Environmental Project Report

Eglinton East Light Rail Transit Project

CITY OF TORONTO & TTC

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Acronyms and Abbreviations

Acronym	Meaning
AAQC	Ambient Air Quality Criteria
ANSI	Areas of Natural and Scientific Interest
APEC	Areas of Potential Environmental Concern
ASI	Archaeological Services Inc.
BHR	Built Heritage Resources
BMP	Best Management Practices
BRT	Bus Rapid Transit
CAAQS	Canadian Ambient Air Quality Standards
CCME	Canadian Council of Ministers of Environment
CEAA	Canadian Environmental Assessment Act
CHER	Cultural Heritage Evaluation Reports
CHL	Cultural Heritage Landscapes
CHVI	Cultural Heritage Value or Interest
CN	Canadian National
CNP	Cycling Network Plan
CO	Carbon Monoxide
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRC	Community Recreation Centre
CREM	Corporate Real Estate Management
CUM	Cultural Meadow
CUMAP	City Utility Mapping
CUP	Cultural Plantation
CUS	Cultural Savannah
CUT	Cultural Thicket
CUW	Cultural Woodland
CVC	Credit Valley Conservation
DFO	Fisheries and Oceans Canada
DM CRC	Don Montgomery Community Recreation Centre
DSBRT	Durham-Scarborough Bus Rapid Transit
DWWP	Drinking Water Works Permit Application
EA	Environmental Assessment
EASR	Environmental Activity and Sector Registry
EB	Eastbound
EBL	Eastbound left
EBR	Eastbound right
EC	Environment Canada
ECA	Environmental Compliance Approval
ECLRT	Eglinton Crosstown Light Rail Transit
ECWE	Eglinton Crosstown West Extension
EEB	Emergency Exit Building
EELRT	Eglinton East Rail Transit
ELC	Ecological Land Classification
EMMP	Environmental Mitigation and Monitoring Plan
EPA	Environmental Protection Agency
EPR	Environmental Project Report
ESA	Environmental Site Assessment
ESA	Environmentally Sensitive Area
ESA	Environmentally Significant Areas
ESC	Erosion and Sediment controls
FAQ	Frequently Asked Questions
FHWA	Federal Highway Administration
FNTN	Frequent Rapid Transit Network
FOD	Deciduous Forest
FOM	Mixed Forest
FTA	Federal Transit Administration
GGH	Greater Golden Horseshoe
GHG	Greenhouse Gases
GTHA	Greater Toronto and Hamilton Area
HA	Hectare
HADD	Harmful Alteration Disruption, or Destruction
HC	Health Canada
HCM	Estimates the average density, speed, or delay over the peak 15 minutes of an hour
HEC-RAS	Hydraulic Watershed Modelling
HIA	Heritage Impact Assessments

Acronym	Meaning
IAA	Impact Assessment Act
IWG	Intersection Working Group
KLM	Kingston-Lawarence-Morningside
LID BMP	Low Impact Development Best Management Practices
LOS	Levels of Service
LRT	Light Rail Transit
LTL	Left Turn Lane
MAM	Meadow Marsh
MAS	Shallow Marsh
MASL	Metres Above Sea Level
MBCA	Migratory Birds Convention Act
MCM	Ministry of Citizenship and Multiculturalism
MCR	Municipal Consent Requirement
MECP	Ministry of the Environment, Conservation and Parks
MNR	Ontario Ministry of Natural Resources
MNRF	Ministry of Natural Resources and Forestry
MOE	Ministry of Environment
MPS	Midblock Pedestrian Signals
MSF	Maintenance and Storage Facility
MTO	Ontario Ministry of Transportation
MUP	Multi-purpose path
MX- DSBRT	Metrolinx Durham-Scarborough Bus Rapid Transit
MX	Metrolinx
MX-SEE	Metrolinx Scarborough Subway Extension
NAAQO	National Ambient Air Quality Objectives
NAPS	National Air Pollution Surveillance
NB	Northbound
NBL	Northbound left
NBR	Northbound right
NHIC	Natural Heritage Information Centre
NIA	Neighbourhood Improvement Areas
NO_2	Nitrogen Dioxide
NSSP	Spill Prevention and Response Contingency Plan
O&M	Operations and Maintenance
OASD	Ontario Archaeological Sites Database
OBBA	Ontario Breeding Bird Atlas
OGS	Ontario Geological Survey
OHA	Ontario Heritage Act
OP	Official Plan
OPSS	Ontario Provincial Standard Specification

Acronym	Meaning
OTC	Ontario Traffic Council
OTM	Ontario Traffic Manual
OWRA	Ontario Water Resources Act
PAH	Polycyclic Aromatic Hydrocarbons
PCA	Potentially Contaminating Activities
PDBC	Preliminary Design Business Case
PHC	Petroleum Hydrocarbons
PMTSA	Protected Major Transit Station Areas
POL	Petroleum, Oil or Lubricants
POR	Point of Reception
PPJ	People Plus Jobs
PPS	Provincial Policy Statement
PPUDO	Passenger Pick Up and Drop Off
PRWG	Public Realm Working Groups
PSW	Provincially Significant Wetland
PTTW	Permit to Take Water
PXO	Pedestrian Crossovers
Q4	Quarter 4
RER	Regional Express Rail
RFQ	Request for Qualifications
RNFP	Ravine and Natural Feature Protection
ROW	Right-of-way
RSC	Record of Site Conditions
RT	Regional Transportation
RTEF	Rapid Transit Evaluation Framework
RTL	Right Turn Lane
RTP	Regional Transportation Plan
SAG	Stakeholder Advisory Committee
SB	Southbound
SBR	Southbound Right
SELRT	Sheppard East Light Rail Transit
SMLRT	Scarborough-Malvern Light Rail Transit
SOE	Support of Excavation
SOV	Single Occupancy Vehicle
SP	Secondary Plan
SRS	Stations, Rail and Systems
SRT	Scarborough Rapid Transit
SSE	Sheppard Subway Extension
SUE	Subsurface utility investigations
SWC	Coniferous Swamp
SWM	Mixed Swamp

Acronym	Meaning
SWT	Thicket Swamp
TAC	Technical Advisory Committee
TAC	Transportation Association of Canada
TBM	Tunnel Boring Machine
TCRP	Transit Cooperative Research Program
TDSB	Toronto District School Board
TOB	Top of Bank
TOC	Transit-Oriented Communities
TOD	Transit Oriented Development
TPAP	Transit Project Assessment Process
TPSS	Traction Power Substation
TRCA	Toronto and Region Conservation Authority
TRPAP	Transit and Rail Project Assessment Process
TSS	Total Suspended Solids
TTC	Toronto Transit Commission
TTMP	Traffic and Transit Management Plan
TWLTL	Two Way Left Turn Lane
UCM	Utility Conflict Management
UTSC	University of Toronto Scarborough Campus
UTSC-SP	University of Toronto Scarborough Secondary Plan
VOC	Volatile Organic Compounds
WB	Westbound
WBL	Westbound left
WBR	Westbound right

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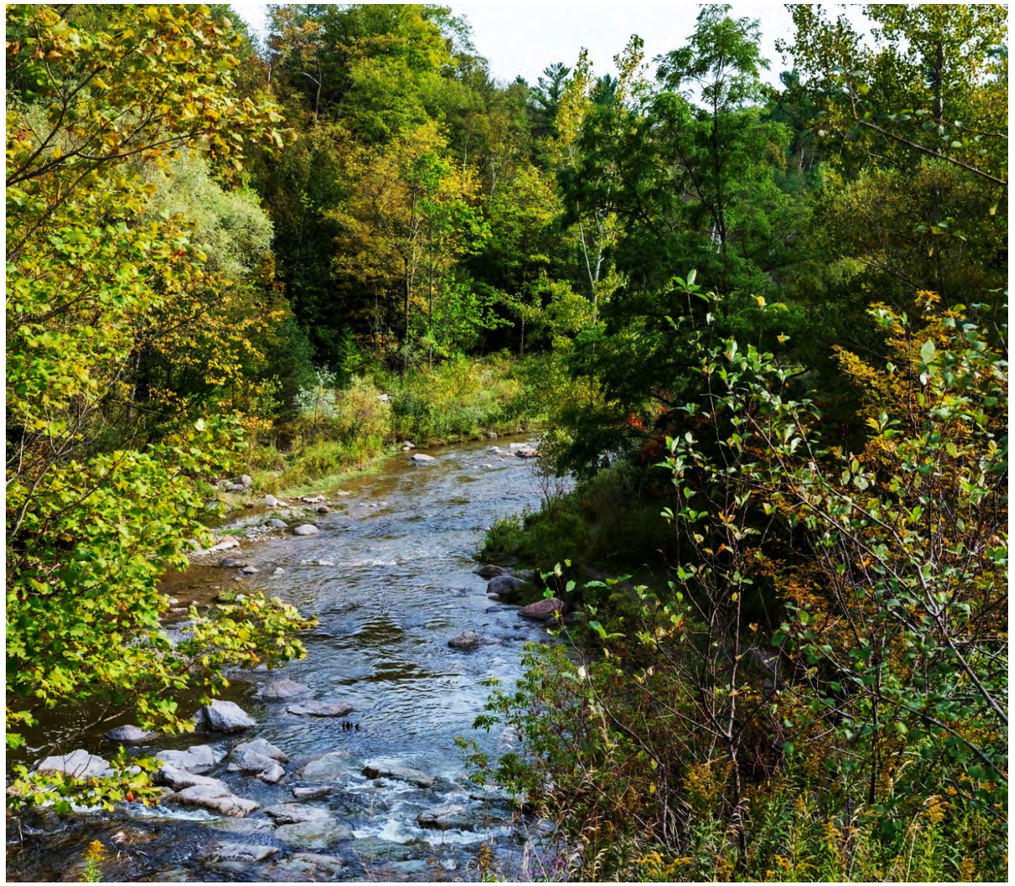
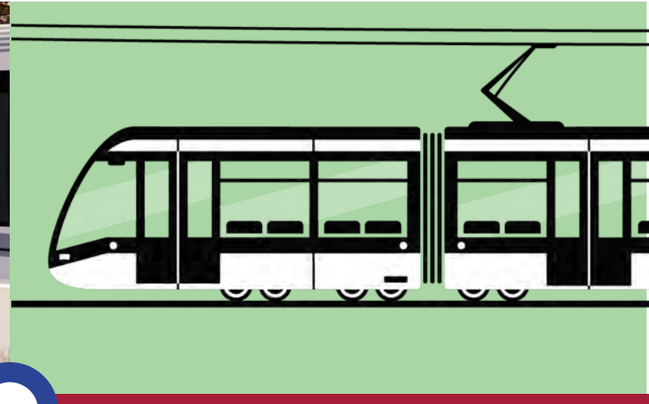
Land Acknowledgement

The City of Toronto and TTC acknowledge that the project is located on the traditional territory of many nations including the Mississaugas of the Credit, the Anishnabeg, the Chippewa, the Haudenosaunee and the Wendat peoples and the area is now home to many diverse First Nations, Inuit and Métis peoples. The City and TTC also acknowledge that Toronto is covered by Treaty 13 signed with the Mississaugas of the Credit, and the Williams Treaties signed with multiple Mississaugas and Chippewa bands.





Executive Summary

The City of Toronto and the Toronto Transit Commission (TTC) (collectively known as the Proponents) are seeking environmental approval for the Eglinton East Light Rail Transit ('EELRT' or 'the project'). A portion of the project was approved as part of the 2007 Transit City Plan in 2009. In September 2021, the 10% design process of the Transit and Rail Project Assessment Process (TRPAP) was initiated.

The purpose of this Environmental Project Report (EPR) is to document the TRPAP by providing:

- A review of past planning activities related to the project;
- A description of the transit project, including a description of the preferred design;
- A summary of existing conditions;
- An analysis of the project's benefits, impacts, and associated mitigation and monitoring measures;
- A record of engagement and feedback; and
- A list of future commitments.

Please note that the EPR was drafted following the change in the assessment process name from transit project assessment process (TPAP) to transit and rail project assessment process (TRPAP), though some supporting studies were completed prior. All future instances of "transit project assessment process" and "TPAP" in this document and its appendices refer to the transit and rail project assessment process.

Artist's concept, subject to change.

Project Background

The EELRT includes the implementation of light rail transit (LRT) and extensive public realm improvements including landscaping, cycling, and pedestrian infrastructure along Eglinton Avenue East, Kingston Road, Morningside Avenue, New Military Trail, Sheppard Avenue East, and Neilson Road between Kennedy Station and the future Line 2 terminus at Sheppard and McCowan with a spur along Neilson Road from Sheppard Avenue East to Tapscott Road.

The EELRT was originally conceived as an extension of Line 5 with a partially at-grade and tunneled alignment. As a result of constructability challenges at Kennedy Station with the Scarborough Subway Extension, the current distinct service alignment was adopted. The distinct service alignment would avoid the following adverse impacts compared with a through service:

- Estimated additional $2.1 billion ($2022) in upfront property, construction, and vehicle.
- Delayed EELRT opening by three to four years.
- Nearly 20-year construction period at Kennedy-Falmouth when accounting for both SSE and EELRT construction, which is six to eight years longer than the distinct service option.
- Extensive property impacts along the north side of Eglinton between Midland Avenue and Bimbrok Road, displacing local businesses and curtailing transit-oriented development potential.
- Significant interface risks with SSE and reaching commercial agreements with Metrolinx and Crosslinx with regards to Line 5 through service on the EELRT.

Decoupled from Line 5, EELRT design requirements can be customized to meet the unique characteristics of the corridor. The benefits of the distinct-service concept include:

- Avoiding dependency on the Line 5 technology, vehicles, operations, and maintenance requirements.
- Ability to tailor EELRT service to the projected demand east of Kennedy Station to provide operational flexibility while improving service.
- Opportunity to acquire light rail vehicles that are tailored specifically for the EELRT including shorter and higher performance trains.
- With shorter trains, eliminating the need for a tunnel alignment on Kingston Road between Lawrence Avenue and Morningside Avenue.
- With higher performance trains, avoiding the need for a new LRT bridge across the Highland Creek valley.
- Shorter platforms to reduce property impacts.
- The resulting significant cost savings compared with the through-service option.

Based on these benefits, City Council in June 2022 approved advancing the 10% design for the EELRT as a distinct-service with an at-grade interface at Kennedy Station, from Kennedy Station to Malvern Town Centre, and for the Sheppard Avenue segment from Neilson Road to

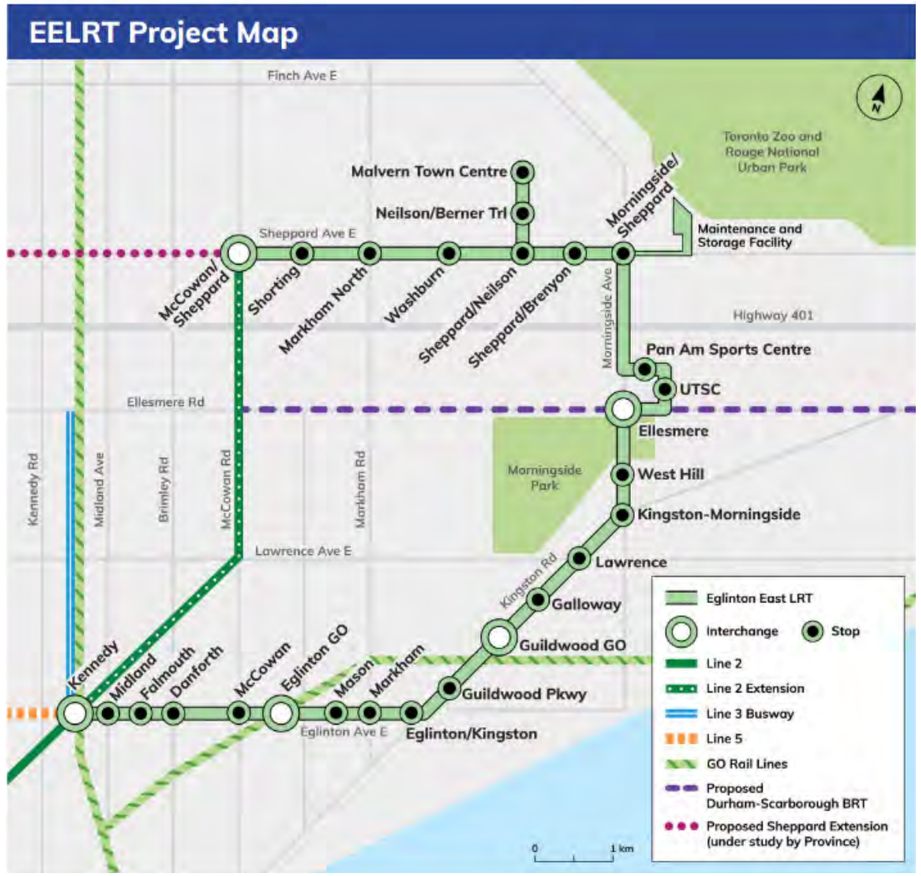
McCowan Road. The EELRT alignment including stations and a preferred Maintenance and Storage Facility (MSF) at Conlins Road and Sheppard Avenue East was approved by Toronto City Council in December 2023.

Project Description

The EELRT is a proposed 18.6 km light rail transit system in Scarborough in the City of Toronto. The EELRT will travel at-grade on a semi-exclusive LRT guideway, following existing or planned streets. The line will run from Kennedy Station to Malvern Town Centre via the University of Toronto Scarborough Campus (UTSC), with a connection to the future Line 2 terminus at Sheppard Avenue and McCowan Road. Key features of the project consist of:

- 18.6 km of revenue trackage and 0.8 km of non-revenue trackage.
- Proposed service frequency of 4-5 minutes during peak periods.
- 27 stations / stops along the alignment, designed for level boarding and barrier-free access, including:
  - A connection to Line 2 (Bloor-Danforth) and Line 5 (Eglinton Crosstown LRT) at Kennedy Station.
  - A connection to the Scarborough Subway Extension (SSE) and Line 2 through the future station at Sheppard-McCowan, which may also connect to the Sheppard (Line 4) Extension being explored by the Province.
  - Three connections to GO regional rail at Kennedy, Eglinton, and Guildwood GO stations.
  - Three stops near and on the University of Toronto Scarborough Campus (UTSC) to align with proposed UTSC Master Plan, including two connections with the proposed Durham-Scarborough Bus Rapid Transit (DSBRT).
- Preferred Maintenance and Storage Facility (MSF) at Conlins Road and Sheppard Avenue (8300 Sheppard Avenue East).
- 16 Traction Power Substations (including one located within the MSF site) to provide the necessary power for the EELRT.
- Incorporation of public realm improvements throughout the corridor, primarily through the implementation of 'Complete Streets' enhancing multi-modal transportation options by providing dedicated and safe bicycle and pedestrian infrastructure.
- Support for other key City priorities, including TransformTO Net Zero Strategy and Vision Zero Plan.
- Modifications to seven existing bridges / crossings.
- Maximum vehicle length of 50 m.

At the functional 10% design stage, the EELRT design is subject to future refinement and further development. Elements such as the service concept, vehicle technology, LRT station and stop amenities, streetscaping, maintenance and storage requirements and property impacts will be confirmed in future phases of the design.



Project Vision and Key Benefits

The EELRT will provide rapid transit service to historically underserved communities in the City, travel through or adjacent to seven Neighbourhood Improvement Areas and Emerging Neighbourhoods and bring higher-order transit within walking distance of an estimated additional 81,000 people in 2041. By providing convenient connections to other transit services such as subway and GO, the EELRT will also provide more transportation options for residents in eastern Scarborough.

More than a transit project, EELRT will also bring significant public realm improvements throughout the corridor, primarily through the implementation of 'Complete Streets' design principles. Among other improvements, Complete Streets designs enhance multi-modal transportation options by providing dedicated and safe bicycle and pedestrian infrastructure along the LRT corridor.

The following encapsulate the vision and key benefits of the EELRT project:

- EELRT is a City of Toronto priority transit expansion project.
- EELRT aims to provide high quality, higher-order transit service in a dedicated right-of-way to underserved communities in the City.
- EELRT supports future growth and development of complete communities.
- EELRT serves local destinations and connects Scarborough to other higher-order transit projects.
- EELRT primes the opportunity for an LRT network in Scarborough.
- EELRT is a distinct line fit for purpose and is to facilitate strategic connections and transfers to the greater transit network.
- EELRT is a transit project, but also Complete Streets retrofit, infrastructure renewal, Vision Zero, and TransformTO project.

Summary of The Planning Process

Several studies have been prepared for the project in support of the TRPAP. The findings of these studies as they relate to the existing conditions in the study area and to the impacts of the project are summarized below. A summary of consultation is also provided.

Existing Conditions

The project study area (defined in Section 1.4 of the EPR) is located entirely in Scarborough, the eastern part of the City of Toronto. The LRT alignment begins at Kennedy Station travelling along Eglinton Avenue East, Kingston Road, Morningside Avenue, Ellesmere Road, New Military Trail, Morningside Avenue, and Sheppard Avenue East, terminating at the under-construction Line 2 Station at McCowan Road. The alignment also includes a branch off Sheppard Avenue East along Neilson Road to the Malvern Town Centre at Tapscott Road. Non-revenue trackage to connect with the MSF site at Sheppard Avenue East and Conlins Road is also part of the project. Section 4 of the EPR discusses the existing conditions in more detail.

Existing conditions in the project study area are summarized below:

- **Transportation:** A range of existing transit services (including local buses, dedicated bus lanes and connections to existing higher-order transit (Line 2) and regional GO Transit services, under-construction transit (Line 2 Extension and Line 5), and planned transit infrastructure (Sheppard Line 4 Extension). The active transportation network consists of sidewalks with limited cycling infrastructure. The typical road right-of-way in the study area is mostly 36 m with a posted speed limit of 50 km/h. The road configuration varies along the study area but ranges between 4 lanes to 6 lanes in, with turning lanes at intersections.
- **Infrastructure:** A range of existing utilities, including multiple medium-to-large sanitary sewers, transmission watermains and crossing storm sewers that manage stormwater runoff into one of two TRCA-regulated watersheds: the highly urbanized Highland Creek watershed and the Rouge River watershed.
- **Socio-Economic Environment:** A range of different land uses including residential neighbourhoods, apartments, mixed use, institutional, and employment uses. Compared to City-wide averages, the neighbourhoods adjacent to the EELRT are two to three times denser, have a higher prevalence of low-income households and have high cultural diversity, with up to 80% of the study area population being visible minorities.
- **Natural Environment:** The study area spans two physiographic regions: the South Slope and the Lake Iroquois Plain. The bedrock geology consists of the upper Ordovician Georgian Bay Formation, primarily composed of shale. Aquatic habitats investigated include the Highland Creek and Rouge River watersheds, with detailed observations on fish species and habitat conditions at watercourse road crossings. Vegetation communities identified in the area are diverse, influenced by human disturbance, and cover various terrestrial and wetland ecosystems. The study area's natural environment is highly urbanized and contains Areas of Natural and Scientific Interest (ANSI), Provincially Significant Wetlands and Environmentally Sensitive Areas (ESA) (Morningside Park ESA and the Highland Forest ESA), which support high quality forest and wetland habitats and several locally rare plant species. Wildlife in the area is diverse, with 41 species recorded, including birds and mammals, and some species at risk identified.
- **Cultural Environment:** A review of federal, provincial, and municipal registers, inventories, and databases and background information shows that there are two (2) known and five (5) potential built heritage resources (BHRs) as well as one (1) known and three (3) potential cultural heritage landscapes (CHLs) in the study area. Fieldwork was completed during the TRPAP to support the development of Cultural Heritage Evaluation Reports and confirm cultural significance for resources identified as having potential value. The assessment confirmed that no Cultural Heritage Value or Interest (CHVI) has been found for resources identified for further evaluation. The Stage 1 Archaeological Assessment (AA) for the study area determined that 18 previously registered archaeological sites are located within one km of the study area, two of which are within approximately 50 metres and do not exhibit further cultural heritage value or interest. The property inspection identified 7 properties that exhibit archaeological potential (beyond areas that have been previously assessed or are disturbed) and will require a Stage 2 AA.
- **Emissions:** Air quality representative of urban environment with limited air quality parameters exceeding air quality standards. Under existing conditions, ambient noise levels in the study area are generally higher than the MECP/TTC Protocol guideline minimums of 55 dBA (daytime) and 50 dBA (nighttime), reflective of an urban environment.

Impacts, Mitigation and Monitoring

Based on the existing conditions and a review of potential impacts and mitigation, the project is expected to have a net positive impact on the study area. Potential impacts are mitigatable, and appropriate measures have been identified to minimize negative effects during construction and operations phases. The project's impacts, mitigation measures, and monitoring activities are summarized below and are detailed in Section 5 of the EPR.

	Impact	Mitigation and Monitoring
Active Transportation	• Significant improvements to active transportation along the entirety of the LRT corridor with wider sidewalks, dedicated cycling facilities, multi-use paths and protected intersections, where feasible.	• None
Transit	• Frequent and reliable LRT service complemented by a realigned bus network and connections to existing and planned higher-order transit. • Improved transit connectivity to businesses, jobs and residences, benefitting underserved communities and supporting future growth and complete communities.	• To mitigate impacts of potential permanent rerouting of existing bus routes, it is recommended to divert local bus routes to intersect and feed the LRT in locations where passengers can transfer conveniently. • Maintain local bus service along segments with wider LRT stop spacing and developing a complementary transit network to make taking transit easier.
Traffic	• Reduction of vehicle lanes to accommodate transit. • Increased travel times for people driving due to LRT implementation. Increases will be specific to each corridor, will need to incorporate mode shift, and will be confirmed during future phases of design. • Localized impacts such as road realignments or extensions, notably at Beath Street, which will be extended beyond its current terminus at Morningside Avenue west to Rodda Boulevard. • Potential for traffic to impact adjacent neighbourhoods in areas where certain intersections are more difficult to access due to the centre-running LRT. • Changes to roadway configuration to improve safety aligned with current City of Toronto guidelines.	• Increase multi-modal capacity, thereby increasing the overall capacity of the EELRT corridor, to counter reduction in vehicle lanes. • Coordinate traffic signals to minimize delays for drivers. • Provide adequate signage and advance notice regarding stop relocation and route rerouting. • Monitor live conditions and adjust service to maintain acceptable performance. • Monitor traffic volumes and adjust signal timings as necessary.
Property Impacts	• According to the functional (10%) design, approximately 380 properties would be impacted to fit all elements of the LRT and public realm improvements. It should be noted that the actual property requirements can only be determined through the completion of detailed design.	• Optimize the project's design in future phases to minimize property acquisition requirements. • Ensure that individual property owners' rights are respected and protected, and that fair compensation is provided within the framework of the Expropriations Act for any property interest acquired or affected by civic projects. • Emphasize negotiation and the achievement of a mutually satisfactory agreement between the City and the owners. • Engage with and continuously inform communities, residents, business owners, and institutions who may be directly impacted by the project.
Construction Impacts	• Temporary rerouting of transit services, auto traffic, cycling routes, and sidewalks around construction zones. • Dust from construction activities. • Potential impacts to built heritage resources due to construction vibration. • Access challenges to businesses and services along the project corridor. • Temporary impacts to public realm elements, such as sidewalks and trees. • Some hydraulic structure enhancements required to support increased roadway width and meet current design standards. • Bridge widenings required at two locations. • Utility relocations required as a result of the LRT centre median guideway.	• Retain RapidTO bus lanes during construction, where possible. • Coordinate road closures and stage construction activities in the same area. • Develop a Traffic and Transit Management Plan as part of construction requirements to provide alternatives to RapidTO, if impacted. • Develop an Emergency Response Plan during the construction phase. • Prepare a Dust Management Plan to identify ways to minimize dust and emission during construction. • Undertake a baseline vibration assessment for potentially impacted properties during detailed design. • Develop an Erosion and Sediment Control Plan for site-specific erosion and sedimentation control measures. • Develop a Construction Staging and Mitigation Plan.
Socio-Economic Environment	• The EELRT will bring higher-order transit within walking distance of an estimated additional 81,000 people in 2041, providing increased access to historically underserved communities throughout Scarborough. • Impact to small businesses during construction. • Potential for gentrification and change in land use and urban fabric due to development.	• Integrate EELRT impacts and implementation into ongoing planning studies (Avenue Study, EHON) to achieve city-building objectives and support strong neighbourhoods.

	Impact	Mitigation
Natural Environment	• Some displacement and disturbance of wildlife and wildlife habitats at the MSF site. • Fish habitats and woodlots impacted at Highland Creek and other watercourse crossings. • Limited overall impact to vegetation communities, with some removals of vegetation and wetland communities. • No impact to aquatic species at risk. • Potential impact to two bird species at-risk.	• Complete a wildlife sweep prior to construction. • Ensure the project is designed to minimize impact on the natural environment. • Develop an Invasive Species Management Plan. • Conduct a Tree Inventory Study to manage tree resources and ensure preservation of forests, parks, and other green spaces. • Develop a Restoration and Enhancement Plan, which would include details about tree replanting.
Cultural Environment	• Impacts to three built heritage resources and one cultural heritage resource. Impacts include property encroachments, the potential for structural removals, and indirect impacts during construction (see the Construction Impacts section later in this document). • No impact to Provincial Heritage Properties or Provincial Heritage Properties of Provincial Interest. • Archaeological potential was identified at several sites along Kingston Road, Ellesmere Road, Sheppard Avenue East, and Neilson Road.	• Completed a Cultural Heritage Evaluation as part of the TRPAP to determine if properties have heritage value. • For properties with known cultural heritage value, complete a Heritage Impact Assessment during detailed design. • Complete a Stage 2 Archaeological Assessment for these seven sites. • Coordinate with interested Indigenous Communities and conduct a Stage 2 Archaeological Assessment on site that require it. Should the proposed work extend beyond the current study area, conduct further archaeological assessments to determine the archaeological potential of the surrounding lands.
Air Quality	• Decrease in vehicle-related emissions by along the route, including an 18% decrease in GHG emissions, resulting in improved local air quality. • The MSF and LRT stops will have negligible effects on air quality.	• None required.
Noise and Vibration	• Maximum ground-borne vibration levels from operations are predicted to meet acceptable criteria. • If left unmitigated, noise levels may exceed acceptable criteria in areas surrounding Military Trail, UTSC, Neilson Road, and the MSF.	• Employ track and wheel treatments along with property line noise barriers to mitigate sound levels to meet applicable guidelines at all noise sensitive areas. • Implement robust complaint response procedures to ensure timely response and corrective actions.
Climate Change and Sustainability	• EELRT is a low-carbon sustainable transportation system that also encourages active travel as well. • The EELRT avoids disruption to natural spaces by primarily operating within the established public ROW.	• None required.

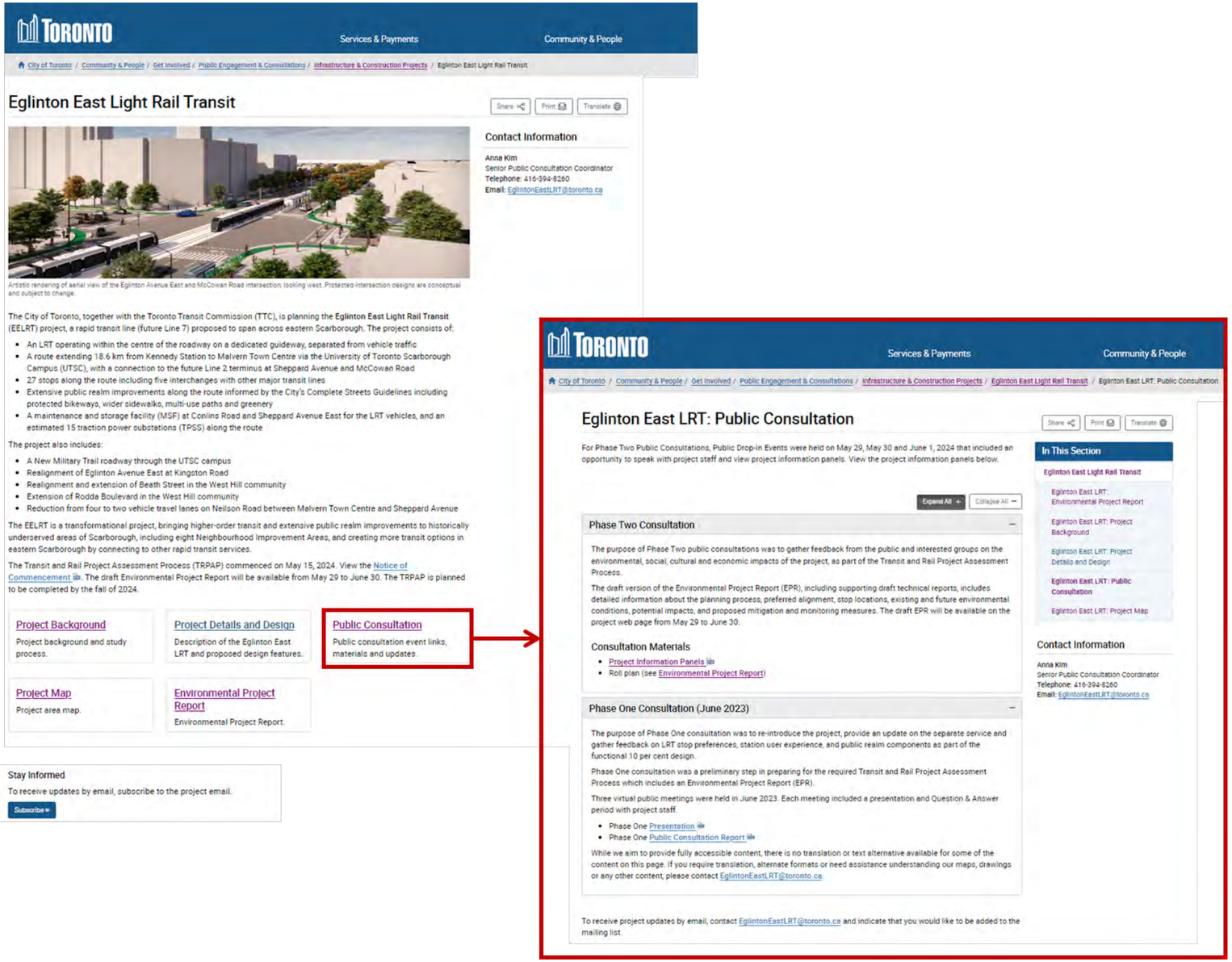
Consultation and Engagement

The TRPAP engagement period began following the issuance of the Notice of Commencement on May 15, 2024 and completed as of the filing of the Notice of Completion on September 10, 2024. To date, the project engagement efforts have included:

- Public Open Houses (both in-person and virtual);
- Regular Technical Advisory Committee (TAC) meetings;
- Stakeholder Advisory Group (SAG) and Interest Group meetings;
- Meetings with and circulation of project materials to key stakeholders , including University of Toronto Scarborough Campus (UTSC), Metrolinx, Ontario Ministry of Transportation (MTO);
- Meetings and correspondence with various regulatory agencies including Ministry of Environment, Conservation and Parks (MECP), Toronto Region Conservation Authority (TRCA), Ministry of Citizenship and Multiculturism, and Credit Valley-Toronto and Region-Central Lake Ontario (CTC) Source Protection Region.
- Meetings with impacted property owners and real estate investment trusts; and
- Consultation with Indigenous Communities.

Project engagement will continue through detailed design and construction. Additionally, a project website has been maintained by the City of Toronto.

A more detailed breakdown of the consultation activities (during Pre-Planning and TRPAP phases) can be found in Section 6 of the EPR. The consultation record is in **Appendix L.**

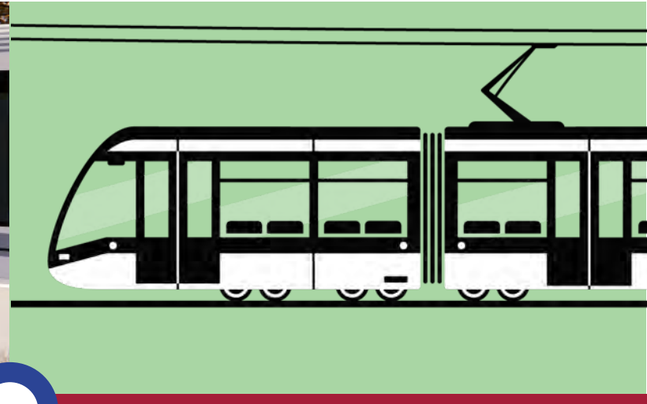


Next Steps

Before construction and operation of the project, the City of Toronto and TTC, as the proponents, have made commitments on completing future actions related to transportation, infrastructure, utilities design, socio-economic, natural, and cultural environments, emissions, climate change and sustainability, property impacts, consultation, implementation, and operations and management. These future commitments are outlined in Section 8 of the EPR. Engagement with external stakeholders, regulatory agencies, the public, property owners and Indigenous Communities will continue as the project advances.

The project will be implemented in accordance with applicable municipal, provincial, and federal laws and regulations. The City of Toronto and TTC will obtain necessary permits and approvals for the construction and operation of the Project.

In advance of commencing construction activities, and during construction, mitigation measures will be implemented. Monitoring activities will continue throughout construction and upon completion of construction, where required. Traffic, transit, emergency response, construction and environmental management plans will be developed to outline protection measures for features located in and around the project footprint in order to minimize disruption and further define the monitoring measures. Mitigation includes coordination amongst project interfaces, especially at Kennedy and Sheppard-McCowan Stations to reduce the negative impacts of construction on surrounding residents and businesses.



1 Introduction

1.1 Study Overview

The Eglinton East Light Rail Transit (referred to as 'EELRT' or 'the project') is a proposed 18.6 km light rail transit (LRT) system in Scarborough, Toronto. The line will run from Kennedy Station to Malvern Town Centre via the University of Toronto Scarborough Campus (UTSC), with a connection to the future Line 2 terminus at Sheppard Avenue and McCowan Road. Key features of the project include:

- 18.6 km of revenue trackage and 0.8 km of non-revenue trackage.
- Proposed service frequency of 4-5 minutes during peak periods.
- Connection to Line 2 (Bloor-Danforth) and Line 5 (Eglinton Crosstown LRT) at Kennedy Station.
- Connection to the SSE and Line 2 through the future station at Sheppard-McCowan, which may also connect to the Sheppard (Line 4) Extension being explored by the Province.
- Three connections to GO regional rail at Kennedy, Eglinton, and Guildwood GO stations.
- Three stops near and on the University of Toronto Scarborough Campus (UTSC) to align with proposed UTSC Master Plan, including two connections to the proposed Durham-Scarborough Bus Rapid Transit (DSBRT).
- Preferred Maintenance and Storage Facility (MSF) at Conlins Road and Sheppard Avenue (8300 Sheppard Avenue East)
- Incorporation of public realm improvements throughout the corridor, primarily through the implementation of 'Complete Streets' enhancing multi-modal transportation options by providing dedicated and safe bicycle and pedestrian infrastructure; and
- Support for other key City priorities, including TransformTO Net Zero Strategy and Vision Zero Plan.

1.2 Study Purpose

The primary purpose of this study is to update and complete technical and environmental study and impact assessment, stakeholder engagement, and other documentation in accordance with Ontario Regulation 231/08: Transit and Rail Project Assessment Process (O.Reg. 231/08) in order for the City of Toronto (the City) to obtain a Notice to Proceed for the Eglinton East LRT (EELRT) from the Minister of the Environment, Conservation, and Parks (MECP). In addition, the project confirms and updates the EELRT core network and Maintenance & Storage Facility (MSF) up to a consistent functional 10% level of design.

1.3 Project Vision and Key Benefits

The EELRT will provide transit to historically underserved communities in the City, travel through or adjacent to seven Neighbourhood Improvement Areas and Emerging Neighbourhoods and bring higher-order transit within walking distance of an estimated additional 81,000 people in 2041. By providing convenient connections to other transit services such as the subway and GO, the EELRT will also provide more transportation options to residents in eastern Scarborough.

More than a transit project, EELRT will also bring significant public realm improvements throughout the corridor, primarily through the implementation of Complete Streets design principles. Among other improvements, Complete Streets designs incorporate landscaping improvements and enhance multi-modal transportation options by providing dedicated and safe bicycle and pedestrian infrastructure along the LRT corridor.

The following encapsulate the vision and key benefits of the EELRT project:

- EELRT is a City of Toronto priority transit expansion project.
- EELRT aims to provide high quality, higher-order transit service in a dedicated right-of-way to underserved communities in the City.
- EELRT supports future growth and development of complete communities.
- EELRT serves local destinations and connects Scarborough to other higher-order transit projects.
- EELRT primes the opportunity for an LRT network in Scarborough.
- EELRT is a distinct line fit for purpose and is to facilitate strategic connections and transfers to the greater transit network.
- EELRT is a transit project, but also Complete Streets retrofit, infrastructure renewal, Vision Zero, and TransformTO project.

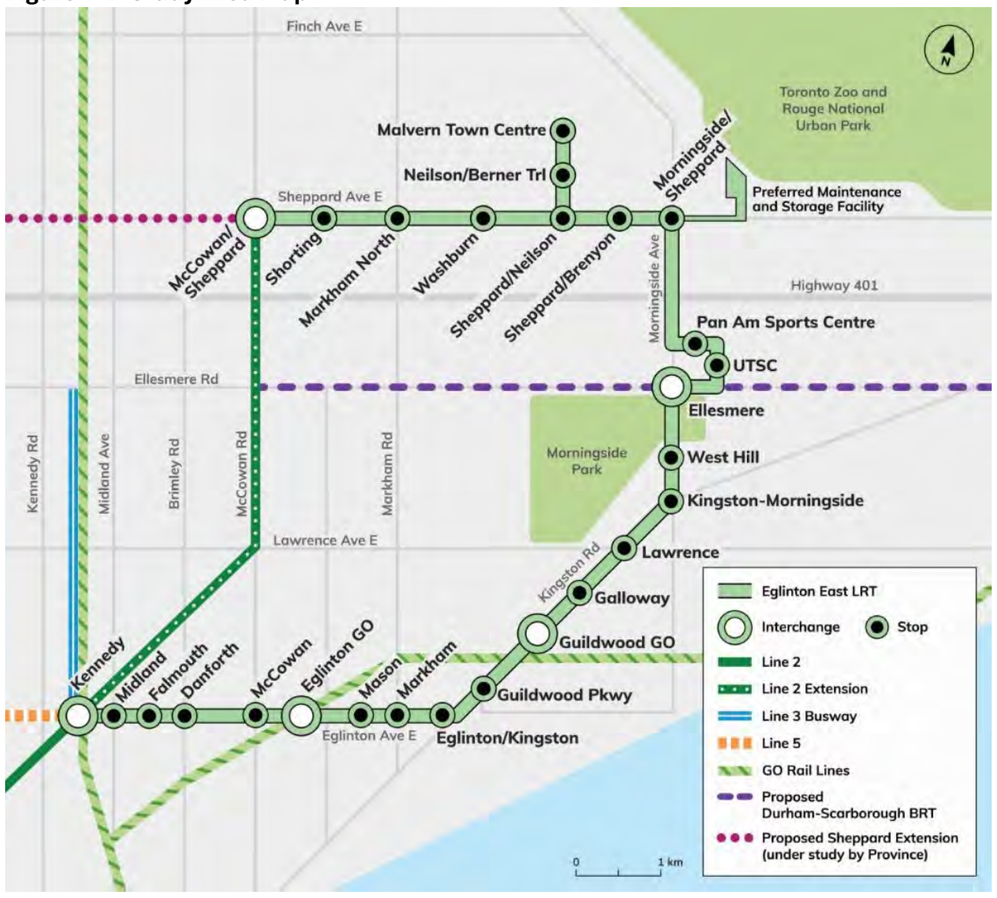
1.4 Study Area

The EELRT study area is located entirely in Scarborough, the eastern part of the City of Toronto. The LRT alignment begins at Kennedy Station travelling along Eglinton Avenue East, Kingston Road, Morningside Avenue, Ellesmere Road, New Military Trail, Morningside Avenue, and Sheppard Avenue East, terminating at the under-construction Line 2 Station at McCowan Road. The alignment also includes a branch off Sheppard Avenue East along Neilson Road to the Malvern Town Centre at Tapscott Road.

The study area also includes the non-revenue trackage to connect with the MSF site at Sheppard Avenue East and Conlins Road.

Figure 1-1 shows the alignment for the EELRT highlighting key points along the route.

Figure 1-1: Study Area Map

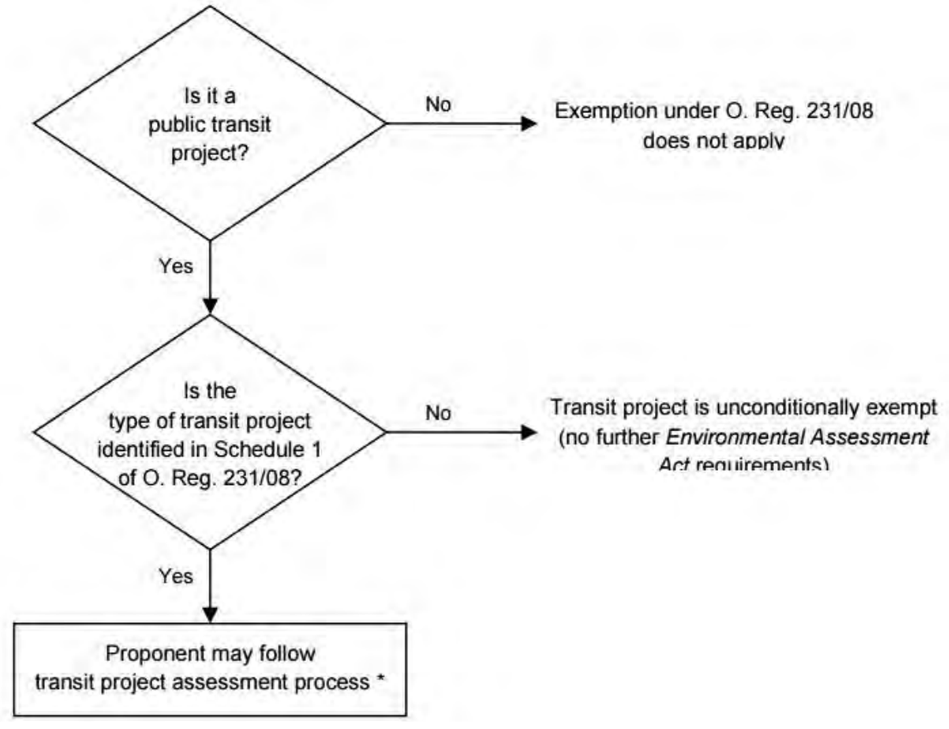


The EELRT is expected to interchange with Line 2 at Kennedy and Sheppard-McCowan stations, the Stouffville line at Kennedy GO, the Lakeshore East line at Eglinton and Guildwood GO, the future Durham-Scarborough Bus Rapid Transit (DSBRT) at Ellesmere Road and Morningside Avenue, and the Sheppard (Line 4) Extension being explored by the Province at Sheppard-McCowan station.

1.5 Study Process

The study was conducted in accordance with the Ontario Regulation 231/08: Transit and Rail Project Assessment Process (O.Reg. 231/08), which permits all proponents of public transit projects to proceed with the Transit and Rail Project Assessment Process (TRPAP) instead of the traditional process through Part II of the Environmental Assessment Act. The eligibility process for the use of a TRPAP over the full Class EA is shown in a flowchart in Figure 1-2.

Figure 1-2: TRPAP Eligibility Criteria



The TRPAP process involves a pre-consultation phase followed by an up to 120-day TRPAP phase to analyze a project's environmental impacts. As such, the study is structured into two stages: Pre-Planning and TRPAP. A variety of Pre-Planning activities were undertaken prior to the issuance of the Notice of Commencement for the TRPAP, including:

- Completion of technical studies, including transportation, natural heritage, cultural heritage, archaeology, Phase I ESA, air quality, and noise and vibration (as discussed in Chapter 4 and Chapter 5 of the Environmental Project Report),
- Development of alternative designs,
- Development of the recommended preliminary engineering design,
- Assessment of impacts and development of mitigation measures; and
- Preparation and implementation of a consultation program.

Prior to the TRPAP, an initial design phase and consultation period is required.

Figure 1-3 shows the process of the TRPAP in relation to these preliminary studies and processes.

Figure 1-3: Overall Study Process

1.6 Transit and Rail Project Assessment Process

A Transit and Rail Project Assessment Process (TRPAP) is a proponent-driven, expedited Environmental Assessment (EA) process specifically designed for transit projects. Formerly known as the Transit Projects and Metrolinx Undertakings and referred to as the Transit Project Assessment Process (TPAP), Ontario Regulation 231/08 was amended in February 2024 and outlined changes to terminology, communication and engagement for transit and rail projects. The amendment bore no changes to the EA process or timeline itself.

Proponents must follow the prescribed steps in the TRPAP within specified timeframes, culminating with the Minister of the Environment's decision within six (6) months of the start of the process, which is marked by the Notice of Commencement.

The six-month timeline includes:

- Up to 120 days for consultation on positive or negative environmental impacts and the preparation of an Environmental Project Report (EPR),
- 30 days for the public, regulatory agencies, Indigenous Communities, and other interested parties to review and comment on the final EPR,
- 35 days for the Minister of the Environment to respond to public requests for a review of the project.

