova Scotia site context.</p>	<p>1) City of Toronto Heritage Preservation Services will require a Heritage Impact Statement (HIA) for the collection of residences to be removed after screening.</p> <p>2) Document the change with photographs and historical mapping prior to intersection modifications and prepare a brief area history. Consult with Heritage Preservation Services regarding report content prior to commencement.</p>
<p>Keele Street</p> <p>Disruption: Road widening on the west side of the Keele Street and placement of an emergency exit in front of York Memorial Collegiate, a municipally designated property under the <i>Ontario Heritage Act</i>.</p>	<p>Prepare a sympathetic design that recognizes the importance of the viewscape in front of the building. A Heritage Impact Statement (HIA) will be required for this site by City of Toronto Heritage Preservation Services.</p>
<p>Dufferin Street</p>	

Location and Potential Impact	Mitigation Recommendation
Displacement: Loss of a 1947 commercial buildings for fire vent placement: 1850-1854 Eglinton Avenue West	Document the change in the streetscape with photographs and historical mapping and prepare a brief area history prior to removal of the buildings. Consult with Heritage Preservation Services regarding report content prior to commencement.
Oakwood Avenue Displacement: Loss of 1950's commercial buildings for station/exit placement. Addresses displaced include: 1557; 1573-75; 1574-76; and, 1606 Eglinton Avenue West.	Document the change in the streetscape with photographs and historical mapping and prepare a brief area history prior to removal of the buildings. Consult with Heritage Preservation Services regarding report content prior to commencement.
Mount Pleasant Road 1) Displacement: The 20 th century commercial building at 794 Mount Pleasant Road will be removed. 2) Disruption: The station development will result in a change in the context adjacent the Uno Prie designed apartment building, 300 Eglinton Avenue East is listed on the City of Toronto Inventory of Heritage Properties.	1) City of Toronto Heritage Preservation Services will require a Heritage Impact Statement (HIA). Adaptive reuse of the building will be considered as a station entrance will be studied further during design. Photo document of the building and site prior to removal, if this is the preferred option. 2) City of Toronto Heritage Preservation Services will require a Heritage Impact Statement (HIA) for the site.
Bayview Avenue Disruption: Change in context due to new secondary entrance at Sunnybrook Plaza, 600 Eglinton Avenue East. Site listed on City of Toronto Modernist Inventory.	City of Toronto Heritage Preservation Services will require a Heritage Impact Statement (HIA) for the site after screening.

and East Don River Bridge, including adding an LRT facility and associated bridge widening and possible reinforcement, may require an approval under the NWPA.

Mitigation

TTC will prepare and submit an application for approval under the *Navigable Waters Protection Act* during detail design. The application will include mitigation measures designed to maintain navigation clearances at these bridges and maintain navigation on these waterways during construction. Measures to mitigate potential impacts on navigable waters may include the following:

- Bridge modifications shall not encroach on the existing horizontal or vertical navigation clearances.
- The navigation channel shall be maintained at all times during construction. Boat traffic shall be allowed uninterrupted passage through the work site at all time, and assisted as necessary. The navigation channel shall not be altered in any way during construction.
- Sufficient signage shall be erected upstream and downstream of the work area to alert boat traffic of construction activities.
- A temporary containment system shall be installed under the bridges to prevent any materials from falling off the bridge into the navigation channel.
- No person shall permit any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of building or placing a work in navigable water to remain in such water after the completion of the project.

NWPA approval will be obtained by TTC prior to construction at navigable waters.

5.4 Construction Impacts

The runningway will be tunnelled through the underground sections. As a result, impacts are predicted to be negligible. Stations and special track work areas will be constructed by cut-and-cover method. Station entrances, emergency exit buildings, ventilation shafts, and traction power substations will be constructed following standard at surface construction methods with excavation activities for connection to the underground sections. Bridge modifications are not anticipated to involve in-water construction work.

5.4.1 Terrain and Soils

Potential Impacts

This project will result in the displacement of approximately 1.8 million m³ of surplus excavated material generated by tunnelling and cut-and-cover construction at the portals, tunnel and stations. This material will be hauled by truck for disposal off-site. A total of 160 trucks per day will be required to remove this material, the equivalent of one truck every four minutes. On busy urban streets such as Eglinton Avenue and the major north-south arterials that already carry a large proportion of truck traffic, the addition of one truck every four minutes is considered a negligible increase in truck traffic. Truck haul routes will be identified during detail design as part of traffic management plans. Trucks hauling materials associated with the Eglinton Crosstown LRT will be restricted from entering residential areas through contract provisions.

5.3.11 Navigable Waters

Potential Impacts

The Humber River, West Don River and East Don River have been identified as navigable waters by Transport Canada, Navigable Waters Protection Agency. The *Navigable Waters Protection Act* (NWPA) regulates any works proposed in, upon, over, under, through or across any navigable waterway in Canada. Modifications to the Humber River Bridge, including adding an LRT facility, and the West Don River Bridge

There is potential for encountering buildings with deep foundations within the underground section of the Eglinton Crosstown LRT. Therefore, where necessary, underpinning will be implemented to minimize the potential for building settlement/structural stress due to tunnelling, piling and dewatering.

Mitigation

A review of historical records identified several areas to have known soil or groundwater impacts from previous and current operations. Phase 1 Environmental Site Assessments and Phase 2 Environmental Soil & Groundwater Investigations will be conducted in areas where excavation, road widening and property acquisitions will take place and have known or high potential for environmental impacts. This is to meet provincial regulatory requirements to assess the environmental site conditions, disposal requirements for soil/groundwater as well as health and safety requirements.

An excess materials management plan will be implemented in accordance to regulatory requirements during construction. Management of contaminated material encountered will follow MOE Standards, Ontario Regulation 153/04 and Ontario Provincial Standards Specification 180 – General Specification for the Management and Disposal of Excess Material.

Monitoring

This baseline monitoring will be undertaken in accordance with the *Ontario Environmental Protection Act* and will be documented in the Geotechnical Baseline Report, which will provide the necessary information for the handling and disposing of excess soil. The disposal of contaminated materials will be directed to an MOE approved soil treatment site or waste disposal site. The monitoring of these facilities is the jurisdiction of the Ministry of the Environment of Ontario.

Prior to construction, TTC will require the contractor to submit the name, location and type of license of the designated soil disposal sites (as issued by MOE).

Prior to the commencement of construction operations, separate instrumentation readings will be taken to provide a pre-condition survey for all buildings to assess current conditions.

Monitoring during construction will include ground settlement measurements, inclinometers and surface monitoring points for structures. Monitoring is undertaken on a weekly basis during active excavation. This monitoring schedule is reduced to every three months for up to a year following backfilling.

The monitoring program will include review and alert levels. If instrument readings exceed “review” levels, TTC and its contractor will jointly assess the necessity of altering the method, rate or sequence of construction. At “alert” levels, TTC can order construction operations to cease until the necessary mitigation measures are undertaken.

Following construction, TTC and its contractors will arrange for a joint post-construction inspection of buildings/structures and utilities with the respective Owners. The results of these surveys will be compared with the pre-construction surveys.

TTC will monitor horizontal and vertical movements and tilt of adjacent structures and utilities on a daily basis during active excavation or backfilling. In the event that instrument readings reach “alert” levels, (as to be defined on a structure-specific basis in the construction contract documents), TTC site supervisory staff will order construction operations to cease and take necessary actions to mitigate unacceptable

movements, including, but not limited to alternative construction methods or construction equipment and/or additional support/protection measures.

Contingency

In the event that a property owner submits a claim for property damage, TTC will conduct further investigations and, if appropriate, will negotiate a settlement.

5.4.2 Groundwater

Potential Impacts

The groundwater table is likely to be above the base of the proposed depth of alignment at many areas within the underground section of the Eglinton Crosstown LRT. Therefore, seepage cut-off and depressurization of aquifers will be required to control groundwater, stabilize the base of excavations and tunneling. It can be expected that groundwater will need to be controlled by methods such as pumping from sumps, educators or well points or in some cases by deep well dewatering systems. For the majority of the underground section of the LRT, the base of excavation/tunneling is likely to be in glaciolacustrine (silt, clay and sand) deposits of the Thorncliffe Formation; therefore, care must be taken to prevent the removal of fine soil particles during pumping.

Mitigation

There is potential to encounter contaminated groundwater. Further hydrogeologic assessments will be conducted at locations requiring dewatering to estimate discharge rates, predict impacts and evaluate treatment/discharge options. These studies are also needed to support the Ministry of the Environment’s Permit to Take Water (PTTW) applications.