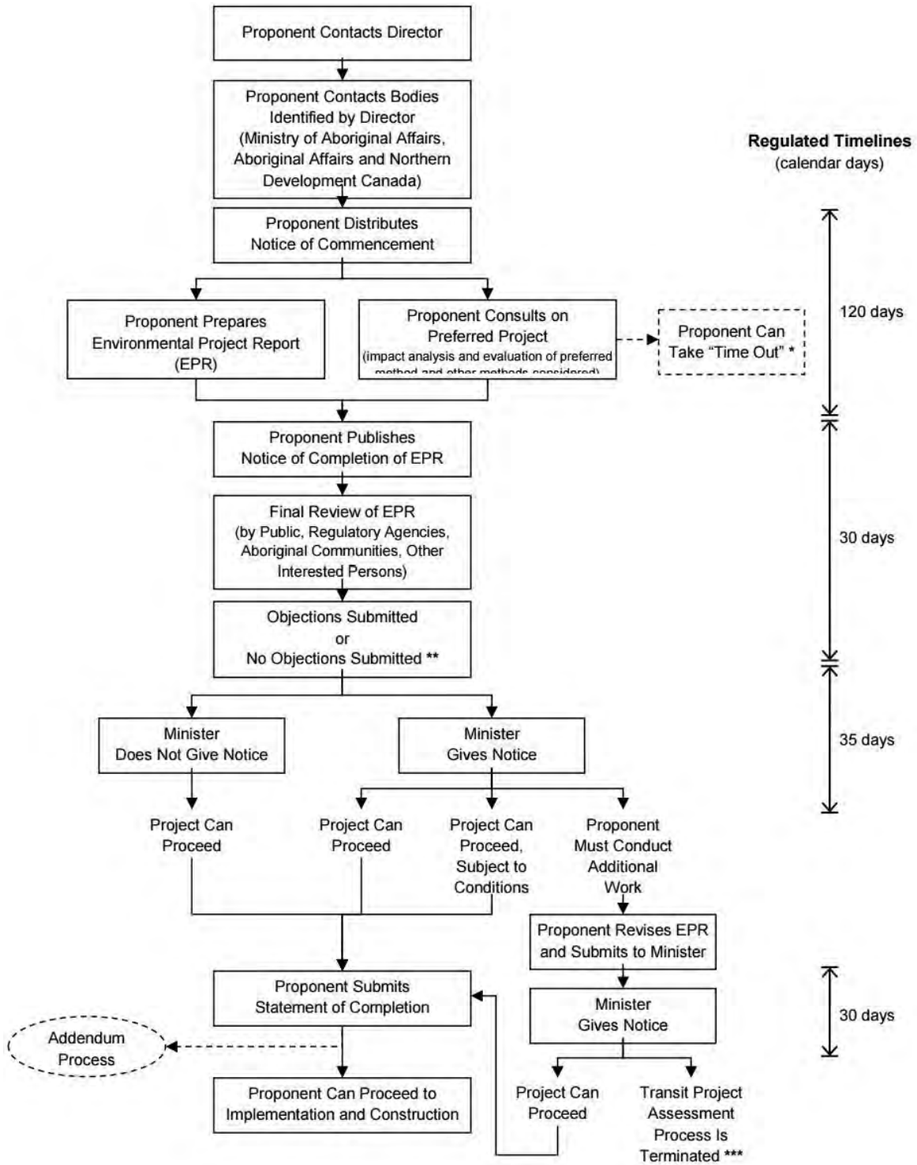
The key steps in the TRPAP are:

- Identify Indigenous Nations that may be interested in the transit project,
- Distribute Notice of Commencement,
- Consult with interested persons, including regulatory agencies and Indigenous Groups and document the process,
- Publish a Notice of Completion of the EPR,
- Provide 30 days for the public, regulatory agencies, Indigenous Groups, and other interested persons to review the EPR,
- Provide 35 days for Minister to act; and,
- Submit a Statement of Completion

A user-friendly guide to the transit projects assessment process was developed by the Ministry of the Environment, Conservation and Parks, and is available on the Ministry's website: https://www.ontario.ca/page/guide-environmental-assessment-requirements-transit-projects. Please note that the MECP site has not been updated to reflect the updated February 2024 TRPAP regulation.

Figure 1-4 shows the decision-making framework and associated timeframes as detailed by the MECP.

Figure 1-4: Outline of TRPAP



1.7 Objection Process, Minister's Review and Statement of Completion

If members of the public, regulatory agencies, other stakeholders, or Indigenous Communities have concerns regarding the transit project following the Notice of Completion of the Environmental Project Report (EPR), they may submit an objection to the Minister.

Objections must be provided during the 30-day review period for the EPR; objections received after the review period has ended will not be considered. Following the 30-day review period, the Minister has 35 days to consider whether the transit project will have a negative impact on a matter of provincial importance or a constitutionally protected Indigenous or treaty right. The Minister may act to issue one of the following three notices to the proponent:

- A Notice to proceed with the planned transit project as documented in its EPR,
- A Notice that requires the proponent to take further steps, which may include further study or consultation; or,
- A Notice allowing the proponent to proceed with the transit project subject to conditions.

Upon the Minister issuing a notice to proceed, or if the Minister does not act within the 35-day period, the City of Toronto will issue a Statement of Completion. Following submission of the Statement of Completion of the EPR to the Director of the Environmental Approvals Branch and the Regional Director of the MECP, the TRPAP is considered complete, and the project can proceed to implementation and construction.

For further details on this process, please reference the MECP Guide for Ontario's Transit and Rail Project Assessment Process (January 2014).

1.8 Addendum Process

The transit project presented in this EPR is not a static plan, nor is the context in which it is being assessed, reviewed, approved, and constructed. O. Reg. 231/08 includes an addendum process for proponents to make changes to a transit project after the Statement of Completion is submitted to the MECP.

An addendum to the EPR may be required if project developments during the approvals, future design phases, and construction processes result in design variations from what was assessed in the EPR. This addendum process is intended to address the possibility that in implementing a transit project, certain modifications may be made that are inconsistent with the EPR. A change that is inconsistent with the EPR is generally defined as one for which the impacts have not been accounted for in the EPR. If a proponent wishes to make a change to a transit project that is inconsistent with the EPR, the proponent must prepare an EPR addendum.

If changes to the project indicate that an EPR addendum is required, it must include the following information:

- A description of the proposed change,
- The reason for the proposed change,
- An assessment and evaluation of any impacts that the proposed change might have on the environment,
- A description of any proposed measure for mitigating any negative impacts that the proposed change might have on the environment; and
- A statement of whether the proponent is of the opinion that the proposed change is significant (or not), and the reasons for the opinion.

All changes that are inconsistent with the EPR require an addendum, but not all changes require a Notice of Environmental Project Report Addendum. If a proponent is of the opinion that the proposed change is not significant, the proponent must document the reasoning behind this opinion and keep a record of the addendum to the EPR with its project file/documentation. For further details on this process, please reference the MECP Guide for Ontario's Transit and Rail Project Assessment Process (January 2014).

1.9 Impact Assessment Act

The Impact Assessment Act, 2019 (IAA 2019) and associated regulations came into effect on August 28, 2019 and replaced the Canadian Environmental Assessment Act (2012). Under IAA 2019, a federal environmental assessment is required for "designated projects." A designated project is one that includes one or more physical activities that are set out in the regulations under IAA 2019 or by order of the Federal Minister of the Environment, Conservation and Parks. This project was reviewed by the project team against the Federal Regulations Designating Physical Activities, and the project team determined that the project is not "designated" and therefore will not require a federal environmental assessment. More information about the Impact Assessment Act (2019) is available at the following link: https://www.canada.ca/en/impact-assessment-agency.html

1.10 Environmental Project Report Overview

An Environmental Project Report (EPR) is the required culminating documentation of the TRPAP and is to be submitted to the Ministry of Environment, Conservation and Parks (MECP) within 120 days of issuing the Notice of Commencement of the TRPAP. The EPR documents the existing environmental conditions within the study area, the potential environmental impacts of the project through construction and operation, and recommended mitigation and monitoring measures. Consultation and future commitments are also documented.

The following studies are included in this EPR:

- Stormwater and Drainage Analysis Report,
- Socio-Economic and Land Use Baseline Conditions and Impact Assessment Report,
- Natural Environment Baseline Conditions and Impact Assessment Report,
- Cultural Heritage Report,
- Archaeology Report,
- Air Quality Baseline Conditions and Impact Assessment,
- Noise and Vibration Baseline Conditions and Impact Assessment,
- Geotechnical Desktop Study,
- Contamination Overview Study, and
- Transportation and Traffic Impact Analysis.

The information necessary to be included in the EPR, as stipulated in the Guide to Ontario's Transit and Rail Project Assessment Process (MECP, 2024), is summarized in Table 1-1, along with the corresponding sections where the information is found.

Table 1-1: Summary of EPR Requirements

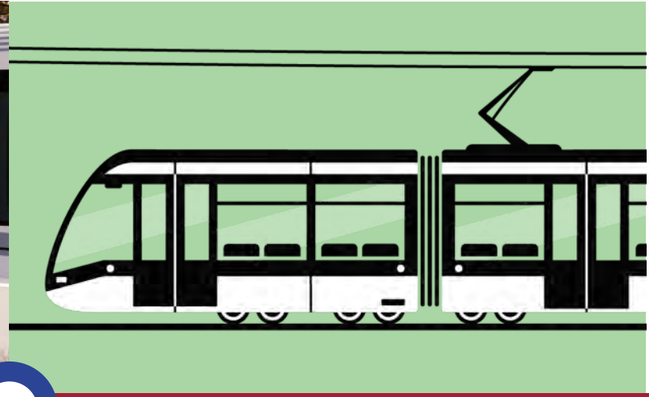
EPR Requirement	EPR Chapter
A statement of the purpose of the transit project and a summary of any background information relating to the transit project.	Chapter 1
A final description of the project including a description of the preferred design method.	Chapter 3
A map showing the site of the transit project.	Chapters 1 and 3
A description of the local environmental conditions at the site of the transit project	Chapter 4
A description of all studies conducted, including a summary of all data collected or reviewed and a summary of all results and conclusions.	Chapters 4
The assessments, evaluation, and criteria for any impacts of the preferred design method and any other design method that were considered once the project's TRPAP commenced.	Chapter 4 and 5
A description of any proposed measures for mitigating any negative impacts the transit project might have on the environment.	Chapter 5
If mitigation measures are proposed, a description of the proposal for monitoring or verifying the effectiveness of the mitigation measures.	Chapter 5
A record of consultation.	Chapter 6
A description of any municipal, provincial, federal, or other approvals or permits that may be required.	Chapter 7

1.11 Project Team Organization

The Eglinton East LRT project is led by the City of Toronto Transit Expansion Division, working closely with a broader core project team consisting of the City of Toronto's City Planning Division, Transportation Services Division, and the Toronto Transit Commission (TTC). The City of Toronto and TTC are co-proponents of the TRPAP. A consultant team led by HDR was appointed to guide the City and TTC team through the 10% design and TRPAP process. Table 1-2 outlines the consultant technical teams and their respective scope.

Table 1-2: EELRT TRPAP Consultant Team

Consultant	Scope
HDR	Transportation, Traffic and Transit Design, Utilities, Structures, Drainage / Stormwater Management, Consultation / Engagement
Perkins & Will	Urban Design, Active Transportation Design, Land Use Planning, Socio-Economic Analysis
LGL Limited	Natural Environment
ASI	Archaeological and Cultural Heritage
SLR Consulting	Air Quality, Noise and Vibration
Peto McCallum	Geotechnical Review, Phase 1 ESA



2 Background and Context

2.1 Pre-Planning Alternatives Assessment

The Eglinton East LRT is based on the Scarborough-Malvern LRT (SMLRT) project that was part of the 2007 Transit City Plan. Approved through the previous Transit Project Assessment Process (TPAP) in 2009, the approved alignment started at Kennedy Station and followed Eglinton Avenue East, Kingston Road, and Morningside Avenue (with an alignment through UTSC) to Sheppard Avenue East. The study also recommended an extension to Malvern via Sheppard Avenue and Neilson Road, but the design was not advanced or approved through the TPAP.

In 2016, Toronto City Council directed staff to advance the Eglinton East LRT (now renamed from the SMLRT) to a 5% design, using the SMLRT alignment as a starting point. Recommendations included having the EELRT continuous with the Eglinton Crosstown LRT (ECLRT) project at Kennedy Station, a tunneled alignment through the Kingston-Lawrence-Morningside intersection, a new LRT bridge across Highland Creek valley, an at-grade alignment through UTSC along a realigned Military Trail, and an extension to Malvern with six stops.

As part of this revised transit plan for Scarborough, the City sought to update the design to reflect the current planning context and revised horizon year (from 2031 to 2041). Critically, the SMLRT did not consider how the line would connect to Kennedy Station and interface with the Eglinton Crosstown, under construction then and now. The development of a revised service concept, stop and alignment review, Malvern route evaluation, and MSF site selection report was advanced. Upon completion of that work, the City initiated the full 5% design update and Class 4 cost estimates of EELRT. The 5% design along with City's Initial Business Case and Council Report led to the recommendation to proceed with further design and TPAP addendum.

In December 2020, City Council approved the revised EELRT 5% design and cost estimate and directed staff to proceed with 10% design and TPAP. At this time, Council re-affirmed support for EELRT as a through service of Line 5 by approving Option 1—an 800-900 m long cut and cover tunnel between Falmouth and Kennedy with an underground Midland Station. In September 2021, the 10% design process of the TPAP EELRT was initiated.

As noted above, planning for the EELRT envisioned the project as an extension of the Metrolinx-owned ECLRT by extending the ECLRT tracks underground at Kennedy Station, to enable through-service at Kennedy Station. As part of the work underway to refine the project design to 10%, City staff undertook a constructability assessment of the EELRT through-service alignment[1]. This assessment identified significant interface issues with the Scarborough Subway Extension and challenges delivering the through-service concept at Kennedy Station. In consultation with Metrolinx, City staff explored numerous alternatives to eliminate or mitigate the conflicts between the SSE and EELRT designs; however, they would result in delay and costs to the SSE project. In addition, many options for the EELRT were evaluated but maintaining through-service at Kennedy Station and mitigating the constructability issues would have resulted in the following adverse impacts:

- Estimated additional $2.1 billion in up front property, construction, and vehicle costs.
- Delayed EELRT opening by three to four years.
- Nearly 20-year construction period at Kennedy-Falmouth when accounting for both SSE and EELRT construction, which is six to eight years longer than the distinct service option.
- Extensive property impacts along the north side of Eglinton between Midland Avenue and Bimbrok Road, displacing local businesses and curtailing transit-oriented development potential.
- Significant interface risks with SSE and reaching commercial agreements with Metrolinx and Crosslinx with regards to Line 5 through service on the EELRT.

City staff analyzed a distinct-service concept and concluded that it would be a viable alternative that mitigates the SSE interface challenges and which could provide other benefits across the alignment. The EELRT distinct-service concept would have an at-grade connection at Kennedy Station and extend to a terminus at Malvern Town Centre. The EELRT would be well integrated to the broader future Kennedy Transit Terminal and provide convenient weather protected connections to Line 2. It would also provide connection to the ECLRT, TTC Bus Terminal, and future 15-minute two-way all-day GO Transit services. Passengers intending to continue their journey on the ECLRT would need to transfer in the same manner as those continuing on Line 2 and GO. The majority of EELRT passengers are destined for downtown and the highest number of transfers would be between the EELRT and Line 2 and GO Transit service, rather than the ECLRT.

As a distinct service, EELRT trains will not continue through to the existing Line 5. This introduces a new transfer movement at Kennedy Station. Decoupled from Line 5, EELRT design requirements can be customized to meet the unique characteristics of the corridor. The benefits of the distinct-service concept include:

- Avoiding dependency on the ECLRT technology, vehicles, operations, and maintenance requirements.
- Ability to tailor EELRT service to the projected demand east of Kennedy Station to provide operational flexibility while improving service.
- Opportunity to acquire light rail vehicles that are tailored specifically for the EELRT including shorter and higher performance trains.
- With shorter trains, eliminating the need for a tunnel alignment on Kingston Road between Lawrence Avenue and Morningside Avenue.

[1] Eglinton East LRT: Constructability Review and Assessment of Interface Options at Kennedy Station
https://www.toronto.ca/legdocs/mmis/2022/ex/bgrd/backgroundfile-226596.pdf

- With higher performance trains, avoiding the need for a new LRT bridge across the Highland Creek valley.
- Shorter platforms to reduce property impacts.
- The resulting significant cost savings compared with the through-service option.

Based on these benefits, City Council in June 2022 approved advancing the 10% design for the EELRT as a distinct-service with an at-grade interface at Kennedy Station, from Kennedy Station to Malvern Town Centre, and for the Sheppard Avenue segment from Neilson Road to McCowan Road[2]. The EELRT alignment including stations and stops was approved by Toronto City Council in December 2023.

Regarding the Maintenance and Storage Facility (MSF), a TPAP for a Light Rail vehicle Maintenance and Storage Facility at 8300 Sheppard Avenue East "Conlins Yard" was completed by the City and TTC in 2010, receiving a Provincial Notice to Proceed under Ontario Regulation 231/08. The facility was intended as the MSF for light rail transit along Sheppard Avenue East, which was identified as the preferred mode of transit for Sheppard Avenue based on expert analysis at that time.

In December 2020, City Council approved an updated design of EELRT, including an extension along Sheppard Avenue to Malvern Centre that included the option to locate an MSF to the north of UTSC. In February 2022, due to concerns over the suitability of the UTSC MSF site including impacts on expansion of the Provincial institution, and constructability concerns at Kennedy Station with providing for a through service with ECLRT, City Council requested that Metrolinx and the City evaluate the potential to host the EELRT MSF at the Conlins Yard, which had already been approved through O.Reg. 231/08 to host an LRT MSF.

In June 2022, City Council confirmed that the Conlins Yard is the preferred location for the EELRT Maintenance and Storage Facility having capacity to accommodate the distinct-service EELRT including the extension to Malvern Centre and an additional extension to Sheppard McCowan to meet demand beyond 2051. The Conlins Yard would not be able to accommodate the requirements for a through-service LRT. In December 2023, City Council re-affirmed its position that the Conlins Yard is the preferred location for the EELRT Maintenance and Storage Facility.

The project planning milestones are summarized below.

Year	Milestone
2009	• Scarborough-Malvern LRT (SMLRT) initial design and environmental assessment is completed.
2010	• SMLRT project is put on hold. Transit City initiative is cancelled. • Sheppard East LRT (SELRT) and Conlins MSF environmental assessments are completed by City and TTC.
2016	• City Council directs staff to update 2009-approved SMLRT concept to conceptual (5%) design, renamed EELRT.
2017	• City initiates conceptual (5%) design and planning process for EELRT.
2018	• City Council approves KLM grade separation, at-grade UTSC alignment, and the recommended Malvern extension route; directs staff to develop Class 4-level cost estimates.
2019	• Province announces funding for four priority subway projects, including a modified 3-stop Line 2 extension (SSE) to Sheppard opening in 2029/30. • City Council approves EELRT alignment north of Highway 401 to Malvern Town Centre.
2020	• City Council directs staff to advance EELRT design to 10%, update the business case, prepare Class 3 cost estimates for 2022 Budget process; complete TRPAP; continue discussions with UTSC on MSF location.
2021	• City initiates 10% Design and TPAP process in September 2021.
2022	• Scarborough Subway Extension interface constructability assessment informs Council direction for distinct service and extension of line to Sheppard-McCowan. • City Council confirms preference for Conlins Yard MSF site.
2023	• City staff complete Initial Business Case for EELRT and report back to Council in Q4 2023 with a Class 3 cost estimate. • City Council approves EELRT alignment and stops, reconfirms preference for Conlins Yard MSF.
2024	• City completes 10% design, develops Environmental Project Report (EPR), and undertakes environmental assessment (TRPAP) for EELRT.

[2] Report from the Executive Director, Transit Expansion Office, and Chief Planner and Executive Director, City Planning on Advancing City Priority Transit Expansion Projects - Eglinton East LRT and Waterfront East LRT: https://www.toronto.ca/legdocs/mmis/2022/ex/bgrd/backgroundfile-226594.pdf

2.1.1 Stops Assessment

The 10% functional design for the EELRT has carried forward the Council-approved alignment from 2022 with some changes to the total number of stops. The original proposal for the 10% design consisted of 31 stops (inclusive of terminal stations), with an average stop spacing of 560 m. In particular, the stop spacing along the Sheppard Avenue portion was less than 400 m, matching the local bus stop spacing. Based on a study completed by TTC to estimate rapid transit operating speed at the planning and conceptual design phases, stop spacing was found to be the strongest predictor of average speed regardless of type of rapid transit (exclusive or semi-exclusive). As such, other stop configuration alternatives were explored with the goal of increasing the average speed of the LRT and improving its performance, and ultimately, its business case. The options considered were as follows:

- **Option 1:** Base Case – Council approved stop configuration with 31 stops.
- **Option 2:** Removal of 9 stops out of 31 along the corridor:
  - 5 stops removed on Sheppard Avenue
  - 1 stop removed along Neilson Road
  - 1 stop removed along Kingston Road
  - 2 stops removed along Eglinton Avenue
- **Option 3:** Removal of 5 stops along Sheppard Avenue:
  - Murison Boulevard
  - Howell Square
  - Progress Avenue
  - Massie Street
  - 4275 Sheppard Avenue East

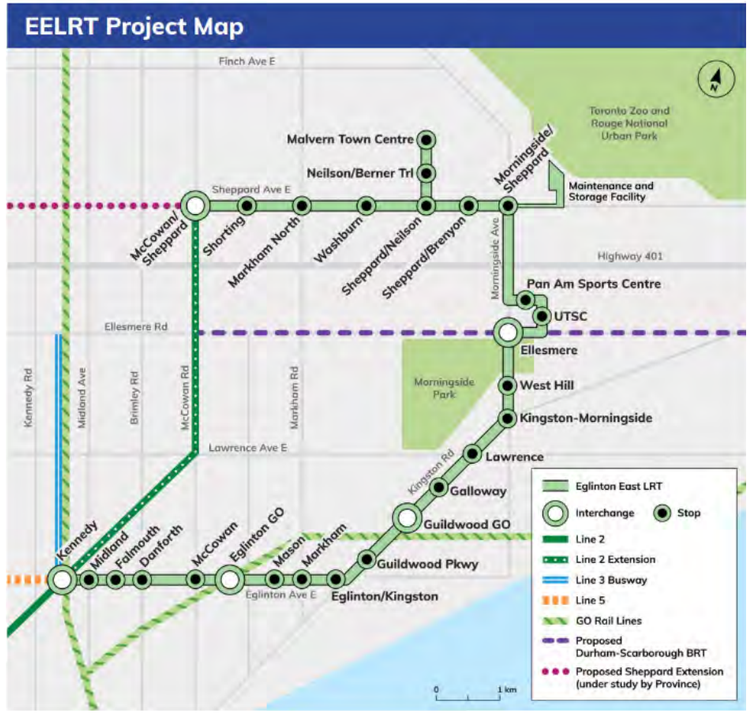
Compared with **Option 1:** Base Case:

- **Option 2** – Option 2 was eliminated as it did not meet TTC operational needs. Removing the stops along Kingston Road and Eglinton Avenue would likely trigger a need for local bus service which could negate the travel time benefits in the business case of removing those stops. It is also preferred to maintain the Berner stop on Neilson Road since the parallel TTC bus service on this segment has a different route than EELRT.
- **Option 3** – Option 3 is the preferred stop configuration as it aligns Sheppard more closely with the average LRT stop spacing for the overall project. Deleted stops along Sheppard Avenue would be served by planned parallel local bus service to Meadowvale.

Ongoing revisions to the EELRT Base Case design at Kingston-Lawrence-Morningside (KLM) created the opportunity for an additional stop on Kingston Road to better serve planned development in the area. Following the application of Option 3 and inclusion of the additional KLM area stop, the EELRT 10% functional design includes 27 stop locations (inclusive of major terminal interchange stations) throughout Scarborough, with an average stop spacing of 670 metres.

Figure 2-1 shows the proposed alignment and stops for the EELRT.

Figure 2-1: Proposed EELRT Alignment and Stops



Morningside Park Stop Assessment

Following Pre-Planning consultation, City Council requested that the project team assess the feasibility of a potential additional LRT stop near the entrance driveway to Morningside Park to improve transit access to the park.

Figure 2-2: Morningside Park Stop Assessment

The project team completed a feasibility study, which concluded that the inclusion of a stop at the entrance to Morningside Park is not recommended due to the following reasons:

- Steep slopes on Morningside Avenue limit a potential stop to about 100 m north of the entrance.
- The stop would be further from the park entrance than the existing TTC 116 bus stop immediately adjacent to the entrance.
- Based on the low ridership of the existing TTC 116 bus, the ridership of a potential LRT stop at the entrance would also be low.
- The stop would add at least $5 million in construction cost, increase environmental impacts to the Highland Creek valley through more extensive roadway widening and regrading, and would add about 40 seconds to LRT travel time.

Therefore, City staff recommend exploring a future TTC bus route to complement the LRT and better serve the park, subject to TTC Board-approved service standards.

2.2 Provincial Land Use and Transportation Policy

This section provides a summary of the provincial land use and transportation policies that are related to the EELRT project.

2.2.1 Provincial Policy Statement (2020)

The Provincial Policy Statement (PPS) is a consolidated statement that works together with provincial land use plans to provide a policy direction to support the creation of strong and complete communities, sustained economic prosperity, and a clean and healthy environment. The PPS clearly sets out the provincial government's vision for land use, providing specific directions on planning and development, including:

- **1.6.7.1** Safe, energy-efficient, facilitate the movement of people and goods, and are appropriate to address projected needs,
- **1.6.7.3** A multimodal transportation system that provides connections within and among transportation systems and modes including across jurisdictional boundaries,
- **1.6.7.4** Land use patterns that minimize length and number of vehicle trips to support transit and active transportation,
- **1.6.8.2** Protect for major goods movement facilities and corridors, and
- **1.6.8.3** New development should be compatible with the long-term purposes of the corridor.

The EELRT project will facilitate energy efficient movement of people throughout Scarborough and to other parts of the City. The project will also provide multimodal transportation systems along the corridor with improved sidewalks, dedicated cycling facilities, and a dedicated transit right-of-way. These improvements will promote mixed-use transit-oriented development along the corridor which will aid in reducing the length of trips and minimize automobile usage

2.2.2 A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020)

A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020) is a plan designed to manage the growth of the region to ensure continued economic prosperity. The plan supports the overall vision for the Greater Golden Horseshoe region by outlining growth and density targets for municipalities within it to ensure that the region remains a great place to live, work, and play.

The plan encourages the development of complete communities with easy access to the daily necessities, work, and leisure locations. An integrated transportation network will provide mode choice and discourages automobiles in favour of active transportation and public transit. In addition, the natural environment, air, land, and water quality will be protected and enhanced to ensure that it remains accessible for residents in perpetuity. The guiding principles of the plan that are particularly relevant to the EELRT project include:

- Supporting the achievement of complete communities that are designed to support healthy and active living and meet people's needs for daily living throughout an entire lifetime.
- Prioritizing intensification and higher densities in strategic growth areas to make efficient use of land and infrastructure and support transit viability.
- Improving the integration of land use planning with planning and investment in infrastructure and public service facilities, including integrated service delivery through community hubs, by all levels of government.
- Integrating climate change considerations into planning and managing growth such as planning for more resilient communities and infrastructure – that are adaptive to the impacts of a changing climate – and moving towards environmentally sustainable communities by incorporating approaches to reduce greenhouse gas emissions.

The EELRT project will contribute positively to the creation of complete communities by providing more transportation options and facilitating mixed-use development. The project will also support greenhouse gas reduction by replacing diesel buses and attracting motorists to the transit system.

2.2.3 Greater Golden Horseshoe Transportation Plan (2022)

Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe (2022), provides a 30-year vision of a transportation system that provides safe, efficient, and convenient travel options for people and businesses. The plan also supports the well-being and economic prosperity of the region. The plan provides a framework for actions to:

- Fight Gridlock,
- Improve Transit Connectivity,
- Give Users More Choice,
- Keep Goods Moving, and
- Foster a Safe and Inclusive Transportation System.

Identified in the Plan as part of the future transit network, the EELRT will help advance the objectives set out in the GGH Transportation Plan by providing enhanced and higher-order transit service and improving transit connections to underserved communities in Scarborough. The project will promote mode shift from single passenger automobiles to more sustainable transportation modes such as walking and cycling, in addition to LRT. The project is essential to meeting existing and future transportation needs arising from a growing population and will result in economic growth, new development, and improvements to quality of life.

2.2.4 Metrolinx 2041 Regional Transportation Plan (2018)

The Metrolinx 2041 RTP is the Greater Toronto and Hamilton Area's (GTHA's) multi-modal long-range regional transportation plan. The 2041 RTP outlines how governments and transit agencies will work together to continue building an integrated transportation system that supports a high quality of life, a prosperous and competitive economy, and a protected environment. The RTP outlines the following goals:

- **Strong connections –** Connecting people to the places that make their lives better, such as homes, jobs, community services, parks and open spaces, recreation, and cultural activities.
- **Complete travel experiences –** Designing an easy, safe, accessible, affordable, and comfortable door-to-door travel experience that meets the diverse needs of travellers.
- **Sustainable and healthy communities –** Investing in transportation for today and for future generations by supporting land use intensification, climate resiliency and a low-carbon footprint, while leveraging innovation.

As part of the plan, numerous transportation policy and infrastructure improvements are planned for local transit systems to provide a more interconnected and seamless transportation network. The EELRT project is listed as a "In Development" project, indicating that it is in advanced stages of planning and design. It is expected to be part of the Frequent Rapid Transit Network (FNTN) as it will provide local access with service every 10 minutes or better. The 2051 update to the 2041 RTP is expected to better reflect the current status of the EELRT project.

The GO Regional Express Rail (RER) is another major in-delivery project outlined in the RTP with potential to affect the EELRT project. The GO RER infrastructure improvements will transform the GO Rail network into the backbone of a regional rapid transit network by providing frequent all-day, two-way service.

Also worth noting, Metrolinx is updating the 2041 Regional Transportation Plan (RTP) for the GTHA with the 2051 update which identifies the EELRT project as a priority "In Development" project to extend the LRT service eastward, linking Kennedy Station, UTSC and Sheppard Avenue.

2.2.5 Ontario Traffic Manual

The Ontario Traffic Manual (OTM) consolidates information and guidance related to the design, application and operation of traffic control devices and systems across Ontario. The manual is an important resource for designing safe, appropriate, and predictable transportation facilities and allows industry practitioners to provide uniform guidelines, consistent with the intent of the Highway Traffic Act. The following two OTM chapters and the protected intersection guide were vital in informing recommendations for the EELRT project.

2.2.5.1 Book 15 – Pedestrian Crossing Facilities (2016)

OTM Book 15 (2016) shares guidance on the selection and design of pedestrian crossing facilities. Elements of the book include:

- **Legal requirements –** highlighting pedestrians' and road users' legal right-of-way and responsibilities at different forms of controlled and uncontrolled crossings, as well as legal requirements for accessible design.
- **Pedestrian crossing devices –** guiding principles for the decision and design process for different crossing methods, including controlled and uncontrolled crossings, and
- **Physically separated facilities –** guidance on the selection and design process which includes a needs assessment and, if eligible, a feasibility study.

2.2.5.2 Book 18 – Cycling Facilities (2013)

OTM Book 18 (2013) offers guidelines for bicycle network design, facility selection, facility design, and network implementation. Facilities range in separation from shared routes and bike lanes to cycle tracks and in-boulevard multi-use trails. Selection criteria include vehicle speed and volume, traffic mix, space availability, existing and future demand, and cost.

2.2.5.3 Protected Intersection Guide

The Ontario Protected Intersection Guide imparts the latest best practices in the planning, design, and operation of protected intersections in the Ontario context.

2.3 Municipal Land Use and Transportation Policy

This section summarizes the municipal planning context in relation to the EELRT project. As this project is located fully in the City of Toronto, the City's official plan will be discussed in more detail.

2.3.1 City of Toronto Official Plan (2022)

The City of Toronto Official Plan (OP) implements Provincial directions identified in the previous section and guides the growth and development of the City to the year 2031. The City's OP highlights the need to integrate land use and the transportation network, maintain the existing network in a state of good repair, and make better use of existing infrastructure. The policies also look to balance the needs of existing and future users within the right-of-way (ROW) by accommodating pedestrians, people with mobility aids, bicycles, transit, automobiles, utilities, and landscaping. In addition, the OP envisions the design of high quality public realm for streets, parks, and open spaces, which provides a setting for community life, economic health, and social equity.

The OP Map 3 indicates that the existing right-of-way (ROW) along most of the corridor is 36 m except at Morningside Avenue, between Kingston Road and Fairwood Crescent, where it is 30 m.

The latest Official Plan consolidation, which includes all currently approved and in-effect amendments, was released in March 2022. This replaced the previous iteration of the consolidated Official Plan from February 2019.

2.3.1.1 Transportation Policies

Section 2.2 in the OP "Transportation Policies and Structuring Growth in the City: Integrating Land Use and Transportation" provides official policy direction on ensuring the integration of land use and transportation planning as follows:

"The integration of transportation and land use planning is critical to achieving the overall aim of increasing access to opportunities throughout the City. Transportation accessibility has two components: mobility (transportation) and proximity (land use). Increasing mobility by providing modal choice, and/or increasing the speed, timeliness or directness of travel allows more trips to be made within a given time, whereas increasing proximity through greater mixing of uses and/or higher densities achieves the same effect by shortening trip lengths. The policies of this Plan reflect the importance of mutually supportive transportation and land use policies that combine the mechanisms of mobility and proximity to maximize access to opportunities."

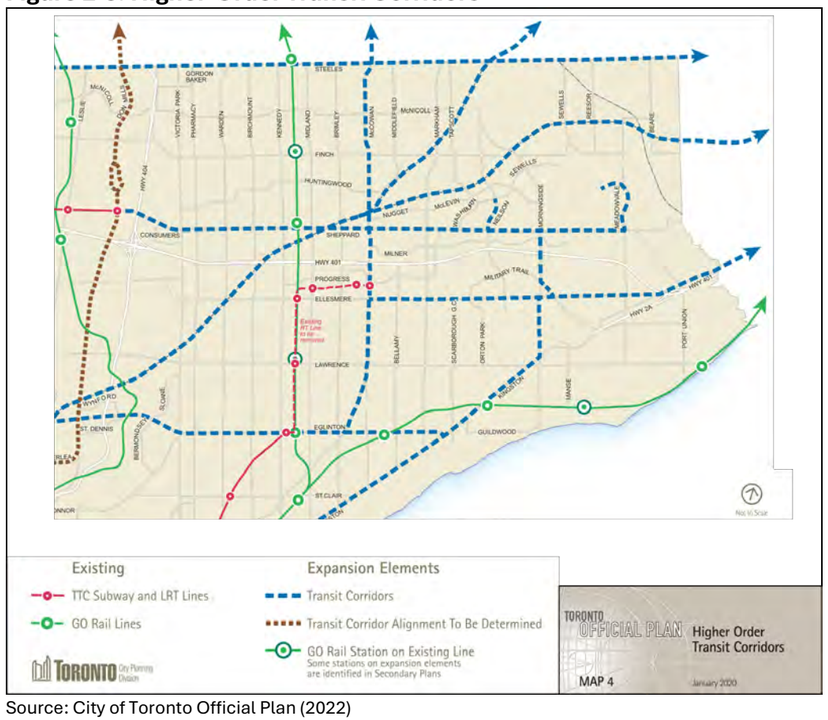
Integrating land use and transportation planning emphasizes that the consolidation of the two fields is key to improving accessibility. To that end, integrating land use and transportation planning emphasizes that the consolidation of the two fields is key to improving accessibility. Transit service should be improved in targeted growth areas, and likewise, development should be prioritized to transportation nodes and corridors.

The OP's transportation policy also focuses on sustainability, active transportation, Complete Streets, accessibility, travel demand management, and goods movement. Moreover, the 2022 OP update contains stronger protection for pedestrians and cyclists and encourages design that facilitates these modes.

The following policies are particularly relevant to the EELRT project:

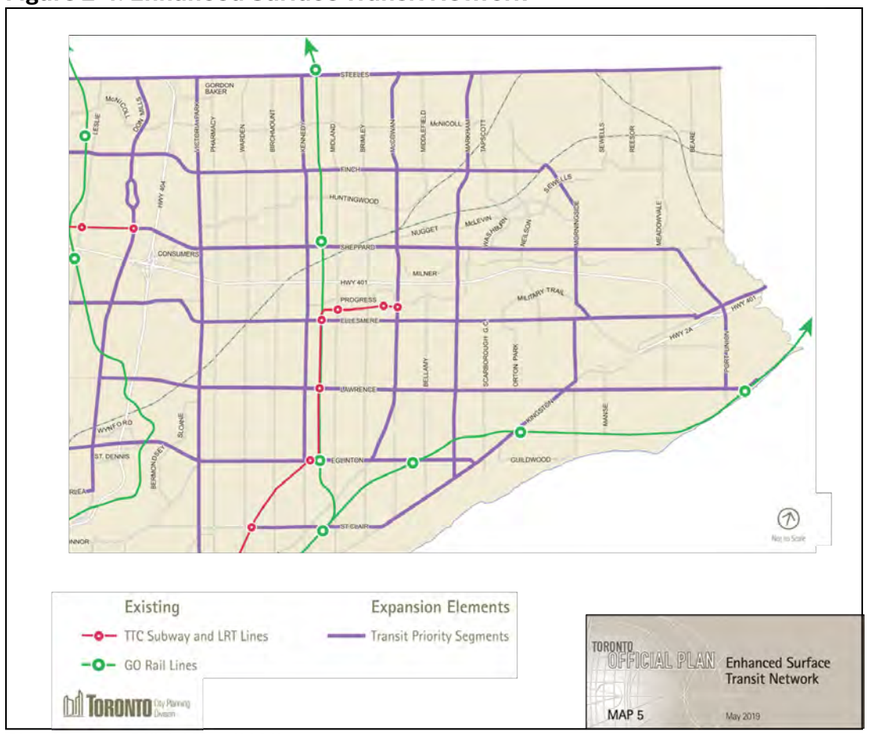
- The alignment of the proposed EELRT (Eglinton Avenue East, Kingston Road, Morningside Avenue, and Sheppard Avenue East) are identified in the City's Official Plan as both Higher-Order Transit Corridors in Map 4 and Enhanced Surface Transit Network Corridors in Map 5 (See Figure 2-3 and Figure 2-4).
- Implement a Complete Streets approach to develop a street network that provides adequate space for pedestrians and cyclists of all ages and abilities, transit vehicles, goods and services vehicles, emergency vehicles, motorists, utilities and services, trees and landscaping, green infrastructure, snow and stormwater management, wayfinding, boulevard cafes, marketing and vending, and street furniture.

Figure 2-3: Higher-Order Transit Corridors



Source: City of Toronto Official Plan (2022)

Figure 2-4: Enhanced Surface Transit Network



City of Toronto Official Plan (2022)

2.3.1.2 Land Use

The study area is comprised primarily of low-density residential neighbourhoods with mixed-use areas along major corridors. There is also a significant institutional land use present at the University of Toronto Scarborough (UTSC) and Centennial College. Apartment neighbourhoods are scattered amongst residential neighbourhoods near major intersections and employment areas exist primarily along the Highway 401 corridor.

The City of Toronto's City Planning department is currently conducting a land use study and the land use designations may change. Community Planning District Staff will be continually engaged as the project advances to capture any proposed changes.

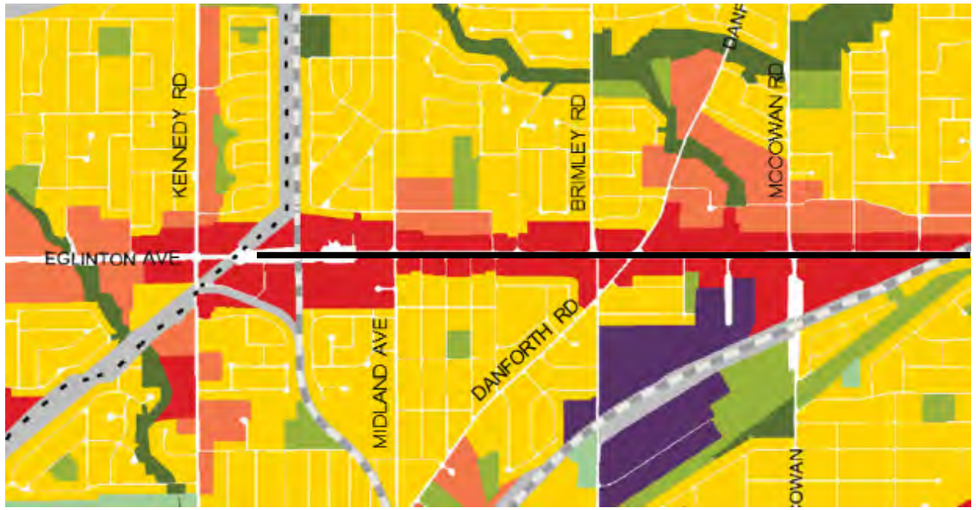
Figure 2-5 shows the map legend for interpreting the land use maps.

Figure 2-5: Land Use Designation Legend for Maps

Figure 2-6 to Figure 2-9 show the official land use plans from the City of Toronto.

Figure 2-6 shows the land use map between Kennedy Station and east of McCowan Road. The area along the corridor is categorized mostly by mixed-uses surrounded by neighbourhoods and apartment neighbourhoods.

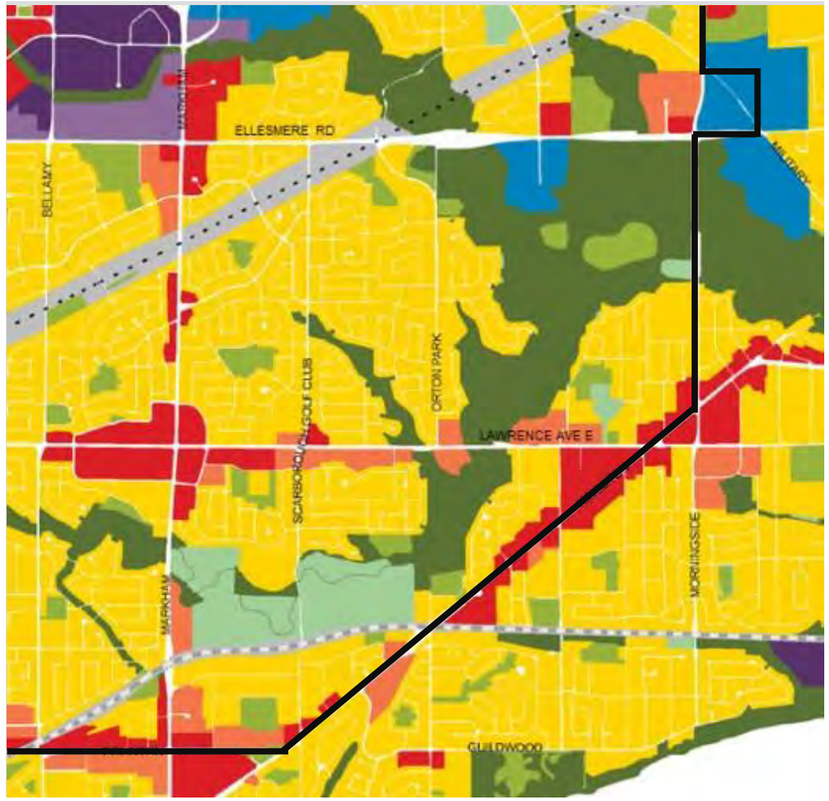
Figure 2-6: Land Use Map for EELRT Segment between Kennedy Station and McCowan Road



City of Toronto Official Plan (2022)

Figure 2-7 shows the land uses between McCowan Road and the University of Toronto Scarborough (UTSC). The area along the corridor is categorized mostly by mixed uses surrounded by neighbourhoods and apartment neighbourhoods. There are also many natural areas and institutional uses at the northern end of this map.

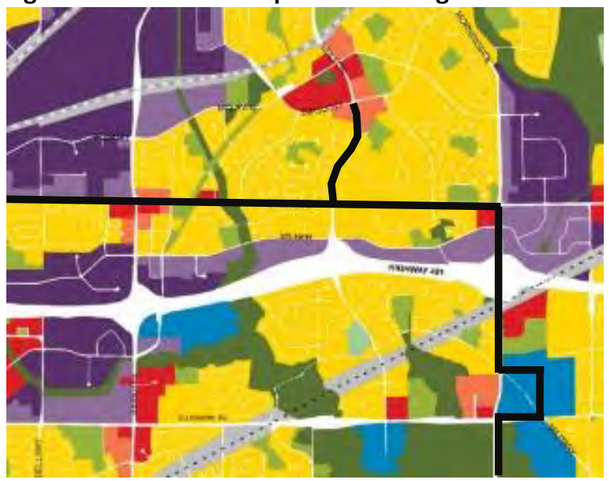
Figure 2-7: Land Use Map for EELRT Segment between McCowan Road and University of Toronto Scarborough (UTSC)



City of Toronto Official Plan (2022)

Figure 2-8 shows the land use map for the proposed alignment between UTSC and Malvern Town Centre. In addition to the neighbourhood uses, there are significant clusters of employment areas alongside Highway 401 and at the intersection of Morningside Avenue and Sheppard Avenue East.

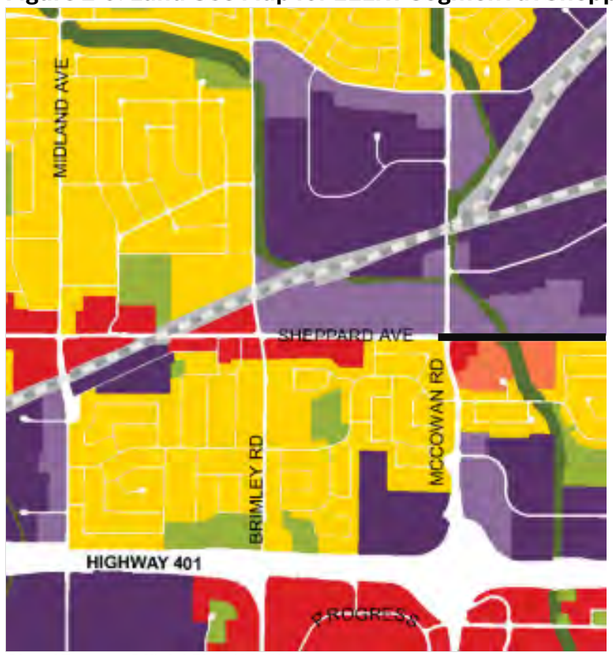
Figure 2-8: Land Use Map for EELRT Segment between UTSC and Malvern Town Centre



City of Toronto Official Plan (2022)

Figure 2-9 shows the land use map around the terminus at Sheppard Avenue East and McCowan Road. Employment areas are dominant in this area, with some residential neighbourhoods.

Figure 2-9: Land Use Map for EELRT Segment at Sheppard and McCowan



City of Toronto Official Plan (2022)

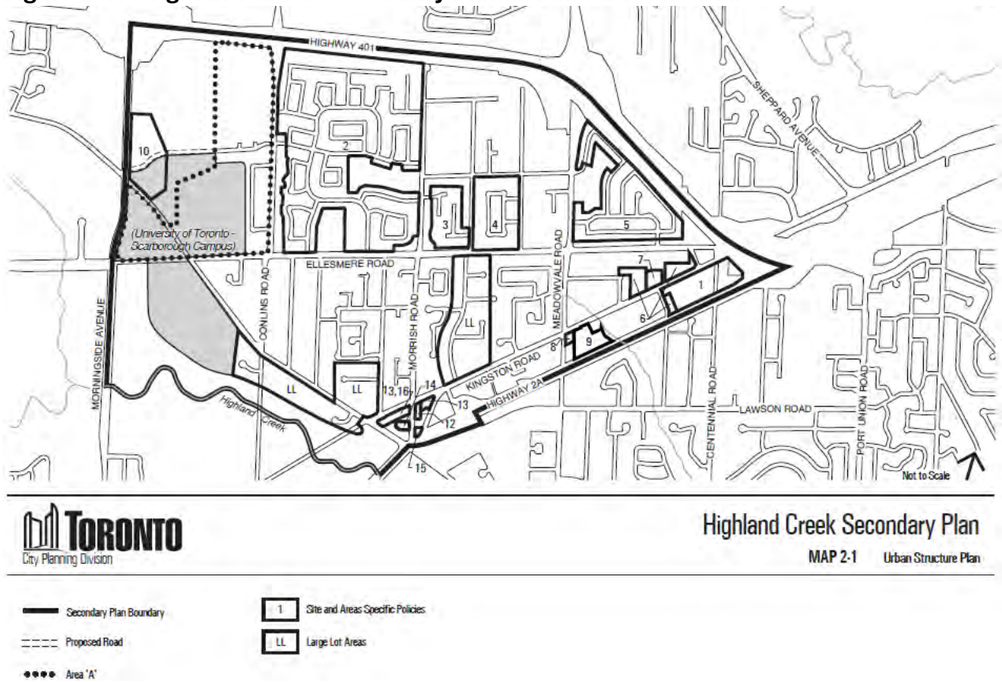
2.3.2 Secondary Plans

2.3.2.1 Highland Creek Community Secondary Plan

The Highland Creek Secondary Plan mainly provides direction on the way the adjacent lands designated “Neighbourhoods” are intended to develop but provides no built form direction on the University of Toronto Scarborough campus lands and the management of growth on these lands. The EELRT alignment runs along Morningside Avenue and Ellesmere Road, crossing through “Area A” of the Highland Creek Community Secondary Plan (SP), shown in Figure 2-10.

Area A, which pertains to the lands east of Morningside Avenue, north of Ellesmere Road and west of Conlins Road, is subject to Policy 1.5. This policy stipulates that construction of any buildings, structures, services, and hard surface parking will only be permitted subject to technical studies including engineering studies and studies of gas, leachate, and hydrogeology. This is due to the area being within a potential influence area of the nearby landfill site and the historical uses and landfill operations within the vicinity of the site.

Figure 2-10: Highland Creek Secondary Plan Urban Structure Plan



Source: City of Toronto, (2015). Highland Creek Secondary Plan (2015)

2.3.2.2 Draft UTSC Secondary Plan (2019)

The draft UTSC Secondary Plan (UTSC-SP) translates key elements of the 2011 Campus Master Plan into municipal policy that will guide campus growth. The UTSC-SP addresses transportation, open space, cultural and natural heritage, and land use; guiding the development of large areas of underused land within the UTSC campus to accommodate increasing enrolment rates and achieving the vision set out in the 2011 Master Plan.

Transit is intended to serve as the primary means for enhancing access and mobility to UTSC. The plan proposes for EELRT to follow a realigned Military Trail, shown in Figure 2-10 with a dedicated transit terminal near the station at Military Trail and Ellesmere Road. The realigned Military Trail will form the backbone of the University's movement network, accommodating transit, vehicular traffic, bicycles, and pedestrians. As part of a separate project by the City and UTSC, the existing Military Trail is anticipated to be closed to vehicular traffic and redesigned as a pedestrian and cycling spine connecting growth in the north to the south campus. The wider street network will prioritize pedestrian traffic while accommodating vehicular traffic where necessary. Cycling will be supported by a network of enhanced on- and off-street cycling infrastructure.

The plan envisions development occurring between Ellesmere Road and the existing Pan Am Sports Centre. The realigned Military Trail will be a focal point for higher density development, and university residential uses will be encouraged to the east of the new road. Active uses, such as retail, will be concentrated around the intersection of Military Trail and Ellesmere Road.

At the time of writing in 2024, the City, in coordination with UTSC, is updating the draft Secondary Plan.

Figure 2-11: UTSC Draft Secondary Plan (2019), Draft Proposed Structure Plan

Source: University of Toronto. (2016). UTSC Secondary Plan Community Open House.

2.3.3 Toronto Walking Strategy (2009)

The 2009 Toronto Walking Strategy, informed by the earlier Pedestrian Charter adopted by Toronto Council in 2002, outlines what is necessary to create physical and cultural environments that encourage walking in Toronto. It links existing guidelines, programs, and projects that focus on improving the pedestrian environment into one integrated plan, guided by three principles: universal accessibility, safety, and design excellence. Actions are grouped into six broad categories:

1. Leadership and support for walking.
2. Promoting a culture of walking.
3. Integrating networks for walking.
4. Designing streets for pedestrians.
5. Creating spaces and places for people.
6. Focus on priority and tower renewal neighbourhoods.

Key actions arising from the plan, intended to be implemented largely through existing processes and programs, include:

- Improving the sidewalk network.
- Improving links between major public transit routes and adjacent neighbourhoods.
- Prioritizing the needs of pedestrians in all planning decisions.
- Transforming streets into attractive destinations.

These actions are intended to be implemented largely through existing processes and programs.