There is potential for buildings to have foundations built below the local water table, and a potential exists for these foundations to be affected by dewatering. Further investigation to determine the radius of influence of any required dewatering will be necessary to fully consider the impacts to nearby structures and infrastructure. Further mitigation plans will be developed during the design phase.

Monitoring

Most cut-and-cover operations for the construction of stations will require dewatering to reduce groundwater pressure and lower groundwater levels to allow for construction on stable undisturbed and substantially dry subgrade. To avoid adverse effects such as settlement of buildings two types of monitoring are employed:

1. Amount of Total Suspended Solids in the Dewatering Effluent – Unless required to be more stringent by the geotechnical engineer during design, is limited to 5 parts per million Total Suspended Solids. This monitoring is undertaken 12 hours after the commencement of pumping.
2. Ground Water Monitoring Wells (piezometers) – The measurement of groundwater levels are taken from piezometers generally situated within areas of excavation. As part of the baseline monitoring, a minimum of 2 sets of readings prior to the start of dewatering will be taken. The monitoring of water levels will be conducted on a daily basis while dewatering systems remaining in operation. The monitoring program will include review and alert levels. If instrument readings exceed “review” levels, TTC and its contractor will jointly assess the necessity of altering the method, rate or

sequence of construction. At “alert” groundwater levels, TTC can order construction operations to cease until the necessary mitigation measures are undertaken.

Recognizing the urban environment within which this project occurs, the disposal of groundwater will be to an existing storm or sanitary sewer and will be arranged by the contractor. The conditions and resulting monitoring and reporting requirements will be the subject of a water disposal permit with the City of Toronto and monitoring will include sampling and analysis carried out in accordance with the procedures, modified or validated by the City, as set out in the City document entitled “Quality System, Analytical Methods Manual” as it may be amended from time to time. [Amended 2002-10-31 by By-law No. 855-2002]

5.4.3 Surface Water

Impacts

In-stream works are not proposed at any of the crossings therefore changes to the fluvial integrity of the channel are not anticipated. Measures will be put in place during all phases of construction to minimize disturbance to watercourses from inputs of soil, concrete dust/washwater and other materials. Measures will be included in the design process to ensure that storm water impacts will be minimal and that water features are protected as part of the proposed construction.

In areas where construction sites or roadways are located in proximity to watercourses, the use of minor grading to direct surface runoff away from the aquatic habitats is recommended. This generally consists of the slope leading to a very shallow swale created by a low ridge of topsoil. The vegetative swale is configured to direct surface runoff along the swale back away from the edge.

If uncontrolled, the construction activities associated with Eglinton Avenue widening could result in increased rates of erosion and sedimentation within and adjacent to the site area and tributaries to three major watersheds which include Mimico Creek, Humber River and the Don River. The potential environmental impacts from increased erosion and sedimentation include: degradation of water quality; destruction of fisheries habitat; and, increased flooding potential. Erosion and sedimentation processes are typically accelerated due to construction activities.

Mitigation

In order to prevent and minimize the release of sediment to watercourses, various sediment and erosion control measures will be implemented during LRT construction, such as:

- Environmental protection measures will be installed in areas adjacent to watercourses. Erosion and sediment control measures will be prepared in accordance with the TRCA Guidelines “Erosion and Sediment Control for Urban Construction Sites”;
- During the design process, a sediment and erosion control plan will be developed 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 be outlet onto a grassed area at least 30m from the watercourse, a settling pond, and/or wetland filter bag. A Permit to Take Water application will be submitted to the Ministry of the Environment to undertake any dewatering that is over 50,000 L/day;

- Any effluents derived from concrete cutting/grinding/forming will be collected and managed in accordance to provincial standard specifications;
- 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 watercourses, 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 Contractors’ work. Dust suppression will be undertaken as per OPSS 501 and 506;
- In order to mitigate the potential impacts associated with excess material storage (pocket), 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 30 metres 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; and
- Sediment control measures will be installed prior to construction, monitored during the construction and replaced as necessary.

Monitoring

Prior to construction, the contractor is required to submit comprehensive environmental controls and methods plan to address, among other elements, effluent (water) control. The effectiveness of this plan is monitored during a demonstration of the process that is undertaken before the Work can commence on site. A representative of TTC will undertake monitoring of plan compliance.

As a component of erosion and sedimentation control, environmental inspections of the construction site will be conducted. Environmental inspections will be conducted to assess the performance of erosion and sedimentation control measures and identify any required maintenance. The frequent inspections will also permit the identification of localized erosion and sedimentation control issues that require site specific attention. A detailed erosion and sedimentation control plan will be prepared during later design phases.

Contingency

During the course of construction, there is a risk of spills or discharges of pollutants or contaminants by the Contractor. The following contingency plan will be put in place:

1. Names and telephone numbers of persons in local municipalities and MOE to be notified forthwith of a spill;
2. Names and telephone numbers of representatives of fire, police and health departments of local municipalities who are responsible to respond to emergency situations;
3. Names and telephone numbers of companies experienced in control and clean up of hazardous materials that will be called in an emergency involving a spill;
4. Contingency plan shall include provisions for hazardous or unknown materials (e.g. puncturing a drain during excavation);
5. Containment and control of spill and clean up procedures are to be initiated immediately to mitigate environmental damage, while awaiting additional assistance; and
6. Ensure materials and products are on site with which temporary repairs can be made to broken pipelines or other services so emissions of pollutants can be controlled and stopped.

5.4.4 Communities/Ecosystems

Potential Impacts

The potential environmental effects on communities and ecosystems are described in detail in Section 4.2.4. Surface construction of the Eglinton Crosstown LRT has the potential to result in short term disturbance to vegetation that currently exists along the Eglinton corridor. Activities such as relocation of street lighting and utilities, temporary or permanent road widening, boulevard modifications, maintaining access to side streets and entrances, and temporary staging areas for construction equipment or construction materials can temporarily increase the overall project footprint size, and result in generally, short term disturbances.

Mitigation

The disturbance to vegetation along Eglinton Avenue 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.

To minimize disturbance at a particular site:

- Work zones will be isolated using construction fencing and silt fencing to minimize the area of disturbance;
- Reinstatement of growing conditions on top of LRT facilities in areas of cut-and-cover construction; and
- Good housekeeping practices related to materials storage (pocket)/stockpiling, equipment fuelling/maintenance, etc. will be implemented during construction.

The work zones associated with the west and east portals will affect a considerably large area of approximately 5000 square metres and 7500 square metres, respectively, at each site.

The proposed location for the west portal work site is on the south side of Eglinton Avenue, 200 metres east of Black Creek Drive. The area is locally known as Keelesdale Park and the present land use consists of baseball diamonds, an indoor hockey arena and a grass soccer pitch. The soccer pitch is located adjacent to but separated from Eglinton Avenue by a cultural woodlot (CUW1), is bordered by a small deciduous forest parcel (FOD2-1) to the east, and a parking lot to the south. The work zone will be established on the soccer pitch, resulting in a temporary disturbance to this grassed area. Upon completion of the project, the soccer pitch will be re-established to its present condition. To minimize or avoid

increased disturbances to this site, the cultural woodlot should be left intact or restored following construction.

The proposed location for the east portal is on the south side of Eglinton Avenue, 400 metres east of Brentcliffe Road. The exact location of the east portal work zone will be determined during design. Vegetation at the site is predominantly manicured grass, extending from the proposed access road in the west to the western boundary of a TRCA property in the east. In order to provide a work zone of 7500 square metres, an encroachment on the TRCA property measuring approximately 25 metres x 80 metres (2000 square metres) is required. The vegetation community that is present on the TRCA property is classified as cultural woodlot (CUW1). The loss of part of the CUW1 community is not regarded as significant as it is a temporary intrusion only. The disturbance will not result in permanent loss of vegetation cover or long term impacts on the natural heritage function of the cultural woodlot. Upon completion, restoration of the site to existing or better natural conditions will occur in accordance with a restoration plan approved by TRCA and Urban Forestry.

Resulting impacts at both of these sites are considered to be temporary and short term.

Monitoring

In the event that works must be undertaken within vegetation communities / ecosystems, TTC will monitor the health of the trees and overall state of the existing vegetation communities during construction. Once all construction activities are complete, this monitoring program will continue into the following growing season.

Contingency

If it is determined that tree health or vegetation community restoration is failing or has failed, then trees or shrubs will be replaced with the identical species and girth, and a modified restoration plan will be determined.

5.4.5 Populations/Species

Potential Impacts

During construction, the urban wildlife species present in the Eglinton Crosstown LRT corridor will be temporarily displaced but will re-establish to the available habitat once operation of the Eglinton Crosstown LRT is established. These short term impacts are not considered to be significant. There is potential impact to streetscape trees and possibly trees within private properties during construction but considered minor. Disturbance to trees and shrubs can have a direct effect on the vegetation itself but can also affect nesting birds.

Mitigation

The *Migratory Birds Convention Act* (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*.

TTC will comply with the requirements of the *Migratory Birds Convention Act* and nesting season, and as a result, the Eglinton Crosstown LRT will have no significant adverse effects on avian wildlife species/populations.

The potential impact to streetscape trees and possibly trees within private properties is of minor concern because trees at risk can be protected with barrier fencing, transplanted or removed and replaced during the final construction stage.

Monitoring

If vegetation clearing is required during the nesting season, TTC will retain a qualified avian biologist to conduct a nesting survey.

Contingency

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.

5.4.6 Air Quality

Potential Impacts

During construction, there is potential for air quality impacts to occur. These impacts will be of short duration, limited to the period where significant excavation and construction activities occur on surface sections of the LRT or where cut and cover construction is required on the underground section of the LRT. The two major sources of emissions from construction are dust emissions and exhaust emissions from construction equipment. All construction locations will be temporary and will have a localized impact.

Mitigation

Best management practices will be implemented to prevent the potential release of dust and other airborne pollutants off site, such as:

- Periodic watering of unpaved construction areas;
- Periodic watering of stockpiles;
- Limiting speed of vehicular travel;
- Use of water sprays during the loading, unloading of materials; and
- Sweeping and/or water flushing of the entrances to the construction zones.

These types of controls aid in minimizing impacts to the environment during the construction phase. Night time construction activities should also be considered in order to reduce the higher emissions from vehicles that are slowed down by the reduced existing road capacity during the day. It is recommended that only water be used as a dust suppressant.

The reductions in greenhouse gases associated with the use of the LRT will far outweigh any short term increase in greenhouse gas emissions that are associated with construction activities.

Monitoring

During a demonstration and throughout the work, air monitoring of crystalline silica, total dusts and other contaminants (as applicable) should be conducted as a check on the effectiveness on dust control measures. In particular, Air quality monitoring should be conducted prior to, during or following construction as follows:

- 1) 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.
- 2) Construction Borne Particulate Matter within Existing Buildings – In instances where works are necessary to connect new works to existing buildings and stations and activities, such as sawcutting are required. Monitoring of airborne contaminants such as crystalline silica will be required to show that these contaminants are below their respective time weighted average exposure values as indicated in Regulation 833.

5.4.7 Noise and Vibration

Potential Impacts

The impact of construction noise and vibration on nearby sensitive receptors has been investigated. Where feasible, noise and vibration control measures will be implemented to limit the potential disturbance of construction equipment and activities to nearby receptors. As the project has not reached the design level, specifics of equipment to be used in the construction process have not been determined. The focus of the construction noise and vibration impact assessment was to develop a generic guide to be further refined and expanded when more information becomes available during the design phase. As the project is quite extensive, consideration is given not only to structural and health-related effects of construction noise and vibration, but also to community annoyance.

Residential receptors were the focus of the impact assessment as they are the predominant sensitive receptor in the corridor. Impacts at nearby residential receptors are representative of potential impacts at other sensitive receptors such as hospitals and nursing homes. It is recommended that in the long term construction areas, high-traffic commercial applications such as restaurants be treated as noise- and vibration-sensitive receptors. Industrial and commercial sites were also considered with respect to structural vibration and noise impacts, although their sensitivity is normally much less than residential and institutional receptors.

Mitigation

Provincial and municipal guidelines provide basic restrictions and recommendations with regard to construction noise and vibration. These criteria will be followed in all areas, regardless of duration of construction. In particular, municipal by-laws from the City of Toronto stipulate limitations on the vibration from construction activity and the times of construction. These have been taken from the MOE Model Noise Bylaw. The applicable guidelines can be found in the following documents:

- MOE's Model Municipal Noise Control Bylaw
- Toronto Municipal Code, Chapter 591, Noise, dated 2007-12-13
- City of Toronto Bylaw No. 1400-2007, Noise, Respecting Construction Noise, in force on January 1, 2008
- City of Toronto By-Law No. 514-2008, amending the Toronto Municipal Code Chapter 363, Building Construction and Demolition, with Respect to Regulation of Vibration from Construction Activity

- NPC-115 'Construction Equipment'
- NPC-205 'Sound Level Limits for Stationary Sources in Class 1&2 (Urban) Areas'
- NPC-118 'Motorized Conveyances'

Provincial guidelines with regard to construction sound levels place specific restrictions on source sound levels. The guidelines are written to restrict maximum allowable sound levels for equipment used in certain construction activities. The applicable guidelines can be found in NPC-115. NPC-205 excludes noise sources related to construction activities.

Municipal bylaws place restrictions on the hours of operation for all construction activity: in particular, construction is limited from 7:00 AM to 7:00 PM on weekdays, and are more stringent on weekends and holidays. If construction activities occur outside the hours of operations, special exemptions will need to be obtained from the City of Toronto and residents in the area will be notified several weeks in advance of the construction activities.

It is assumed that the surface LRT construction will be carried out in a manner similar to the current streetcar construction methods. Much of the noise resulting from this construction activity will be that typical of a highway or road widening. The overall duration of the construction activity will be significant; however, the impact to a specific area will be comparatively short during the course of construction as construction will progress from one area to the next.

Monitoring

Noise levels for nearby sensitive uses (such as residential or institutional) will have specific monitoring locations and maximum noise levels. These levels and construction activities that may generate exceedences will be defined prior to construction. The monitoring program will include review and alert levels. If instrument readings exceed "review" levels, TTC and its contractor will jointly assess the necessity of altering the method, rate or sequence of construction. At "alert" levels, TTC can order construction operations to cease until the necessary mitigation measures are undertaken.

Vibration resulting from construction will be monitored using seismographs. Vibrations will be monitored at locations at various distances from work operations and at critical structural or utility locations. As part of the baseline monitoring, a minimum of 3 consistent sets of readings will be taken prior to the start of work. TTC will then continuously monitor ambient vibration levels during construction. The monitoring program will include review and alert levels. If instrument readings exceed "review" levels, TTC and its contractor will jointly assess the necessity of altering the method, rate or sequence of construction. At "alert" levels, TTC can order construction operations to cease until the necessary mitigation measures are undertaken.

Similarly, vibration during the tunnelling process will require monitoring.

Contingency

In the event that instrument readings reach "alert" levels, (as to be defined on a structure-specific basis in the construction contract documents), TTC site supervisory staff will order construction operations to cease and take necessary actions to mitigate unacceptable movements, including, but not limited to alternative construction methods or construction equipment.

5.4.8 Business Operations

Potential Impacts

Eglinton Avenue, Commerce Boulevard, Convoir Drive and Silver Dart Drive provide the essential visibility and accessibility needed by businesses and other economic activities. The proposed Eglinton Crosstown LRT will enhance this accessibility with improved transit service, bringing more patrons to and along the corridor. By stimulating transit oriented development along the corridor, the Eglinton Crosstown LRT will attract more business activity, resulting in positive economic benefits.

Experience from other large LRT projects in the City has suggested that an important business issue is the possible reduced vehicle access to the area and potential loss of on-street parking. The design of the project has been developed to minimize these impacts. The City/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. Auto and transit traffic will be maintained throughout the construction period with a minimum of a single lane of travel in each direction. Pedestrian access may be detoured at times but will also be maintained throughout construction. Every attempt will be made to replace any short-term parking loss for individual homes and businesses.

Access to businesses will be modified during construction activities. As part of this study the construction footprint of the station box was analyzed. As a result, a minimum 1 metre clearance from the building face to construction could be provided for access to businesses during construction.

Mitigation

The City/TTC will form a "Construction Liaison Group" in active construction zones during construction to provide quick access to construction related information, specifically schedule and timing information for local business owners and residents. The Construction Liaison Groups will be made up of City/TTC and Contractors staff who will meet regularly on site. Business owners and residents directly impacted by the current/future construction activity will be invited and encouraged to attend these meetings where the day to day issues affecting their home/business will be discussed and resolved. Issues such as business deliveries, local parking, and garbage pick-up will often be topics of concern. Further, construction schedule and activity timing is also a prime topic. Besides the Construction Liaison Group, the City and TTC will undertake prior to each phase of construction, a comprehensive 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.

Monitoring

A public consultation plan, including information on how the public can raise issues/concerns, will be developed during the design phase.

Contingency

Any complaints received will be investigated and resolved in an effective and efficient manner.