2.3.4 TransformTO

TransformTO is the City of Toronto's plan to address climate change by reducing community-wide greenhouse gas emissions to net zero by 2040. The plan breaks down emissions by sector and provides the corresponding policy changes required to reach net zero emissions. A big component of the greenhouse gas emissions in the City originates from the transportation sector.

The EELRT project furthers the goals of TransformTO as the LRT will replace diesel buses currently serving the area and replace them with vehicles that are powered by electricity. Electricity is often generated from renewable sources, reducing the direct emissions associated with burning fossil fuels.

LRT also have higher passenger capacities compared to individual cars, meaning that more people can be transported using fewer vehicles, which reduces overall emissions per passenger.

2.3.5 Vision Zero 2.0 (2019)

The Vision Zero Road Safety Plan is a comprehensive action plan focused on reducing traffic-related fatalities and serious injuries on Toronto's streets. The Plan prioritizes the safety of the most vulnerable road users across seven emphasis areas through a range of extensive, proactive, targeted and data driven initiatives. Emphasis areas encompass pedestrians, school children, older adults, cyclists, motorcyclists and aggressive driving and distraction.

The plan relies on both existing and future safety measures including engineering improvements, educational programs, and technology initiatives. In its efforts to increase safety on City streets, Toronto Council approved in June 2019 a speed limit reduction from 60 km/h to 50 km/h on the following road segments located within the EELRT study area:

- Eglinton Avenue East from Kennedy Road to Kingston Road,
- Ellesmere Road from Morningside Avenue to Victoria Park Avenue,
- Morningside Avenue (Scarborough) from Kingston Road to Tams Road/ Pan Am Drive, and
- Sheppard Avenue East from Yonge Street to Meadowvale Road.

2.3.6 Design Guidance

2.3.6.1 Complete Streets Guidelines (2016)

The City of Toronto has developed Complete Streets Guidelines to provide Toronto-specific direction on how to allocate space in the street rights-of-way that account for all users as provided for by the Official Plan. The three guiding principles are summarized in Table 2-1.

Table 2-1: City of Toronto Complete Streets Principles

Principles	Description
Streets for People	• Improve safety and accessibility of streets for the most vulnerable road users in mind – children, the elderly, and individuals with disabilities. • Give people mobility choices. • Make connected network and infrastructure for all mobility choices for people. • Promote healthy and active living by designing streets that are more comfortable and inviting for walking and cycling.
Streets for Placemaking	• Create Beautiful and Vibrant Public Spaces where people naturally want to stop, spend time, and engage with the social fabric of the street. • Respect and respond to the local area context as provided by the envisioned land uses and the character of the surrounding neighbourhoods. • Improve environmental sustainability goals through incorporating street vegetation and other progressive stormwater management systems.
Streets for Prosperity	• Support economic vitality and the neighbourhood businesses that front it. • Enhance social equity by welcoming all races, incomes, genders, and abilities. • Balance flexibility and cost-effectiveness by having the ability to adapt to the City's changing needs over time.

Intended to be considered in all street design projects in the City of Toronto, the Guidelines describe a range of aspirational street types in Toronto, outline the steps involved in street design, and provide an overview of design principles and considerations for the key components and functions of streets: design for pedestrians, cycling, transit, green infrastructure, roadways, and intersections. The Complete Streets guidelines were used to inform design decisions for the EELRT project.

2.3.6.2 City of Toronto Vehicle Travel Lane Width Guidelines (2017)

The City's Travel Lane Width Guidelines were reviewed and updated in January 2017. This guideline is primarily for use by engineering staff to determine appropriately sized lane widths on roads with delineated lanes. This document is intended to eventually become part of a future Toronto-specific Street Design guidelines. These guidelines were designed to provide appropriate motor vehicle accommodation while improving cyclist and pedestrian safety, improving cyclist accommodation, and making effective use of the limited right-of-way and pavement width.

Table 2-2 identifies minimum, target, and maximum widths for through lanes, curb lanes, urban shoulders, turn lanes, and parking lanes. The 'x' shows that the influencing design control has no impact on the lane widths and the '+' shows that the influencing design control gives reasoning to provide a lane width wider than the target, up to the maximum lane width. Lane widths are typically only widened beyond the target width if there is space available in the cross section and if there is a requirement to accommodate TTC streetcars, high truck volumes and significant horizontal alignment curves.

Table 2-2: City of Toronto Vehicle Travel Lane Width Guidelines (2017)

			Minimum (m)	Target (m)	Maximum (m)	TTC			
						TTC Bus Routes	TTC Streetcar Routes	High Truck Volume	Horizontal Alignment Curves
Through Lane	**60km/h or more**		3.0	3.0	3.5	x	+[1]	+	+
	50 km/h			3.0	3.3				
	40km/h or less			3.0	3.0				
Curb Lane	**Shared Curb Lane without Urban Shoulder**		3.3	4.3	4.3	+[2]	x	+	+
	Shared Curb Lane with Urban Shoulder or Curb Lane with Dedicated Cycling Facility	**60km/h or more**	3.0	3.5	3.5				
		50km/h		3.3	3.5				
		40 km/h or less		3.3	3.5				
Urban Shoulder			1.2	2.3	2.3				
Two-way Left Turn Lane			3.0	3.0	3.3	x	x	+	+
Dedicated Left Turn Lane			3.0	3.0	3.3	x	x	+	+
Dedicated Right Turn Lane			3.0	3.0	3.3	+	x	+	+
Dedicated Parking Lane			2.0	2.4	2.8	x	x	x	+
Dedicated Cycling Facility			Note 1						

Note 1 – Refer to Ontario Traffic Manual Book 18: Cycling Facilities
[1] Through lanes should be a minimum width of 3.1 m on TTC streetcar routes.
[2] Curb lanes should be a minimum width of 3.3 m on TTC bus service routes.

Source: City of Toronto, Travel Lane Width Guidelines (2017).

2.3.6.3 City of Toronto Curb Radii Guidelines

While Transportation Association of Canada (TAC) Guidelines are typically relied upon for design, the 2015 City of Toronto Curb Radii Guidelines were developed to better incorporate the needs of all road users, including pedestrians and cyclists of all ages and abilities.

These guidelines retain many of the elements of the TAC guidelines but look for ways to increase active transportation user confidence and sense of safety by considering all modes of travel when designing intersections, rather than implementing larger radii to improve vehicular speed and flow. Some notable diversions from previous intersection design guidelines include:

- Greater burden of proof required when justifying increasing curb radii.
- Greater considerations for bike lanes when determining effective turning radii.
- Options for 1m radii at intersection corners where right turns are restricted.
- Maximum radii of 15 m – this should never be increased; instead, the truck route type should be downgraded.

The curbs within the study area were likely designed under an older standard, meaning opportunities exist to re-examine curb radii to further improve safety and comfort for vulnerable road users.

2.3.6.4 City of Toronto Transit Design Guide

The City's Transit Design Guide serves as a comprehensive framework outlining strategies for leveraging transit infrastructure improvements to enrich the public realm. The guide's main objective is to establish uniformity in the design ethos governing transit infrastructure. This includes recommendations pertinent to each phase of planning and design as well as guidance on collaboration with stakeholders to overcome barriers for implementation.

This guide pertains specifically to urban, architectural, and landscape design for both new construction and upgrades to existing rapid transit facilities and associated public-facing amenities within the Toronto area. It is intended to complement and align the extensive array of direct and indirect design directives governing transit initiatives, rather than replace existing policies, guidelines, regulations, and standards.

2.3.7 Relevant Major Transit Studies

This section will discuss major transit studies within the vicinity of the Eglinton East LRT study area. The EELRT is being advanced to integrate appropriately into this network context.

2.3.7.1 Scarborough Subway Extension TPAP and Construction

The Scarborough Subway Extension (SSE) is a currently under construction project to extend TTC Line 2 by 7.8 km along Eglinton Avenue East, Danforth Road, and McCowan Road to Sheppard Avenue East. The SSE project contains 3 new stations at Lawrence Avenue East and McCowan, Scarborough Centre (Ellesmere Road and McCowan), and Sheppard Avenue East and McCowan Road.

SSE builds on the work undertaken by the City of Toronto and the Toronto Transit Commission (TTC) between 2014 and 2019. A TPAP addendum to the completed 2017 TPAP of a one-stop extension was completed prior in July 2020.

The Tunnel contract was awarded in May 2021, and the development partner for the Stations, Rail, and Systems contract was selected in November 2022. The extension is expected to open in 2030.

2.3.7.2 Durham-Scarborough BRT TPAP and PDBC

The proposed Durham-Scarborough BRT (DSBRT) consists of 36 km of bus rapid transit infrastructure that would serve Scarborough, Pickering, Ajax, Whitby, and Oshawa. The proposed project aims to create seamless connections with local transit networks that will link destinations in the Region.

The project was assessed under the Transit Project Assessment Process (TPAP) in accordance with Ontario Regulation 231/08 and was completed early 2022. On March 28, 2022, the Minister of the Environment, Conservation and Parks issued a Notice to Proceed with this project. The Preliminary Design Business Case (PDBC) is expected to be completed by the end of 2024.

2.3.7.3 Sheppard (Line 4) Extension Study

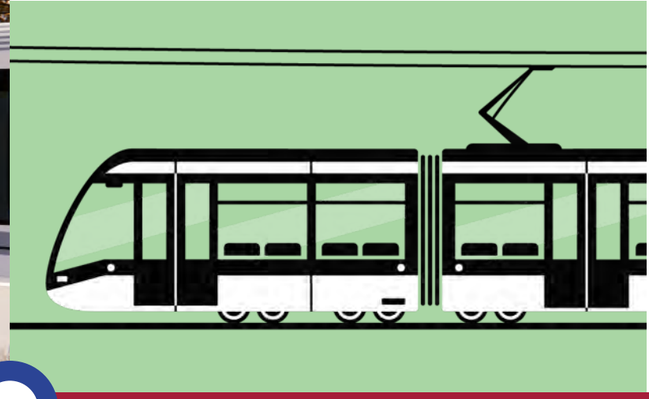
The proposed Sheppard (Line 4) Extension Study has commenced. Metrolinx is currently studying options developed through community input on the best way to provide rapid transit within the Sheppard Avenue corridor between Allen Road and Meadowvale Road. The consultations will be used to develop options for evaluation in an Initial Business Case framework expected for completion by the end of 2024.

2.3.7.4 GO Expansion

GO Expansion is a plan to improve rail service on the GO rail network. It aims to transform GO into a regional rail service with frequent service, more stations, and seamless connections to a regional rapid transit network. The Kitchener, Stouffville, Barrie, and Lakeshore lines are expected to provide all day, two-way service every 15 minutes on certain portions of the line.

The Full Business case for this project was completed in 2018 and various environmental assessments on project components such as, electrification, new tracks, and facilities has been completed.

The Stouffville and Lakeshore East lines pass through the Eglinton East LRT (EELRT) study area with connections at Kennedy GO, Eglinton GO, and Guildwood GO. In anticipation of service frequencies increasing on these lines, the EELRT has been designed to accommodate ridership growth.



3 Project Description

This chapter provides a detailed description of the 10% functional design for the Eglinton East LRT (EELRT), prepared in support of the Transit and Rail Project Assessment Process, including an overview of the design objectives, design development and implementation. The functional design has been developed with a consultant team in close coordination between the City and TTC in consideration of public and stakeholder feedback and a broad range of applicable policies and guidelines including:

- Provincial Policy Statement (2020),
- A Place to Grow: Growth Plan for the Greater Golden Horseshoe (2020),
- Greater Golden Horseshoe Transportation Plan (2022),
- Metrolinx 2041 Regional Transportation Plan (2018),
- Ontario Traffic Manual (OTM),
- City of Toronto Official Plan (2022),
- City of Toronto Cycling Network Plan Update (2016, 2021),
- Toronto Walking Strategy (2009),
- TransformTO,
- Toronto Green Standards (TGS), All
- Vision Zero 2.0 (2019),
- Complete Streets Guidelines (2016),
- City of Toronto Vehicle Travel Lane Width Guidelines (2017), and
- City of Toronto Curb Radii Guidelines.

3.1 Design Development

3.1.1 Design Objectives

The strategic goals and objectives of the EELRT study are aligned with those of the City of Toronto's Rapid Transit Evaluation Framework (RTEF). Specifically, that transit should serve people by providing multi-modal connections, improving travel times and reliability; and providing access to places of work, school, and leisure. The LRT should also strengthen places by supporting complete and healthy communities; and protecting the natural environment and public health. Finally, the project should support prosperity by promoting economic development and affordability. The project design objectives are elaborated upon below.

3.1.1.1 Serving People

The EELRT will serve the community by improving connections between people and places, thereby increasing travel options, improving the travel experience; and providing more people with more access to workplaces, schools, and places of leisure. The LRT will provide connections to Line 2, Line 5, the potential future Sheppard (Line 4) Extension, and several GO stations. Additionally, it will serve key destinations, such as the University of Toronto Scarborough and Malvern Town Centre.

3.1.1.2 Strengthening Places

The EELRT will strengthen communities and neighbourhoods by catalyzing compact mixed-use development, promote active transportation, reduce automobile use, and protect public health. The LRT will bring public realm and streetscaping enhancements such as dedicated cycling facilities, where possible and enhanced pedestrian walkways which will provide a more conducive environment for sustainable development and vulnerable road users. Additionally, this can reduce auto-dependency and support greater efficiency in people movement while reducing greenhouse gas emissions and airborne pollutants.

3.1.1.3 Supporting Prosperity

The EELRT will support the City's prosperity through the introduction of higher-order transit which will improve affordability of movement and economic development. The LRT will improve equity and accessibility by providing higher-order transit to underserved neighbourhoods and bring more economic opportunities to Scarborough through a reduction in traffic congestion and more efficient people and goods movement.

Artist's concept. Subject to change.

3.1.2 City of Toronto Cycling Network Plan Update (2016, 2024)

The Cycling Network Plan (CNP) serves as a comprehensive roadmap and work plan, outlining the City's planned cycling infrastructure investments in the near-term and intentions for the long-term. The CNP is grounded in many City policies and strategies including the Official Plan, the Road to Health, Vision Zero Road Safety Plan, TransformTO Climate Action Strategy, Complete Streets, among others.

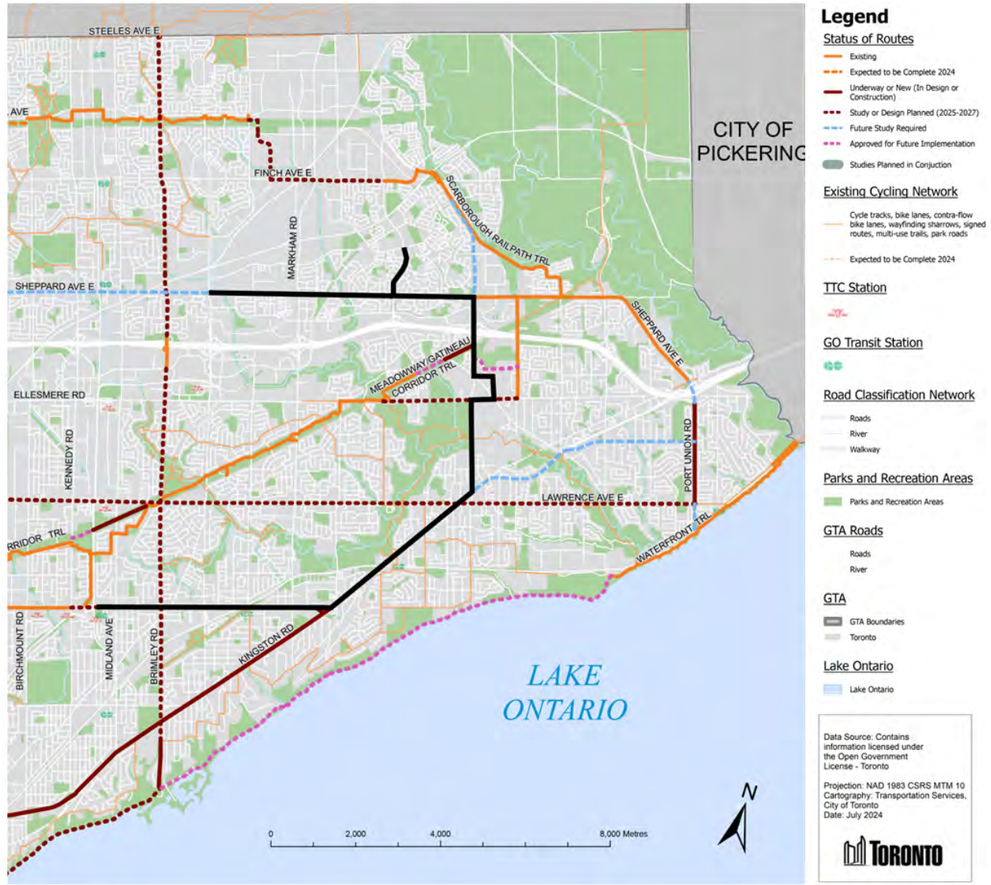
The CNP is an evolution of the Ten-Year Cycling Network Plan, approved in principle in June 2016. In 2019,2021, and 2024, the Cycling Network Plan was updated to continue to build on the work of its predecessor, its mandate being to:

- Connect the gaps in Toronto's existing cycling network,
- Grow the cycling network into new parts of the City, and
- Renew the existing cycling network routes to improve their quality.

Within the EELRT study area, the plan includes a boulevard trail connection between two segments of the Gatineau Hydro Corridor, running along Ellesmere Road from Military Trail to Morningside, and then along Morningside to just north of Military Trail, where it turns to the east until Conlins Road.

The Council Approved Network Plan for the EELRT study area is illustrated in Figure 3-1.

Figure 3-1: Toronto Major Cycling Routes



Source: Major City-wide Cycling Routes (toronto.ca)

3.1.3 Design Philosophy

The following list summarizes the proposed corridor wide EELRT design principles to guide the 10% design process.

General

1. The EELRT should be located, configured and dimensioned to allow for improvements to the surrounding public realm.
2. The EELRT should consider that improvements may occur in tandem with the development of transit infrastructure, or later as adjacent communities evolve increasingly into pedestrian and cyclist friendly urban environments.

Streetscape: Cycling, Pedestrian Clearway, Street Tree

3. The EELRT should preserve sufficient space within the right-of-way (ROW) in excess of transit infrastructure and vehicular lanes to accommodate pedestrian and cycling infrastructure in accordance with established City standards.
4. The EELRT should provide sufficient space on all streets making up the corridor to accommodate continuous rows of trees. Space allocated should comply with established City standards.
5. The EELRT design should limit impact on developable parcels of land and sensitive uses by shifting the location of the LRT track centre line to the extent possible.
6. The EELRT design should identify additional right-of-way (ROW) width required where the right-of-way (ROW) is not wide enough to accommodate all streetscape components.
7. The EELRT should determine where space within the right-of-way (ROW) can be conserved by shifting vehicular lanes into gore areas.
8. On overpasses and in underpasses, where there is space in excess of minimum standard requirements, the EELRT design should allocate additional space to the pedestrian clearway / sidewalk.
9. Generally, along the corridor, where there is space within the right-of-way (ROW) in excess of minimum standards, the EELRT should allocate this space to the tree planting zone to allow greater- separation between above grade utilities and street trees.

Road Layout: Reduce Conflicts with Pedestrians

10. The design speed corresponds to the posted speed limit.
11. The EELRT design should limit vehicular lane widths to minimum dimensions required for design speed.
12. The EELRT design should plan traffic flows to minimize corner radii at all intersections to the extent possible.
13. The EELRT design should plan to eliminate, and not create new right turn slip lanes / two stage pedestrian crossings (“pork chop” shaped traffic islands) where possible.
14. The EELRT project should review the need for dedicated turning lanes and eliminate them where possible.

Transit Infrastructure

15. The EELRT project should minimize distances and preserve sight lines between LRT platforms and bus stops to facilitate transfers.
16. The EELRT project should support transfers between the LRT and connecting transit/bus services. The design should focus efforts at locations on intersecting arterial roadways where transit riders from the LRT will wait for connecting bus service.
17. The EELRT project should aim to locate Traction Power Substation (TPSS) facilities away from street frontages, where possible, to reduce their visibility from adjacent streets and allow space for mitigation.
18. The EELRT project should locate TPSS facilities on private properties to promote integration into existing or future developments. The TPSS should be located to preserve maximum developable lot area, preserve opportunity for regularly shaped building footprints and to not subdivide lots.
19. The EELRT project should locate parking for TPSS facility to the rear of lots where it can be accessed via a lane and is less visible from adjacent streets.

The EELRT creates an opportunity to transform the way that people move around Scarborough by providing convenient and reliable higher-order transit, supporting a shift to more sustainable travel modes, and building Complete Streets that support a variety of road users (OP Policy 3.1.1(6)). Combined with the bus network and improved points of transfer, there will be an opportunity to enhance access to key destinations beyond and along the corridor while complementary investments in pedestrian and cycling infrastructure can help to support first and last mile access to transit and amenities in the area.

3.1.4 Design Criteria

The design criteria for the EELRT were developed based on Provincial and Municipal design standards as well as the *Transit Cooperative Research Program (TCRP) Report 155: Track Design Handbook for Light Rail Transit, Second Edition*. Feedback from stakeholder engagement activities also helped inform the various elements of the roadway, LRT, and active transportation components.

Table 3-1 summarizes the design criteria used for this project’s LRT elements.

Table 3-1: Design Criteria for LRT Elements

	EELRT 10% Design – TRPAP Mainline Track Design Criteria		
	Parameters	**Desired**	**Absolute**
General	Design speed	V = 70 km/h	Based on geometric conditions.
	Track gauge	1435mm	1435mm
	Track spacing with centre OCS poles (CL to CL)	Tangent = 4m Special trackwork = 4.2m Curves = Per vehicle specifications	Tangent = 4m Special trackwork = 4.0m Curves = Per vehicle specifications
	Track spacing with side OCS poles (CL to CL)	Tangent = 3.5m Curves = 3.7m Operator walkway = 4.5m	Tangent = 3.5m Curves = 3.7m Operator walkway = 4.5m
	Superelevation maximum, Ea	Intersection Ea = 0mm Semi-exclusive guideway Ea = 100mm	Intersection Ea = 0mm Semi-exclusive guideway Ea = 150mm
	Superelevation maximum, Eu	Eu = 75mm	Eu = 115mm
	Platform length	L = 50m (additional 10 m protected for future expansion)	L = 50m (additional 10 m protected for future expansion)
	Platform Width	Side platforms = 3.0m Centre platform = 5.5m	Side platforms = 3.0m Centre platform = 5.5m
	Minimum platform set back from crosswalk	L = 10m	L = 10m
Horizontal	**Tangents**		
	Between horizontal curves	Greater of: L = 0.57V L = 1 LRV length	L = Largest bogie spacing plus 3m L = 16m
	Beyond special trackwork	Greater of: L = 0.57V L = 16m	At PS end, L = 16m At heel end, L = 3m At diverging end, L = 3m
	Curves		
	Mainline horizontal radius	R = 50m	Greater of: If vertical tangent, R = 30m If K greater than 20, R = 30m If combined with 250m crest or 350m sag, R = 100m
	Minimum curve length	Greater of: L = 0.57V L = 1 LRV length	Greater of: L = Largest bogie spacing plus 3m L = 16m
	Minimum spirals	Greater of: Unbalanced Superelevation (Jerk) Ls = 0.008Veu Applied Ea (Twist) Ls = 0.75Ea Applied Ea and Speed Ls = 0.0076Vea Ls = 14m	Greater of: Unbalanced Superelevation (Jerk) Ls = 0.008Veu Applied Ea (Twist) Ls = 0.5Ea Applied Ea and Speed Ls = 0.0046Vea Ls = 14m
	Stops		
	Platform horizontal radius	Horizontal tangent	Horizontal tangent
	Beyond station platforms	L = 16m	L = 16m

Vertical	**Tangents**		
	Between vertical curves	Greater of: L = 0.57V L = 1 LRV length	L = Largest bogie spacing plus 3m L = 16m
	Minimum Beyond special trackwork	Greater of: L = 0.57V L = 16m	L = 16m
	Curves		
	Minimum sag	Greater of: L = 60A L = 1 LRV length	Greater of: L = (AV^2)/387 L = Largest bogie spacing plus 3m L = 16m Radius = 350m
	Minimum crest	Greater of: L = 60A L = 1 LRV length	Greater of: L = (AV^2)/215 L = Largest bogie spacing plus 3m L = 16m Radius 250m
	Stops		
	Tangent beyond station platforms	L = 16m	L = 16m
	Vertical curve radius	Vertical tangent	Vertical tangent
	Maximum platform grade	G = 0.5%	G = 2.0%
	Minimum platform grade	G = 0.5%	G = 0.0%
	Grades		
	Maximum mainline grade	G = 4.0%	G = 6.0%
	Minimum mainline grade	G = 0.5%	G = 0.0%
	Maximum mainline storage track grade	G = 0.0%	G = 0.3%
	Minimum mainline storage track grade	G = 0.0%	G = 0.0%
Special Trackwork	Terminal turnouts	VDV100	VDV50
	Mainline turnouts	VDV50	VDV50
	Mainline storage track turnouts	VDV50	VDV50
	Mainline wye turnouts	VDV30	VDV30
	Horizontal geometry	Horizontal tangent	Horizontal tangent
	Vertical geometry	Vertical tangent	Vertical tangent
	Spacing between special trackwork	L = 16m	L = 3m where no reverse movement is permitted
	Maximum special trackwork grade	G = 0.5%	G = 2.0%
	Minimum special trackwork grade	G = 0.5%	G = 0.0%

All roads within the study area are under the jurisdiction of the City of Toronto, except for a segment on Morningside Avenue between Pan Am Drive and Milner Avenue. This segment passes over Highway 401 and is under the jurisdiction of the Ontario Ministry of Transportation (MTO). The project assumes, subject to MTO approval, that the City of Toronto standards will be followed in this segment. The following standards, codes, and reference guidelines were used to inform the proposed design criteria:

- TAC Geometric Design Guide for Canadian Roads (2017),
- Ontario Traffic Manual,
- City of Toronto Standard Drawings, and
- City of Toronto Road Engineering Design Guidelines.
  - Lane Width Guidelines (2018)
  - Curb Radii Guidelines (2017)

Table 3-2 summarizes the design criteria for this project's roadway elements.

Table 3-2: Design Criteria for Roadway Elements

Road Name	Eglinton Ave	Kingston Rd	Morningside Ave	Ellesmere Rd	New Military Tr[3]	Morningside Ave	Morningside Ave	Morningside Ave	Sheppard Ave	Sheppard Ave	Neilson Rd
Segment	Kennedy to Kingston	Eglinton to Morningside	Kingston to Ellesmere	Morningside to New Military Tr	Ellesmere to Morningside	New Military Tr to Pan Am Dr	Pan Am Dr to Milner [4]	Milner to Sheppard	Conlins to Morningside	Morningside to McCowan	Sheppard to McLevin
Existing Roadway Classification	Major Arterial	Major Arterial	Major Arterial	Minor Arterial	N/A	Major Arterial	Major Arterial	Major Arterial	Major Arterial	Major Arterial	Minor Arterial
Existing Posted Speed (km/h)	50	60	50	50	N/A	50	60	50	50	50	50
Existing number of General-purpose lanes per direction	2	2	1	2	N/A	2	2	2	2	2	2
Existing number of RapidTO bus lanes per direction	1	1	1	0	N/A	0	0	0	0	0	0
Proposed Roadway Classification	Major Arterial	Major Arterial	Major Arterial	Minor Arterial	N/A	Major Arterial	Major Arterial	Major Arterial	Major Arterial	Major Arterial	Minor Arterial
Proposed Design Speed (km/h)	50	50	50	50	50	50	50	50	50	50	50
Proposed Posted Speed (km/h)	50	50	50	50	40	50	50	50	50	50	50
Proposed number of General-purpose lanes per direction	2	2	1	2	1	2	2	2	2	2	1
Minimum radius	135 m RC	135 m RC	135 m RC	135 m RC	80 m RC	135 m RC	135 m RC	135 m RC	135 m RC	135 m RC	135 m RC
Maximum grade	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Minimum grade	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Through lane width	3.0 m	3.0 m	N/A	3.0 m	N/A	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	N/A

[3] Desired configuration to support LRT alignment. Roadway subject to separate future approval requirements under the Environmental Assessment Act
[4] Subject to MTO Review

Road Name	Eglinton Ave	Kingston Rd	Morningside Ave	Ellesmere Rd	New Military Tr[3]	Morningside Ave	Morningside Ave	Morningside Ave	Sheppard Ave	Sheppard Ave	Neilson Rd
Segment	Kennedy to Kingston	Eglinton to Morningside	Kingston to Ellesmere	Morningside to New Military Tr	Ellesmere to Morningside	New Military Tr to Pan Am Dr	Pan Am Dr to Milner [4]	Milner to Sheppard	Conlins to Morningside	Morningside to McCowan	Sheppard to McLevin
Curb lane width	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m	3.3 m
Dedicated right turn lane width	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m
Dedicated right turn lane width – TTC bus route	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m
Left turn lane width	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m
Left turn lane width – TTC bus route	3.0 m	3.0 m	3.0 m	3.0 m	N/A	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m	3.0 m
Guideway buffer	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m	0.3 m to 0.5 m
Intersection Corner Radius[5]											
Major/Minor Arterial	15 m	15 m	15 m	15 m	15 m	15 m	15 m	15 m	15 m	15 m	15 m
Collector/Industrial	12 m	12 m	12 m	12 m	12 m	12 m	12 m	12 m	12 m	12 m	12 m
Collector-Residential	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m
Local-Residential	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m	7 m
Left turn taper ratio approaching intersection	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15
Lane taper ratio past the intersection or platform	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15	1:15
Lane taper ratio past the track crossover	1:30	1:30	1:30	1:30	1:30	1:30	1:30	1:30	1:30	1:30	1:30

[5] Corner radii to be refined during 30% design using AutoTurn analysis. Using standard radii for 10% design.

Road Name	Eglinton Ave	Kingston Rd	Morningside Ave	Ellesmere Rd	New Military Tr[3]	Morningside Ave	Morningside Ave	Morningside Ave	Sheppard Ave	Sheppard Ave	Neilson Rd
Segment	Kennedy to Kingston	Eglinton to Morningside	Kingston to Ellesmere	Morningside to New Military Tr	Ellesmere to Morningside	New Military Tr to Pan Am Dr	Pan Am Dr to Milner [4]	Milner to Sheppard	Conlins to Morningside	Morningside to McCowan	Sheppard to McLevin
Taper curve smoothing radius	500 m	500 m	500 m	500 m	500 m	500 m	500 m	500 m	500 m	500 m	500 m
PI past the intersection crossing centerline (minor/major?)	30 m	30 m	30 m	30 m	30 m	30 m	30 m	30 m	30 m	30 m	30 m
PI past the platform	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m
PI past the point of switch	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m	20 m
Left turn lane length	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Based on volume from 5% design	Consistent with existing lengths	Based on volume from 5% design
Buffer between the travel lanes and the back of platforms	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m	0.5 m
Buffer between the travel lanes and the guideway	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m	0.3 m

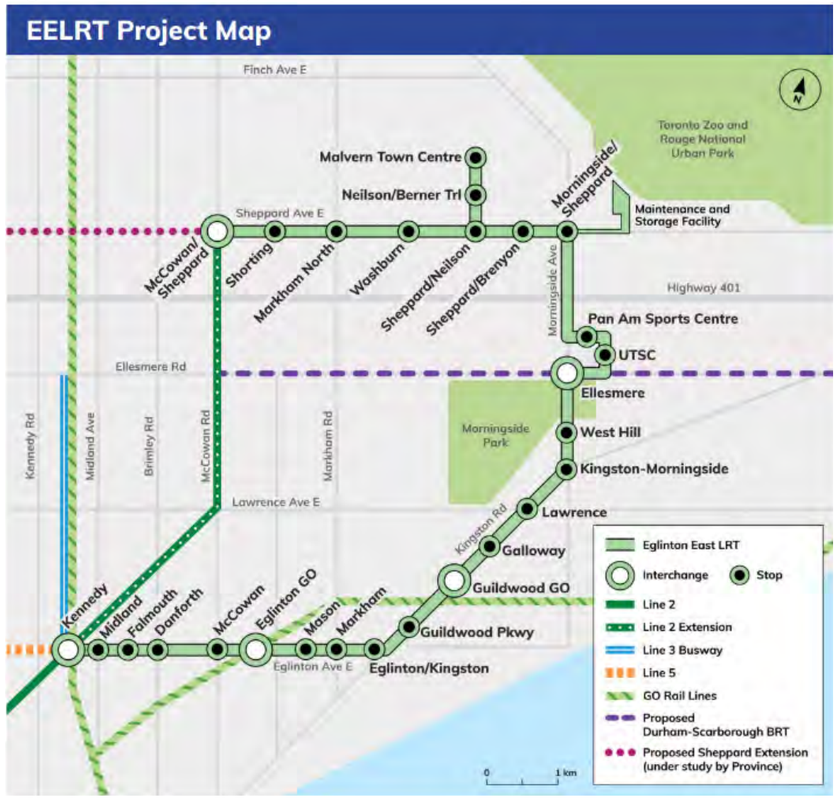
3.2 Functional Design

3.2.1 Overview of the Alignment

The EELRT is envisioned as a distinct service and is not proposed to be an extension of the Eglinton Crosstown (Line 5). The LRT will travel at-grade on a semi-exclusive LRT guideway, following existing or planned streets. The LRT alignment begins at Kennedy Station and follows Eglinton Avenue East, Kingston Road, Morningside Avenue, Ellesmere Road, New Military Trail, and Sheppard Avenue East, terminating at the under-construction Line 2 station at McCowan Road. The alignment also has a branch that diverges north of Sheppard Avenue along Neilson Road, terminating at Malvern Town Centre.

The EELRT has a total length of 18.6 km from the end of the new tracks at Kennedy Station to the end of the tail tracks at McCowan Station (including the Neilson Road branch). Twenty-seven (27) stops (including terminal stations) are included along the line, described further in Section 3.2.4.

Figure 3-2: EELRT Project Map



The EELRT will connect to Line 2 and 5 at Kennedy Station; and Line 2 and the potential future Sheppard (Line 4) Extension at Sheppard-McCowan Station. GO Transit connections will be provided at Kennedy GO, Eglinton GO, and Guildwood GO. Additionally, the LRT plans to intersect with the Durham-Scarborough Bus Rapid Transit (DSBRT) at Ellesmere Road between Morningside Avenue and future Military Trail. Passenger transfers with local bus services will be provided where appropriate to complement the LRT service and support Scarborough transit users.

For ease of reference, the study corridor was divided into 4 segments:

- **Segment 1:** Eglinton-Kingston,
- **Segment 2:** Morningside-UTSC,
- **Segment 3:** Sheppard, and
- **Segment 4:** Neilson

Design elements along each segment of the alignment are described in further detail in Section 3.2.5 (Typical Sections) and Section 3.2.12 (Bridges and Structures). Please note that coordination of the public realm design along New Military Trail will continue with UTSC in conjunction with updates to the UTSC Secondary Plan.

The horizontal alignment was developed following the LRT design criteria presented in Chapter 3.1.4 and labelled on the EELRT alignment plan and profile plates in **Appendix A.**

3.2.2 Vertical and Horizontal Alignment

The vertical and horizontal alignment for the EELRT 10% functional design is being developed following the design criteria in Chapter 3.1.4. The minimum and maximum desired and absolute design parameters used on the vertical alignment are included in Table 3-1. Sight lines for signalling will be confirmed during future phases of the design.

The vertical curves and other design parameters are labelled on the EELRT alignment plan and profile plates in **Appendix A**.

3.2.3 Alignment Stationing / Chainage

Stationing / chainage is the distance along the alignment and is measured in metres. The EELRT stationing increases in an easterly direction along Eglinton Avenue East, then a northerly direction on Kingston Road and Morningside Avenue, easterly along Ellesmere Road, northerly along New Military Trail, westerly along Pan Am Drive, westerly along Sheppard Avenue East and northerly along Neilson Avenue.

Stationing is not continuous to allow for stationing equations in between each of the major segments to account for modifications to the alignment length.

The EELRT starts at chainage 10+000 at Kennedy Station and ends at chainage 45+719 at McCowan Station and at chainage 51+169 at Malvern Town Centre.

3.2.4 Stations and Stops

The EELRT stops and stations are described at a high-level in Table 3-3.

Table 3-3: Summary of EELRT Stations and Stops

	Stop	Description
Segment 1: Eglinton - Kingston	**Kennedy Station**	• 50 m wedge-shaped centre platform (14 m wide on the west, 6.5 m wide on the east). • Proposed to be located on the City-owned parking lot near the loop access road on the east side of the GO rail corridor. Covered terminal station building facilitating weather protected connections to all Kennedy Station higher-order transit lines and bus terminal.
	Midland	• 5.5 m wide centre platform, east of Midland Avenue. • Utilizes the shadow of the storage track east of the platform.
	Falmouth	• 5.5 m wide centre platform, east of Falmouth Avenue. • Utilizes the shadow of the centre storage track west of Falmouth Avenue.
	Danforth	• Two 3 m wide side-facing platforms, west of Danforth Road • Reduces potential property impact east of Danforth Road, as the area is constrained due to townhouses on both the north and south sides.
	McCowan	• Two 3 m wide far side platforms.
	Eglinton GO	• Two 3 m wide side-facing platforms.
	Mason	• Two 3 m wide far side platforms.
	Markham	• Two 3 m wide far side platforms.
	Eglinton-Kingston	• 5.5 m wide centre platform. • Utilizes the shadow of the storage track west of the platform.
	Guildwood Parkway	• Two 3 m wide far side platforms.
	Guildwood GO	• Two 3 m wide far side platforms.
	Galloway	• Two 3 m wide far side platforms.
	Lawrence	• 5.5 m wide centre platform, west of Lawrence Avenue • Utilizes the shadow of the storage track east of the platform.
Segment 2: Morningside - UTSC	**Kingston-Morningside**	• 5.5 m wide centre platform, west of Morningside Avenue • Utilizes the shadow of the centre storage track west of the platform.
	West Hill	• Two 3 m wide far side platforms.
	Ellesmere	• 5.5 m centre platform, south of Ellesmere Avenue on • Morningside Avenue.
	UTSC (Military Trail)	• 5.5 m centre platform, north of Ellesmere Avenue on New **Military Trail.**
	Pan Am Sports Centre	• Two 3 m wide far side platforms at Pan AM Drive on New Military Trail.
Segment 3: Sheppard	**Morningside-Sheppard**	• 5.5 m wide centre platform, west of Morningside Avenue.
	Sheppard-Brenyon	• Two 3 m wide far side platforms at Brenyon Way and Breckon Gate.
	Sheppard-Neilson	• Three 3 m wide far side platforms on each of the north, east and west legs of the intersection.
	Washburn	• Two 3 m wide far side platforms at Washburn Way and Lapsley Road.
	Markham North	• Two 3 m wide far side platforms at Markham Road.
	Shorting	• Two 3 m wide far side platforms at Shorting Road and Havenview Road.
	Sheppard – McCowan Station	• 10 m wide centre platform, east of McCowan Road, to accommodate elevators and staircases to facilitate underground connection with SSE and potential future Sheppard (Line 4) Extension.
Segment 4: Neilson	**Neilson-Berner**	• Two 3 m wide far side platforms at Berner Trail and Wickson Trail.
	Malvern Town Centre	• Two 3 m wide side-facing platforms north of Tapscott Road.

The EELRT stations and stops are designed such as to facilitate level boarding and barrier-free access at all stops. Station and stop amenities and features will be confirmed in future phases of the design. More details about interchange stations are provided in the subsequent sections.

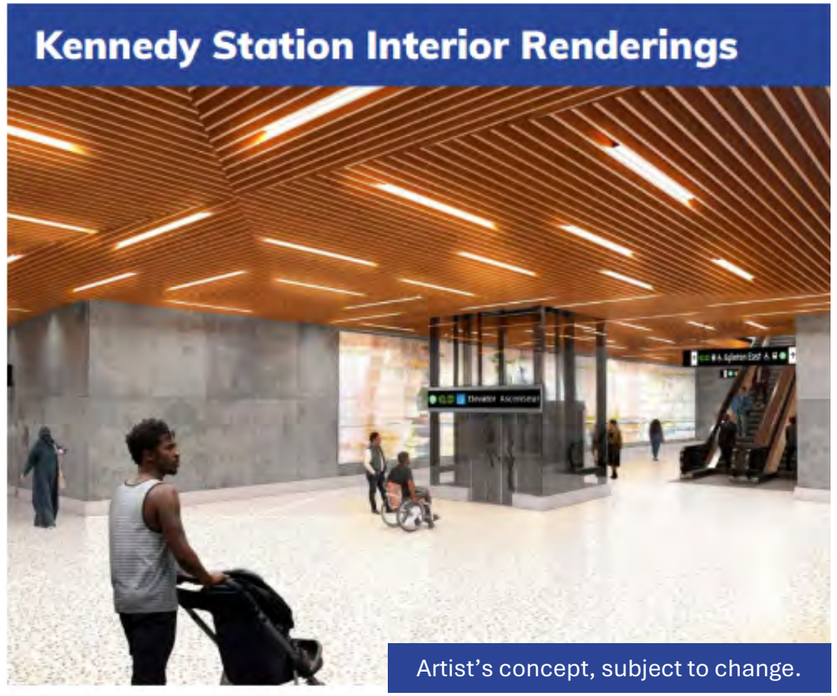
3.2.4.1 Kennedy Station

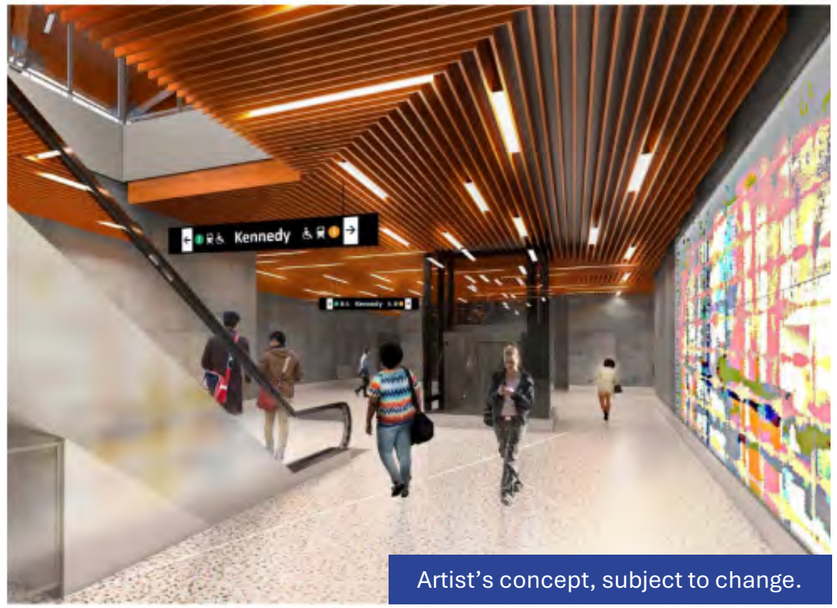
Kennedy Station is a key transportation node connecting the EELRT with the Eglinton Crosstown LRT (ECLRT, Line 5), Line 2 and Kennedy GO Station. The Scarborough Subway Extension (SSE) that extends Line 2 to Sheppard Avenue and McCowan Road, also connects at this location and is currently under construction.

The EELRT terminus at Kennedy Station is proposed to be located on the City-owned parking lot near the loop access road on the east side of the GO rail corridor. The station will be covered, positioned directly south of the GO headhouse and the ECLRT concourse. Transfers with ECLRT will be facilitated at-grade and underground via the EELRT station building. An elevator, escalators and stairs will transport passengers between the centre platform and the proposed underground concourse. The concourse will connect to ECLRT and house mechanical and electrical systems. Reconfiguration of the Eglinton Avenue Loop Road will be required to service the station and future adjacent land uses. The existing TTC box structure and future SSE cut and cover box abut the EELRT Kennedy concourse to the south. The EELRT building overlays the SSE box along the site. Due to the proximity between the EELRT station and future underground SSE box structure, it is recommended for Metrolinx to make accommodations necessary during the SSE implementation to protect for the future EELRT Kennedy station construction.

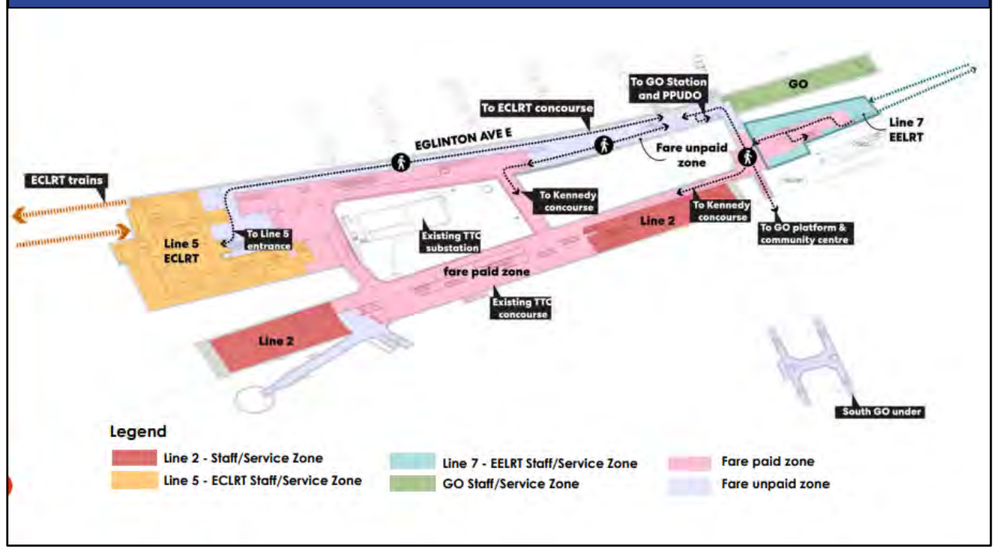
Figure 3-3 illustrates the Kennedy Station EELRT 10% functional design. **Appendix N** includes the architectural package for Kennedy Station.

Figure 3-3: EELRT Kennedy Station 10% Functional Design

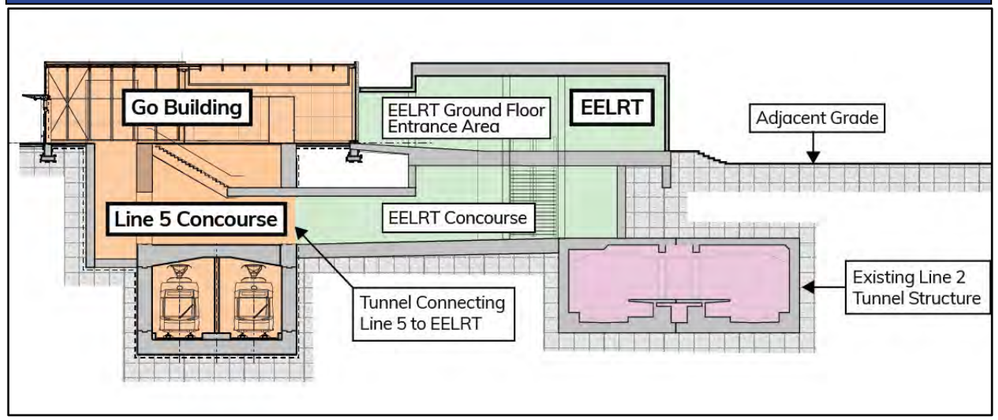




Kennedy Station Below Grade Interface Context Plan



Below Grade Interface - Section View - East of GO Corridor (immediately west of future SSE box)



3.2.4.2 Sheppard-McCowan Station

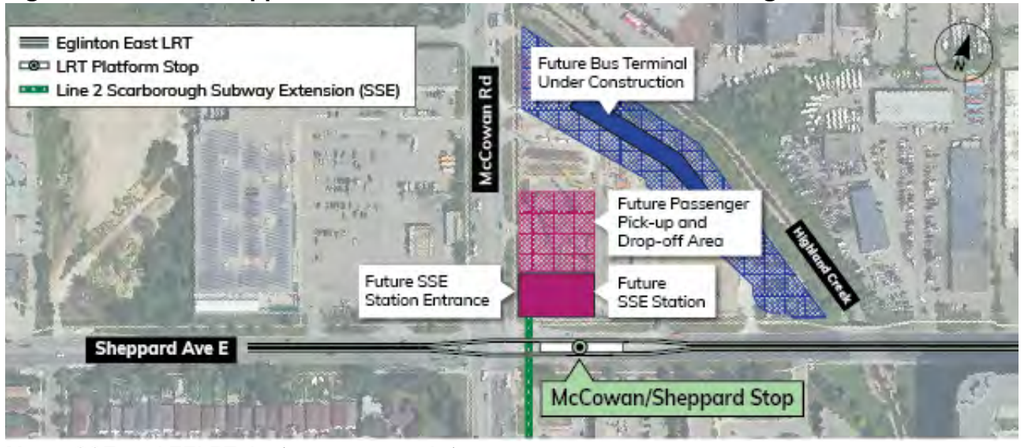
Sheppard-McCowan Station will become another key transportation node connecting the EELRT with the northern terminus of the SSE, a new bus terminal, and the potential future Sheppard (Line 4) Extension.

The station is proposed to be weather-protected and is located in the median of Sheppard Avenue East, east of McCowan Road and south of the SSE station headhouse. The at-grade centre platform accommodates two elevators, escalators, and stairs to facilitate transfers to the SSE. Passengers will travel down two levels from the EELRT platform to the concourse level and walk north along a proposed underground connection to reach the SSE and the future bus terminal.

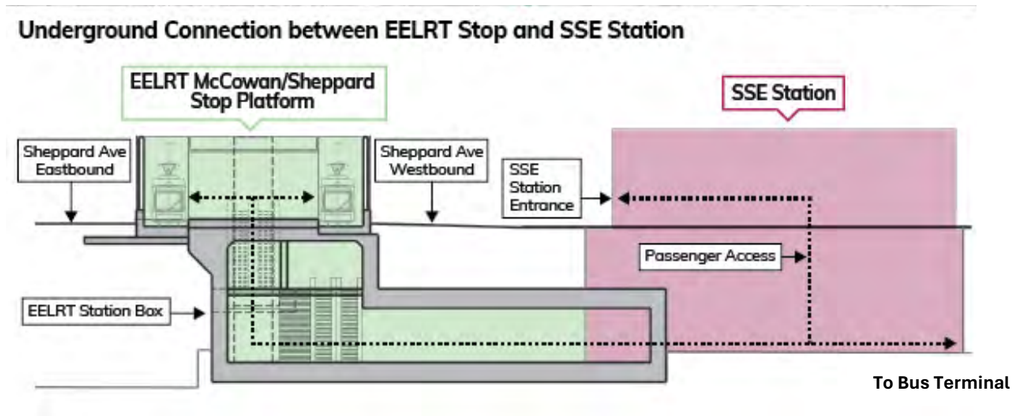
Sheppard-McCowan Station is being designed to avoid the relocation of a major 2250 mm storm sewer running along Sheppard Avenue (to the south of the EELRT station box). The ability of the storm sewer to manage the additional load of the EELRT station box as well as future maintenance accessibility to the sewer will need to be confirmed in future phases of the design.