5.4.9 Parks and Open Space

Potential Impacts

The proposed location for the west temporary work site is on the south side of Eglinton Avenue, 200 m east of Black Creek Drive. The area is locally known as Keele Park and the present land use consists of baseball diamonds, an indoor hockey arena and a grass soccer pitch. The soccer pitch is located adjacent to but separated from Eglinton Avenue by a cultural woodlot (CUW1), and is bordered by a small deciduous forest parcel (FOD2-1) to the east and a parking lot to the south. The majority of the work zone will be established on the soccer pitch, but will also require removal of approximately 0.105 ha. of cultural woodlot to accommodate the northern boundary of the work zone and the 'open shaft' access to the portal. The FOD2-1 vegetation community will not be affected. The soccer pitch will also be used as the tunnel boring machine launch site and as temporary material stockpiling and heavy equipment operations site resulting in temporary impacts to its recreational use.

Mitigation

To ensure that the forested area remains undisturbed, the entire FOD2-1 vegetation community will be separated and isolated with a barrier to prevent encroachment by any construction related activity. Upon completion of the project, the soccer pitch will be re-instated to its present condition. The cultural woodlot (CUW-1) will also be restored to its pre-construction state as it will be replanted with suitable native species.

5.4.10 Traffic Operations

Potential Impacts

Road improvements and cut-and-cover construction used for station construction and special track work areas will result in disruption to traffic operations along Silver Dart Drive, Conair Drive, Commerce Drive and Eglinton Avenue.

At least three traffic lanes will be open to traffic and on-street parking will not be permitted during construction.

Mitigation

During the design process, TTC will work with the City of Toronto and the City of Mississauga to develop an acceptable approach for traffic maintenance during construction. This material will be provided to the contractor as a guide. In the event that the contractor decides to deviate from this plan, the contractor will be required to prepare and submit a detailed and comprehensive Traffic Management Plan, for review by TTC and the Toronto and Mississauga transportation departments.

5.4.11 Property

Potential Impacts

Temporary property easements will be required during the construction phase to establish work zones, material laydown areas, equipment maintenance/storage (pocket) and to obtain access for construction activities.

Mitigation

The City of Toronto will negotiate temporary construction easements with property owners on a case-by-case basis following the procedures described in **Section 5.3.8**. Following construction, the City will reinstate lands to pre-construction conditions.

5.5 Operations and Maintenance Impacts

The operations and maintenance of the Eglinton Crosstown LRT will result in impacts that will be experienced over the life of the project. These impacts are associated with emissions during facility operations including air pollution, noise, vibration, electromagnetic interference and stray current. The Eglinton Crosstown LRT will also have long term effects on traffic and transit operations.

5.5.1 Air Quality

Potential Impacts

The operation of the Eglinton Crosstown LRT will result in significant reductions in emissions of oxides of nitrogen, volatile organic compounds and carbon monoxide along Eglinton Avenue compared to current conditions. The replacement of existing diesel powered buses that serve the LRT corridor and transfer of terminus points for some bus routes that are currently served from either the Eglinton Station or Eglinton West Station will result in a reduction in local air emissions.

There will be a need for more electricity to operate the Eglinton Crosstown LRT. However, even with the increased contaminant releases associated with electricity production, it is estimated that there will be a reduction of common air contaminants released in southern Ontario as a result of implementing the LRT. These reductions will grow if private vehicle users become LRT riders.

The new off-street bus terminals/bus loops located at the Keele Station, Don Mills Station and Caledonia Station will be point sources for exhaust emissions. Based on the number of buses to use these terminals/bus loops at any one time, the duration that the buses will be idling on site and the age of the bus fleet, it was determined that carbon monoxide (CO), total suspended particulate (TSP) and nitrogen oxide (NO_x) emission will be well below Canada Wide Standards and Ontario Ambient Air Quality Objectives at these locations.

5.5.2 Noise

Potential Impacts

Overall, the noise impact of the LRT is a slight increase in sound levels on the surface and a zero change or reduction in sound levels on the underground sections. The increases, at the most are 3dB on the surface routes and 4dB at the portals, are below the criterion limit of 5dB permissible increase in sound. Hence, no noise control is warranted as a result of the surface LRT operations.

Near the eastern tunnel portals, near Brentcliffe and on the east side of the Don Mills portal, the increase in sound approaches 5dB. Although slightly below the criterion limit, some noise absorption within the tunnel should be considered during the detail design phase to ensure that sound levels do not exceed 5dB. This comment partially reflects the reverberant character of the sound emanating from the tunnel out of the portals.

The Keele Street bus terminal, the Don Mills Road bus terminal and the Caledonia bus loop do not exceed the guideline limits with their current designs. No noise control is required for these facilities.

Traction power substations 10, 11 and 17 are significantly above the ambient sound levels at the nearest receptors.

Several fire ventilation shafts may generate noise in excess of the ambient sound levels in the area and guidelines.

Mitigation

Although no noise control measures are warranted for the Keele Street Bus Terminal, TTC has committed to install noise barriers along the terminals eastern property line in recognition of nearby residences.

At traction power substations 10, 11 and 17, consideration should be given to moving these power stations further away from the receptors. Otherwise, noise control measures should be incorporated into the design of the power substations. As this analysis is based on approximate data, the requirement for mitigation should be reviewed once more detailed data become available.

At several fire ventilation shafts, silencing beyond the standard generic package needs to be developed and implemented in order to meet the guidelines at the limited number of locations. In addition, the removal of property to facilitate the placement of fire ventilation shafts results in very local impacts that trigger the warrants for acoustic barriers or other forms of shielding for the roadway noise. These barriers should be constructed to a height similar to that of the buildings that are being removed.

5.5.3 Vibration

Potential Impacts

The perceptible vibration levels expected to be caused by the LRT are 0.1mm/s at a setback of 20 metres from the track. This vibration level meets the MOE/TTC vibration criterion limit of no more than 0.1 mm/s of vibration being received by a receptor along the LRT. At closer setbacks, further vibration isolation will be required. The induced noise from vibration is predicted to cause some impact based on the US Federal Transit Administration guideline limit of 35dBA. Vibration impacts along tangent track in the underground section are not expected provided the isolation system is as effective as that employed along the Sheppard Subway Line.

Mitigation

Vibration isolation improvements would be needed for the tangent tracks, on the surface, located in residential neighbourhoods to reduce interior sound levels resulting from LRV vibration to 35dBA. Significant modifications to the vibration isolation system would be required for the special track areas noted as local vibration levels are expected to be significantly above the criterion limit, both in terms of noise and perceptible vibration in the areas where surface operations are within 20 m of residences.

5.5.4 Electromagnetic Interference (EMI)

Potential Impacts

All electrical devices generate electromagnetic interference (EMI). The LRT will operate using 600 VDC; therefore, it is a source of EMI. The most common sources of EMI include:

- Computing devices including microprocessor based patient diagnostic, monitoring and therapeutic equipment;
- Radio transmitters including radio paging transmitters and portable/mobile transmitter/receivers such as the familiar walkie-talkie units used by maintenance and security personnel;
- Television receivers and projection devices;
- Cellular telephones; and
- Electrical distribution systems within buildings.

Based on recent tests undertaken by the Bay Area Rapid Transit System (BART), examples of EMF intensities from human activities include the following:

- Overhead power transmission line – 32 to 57 mG (range of exposure to utility workers);
- Household appliances – 8 to 165 mG (at a distance of 27 cm);
- Computer video display – 2 to 4 mG (at a distance of 35 cm); and
- Electric powered rail vehicle – 400 mG (at 110 cm from the vehicle floor) to 1,500 mG (at floor level).

For comparison, in the natural environment apart from human activity, the earth's static magnetic field varies from 300 mG (30µT) at the equator to over 600 mG (µT) at the magnetic poles.

Mitigation

TTC currently operates under and nearby a variety of sensitive uses, including hospitals and university laboratories. TTC has had no EMI related issues materialize along any part of its electric system. Based on measurements taken on the BART system, the results of the modelling showed that static magnetic field levels above 50 µT do not extend beyond 10.0 m from the centre of the two BART tracks at track level. Therefore EMI can be mitigated through the setback of the overhead catenary wire.

5.5.5 Stray Current

Potential Impacts

Stray current corrosion, which is a form of electrolytic corrosion, occurs on buried metallic structures and differs from other forms of corrosion damage in that the current, which causes 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. Stray current activities and step and touch voltage hazards will be considered during the design of traction power substations.

Mitigation

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

- Low linear rail electrical resistance;
- High rail-to-earth resistance, including insulated trackwork mounted fittings and appurtenances;
- Good rail bonding, both longitudinally and track cross-bonding;
- Parallel connected negative reinforcing feeder cables, insulated and cross-bonded to the return rails;
- Good water drainage;
- Structural steel-work and reinforcing isolation/separation; and
- Utility structures to be electrically insulated, bonded, coated and cathodically protected as required.

The LRT traction power distribution system shall be ungrounded and shall have no direct connection to the earth.

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. Where applicable, the negative running rails shall be connected to the AC ground system through a floating negative automatic ground switch (FNAGS). The FNAGS operates (and alarms) only on an abnormally high return rail to ground voltage.

Monitoring

A monitoring program will be put in place where the LRT crosses a high-pressure steel pipeline. The monitoring program will include:

- Prior to construction, a baseline survey for stray current corrosion control is undertaken and reported to the pipelines;
- During construction, stray current test equipment is installed in the immediate vicinity of the pipelines;
- Upon completion of the work, stray currents will be monitored as often as is prudently required; and
- All data will be shared between the pipelines and TTC.

5.5.6 Traffic Operations

Along these sections, there will be some impact on the capacity for automobile movements although the total people carrying capacity of the corridor will be increased by introducing LRT service.

At existing non-signalized intersections, there will be a right-in/right-out arrangement to ensure safe LRT operation by not permitting crossing of the alignment by motor vehicles. A preliminary planning study has carefully considered each location to ensure that either an existing or new signalized intersection is nearby to provide a nearby U-turn opportunity.

At specific major signalized intersections, left-turns will not be provided to improve transit operations. Instead, motorists will be provided with left-turn and U-turn opportunities at locations beyond the intersections. The LRT section from the Pearson International Airport to Martin Grove Road will not have left turn prohibitions at intersections.

In the section from Keele Street to Brentcliffe Road, the LRT will be underground. Lane configurations on Eglinton Avenue in this section will be unaffected.

The removal of one through lane in each direction along the east section of the Eglinton Crosstown LRT may displace some vehicular traffic. Current drivers could use other roads or could be converted to transit users.

Bicycle lanes will be provided or maintained along the LRT alignment to provide an alternative travelling mode for non-drivers.

Emergency service providers will continue to operate at current service levels with the LRT in place. The track area of the LRT will be paved with concrete. Emergency vehicles can utilize this right-of-way to avoid traffic congestion. As a step towards accommodating emergency vehicles' entry/exits, modifications to the LRT right-of-way will include adjusting pole locations or lowering the raised right-of-way at the driveways of fire, police and ambulance stations.

Monitoring

Traffic volumes on public roads and transit schedules are part of the City of Toronto's and TTC normal operating procedures. This will allow for either agency to identify future issues and develop corrective actions. Furthermore, as development proceeds around each station/stop, the City of Toronto and the City of Vaughan will ensure the continued functioning of the road network, through the use of supporting traffic impact studies.

5.5.7 Transit Operations

A formal analysis of bus routing changes, including public consultation, will be undertaken between 12 and 18 months prior to the opening of the Eglinton Crosstown LRT. For planning purposes, TTC staff have developed a preliminary bus plan to help guide discussion about LRT facilities and potential bus connections. The preliminary bus plan is presented in **Exhibit 159** and identifies the following changes to the existing bus network related to the Eglinton Crosstown LRT:

- No parallel bus routes will be provided along Eglinton Avenue;
- North-south arterial bus routes will continue to operate;
- The Don Mills and Eglinton Station will include a new seven-bay bus terminal to service the 25N, 25S, 54 and 100 bus routes;
- The Keele and Eglinton Station will include a new four-bay bus terminal to service the 32C and 32D bus routes; and

- The Caledonia Station will include a new bus loop to service the 47N and 47S bus routes.
- Stop/station locations were selected based on achieving the right balance between convenient local access and speed of service. Closely spaced stops/stations provide excellent local access, but speed of service is compromised if stops/stations are spaced too closely together. Stops/stations will be located where current TTC services, including buses and subways, intersect Eglinton Avenue in order to provide convenient passenger connections between those services and the LRT. The proximity of existing neighbourhoods, commercial areas, major destinations and future developments was also considered when stop/station locations. The average distance between stops/stations and corresponding LRT vehicle speed is presented in **Exhibit 178**. The spacing and resulting speed of service in the underground section is comparable to the Bloor-Danforth Subway. On the surface sections, average stop spacing is approximately twice that of the existing bus service along Eglinton Avenue which, together with providing exclusive lanes, results in a speed of service increase of approximately 50%.

Exhibit 178: Stop/Station Spacing and Resulting Route Speed

Section	Stop/Station Spacing	Route Speed
West Surface Section	670 m	28-31 km/h
Underground Section	850 m	32 km/h
East Surface Section	660 m	22-25 km/h

Exhibit 179 lists the existing bus routes that serve portions of the Eglinton Crosstown LRT route and their potential re-alignments.

Exhibit 179: Potential Modifications to Bus Routes on Eglinton Avenue

Route	Description	Start/End Station	Route Overlaps LRT to:	Distance on Eglinton (km)	Potential Re-Alignment
<i>Existing Routes to be Altered</i>					
5	Avenue Road	Eglinton	Oriole Pkwy	0.6	Combine with 61- run through Avenue Rd Stn
32	Eglinton West	Eglinton	Renforth	16.13	Discontinue
32A	Eglinton West	Eglinton	Renforth	16.13	Discontinue
32B	Eglinton West	Eglinton	Renforth	16.13	Discontinue
32C	Eglinton West	Eglinton	Keele	6.4	Terminate at Trethewey (Keele & Eglinton Stn)
32D	Eglinton West	Eglinton W	Keele	3.3	Terminate at Trethewey

Route	Description	Start/End Station	Route Overlaps LRT to:	Distance on Eglinton (km)	Potential Re-Alignment
					(Keele & Eglinton Stn)
34	Eglinton East	Eglinton	Kennedy	11.5	Discontinue
47	Lansdowne	Lansdowne	Caledonia	0.3	Re-routed to serve Caledonia Station
51	Leslie	Eglinton	Leslie	4.1	Combine with 56 along Eglinton to Laird
54	Lawrence East	Eglinton	Leslie	4.1	Terminate at Don Mills & Eglinton Station
56	Leaside	Eglinton	Laird	2.8	Combine with 51 along Eglinton to Leslie
61	Avenue Road North	Eglinton	Avenue Rd	0.6	Combine with 5 - run through Avenue Rd Stn
100	Flemingdon	Eglinton	Don Mills	5.1	Terminate at Don Mills & Eglinton from east via Wynford to Donlands Stn
103	Mt. Pleasant North	Eglinton	Mt. Pleasant	0.6	Loop at Eglinton Station with 74 Mt. Pleasant to St. Clair
<i>New Routes to be Added</i>					
51/56	Leslie/Leaside	Donlands	Laird to Leslie	1.25	New route for Leslie bus along Eglinton to Laird

5.6 Beneficial Effects

In general the benefits of a well developed transit system for the health and vitality of big cities are well documented. Transit helps cities be more liveable and vibrant by:

- Ensuring that transit is an more attractive travel option by improving travel times, comfort, and reliability of service;
- Increasing the people movement capacity in all corridors, generally without the widening of roadways and in an environmentally sound manner, so that they can take advantage of the employment, educational, recreational, and many other opportunities cities offer;

- Providing alternative travel choices for non-drivers, including transit and enhanced environments for cycling and walking;
- Providing opportunities to include urban design and streetscaping features in the construction of the LRT line;
- Improving air quality and, in doing so, improving people's health and their ability to enjoy outdoor spaces and activities;
- Reducing the wear-and-tear on city roads and the need to spend tax dollars on repairing and expanding road infrastructure; and
- Ensuring the long-term economic stability and environmental sustainability by reducing climate-changing emissions and reliance on fossil fuels.

A recent study named "*Greenhouse Gases and Air Pollutants in the City of Toronto-Toward a Harmonized Strategy for Reducing Emissions, 2007*" on the sources of greenhouse gases and air pollutants in the City of Toronto indicates that close to 40 per cent of greenhouse gas emissions originate from the transportation sector. The vast majority of these emissions are from cars and trucks. Encouraging residents to choose alternatives to the automobile for as many trips as possible must be a vital part of any action plan to reduce harmful emissions and address climate change. The emission reductions resulting from the implementation of the Eglinton Crosstown LRT will result in a net benefit to those who reside in close proximity to Eglinton Avenue. Furthermore, greenhouse gas emissions are estimated to be reduced and that benefit can be extended should the LRT encourage motorists to use the public transit system.