Figure 3-4 illustrates the Sheppard-McCowan Station EELRT 10% functional design.

Figure 3-4: EELRT Sheppard McCowan Station 10% Functional Design



Note: SSE and EELRT designs are a work-in-progress



Appendix N includes the architectural package for Sheppard-McCowan Station.

3.2.5 Typical Sections

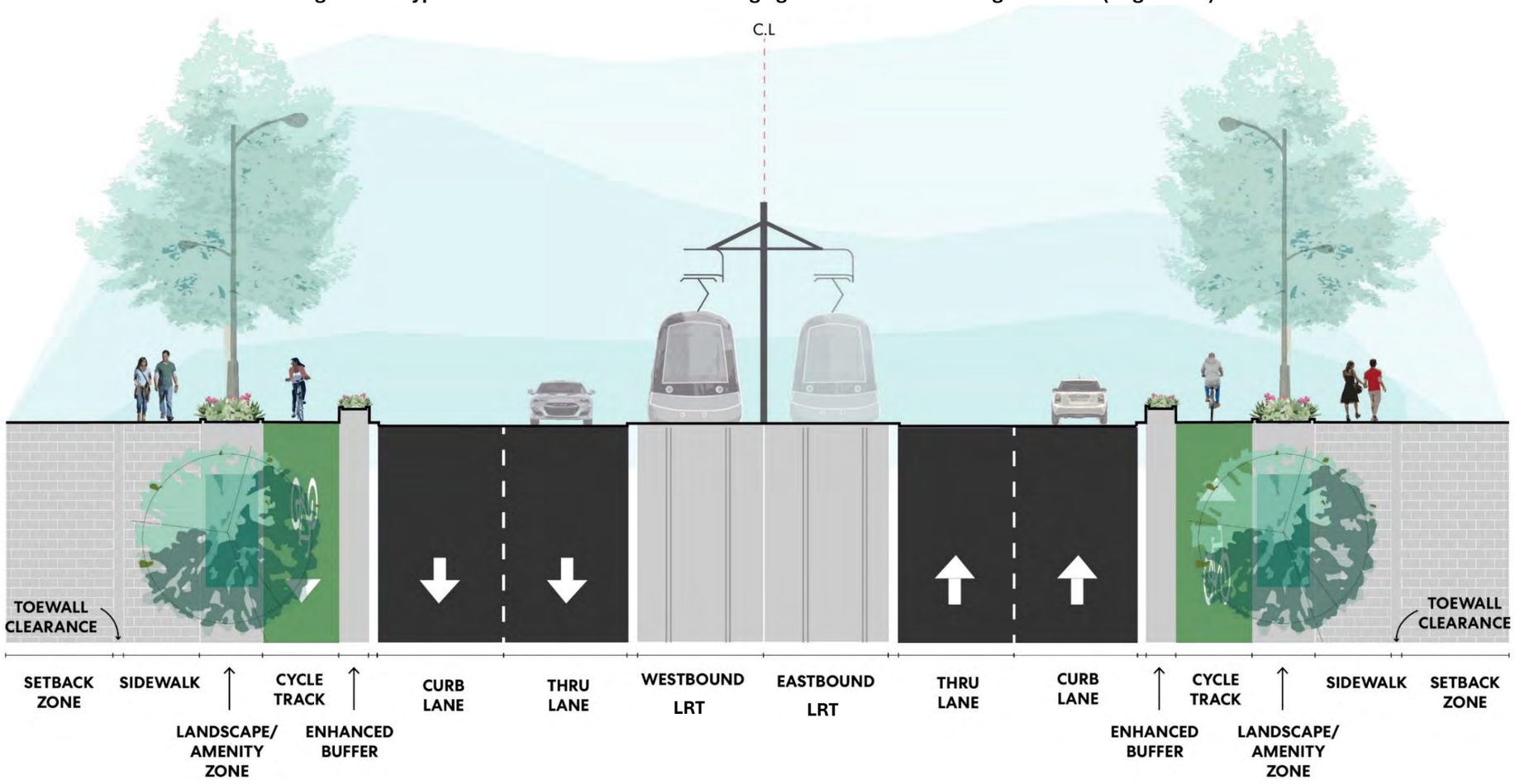
3.2.5.1 Segment 1: Eglinton Avenue East and Kingston Road

Table 3-4 and Figure 3-5 summarize the key elements of the preferred design of Segment 1, which consists of Eglinton Avenue East from Kennedy Station to Kingston Road, and Kingston Road from Eglinton Avenue East to Morningside Avenue.

Table 3-4: Key Elements of Segment 1 (Eglinton Avenue East and Kingston Road)

Segment 1	Eglinton Avenue East (from Kennedy Station to Kingston Road) and Kingston Road (from Eglinton East to Morningside Avenue)
Road	Starting east of Kennedy Loop Road, the LRT will run along Eglinton Avenue East and then along Kingston Road while maintaining four lanes for general traffic (two lanes in each direction) until it reaches Morningside Avenue. Vehicular lane widths vary between 3 m for through lanes and 3.3 m for curb lanes. Left-turn lanes are provided at all major intersections in both eastbound and westbound directions. No left-turn lanes are provided at the following locations due to space constraints: • Eglinton Avenue and Brimley Road (WB), • Eglinton Avenue and Danforth Road (EB), • Eglinton Avenue and Centre Street (EB), • Kingston Road and Saunders Road (EB and WB), • Kingston Road and Dale Avenue (EB and WB), • Kingston Road and Lawrence Avenue (EB and WB), and • Kingston Road and Falaise Road (EB). At the Kingston Road intersection, Eglinton Avenue East will be realigned to the north to follow the LRT alignment and meet Kingston Road at a new signalized intersection. The existing portion of Eglinton Avenue East that terminates at a T-junction with Kingston Road will be modified to provide access to local adjacent land use.
Transit	In Segment 1, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m wide median curbs on each side to separate LRVs from general traffic. The LRT guideway varies in width along Segment 1, increasing where tracks diverge to accommodate centre storage tracks or centre platforms (such as at Midland, Falmouth, Kingston, Lawrence, and Morningside stops). Elsewhere, the LRT guideway narrows as tracks converge at split platforms (such as at Danforth, McCowan, Eglinton GO, Mason, Markham, Guildwood Parkway, Guildwood GO and Galloway stops). Station and stop platforms are 50 m long with protection for future 10 m extensions, if required. Centre platforms are 5.5 m wide whereas side platforms are 3 m wide. Segment 1 proposes 13 LRT stops, including Kennedy Station. Station and stop features and amenities (such as seating areas, shelters, fare gates and ticket vending machines) will be confirmed in future phases of design. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation Services for inclusion in design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	In Segment 1, protected, unidirectional cycle tracks are proposed on both sides of the street. The cycle tracks are 2.1 m wide and have a 1 m wide enhanced buffer from the roadway. Sidewalks are provided on both sides of the street and are 2.1 m wide along the segment. A 0.2 m wide curb and 0.8 m wide enhanced buffer separate the curb lane from the cycle track on each side of the street. A 1.8 m wide landscape and amenity zone separates the cycle track from the sidewalk. A 0.3 m wide buffer zone separates the sidewalk from the street line. The approach noted above is desirable, but widths may need to vary at pinch points and due to localized constraints. To limit impacts on property, a 3 m wide multi-use path is proposed for certain sections such as at Eglinton Avenue East from Danforth Road to Oswego Road (south side), from Bellamy Road North to 150 m before Mason Road (north and south sides) and at Kingston Road from Saunders Road to Celeste Drive (west side), from Cromwell Road to Celeste Drive (east side), from Overture Road to 130 m north of Overture Road (west side), and 70 m on both sides of Galloway Road (west side).
Property Impacts	Segment 1 consists of a 36 m existing right-of-way (ROW) per Official Plan (Map 3) and can only accommodate the elements of the preferred design at certain locations (generally midblock). At a minimum, intersections with proposed LRT stops and turning lanes, property acquisition will be required. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design.

Figure 3-5: Typical Cross-Section Elements along Eglinton Avenue and Kingston Road (Segment 1)



3.2.5.2 Segment 2A: Morningside Avenue (between Kingston Road and Ellesmere Road)

Table 3-5 and Figure 3-6 summarize the key elements of the preferred design of Segment 2A, which consists of Morningside Avenue from Kingston Road to south of Ellesmere Road.

Table 3-5: Key Elements of Segment 2A (Morningside Avenue)

Segment 2A	Morningside Ave from Kingston Road to south of Ellesmere Road
Road	In Segment 2A, the LRT will be centre-running along Morningside Avenue. Between Kingston Road and Ellesmere Road, Morningside Avenue will consist of two lanes for general traffic (one lane in each direction). Vehicular lane dimensions vary between 3 m wide for left-turn lanes and 3.3 m wide for curb lanes. Left-turn lanes are provided at all signalized intersections in both northbound and southbound directions.
Transit	In Segment 2A, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m wide median curbs on each side to separate LRVs from general traffic. The Highland Creek crossing structure requires a reduced guideway width and does not provide a 0.3 m median separation to the adjacent lane. The LRT guideway varies in width along Segment 2, increasing where tracks diverge to accommodate centre platforms (such as at the Ellesmere stop). Station and stop platforms are 50 m long with protection for future 10 m extensions. Centre platforms are 5.5 m wide whereas side platforms are 3 m wide. Station and stop features and amenities (such as seating areas, shelters, fare gates and ticket vending machines) will be confirmed in future phases of design. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation Services for inclusion in design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	In Segment 2A, between Kingston Road and Fairwood Crescent, a 2.5 m wide landscape and amenity zone is located beside the roadway on both sides, separated by a 0.2 m wide curb, as shown in Figure 3-6. Protected, unidirectional cycle tracks are provided on both sides of the street between Kingston Road and Fairwood Crescent. Cycle tracks are 2.1 m wide, situated between the tree planting zone and sidewalk. The sidewalks and the cycle tracks are separated by a 0.35 m wide beveled curb. Sidewalks are provided on both sides of the street and are 2.1 m wide on Morningside Avenue between Kingston Road and Fairwood Crescent. A 0.3 m wide buffer zone separates the sidewalk from the street line. North of Fairwood Crescent, Morningside Avenue is bounded by the Highland Creek valley on the east and west sides, until it reaches Ellesmere Road. To limit impacts to the valley embankment and avoid widening the Morningside-Highland Creek Bridge, 3 m wide multi-use paths are on both sides of Morningside Avenue between Fairwood Crescent and Ellesmere Road, as shown in Figure 3-7 Typical widths may vary due to pinch points and due to localized constraints.
Property Impacts	Morningside Avenue between Kingston Road and Fairwood Crescent consists of a 26 m wide existing right-of-way (ROW) per the Official Plan (Map 3). The EELRT alignment shifts to the west to protect the West Hill Public School on the east side of Morningside Avenue (at Tefft Road). To accommodate the elements of the preferred design and protect West Hill Public School, property acquisition will be necessary along this segment. To accompany the EELRT preferred design, it is further assumed that Beath Street will be realigned as per the Scarborough-Malvern LRT TPAP. North of the Highland Creek Bridge, the top of the Morningside Avenue embankment is proposed to be widened on both sides by about 3 m to accommodate pole zones and multi-use paths. Retaining walls are proposed on both sides to avoid re-grading the lower part of the embankment and to reduce impacts on the valley. The right-of-way (ROW) widening increases at Ellesmere stop and at the Morningside Park entrance intersection to accommodate a northbound left-turn lane. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-6: Typical Cross-Section Elements at Morningside Avenue between Kingston Road and Fairwood Crescent (Segment 2A)

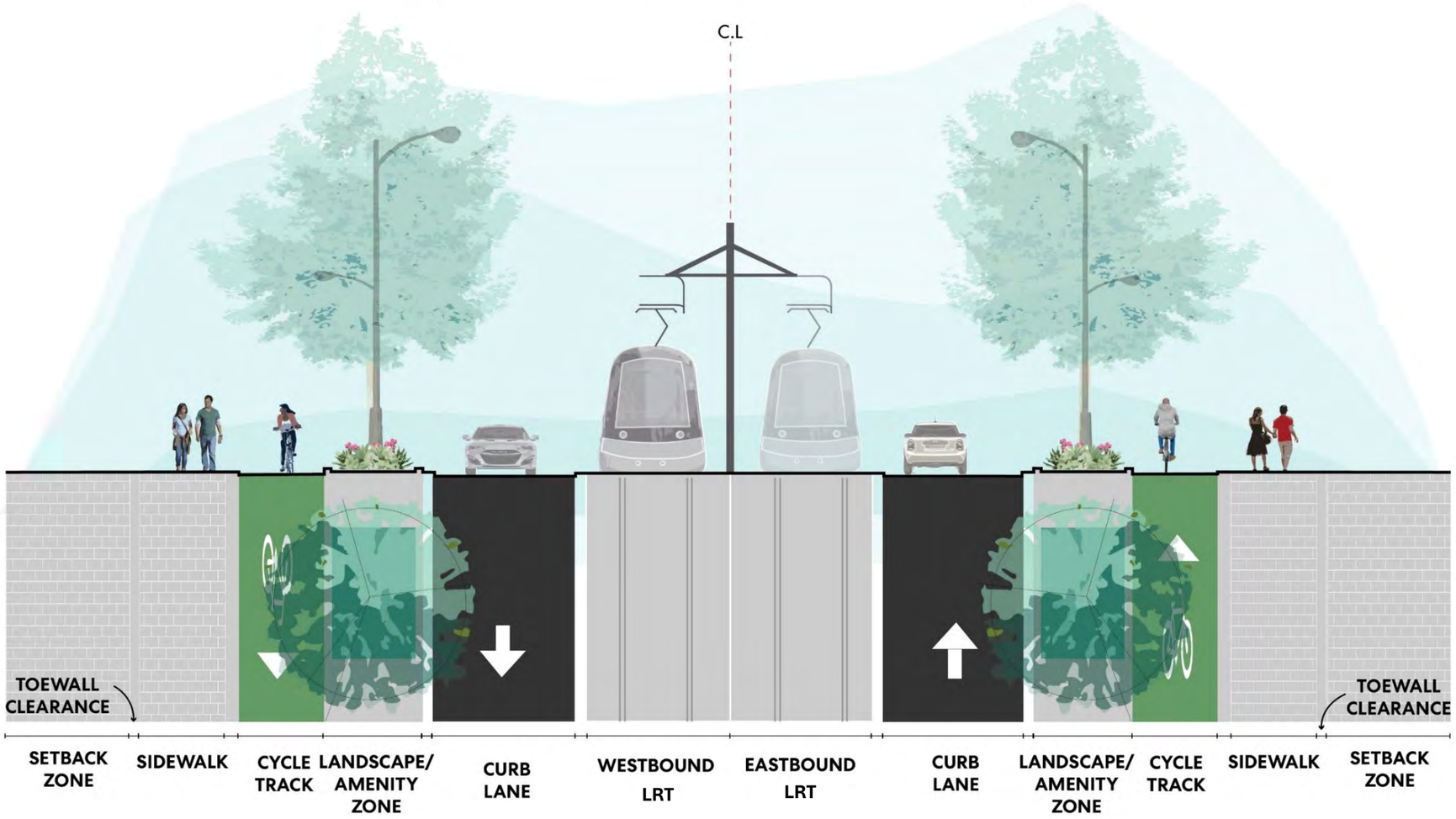
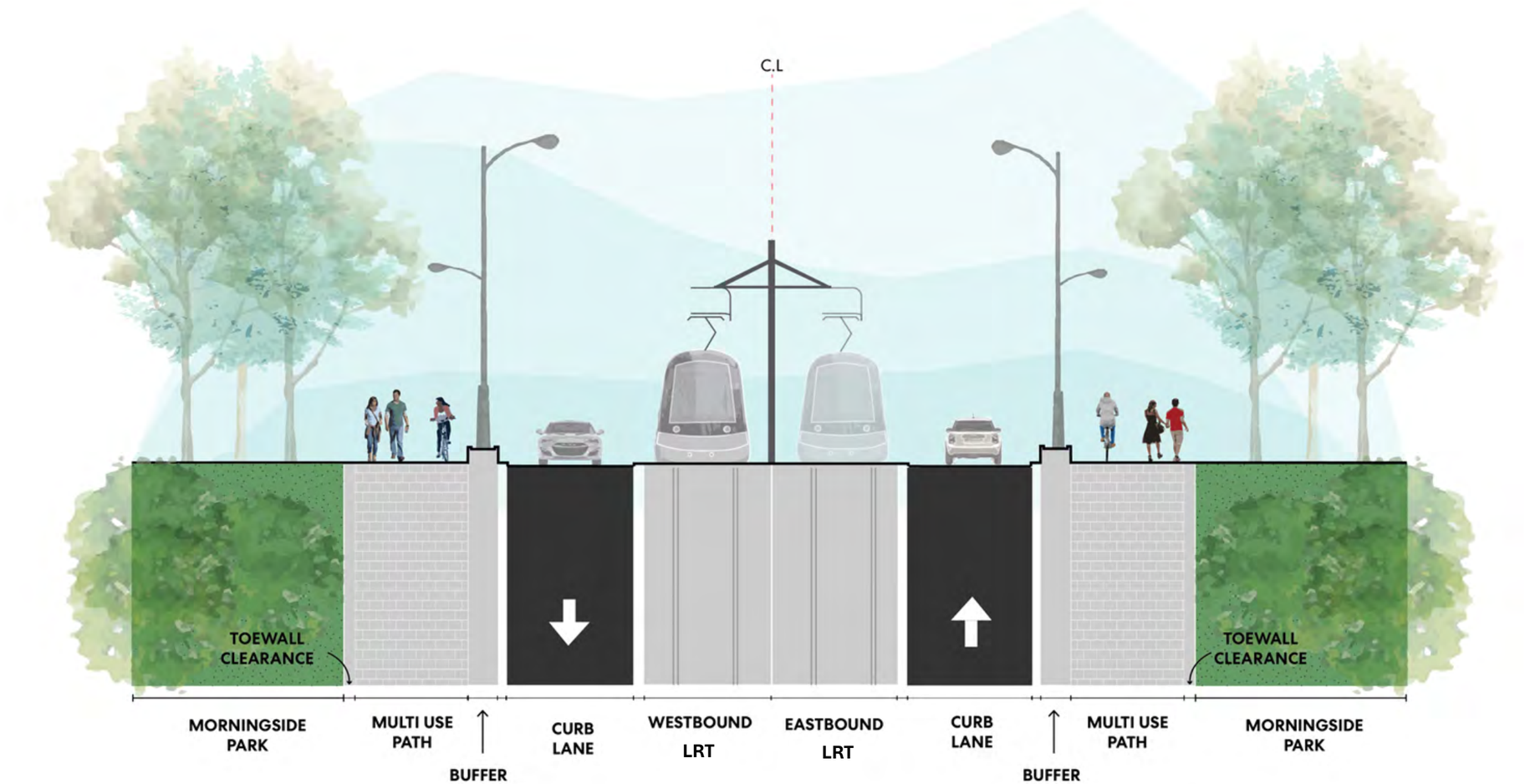


Figure 3-7: Typical Cross-Section Elements at Morningside Avenue between Fairwood Crescent and Ellesmere Road (Segment 2A)



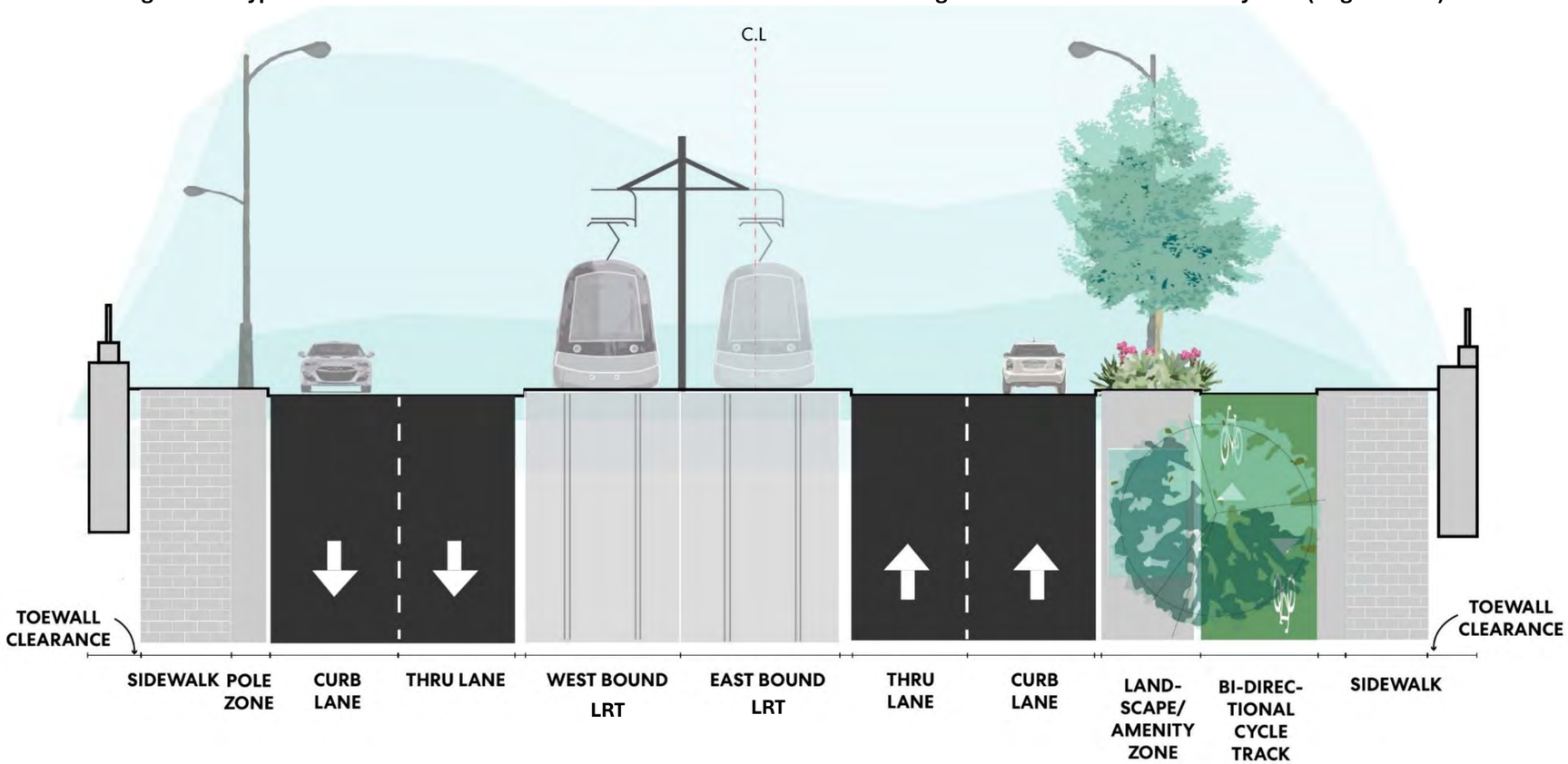
3.2.5.3 Segment 2B: Ellesmere Road (between Morningside Avenue and New Military Trail)

Table 3-6 and Figure 3-8 summarize the key elements of the preferred design of Segment 2B, which consists of Ellesmere Road from Morningside Avenue to New Military Trail.

Table 3-6: Key Elements of Segment 2B (Ellesmere Road)

Segment 2B	Ellesmere Road from Morningside Avenue to New Military Trail
Road	Between Morningside Avenue and New Military Trail, Ellesmere Road maintains four lanes for general traffic (two lanes in each direction). Vehicular lane widths vary between 3 m for through lanes and 3.3 m for curb lanes. 3.0 m wide left-turn lanes are provided at all major intersections in both eastbound and westbound directions. It is assumed that Durham-Scarborough BRT will run in mixed traffic in this segment, with the EELRT guideway in the centre of the roadway.
Transit	In Segment 2B, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m wide median curbs on each side to separate LRVs from general traffic. There are no LRT stops directly on Ellesmere Road. Proposed bus stop locations are currently under development and will be sited in consultation with relevant stakeholders for inclusion in the design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	Space for public realm is limited on the north side of Ellesmere Road due to constraints such as grade differentials and the UTSC Instructional Centre building. As such, the north side can accommodate a 2.1 m wide sidewalk, separated from the street by a 1.3 m wide pole zone and 0.2 m wide curb. On the south side of Ellesmere Road, protected, bidirectional cycle tracks are proposed. The cycle tracks are 4 m wide and are situated between a landscape and amenity zone and sidewalk. The width of the landscape and amenity zone varies along the length of the segment to occupy the remaining space between the cycle track and roadway. The sidewalk and the cycle tracks are separated by a 0.35 m wide beveled curb. 2.1 m wide sidewalks are provided on the south side of the cycle track. A 0.3 m clearance zone separates the sidewalk from the southern street line. The typical widths above may vary due to pinch points and due to localized constraints.
Property Impacts	Ellesmere Road between Morningside Avenue and New Military Trail consists of a 36 m wide existing right-of-way (ROW) per the Official Plan (Map 3). To accommodate the elements of the preferred design, property acquisition will be necessary along this segment. Ellesmere Road is bounded by the Highland Creek Valley along the south side. Immediately north of the valley, there is a 2100 mm diameter high-pressure watermain that runs south of Ellesmere Road, parallel to the roadway. Retaining walls are proposed to be located south of the watermain, along its length. This results in a potentially wider space available for the public realm along the south side of Ellesmere Road. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-8: Typical Cross-Section Elements at Ellesmere Road between Morningside Avenue and New Military Trail (Segment 2B)



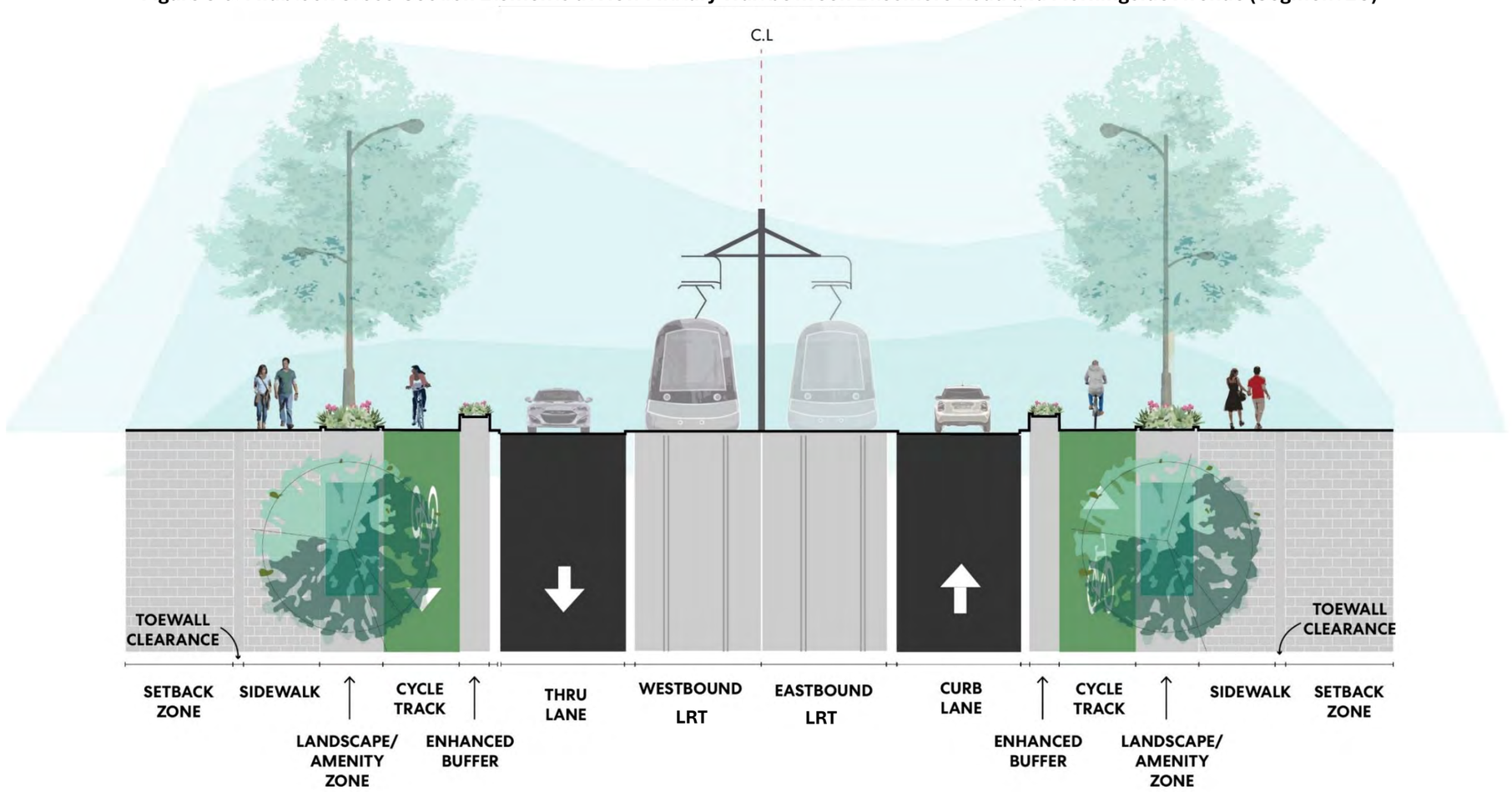
3.2.5.4 Segment 2C: New Military Trail

Table 3-7 summarizes the key elements of the preferred design of Segment 2C, which consists of the light rail transit alignment including two stops along a New Military Trail roadway within the University of Toronto Scarborough Campus (UTSC), connecting Ellesmere Road and Morningside Avenue. The New Military Trail roadway is subject to a future Class EA or future streamlined assessment as permitted under the Environmental Assessment Act. Figure 3-9 shows a mid-block section in this segment.

Table 3-7: Key Elements of Segment 2C (New Military Trail)

Segment 2C	New Military Trail from Ellesmere Road and Morningside Avenue
Road	Two lanes for general traffic (one lane in each direction) are proposed for the New Military Trail roadway. A future Class EA, streamlined assessment or studies, may be undertaken for the New Military Trail roadway, as required by the Environmental Assessment Act, to confirm roadway elements.
Transit	In Segment 2C, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m wide median curbs on each side to separate LRVs from general traffic. The LRT guideway varies in width along Segment 2C, increasing where tracks diverge to accommodate curves and centre platforms (such as at New Military Trail - UTSC stop). Elsewhere, the LRT guideway narrows as tracks converge at split platforms (such as at Pan Am Sports Centre stop). Station and stop platforms are 50 m long with 10 m protected for future extensions. Centre platforms are 5.5 m wide whereas side platforms are 3 m wide. Station and stop features and amenities (such as seating areas, shelters, fare gates and ticket vending machines) will be confirmed in future phases of design. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation Services for inclusion in the design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	In Segment 2C, a sidewalk, landscaping strip, and unidirectional cycle tracks with a buffer from the roadway are proposed on both sides of the street where space permits. Dimensions may vary due to pinch points and localized constraints. Coordination of the public realm design along New Military Trail will continue with UTSC in conjunction with updates to the UTSC Secondary Plan.
Property Impacts	The right-of-way for New Military Trail through UTSC Campus is designed to be up to 36 m wide (to accommodate a desired building face to building face width). Coordination of the public realm design and right-of-way width along New Military Trail will continue with UTSC in conjunction with updates to the UTSC Secondary Plan.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-9: Midblock Cross-Section Elements at New Military Trail between Ellesmere Road and Morningside Avenue (Segment 2C)



Note: A future Class EA, streamlined assessment or studies, may be undertaken for the New Military Trail roadway, as required by the Environmental Assessment Act. Coordination with UTSC will continue to confirm the public realm, roadway design, and ROW width.

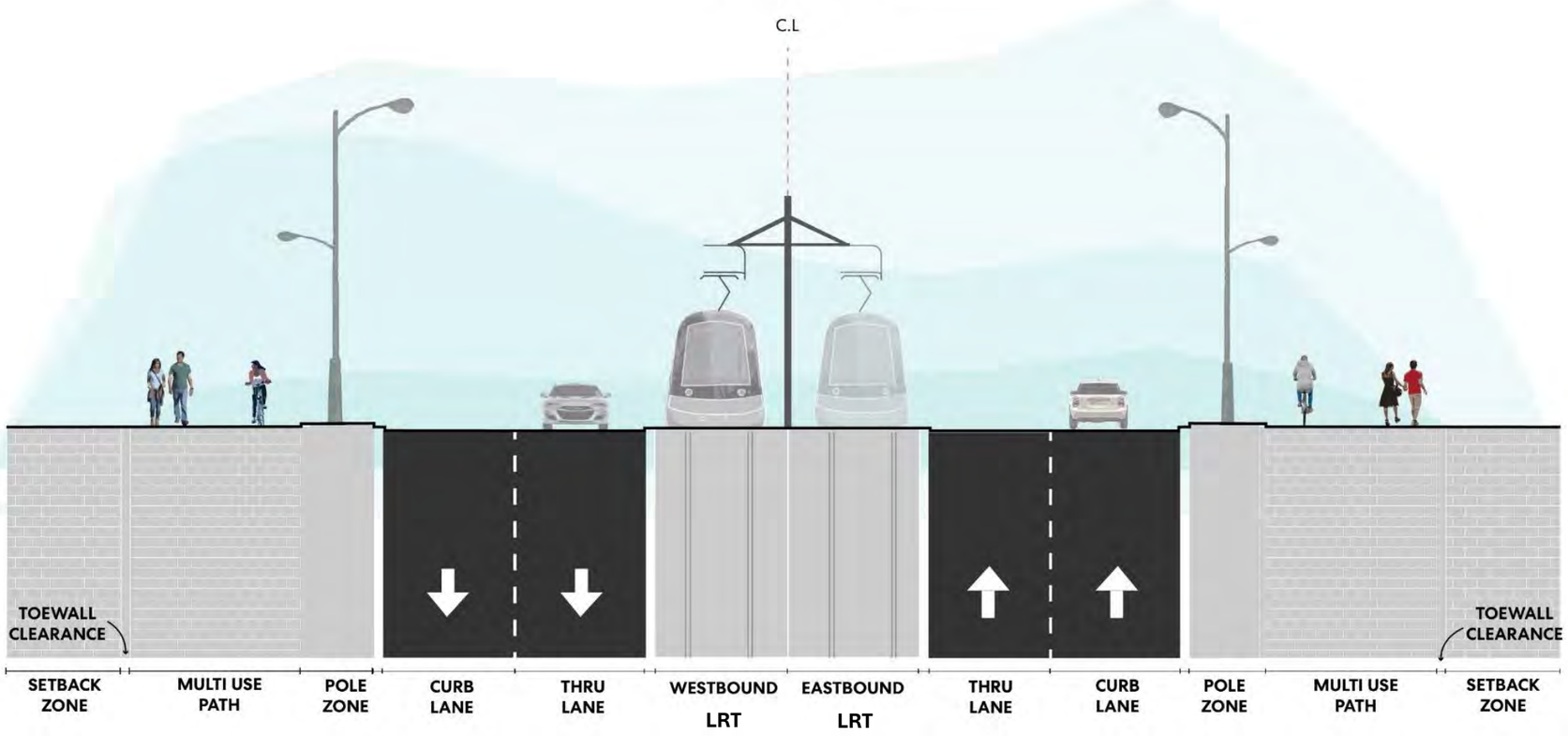
3.2.5.5 Segment 2D: Morningside Avenue (between New Military Trail and Sheppard Avenue East)

Table 3-8 and Figure 3-10 summarize the key elements of the preferred design of Segment 2D, which consists of Morningside Avenue from New Military Trail to Sheppard Avenue East.

Table 3-8: Key Elements of Segment 2D (Morningside Avenue from New Military Trail to Sheppard Avenue East)

Segment 2D	Morningside Avenue from New Military Trail to Sheppard Avenue East
Road	In Segment 2D, the LRT will run in the centre median. In this segment, Morningside Avenue consists of four lanes for general traffic (two lanes in each direction). Vehicular lane widths vary between 3 m for left-turn lanes and 3.3 m for curb lanes. Left-turn lanes are provided at all signalized intersections in both eastbound and westbound directions.
Transit	In Segment 2D, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m median curbs on each side to separate LRVs from general traffic. There are no stops within this segment. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation Services for inclusion in the design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	On Morningside Avenue between New Military Trail and Pan Am Drive, the proposed LRT centre storage tracks increase the overall right-of-way (ROW) width. To reduce impact on residential properties, a 3 m multi-use path and 1.3 m wide pole zone are located on the west side. The east side public realm consists of a 3 to 5 m wide multi-use path and encroaches onto the UTSC Pan Am Centre property. The Morningside Avenue-Highway 401 Bridge deck is constrained, accommodating a 3 m wide multi-use path along with a 0.5 m wide enhanced buffer between the roadway and the multi-use path. North of the bridge, 2.5 m wide landscape and amenity zones are located beside the roadway on both sides, separated by 0.2 m curbs. Protected, unidirectional cycle tracks are provided on both sides of the street. The cycle tracks are 2.1 m wide, located between the tree planting zone and sidewalk. The sidewalk and the cycle tracks are separated by a 0.35 m wide beveled curb. Sidewalks are provided on both sides of the street and are 2.1 m wide on Morningside Avenue between Milner Avenue and Sheppard Avenue East. A 0.3 m wide buffer zone separates the sidewalk from the street line. The active transportation and public realm configuration in this section is similar to that along Morningside Avenue between Kingston Road and Fairwood Crescent, as shown in Figure 3-6. The typical width may vary due to pinch points and localized constraints at certain locations.
Property Impacts	Morningside Avenue between New Military Trail and Sheppard Avenue East consists of a 36 m existing right-of-way (ROW) per the City of Toronto Official Plan (Map 3). Between New Military Trail and the Highway 401, the proposed LRT centre storage tracks increase the overall right-of-way (ROW) width. Encroachment has generally been reduced on the west side to avoid significant impacts to residential properties. On the east side, the right-of-way (ROW) encroaches into the UTSC Pan AM Sports Centre property and the City-owned Morningside Yard at 891 Morningside Ave. There are no property impacts along the MTO jurisdiction at the Morningside Avenue-Highway 401 bridge. North of the bridge until Sheppard Avenue East, property acquisition is necessary to accommodate elements of the preferred design, where property impact is distributed evenly on either side of Morningside Avenue. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-10: Typical Cross-Section Elements at Morningside Avenue between New Military Trail and Sheppard Avenue East (Segment 2D)



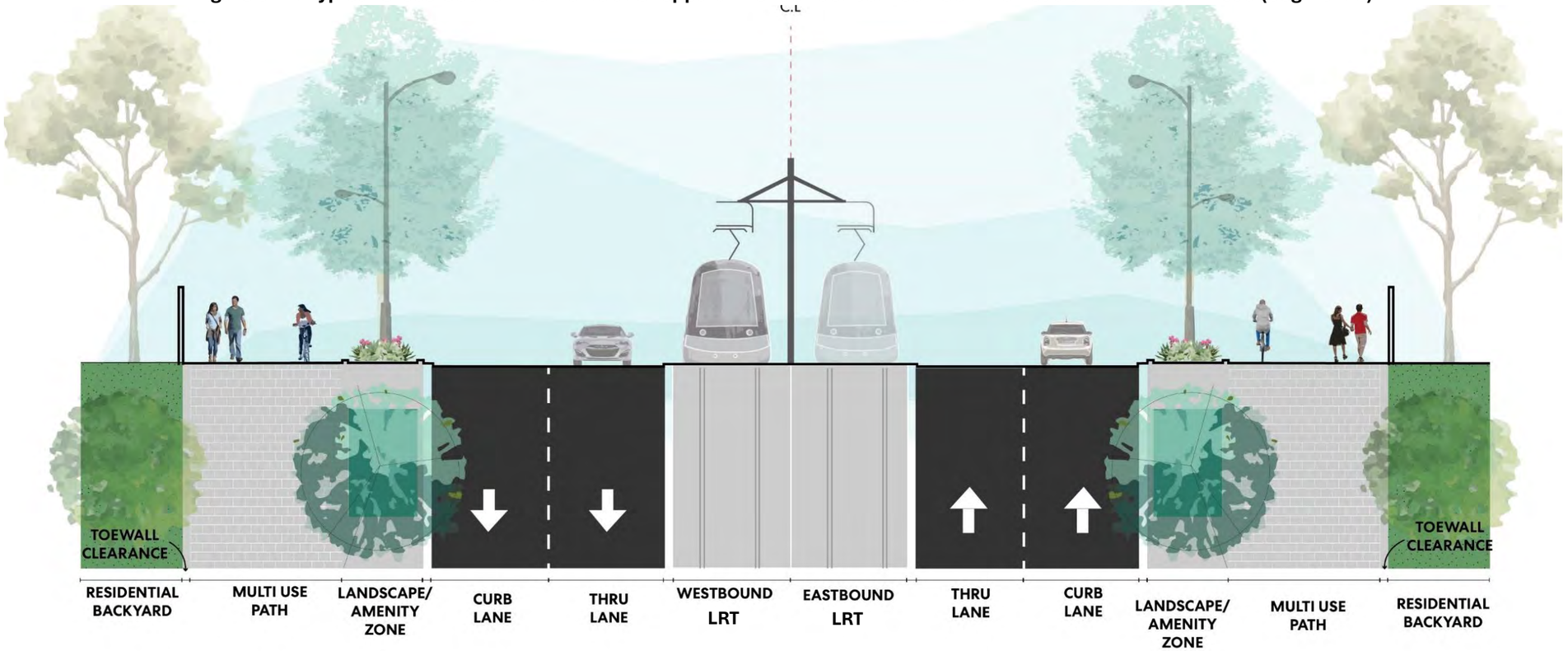
3.2.5.6 Segment 3: Sheppard Avenue East

Table 3-9 and Figure 3-11 summarize the key elements of the preferred design of Segment 3, which consists of Sheppard Avenue from Conlins Road to McCowan Road.

Table 3-9: Key Elements of Segment 3 (Sheppard Avenue East)

Segment 3	Sheppard Avenue East from Conlins Road to McCowan Road
Road	Between Conlins Road and McCowan Road, Sheppard Avenue East will maintain four lanes for general traffic (two lanes in each direction). Vehicular lane widths vary between 3 m for through lanes and 3.3 m for curb lanes. Left-turn lanes are provided at all major intersections in both eastbound and westbound directions.
Transit	In Segment 3, the LRT runs in an 8 m wide centre median (at minimum) with additional 0.3 m median curbs on each side to separate LRVs from general traffic. The LRT guideway varies in width along Segment 3, increasing where tracks diverge to accommodate centre platforms (such as at Sheppard-Morningside and Sheppard-McCowan stops). Elsewhere, the LRT guideway narrows as tracks converge at split platforms (such as at Sheppard-Brenyon, Sheppard-Neilson, Washburn, Markham North and Shorting stops). Station and stop platforms are 50 m long with 10 m protected for future extensions. Centre platforms (except for the Sheppard-McCowan Terminal) are 5.5 m wide whereas side platforms are 3 m wide. Station and stop features and amenities (such as seating areas, shelters, fare gates and ticket vending machines) will be confirmed in future phases of design. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation Services for inclusion in the design where appropriate. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	To limit impacts on residential property and mature existing vegetation and avoid an unintuitive design with frequent switching between cycle track and MUP, a 3 m wide multi-use path is proposed on both sides of the street for the full length of this segment. An enhanced landscape and amenity zone between the curb and MUP is provided where space permits. While the MUP does provide a continuous active transportation facility, it is recognized that this does not adhere to existing City policies to provide separated active transportation facilities along streets. Further assessment to potentially allow continuous separate sidewalk and cycling facilities, where possible, will be undertaken in subsequent phases of design in conjunction with analysis of public feedback and the future evolving transportation network in Malvern.
Property Impacts	Segment 3 consists of a 36 m wide existing right-of-way (ROW) per the City of Toronto Official Plan (Map 3). The requirement for the Sheppard Avenue East right-of-way (ROW) width east of McCowan Road at the SSE Headhouse to the bus terminal is 45.5 m. At intersections where turning lanes and LRT stops are proposed, property acquisition will be required. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-11: Typical Cross-Section Elements at Sheppard Avenue East between Conlins Road and McCowan Road (Segment 3)



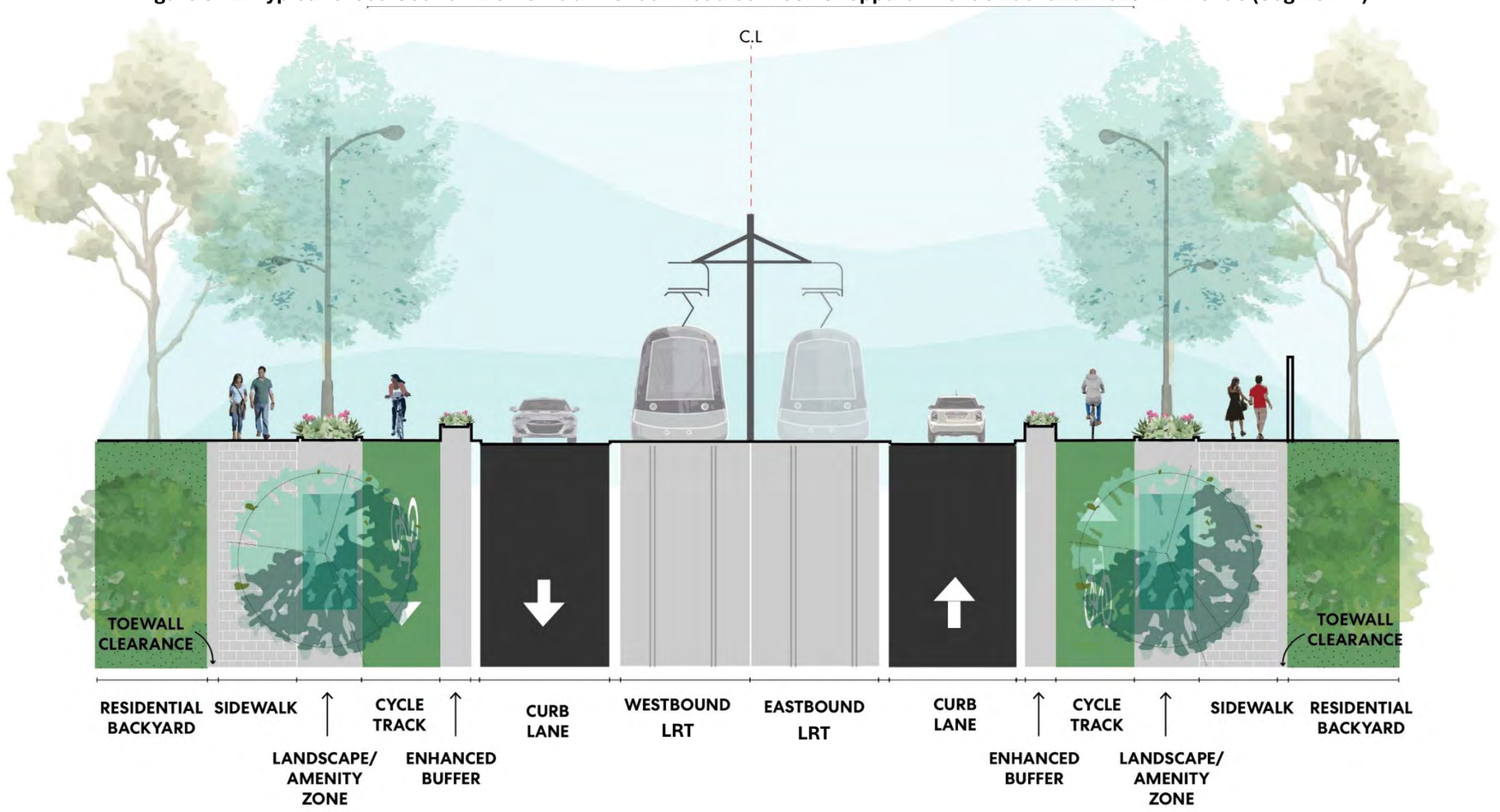
3.2.5.7 Segment 4: Neilson Road

Table 3-10 and Figure 3-12 summarize the key elements of the preferred design of Segment 4, which consists of Neilson Road between Sheppard Avenue East and McLevin Avenue.

Table 3-10: Key Elements of Segment 4 (Neilson Road)

Segment 4	Neilson Road from Sheppard Avenue to McLevin Avenue
Road	Between Sheppard Avenue East and McLevin Avenue, Neilson Road is proposed to have two lanes for general traffic (one lane in each direction). Vehicular lane widths vary between 3 m for left-turn lanes and 3.3 m for curb lanes. Left-turn lanes are provided at all signalized intersections in both northbound and southbound directions.
Transit	In Segment 4, the LRT runs in an 8.2 m wide centre median (at minimum) with additional 0.3 m wide median curbs on each side to separate LRVs from general traffic. This segment includes two stops: one at Neilson-Berner Trail, which has far side platforms, and the other at Malvern Town Centre, which consists of double side platforms. The northbound only platform for the Sheppard-Neilson stop is also located within Segment 4. The LRT guideway varies in width along Segment 4, increasing on the approach to the Malvern stop. Station and stop platforms are 50 m with protection for future 10 m extensions. The side platforms are 3 m wide. Station and stop features and amenities (such as seating areas, shelters, fare gates, and ticket vending machines) will be confirmed in future phases of design. In addition to the LRT, local buses will be running in mixed traffic, with service frequency to be confirmed in future phases of the project. Proposed bus stop locations are currently under development and will be sited in consultation with TTC and Transportation. Proposed bus stops are shown in the roll plan in **Appendix A**.
Active Transportation and Public Realm	In Segment 4, protected, unidirectional cycle tracks are provided on both sides of the street. The cycle tracks are 2.1 m wide, situated between the tree planting zone and sidewalk. A 2.35 m wide landscape and amenity zone are located beside the roadway on both sides where space allows, separated by a 0.2 m wide curb. The sidewalk and the cycle tracks are separated by a 0.35 m wide beveled curb. Sidewalks are provided on both sides of the street and are 2.1 m wide on Neilson Road. A 0.3 m clearance zone separates the sidewalk from the street line. The typical width may vary due to pinch points and localized constraints. At a minimum, a 1.3 m wide pole zone is provided in lieu of the landscape and amenity zone.
Property Impacts	Neilson Road between Sheppard Avenue and McLevin Avenue consists of a 36 m existing right-of-way (ROW) per the Official Plan (Map 3). As a result of the reduction to the number of through traffic lanes, impacts to residential property will be generally avoided in mid-block locations along Neilson Road. In order to accommodate the elements of the preferred design at LRT stop locations (Sheppard, Neilson-Berner Trail, and Malvern Centre), some property acquisition will be necessary. Property requirements are shown in the preferred design roll plots in **Appendix A** and are summarized in Chapter 5.3. Potentially affected property owners have been notified as part of the TRPAP.
Utilities	Utility conflicts were reviewed and are identified in **Appendix B**. A utility relocation strategy and detailed utility relocation plans will be developed during future phases of design. The solutions proposed in the design will follow all applicable standards.