Light-rail transit technology, as proposed in this study, offers significant benefits with respect to the environment and city-building. These include:

- Provision of premium quality service – quiet, smooth, comfortable, fast, and reliable – which attracts people to ride transit;
- Highly energy-efficient technology: light rail vehicles produce 92 per cent less CO₂ than autos and 83 per cent less CO₂ than diesel buses, and produce zero local-area or "tailpipe" emissions;
- Ample capacity for projected ridership in all proposed corridors, with the capability to expand to meet increasing demands;
- Demonstration of long-term and substantial commitment to quality transportation, to instil the confidence which landowners and investors need to invest in development and city-building, and the confidence which residents need to choose a transit-oriented lifestyle;
- Creation of a strong and highly-recognizable presence which signifies the availability of high-quality transit; and
- Association with Toronto's streetcar heritage and the positive connotations which streetcars bring to the City and its transit system

Potential benefits of the Eglinton Crosstown LRT are that it will promote the Official Plan vision for a more liveable Toronto as future growth within Toronto will be steered to areas which are well served by transit, the existing road network and which have a number of properties with redevelopment potential.

Having a safe, fast and reliable transit service like the Eglinton Crosstown LRT, that is a viable alternative to vehicular travel, will attract new business in the area based on the provision of increased people movement capacity.

The mixed use areas within Avenues will perform a "Main Street" function and become meeting places for local neighbours and the wider community. By promoting alternative forms of travel, these areas become vibrant communities centred on the people and uses instead of automobiles. By directing growth to areas such as Avenues, the Official Plan provides greater certainty for land owners, businesses and residents about what type of growth can be anticipated, and where growth will occur.

Exhibit 180: Summary of Eglinton Crosstown LRT Potential Impacts, Mitigation Measures, Monitoring, Future Work and Contingencies

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
Terrain and Soils	Changes in terrain and generation of excess soil	<p>LRT facilities will be located primarily within the right-of-way and the vertical profile of Silver Dart Drive, Convair Drive, Commerce Drive and Eglinton Avenue will be maintained. Minimum impact on terrain will occur in underground sections.</p> <p>Approximately 1.8 million m³ of soils are expected to be removed.</p>	<p>Regulatory requirements in place at the time of construction and excess materials management guidelines and specifications (e.g. OPSS180) will be used when developing an excess materials management plan.</p> <p>Contaminated soils will be managed in accordance with provincial legislation and regulations including the Ministry of the Environment's Guidelines for Use at Contaminated Sites in Ontario (MOE 1997).</p>	<p>A Soil and Groundwater Management Strategy will be developed during the design phase.</p> <p>Any brownfield sites will be managed in accordance with the Ontario Regulation 153/04 and Ontario Regulation 511/09 once it comes into force. A Designated Substances Surveys for any buildings or structures which require demolition will be undertaken during design phase.</p> <p>If excavations or property acquisitions are planned in areas of known or high potential for contaminated soils, Phase 1 and 2 Environmental Site Assessments will be conducted during design phase.</p> <p>A contingency plan will be developed during design phase where appropriate.</p>
Groundwater	Impacts to groundwater during construction and from implementation of the LRT.	<p>Potential for tunnelling activities encountering groundwater. The groundwater table is likely to be above the base of the proposed depth of alignment at many areas within the underground section of the Eglinton Crosstown LRT.</p> <p>Potential for encountering contaminated groundwater during dewatering.</p> <p>There is potential for buildings to have foundations built below the local water table, and a potential exists for these foundations to be affected by dewatering.</p>	<p>Groundwater will need to be controlled by methods such as pumping from sumps, educators or well points or in some cases by deep well dewatering systems.</p> <p>For the majority of the underground section of the LRT, the base of excavation/tunneling is likely to be in glaciolacustrine (silt, clay and sand) deposits of the Thorncliffe Formation; therefore, care must be taken to prevent the removal of fine soil particles during pumping.</p> <p>It is anticipated that Eglinton Crosstown LRT facilities will not interrupt existing groundwater migration pathways and permanent groundwater dewatering systems will not be used.</p>	<p>Further hydrogeology studies will be conducted at locations requiring dewatering to estimate discharge rates, predict impacts and evaluate treatment/discharge options. These studies are also needed to support the Ministry of the Environment's Permit to Take Water (PTTW) applications.</p> <p>Contaminated groundwater will be managed in accordance with provincial legislation and regulations including the Ministry of the Environment's Guidelines for Use at Contaminated Sites in Ontario (MOE 1997).</p> <p>A Soil and Groundwater Management Strategy will be developed during the design phase.</p> <p>A contingency plan will be developed during design phase where appropriate.</p>
Surface Water, Drainage and Stormwater	<p>Impacts to LRT operations during regional and 100 storm events.</p> <p>Impacts to drainage and stormwater systems from the LRT.</p> <p>Fuel spills, due to accidents</p>	<p>At two locations, Humber River and Black Creek, it was determined that the Eglinton Crosstown LRT will be affected by the regional storm event (1 in 500 years) but operations will not be affected by the 100 year storm event. The east and west portal are both located above the flood elevation for the regional storm; therefore,</p>	<p>Stormwater control, mitigation, erosion and sediment control measures will be enumerated as per MOE's Stormwater Design Manual 2003 and the City of Toronto's Wet Weather Flow Management Guidelines 2007.</p> <p>LRT operations will be suspended during the regional storm event to prevent potential risks to human health and safety and damage to LRT facilities and vehicle.</p>	<p>Stormwater management, in accordance with City of Toronto, City of Mississauga, TRCA and MOE requirement will be developed during the design phase.</p> <p>The City of Toronto operates and maintains a network of rainfall gauges. The information is used to determine sewer sizes and the influence of storms of various sizes on the existing sewer system and on streams (floods).</p>

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
	<p>during construction refueling and accidents during operation, entering the watercourses.</p> <p>Impacts to quality and quantity of surface water.</p>	<p>minimum risk of flooding within the portal or tunnel are predicted.</p> <p>West of Martin Grove Road, catchbasins/storm sewers may require relocation as a result of proposed Eglinton Avenue widening. The storm sewers located between Royal York and Weston Road may require hydraulic capacity assessment to ensure that the capacities of these receiving storm sewers are not compromised due to proposed increase in pavement area. At other locations where increase in pavement area is nominal, it is anticipated that the existing storm sewers capacities will not be impacted.</p> <p>The LRT will not significantly add impervious surfaces, as such no water quality control measures are warranted.</p> <p>Potential for decline of quality of surface water during construction due to erosion and sedimentation.</p> <p>Potential for surface water contamination.</p>		<p>The City collects and analyses water samples from sewers at sewer outfalls, in stream and at the lakefront for a variety of management reasons. Sample results from sewers and at sewer outlets are used to determine, trace and correct the discharge of prohibited pollutants to its sewer systems.</p> <p>A permit under Ontario Regulation 166/06 will be secured from TRCA during the design phase.</p>
Fisheries	Alteration of fish habitat during construction.	Potential alteration of fish habitat as a result of bridge widening and culvert extensions. No work in the wetted stream channel is proposed.	<p>Implement best management practices for work on watercourse banks.</p> <p>Implement erosion and sedimentation control measures.</p> <p>Implement stormwater management practices</p>	<p>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 <i>Fisheries Act</i>. 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. Staff will work with TTC to ensure appropriate mitigation and restoration is achieved during construction</p> <p>On-site environmental inspection during work at</p>

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
	Mortality of fish species during construction.	Potential mortality to fish species as a result of bridge widening and culvert extensions. No work in the wetted stream channel is proposed.	<p>Implement best management practices for work on watercourse banks.</p> <p>Implement erosion and sedimentation control measures.</p> <p>Implement stormwater management practices.</p>	<p>bridge/culvert sites.</p> <p>On-site environmental inspection during work at bridge/culvert sites.</p>
Vegetation	Loss of vegetation during construction and from the operation of the LRT.	A total of 1.357 hectares of vegetation will be removed along the Eglinton Crosstown LRT corridor. Deciduous forests account for 42.7% (0.579 hectares) of this total. The majority of forest cover to be removed (0.554 hectares) occurs along the west section of the alignment between Martin Grove Road and Keele Street. The remaining vegetation communities at risk are culturally based and account for 59.6% (0.741 hectares) of the total area affected.	The following environmental protection measures designed to reduce or minimize vegetation removals will be considered on a site-specific basis during the design phase.	<p>Obtain permits and approvals for tree protection and removal/injury from TRCA, city of Mississauga and City of Toronto (including permits required under the Ravine and Natural Feature Protection By-law and by-laws that protect private trees, street trees and park trees), as applicable.</p> <p>Preparation of arborist reports, tree protection plans, edge management plans and restoration plans will be developed during the design phase to identify site-specific impacts, mitigation and compensation measures to offset vegetation losses and to achieve a net gain in vegetation area, attributes and functions.</p> <p>Prepare restoration and enhancement plans that will meet or exceed both TRCA and Urban Forestry standards that will offset vegetation losses and achieve a net gain in vegetation area, attributes and functions. A monitoring plan will be developed during the design phase to measure the effectiveness of proposed mitigation measures.</p> <p>A contingency plan will be developed during the design phase.</p>
	Disturbance to vegetation through edge effects during construction.	Creating new forest edges may result in sunscald, wind throw, and invasion by exotic species. Ditching, grading and other drainage modifications may alter local soil moisture regimes.	<p>The City of Toronto Tree Protection Policy and Specifications for Construction Near Trees requirements will be met.</p> <p>To minimize disturbance at a particular site,</p> <ul style="list-style-type: none"> • work zones will be isolated using construction fencing and silt fencing to minimize the area of disturbance; • reinstate growing conditions on top of LRT facilities in areas of 	<p>A monitoring plan will be developed during the design phase to measure the effectiveness of proposed mitigation measures.</p> <p>A contingency plan will be developed during the design phase.</p>