Figure 3-12: Typical Cross-Section Elements at Neilson Road between Sheppard Avenue East and McLevin Avenue (Segment 4)



3.2.6 Technology and Vehicles

LRT was recommended in earlier phases of the project as the preferred transit solution over subway and bus rapid transit alternatives, due mainly to its passenger carrying capacity and community feedback. Ridership projections for the EELRT have been developed using the City's travel demand model, based on the best information and data available at this time. Based on the modelling results, peak point ridership in the year 2041 is projected to be approximately 3,000-4,000 passengers per hour going in the peak direction. 50-metre-long trains operating about every 4-5 minutes at the busiest times and locations can accommodate this projected EELRT ridership. If needed, the infrastructure would be able to support more frequent service to accommodate growth beyond 2041. Beyond fulfilling passenger requirements, LRT integrates with the physical environment and adjacent communities, and provides flexibility for future growth. Further, it supports the City's vision of a better integrated transit system serving Scarborough, reduced car dependency on roads (thereby lowering greenhouse gas emissions), and increased ridership along the EELRT corridor. The ridership projections will continue to be updated as needed should new information about future conditions become available. The LRT system infrastructure will include comprehensive communication capabilities including transit signal priority.

At this stage in the project, the Light Rail Vehicle (LRV) type and supplier have not been confirmed; these are intended to be determined through a competitive bidding process prior to implementation of the EELRT.

The following list summarizes the key considerations and guiding principles for LRVs in the context of the EELRT study. These LRV characteristics align with the goals of the EELRT project while leaving open opportunities for optimizing functionality, retaining flexibility, and protecting for the project's economic viability.

Prescriptiveness

The design vehicle will protect for:

- Competitive bidding in the North American vehicle market and multiple experienced manufacturers.
- Modularity allowing for customization while benefitting from economies of scale.
- Compatibility with increasing urbanization.

Low Floor LRV

The EELRT study assumes standard gauge low floor LRV as the reference vehicle. Low floor vehicles have the following advantages:

- Platforms at sidewalk level – no need for ramps, stairs, or railings,
- Lower construction costs, and
- Lower visual impacts and more compatible with the urban realm.

50 m Train Length

The EELRT study assumes maximum vehicle length of 50m, as even shorter trains can meet projected lifecycle demand growth with buffer for unknowns. Moreover, 50 m trains can be competitively procured, with no major manufacturers precluded. Most models allow for high degree of tailoring due to their modular vehicle design platforms.

Performance

LRVs should be able to sustain >6% grades required to achieve extended grades along Morningside Avenue.

LRVs should be able to negotiate small radius curves to make perpendicular intersection turns.

Max Speed (Exclusive ROW): 80 km/h.

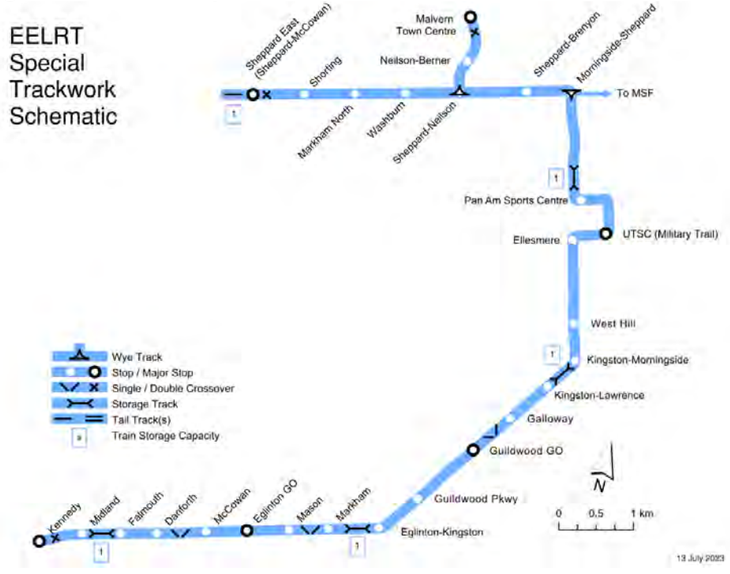
Max Speed (Semi-Exclusive ROW): 60 km/h.

A market scan of Light Rail vehicles (LRVs) has helped identify potential vehicles and confirm service planning capacity to help meet opening day ridership and long-term growth. Technical assumptions for track design used for the EELRT are listed in Chapter 3.1.4. Special trackwork is detailed in the next sections.

3.2.7 Special Trackwork

To allow the LRVs to change directions or change to other tracks for operational flexibility, special trackwork, comprised of rail turnouts, switches, and diamonds track pieces, is provided at strategic locations throughout the mainline EELRT alignment. Most of the special trackwork are found within the MSF including grade crossings trackwork.

Figure 3-13: EELRT Special Trackwork Schematic



3.2.7.1 Crossovers

Crossovers have been provided along the mainline alignment at every terminus end and at strategic locations along the mainline for various operational needs.

Diamond double crossovers are located at each terminus end to permit regular operational turnback. These are typically larger sized turnouts to permit faster turnback maneuvers to maintain operational headways.

In-line crossovers are provided at regular intervals at approximately every 1.5 km. These are used for emergency purposes such as turning a train around or to permit single track operations should one bound of the track be out of service. These crossovers are typically sized smaller than the terminus crossover turnouts as their use will be infrequent.

Wye tracks and turnouts are provided at two locations along Sheppard Avenue East to connect one mainline with another at a T-junction intersection. Full movement wyes are provided to permit movement between every mainline track connection. These are smaller slow speed turnouts and will be in regular operation use using revenue service.

3.2.7.2 Tail Tracks

A tail track is provided west of Sheppard-McCowan Station for either planned train storage or temporary parking of a disabled train. The tail tracks are designed with a single crossover connection to both mainline tracks and such can also be used as an emergency turnback in a degraded service pattern should the main crossover east of the station be out of service. The tail track is sized for one train consist up to 60 m long plus a minimum of 20 m for overrun and an end of track sliding device.

3.2.7.3 Pocket / Storage Tracks

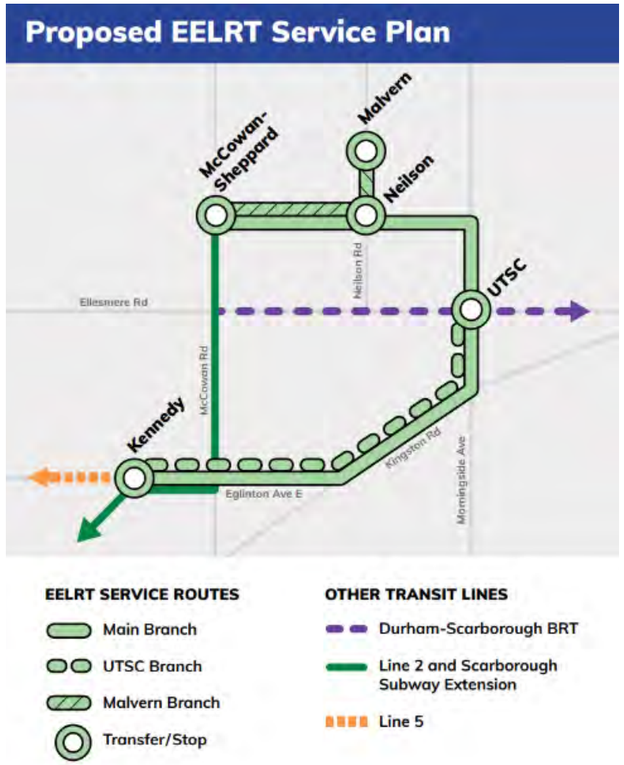
Storage tracks are provided at locations where train turnbacks will occur for either emergency situations, short turns for short turn adjustments or as regular service concepts. They may also be used to store a disabled train or provide service adjustments. Storage tracks are in the centre of both mainline running tracks and can be accessed from both ends. Mainline running tracks spacing will widen to provide the space required for one storage track and one staff or operator access walkway. Storage tracks are sized to store one train consist up to 60 m plus an additional buffer at both ends of the parked train away from the point of switch. Majority of the storage tracks are designed with standard single crossovers from the mainline tracks. Equilateral crossovers are applied in locations with track length limitations such as proximity to an intersection. Storage tracks are provided at Eglinton-Kingston, Kingston-Lawrence-Morningside and south of Pan Am Drive/Tams Road.

3.2.7.4 Other Special Track Work Requirements

Storage tracks are required to adhere to a maximum grade to safely park a train and prevent a rollaway risk. The Eglinton-Kingston and Pan Am Drive/Tams Road storage tracks are unable to meet the grade requirement due to existing topography constraints. To mitigate the rollaway risk, additional measures are to be considered such as the use of derailers, wheel chocks or sand drags. The storage track design for these two locations provides an additional stub track at end where rollaway risk may occur. The stub track may be fitted with end of track devices such a sliding friction bumping post or material arresting systems such as sand drags.

3.2.8 Service Plan

The peak period EELRT operating concept would consist of three branches, depending on demand, as shown in the image below.

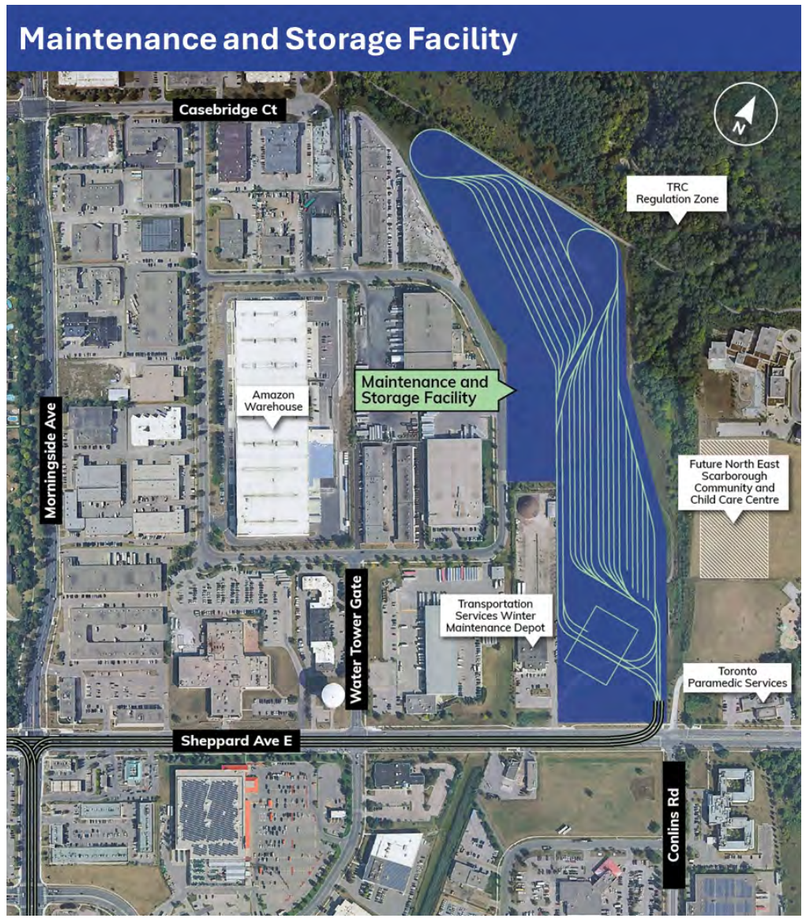


In the segments where two branches overlap, the service would operate at 4 to 5-minute intervals, depending on demand. This applies to the Kennedy to UTSC segment and the Sheppard-McCowan to Neilson Road segment. In the segments where there is only one line, the service would operate at 8-minute intervals, depending on demand. This applies to the Malvern branch, along Sheppard east of Neilson, and along Morningside north of UTSC.

The City of Toronto and TTC are developing a future bus network that is complementary to EELRT, serving the needs of Scarborough. Once the EELRT is in service, RapidTO bus lanes that overlap the LRT alignment would be removed.

3.2.9 Maintenance and Storage Facility (MSF)

The Maintenance and Storage Facility (MSF) is assumed to be located at 8300 Sheppard Avenue East, otherwise known as Conlins Yard, that is currently owned by Metrolinx. It should be noted that an environmental assessment led by the City and TTC for an LRT MSF on the Conlins Yard property was previously approved in 2010. The property is 138 m wide at Sheppard Avenue East and 800 m deep with an area of approximately 129,000 m^2. The yard is limited at the northern boundary by the nearby Rouge River and is constrained by a TRCA Regulated Area along the east portion of the property. Further, a commercial private property is limiting the west boundary, and a City of Toronto property (park and potential extension of Conlins Road) limits the east boundary.



Based on preliminary review, early enabling works appear to have been completed for this site including the installation of an underground culvert across the south portion of the property to realign the Rouge River tributary, which is an additional constraint to the layout. The sanitary sewer that formerly ran across the northern portion of the property has been realigned along the western property limit. TRCA has advised that, according to 2022 mapping, a drainage feature through the southern portion of the property has been classified as a regulated watercourse. Provision for a watercourse corridor along the southern limit has been incorporated into the MSF 10% functional design site plan to address TRCA's advice.

Additional detailed investigations and analyses are required to determine the scope of the constructed enabling works and extent of applicable regulatory limits. In addition, public and other stakeholder consultation based on the 10% functional design will inform the proposed mitigation and future commitments for the site.

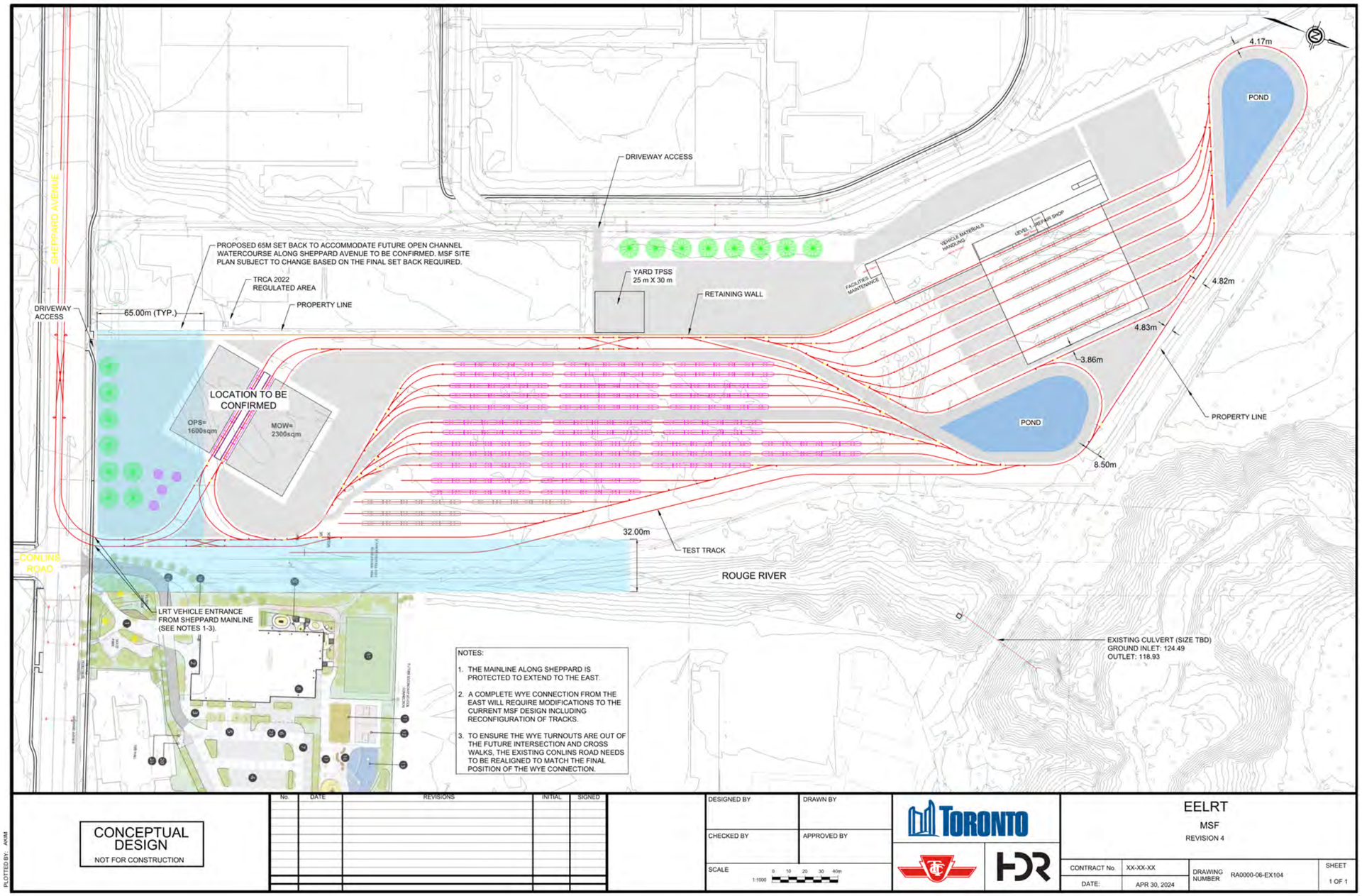
Ultimately, and based on the findings of future detailed environmental analysis and consultation, the MSF site configuration will need to be updated to reflect the final recommendation for a regulated watercourse. The track and site layout are subject to change to accommodate a possible future open channel along Sheppard Avenue, subject to TRCA requirements. Vehicular entrance, storage, and operational requirements may be impacted.

Operating and maintenance responsibilities for EELRT would be confirmed in future phases of the project. Assumptions that guided the current MSF 10% functional design layout, are as follows:

1. Storage capacity is for 36 trains (30 x 60 m trains and an additional 20% spares)
2. Test track length is 260 m
3. Track length between parked trains is 7 m
4. TTC is assumed to operate the trains, operators would access the hostler platform by foot, no tunnel or bridge structure required
5. Trains and revenue line would be maintained by a future Project Co.
6. Revenue line would be maintained by a future Project Co.
7. Operations Control Centre is assumed in a TTC facility outside of the MSF site
8. Emergency vehicle access to be provided through the storage yard not more than 40 m apart
9. TTC specific staff office sizing requirements
10. Curve radius in yard is 30 m
11. Parking along Sheppard frontage is not preferred
12. Parking count will be exempt of parking zoning bylaw and will provide parking spaces as needed to service the MSF
13. Assumed TTC parking requirement is based on 1.5 x number of trains + 10%
14. Protection for the potential future eastern extension of the mainline is provided along Sheppard Avenue East adjacent the site, however protection for a track connection from the east to the MSF would require further review in conjunction with detailed environmental investigations

The current MSF layout is shown in Figure 3-14.

Figure 3-14: 10% Functional Design Layout for EELRT MSF



3.2.10 Traction Power Substations

Traction Power Substations (TPSS) use electricity from the local power supply to generate the consistent power needed to operate LRVs. The TPSS buildings are rectangular in form and are to house electrical equipment such as transformers.

Industry knowledge and established precedents informed TPSS assumptions and requirements for the functional design stage. The proposed TPSS spacing is consistent with the approach used to identify at-grade TPSS for Line 5, which is a conservative approach to assessing traction power needs.

One TPSS has been located at the preferred MSF at Conlins Road and Sheppard Avenue (8300 Sheppard Avenue East). A TPSS at this location is required to supply power for moving trains and for storage in the yard and to provide maintenance power to the workshops.

Along the rest of study area, TPSS have been located near EELRT stations and stops because it is easier to implement electricity network sectionalization at stops. Power trips can be added at LRT platforms to disconnect the power flow before and after the LRT stop, helpful in case of emergency. In addition to enhanced safety, sectionalization at the stop-level is beneficial for maintenance and servicing of tracks along the line.

Siting the TPSS has also considered the availability of public right-of-way (ROW) to feed power from the substations to the platforms and tracks. The facility design for TPSS must also incorporate a driveway and parking area for maintenance purposes. As TPSS locations are flexible and can be located within 150 m of the LRT stop tracks, the preliminary recommendations are subject to further refinement in later design stages.

To provide preliminary TPSS site recommendations, an evaluation was conducted using criteria outlined in Table 3-11 and informed by the City of Toronto Transit Design Guide for Ancillary Structures (2022).

Finch West LRT TPSS

Hurontario LRT TPSS rendering

Table 3-11: Traction Power Substation Location Evaluation Criteria

Criteria	Description
Meets TPSS Functional Requirements	• Site can accommodate functional requirements below: o TPSS should be located within ~150m of the tracks to prevent major voltage drop. o Estimated TPSS footprint size = 45 x 15 m (675 m^2), based on the assumption of prefabricated TPSS, as used in ECLRT and Hurontario LRT. The footprint size includes vehicle parking and access road for construction and maintenance. o TPSS are to be placed at 1.2 to 1.5 km intervals. • Connect to TPSS conduits along public right-of-way (ROW) for construction and maintenance access.
Land Use	• Preference for public lands. • Preference for underutilized sites, such as, parking lots, greenfield, etc. o Screening treatments to mitigate visual impact of the TPSS will be explored at a later phase. • Protect for potential future development sites by locating the ancillary structure along the perimeter to preserve overbuild opportunity (City of Toronto Transit Design Guide - Ancillary Structures, 2022). o Integrate the structure with the surrounding context. o Protect egress routes required for potential development. o Avoid locating TPSS at future development sites with active frontages. • Preference for larger lots to allow for more flexibility, improved integration with surroundings and desired orientation.
Impacts to Surroundings	• Limit functional impacts to the property owners (e.g., number of parking spaces lost, impact on driveway access, impact on fire routes, impacts on back door access). • Limit visibility of the structure from public realm (COT Transit Design Guide - Ancillary Structures, 2022). • Preferred TPSS orientation would be one that minimized length of the enclosure along major street frontage. • Preference to be located away from residential areas to limit noise impacts to residents. • Preference for site access from a minor street with less pedestrian activity (City of Toronto Transit Design Guide - Ancillary Structures, 2022). • Dedicated curb cuts for TPSS are not appropriate for active street frontages and must be avoided along dedicated cycling tracks (COT Transit Design Guide - Ancillary Structures, 2022). • Siting must minimize removal of mature healthy trees.

Criteria	Description
Cost	• Qualitative cost of the property required. Public < Commercial < Residential. • Further the TPSS is away from the stop, the higher the cost of construction (i.e. higher tractive effort and longer conduits).

A preliminary estimate indicates that 16 TPSS (including the TPSS located within the MSF site) would be needed to provide the necessary power for the EELRT. This includes a TPSS located at the MSF, which will be about 25 m by 30 m and is proposed to serve the active yard and parked train function. The team has not yet optimized the design due to the TRCA regulated area at the MSF, and discussions with TRCA will continue. The TPSS locations resulting from the evaluation are outlined in Table 3-12.

Table 3-12: TPSS Locations for Functional Design Stage

ID	TPSS Location	Selected Location
1	Kennedy Stop	Kennedy Station
2	Danforth Stop	No Frills Parking Lot
3	Eglinton GO Stop	GO north Parking Lot
4	Eglinton-Kingston Stop	Closed Eglinton Avenue connecting road
5	Guildwood GO Stop	Guildwood GO parking lot
6	Lawrence Stop	4411 Kingston Road - Krispy Kreme Parking lot
7	West Hill Stop	338 – 344 Morningside Avenue - North of Beath
8	NMT Stop	Open space on the southeast corner of Ellesmere/New Military Trail
9	Morningside-Tams	Morningside Transportation Services Yard
10	Morningside-Sheppard Stop	7601 Sheppard Avenue – Church Parking lot
11	Conlins MSF	8300 Sheppard Avenue
12	Sheppard-Neilson Stop	6705 Sheppard Avenue – Church Parking lot/Open space
13	Malvern Stop	1301 Neilson Road – Church Parking lot
14	Washburn Stop	10 Washburn Way – Church Parking Lot
15	Markham North Stop	5117 Sheppard Avenue – Markham Corners Plaza – East side
16	Sheppard-McCowan Stop	SE Corner of Sheppard-McCowan

The TPSS recommendations are only preliminary at this stage in the project. The number of TPSS, their locations and other details are subject to change as the project evolves, load-flow simulation completed, ground conditions evaluated, and property availability is reviewed.

The TPSS visual impact on the surroundings can be minimized using a combination of vegetation cover and screening through building cover design, public art, or murals. Steps to mitigate the visual, noise and vibration impacts of surface TPSSs will be investigated in future phases of design.

3.2.11 Streetscape and Urban Design

The general approach to streetscape and urban design described in the section was applied in the preferred 10% design for the segments noted in Section 3.2.5. The local context along with constraints and project requirements were considered in applying the design standards.

3.2.11.1 Public Boulevard Design

The public boulevard consists of the area between the property line and the curb line bordering the vehicular lane. Boulevards are a key element of the proposed LRT public realm. These spaces provide opportunities for greening with grass and street trees, active transportation facilities, and vibrant spaces for residents and visitors to gather and socialize. The design of the public boulevard is intended to respond to the existing and planned adjacent and area land use context and character. Public boulevards provide opportunities to improve safety consistent with the City's Vision Zero objectives and reinforcing sustainable transportation choices for street users.

One primary public boulevard type applies to the largely mixed-use, urban context, primarily along Eglinton Avenue East and Kingston Road. This boulevard type caters to expected higher volumes of foot traffic and is applied to areas along the corridor where a more pedestrian supportive streetscape is envisioned, where buildings have retail, commercial and mixed-uses on the ground floor and little or no setbacks as well as locations with potential redevelopment plans and intensification potential. In these areas, the planting and amenity zone is located between the sidewalk and the cycle track to provide greater separation between modes and reducing the potential for conflict between cyclists and the higher volume of pedestrians anticipated. The typical preferred public realm configuration proposed for this boulevard type consists of 0.2 m wide curb along with a 0.8 m wide enhanced buffer that separates a 2.1 m wide unidirectional cycle track from the roadway.

An enhanced buffer will further help improve safety for cyclists and its details will be developed in future phases of design. The rest of the boulevard space is allocated to a 1.8 m wide landscape and amenity zone, a 2.1 m wide sidewalk and 0.3 m wide sidewalk clearance from the street or property line. This boulevard type features an emphasis on creating a

vibrant, social public realm through use of attractive landscaping and larger public spaces enabled more generous setback zones from building faces.

The public boulevard treatment for New Military Trail will continue to be refined with UTSC in conjunction with updates to the UTSC Secondary Plan to capture the unique requirements of the University campus.

The remainder of the study corridor along Ellesmere, Morningside, Sheppard, and Neilson features a more diverse mix of land uses including residential neighbourhoods featuring fronting and back-lotted single-family homes, parkland areas, and employment areas with commercial plazas and business parks. In these areas, the location of the planting and furniture zone would be between the cycle track or MUP and roadway, and wider where possible, increasing separation between cyclists and vehicular traffic. This configuration also helps mitigate noise and air pollution from vehicles through natural barriers. The boulevard treatment for various segments in these areas is noted in Section 3.2.5.

3.2.11.2 Safety Considerations

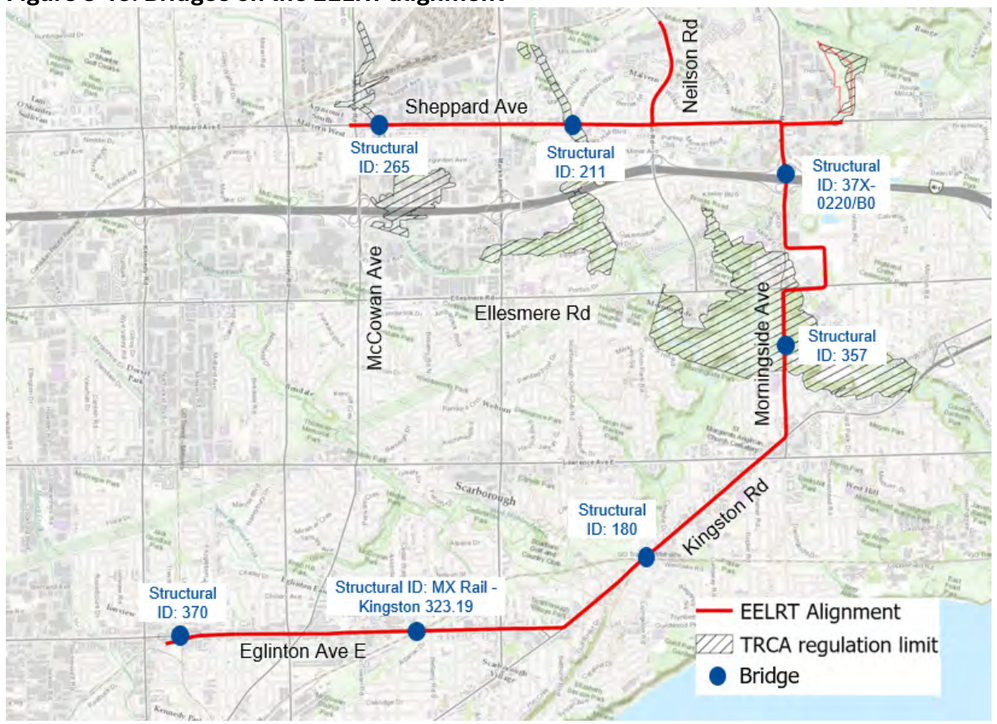
Notable safety considerations were included in the functional 10% design to ensure the protection of all road users, particularly the most vulnerable pedestrians and cyclists. The safety considerations are as follows:

- Accommodation for protected intersections.
  - Protected intersections are designed to provide greater physical separation between cars and active transportation by setting the cross-ride and crosswalks back from the parallel general purpose traffic lanes. Such intersection configurations improve safety for pedestrians and cyclists by reducing turning speeds, improving sightlines, and reducing crossing distances. The functional 10% design will accommodate space for protected intersections for detailed design to be completed at later stages of the project when the City of Toronto guidelines for protected intersections have been developed and finalized.
- Signalized intersections.
- Protected turning movements.
- Traffic islands.
  - Islands provide a safe place for pedestrians to stand while crossing the street.
- Buffer between active transportation and traffic lanes.
  - Horizontal buffer and physical barrier are proposed between active transportation facilities and traffic lanes to encourage safety by separating cyclists and pedestrians from motor vehicles.
- Buffer between cyclists and pedestrians.
  - Separation between cycle tracks and sidewalks are important to ensure accessibility requirements are met.
  - In cases where the cycle track is located adjacent to the sidewalk, risk of tripping hazard and pedal strikes are mitigated with a bevelled curb.

3.2.12 Bridges and Structures

The EELRT alignment passes close to or through a number of bridges along the corridor (See Figure 3-15). The impacts of the proposed functional design on study area structures are described in the subsequent section.

Figure 3-15: Bridges on the EELRT alignment



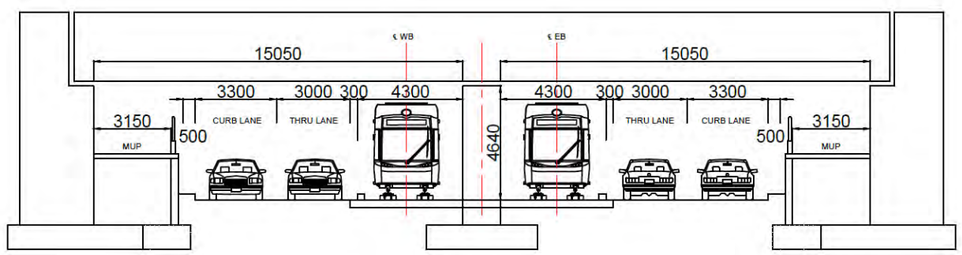
3.2.12.1 Eglinton Avenue Bridge over Stouffville GO rail corridor (Structure ID: 370)

This bridge was built in 1974 and is located on Eglinton Avenue between Kennedy Road and Midland Avenue and passes over the Stouffville GO rail corridor. The EELRT alignment runs south of the bridge and stays clear of the structure. Future analysis is required to determine the appropriate Eglinton Avenue right-of-way (ROW) configuration on the structure, in consideration of the EELRT.

3.2.12.2 Lakeshore East Rail Bridge at Eglinton GO Station (Structure ID: MX Rail - Kingston 323.19)

Lakeshore East Rail Bridge at Eglinton GO Station passes over Eglinton Avenue East between Cedar Brae Boulevard and Bellamy Road North. It was built in 1962 and is owned by Metrolinx. The overpass consists of a 1.52 m wide pier column in the middle and is supported by retaining walls on the north and south sides. The overpass width is sufficient to fit the LRT guideway, 4 general purpose lanes, and 3 m wide multi-use paths on either side. The EELRT alignment is proposed to run on either side of the middle bridge pier, with the eastbound tracks located south of the pier, and the westbound tracks located north of the pier. To accommodate 3 m wide multi-use paths, the existing sidewalks under the bridge are proposed to be widened, which would require extending the bridge footings, subject to further consultation and agreement with Metrolinx.

Figure 3-16: 10% Functional Design Cross Section of Eglinton Avenue at Lakeshore East Rail Bridge at Eglinton GO Station



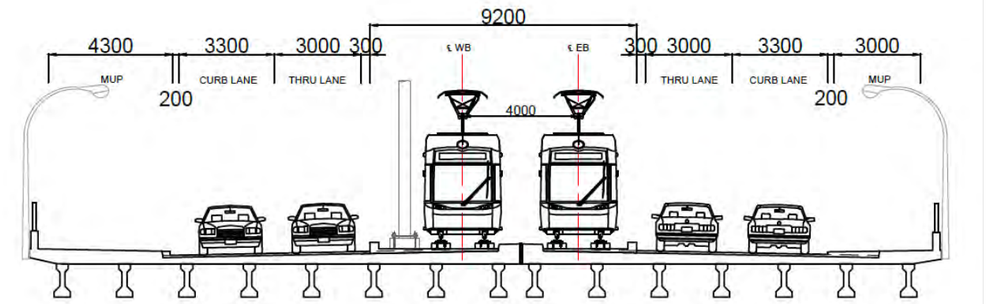
Bridge Structure is conceptual – not to scale.

3.2.12.3 Kingston Road Bridge over Lakeshore East GO rail corridor (Structure ID: 180)

The existing structure, built in 1979, is a precast pre-stressed concrete girder that passes over the Lakeshore East GO corridor on Kingston Road between Westlake Road and Celeste Drive. The current configuration consists of two through lanes and one RapidTO bus lane in each direction, with a concrete median. Sidewalks are present on both directions.

Based on a preliminary structural assessment, the capacity of existing structure is sufficient for supporting LRT loads. No structural modifications to the bridge are proposed. The width of the bridge deck between the inner edges of the parapet walls is 30.8 m, which can fit the centre-median LRT guideway, 4 general purpose lanes, minimum 3 m wide multi-use paths, and pole zones.

Figure 3-17: 10% Functional Design Cross Section of Kingston Road Bridge over Lakeshore East GO rail corridor (near Guildwood)



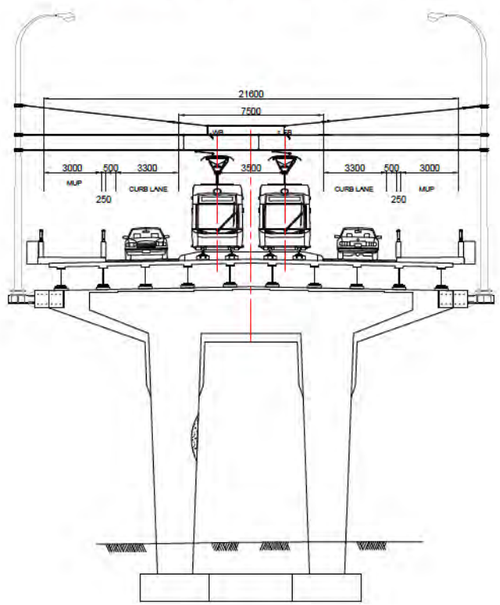
Bridge Structure is conceptual – not to scale. Overhead Catenary System requirements will be confirmed in future phases of design.

3.2.12.4 Morningside Avenue — Highland Creek Bridge (Structure ID: 357)

This bridge, built in 1964, is located on Morningside Avenue between Beath Street and Ellesmere Road and passes over the Highland Creek. The current configuration has one through lane and one bus and bike shared lane in each direction. Sidewalks are present on both sides with a setback from the RapidTO bus lane. The existing bridge was previously widened in 2017 to accommodate the new bike lanes and wider sidewalks on both sides of the bridge.

The EELRT will be using the existing Morningside Avenue – Highland Creek bridge. No widening or structural modifications have been proposed to the existing structure. After preliminary level structural loading analysis, it was determined that the bridge can support centre-running LRT configuration along with 3 m wide multi-use paths on each side. The bridge cross-section will also include a 0.5 m wide buffer with concrete barriers to ensure the safety of both pedestrians and cyclists. A cross section for the future Morningside Avenue – Highland Creek bridge carrying EELRT is illustrated in Figure 3-18.

Figure 3-18: 10% Functional Design Cross Section of Morningside Avenue Highland Creek bridge

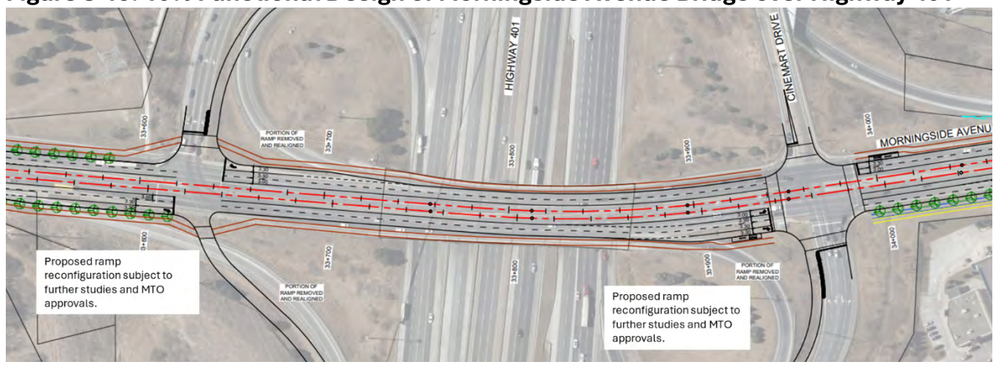


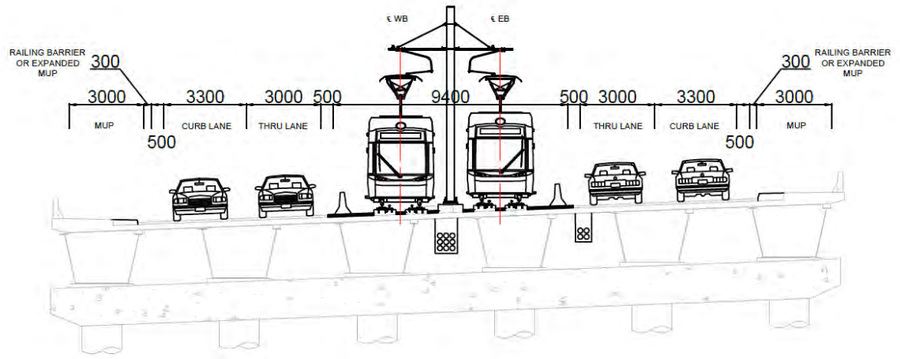
Bridge Structure is conceptual – not to scale.

3.2.12.5 Morningside Avenue — Highway 401 Bridge (Structure ID: 37X-0220/B0)

The existing Highway 401 Morningside Avenue bridge, owned by the Ministry of Transportation (MTO) was constructed in 1989 and is a three (3) span concrete slab over steel box girder bridge. The EELRT alignment has been optimized to maximize active transportation space on the existing bridge. To avoid any structural widening of the existing bridge, modified lane widths are being proposed that are consistent with the City of Toronto standards. The proposed Morningside bridge 10% functional design plan and cross section is noted below as Figure 3-19.

Figure 3-19: 10% Functional Design of Morningside Avenue Bridge over Highway 401





Bridge Structure is conceptual – not to scale.

The design incorporates urbanization, or creation of normalized right turn access from Morningside Avenue to Highway 401 to facilitate improved safety for all roadway users, in particular cyclists. Ultimately, further study to urbanize the bridge ramp configuration is required as well as MTO approval. Discussions are ongoing between the City and MTO.

3.2.12.6 Sheppard Avenue — Highland Creek Bridge near Washburn Way (Structure ID: 211)

This road bridge is located on Sheppard Avenue between Washburn Way and Gateforth Drive and passes over a branch of the East Highland Creek. It was built in 1974. The watercourse has been completely channelized with gabions both upstream and downstream of the crossing. The current configuration consists of 4 lanes and sidewalks on either side. To accommodate the LRT guideway, while maintaining 4 lanes and meeting the current City public realm standard, widening or replacement of this bridge is anticipated. Feasibility of widening and/or replacement will be analyzed during the next design phase.

3.2.12.7 Sheppard Avenue — Highland Creek Bridge near McCowan Road (Structure ID: 265)

This road bridge is located on Sheppard Avenue between McCowan Road and Shorting Road and passes over a branch of the East Highland Creek. It was built in 1969. The watercourse has been completely channelized with concrete both upstream and downstream of the crossing. The current configuration consists of 4 lanes, a painted median and sidewalks on either side. To accommodate the LRT guideway, while maintaining 4 lanes and meeting public realm requirements, widening or replacement of this bridge is anticipated. Feasibility of widening and/or replacement will be analyzed during the next design phase.

3.2.13 Utilities

There are existing utilities within and across the project study area that will require relocation to address conflicts with LRT infrastructure and accommodate roadway widening. The Utility Conflicts Matrix identified and assessed potential conflicts associated with existing utilities (e.g., water pipes, sewers) within the study area. The study was based on available information from the CUMAP, future phases of design will undertake SUE to confirm utility conflicts, including dry utilities. The Utility Conflict Matrix and related Annotation drawings can be found provided in **Appendix B.**

At the functional design stage, the approach to utilities is to follow the guidelines for the utility free zone / utility restriction area as described in the Metrolinx Design Criteria Manual (Chapter 10 - Utilities in Metrolinx LRT Design, 2016), the City of Toronto's Municipal Consent Requirements (Appendix O, 2021), and Toronto Water Requirements for Surface Light Rail Transit to identify clearances from utility services. Utilities found within the proposed LRT right-of-way (ROW) will generally be relocated to minimize potential disruption to transit during maintenance and repair activities.

In future phases of design, a utility relocation strategy and detailed utility relocation plans will need to be developed following all applicable standards. Utility impacts and recommendations will need to be reviewed and confirmed based on the design of the EELRT at the time. The project team will need to coordinate the proposed utilities relocation design with the City, TTC, Metrolinx, and potentially affected private utility owners. Potential utility conflicts shall be identified in consultation with each utility owner as part of detail design to develop applicable protection and/or relocation strategies prior to construction. Impacts to municipal servicing shall be consulted with the City of Toronto and required permits shall be obtained prior to construction.

3.2.14 Geotechnical

At the 10% design, only a desktop assessment of geotechnical conditions was completed to provide preliminary subsurface geotechnical and groundwater information from existing borehole logs and published documents. No site visit or soil sampling were conducted, and all the information was gathered by reviewing previous geotechnical works and from geological maps prepared by the Ministry of Natural Resources and Forestry (MNRF) and Ontario Geological Survey (OGS).

Any advanced environmental study and related impact assessment, including a full-scale design of the EELRT and construction, will require a comprehensive program of geotechnical investigation involving the drilling of boreholes, and in-situ and soil laboratory tests, and topographical and hydrogeological studies.

The project's geotechnical review found that:

- Along the EELRT alignment, the subsurface materials mainly consist of glaciolacustrine sands, gravels, silts, and clays underlain by both till deposits. In some places, thicker zones of topsoil and organics as well soft and loose soils can be presumed to be present.
- There is a potential to encounter cobbles and boulders in the overburden soils and these may influence the choice of excavation equipment and methods.
- The groundwater level along the LRT corridor is expected to be as high as the ground surface and as deep as 5 m below existing grade.
    - It must be noted that the discharge of private water, including groundwater to the City's sewage works is prohibited under Toronto Municipal Code Chapter 681, Sewers unless an exemption against these provisions and a connection to City's sewage works is authorized by the General Manager of Toronto Water.
- The clayey silt and silty clay tills are poor pavement and track bed subgrade materials.

3.3 Implementation

This section presents the construction staging and implementation of the proposed EELRT project and associated infrastructure and any constructability constraints and mitigations required.

The implementation of the recommended EELRT improvements will entail:

- Permits and environmental approvals,
- Property acquisition and easements (if required),
- Utility relocations (dry and wet utilities),
- Removals,
- Roadworks,
- Overhead lighting,
- Transit facilities construction,
- Traffic control and signaling work, and
- Landscaping and/or streetscaping.

Permits and environmental approvals are documented in Chapter 7 of this EPR.

3.3.1 Planning Issues

The following planning issues have arisen from the study process:

- Right-of-way (ROW) width in certain areas of the corridor do not currently support the proposed Complete Streets and higher-order transit implementation. This will require an Official Plan Amendment (OPA) and property owner engagement in conjunction with redevelopment.
- The project is currently not aligned with the Regional Transportation Plan (RTP) definition of the EELRT, which will have to be updated in revisions to the RTP.

3.3.2 Roadworks

Grading and utility relocations and installations will need to be performed ahead of road widening and LRT track slab construction. During this process, especially for above ground and subsurface utility relocation, the respective utility asset owners shall be consulted for guidance and coordination.

Construction staging will need to ensure that general traffic as well as local transit is maintained along Eglinton Avenue, Kingston Road, Morningside Road, Ellesmere Road, Sheppard Avenue and Neilson Road because these roadways constitute a major portion of the arterial roadway network or are part of the RapidTO program. Although full closures are not recommended, partial lane closures will need to be implemented for the staged construction. During construction, the RapidTO bus lanes would need to be maintained along with one auto lane during peak periods in peak direction. Outside of peak periods, one lane must be always maintained in each direction. The staging plans are to be developed during the detailed design stage. In addition, an Emergency Response Plan during construction is to be prepared by the contractor.

Intersections will need to be closed during construction to accommodate excavation, grading, utility relocation and track slab construction and therefore intersection closures will need to be coordinated with the City of Toronto to reduce traffic impacts.

The physical construction activities that will occur, not in chronological order, include:

1. Installation of traffic accommodation measures as required by staging plan.
2. Clearing and grubbing of trees and vegetation within the grading limits for construction of the project.
3. Stripping of topsoil within the grading limits.
4. Excavation of roadway and stop platform areas.
5. Excavation of trenches and installing new or relocated above- and below-grade utility infrastructure.
6. Removing existing asphalt and disposing at approved facility.
7. Structural removals and disposal of debris.
8. Installing stormwater management system components.
9. Potentially salvaging existing granular/asphalt for reuse.
10. Placing concrete or erecting fabricated steel or precast elements for bridges or other structures.
11. Placing concrete for curb, barriers, retaining walls, planters, and sidewalks.
12. Excavating bore holes for platform foundations.
13. Fabricating and erecting stop platform structures.
14. Laying granular and application of hot mix asphalt.
15. Installing lighting, ITS equipment and traffic signals.
16. Final site grading and topsoil application.
17. Painting roadway pavement marking.
18. Installing landscaping features such as sod, shrubs, trees, paving stones, irrigation systems, station amenities and platform furniture.

19. Installing corridor landscape features and replacement vegetation.
20. Managing excess soil will be done in accordance with the O. Reg. 406/19: On-Site and Excess Soil Management (2019).

Throughout the construction stage, various related activities, such as noise, vibration and air quality control as well as excess soil disposal, which can have potentially adverse effects to the environment and adjacent residential properties and businesses, will be mitigated, as outlined in Chapter 5 of this EPR.

3.3.3 Kennedy Station (Kennedy-Eglinton)

As a key transportation hub connecting the EELRT with several transit lines (Line 2, Line 5) and GO services (GO), Kennedy Station will be heavily used by commuters during construction of the EELRT and therefore careful coordination with all stakeholders will be required. Construction will take place on the parking lot of the City-owned Don Montgomery Community Recreation Centre where the station will be located. No additional property is anticipated to be required to facilitate construction of this station, depending on the final layout of the station.

There are also interface points between the SSE and the EELRT that will need to be considered prior to construction of the EELRT. The project team explored constructability issues at the Kennedy Station interface of SSE and EELRT, identifying technical fatal flaws and major challenges due to the proximity of the two station boxes. Through the exercise, some provisions for the EELRT have been made in the SSE design of the Kennedy Station box by Metrolinx. The constructability for the EELRT station is expected to be challenging should no further accommodations be made.

Discussions between Metrolinx and the City of Toronto will continue to confirm a mutually agreeable scenario to ensuring constructability of EELRT Kennedy Station.

3.3.4 Sheppard East Station (Sheppard-McCowan)

The Sheppard-McCowan terminal station is a centre platform station that connects to the SSE station box below grade. It is highly likely that this station and its connection to the SSE will be constructed by cut and cover, mostly impacting the north side of Sheppard Avenue.

In addition, there is a 2,250 mm concrete storm sewer that runs west to east draining into the Milliken Branch watercourse a short distance away to the east. This storm sewer is located approximately 8 m beneath the EB LRT track and is not planned to be relocated. Therefore, coordination with Toronto Water will be required to determine the risks and mitigation measures to protect both the sewer and the LRT infrastructure. No additional property is anticipated to be required to facilitate construction of this station.

3.3.5 Stop Platforms

The remainder of the 25 stops will be at grade platforms comprised of foundations with similar extents to that of the adjacent track slabs. Due to the relatively limited size of these stops in comparison to the two terminal stations, the construction footprints can be accommodated within the public right of way.

3.3.6 Bridges and Structures

According to the City of Toronto's online Bridge and Structure condition tool, all bridges within the study area are in good condition. The two bridges proposed to be modified or replaced along Sheppard Avenue over the Malvern branch of the Highland Creek (City structure ID 211), and the Milliken branch of the Highland Creek (City structure ID 265) are proposed to do so in a phased approach to accommodate the new infrastructure. Further investigation of these bridge structures is required to develop a detailed replacement or modification strategy and will be completed beyond the functional design stage.

3.3.7 Procurement

The method of project procurement and implementation has yet to be determined and will be confirmed in future phases of the project. Procurement opportunities available for EELRT include the traditional delivery model and Public Private Partnerships (P3), also referred to in Ontario as the Alternative Financing and Procurement (AFP) approach.

In the traditional delivery model, the government (public agency or authority) is responsible for owning, funding, and operating and maintaining the infrastructure investment and uses public financing to raise capital. The process typically involves sequential steps of design, bidding, and construction. While retaining control and ownership, the public agency also bears primary responsibility for project risks, delays, and cost overruns.

Consistent with other LRT projects of similar scale implemented in Ontario (Finch West LRT, ECLRT, Ottawa LRT), a prevailing trend over the past 20 years has been the use AFP or Design-Build type procurement models. Under the AFP, companies bid through a competitive process to undertake the entire project, including the design, construction, project financing, maintenance, and rehabilitation and, in some cases, operation of the system for a defined period of time, typically about 30 years. Design-Build procurement models are similar, but typically do not include the long-term maintenance, rehabilitation, and operations elements.