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
			cut-and-cover construction; and, <ul style="list-style-type: none"> good housekeeping practices related to materials storage (pocket)/stockpiling, equipment fuelling/maintenance, etc. will be implemented during construction. 	
	Rare, threatened or endangered flora.	Forty-one plant species that are rare to uncommon in the City of Toronto and in the TRCA watershed	Determine precise GPS locations of potentially affected plant species during design phase.	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.
Wildlife	Destruction/ Disturbance of wildlife habitat during construction.	Construction of the LRT and associated facilities will result in the removal of vegetation and the wildlife habitat that it supports.	<p>The <i>Migratory Birds Convention Act</i> 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 <i>Fish and Wildlife Conservation Act</i>.</p> <p>TTC will comply with the requirements of the <i>Migratory Birds Convention Act</i> and nesting season, and as a result, the LRT will have no significant adverse effects on avian wildlife species/populations.</p> <p>Mitigation measures for the disturbance to vegetation will be implemented to mitigate any impacts to wildlife habitat.</p>	<p>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.</p> <p>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.</p> <p>A monitoring plan will be developed during the design phase to measure the effectiveness of proposed mitigation measures.</p> <p>A contingency plan will be developed during the design phase.</p>
	Impacts on wildlife mortality during construction	Removal of wildlife habitat may result in wildlife mortality.	Perform vegetation removals outside of wildlife breeding seasons (typically April 1 to July 31).	Bird Friendly lighting and design will be incorporated where the LRT crosses valley and stream corridors to reduce the potential for birds to impact buildings.
	Disturbance to rare, threatened or endangered wildlife.	No rare, threatened or endangered wildlife identified within study area.	None required.	None required.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
Electromagnetic Interference (EMI)	Potential generation of electromagnetic interference	All electrical devices generate electromagnetic interference (EMI). The LRT will operate using 600 VDC; therefore, it is a source of EMI.	EMI can be mitigated through the setback of the overhead catenary wire.	
Air Quality	Impacts on air quality during construction. Impacts on air quality due to implementation of LRT.	Air quality impacts will be of short duration, limited to the period where significant excavation and construction activities occur on surface sections of the LRT or where cut and cover construction is required on the underground section of the LRT. The two major sources of emissions from construction are dust emissions and exhaust emissions from construction equipment. All construction locations will be temporary and will have a localized impact. Overall emissions are expected to decrease with LRT implementation.	Best management practices will be implemented to prevent the potential release of dust and other airborne pollutants off site. Air quality is anticipated to be improved after the LRT implementation. Gases pollutants and particulate based pollutants are anticipated to be decreased during LRT operations.	Monitor and investigate complaints on air quality issues.
Noise and Vibration	Noise level increase during construction and operation of the LRT. Vibration impacts generated from the operation of the LRT	Noise level increases during construction will be of short duration, limited to the period where significant excavation and construction activities occur on surface sections of the LRT or where cut and cover construction is required on the underground section of the LRT. Overall, the noise impact of the LRT is a slight increase in sound levels on the surface and a zero change or reduction in sound levels on the underground sections. The increases, at the most are 3dB on the surface routes and 4dB at the portals, are below the criterion limit of 5dB permissible increase in sound. Hence, no noise control is warranted as a result of the surface LRT operations. Near the eastern tunnel portals, near	Comply with construction noise by-laws (Toronto Municipal Code) to provide means of limiting excessively noisy operations and equipment. Specify hours of operation during construction. Noise by-law exemptions will be obtained prior to construction if required. Although slightly below the criterion limit, some noise absorption within the eastern tunnel should be considered during the detail design phase to ensure that sound levels do not exceed 5dB. Consideration should be given to moving the three power stations further away from the receptors. Otherwise, noise control measures should be incorporated into the design of the power substations. Silencing fire ventilation shafts beyond the standard generic package needs to be developed and implemented in order to meet the guidelines at the limited number of locations. The acoustic barriers should be constructed to a height similar to	Monitor and investigate complaints on noise and vibration issues Provincial and municipal guidelines provide basic restrictions and recommendations with regard to construction noise and vibration. These criteria will be followed in all areas, regardless of duration of construction. In particular, municipal by-laws from the City of Toronto stipulate limitations on the vibration from construction activity and the times of construction. Mitigation measures will be developed during the design phase.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
		<p>Brentcliffe and on the east side of the Don Mills portal, the increase in sound approaches 5dB.</p> <p>The Keele Street bus terminal, the Don Mills Road bus terminal and the Caledonia bus loop do not exceed the guideline limits with their current designs. No noise control is required for these facilities.</p> <p>Traction power substations 10, 11, and 17 are significantly above the ambient sound levels at the nearest receptors.</p> <p>Several fire ventilation shafts may generate noise in excess of the ambient sound levels in the area and guidelines.</p> <p>The removal of property to facilitate the placement of fire ventilation shafts results in very local impacts that trigger the warrants for acoustic barriers or other forms of shielding for the roadway noise.</p> <p>The perceptible vibration levels expected to be caused by the LRT will meet vibration criterion limit of 0.1mm/s rms at a setback of 20 metres from the tracks.</p> <p>Vibration impacts along tangent track in the underground section are not expected provided the isolation system is effective.</p>	<p>that of the buildings that are being removed.</p> <p>Vibration isolation improvements would be needed for the tangent tracks, on the surface, located in residential neighbourhoods to reduce interior sound levels resulting from LRV vibration to 35dBA. Significant modifications to the vibration isolation system would be required for the special track areas noted as local vibration levels are expected to be significantly above the criterion limit, both in terms of noise and perceptible vibration in the areas where surface operations are within 20 m of residences.</p> <p>Mitigation measures will be developed during the design phase.</p>	
Property	Loss of property for the construction of the LRT	Total of 149 properties - 45 full acquisitions and 104 partial acquisitions are required, while 88 of the acquisitions are private properties	<p>Compensation for residential and commercial impacts will be provided for temporary and permanent property requirements.</p> <p>For permanent property acquisitions, compensation will be provided</p>	<p>The property owners will be contacted during the design stage.</p> <p>Partial property acquisitions have been identified for a</p>