An emerging approach to procurement is the Alliance model used by Metrolinx on the Union Station Enhancement Project and on the Hamilton LRT. The Alliance model innovates on AFP models, focusing mainly on the collaboration between the project owner and private sector participants. The basis for this type of emerging partnership rests on collaborative working relationship between parties. This model emphasizes cooperation and prohibits any legal action between the parties in cases of dispute (except in the circumstances set out in the

alliance agreement). The primary means of accomplishing this sharing is a contractual agreement between the parties to apportion cost overruns, savings, losses, and profits, according to a sharing formula set out in the alliance contract. Given this collective responsibility, each decision made during project delivery is motivated by the same criterion of common success, because all the parties will assume any losses and gains.

3.3.8 Construction Phasing and Staging

Construction is planned to occur in phases. Areas with existing congestion are proposed to be prioritized. Right-of-way (ROW) widening is required in multiple areas to implement the Complete Street elements of the project, a long-term phasing approach for these elements may be required. Details regarding construction phasing and staging will be confirmed as the project advances beyond the functional design phase.

3.3.9 Next Steps

The parameters described in this EPR as well as any variations to the environmental and design specifications will need to be reviewed, confirmed, or revised where necessary prior to construction of the EELRT project. The actions below must be undertaken and resolved prior to facilities construction:

- Review commitments stated in the EPR and develop a plan to comply with the commitments made.
- Consult further with applicable stakeholders.
- Review applicable updated regulations, design guidelines, and design standards.
- Conduct detailed archaeological and excess soil contamination investigations, as required.
- Conduct geotechnical investigations, including drilling of boreholes to determine existing soil and groundwater conditions.
- Complete hydrogeological and geomorphological studies.
- Undertake site surveying (including field investigations for species at risk), as required for natural, cultural, and archaeological environment studies.
- Review the EPR document and proceed with design refinements of all infrastructure and system components:
  - Transit stop design, median breaks, including passenger amenities, access, and circulation roads.
  - Drainage and stormwater management.
  - Structures.
  - MSF.
  - Illumination and traffic signals.
  - Intelligent Transportation Systems (ITS).
  - Landscaping and pavement.
  - Phasing requirements for infrastructure implementation.
- Discuss and define, utility relocation strategy and design with owners.
- Acquire required property.
- Define vehicle types and operational service plans.
- Obtain environmental approvals/permits/exemptions, as required.
- Coordinate passenger transfer strategies, and facility designs with local transit agencies.
- Develop fare collection strategies in coordination with all relevant operators.

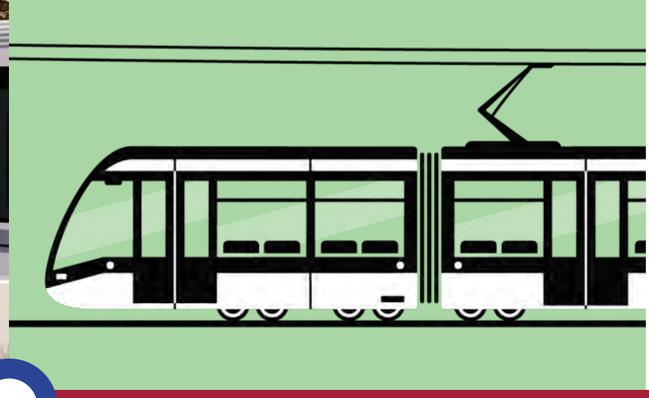
There is a potential that the functional design of the EELRT will experience changes as the project progresses. If the proposed works change following the EPR, the proponent will be required to assess any change to the impacts following addendum process (summarized in Chapter 1.8) or through a separate TRPAP process, as applicable.

3.4 Lifecycle Operations and Maintenance

The LRT service concept will be confirmed in future phases of the project. The EELRT study assumes maximum vehicle length of 50 m as even shorter trains can meet projected lifecycle demand growth with buffer for unknowns. The functional design protects for an additional 10 m platform extension, should this be required in the future. In terms of operating capacity, a typical 50 m LRV can comfortably carry up to 4,000 people per hour. Service headways ranging from 4 to 8 minutes are anticipated, subject to change as the project advances and as further ridership forecasting and demand modeling is completed.

Though vehicle types and track technology have yet to be determined, it is expected that train operations, for both locomotive control and opening / closing of doors, would be controlled by on-board staff. Also, double-ended LRVs with operator cabs at both ends will be employed, allowing trains to operate in both directions, eliminating the need for looping at the end of the lines and reducing operating costs. The movement of trains along the right-of-way (ROW) will be regulated by three-staged traffic signals giving cross-traffic and pedestrians, parallel traffic including left-turns, and the LRT and parallel pedestrian traffic opportunities to move through the intersection. The EELRT system will be designed to provide the necessary power, as well as the voltage range, to ensure proper operation of the trains.

During operation of the new LRT, the City and the TTC will monitor traffic volumes on public roads and transit schedules as part of the normal operating procedures to determine if any further changes to the traffic or bus system should be implemented. Parties responsible for operations and maintenance will depend on the procurement approach selected, as discussed in Chapter 3.3.7. Operators will need to establish regular operation schedules, manage daily operations (such as collecting fares, ensuring system safety, and serving passengers), monitor vehicle movements, coordinate maintenance activities, and respond to emergencies. Maintenance activities include routine inspections, regular rail tracks check-ups, cleaning, and preventive maintenance to ensure the LRT system's reliability and safety. Repairs are to be conducted as needed to address wear and tear, accidents, or equipment failures.



4 Existing Conditions

This Eglinton East LRT (EELRT) project traverses a range of urban environmental conditions.

This chapter details the existing conditions within the study area in the context of the built, natural, socio-economic, and cultural environments. These conditions establish the baseline to compare the anticipated effects of the project. Components of this section have been informed by technical studies, provided in the following appendices:

- **Appendix B**: Utility Conflict Matrix and related Annotation drawings,
- **Appendix C:** Drainage and Stormwater Management Report,
- **Appendix D:** Socio-Economic Report,
- **Appendix E:** Natural Environment Report,
- **Appendix F:** Cultural Environment and Heritage Reports,
- **Appendix G:** Archaeology Report,
- **Appendix H:** Air Quality Report,
- **Appendix I:** Noise and Vibration Report,
- **Appendix J:** Geotechnical Assessment Report, and
- **Appendix K:** Contamination / Limited Phase 1 ESA
- **Appendix M:** Traffic Impact Assessment Report

4.1 Transportation

This section provides an overview of the existing transportation network.

4.1.1 Active Transportation

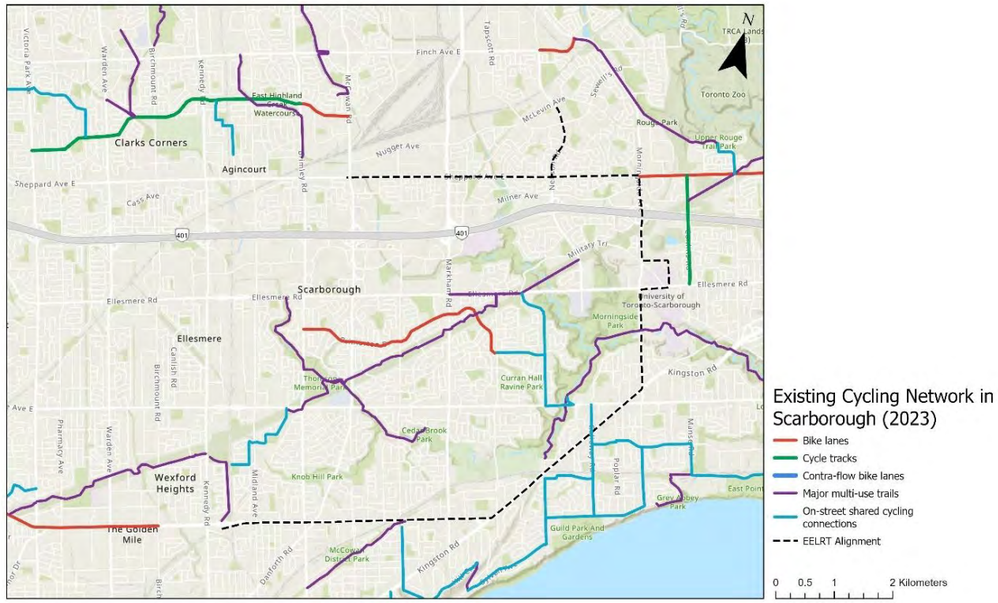
4.1.1.1 Pedestrian Infrastructure

Most of the roads along the study area have sidewalks on both sides of the road, except for two locations. These include a portion of Ellesmere Road that lacks a north side sidewalk and Morningside Avenue at the Highway 401 interchange where there are discontinuous sidewalks due to the free flow on-ramps. The free flow ramps at the Morningside - Highway 401 interchange are unconducive to active transportation because of the large volume of vehicles entering the ramps at high speed, making it dangerous to pedestrians and cyclists crossing the ramps.

4.1.1.2 Cycling Infrastructure

Currently, there are no dedicated bike lanes or cycle tracks along the proposed LRT alignment (see Figure 4-1). The Eglinton East Trail, Highland Creek Trail, Sheppard Avenue East bike lane, and Conlins Road cycle track are existing cycling facilities that cross the study area. RapidTO bus lanes in the study area also permit bicycles.

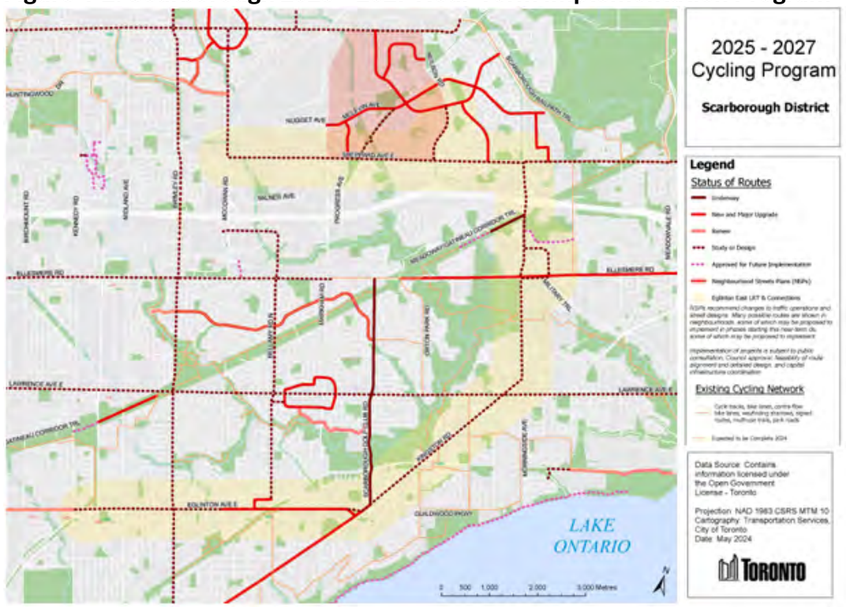
Figure 4-1: Existing Cycling Network in Scarborough in 2023



Source: City of Toronto

The City of Toronto's Near-Term Cycling Implementation Program specifies which cycling infrastructure projects and studies will be implemented in the 2022 to 2024 period (see Figure 4-2). Table 4-1 summarizes the existing and near-term implementation bike lanes in the EELRT study area. As of July 2024, the City has completed the development of a 2025-2027 cycling implementation plan.

Figure 4-2: Scarborough 2025 – 2027 Near-Term Implementation Program



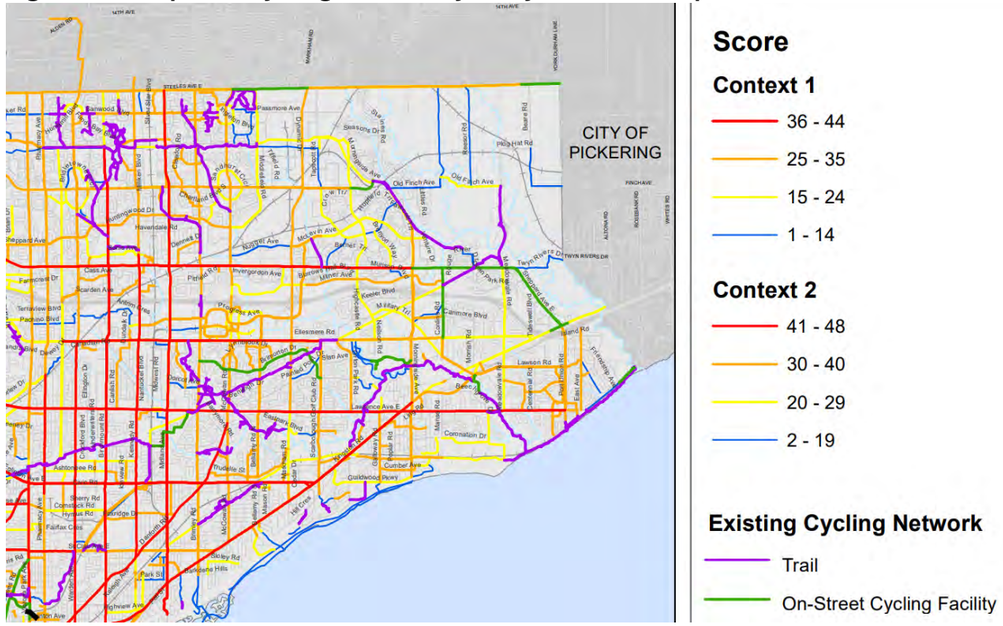
Source: City of Toronto

Table 4-1: Existing and Near-Term Cycling Facilities in the Study Area

Corridor	Limits	Status	Facility Type	Facility along EELRT alignment?
Eglinton Ave	Kennedy Rd to Kingston Rd	Study (2022-2024)	Dedicated bikeway	Yes
Midland Ave/ Brimley Rd	Kingston Rd to Steeles Ave	Study (2022-2024)	Dedicated bikeway	No Crosses EELRT corridor at Eglinton Ave and Midland Ave/Brimley Rd
McCowan District Park Trail	Brimley Rd to Eglinton Ave	Existing	Multi-use trail	No Meets EELRT corridor at Eglinton Ave and Bellamy Rd
Kingston Rd	Cliffside Dr to Eglinton Ave E	New (2022-2024)	Dedicated bikeway	No Meets EELRT corridor at Eglinton Ave and Kingston Rd
Scarborough Golf Club Rd	Lawrence Ave to Kingston Rd	New (2022-2024)	Dedicated bikeway	No Meets EELRT corridor at Kingston Rd and Scarborough Golf Club Rd
Galloway Rd	Lawrence Ave to Guildwood Parkway	Existing Study for upgrade (2022-2024)	On-street shared cycling connection	No Crosses EELRT corridor at Kingston Rd and Galloway Rd
Highland Creek Trail	N/A	Existing	Multi-use trail	No Grade separated - passes under the Morningside Highland Creek Bridge. Accessible from Morningside Ave from Morningside Park.
Ellesmere Rd	Morningside Ave to Kingston Rd	New (2022-2024)	Dedicated bikeway	Yes
Sheppard Ave	Kingston Rd to Morningside Ave	Existing Renew (2022-2024)	Bike lane	No Meets EELRT corridor at Morningside Ave and Sheppard Ave
Conlins Rd	Sheppard Ave to Ellesmere Rd	Existing	Cycle track	No Exists within 500 m of the EELRT corridor, parallel to Morningside Ave

In the long-term, according to the City's "Proposed Cycling Network by Analysis Scores Map" (see Figure 4-3), Eglinton Avenue East, Kingston Road, and Sheppard Avenue East are rated high in terms of the value they add in expanding the City's cycling network. This means a significant portion of the EELRT corridor is considered a priority corridor for cycling infrastructure development in Toronto.

Figure 4-3: Proposed Cycling Network by Analysis Scores Map



Source: City of Toronto, 2019

It must be noted that the entire EELRT study corridor has been identified for further study in the future, as shown in the City's Major City-Wide Cycling Routes Map (July 2024).

4.1.2 Transit

This section provides more detail on the existing transit services within the study area prior to the construction of EELRT.

4.1.2.1 Local Transit

4.1.2.1.1 Rapid Transit

In terms of higher-order transit, the TTC currently operates Line 2 Bloor-Danforth Subway in the study area.

Line 5 Eglinton and Scarborough Subway Extension (SSE) are two projects currently under construction in the study area that would become part of the future existing condition. Line 5 is a 19 km long east-west LRT line, which will run along Eglinton Avenue from Mount Dennis Station in the west, terminating at Kennedy Station in the east, intersecting with the EELRT study area. Set to open in 2030, SSE is a 7.8 km three-stop extension of Line 2 from Kennedy Station to a new terminus at Sheppard Avenue East and McCowan Road, which will also interface with the EELRT project.

Between the closure of Line 3 (SRT) in 2023 and the opening of SSE in 2030, the TTC plans to operate a Bus Rapid Transit (BRT) service within a portion of the SRT right-of-way.

At present, Kennedy Station serves as the east terminus of Line 2. In the future existing condition, Kennedy Station will be the eastern terminus for Line 5, and an inline station for Line 2. Overall, Kennedy Station will be a major transit hub for connecting passengers to three TTC rapid transit lines, namely Line 5, Line 2, Stouffville GO Line, as well a large network of bus routes.

4.1.2.1.2 Local Buses

The study area is served by a large network of TTC bus routes in 2022, as shown in Figure 4-4. Notably, along this corridor, the City of Toronto has implemented 8.5 km of RapidTO bus lanes as a transit priority measure since 2020. The bus lanes run on Eglinton Avenue, Kingston Road, and Morningside Avenue from Brimley Road to Ellesmere Road. The curb lanes have been converted to dedicated bus lanes using red pavement paint and signage.

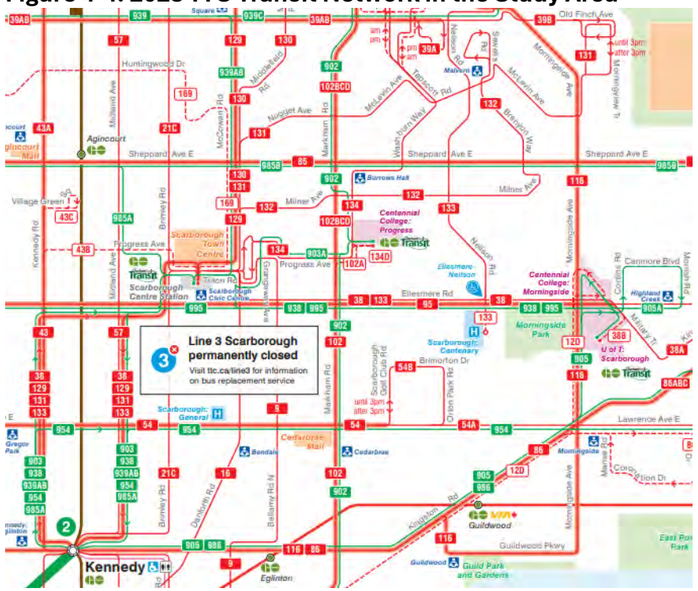
A summary of the bus routes that travel along a significant portion of the corridor are listed below.

- **85 Sheppard East**: A local route with 3 branches that operates predominantly along Sheppard Avenue East between Sheppard-Yonge Station and Meadowvale Road. This route operates at least every 10-minutes or better all day, every day.
- **86 Scarborough:** A local route with 4 branches that operates from Kennedy Station along Eglinton Avenue East and Kingston Road to Sheppard Avenue East and Meadowvale Road. This route operates at least every 10-minutes or better all day, every day.
- **116 Morningside:** A local route that operates from Kennedy Station along Eglinton Avenue East, Guildwood Parkway, and Morningside Avenue to Finch Avenue East. This route operates at least every 10-minutes or better all day, every day.
- **905 Eglinton East Express:** An express route that operates from Kennedy Station along Eglinton Avenue East and Kingston Road to the University of Toronto Scarborough Campus. This route operates every 15-30 minutes every day.
- **954 Lawrence East Express:** An express route that operates from Lawrence East Station along Lawrence Avenue to Starspray Boulevard. This route operates every 10-15 minutes Monday to Friday.
- **985 Sheppard East Express:** An express route with 2 branches that operates from Don Mills Station to Scarborough Centre Station and Meadowvale Road and Sheppard Avenue East. This route operates every 5-15 minutes every day.
- **986 Scarborough Express:** An express route that operates from Kennedy Station along Eglinton Avenue East, Kingston Road, and Meadowvale Road to Sheppard Avenue East. This route operates every 5-15 minutes during weekday peak periods only.

Bus routes that cross the study corridor are as follows:

- 9 Bellamy
- 12 Kingston
- 16 McCowan
- 20 Cliffside
- 21 Brimley
- 38 Highland Creek
- 54 Lawrence East
- 57 Midland
- 95 York Mills
- 102 Markham
- 129 McCowan North
- 130 Middlefield
- 131 Nugget
- 132 Milner
- 133 Neilson
- 134 Progress
- 169 Huntingwood
- 902 Markham Road Express
- 939 Finch Express
- 995 York Mills Express

Figure 4-4: 2023 TTC Transit Network in the Study Area



Source: TTC (2023)

4.1.2.2 Inter-Regional Transit

4.1.2.2.1 GO Rail

The EELRT alignment interfaces with the Stouffville Line at Kennedy GO Station and the Lakeshore East Line at Eglinton GO Station and Guildwood GO Station. The GO Expansion Program aims to electrify several lines in its network, including Stouffville and Lakeshore East, which will allow all-day 15–minute or better two-way service, 7 days a week. In addition to electrification, the program includes new tracks, station improvements and other infrastructure enhancements for the Stouffville and Lakeshore East lines. The full-business case assumed all new services commencing between 2027 and 2028. On-corridor improvement construction is expected to begin in 2023.

As a part of the program, Kennedy Station will see a new GO ticketing building along with retail spaces on concourse level.

4.1.2.2.2 GO Buses

GO Bus route 41 and 41A Hamilton-Pickering travel along Morningside Avenue and Military Trail to serve the University of Toronto Scarborough Campus at 3 stops.

4.1.2.2.3 Durham Region Transit

In June 2013, the Durham Region Transit PULSE BRT was launched, connecting Durham Region and Scarborough Town Centre via UTSC along Ellesmere Road. It provides 7–8-minute peak service, 10-minute midday, and 30-minute evening service on weekdays.

4.1.2.2.4 VIA Rail

The EELRT interfaces with VIA Rail at Guildwood Station, which is a shared VIA and GO Station. The train station services the Toronto-Ottawa and Toronto-Montreal VIA routes. There are 13 scheduled daily trains that stop at Guildwood Station.

4.1.2.3 Future Transit

The Eglinton East LRT project will interface with a number of transit projects that are currently being studied.

4.1.2.3.1 Durham-Scarborough BRT (DSBRT)

Further north in the study area, the Durham-Scarborough Bus Rapid Transit (DSBRT) project proposes 36 km of dedicated bus lanes along Highway 2 and Ellesmere Road to provide frequent bus service connecting Scarborough and Durham Region. In Scarborough, DSBRT is proposed to run along Ellesmere Road from Scarborough Town Centre to Kingston Road. In the portion between Morningside Avenue and New Military Trail, DSBRT is planned to run in the curb lanes in mixed traffic. The project is currently in the preliminary design stage and is partially funded. The DSBRT Notice of Completion of Environmental Project Report and Transit Project Assessment Process was issued in January 2022 and March 2022, respectively.

4.1.2.3.2 Sheppard (Line 4) Extension

Metrolinx is currently studying options developed through community input on the best way to provide rapid transit within the Sheppard Avenue corridor between Allen Road and Meadowvale Road. There is a study area overlap along Sheppard Avenue East between McCowan Road and Meadowvale Road.

4.1.3 Traffic

Traffic conditions along the road network surrounding the EELRT study area are discussed in greater detail in this section.

4.1.3.1 Existing Road Network

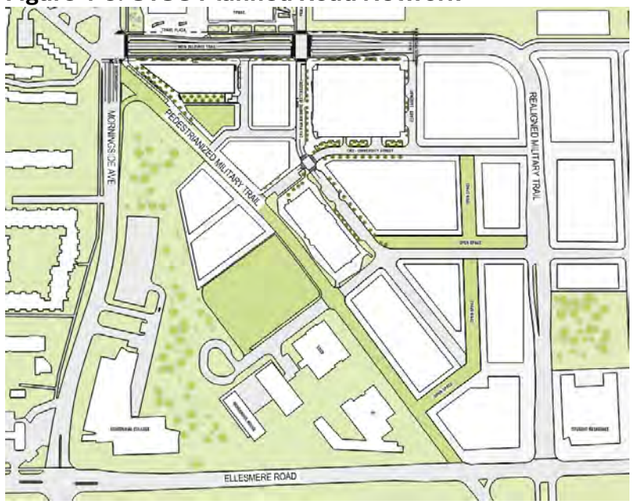
As summarized in Table 4-2 to Table 4-9, the EELRT alignment traverses 7 different roads, with a varying number of traffic lane configurations. Typically, the right-of-way (ROW) width in this study area is around 36 m and the posted speed limit is 50 km/h.

Since 2020, the City of Toronto has converted 8.5 km of general vehicle curb lanes into dedicated transit priority bus lanes. The RapidTO service now runs along Eglinton Avenue, Kingston Road, and Morningside Avenue from Brimley Road to Ellesmere Road.

In the University of Toronto Scarborough Campus (UTSC) Master Plan, Military Trail is proposed to be realigned to form a new road. A future Class EA, streamlined assessment or studies, may be undertaken for the New Military Trail roadway, as required by the

Environmental Assessment Act, to confirm roadway elements. The Master Plan also proposes the pedestrianization of the existing Military Trail.

Figure 4-5: UTSC Planned Road Network



Source: UTSC Master Plan

Table 4-2: Existing Road Network Characteristics – Eglinton Avenue East

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Eglinton Avenue East	4.1 km Kennedy Station – Kingston Rd	36	50	• 3 Eastbound (EB) Lanes (2 General Purpose Lanes and 1 RapidTO bus lane) + • 3 Westbound (WB) Lanes (2 General Purpose Lanes and 1 RapidTO bus lane) + • 1 Centre Two Way Left Turn Lane (TWLTL)

Table 4-3: Existing Road Network Characteristics – Kingston Road

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Kingston Road	3.6 km Eglinton Ave – Lawrence Ave	36	60	• 3 EB Lanes (2 General Purpose Lanes and 1 RapidTO bus lane) + • 3 WB Lanes (2 General Purpose • Lanes and 1 RapidTO bus lane) + • 1 Raised Median

Table 4-4: Existing Road Network Characteristics – Morningside Avenue (South)

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Morningside Avenue (South)	2 km Lawrence Ave – Highland Creek	30	50	• 2 Northbound (NB) Lanes (1 General Purpose Lanes and 1 RapidTO bus lane), • 2 Southbound (SB) Lanes (1 General Purpose Lanes and 1 RapidTO bus lane) + 1 Left-turn lane (LTL), 1 Right-turn lane (RTL)

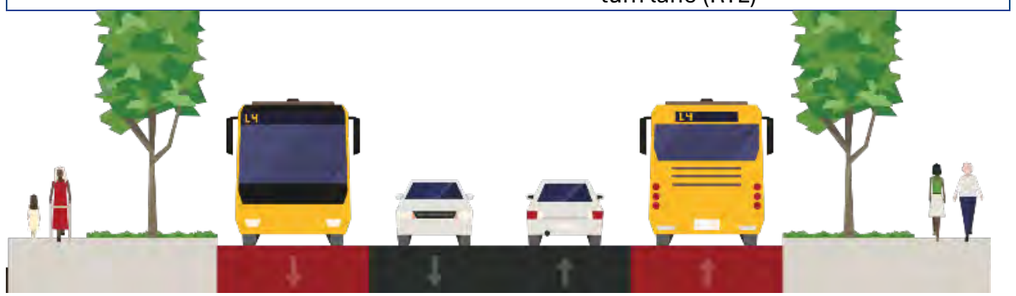


Table 4-5: Existing Road Network Characteristics – Morningside Avenue (North)

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Morningside Avenue (North)	2.7 km Ellesmere Rd – Sheppard Ave	36	50	• 2 NB, 2 SB + 1 LTL,1 RTL. • 3 lanes in each direction over Highway 401

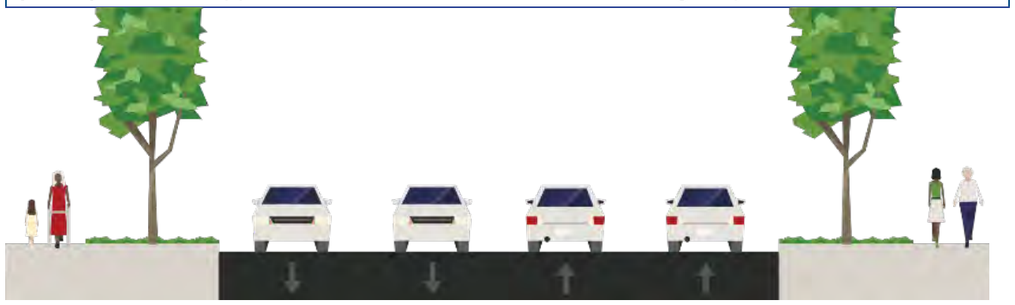


Table 4-6: Existing Road Network Characteristics – Ellesmere Road

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Ellesmere Road	0.5 km Morningside Ave – New Military Trail	36	50	• 2 EB, 2 WB + 1 LTL

Table 4-7: Existing Road Network Characteristics – New Military Trail (without LRT scenario)

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
New Military Trail (without LRT scenario)	0.8 km	36	N/A	• 1 EB, 1WB + 1 TWLTL

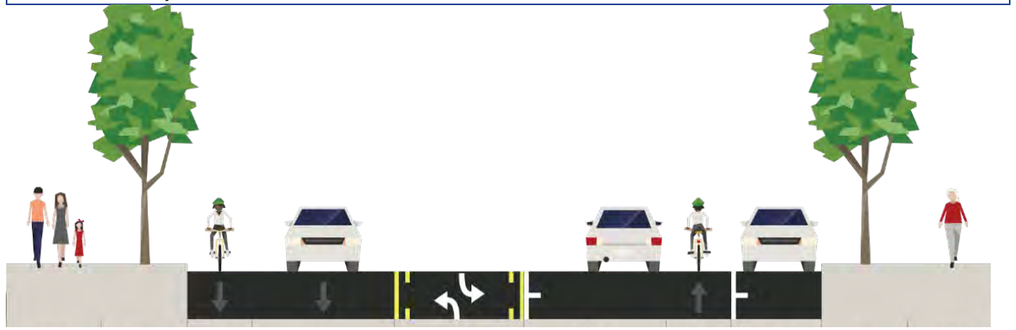


Table 4-8: Existing Road Network Characteristics – Sheppard Avenue East

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Sheppard Avenue East	4.9 km Morningside Ave – McCowan Rd	36	50	• 2 EB, 2 WB + 1 LTL

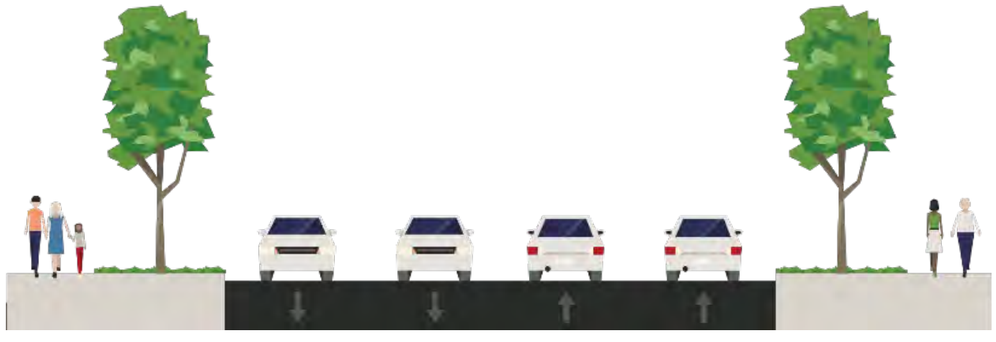


Table 4-9: Existing Road Network Characteristics – Neilson Road

Road	Limits and Length	Designated ROW Width (m)	Posted Speed (km/h)	Lane Configuration
Neilson Road	1.3 km Sheppard Ave – Malvern Town Centre	36	50	• 2 EB, 2 WB • 1 Raised Median

4.2 Infrastructure

4.2.1 Drainage and Stormwater Management

The study corridor spans two watersheds that are regulated by the Toronto and Region Conservation Authority (TRCA). The highly urbanized Highland Creek watershed encompasses most of the study corridor, while the northwest portion of the study area along Sheppard Avenue East and Morningside Avenue, which includes the MSF site, lies within the Morningside Creek Subwatershed of the Rouge River watershed. Stormwater runoff is primarily managed by traditional urban major and minor systems with storm sewers and overland flows within the right-of-way. The existing drainage areas and discharge areas in the existing condition are summarized by segment in Table 4-10**.**

Further details are provided in the Drainage and Stormwater Management Report in **Appendix C**.

Table 4-10: Summary of Existing Preliminary Drainage Areas

Drainage Area Segment No.	Description	Drainage Area (ha)	Discharge Location
1	Sheppard Avenue East, from Brimley Road to Highland Creek Milliken Branch	4.24	Highland Creek Milliken Branch
2	Sheppard Avenue East, from Highland Creek Milliken Branch to 300 m west of Markham Road	4.04	Highland Creek Milliken Branch
3	Sheppard Avenue East, from 300 m west of Markham Road to Highland Creek Malvern Branch	4.05	Highland Creek Malvern Branch
4	Sheppard Avenue East (south side), from 240 m east of Malvern Street to 40 m west of Highland Creek Malvern Branch	0.16	Existing storm sewer system on Purvis Crescent, nearby outlet to Highland Creek Malvern Branch
5	Sheppard Avenue East from Highland Creek Malvern Branch to 80 m east of Murison Boulevard, including Neilson Road from Sheppard Avenue to Berner Trail/Wickson Trail	6.40	Highland Creek Malvern Branch
6	Neilson Road from Berner Trail/Wickson Trail to McLevin Avenue	3.36	Existing storm sewer system on Sheppard Avenue
7	Sheppard Avenue East (south side), from 140 m east of Neilson Road to 80 m east of Murison Boulevard	3.94	Existing storm sewer system on Coltman Crescent
8	Sheppard Avenue East, from 80 m east of Murison Boulevard to 270 m west of Brenyon Way	0.58	Existing storm sewer system on United Square
9	Sheppard Avenue East, from 270 m west of Brenyon Way to 300 m east of Morningside Avenue, including Morningside Avenue from Sheppard Avenue to Highway 401	6.54	Existing storm sewer system on Morningside Avenue
10	Sheppard Avenue East, from 300 m east of Morningside Avenue to Conlins Road	2.02	Existing storm sewer system on Conlins Road, nearby outlet to Tributary of Morningside Creek
11	Morningside Avenue, from Highway 401 to Military Trail	2.74	Existing storm sewer system on Morningside Avenue, nearby outlet to Highland Creek
12	Ellesmere Road, from Military Trail to 110 m east of Military Trail	0.29	Existing storm sewer system on Ellesmere Road
13	Ellesmere Road, from 40 m east of Morningside Avenue to Military Trail	1.73	Highland Creek

Drainage Area Segment No.	Description	Drainage Area (ha)	Discharge Location
14	Ellesmere Road, from 20 m west of Morningside Avenue to 40 m east of Morningside Avenue	0.28	Highland Creek
15	Morningside Avenue, from Ellesmere Road to 160 m south of Ellesmere Road	0.32	Highland Creek
16	Morningside Avenue, from 160 m south of Ellesmere Road to 230 m south of Ellesmere Road	0.15	Highland Creek
17	Morningside Avenue, from 230 m south of Ellesmere Road to 300 m south of Ellesmere Road	0.15	Highland Creek
18	Morningside Avenue, from 300 m south of Ellesmere Road to 370 m south of Ellesmere Road	0.15	Highland Creek
19	Morningside Avenue, from 370 m south of Ellesmere Road to 440 m south of Ellesmere Road	0.15	Highland Creek
20	Morningside Avenue, from 440 m south of Ellesmere Road to 510 m south of Ellesmere Road	0.13	Highland Creek
21	Morningside Avenue, from 510 m south of Ellesmere Road to 590 m south of Ellesmere Road	0.16	Highland Creek
22	Morningside Avenue, from 590 m south of Ellesmere Road to 670 m south of Ellesmere Road	0.14	Highland Creek
23	Morningside Avenue, from 670 m south of Ellesmere Road to 770 m south of Ellesmere Road	0.21	Highland Creek
24	Morningside Avenue, from 470 m north of Beath Street to Warnsworth Street	1.20	Highland Creek
25	Morningside Avenue, from Warnsworth Street to Kingston Road, and Kingston Road from Morningside Avenue to Lawrence Avenue East	2.53	Existing storm sewer system on Morningside Avenue
26	Kingston Road (north side), from Lawrence Avenue East to 180 m east of Galloway Road	1.11	Existing storm sewer system on Lawrence Avenue East
27	Kingston Road (south side), from Lawrence Avenue East to Poplar Road	0.45	Existing storm sewer system on Kitchener Road
28	Kingston Road (south side), from Poplar Road to 230 m west of Poplar Road	0.45	Existing storm sewer system on Poplar Road
29	Kingston Road, from 180 m east of Galloway Road to Payzac Avenue	2.43	Existing storm sewer system on Galloway Road
30	Kingston Road, from Payzac Avenue to Metrolinx rail crossing	3.22	Existing storm sewer system on Payzac Avenue (partial outlet to storm sewer system on Celeste Avenue)
31	Kingston Road, from Metrolinx rail crossing to Guildwood Parkway	3.45	Existing storm sewer system on Livingston Road
32	Kingston Road, from Guildwood Parkway to Scarborough Golf Club Road	1.83	Existing storm sewer system on Guildwood Parkway
33	Kingston Road, from Scarborough Golf Club Road to Eglinton Avenue East	1.45	Existing storm sewer system on Kingston Road, connects to storm sewer system on Cedar Drive
34	Eglinton Avenue East, from Kingston Road to Markham Road	3.92	Existing storm sewer system on Cedar Drive
35	Eglinton Avenue East, from Markham Road to Mason Road	1.31	Existing storm sewer system on Markham Road
36	Eglinton Avenue East, from Beachell Street to 90 m west of Mason Road	0.85	Existing storm sewer system on Beachell Street
37	Eglinton Avenue East, from 90 m west of Mason Road to Torrance Road	3.09	Existing storm sewer system on Bellamy Road North
38	Eglinton Avenue East, from Torrance Road to 30 m west of Brimley Road	3.93	Existing storm sewer system discharging to open channel on Barbados Boulevard (partial outlet to storm sewer system on Danforth Road)
39	Eglinton Avenue East, from 20 m east of Brimley Road to 30 m west of Brimley Road	0.21	Existing storm sewer on Brimley Road
40	Eglinton Avenue East, from 30 m west of Brimley Road to Glider Drive	1.43	Existing storm sewer system on Bimbrok Road
41	Eglinton Avenue East, from Glider Drive to Metrolinx rail crossing	2.88	Existing storm sewer system on Glider Drive
42	Eglinton Avenue East, from Metrolinx rail crossing to 190 m east of Kennedy Road	0.69	Existing storm sewer system on Eglinton Avenue

A hydraulic structure inventory has been compiled based upon the background information review. Three bridge crossings were identified along the study corridor based on review of Toronto Maps and EELRT corridor Available Satellite Imagery. All three structures are within the Highland Creek Watershed.

Two bridge crossings, Structures 265 and 211, are located along Sheppard Avenue East, while Structure 357 is along Morningside Avenue, adjacent to the University of Toronto

Scarborough (UTSC) lands. Refer to the Drainage Mosaic in **Appendix C** for the location of the crossings.

A summary of the size and location of the existing bridge structures can be found in Table 4-11.

Table 4-11: Summary of Creek Crossing Structures

Structure ID (City of Toronto)	Crossing (Watercourse)	Crossing Location	Crossing Dimensions (Span x Rise x Length)
265	Bendale Branch	Sheppard Ave E, between McCowan Rd and Shorting Rd	10.2 m x 3.03 m x 26.8 m
211	Milliken Branch	Sheppard Ave E, between Gateforth Dr and Washburn Way	12.2 m x 6.07 m x 29.6 m
357	Highland Creek	Morningside Ave, between Ellesmere Rd and Beath St	130 m x 13.54 m x 19.5 m

The hydraulic structure sizes were summarized based on the available background data. TRCA HEC-RAS models were utilized to ensure the accuracy with above findings. Based upon a high-level review of the area, it is anticipated that other hydraulic structures (i.e. culverts) are possibly located within the study area. The drainage and stormwater management inventory will be updated at the detailed design stage based upon review of any additional background information.

4.2.2 Utilities

The EELRT study utilized available City Utility Mapping (CUMAP) data, which primarily featured wet utilities. Dry utility information was unavailable at this stage in the design and was not included in this analysis. Gathering data on dry utilities will be crucial in the next phases of design and essential for creating a more comprehensive Underground Utility Conflict Management (UCM) plan. A summary of identified existing utilities that may pose conflicts with EELRT are outlined below for different segments of the study area.

- **Eglinton Avenue**
  - One existing sanitary and storm sewers running parallel to the roadway, with diameters changing from 370 mm to 975 mm.
  - A few large crossing storm sewers: Three 1500 mm, one 1350 mm, two 900 mm, one 675 mm and one 400 mm, one concrete sanitary 600 mm and one 675 mm sanitary.
  - Numerous service structures (i.e., catch basins, leads).
  - Existing watermains, some crossing and others parallel to the EELRT alignment.
- **Kingston Road**
  - Two large crossing (1200 mm, 1350 mm) and three medium size crossing (975 mm, 825 mm,750 mm). Two sewers parallel to the roadway with sizes changing from 300 mm to 900 mm.
  - Numerous service structures possibly conflicting with the exclusion zones (i.e. catch basins, leads).
  - Existing watermains, some crossing and others parallel to roadway.
- **Morningside Avenue**
  - One large (1800mm), and two medium-sized (725 mm, 825 mm) crossing sewer
  - One medium sewer network parallel to the roadway (750 mm).
  - Service structures (i.e. catch basins, leads).
  - Existing watermains, some crossing and some parallel to roadway structures.
- **Ellesmere Road**
  - Existing medium to large sewer crossing (1800 mm, 850 mm).
  - Two medium to large existing parallel watermains (2100 mm and 1100mm).
  - Service structures (i.e. catch basins, leads).
- **New Military Trail**
  - One crossing sanitary (300 mm) and one storm sewer (750 mm).
  - Two crossing and one parallel watermains of unknown size
  - Service structures (i.e. catch basins, leads).
- **Sheppard Avenue**
  - Four large (1800 mm, 1950 mm, 1350 mm) and a few small to medium-sized (600 mm, 450 mm) crossing sewers.
  - One very large sewer (2250 mm Concrete, located just east of McCowan Road) parallel to the roadway.
  - Numerous service structure (i.e. catch basins, leads).
  - Existing water networks, some crossing, and others parallel to the roadway.

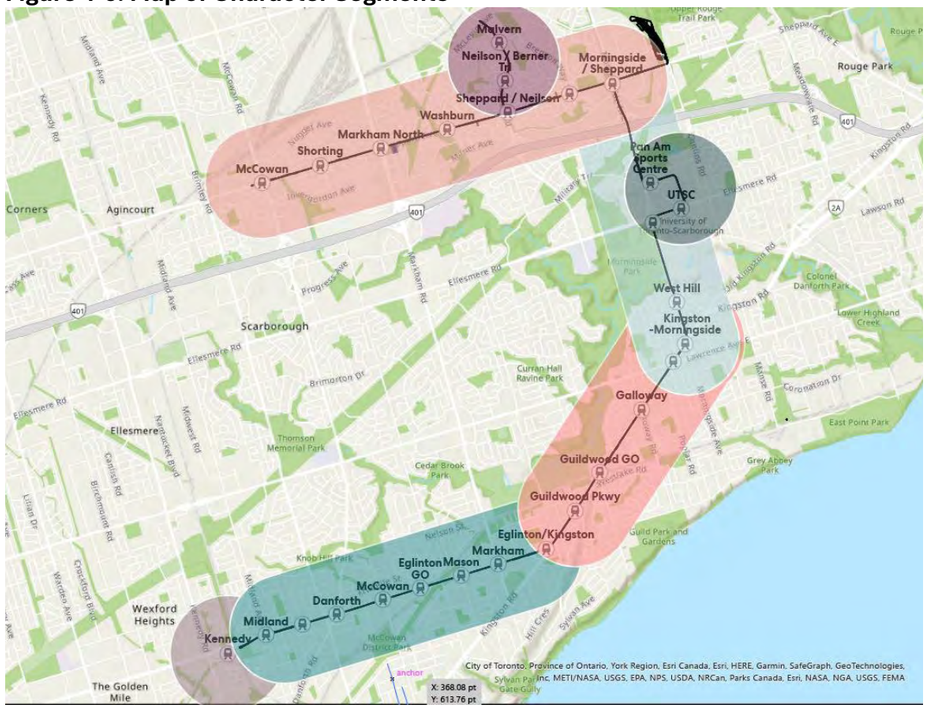
A more detailed list of existing utilities as well as an existing utility drawing set based on available information from the CUMap is provided in **Appendix B**.

4.3 Socio-Economic Environment

The study area along the corridor has differing existing conditions and potential for change along its length. For the purposes of the socio-economic assessment, the corridor has been divided into seven (7) distinct areas shown in Figure 4-6 based on their geographic locations, land use characteristics, and right-of-way, as follows:

- Kennedy Station
- Eglinton East Corridor
- Kingston Corridor,
- Morningside Corridor,
- University of Toronto Scarborough Campus (UTSC) Area,
- Sheppard East Corridor, and
- Malvern Extension.

Figure 4-6: Map of Character Segments



4.3.1 Kennedy Station and Eglinton East Corridor

The Eglinton Corridor extends from Kennedy Road in the west to Markham Road in the east, touching on neighborhoods such as Ion view, Cliffcrest, Eglinton East, Kennedy Park, Scarborough Village and Golfdale-Cedarbrae-Woburn. This 3.8km long segment consists of 8 EELRT stop locations; Kennedy, Midland, Falmouth, Danforth, McCowan, Eglinton GO, Mason and Markham. Existing Land Use and Built Form Patterns

The areas with direct frontage onto the Eglinton Avenue segment predominantly contain Mixed-Use Areas, a combination of big box grocery stores, strip malls, parking lots, auto shops, and mixed retail, office, and residential buildings. Recent changes in the transit network along Eglinton Avenue and Kennedy Station have triggered the redevelopment of several strip mall sites along Eglinton Avenue, and currently, there are 14 development proposals in the Eglinton Segment at different stages of development, shown in Figure 4-7.

Figure 4-7: Eglinton Corridor Land Use Map and Proposed Developments

Source: City of Toronto

The average right-of-way along the corridor is 36 m wide with 3 lanes of traffic in each direction, including priority bus lanes along the curb lane, that runs along Eglinton Avenue East from Brimley Avenue. Only buses, Wheel-Trans and bikes are allowed on the priority bus lanes. The wide roadway also includes a centre turn lane. A narrow 2 m existing sidewalk is available on both sides of the street with few landscaped boulevards and no street furniture on commercial frontages. There are mature trees within the private properties but there are none in the public realm except for very few new trees that were planted as part of recent developments.

In the immediate vicinity of the existing Kennedy Station, the built form consists of low-rise residential neighborhood to the east, mid to low-rise buildings further east, high-rise residential development to the north and across Eglinton Avenue, and the Don Montgomery Community Recreation Centre to the south. The Kennedy GO Station & Subway Station is located in the west.

Figure 4-8: Existing Transit Hub at Kennedy Station

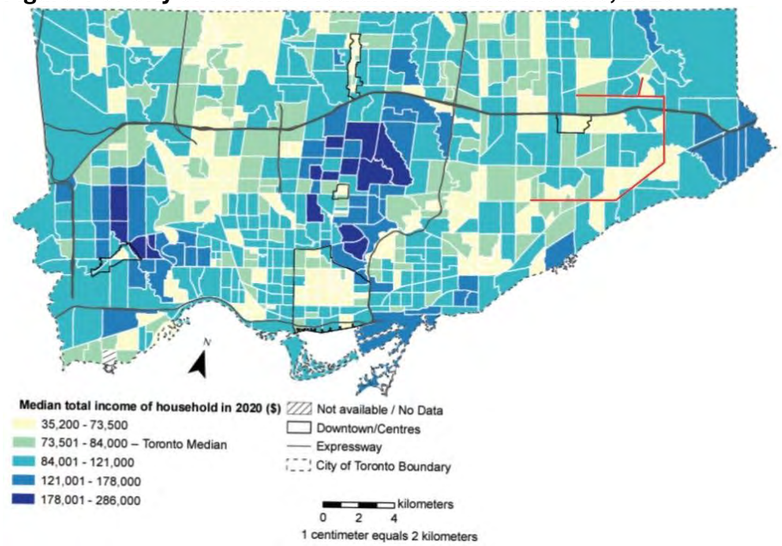
Source: Wikipedia

The streetscape along Eglinton Avenue in this segment is predominantly characterized by deeper setbacks used for parking lots that support the existing strip malls.

4.3.1.1 Demographic & Economic Profile of Study Area Residents

The Eglinton segment has a total population of 113,107 which constitutes 4 % of the City's population and a population density of 8,530 people per square km, almost twice the City average of 4,423 people per square km. As of 2020, the median income along this segment is under $73,500 which is lower than the City-wide average of $84,000, as shown in Figure 4-9. The neighborhoods along Eglinton segment have a high prevalence of low-income households (19%) when compared to the City-wide average of 13%.

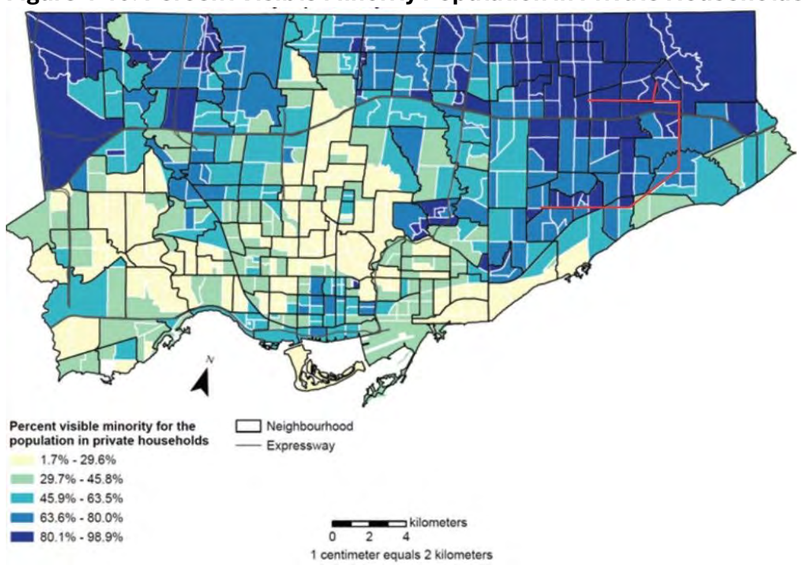
Figure 4-9: City of Toronto Median Household Income, 2020



Source: City of Toronto and Statistics Canada

The neighborhoods along the Eglinton segment are also vastly diverse, where approximately 80% of the population living in private households are members of a visible minority population, as reflected in Figure 4-10.

Figure 4-10: Percent Visible Minority Population in Private Households, 2020



Source: City of Toronto and Statistics Canada

4.3.1.2 Future Changes

The Avenues designation and Mixed-Use land use identified for the Eglinton corridor in the Toronto Official Plan support redevelopment of the adjacent lands into a mixed-use, mid-rise form of development. The existing low-rise commercial buildings with deep setbacks and surface parking lots, are likely to attract development interest, pending market demand.

This linear form of development will be punctuated by higher density nodes at the Kennedy Transit Hub and Eglinton GO Station, as outlined in Our Plan Toronto, pending ministerial approval. Currently proposed development applications are reflected in Figure 4-7.

The lands around the Kennedy Transit Hub will be contained within the Kennedy (Subway) PMTSA which has a proposed minimum density target of 200 people and jobs per hectare (PPJ/Ha) across the entire PMTSA and a planned density of 280 PP/Ha. Key sensitive receptors around the EELRT Kennedy Station include the Don Montgomery Community Recreation Centre to the south, and residential townhomes to the east. Currently, a 25-storey residential building containing 205 dwelling units including 58 affordable units at 30 Gilder Dr and a 11-storey midrise mixed-use condominium with 101 residential units are to be constructed within the Kennedy PMTSA. TTC is also undertaking station modernization, pavement rehabilitation, and/or bridge and tunnel repairs that was set to begin in 2023.

Similarly, the lands around the EELRT Eglinton GO stop will form the Eglinton GO PMTSA which has a proposed minimum density target of 150 PPJ/Ha across the entire PMTSA and a planned density of 241 PPJ/Ha. Parcels directly fronting onto Eglinton Avenue East will be required to provide a minimum density of 1.5 to 3.0. A new 44 storey mixed-use condominium has been approved at 2941 Eglinton Avenue East beside the Eglinton GO station with 555 residential units and this development is currently in pre-construction. Together, this anticipated development activity will lead to an increase in pedestrian activity along the corridor, necessitating wider sidewalks, dedicated infrastructure for active transportation and the creation of high quality public spaces. This need will be particularly acute within proximity to and providing access to proposed EELRT stops. Moreover, the increased density is likely to drive a greater demand for community amenities, social support services, parks, and schools.

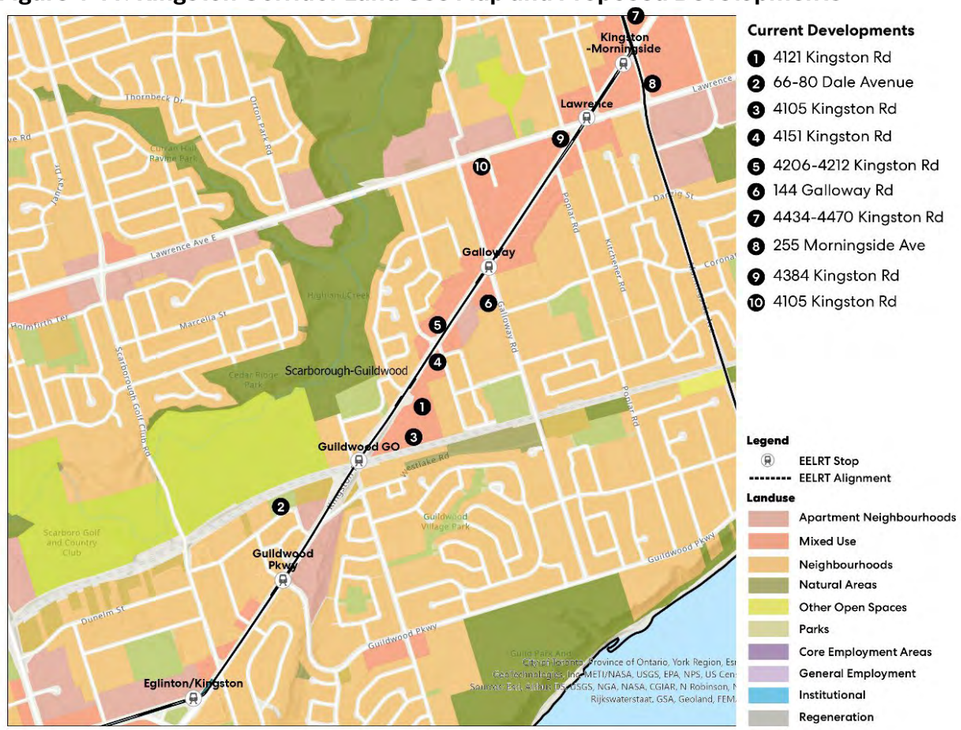
4.3.2 Kingston Corridor

Kingston Road is a major arterial in Toronto that serves both local and regional traffic. This study area segment extends from Eglinton Avenue East in the southwest to the Kingston-Lawrence-Morningside (KLM) intersection to the northeast. Due to the diagonal nature of this road parallel to the present-day shoreline of Lake Ontario, it forms the terminus of many east-west streets and results in complex geometries at major intersections. This 3.6 km-long segment cuts through neighborhoods such as Guildwood, West Hill, and Golfdale-Cedarbrae-Woburn and would coincide with multiple future EELRT stops, including Eglinton/Kingston, Guildwood Parkway, Guildwood GO, Galloway, Lawrence, and Kingston-Morningside.

4.3.2.1 Existing Land Use and Built Form Patterns

The lands with direct frontages to Kingston Road within the Kingston segment have an overall mixed-use context and are designated as combination of Mixed-Use Areas, Neighbourhoods, and Apartment Neighbourhoods. Uses on these lands include residential neighborhoods and apartments, gas stations, auto shops and car dealerships, storage facilities, places of worship, restaurants, and strip malls with a range of office, commercial, and retail uses. As a designated Avenue by the City of Toronto, Kingston Road will potentially undergo re-urbanization with new housing and job opportunities. Currently, there are 7 active development proposals in the Kingston Segment at different stages of development – most of them residential.

Figure 4-11: Kingston Corridor Land Use Map and Proposed Developments



Source: City of Toronto

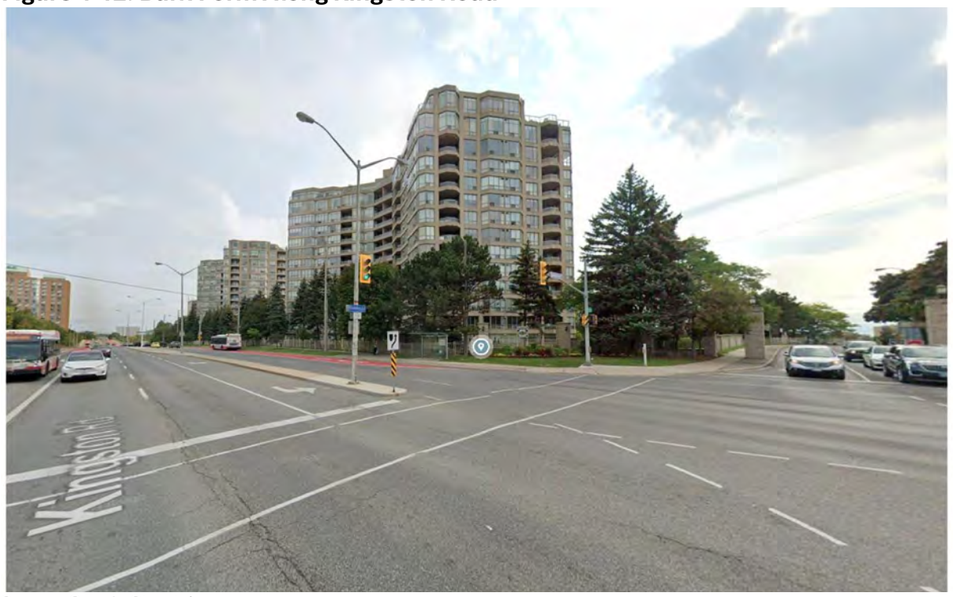
As a designated Avenue by the City of Toronto, Kingston Road will potentially undergo re-urbanization with new housing and job opportunities. Currently, there are 10 active development proposals in the Kingston Segment at different stages of development – most of them residential. Towards the east end of the Kingston segment and in the vicinity of the KLM intersection, there are existing higher density apartment neighborhoods and key local shopping mall destinations, Kingston Square and Morningside Crossing.

The average right-of-way (ROW) along Kingston Road is 36 m wide with 3 lanes of traffic in each direction, including priority bus lanes (RapidTO) along the curb lane which can also be used by cyclists. There are 3 m sidewalks on both sides of the street and buffers and boulevard setbacks vary throughout. Mature tree canopies are found within private properties with the foliage extending into the existing public realm.

The section of Kingston Road from Eglinton Avenue to Guildwood Parkway has a mix of rowhouses, strip malls, and single use buildings on the north and south sides of the street. The section between Guildwood Parkway and Galloway Road predominantly consists of high-rise apartment buildings and green natural areas on both sides of the street, towards the west end. Towards the east, Guildwood GO station, auto shops, and row houses are on the south side of the street, and on the north side of the street, there are row houses, townhouses, auto shops, and commercial establishments within strip malls and single use buildings.

The section between Galloway Road and Morningside Avenue consists of taller apartment buildings, a rowhouse development complex with a private road adjacent to Kingston Road, and various commercial single use buildings and strip malls in the south. Kingston Square occupies the block between Lawrence Avenue and Morningside Avenue. On the north side, there are rowhouses with access to Kingston Road, auto shops, strip malls containing multiple uses, a car dealership, bank, gas station, and mid- to high-rise apartment buildings across from Kingston Square.

Figure 4-12: Built Form Along Kingston Road



Source: Google Streetview

Generally, Kingston Road east of the Guildwood GO station lacks street trees and a has a minimal public realm. The streetscape along Kingston Road in this segment is predominantly characterized by deeper setbacks used for parking lots that support the existing strip malls or serve as buffers to adjacent residential neighbourhoods.

Today, the rail corridor and Kingston Road bridge are barriers that restrict pedestrian and cyclist movement across Kingston Road from Livingston Road North to Celeste Drive.

4.3.2.2 Demographic & Economic Profile of Study Area Residents

The Kingston segment has a total population of 65,640 which constitutes 2.4 % of the population of Toronto and a population density of 14,043 residents per square km, which is more than triple the city-wide average of 4,428 people per square km.

The neighborhoods on the southern side of Kingston Road have a higher median income compared to the city-wide average of $84,000, highlighting a disparity in income levels within the Scarborough-Guildwood Ward. Conversely, the neighborhoods to the north of Kingston Road have significantly lower median incomes, underscoring income inequality along this segment. Overall, low-income population (16%) is higher in neighbourhoods along Kingston Road when compared to the City-wide average of 13.2 %.

The visible minority population is lower in the higher-income neighborhoods located south of Kingston Road, while it is higher in the lower-income neighborhoods to the north. This illustrates a demographic contrast in terms of visible minority populations across the income-diverse neighborhoods along Kingston Road.

4.3.2.3 Future Changes

Guildwood GO station provides national and regional transit service to the community and includes the Lakeshore East GO rail line and the VIA Rail line and the station area is a key receptor for density along the segment. The lands around the EELRT stops (Guildwood Parkway, Guildwood GO and Galloway) and the existing GO station will form the Guildwood GO PMTSA, which will significantly transform the area as the City plans to raise the density from 41 PPJ/Ha to a proposed minimum density target of 150 PPJ/Ha and planned density of 241 PPJ/Ha. Awaiting ministerial approval, parcels directly fronting onto Kingston Road will be required to provide a minimum density of 0.5 to 3.5, with the highest densities directly adjacent to the Guildwood GO station. Such changes in land use are already seen in planned developments such as 200 Poplar Road where an existing school site is being reimagined as a cluster of townhomes.

Recently the station area around Guildwood GO underwent improvements that included replacing and expanding the existing Guildwood GO station buildings, replacing the existing tunnel under the tracks with a new and larger tunnel, providing for additional bicycle parking, improving passenger pick-up areas, adding new canopies on the waiting platforms and constructing a utility building on the site. These changes to the station area demand improved last mile connectivity that provides easy access from the stations to neighbourhoods to the north and south. With close access to the Ravine and other green

spaces, the segment also presents multiple opportunities to connect to nature through the neighbourhoods, offering opportunities to implement a wide public realm with dedicated active transportation.

4.3.3 Morningside Corridor

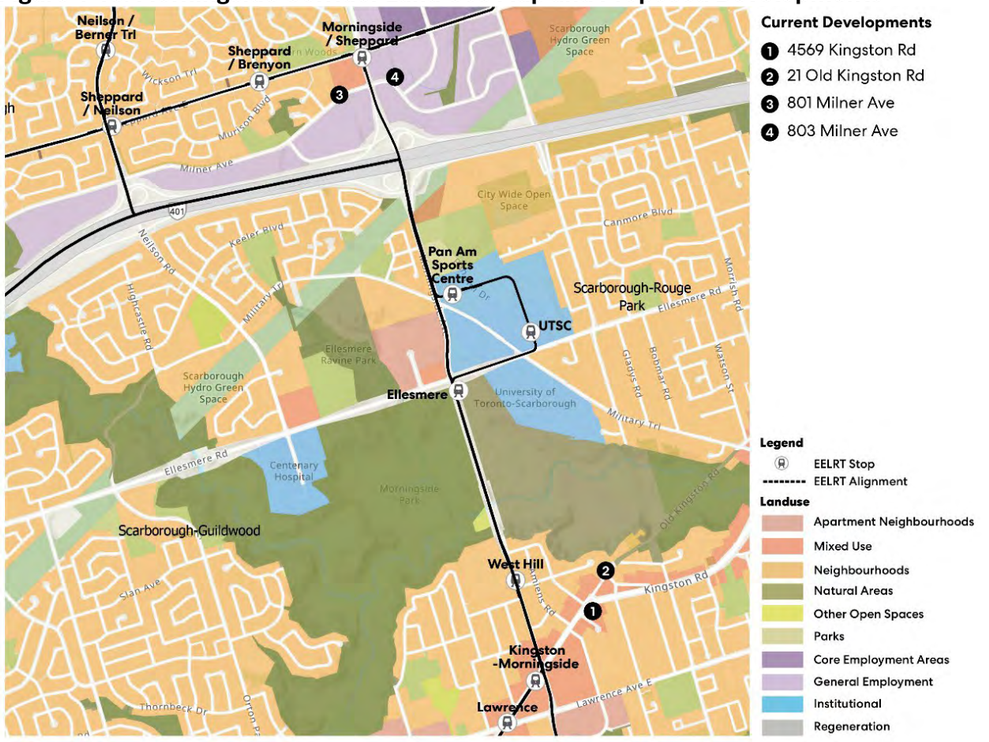
The Morningside corridor spans from the Kingston-Morningside-Lawrence (KLM) intersection to Sheppard Avenue along Morningside Avenue, encompassing several diverse neighborhoods such as West Hill, Morningside, Highland Creek, Morningside Heights, and Malvern East. This segment excludes the portion of Morningside between Ellesmere and Military Trail where the study area corridor diverts into and around the University of Toronto Scarborough Campus and Pan Am Sports Centre. This stretch measures 3.6 km in length and would coincide with the West Hill and Ellesmere EELRT stops. A significant portion of the corridor cuts through the Environmentally Significant Highland Creek Area on the south side and is intersected by the ON Highway 401 Express in the north.

4.3.3.1 Existing Land Use and Built Form Patterns

The lands with direct frontages to Morningside Avenue within the Morningside segment are designated as a combination of Neighbourhoods, Apartment Neighbourhoods, Mixed-Use Areas, Natural Areas, Institutional Areas, and General Employment Areas with the predominant ones being Neighbourhoods and Natural Areas. The intersection of Morningside Avenue and Kingston Road is intended to be a Mixed-Use node.

The uses of these lands include residential neighbourhoods and apartments, schools, gas stations, a sports center, supermarkets, and a range of office, commercial, and retail uses in strip malls and shopping plazas. Currently, there is little development activity along this corridor since most of the area around is designated Environmentally Sensitive Area (ESA) that require special protection to preserve their environmentally significant qualities. The only developments are closer to KLM Intersection, which is a fast-growing centre and closer to the highway.

Figure 4-13: Morningside Corridor Land Use Map and Proposed Developments



Source: City of Toronto

Between Kingston Road and Ellesmere Road, which includes the stretch through Morningside Park, the corridor has an average right-of-way width of 26 m. This includes 1 lane for general purpose traffic in each direction and priority bus lanes along the curbs that cyclists can also use. Painted bike lanes are located only along a short segment spanning the length of the Morningside bridge over Highland Creek. Sidewalks are typically narrow at 1.5 m, provided on both sides of the street, and generally setback from the curb through landscaped boulevards for the majority of Morningside Avenue. Access to the Upper Highland Creek Trail and Morningside Park is available from the west side of Morningside Avenue, situated between Ellesmere Road and Highland Creek.

North of Ellesmere Road to Sheppard Avenue East, the Morningside Road right-of-way is 36 m wide with two lanes in each direction and an existing narrow 1.5 m wide sidewalk on both sides of the street, except between Pan Am Drive and Cinemark Drive. In this area, the sidewalk on the east side gradually disappears as it approaches Highway 401. A wide landscaped boulevard of widths ranging from 3.5 m – 7.5 m is also part of the boulevard and has some new tree planting. This portion of Morningside Avenue is within a close proximity to the Hydro Corridor and plays a crucial role in establishing connections to the future Meadoway project along the Hydro Corridor.

The section of the Morningside segment from Kingston Avenue to Highland Creek has a mix of building typologies, including mid to high-rise apartment buildings, a school, and a mixed-use strip mall at the intersection of Morningside Avenue and Kingston Road. Further north of this intersection, semi-detached and single-family homes line both sides of the street, and West Hill Collegiate Institute is located just south of Highland Creek. North of Highland Creek to Ellesmere Road, the Highland Creek Ravine natural areas flank both sides of Morningside Avenue.

Buildings between Ellesmere Road and Highway 401 have an institutional character to the east where the UTSC and Pan Am Sports Centre are located, and a mixed character to the west with gas stations, high-rise apartment buildings, row houses, and semi-detached homes back lotted onto Morningside Avenue. North of Highway 401, an industrial and office complex is located on the west side of Morningside Avenue, and shopping plazas of big box stores, restaurants, supermarkets, and other commercial and retail establishments.

4.3.3.2 Demographic & Economic Profile of Study Area Residents

The Morningside segment is home to a total population of 109,885, which accounts for approximately 3.9 % of Toronto's overall population. The population density in this area is notably high, with 11,262 residents per square km, which is three times the city-wide average of 4,428 people per square km.

In terms of economic indicators, the median income in the Morningside segment is in line with the city-wide average, standing at $84,000. Additionally, the communities within this segment have a 14% of their population living below the low-income line, which is comparable to the city-wide average of 13%.

The neighborhoods along Morningside Avenue are known for their cultural diversity, particularly in the northern portion near Sheppard Avenue, where there is a higher concentration of visible minority populations.

4.3.3.3 Future Changes

North of the future new Military Trail, the segment of Morningside Avenue will be subject to potential changes in land use and frontage conditions, aligning with the University of Toronto Campus Master Plan's vision for the North Campus expansion. The anticipated rise in institutional uses, such as academic buildings and student residences, will necessitate the establishment of a safe and high quality public realm with wide sidewalks, dedicated active transportation infrastructure and a wide landscape strip with continuous tree canopy.

The planned Durham – Scarborough BRT runs east-west intersecting Morningside Avenue at Ellesmere Road. Coordination of intersection design and public realm will be required at these intersections.

The employment land situated north of Highway 401 currently houses big box stores and storage units, surrounded by vast parking lots. These parking areas offer prospects for future mixed-use developments and infill projects. Additionally, this area provides multiple opportunities for connectivity to the Hydro Corridor and Rouge Valley, with the potential alignment of public realm improvements outlined in the Meadoway initiative.

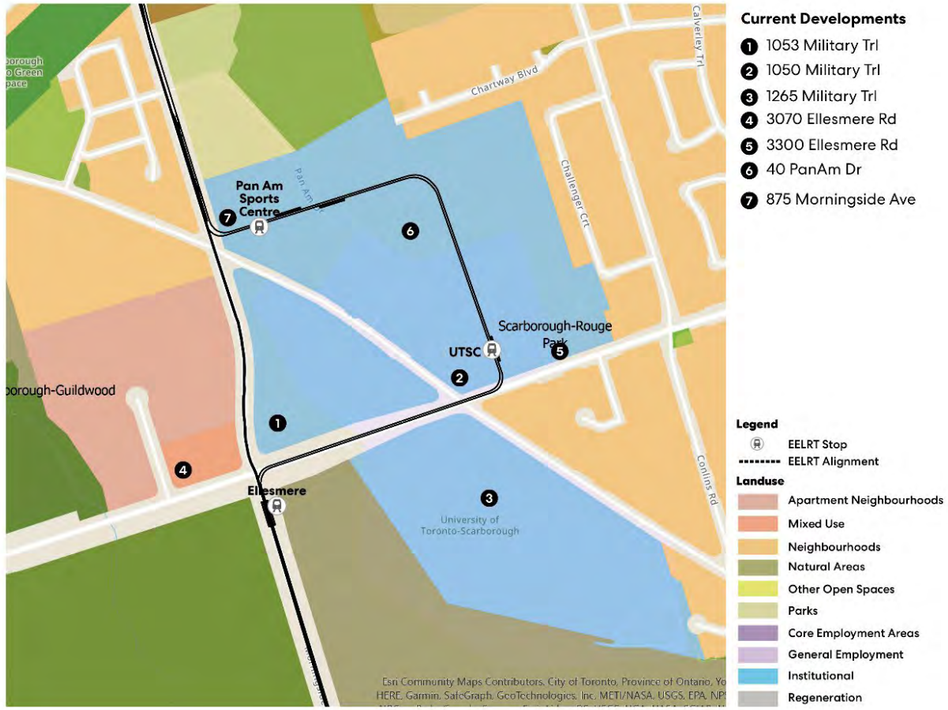
4.3.4 University of Toronto Scarborough Campus (UTSC) Area

The University of Toronto Scarborough Campus (UTSC) segment is between Ellesmere Road and Military Trail, just east of Morningside Avenue. This segment is 1.6 km long and coincides with the proposed EELRT UTSC and Pan Am Sports Centre stops. Through coordination with UTSC, the proposed EELRT design will utilize the future realigned New Military Trail established through the University's Master Plan and Draft Secondary Plan to serve both the north and south campuses.

4.3.4.1 Existing Land Use and Built Form Patterns

The lands with direct frontages to Military Trail within this segment are designated as Institutional Areas, Natural Areas and Neighbourhoods and are shown in Figure 4-14. The institutional uses on these lands are made up of educational and ancillary uses provided by the University of Toronto Scarborough and Centennial College. The Toronto Pan Am Sports Centre is a community institution which serves the nearby neighborhoods. East of the University campus extend residential neighbourhoods. The lands designated as Natural Areas in this segment represent the Highland Creek Ravine and Morningside Park. In the UTSC segment at the intersection of Ellesmere and Morningside Avenue, there is currently one development proposal at 1053 Military Trail.

Figure 4-14: UTSC Land Use Map and Proposed Developments



Source: City of Toronto

At present, the planned New Military Trail does not exist beyond a driveway extending north of Ellesmere Road, flanked to the west by the UTSC Students Residence completed in September 2023. On the north side of Ellesmere Road, there are academic buildings which include Centennial College and the UTSC Environmental Science and Chemistry Building. On the south side of Ellesmere Road, there are natural areas as well as student residences lining the valley and south campus. The UTSC Master Plan envisions a mixed-use node at the intersection of New Military Trail and Ellesmere Road with academic, residential, recreational buildings extending from the node northwards.

4.3.4.2 Demographic & Economic Profile of Study Area Residents

This segment is home to 20,386 residents which constitutes 1.1 % of the City population but this does not include the transient population that commutes to area for work and study. This segment has a median household income level of $103,000, which is higher than the city average of $84,000 and has a lower low-income population (12%) than the city-wide average of 13 %. The neighborhoods along the UTSC segment are also vastly diverse, where up to 80% of the population living in private households are members of a visible minority population.

4.3.4.3 Future Changes

Future changes in UTSC are primarily shaped by the University of Toronto Scarborough Campus Master Plan that was created in 2011 and elaborated on the Public Realm through the Landscape and Public Realm Plan from 2022. The Campus Master Plan details how the campus will grow to support the academic mission of the University while contributing to build a thriving community around it. The master plan focuses on maximizing the use of existing facilities, facilitating a vibrant campus life, maximizing transportation options through the integration of Eglinton East LRT, Durham-Scarborough BRT, supporting pedestrians and cyclists, improving the south campus, and growing the north campus.

New developments along will increase urban activity in this area. New Military Trail offers opportunities for planned developments along the street to maintain a consistent street wall with generous setback supporting a vibrant campus life. Additionally, it provides chances to establish a secure public space seamlessly integrated with transit facilities.

Figure 4-15: Artistic Rendering Showing UTSC Master Plan

Source: UTSC Master Plan

4.3.5 Sheppard East Corridor

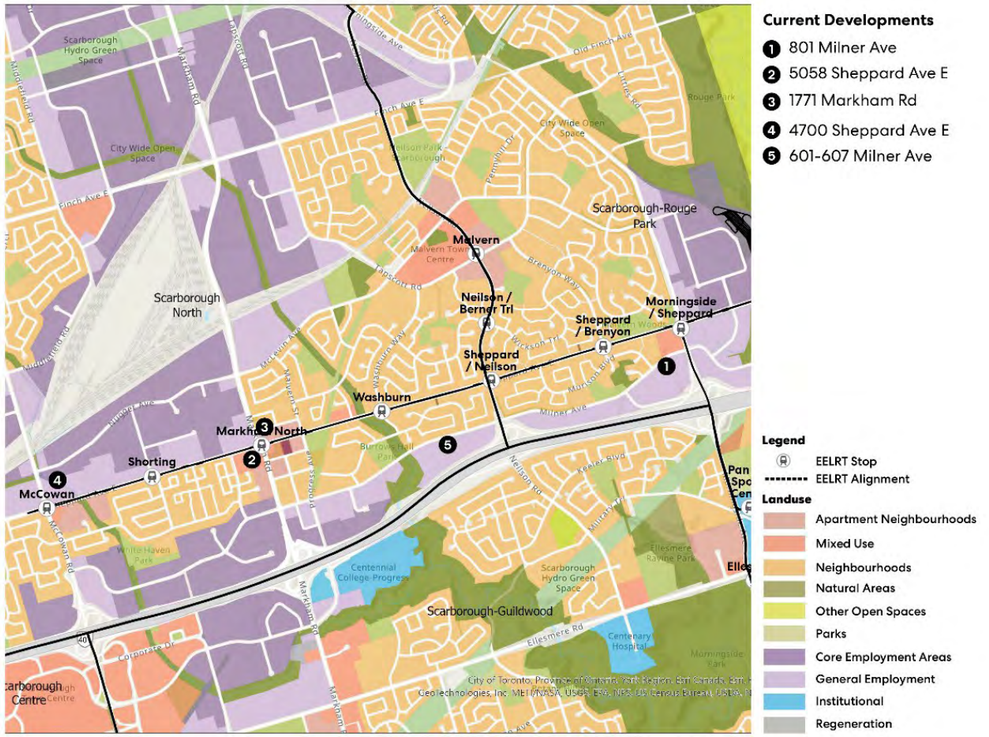
The Sheppard segment is between Morningside Avenue and McCowan Road along Sheppard Avenue, and touches upon several neighbourhoods, including Morningside Heights, Malvern East, Highland Creek, Malvern West, and Agincourt South-Malvern West. This segment is 5 km long and would contain the Sheppard/Brenyon, Sheppard/Neilson, Washburn, Markham North, Shorting, and Sheppard-McCowan EELRT stations. Sheppard-McCowan is the terminal station and the parcel northeast of McCowan Station is home to the future Line 2 terminus and bus terminal.

Two spur lines also emerge from this segment: Conlins Maintenance and Storage Facility (MSF) and Malvern Extension. The Conlins MSF site is on a wedge of land extending from Rouge Valley in the north and Sheppard Avenue in the south, Thornmount Drive in the west and Conlins Road to the east.

4.3.5.1 Existing Land Use and Built Form Patterns

The lands with direct frontages to the Sheppard Avenue in this segment are predominantly designated as Neighbourhoods, with Employment lands on the north side of Sheppard Avenue between Markham Road and McCowan Road, as well as some localized areas with Mixed-Use or Apartment Neighbourhood designation.

Figure 4-16: Sheppard Corridor Land Use Map and Proposed Developments



Source: City of Toronto

This corridor is characterized by residential uses, places of worship, strip malls and shopping plazas with a various commercial, retail, and medical office uses, gas station, auto shops and car dealerships, TTC garage, a storage facility, a research facility, and industrial warehouses. Currently, there are 5 development proposals in the Sheppard segment at different stages of development shown in Figure 4-16.

The Conlins MSF is primarily industrial, with residential neighborhoods located farther east. To the west, lies the Transportation Services Winter Maintenance Depot. The Rouge Valley, an Environmentally Significant Area within the Ontario Greenbelt, is situated north of MSF site. Moreover, a tributary of the Rouge River flows through the site from north to south until it is entirely buried underground just south of Sheppard Avenue. Given its sensitivity, this area demands extra protection to preserve its distinctive environmental features. The right-of-way along the entire stretch of Sheppard Avenue measures approximately 36.6 m in width. It accommodates two lanes of traffic in each direction, with a narrow 1.5 m wide existing sidewalk on both sides of the street. A 7 m-wide landscape buffer separates the roadway and sidewalk intermittently and features a combination of new and mature trees in some locations.

The section of Sheppard Avenue from McCowan Road to Markham Road is primarily characterized by Employment Areas on the north side and host various businesses, including automotive facilities, medical centres, large storage units, warehouses, restaurants, and gas stations. Additionally, the Toronto Transit Commission's Malvern Garage is situated on the northwest side of Sheppard Avenue and Markham Road. The presence of these employment areas with substantial parking lots provides an opportunity to create a generous public realm, complete with wide sidewalks, dedicated cycle tracks, and a continuous tree canopy. On the south side of this segment, single-family homes with backyard fences line the street.

Figure 4-17: Sheppard Avenue, Looking West from Massie Street, Showing Employment Areas to the North

Source: Google Streetview

Moving from Markham Road to Morningside Avenue, Sheppard Avenue transitions into a residential area, with backlotted homes. In this section, there are challenges related to public realm safety due to poor lighting, limited "eyes on the street," and constrained accessibility due to continued fences.

Throughout the Sheppard segment, there are mature trees within the public right-of-way (ROW) and within residential backyards, which must be preserved and protected, especially along Malvern Woods where healthy mature trees line the north side of the street.

4.3.5.2 Demographic & Economic Profile of Study Area Residents

The Sheppard segment has a total population of 85,277 which is 3.1 % of the population of Toronto and a population density of 6,856 people per square km which is higher than the City-wide average of 4,428 people per square km. The median income along this segment is under $73,500 which is lower than the City-wide average of $84,000.

The neighborhoods along Sheppard segment have a higher prevalence of low-income households (15%) when compared to the city average of 13%. The neighborhoods along the Sheppard segment are also vastly diverse, where approximately 80% of the population living in private households are members of a visible minority population.

4.3.5.3 Future Changes

The EELRT reaches the terminus at McCowan Road on Sheppard Avenue and is home to a planned bus terminal with a station building and waiting area.

Figure 4-18: Sheppard-McCowan Station Area Map

Source: Metrolinx

The lands around the Sheppard and McCowan Transit Hub will be contained within the McCowan PMTSA which has a proposed minimum density target of 200 people and jobs per hectare (PPJ/Ha) across the entire PMTSA and a planned density of 211 PP/Ha. These lands around the transit area will potentially see new mixed-use developments. Currently, an 11-storey mixed-use development is proposed close to Brimley Road. Further east, the employment areas with large parking lots they will remain largely stable with opportunities for limited public realm and site landscaping opportunities to improve the Sheppard public realm. Currently there are two proposals; 1771 Markham Road, a 24-storey condominium building and 5131 Sheppard Avenue East, a low to mid-rise multi-housing development with 207 residential units are currently going into construction.

4.3.6 Malvern Extension

The Malvern extension corridor spans from Sheppard Avenue along Neilson Road to Malvern Town Centre, touching upon several neighbourhoods, including Malvern East and Malvern West. This segment is 1.1 km long and would contain EELRT stations such as Neilson/Berner

Trail and Malvern Town Centre. The extension terminates at Malvern Town Centre which is planned to be redeveloped into a mixed-use community consisting of 13 buildings.

4.3.6.1 Existing Land Use and Built Form Patterns

The lands with direct frontages on Neilson Road in this segment are predominantly designated as Neighbourhoods, Mixed-Use, and Apartment Neighbourhoods. The uses on these lands include single family residences, apartments, various commercial and retail uses, government services, gas station, places of worship, and school. Currently, there are 4 development proposals in this extension with the most important one being Malvern Town Centre development.

Figure 4-19: Malvern Extension Land Use Map and Proposed Developments

Source: City of Toronto

The right-of-way along the entire stretch of the Malvern extension measures approximately 36.6 m in width. Currently, it accommodates two lanes of traffic in each direction, with a narrow 1.5-meter-wide existing sidewalk on both sides of the street. Between intersections, there is a 5 m-wide landscape buffer featuring a combination of new and mature trees separating the roadway from the sidewalk.

This segment is lined with residences on either side with fences facing homes whose backyards face the street, similarly, enclosed by fences. In this section, there are challenges related to public realm safety due to poor lighting, limited "eyes on the street," and constrained accessibility due to continued fences.

4.3.6.2 Demographic & Economic Profile of Study Area Residents

The Malvern segment has a total population of 43,467 which 1.56 % of the population of Toronto and a population density of 8,269 people per square km which is almost twice as much as the city average of 4,427.8 people per square km. The median income along this segment is above $84,000 which is the same as the city average of $84,000. The neighborhoods along the Malvern Segment have a higher than prevalence of low-income households (15%) when compared to the city average of 13.2%. The neighborhoods along this segment are also vastly diverse, where approximately 80% of the population living in private households are members of a visible minority population.

4.3.6.3 Future Changes

The extension concludes at Malvern Town Centre mall, a redevelopment site planned to transform into a mixed-use community featuring 13 towers. This transformation will spark significant changes in the surrounding land use, potentially leading to the redevelopment of nearby commercial areas characterized by large parking lots. The balance of this segment is expected to experience limited development activity.

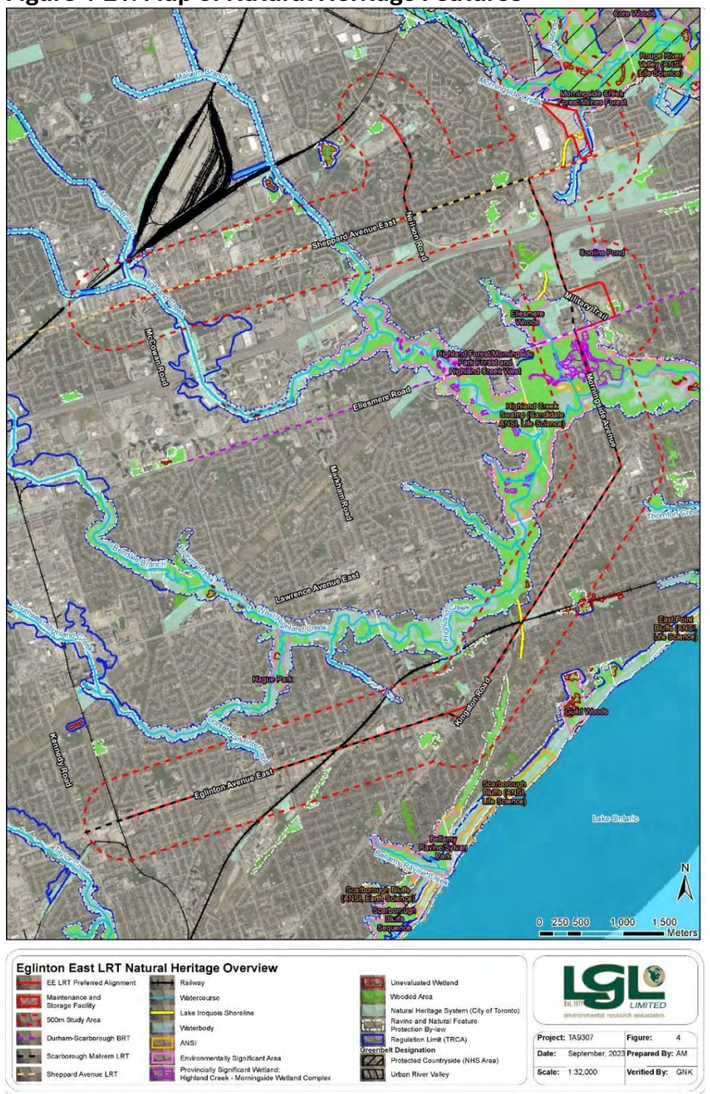
Figure 4-20: Malvern Town Centre Redevelopment Master Plan

Source: City of Toronto Development Application Details for 31 Tapscott Road, 2022

4.4 Natural Environment

The following sections provide a summary of the existing natural environment conditions within the study area. Figure 4-21 maps the natural heritage features within the study area of the project. The Natural Environment Report can be found in **Appendix E**.

Figure 4-21: Map of Natural Heritage Features



Source: Natural Environment Report, Appendix E, 2023

4.4.1 Physiography, Bedrock, and Surficial Geology

The study area lies within two physiographic regions – the South Slope and the Lake Iroquois Plain. The South Slope is a smooth, faintly *drumlinized* clay till plain containing the deeply incised stream valleys of the Credit, Humber, Don, and Rouge rivers. Elevations range from about 280 metres above sea level (mASL) where the South Slope intersects the Oak Ridges Moraine to about 80 mASL near the Lake Ontario shoreline. The Iroquois Lake Plain represents the near-shore area of glacial Lake Iroquois. Wave action on this predecessor to Lake Ontario cut down and smoothed the Halton and older tills and deposited beach sand and lake-bottom silts and clays within 5 km of the present shoreline. The EELRT crosses the shoreline of the Lake Iroquois Plain in several locations.

Bedrock geology comprises the Georgian Bay Formation that is upper Ordivician in age and comprised primarily of shale.

Surficial geology comprises Young Tills, which comprise clayey, silt tills; Lake Iroquois shallow water deposits, which comprise sand, silty sand; Lake Iroquois beach or bar deposits, which comprise gravel, sand; Modern River Deposits, which comprise sand, silt, minor gravel and organic material; and, Peel Ponds shallow water deposits, which comprise sand.

4.4.2 Fish and Fish Habitat

The study area is located within the Highland Creek watershed and the Rouge River watershed. As seen in Figure 4-22, the Main Branch of Highland Creek crosses Morningside Avenue (#4), while the Markham (#1) Branch and Malvern (#2) Branch cross Sheppard Avenue. A Tributary of Morningside Creek, a tributary of the Rouge River, crosses Sheppard Avenue at Collins Road (#3). All watercourses are under the jurisdiction of the Toronto and Region Conservation Authority (TRCA) and the Ministry of Natural Resources and Forestry (MNRF) Aurora District.

The aquatic habitat investigation was completed to document fish habitat conditions at watercourse road crossings within the study area. In addition, a secondary source information review was undertaken to identify the fisheries resources and associated aquatic habitat within the study area. The secondary source review included correspondence with the TRCA regarding fish collection records in the study area watercourses. Fish collected historically in the study area watercourses are summarized in Table 4-12.

Figure 4-22: Study Area Watercourses

Source: Natural Environment Report, Appendix E, 2023

4.4.2.1 Highland Creek

Highland Creek flows in an easterly direction across Morningside Avenue. It travels across Morningside Avenue under a large bridge. The river and valley are wide within the study area. The channel upstream contained a mixed morphology of runs and riffles with a single pool. At the time of investigation, the water was clear, and the substrates were comprised of boulder, cobble, gravel, and sand. No instream vegetation was observed. Riparian vegetation consisted of mixed forest and open areas associated with pathways and a works yard. A concrete weir was located adjacent to the works yard and the southern bank in that area was reinforced with armourstone blocks.

Downstream (east) of Morningside Avenue, large, angular boulders have been placed in the water to create riffles. Substrates were comprised of boulders, cobble, gravel, and sand. Instream cover was provided by boulders and cobbles. A new outfall pipe was present on the southern bank at the bridge and recent work was done on both banks within the downstream area investigated as coconut matting and live stakes were present. Riparian vegetation was similar to upstream.

No formal fish collection was undertaken at this location during the site visit, but many fish were observed. Most were identified as Blacknose Dace (Rhinichthys atratulus) and there were some Common Shiner (Luxilus cornutus), as well. Historic fisheries data provided by the TRCA indicate that nine species have been captured from this watercourse including warmwater baitfish and sportfish and coldwater sportfish.

4.4.2.2 Markham Branch

The Markham Branch of Highland Creek flows in a southeasterly direction across Sheppard Avenue east of the McCowan Road intersection. The watercourse has been completely channelized with concrete both upstream and downstream of the crossing. It travels under Sheppard Avenue through a concrete bridge. Bank vegetation consisted of grasses and scattered shrubs and small trees along the slopes leading up from the channel.

Downstream (south) of Sheppard Avenue, the channel characteristics are similar to upstream; however, there were a few areas of sediment deposits noted.

No formal fish collection was undertaken at this location during the site visit and no fish were observed. Historic fisheries data provided by the TRCA indicate that three species have been captured from this watercourse, warmwater baitfish only.

4.4.2.3 Malvern Branch

The Malvern Branch of Highland Creek flows in a southeasterly direction across Sheppard Avenue east of Markham Road. The watercourse has been completely channelized with gabions both upstream and downstream of the crossing. It travels under Sheppard Avenue through a concrete bridge. The upstream channel is contained within a trapezoidal channel formed by gabions. Substrates are cobble and boulder (rip-rap from gabions) with some silt and detritus overlaying. An outfall pipe exists on the northwest bank that discharges down a steep concrete ramp into the watercourse. Instream cover consisted of boulders/cobbles and sparse submerged vegetation. Bank vegetation consisted of grasses and shrubs.

Downstream (south) of Sheppard Avenue, the channel bends to the southeast along a steep slope enforced by layered gabions. Substrates were similar to upstream, and the channel was reinforced with gabions throughout. It contained some sparse submerged vegetation. Instream cover was provided by boulders/cobbles, overhanging bank vegetation and some large woody debris. Dense shrubs lined the banks up to the base of the gabions. Above the gabions, large trees provided additional shading to the channel.

No formal fish collection was undertaken at this location and no fish were observed. Historic fisheries data provided by the TRCA indicate that four species have been captured from this watercourse, warmwater baitfish only.

4.4.2.4 Tributary of Morningside Creek

The Tributary of Morningside Creek flows in a northeasterly direction across Sheppard Avenue east of Morningside Avenue. This watercourse has been channelized and consisted of a shallow ditch in which either cattails, phragmites or both were densely growing. Substrate was entirely silt. Some submerged vegetation was present within the wingwalls on the upstream end of the culvert under Sheppard Avenue. Instream cover was provided entirely by vegetation growing within the wetted width of the channel.

No formal fish collection was undertaken at this location during the site visit and no fish were observed. No historic fisheries data were available from the TRCA from this watercourse.

4.4.2.5 Fish Species

Table 4- indicates the fish species collected historically in the study area watercourses. None of the species identified are designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or by Ontario Ministry of Natural Resources (MNR). No legal status is associated with any of the species.

Table 4-12: Fish Collected Historically in the Study Area Watercourses

			Watercourse			
Scientific Name	**Common Name**	**Provincial**	**Highland Creek-Main Branch**	**Highland Creek – Markham Branch**	**Highland Creek – Malvern Branch**	**Tributary of Morningside Creek**
Salmo trutta	Brown Trout	Exotic (SE)	X	-	-	-
Semotilus atromaculatus	Creek Chub	Very Common (S5)	X	-	X	-
Rhinichthys atratulus	Blacknose Dace	Very Common (S5)	X	X	X	-
Rhinichthys cataractae	Longnose Dace	Very Common (S5)	X	X	X	-
Luxilus cornutus	Common Shiner	Very Common (S5)	X	-	-	-
Pimephales notatus	Bluntnose Minnow	Very Common (S5)	X	-	-	-
Catostomus commersoni	White Sucker	Very Common (S5)	-	X	-	-
Noturus flavus	Stonecat	Common (S4)	X	-	X	-
Ambloplites rupestris	Rock Bass	Very Common (S5)	X	-	-	-
Etheostoma nigrum	Johnny Darter	Very Common (S5)	X	-	-	-
Etheostoma caeruleum	Rainbow Darter	Common (S4)	X	-	-	-

4.4.2.6 Species at Risk

All aquatic 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). According to the Natural Heritage Information Centre (NHIC) database, no aquatic species at risk have been found within or adjacent to the study area.

4.4.3 Vegetation and Vegetation Communities

The geographical extent, composition, structure, and function of vegetation communities were identified through air photo interpretation and field investigations. Air photos were interpreted to determine the limits and characteristics of vegetation communities. Field investigations of natural/semi-natural vegetation were conducted within the study area to ground truth the boundaries of vegetation communities and to conduct a botanical survey.

Vegetation communities were classified according to the Ecological Land Classification for Southern Ontario: First Approximation and Its Application (Lee et al. 1998). The community was sampled using a plotless method for the purpose of determining general composition and structure of the vegetation. Plant species status was reviewed for Ontario (Oldham 1999), Toronto and Region Conservation Authority (TRCA 2003a), City of Toronto (City of Toronto 2003), and Regional Municipality of Toronto (Varga et al. 2000).

Most of the vegetation within the study area is the result of human disturbance being influenced by hydro corridors, rail corridors and residential, commercial, and industrial land uses. The natural vegetation communities that are present are fragmented and essentially isolated by these surrounding land uses. A total of eleven Ecological Land Classification (ELC) community types have been identified within the corridors associated with Eglinton Avenue, Kingston Road, Morningside Avenue north of Ellesmere Road, Sheppard Avenue and Neilson Road. The vegetation communities along these sections include mixed forest, deciduous forest, cultural communities, and wetland communities. More specifically, the vegetation community ecosites are:

- Terrestrial-Natural/Semi-Natural
  - Mixed Forest (FOM)
  - Deciduous Forest (FOD)

- Terrestrial / Cultural
  - Cultural Meadow (CUM)
  - Cultural Thicket (CUT)
  - Cultural Woodland (CUW)
  - Cultural Savannah (CUS)
  - Cultural Plantation (CUP)

- Wetland
  - Coniferous Swamp (SWC)
  - Mixed Swamp (SWM)
  - Thicket Swamp (SWT)
  - Meadow Marsh (MAM)
  - Shallow Marsh (MAS)

Notwithstanding the high diversity of vegetation communities found within the total study area, the individual route segments do not exhibit these same characteristics. Along Eglinton Avenue, for example, there is only one area (Bellamy Road at the CN crossing) where vegetative cover is present. On the south side of Eglinton Avenue, a small cultural meadow (CUM1-1) and an alder thicket swamp (SWT2-1) are present, while on the north side, adjacent to and east of the CN rail line, a small (< .07 ha.) cultural woodlot (CUW1) and cultural meadow (CUM1-1) characterize the vegetative cover.

A comparable situation exists for Kingston Road. The lands adjacent to the Kingston Road overpass near the Guildwood GO train station are the only areas where natural cover is found. Cultural meadows and cultural woodlots are present on both sides of Kingston Road. The CUM1-1 parcels range in size between 0.35 and 1.0 ha., while the CUW1 ecosites are between 0.16 and 0.25 ha.

On Morningside Avenue between Kingston Road and Ellesmere Road there is a notable change in both the type and size of vegetation communities that are present as the alignment passes over the Highland Creek Valley which is part of the Morningside Park Environmentally Sensitive Area (ESA) and through the Highland Forest ESA.

North of Ellesmere Road to Sheppard Avenue the vegetative communities present are again typical of those found in an urban landscape. Cultural meadows (CUM1-1), cultural woodlots (CUW1) and cultural thickets (CUT1) are the main ecosite types occurring along this section. Two communities, a white cedar mixed forest (FOM4) and a cattail mineral shallow marsh (MAS2-1), were found in the northwest quadrant of the Morningside/Highway 401 interchange, however both are outside the zone of influence for this project.

The vegetation communities that were identified are considered widespread and common in Ontario, the TRCA watershed (TRCA 2003b) and are secure globally. A more detailed account of the vegetation communities as well as their locations within the study area is presented visually through mapping in **Appendix E**.

4.4.3.1 Morningside ESA / ANSI

In terms of Environmentally Sensitive Areas and Areas of Natural and Scientific Interest, the Morningside Park ESA is connected to the Highland Forest ESA and together, they form the largest remaining forested area within the Highland Creek watershed. The Highland Forest ESA also encompasses the Highland Creek Swamp, an extensive area of approximately 16.4 hectares that extends on both sides of Morningside Avenue.

The portion of the study through the Morningside Park ESA/ANSI largely supports high quality forest and wetland communities. Small portions of cultural vegetation habitat were identified adjacent to the Morningside Avenue right-of-way. A total of 18 vegetation communities were identified within this portion of the study area including Dry-Moist Old Field Meadow (CUM1-1), Mineral Cultural Woodland (CUW1), Mineral Cultural Thicket (CUT1 and CUT1-1), Deciduous Forest (FOD3-1, FOD4, FOD5-3, FOD7, FOD8-1), Mixed Forest (FOM2, FOM2-2, FOM7-2), Meadow Marsh (MAM2-2), Shallow Marsh (MAS2-1), Coniferous Swamp (SWC1-2, SWC3), Mixed Swamp (SWM5-1), and Swamp Thicket (SWT3-2). A more detailed account of the vegetation communities found within the Morningside forest and wetland complex is presented in **Appendix E**.

In addition to being part of the Morningside Park ESA, the wetlands in this portion of the study area are a component of the Highland Creek-Morningside Provincially Significant Wetland. In general, these communities support high quality swamp habitat largely dominated by eastern white cedar (Thuja occidentalis). Several Mineral Shallow Marsh (MAS2-1) communities were identified along the Morningside Avenue right-of-way. Evidence of disturbance was observed in the marsh communities including a higher proportion of non-native plant species which is likely as a result of being adjacent to the roadway.

As noted above, several mixed forest and deciduous forest communities were identified within the Morningside ESA portion of the study area. In general, these forest communities are considered to be of higher quality habitat, however, edge habitat was observed in the portions of the communities adjacent to the roadways.

Overall, vegetation communities within the Morningside Park ESA support high quality habitat and a large number of native and specialized plant species. Four of the vegetation communities identified within the Morningside Park ESA lands are considered locally rare by TRCA including Willow Organic Thicket Swamp (SWT3- 2), Red Maple-Conifer Organic Mixed Swamp (SWM5-1), White Cedar Organic Coniferous Swamp (SWC3), and White Cedar-Conifer Mineral Coniferous Swamp (SWC1-2). All of the communities identified within the Morningside Park ESA are listed and described in **Appendix E**.