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
		and 61 are public properties.	<p>at fair market value, which is determined at the time of purchase with a property appraisal report forming the basis for negotiations. Other ancillary costs are negotiated on a case-by-case basis. Compensation will provided for the temporary property requirements. Upon completion of construction, temporary property will be returned to the owner and restored to its original condition.</p> <p>Where properties to be displaced form a continuous development of retail/business streetscape, the displacement TTC facility will ensure the continuation of the existing street wall (with respect to height setback and general architectural characteristics).</p>	further 49 properties. These include underground easements and surface facilities such as station entrances. TTC and the City of Toronto will conduct a Property Protection Study during the design of the Eglinton Crosstown LRT, which will determine detailed property requirements, including temporary construction easements. The acquisition of these properties will follow the same principles described above.
Stray Current	Potential impacts from stray current	Stray current corrosion occurring on buried metallic structures	<p>Stray current activities and step and touch voltage hazards will be considered during the design of traction power substations.</p> <p>In order to minimize uncontrolled stray currents a number of measures shall be used in connection with measures applied to the traction power return system.</p>	<p>A monitoring program will be put in place where the LRT crosses a high-pressure steel pipeline. The monitoring program will include:</p> <ul style="list-style-type: none"> • Prior to construction, a baseline survey for stray current corrosion control is undertaken and reported to the pipelines; • During construction, stray current test equipment is installed in the immediate vicinity of the pipelines; • Upon completion of the work, stray currents will be monitored as often as is prudently required; and, • All data will be shared between the pipelines and TTC.
Parks and Open Space	Impacts to parks and city trees	<p>Between Martin Grove Road and Scarlett Road, Eglinton Avenue will be widened on the north side within the Richview Corridor.</p> <p>Temporary impacts to the use of the soccer pitch at Keelesdale Park as the west temporary work site will be used for tunnel boring machine launch site, temporary material stockpiling and heavy equipment operations site. The west temporary work site will also require removal of approximately 0.105 ha. of cultural woodlot to</p>	<p>Vegetation located east of the soccer pitch will be separated and isolated with a barrier to prevent encroachment by any construction related activity. Upon completion of the project, the soccer pitch will be re-instated to its present condition. The cultural woodlot will also be restored to its pre-construction state as it will be replanted with suitable native species.</p> <p>The LRT facilities will be positioned and configured to minimize intrusion into the parks to the extent possible. The LRT facilities will be designed to blend into their surroundings using a context sensitive solution.</p>	TTC will consult with City of Toronto Parks, Forestry and Recreation division during design to mitigate impacts on City of Toronto parks and parkettes located along Eglinton Avenue.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
		<p>accommodate the northern boundary of the work zone and the 'open shaft' access to the portal.</p> <p>Construction of fire ventilation shafts, station entrances, emergency exit buildings and traction power substations along the Eglinton Crosstown LRT corridor will result in minor encroachment at five parks/parkettes (St. Hilda's parkette; Ben Nobleman Park; Chaplin parkette; Eglinton Park; and, Howard Talbot Park)..</p>		
Utilities	Potential conflicts with existing utility plants	The presence of an extensive system of storm and sanitary sewers, large diameter utility plants, pipelines and utility poles may be impacted by the implementation of the LRT.	Utilities and pipelines located within the underground section of the Eglinton Crosstown LRT will be avoided to the extent possible through tunneling. In areas of cut and cover construction, small utilities that are not in direct conflict with the LRT facility will be supported and protected during construction. For utilities that are in direct conflict with the LRT facility, or for large utilities that cannot be temporarily supported, relocation will occur. Services will be maintained to the extent possible during relocation and notice of planned service interruptions will be provided to service users prior to interruptions. The location of all plant, potential conflicts and the relocation strategy will be confirmed with service providers during detail design.	For all utilities that will be relocated, relocation plans and construction activities will be undertaken in accordance with the <i>Road Rights of Way Act</i> and with the City's Requirements for the Installation of Services within the City of Toronto Road Allowance or its equivalent in Mississauga.
Businesses Operations, Pedestrians and Cyclists	Access to businesses will be modified during construction activities.	Reduced vehicle access to the area and potential loss of on-street parking during construction	<p>A minimum 1 metre clearance from the building face to construction could be provided for access to businesses during construction.</p> <p>The City/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. Auto and transit traffic will be maintained throughout the construction period with a minimum of a single lane of travel in each direction.</p> <p>Pedestrian access may be detoured at times but will also be maintained throughout construction. Every attempt will be made to replace any short-term parking loss for individual homes and businesses.</p> <p>The City/TTC will form a "Construction Liaison Group" in active</p>	<p>A public consultation plan, including information on how the public can raise issues/concerns, will be developed during the design phase.</p> <p>Any complaints received will be investigated and resolved in an effective and efficient manner.</p>

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
			<p>construction sites during construction to provide quick access to construction related information, specifically schedule and timing information for local business owners and residents. The Construction Liaison Group will be made up of City/TTC and Contractors staff who will meet regularly on site. Business owners and residents directly impacted by the current/future construction activity will be invited and encouraged to attend these meetings where the day to day issues affecting their home/business will be discussed and resolved. Issues such as business deliveries, local parking, and garbage pick-up will often be topics of concern. Further, construction schedule and activity timing is also a prime topic. Besides the Construction Liaison Committee, the City and TTC will undertake prior to each phase of construction, a comprehensive 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</p>	
Archaeology	Loss of archaeological resources	<p>Stage 1 and Stage 2 archaeological assessment was conducted for the LRT corridor except for two segments of the proposed LRT corridor, north and south of Highway 401 between Matheson Boulevard and Convair Drive.</p>	<p>Despite careful scrutiny, no archaeological resources were encountered during the Stage 2 Archaeological Assessment field investigation and, thus, with the exception of the unassessed segments, the remainder of the subject lands, encompassing the Eglinton Crosstown LRT have been considered clear of further archaeological concern. The Ministry of Culture have reviewed the Stage 1 and Stage 2 Archaeological Assessment reports and agreed to its findings.</p>	<p>A Stage 2 archaeological assessment will be conducted for the two unassessed segments segments of the proposed LRT corridor, north and south of Highway 401 between Matheson Boulevard and Convair Drive during design phase.</p> <p>The following monitoring and contingency measures are recommended by the Ministry of Culture:</p> <ol style="list-style-type: none"> 3. Should previously unknown or unassessed deeply buried archaeological resources be uncovered during development, they may be a new archaeological site and therefore subject to Section 48 (1) of the <i>Ontario Heritage Act</i>. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the <i>Ontario Heritage Act</i>. The office of the Heritage Operations Unit, <i>Ministry of Culture</i> (416-314-7146) should be contacted immediately. 4. Any person discovering human remains must immediately notify the office of the Heritage Operations Unit, <i>Ministry of Culture</i> (416-314-7146), the police or coroner, and the Registrar of Cemeteries, Cemeteries Regulation Unit, <i>Ministry of Government Services</i> (416-326-8404).

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
Built Heritage and Cultural Landscapes	Generally changes due to transit infrastructure projects have the potential to adversely affect cultural heritage landscapes and built heritage resources by displacement and/or disruption during and after construction.	Buildings near the intersection with Eglinton Avenue and Weston Road, Keele Street, Dufferin Street, Oakwood Avenue, Mount Pleasant Road and Bayview Avenue may be affected. Built heritage and/or cultural heritage landscapes may experience displacement (removal) or disruptions (by the introduction of physical, visual, audible or atmospheric elements that are not in keeping with their character and, or setting).	A Heritage Impact Statement (HIA) for the collection of buildings to be removed will be conducted during design phase. Documentation through the use of historical mapping and photography of the affected buildings will be conducted prior to removal in accordance with the requirements of the City of Toronto Heritage Preservation Services requirements. LRT Station entrances will be designed using context sensitive solutions in consultation with the City of Toronto, Heritage Preservation Services.	TTC will prepare Cultural Heritage Evaluation Reports and/or undertake Heritage Impact Assessments at select sites to address City of Toronto Heritage Preservation Services and City of Mississauga Local Municipal Heritage Committee requirements during the design phase.
Traffic Operations	Reduce level of services on vehicular traffic	Road improvements and cut-and-cover construction used for station construction and special track work areas will result in disruption to traffic operations along Silver Dart Drive, Convair Drive, Commerce Drive and Eglinton Avenue. At least three traffic lanes will be open to traffic and on-street parking will not be permitted during construction.	During the design process, TTC will work with the City of Toronto and the City of Mississauga to develop an acceptable approach for traffic maintenance during construction.	The contractor will be required to prepare and submit a detailed and comprehensive Traffic Management Plan, for review by TTC and the Toronto and Mississauga transportation departments. City Transportation Services will monitor.
Transit Services	Change to TTC bus routes and stops	A high-order transit service will replace some of the existing TTC routes. Stops/stations will be located where current TTC services, including buses and subways, intersect Eglinton Avenue in order to provide convenient passenger connections between those	For planning purposes, TTC staff have developed a preliminary bus plan to help guide discussion about LRT facilities and potential bus connections. The preliminary bus plan identifies the following changes to the existing bus network related to the Eglinton Crosstown LRT: <ul style="list-style-type: none"> • no parallel bus routes will be provided along Eglinton Avenue; • north-south arterial bus routes will continue to operate; • the Don Mills and Eglinton Station will include a new seven-bay 	TTC will require to continue to monitor the future transit service demands. A formal analysis of bus routing changes, including public consultation, will be undertaken between 12 and 18 months prior to the opening of the Eglinton Crosstown LRT.

Factor	Environmental Issue / Concern	Effect / Impact	Mitigation Measures	Monitoring / Future Work / Contingency
		(During Construction; During Operations)		
		services and the LRT.	bus terminal to service the 25N, 25S, 54 and 100 bus routes; <ul style="list-style-type: none"> the Keele and Eglinton Station will include a new four-bay bus terminal to service the 32C and 32D bus routes; and, the Caledonia Station will include a new bus loop to service the 47N and 47S bus routes. 	
Navigation	Potential impacts to navigation activities at watercourses	The Humber River, West Don River and East Don River are considered navigable. Therefore, modifications to the Humber River Bridge, including adding an LRT facility, and the West Don River Bridge and East Don River Bridge, including adding an LRT facility and associated bridge widening and possible reinforcement, may require an approval under the <i>Navigable Waters Protection Act</i> .	Measures to mitigate potential impacts on navigable waters will meet the <i>Navigable Waters Protection Act</i> requirements.	The <i>Navigable Waters Protection Act</i> approval will be obtained by TTC prior to construction at navigable waters.