4.4.3.2 Species at Risk

One plant species listed under the Ontario Endangered Species Act was identified within the study area. Black ash (Fraxinus nigra) was found within several of the wetland communities within the Morningside Park ESA and is presently listed as 'Endangered' under the ESA; however, the Minister of MECP placed a two-year temporary pause on the protection of black ash. As of January 2024, the temporary pause will be lifted, and black ash will receive protection under the ESA. The species protection will include all healthy black ash trees that measure 8 cm diameter at breast height and a 30 m habitat protection zone.

In terms of regionally and locally rare plant species, fifteen plant species considered to be TRCA species of concern (L1 to L3) were identified within the study area. Of those 15, 11 plant species are considered rare in the City of Toronto. The majority of rare plant species identified within the study area are located in the vegetation communities associated with the Morningside Park ESA.

4.4.4 Wildlife and Wildlife Habitat

Existing wildlife and wildlife habitat in the study area is described in this section from both background sources and field investigations. The land uses consist of predominantly urban / anthropogenic, with meadow, thicket, wetland, and forest (interior, edge…). The databases were reviewed to determine these constraints include the following:

- Natural Heritage Information Centre (NHIC),
- Ontario Breeding Bird Atlas (OBBA), and
- Marsh Monitoring Program (2000).

Wildlife habitat within the study area is relatively diverse but consists largely of anthropogenic influenced areas including manicured lands, hedgerows, and cultural communities. Aquatic features include three watercourses: Highland Creek, Tributary of Highland Creek, and Malvern Branch of Highland Creek, along with the wetland communities associated with the Highland Creek/Morningside Park Wetland Complex Provincially Significant Wetland (PSW). These valley lands, in addition to the PSW, comprise the highest quality natural heritage features in the study area, provide important movement corridors for wildlife, and support a moderate diversity of wildlife species.

Due to the diversity of habitats and the connectivity of those habitats to one another and the regional landscape, it is likely that the entire study area is used by a wide variety of wildlife for all or parts of their life cycles. Based on the types of habitats present, species which occupy meadow, wetlands, forests (edge habitat), and open country/anthropogenic communities are expected to be found within the study area. Generally, wildlife species inhabiting these lands within the study area would be considered urban or tolerant of anthropogenic features and disturbance.

Based on field observations, 41 species of wildlife (35 birds and six mammals) could be verified in the study area and the majority of these recordings came from identification (through calls and sightings) of bird species with more modest numbers of other fauna identified. Mammals such as the Grey Squirrel (*Sciurus carolinensis*) and Eastern Cottontail (*Sylvilagus floridanus*) were observed in residential and natural areas while Red Squirrel

(*Tamiasciurus hudsonicus*) and Eastern Chipmunk (*Tamias striatus*) were recorded in the more naturalized habitat associated with Morningside Park. A Northern Racoon (Procyon lotor) and Striped Skunk (*Mephitis mephitis*) were also noted in field investigations.

4.4.4.1 Species at Risk

Of the 35 bird species recorded through field investigations, 26 are afforded protection under the *Migratory Birds Convention Act* (MBCA). Two bird species, Blue Jay (*Cyanocitta cristata*) and Red-tailed Hawk (*Buteo jamaicensis*) are protected under the *Fish and Wildlife Conservation Act* (FWCA). All six mammal species are also afforded protection under the FWCA.

Two wildlife species recorded within the study area through field investigations are regulated under the Ontario *Endangered Species Act, 2007* (ESA) or the federal *Species at Risk Act* (SARA), including Chimney Swift (*Chaetura pelagica*) and Barn Swallow (*Hirundo rustica*).

A supplemental screening of the study area was undertaken on the NHIC database (MNRF 2023) to determine if species at risk have been previously recorded in the general vicinity. An additional 13 species are listed as present or have the potential to be present within the study area. These include: Bank Swallow (Riparia riparia), Blanding's Turtle (*Emydoidea blandingii*), Bobolink (*Dolichonyx oryzivorus*), Eastern Meadowlark (Sturnella magna), Eastern Milksnake (*Lampropeltis triangulum*), Eastern Wood-pewee (*Contopus virens*), Midland Painted Turtle (*Chrysemys picta marginata*), Peregrine Falcon (*Falco peregrinus*), Queensnake (*Regina septemvittata*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Rusty-patched Bumble Bee (*Bombus affinis*), Wood Thrush (*Hylocichla mustelina*), and Yellow-banded Bumble Bee (*Bombus terricola*).

4.4.5 Designated Natural Areas

Figure 4- indicates the location of Areas of Natural and Scientific Interest (ANSI), Environmentally Significant Areas (ESA), Provincially Significant Wetlands and other natural heritage systems. Designated natural areas include those that have been identified for protection by the MNRF, TRCA, and the City of Toronto.

The Highland Creek Swamp is a candidate Life Science ANSI associated with the Highland Forest/Morningside Park Forest ESA. The Rouge River Valley Life Science ANSI is located along Morningside Creek and the Rouge River immediately north of the maintenance and storage facility.

There is one provincially significant wetland found in the study area – the Highland Creek – Morningside Wetland Complex.

There are several ESAs found within the study area including: Morningside Creek Forest/Milnes Forest located along Morningside Creek immediately north of the maintenance and storage facility and Highland Forest/Morningside Park Forest/Highland Creek West, located at the Highland Creek Main Branch crossing of Morningside Avenue.

The City of Toronto Official Plan identifies components of the Natural Heritage System associated with the four watercourse crossings, as well as several isolated vegetation communities and the hydro corridor.

Shorelines and watercourses (Ontario Regulation 166/06), valleylands and wetlands associated with Highland Creek, Morningside Creek and their tributaries are regulated areas under Ontario Regulation 166/06, Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. TRCA permits will be required at the detailed design stage under Section 28.1 of the Conservation Authorities Act.

4.4.6 Geotechnical Conditions

This geotechnical desktop study report provides preliminary geotechnical information based on the subsurface and groundwater information collected from existing borehole logs and published documents. No site visit or soil sampling were conducted, and all the information was gathered by reviewing previous geotechnical works conducted by Golder Associates (Golder), Terraprobe Inc. (Terraprobe), Ministry of Transportation of Ontario (MTO) and from a geological map called "Surface geology of Southern Ontario", prepared by Ministry of Natural Resources (MNR) and Ontario Geological Survey (OGS). Hence, the information provided in this report should not be used for advanced stages of design and construction work. Any advanced environmental study and related impact assessment, including a full-scale design of the EELRT and construction, will require a comprehensive program of geotechnical investigation involving the drilling of boreholes, and in-situ and soil laboratory tests, and topographical and hydrogeological studies.

For the geotechnical desktop study, the study area was divided into the following parts:

- Segment 1 – Eglinton Avenue East and Kingston Road,
- Segment 2 – Morningside Avenue and UTSC,
- Segment 3 – Sheppard Avenue East and Neilson Road, and
- Maintenance and Storage Facility (MSF)

The following is a summary of the geotechnical desktop study conducted for this project.

- Along the EELRT alignment, the subsurface materials mainly consist of glaciolacustrine sands, gravels, silts, and clays underlain by both till deposits. In some places, thicker zones of topsoil and organics as well soft and loose soils can be presumed to be present.
- There is a potential to encounter cobbles and boulders in the overburden soils and these may influence the choice of excavation equipment and methods.
- The groundwater level along the LRT corridor is expected to be as high as the ground surface and as deep as 5 m below existing grade.

- The clayey silt and silty clay tills are poor pavement and track bed subgrade materials.
- There is potential for fill to be encountered in some areas that may be unsuitable for foundations.

The MECP noted that many of the ravines in Toronto were partially filled with waste historically, so these fill materials may also be unsuitable to support foundation footings.

The Geotechnical Desktop Assessment can be found in **Appendix J**.

4.4.6.1 Physiography and Regional Geology

Based on Chapman and Putnam (1984), the Physiography of Southern Ontario, the western parts of the Eglinton, Kingston and Sheppard segments are located in the physiographic region known as South Slope, whereas the eastern part where much of Segment 2 traverses is located in Iroquois Plain. The South Slope contains a variety of soils, including moraine till, lacustrine clay and isolated silt and sand deposits. The Iroquois Plain is characterized by gently rolling, beveled till plains with flat sand and clay plain areas that formed as lakebed deposits. The Lake Iroquois Sand Plain forms the southern boundary of the South Plain. This ancient shoreline comprised largely of sand and gravel with a major relief provided by the deep valley of Highland Creek and the surrounding hills. Information obtained from maps published by the Ontario Geological Survey, the Quaternary geology in the region consists of glacial moraine deposits comprised of silty sand/sandy silt tills. Bedrock in the area is very deep, and belongs to the Georgian Bay Formation shale, limestone, and siltstone.

4.4.6.2 Subsurface and Groundwater Conditions

In order to assess the subsurface and groundwater conditions along the proposed alignment of the EELRT and its the MSF, the following documents were reviewed:

- Preliminary Geotechnical Data Compilation – Revised Scarborough-Malvern LRT Environmental Assessment, Technical Memorandum, Golder Associates, March 2009.
- Geotechnical Design Report TTC LFLRV Sheppard Maintenance and Storage Facility, 8304 Sheppard Avenue East, Toronto, Ontario, Terraprobe Inc., March 2010.
- Foundation Investigation and Design Report, Eglinton GO Station, Scarborough, Ministry of Transportation of Ontario (MTO), June 1977.
- Regional geological maps prepared by Ontario Geological Survey (OGS), previous boreholes logs prepared by others, and available on OGS online database.
- Relevant geotechnical information and borehole logs prepared by PML for projects carried out previously, especially in the area near Malvern Town Centre.

Based on the report prepared by Golder and the information from previous borehole logs, the subsurface conditions along the proposed EELRT alignment generally consist of granular materials (sands and gravels), clays and silts as well as till deposits. The following sections provide brief descriptions of the subsurface conditions along each segment of the project work.

4.4.6.2.1 Segment 1 – Eglinton Avenue East and Kingston Road

Along Segment 1, existing background information indicated that the quaternary deposits contained glaciolacustrine derived silty to clayey silt till. In some places, predominantly cohesionless soils (sands and gravels) are expected. Any granular or cohesive fill that existed along the alignment on top of the till is expected to be between 0.5 m and 2.0 m thick. Based on the 10% design, widening of sidewalks under the existing bridge at Eglinton GO is proposed to accommodate a 3 m multi-purpose path (MUP). This widening will require extending the footings of the bridge on both sides. A review of a Foundation Investigation and Design Report prepared by MTO in 1977 for a Canopy Shelter at the Eglinton Go Station indicated that the area in the surroundings of the station is covered with sand deposited by ancient Lake Iroquois. This sand is underlain by Pleistocene deposits of till, varved clay and interglacial sands of various ages. At the GO station specifically, the subsurface consisted of 3 m to 4 m fill underlain by glacial till. The glacial till was described to be dense to very dense. The groundwater level observations in open boreholes after the completion of drilling indicated that the groundwater existed 2 m to 3 m below the platform surface.

4.4.6.2.2 Segment 2 – Morningside Avenue and UTSC

Based on the surface geology map prepared by Ontario Geological Survey, the area along Segment 2 consists of gravels and sands with some silt deposits. There is a plan to widen the Highland Creek valley on both sides by 3 m to accommodate pole zones and MUP, and this may require the construction of a retaining wall to support the valley slopes. Similarly, retaining walls are proposed on both sides of Ellesmere Rd. At Highland Creek crossing, thick deposits of granular soils and silt layers are anticipated. The granular deposits are expected to be dense to very dense and any proposed retaining wall may be supported by shallow spread footings.

At the location of Highway 401 underpass, a soil profile prepared by MTO indicates a subsurface condition made up of a 3 m fill underlain by a sandy silt to silty clay glacial till with a thickness of about 6 m. The till is underlain by a very dense sand with silt deposit. Generally, in areas where retaining walls are required or in places where bridges are planned, local site investigation supported by the drilling of boreholes will be needed to identify the subsurface soil materials.

4.4.6.2.3 Segment 3 – Sheppard Avenue East and Neilson Road

The overburden along Sheppard Avenue East in Segment 3 consists of glaciolacustrine clay and silt tills. Along Neilson Road, predominantly gravels and sands are common with some clayey silts and silty clays.

Based on foundation investigation reports obtained from MTO's foundation library, the subsurface consist of about 1.5 m fill underlain by clayey silt deposits. The clayey silt deposits are underlain by dense to very dense silty sand to sandy silt materials. Near Malvern Town Centre, the subsurface consisted of fill material underlain by a layer of sandy silt till and sandy silt/sand/clayey silt till deposits.

4.4.6.2.4 Maintenance and Storage Facility

The review of the geotechnical design report prepared by Terraprobe in 2010 indicated that the stratigraphy at the area consisted of 0.6 to 4.5 m thick fill underlain by cohesionless soils (silty sand, sand, gravel, and sandy gravel materials). Beneath the cohesionless soils, a stiff to hard glacial till comprising clayey silt deposits with sands and gravels, was encountered. The groundwater level measured in wells installed in the area varied from 1.1 m to 4.7 m below grade.

4.4.6.2.5 Groundwater Conditions

Groundwater conditions along the proposed LRT alignment are expected to vary because of a series of aquifers within cohesionless deposits separated by silt and clay layers or fine-grained glacial till. Shallow perched zones are also expected within surficial granular deposits that are overlain and underlain by cohesive deposits. Such perched water levels may be highly localized, and are often governed by seasonal conditions, local topography, and the underlying soil. Perched water zones may have an implication for dewatering of open-cut excavations and the design of deep foundations. In some cases, the perched water zones represent shallow perched groundwater accumulated primarily as run-off across the ground surface and seepage into the surficial silty clay soil. The silty clay and silty clay till soils encountered in many places have low permeability, resulting in shallow perched conditions due to slow infiltration rate. The effect of surficial perched groundwater can be controlled with the implementation of a storm drainage.

The depth to the groundwater table is expected to be in the range from near surface conditions to depths in the range of 5.0 m below existing grade. Due to the low permeability and confining nature of the till deposits, together with the presence of higher permeability materials interbedded within the till, the water levels reported in some reports and borehole logs may be more a reflection of a potentiometric surface rather than an indication of the true depth of the groundwater table within the subsurface.

4.4.7 Contamination / Limited Phase 1 ESA

The Limited Phase I ESA is a qualitative assessment of the environmental condition of the site based on a review of current activities and historical information at the project site and the adjacent properties within the study area. The objective of the Limited Phase I ESA is to identify actual or potential sources of soil and groundwater impact that can potentially affect the Site, and which may require management or mitigation during the construction stages. The Limited Phase 1 Environmental Site Assessment (ESA) does not constitute a Phase 1 Environmental Site Assessment under Ontario Regulation 153/04 and is not intended to be used for the purpose of filing a Record of Site Condition (RSC).

The Phase 1 ESA was conducted for the study area, including a 250 m radius buffer, as due diligence to identify and verify the potential sources of contamination. The Phase 1 ESA was performed in accordance with the protocols outlined in Schedule D of O. Reg. 153/04 (amended) and involved the following tasks to assess the physical and geo-environmental settings and to document past and present land use activities:

- A review of available documents from federal, provincial, and municipal databases including aerial photographs, topographic, geologic and hydrogeologic maps, Ministry of the Environment, Conservation and Parks (MECP) water well records.
- Collecting data about past activities at the sites and the study area that could be interpreted as contributing to the existing conditions and/or potential contaminating activities.
- Conducting a walk-through visual inspection at sites and within the study area to assess current conditions and the visual presence of features or olfactory evidence indicating potential contamination, if any.

Findings from the site reconnaissance and the desktop study of available databases confirmed the presence of current or historical potentially contaminating activities (PCAs) within the study area. One (1) PCA was found on the project site (or footprint) and ninety-four (94) within the study area (including the 250 m buffer).

The project site PCA was related to the importation of fill material of unknown quality for previous road works.

The study area PCAs include the following facilities or establishments associated with the historical development and use in the corridor:

- Gas stations and gas storage tanks
- Laundromats
- Car wash centers
- Autobody shops
- Dry cleaning centers
- Paint stores
- Rail Yards, Tracks, and Spurs
- Chemical storage facilities
- Salt storage domes

The identified PCAs are located along Eglinton Avenue, Kingston Road, Ellesmere Road, Falaise Road, Morningside Avenue, Milner Avenue, Sheppard Avenue and Markham Road.

The noted PCAs were further evaluated to determine Areas of Potential Environmental Concern (APEC):

- The site PCA was considered an environmental concern due to historical use.
- Sixty-five (65) of the ninety-four (94) PCAs identified within the study area were considered environmental concerns due to the nature of the activities and their proximity to the site.
- The remaining study area PCAs were not considered environmental concerns contributing to APEC on the site since they were located downgradient and distant from the site.

Various contaminants were identified in the review, including metals, hydride forming metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and petroleum hydrocarbons (PHCs). The soil and groundwater are identified as the media potentially impacted by these contaminants across all APECs.

Findings of the Limited Phase 1 ESA can be found in **Appendix K**.

4.5 Cultural Environment

This section documents the existing built heritage resources and cultural landscapes as well as archaeological resources in the study area.

4.5.1 Built Heritage Resources and Cultural Heritage Landscapes

A cultural heritage assessment was conducted in 2023 to document cultural heritage conditions and create an inventory of the cultural heritage resources within the study area. The cultural heritage report identifies existing conditions and presents an inventory of all known and potential built heritage resources (BHR) and cultural heritage landscapes (CHL) in the study area. The Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment can be found in **Appendix F**.

4.5.1.1 Methodology

The cultural heritage assessment follows the MECP's Guide to Environmental Assessment Requirements for Transit Projects (Transit Guide). The Transit Guide provides guidance to proponents undertaking the TRPAP on how to meet the requirements of Ontario Regulation 231/08 under the Environmental Assessment Act (1990). The cultural heritage assessment also follows guidelines from the MCM on preparation of cultural heritage reports within the TRPAP (2019).

The Ontario Heritage Act (OHA, 1990, as amended in 2023) is the primary piece of legislation that determines policies, priorities, and programs for the conservation of Ontario's heritage. Other provincial acts, regulations, and policies governing land use planning and resource development that support heritage conservation, include the Planning Act (1990) and the Environmental Assessment Act (1990). Municipal policies relating to built heritage resources and cultural heritage landscapes were reviewed from the following sources:

- Office Consolidation Toronto Official Plan (City of Toronto, 2019a).
- Highland Creek Community Secondary Plan (City of Toronto, 2019a).
- Management Plan for Guild Park & Gardens (The Planning Partnership & ERA Architects Inc., 2014.
- Trails Master Plan for Guild Park & Gardens (The Planning Partnership, 2018).
- University of Toronto Scarborough Secondary Plan (University of Toronto Scarborough, 2019).
- University of Toronto Scarborough Campus Master Plan (University of Toronto Scarborough, 2011).
- University of Toronto Scarborough Urban Design Guidelines (Urban Strategies Inc., 2020).

Generally, when conducting an identification of BHRs and CHLs within a study area, three stages of research and data collection are undertaken to appropriately establish the potential for and existence resources and features: background research and desktop data collection; field review; and identification.

4.5.1.2 Existing Context

The Cultural Heritage Report study was completed with a 50-metre buffer from the proposed alignment and a 50-metre buffer around the proposed maintenance and storage facility property parcel. The study identified 11 known and potential heritage resources within the study area, including:

- Seven (7) Built Heritage Resources (BHRs):
  - Two (2) Part IV designated:
    - One (1) Former Residence (Presently Commercial), and
    - One (1) Former Residence (Presently Institution).
  - Five (5) Potential Heritage Value:
    - One (1) Church,
    - Two (2) Residences,
    - One (1) Entryway, and
    - One (1) Former Residence (Presently Commercial).
- Four (4) Cultural Heritage Landscapes (CHLs):
  - One (1) Part IV designated:
    - One (1) Former Estate (Presently Institution) (Known).
  - Three (3) Potential Cultural Value:
    - One (1) Post-War Streetscape (Potential),
    - One (1) Watercourse (Potential), and
    - One (1) University Campus (Potential).

The Eglinton Avenue East and Kingston Road segments, at the southernmost section of the study area, include six of the seven designated and potential BHRs:

- BHR 1 is a potential site located at 3739 Kingston Road. It currently functions as a church.
- BHR 2 is a potential site located at 3741 Kingston Road (southeast corner of Kingston Road and Scarborough Golf Club Road). It currently functions as a residence.
- BHR 3 is a Part IV designated site at 3750 Kingston Road (northeast corner of Kingston Road and Scarborough Golf Club Road). A former residence, it presently houses commercial uses.
- BHR 4 is a potential site located at Guildwood Parkway and Kingston Road. It consists of wrought iron gates and stone pillars marking an entryway.
- BHR 5 is located at 4234 Kingston Road, west of Galloway Road. A former residence, it presently houses commercial uses.
- BHR 6 is a Part IV designated site located 156 Galloway Road at the northwest corner of Kingston Road and Galloway Road. A former residence, it currently houses the Native Child and Family Services of Toronto Centre.

The Morningside Avenue and University of Toronto Scarborough Campus Segment, includes one potential built heritage resources and four designated and potential cultural heritage landscapes.

- BHR 7 is a potential site located along Morningside Avenue north of Beath Street. It currently functions as a residence.
- CHL 1 is a potential site located along Morningside Road from Fairwood Crescent to Tefft Road. It consists of a post-war streetscape.
- CHL 2 is a Part IV designated site located at 130 Old Kingston Road. It is a former estate, currently functioning as an institution.
- CHL 3 is a potential site, the Highland Creek watercourse.
- CHL 4 is potential site, comprised of the University of Toronto Scarborough Campus. The potential heritage attributes of the campus include the historical, design, and contextual values of the property.

The Sheppard Avenue and Malvern Town Centre segments, the northernmost section of the study area, have no identified built heritage resources and cultural heritage landscapes.

4.5.2 Archaeological Resources

A Stage 1 archaeological assessment was finalized in 2024 by Archaeological Services Inc. for the EELRT study area. A Stage 1 AA consists of a review of geographic, land use and historical information for the property and the relevant surrounding area, a property visit to inspect its current condition and contacting the Ministry of Citizenship and Multiculturalism (MCM) to find out whether, or not, there are any known archaeological sites on or near the property. Its purpose is to identify areas of archaeological potential and recommend further archaeological assessment (e.g. Stage 2-4) as necessary.

The Stage 1 Archaeological Assessment can be found in **Appendix G.**

4.5.2.1 Methodology

The Archaeological Assessment study was completed with a 50-metre buffer from the proposed alignment and a 50-metre buffer around the proposed maintenance and storage facility property parcel.

Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MCM through “Ontario’s Past Portal” published and unpublished documentary sources; and the files of the archaeological consultant, ASI.

A property inspection was conducted for the Stage 1 Archaeological Assessment under the field direction of Eliza Brandy (R1109) of ASI, on April 20, 2023, and Kirstyn Allam (R1258) on April 20 and 26, 2023. This inspection intended to gain first-hand knowledge of the geography, topography, and current conditions and to valuate and map archaeological potential of the study area. It was a systematic visual inspection from publicly accessible lands/public right of ways only and did not include excavation or collection of archaeological resources. Fieldwork was conducted when weather conditions were deemed clear with good visibility (partly cloudy/sunny with seasonal temperatures), per Section 1.2., Standard of the 2011 Standards and Guidelines for Consultant Archaeologists (S & G), administered by the Ministry of Citizenship and Multiculturalism (MCM 2011). Field photography and observations are presented in **Appendix G**.

4.5.2.2 Archaeological Potential

Historical aerial imagery from 1947 to 1992 demonstrated previous disturbances within areas identified as retaining archaeological potential according to the Toronto Archaeological Potential Map.

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MCM. According to the OASD, 18 previously registered archaeological sites are located within one km of the study area, one of which is located within 50 metres and one site is approximately 55 metres from the study area. A summary of all sites is provided in **Appendix G**.

Based on the above considerations, it was determined that the study area meets the criteria indicative of archaeological potential, including:

- Previously identified archaeological sites,
- Water sources (Highland Creek and tributaries),
- Elevated topography (plateaus of Highland Creek valley),

- Well-drained soils,
- Proximity to early settlements (Scarboro, Malvern, and villages), and
- Early historic transportation routes (Eglinton Avenue, Kingston Road, Morningside Avenue, Ellesmere Avenue, Sheppard Avenue).

More details on the findings and recommendations of the Stage 1 Archaeological report are provided in Chapter 5.5.2.

4.6 Emissions

4.6.1 Air Quality

The assessment is intended to address air quality portions of the Ontario Regulation 231/08: Transit and Rail Project Assessment Process (O. Reg. 231/08) in order for the City of Toronto (the City) to obtain a Notice to Proceed for the EELRT from the Minister of the Environment, Conservation, and Parks (MECP). The following guidelines were used in this assessment:

- Public Health Toronto report "City of Toronto. Avoiding the TRAP: Traffic-Related Air Pollution in Toronto and Options for Reducing Exposure. Technical Report", dated October 2017,
- MTO's Environmental Guide for Assessment and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects,
- MECP Ambient Air Quality Criteria (AAQC),
- Health Canada/Environment Canada National Ambient Air Quality Objectives (NAAQOs), and
- Canadian Council of Ministers of the Environment (CCME) Canadian Ambient Air Quality Standards (CAAQS).

The contaminants of interest from transit fleet vehicle emissions are based on the regularly assessed contaminants of interest for transportation assessments in Ontario, as determined by the Ministry of Transportation Ontario (MTO) and Ministry of Environment, Conservation and Parks (MECP).

Motor vehicle emissions have largely been determined by scientists and engineers with United States and Canadian government agencies such as the U.S. Environmental Protection Agency (EPA), the MECP, Environment Canada (EC), Health Canada (HC), and the MTO. These contaminants are emitted due to fuel combustion, brake wear, tire wear, the breakdown of dust on the roadway, fuel leaks, evaporation and permeation, and refuelling leaks and spills. Note that emissions related to refuelling leaks and spills are not applicable to motor vehicle emissions from roadway travel. Instead, these emissions contribute to the overall background levels of the applicable contaminants. All of the selected contaminants are emitted during fuel combustion, while emissions from brake wear, tire wear, and breakdown of road dust include only the particulates.

Contaminants of interest associated with vehicle emissions include:

- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Fine Particulate Matter) (PM2.5, <2.5 microns in diameter)
- Coarse Particulate Matter (PM10, <10 microns in diameter)
- Total Suspended Particulate Matter (PM, <44 microns in diameter)
- Benzo[a]Pyrene

In addition to the contaminants above, greenhouse gases (GHG) will be assessed for the project however, GHG's were not monitored and included as part of the baseline conditions.

A review of MECP and National Air Pollution Surveillance (NAPS) ambient monitoring stations in Ontario was undertaken to identify the monitoring stations that are in relative proximity to the study area and that would be representative of background contaminant concentrations.

The nearest monitoring stations to the study area are shown in Table 4-13. Background concentrations from these stations are summarized for the available contaminants of interest from 2017 to 2021. Note that CO is only monitored at the Toronto West Station. In addition, Windsor is the only station in Ontario at which background concentrations of Acrolein, Formaldehyde and Acetaldehyde are measured in recent years. Only these contaminants were considered from the Windsor station.

Table 4-13: Relevant MECP and NAPS Station Information

City/Town	Station ID	Location	Operator	Contaminants
Toronto North	34020	Hendon Ave./Young St.	MECP	CO | NO2 | PM2.5
Toronto West	35125	125 Resources Rd	MECP	CO | NO2 | PM2.5
Toronto East	33003	Kennedy Rd./Lawrence Ave. E.	MECP	CO | NO2 | PM2.5
Toronto Downtown	31103	Bay St./Wellesley St. W.	MECP	CO | NO2 | PM2.5
Toronto West Roadside	60438	401W - 125 Resources Road	NAPS	Benzo[a]Pyrene
Toronto Gage Institute	60427	223 College Street	NAPS	Benzo[a]Pyrene
Etobicoke West	60413	Elmcrest Road	NAPS	1,3-Butadiene | Benzene
Etobicoke South	60435	461 Kipling Ave.	NAPS	1,3-Butadiene | Benzene
Windsor	60211	College St/Prince St	NAPS	Formaldehyde | Acetaldehyde | Acrolein

Two NAPS stations were considered for the Benzo[a]Pyrene ambient background data. It was found that the available ambient Benzo[a]Pyrene data was measured at inconsistent frequencies and time intervals. Therefore, the 90th percentile value of all measured concentrations between 2016 to 2021 at the Toronto West NAPS station, and between 2010 to 2014 at the Toronto Gage NAPS Station are provided, rather than the maximum, 90th and average concentrations. It should be noted that PM10 and TSP were calculated based on their relationship to PM2.5.

Table 4-14 shows the selected worst-case monitoring station for the various contaminants con of the selected worst-case background monitoring station for each of the contaminants of interest was performed.

The NO_2 CAAQS guidelines, benzene annual, and Benzo[a]Pyrene guidelines are exceeded. It should be noted that the assessment was done on a conservative approach comparing maximum, 90th percentile, and average concentration to standards. Note that Benzo[a]Pyrene is not shown as it exceeds the guideline by a significant amount and therefore skews the scale. For the remaining contaminants and averaging periods, the ambient concentrations meet the respective guidelines.

Table 4-14: Ambient Background Concentration

Contaminant	Averaging Period (hrs)	Threshold Value (µg/m³)	Maximum Ambient Conc. (µg/m³)	90th Percentile Ambient Conc. (µg/m³)	Average Ambient Conc. (µg/m³)	Worst-Case Station
NO_2	1	400	155	42	20	Toronto East
	24	200	81	44	27	Toronto West
	1	79[1]	-	42	-	Toronto West
	Annual	23[2]	30	-	-	Toronto West
CO	1	36,200	1866	409	286	Toronto West
	8	15,700	1294	391	284	Toronto West
PM2.5	24	27[3]	-	20	-	Toronto East
	Annual	8.8[4]	-	-	8	Toronto West
PM10	24	50	80	23	14	Toronto West
TSP	24	120	144	41	25	Toronto West
Acetaldehyde	24	500	3	2	1	Windsor
Acrolein	24	0.4	0.12	0.07	0.06	Windsor
	1	4.5	0.12	0.07	0.06	Windsor
Benzene	Annual	0.45	-	-	0.93	Etobicoke South
	24	2.3	1.48	1.07	0.60	Etobicoke South
1,3-Butadiene	24	10	0.22	0.09	0.05	Etobicoke West
	Annual	2	-	-	0.08	Etobicoke West
Formaldehyde	24	65	4	3	2	Windsor
Benzo[a]Pyrene	24	0.00005	-	0.00013	-	Toronto Gage
	Annual	0.00001	-	-	0.00011	Toronto Gage

Notes:
[1] The 1-hour NO2 CAAQS is based on the 3-year average of the annual 98th percentile of the NO2 daily maximum 1-hour average concentrations.
[2] The annual NO2 CAAQS is based on the average over a single calendar year of all the 1-hour average NO2 concentrations.
[3] The 24-hr PM2.5 CAAQS is based on the 3-year average of the annual 98th percentile of the 24-hr average concentrations.
[4] The annual PM2.5 CAAQS is based on the average of the three highest annual average values over the study period.

Based on a review of ambient monitoring data, background concentrations were generally below their respective guidelines. The exceptions are 24-hour and annual Benzo[a]Pyrene, annual benzene, as well as the 1-hour and annual NO_2 CAAQS standards. It should be noted that the assessment was completed based on a conservative approach comparing maximum, 90th percentile, and average concentrations of ambient background data to applicable standards.

The Air Quality Report can be found in **Appendix H**.

4.6.2 Noise and Vibration

The assessment is intended to address noise, and vibration portions of the Ontario Regulation 231/08: Transit and Rail Project Assessment Process (O.Reg. 231/08) in order for the City of Toronto (City) to obtain a Notice to Proceed for the EELRT from the Minister of the Environment, Conservation, and Parks (MECP). The following guidelines were used in this assessment:

- MECP / Ontario Ministry of Transportation (MTO), "A Protocol for Dealing With Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments (1986)", for operational road noise.
- MECP/ Toronto Transit Commission (TTC), Protocol for Noise and Vibration Assessment for the Proposed Scarborough Rapid Transit Extension (MECP/TTC, 1993), for operational light-rail noise.
- MECP Publication NPC-300 (2013), which sets out acceptable noise criteria for the Maintenance and Storage Facility (MSF) operations.
- U.S. Federal Transit Administration (FTA) Transit Noise and Vibration Assessment Manual (FTA-VA-90-1003-06) and the U.S. Federal Highway Administration (FHWA)
- Highway Construction Noise Handbook (FHWA-HEP-06-015) guidance, which provide guidance on acceptable levels of construction noise.
- The City of Toronto Noise By-law (Chapter 591 of the Municipal Code).
- The City of Toronto Construction Vibration By-law 514-2008 (Chapter 363 of the Municipal Code).

Sound level measurements were collected at 18 locations that are representative of the noise sensitive receptors. Unattended 48-hour measurements of existing roadway traffic sound levels were conducted from May 10 to May 12, 2023. Attended short-term measurements of traffic induced sound levels were conducted on April 25, May 10, May 12, and November 22, 2023.

Sound level measurements were collected with a Larson Davis 824 and 831 sound level metre/real-time analyzers. The weather conditions consisted of sunny/cloudy skies with approximate temperatures ranging from 4-23°C, low winds (less than 10 km/h), and a relative humidity between 26% and 83%. There were no periods of precipitation during the measurement period.

Periods of intrusive construction-related noise were omitted from measurements.

The Noise and Vibration Report can be found in **Appendix I**.

Table 4-15 outlines the long-term monitoring results at noise-sensitive points of reception.

Table 4-15: Long-term Noise Monitoring Results

Monitor	Location	Minimum, L_{eq} (1-hour) (dBA)			Daytime L_{eq} (16-hour) (dBA)	Night-time L_{eq} (8-hour) Day (dBA)
		Day (dBA) (7AM-7PM)	Eve (7PM-11PM)	Night (11PM-7AM)		
LT01	West Tunnel	61	60	52	62	58
LT02	MSF	50	53	50	55	55
LT03	Morningside	62	62	57	63	60
LT04	Sheppard	56	56	51	58	56

Table 4-16 provides results and spot-checks for assessing existing traffic sound levels for major roadways. L_{eq} sound levels are generally higher than the MECP/TTC Protocol guideline minimums of 55 dBA and 50 dBA during the daytime/night-time.

Table 4-16: Short-term Noise Monitoring Results

Monitor Location	Location	L_{eq} (10 min) (dBA)	Distance to Road Centreline (m)	Vehicle Breakdown (# of each)		
				Cars	Medium Trucks	Heavy Trucks
ST01	Eglinton Ave at Bimbrok Rd	70	27	149	8	0
ST02	Kingston Ave South of Morningside	66	30	190	6	2
ST03	Morningside adjacent to Pan Am Centre	68	20	166	0	0
ST04	Sheppard Ave at Conlins Rd	67	24	93	1	0
ST05	Eglinton Ave at Haven Place	68	20	331	23	8
ST06	Eglinton Ave at Commonwealth Ave	67	20	272	10	8
ST07	Eglinton Ave at Mason	66	26	249	7	5
ST08	Kingston Rd at Morningside	66	41	416	11	3
ST09	Kingston Rd at Celeste Drive	71	22	395	8	5
ST010	Sheppard Ave at Murison Blvd	67	27	96	4	2
ST011	Sheppard Ave and Neilson Rd	61	22	120	1	0
ST012	Sheppard Ave at Lapsley Rd	66	15	81	1	1
ST013	Sheppard Ave at Scunthorpe Rd	64	16	120	5	0
ST014	Sheppard Ave at Havenview Rd	66	16	137	1	0
ST015	Realigned Military Trail near Chartway Blvd	55	750	N/A	N/A	N/A
Notes: [1] Counts for Highway 401 were not obtainable at the location of the measurement						

5 Impact Assessment, Mitigation and Monitoring

The impacts of the functional design have been assessed by discipline-specific environmental studies to identify the footprint, construction and operation/maintenance impacts associated with the implementation of the EELRT. The impact assessment considered:

- Impacts identified through the completion of technical studies.
- All applicable federal and provincial regulatory requirements for the assessment of environmental effects.
- Issues raised by external agencies, the public, property owners, Indigenous Communities, and other persons of interest during consultation and participation activities conducted to date.
- Engineering design and programs for mitigation and monitoring.

If the proposed works change following the EPR, the proponent will be required to assess any change to the impacts following addendum process summarized in **Section 1.8**.

The following sections document the potential impacts and proposed mitigation measures pertaining to the natural, socio-economic, and cultural environments during both the construction and operations phases of the project. See the table below for a complete list of environmental components as well as criteria that these mitigation measures have been developed for.

Table 5-1: Environmental Components and Criteria for Development of Mitigation Measures

Environmental Component	Criteria
Transportation	• Active Transportation • Transit • Traffic
Infrastructure	• Drainage and Stormwater Management • Bridges and Structures • Utilities
Socio-Economic Environment	• Building and Property • Land Use, Demographics and Built Form
Natural Environment	• Terrain and Soils • Fish and Fish Habitat • Vegetation Communities • Wildlife and Wildlife Habitat • Designated Natural Areas • Contamination and Limited Phase 1 ESA • Species at Risk
Cultural Environment	• Built Heritage and Cultural Resources • Archaeological Resources
Emissions	• Air Quality • Noise and Vibration
Climate Change and Sustainability	• Adaptation • Mitigation

These sections describe impacts based on the existing conditions described in Chapter 4. These impacts and mitigation measures will be reviewed and refined in future phases of the project.

5.1 Transportation

This section documents the impacts, mitigation, and monitoring for the project with respect to multi-modal transportation (active transportation, transit, and traffic).

5.1.1 Active Transportation

5.1.1.1 Permanent Impacts and Associated Mitigation

The project proposes significant improvements to active transportation along the LRT study corridor. Proposed bicycle and pedestrian infrastructure will increase safety and enhance the experience of cycling and walking through wider, dedicated, and shared spaces in the boulevards between the roadway and property lines.

Enhancements to active transportation will build upon and complement the network of existing and future connections contemplated in the City's Cycling Network Plan, Active TO and the Walking Strategy and Complete Streets Guidelines. Moreover, space for protected intersections is accommodated for at all intersections in the alignment to mitigate safety risks to active transportation users (Figure 5-1). Detailed design of protected intersections will be developed using the latest available City standards during future design stages.

Figure 5-1: Artist's Rendering of the Protected Intersection at Bloor Street West and St. George Street

Source: City of Toronto

The proposed replacement of existing sidewalks along Sheppard Avenue with multi-use paths will help accommodate various users, such as those walking, running, rolling, cycling, and using accessible mobility aids. However, the mix of different modes of transportation can lead to conflicts and pedestrians may feel less comfortable sharing the space with users travelling at higher speeds.

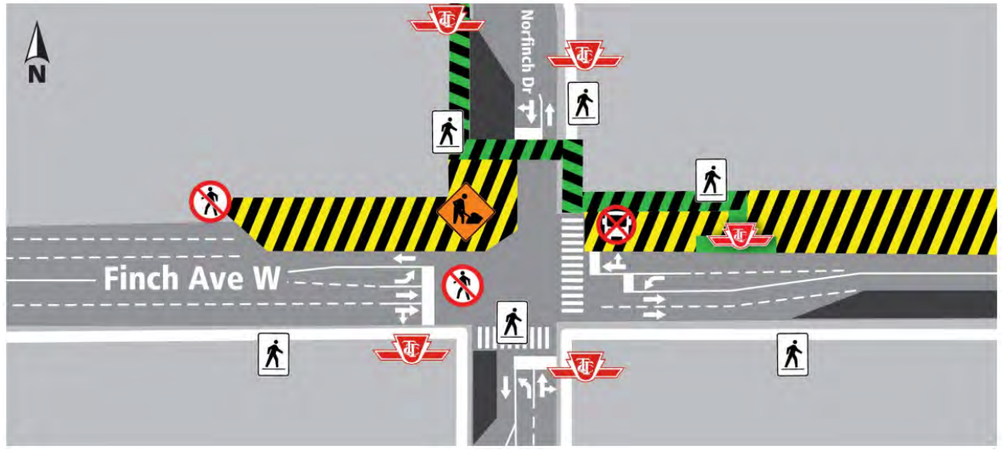
To address these potential impacts, careful planning, thoughtful design, and community engagement are crucial. Consideration should be given to providing clear separation between pedestrians and cyclists, incorporating proper signage, and ensuring accessibility for all. Additionally, ongoing community feedback and monitoring can help identify and address issues that arise after the implementation of multi-use paths.

5.1.1.2 Temporary Impacts and Associated Mitigation

During construction, temporary disruption is expected to existing active transportation facilities along the LRT corridor to accommodate utility relocation, widening, and implementation of the proposed upgrades to active transportation facilities.

To mitigate such impacts, maintaining safe pedestrian and cycling access must be prioritized. Construction staging plans, developed as part of the Construction Management Plan during future design phases, must ensure adequate physical separation between active transportation paths from construction sites and equipment, as well as from motor vehicle traffic—see Figure 5-2. Temporary active transportation paths will be replicated to match existing facilities to the extent possible. In addition, alternative routing should be planned to be located close to the existing pedestrian and cycling connections. Temporary pedestrian and cycling connections will be cleared of snow and debris to ensure safety. The Ontario Traffic Manual (OTM) Book 7 Temporary Conditions will be referred to develop the Construction Management Plan.

Figure 5-2: Sample Temporary Roadway Configuration Graphic from Finch West LRT Construction



Source: Metrolinx

5.1.2 Transit

5.1.2.1 Permanent Impacts and Associated Mitigation

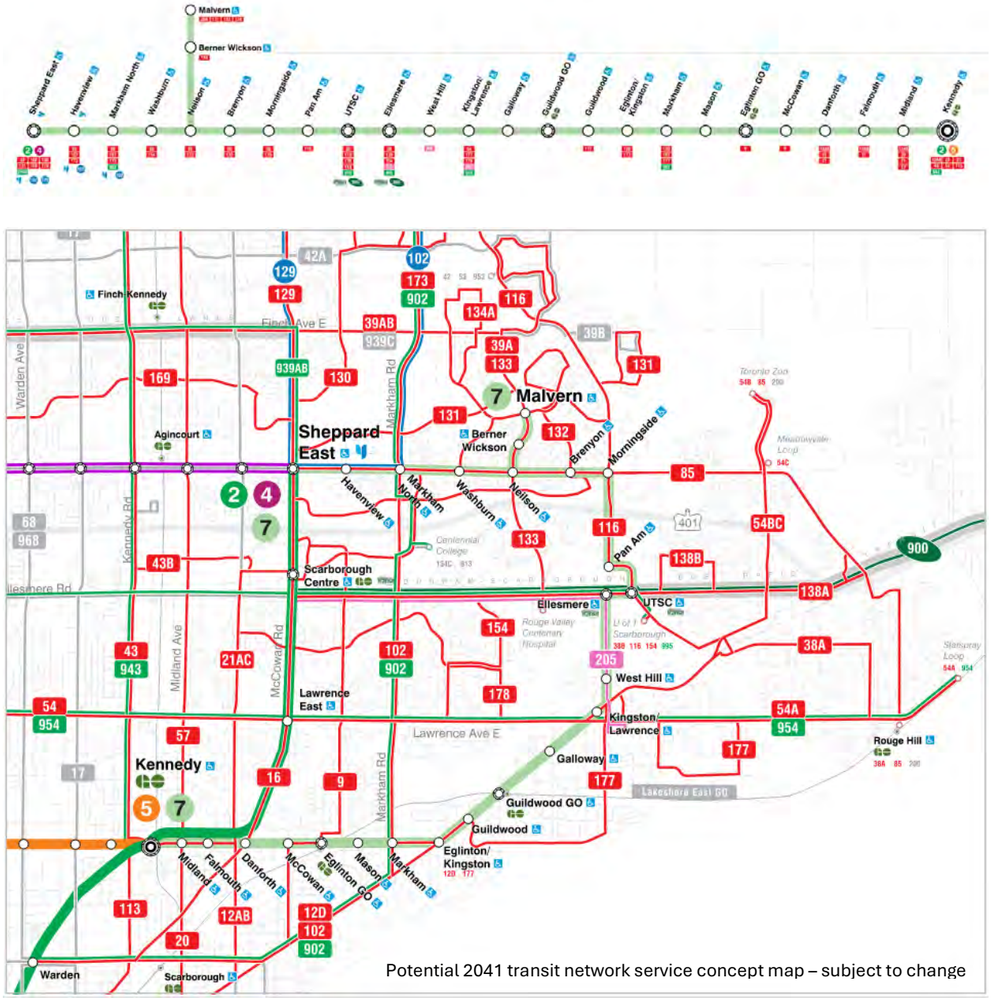
Permanent impacts to transit resulting from the LRT along the EELRT corridor are expected in the form of increased transit connections, improved travel time and reliability, and increased ridership compared to existing conditions. The LRT will operate in dedicated centre median lanes of the road along the entire corridor. Existing bus services crossing the EELRT may experience degradation in both travel time and reliability, a necessary trade-off impacting generally lower ridership routes.

In response to LRT implementation, the connecting bus routes will be adjusted to minimize duplication with the LRT and ensure a good network of connections. These modifications could include:

- 905 Eglinton East Express that serves as a limited stop express route along the Eglinton Avenue East corridor can be eliminated to avoid duplication with LRT service.
- Local route diversions to intersect and feed the LRT in at least one location where passengers can transfer conveniently at LRT stations.
- Parallel bus services along Sheppard Avenue East and Morningside Avenue to provide greater accessibility for local trips.

Details surrounding the future service plans (routes, origins/destinations, service span, frequency, etc.) are to be defined by the TTC based on further design of the LRT and how best to serve community needs. Figure 5-3 illustrates the potential 2041 transit service concept at this stage.

Figure 5-3: Potential 2041 Transit Service Concept



Source: TTC (2023)

5.1.2.2 Temporary Impacts and Associated Mitigation

Temporary impacts to transit from LRT construction works will generally be in the form of transit stop relocations, bus rerouting, and increased travel times associated with potential lane closures and rerouting. The routes listed below are expected to be the most severely affected by construction because they travel along substantial parts of the EELRT corridor:

- 9 Bellamy,
- 12 Kingston Road,
- 21 Brimley,
- 57 Midland,
- 85 Sheppard East,
- 86 Scarborough,
- 116 Morningside,
- 905 Eglinton East Express,
- 985 Sheppard East Express, and
- 986 Scarborough Express.

Minor delays and diversions can be expected for routes that cross the corridor as well. Delays to service will likely increase because of construction activities. Temporary street closures may be warranted at segments and will require the detour of bus routes around the affected area. The uncertainty at this early functional design stage regarding construction timelines precludes a full assessment of the transit impacts around EELRT interchanges at Kennedy Station and Sheppard East Station.

Adequate signage and advance notice should be provided for passengers regarding stop relocation and route rerouting. If long-term route detours are required, impacts to riders for routing to alternative corridors should be evaluated with the intent of minimizing impacts to riders. Where possible, any potential disruptions to the existing RapidTO curbside bus lanes should be minimized in duration and length and, if possible, opportunities to remove RapidTO lanes asymmetrically should be investigated, to ensure that transit ridership is maintained in the corridor throughout construction and to continue moving the most people efficiently. This approach must be confirmed with the City and TTC and is recommended to be based on an assessment of benefits and trade-offs such as person-hour savings (based on people moved through corridor rather than vehicles, since buses carry a lot more the SOV). The assessment should also include strategic considerations around maintaining a ridership base with reliable service, climate, and equity goals. Any diversionary corridors for transit should be evaluated for transit priority treatments to maintain service reliability and retain ridership base during construction. The TTC should monitor travel time impacts from construction activities and adjust schedule and frequency accordingly to maintain acceptable performance.

5.1.3 Traffic

One of the main design objectives for the 10% design of the EELRT was to support an equitable transit service serving communities across Scarborough and to take a potential once-in-a-generation opportunity to improve the public realm and active transportation conditions. The LRT running at-grade facilitates the implementation of Complete Streets, is more accessible and convenient for pedestrians and alleviates construction impacts and financial requirements for the project. Changes to traffic operations have been assessed network- wide to understand impacts to drivers, in an effort to balance the needs of all users. Intersection capacity analysis and network level meso/micro simulation were performed to support the decision making and identify the impacts of the 10% TRPAP design.

Intersection capacity analysis was conducted to evaluate their traffic flow and operational characteristics at three (3) focus areas: Kennedy Terminus, Kingston-Lawrence-Morningside, and Kingston-Falaise Detour. Development of draft signal timing plans utilized existing conditions and timing plans, City policy on signal timings, and comparable parameters-and-assumptions based on LRT implementations in the City of Toronto. Draft signal timings that incorporated in at-grade LRT movements were developed and analyzed using Synchro, then evaluated under HCM methodology. Focus area analyses concluded that the at-grade operations would be viable within current City policy. For further improvements and optimizations to levels of service for all modes and users, policy-level decisions on prohibitions and/or full closures of existing left turn movements may need to be explored in the implementation phase. The findings and recommendations of this analysis have informed and been incorporated into the proposed 10% design. Additional details and considerations are provided in **Appendix M.**

The meso/micro network simulation reviewed the overall traffic network operations. The objective here was to build on previously established modelling work and studies and analyze how the updated EELRT design affects traffic operations across a broader area. Based on the traffic model last updated in June 2019, additional changes were made to reflect the current design refinements. They include intersection and LRT alignment configuration updates summarized in this section, as well as an extension of the alignment along Sheppard Avenue East west to McCowan Road.

The base Aimsun model was calibrated to 2017 conditions, shown in the following study area map, and modified to include 2041 horizon year traffic forecasts and EELRT transit services. As part of the current study, a small extension to the model was performed to add three intersections to the model up to Sheppard Avenue and McCowan Road. The expanded study area (shown in yellow below) was originally out of scope and the expansion was performed for the 2041 preferred scenario only. For comparison to the Future Background or Existing Scenario, a further Aimsun model exercise would be required in a future phase of the design.

Figure 5-4: Aimsun Model Study Area

Note that, since 2019, the City of Toronto has deployed multiple Vision Zero related traffic signal updates to intersections in the study area, as well as upgraded the surface transit operations along Eglinton Avenue East, Kingston Road, and Morningside Avenue as part of the RapidTO initiates. Capturing these changes would have required updating the base model calibration and future background traffic forecasts, which are beyond the scope of this study and would have caused significant delays.

Discussions were held with various units within the City's Transportation Services and a consensus was achieved during the Intersection Working Group meeting #2 in June 2023. The decision was to keep the existing calibrated modelling and forecast conditions unchanged and modify only the elements made as part of the 10% design refinements along the EELRT corridor, to provide an apples-to-apples comparison.

The following intersection level updates were captured in the traffic modelling analysis, which reflects the latest design refinements and is summarized in Table 5-2.

Table 5-2: Summary of Design Changes

Intersection/Segment	Movement	Remark
Eglinton Ave and Midland Ave	SBR	Change to shared through-right lane for SBR
Eglinton Ave and Danforth Rd	EB/WB	Remove channelization
	NBL	Prohibit left turns
	NBR	Change to shared through-right lane
	SBR	Change to shared through-right lane
	WBL	Add dedicated left-turn lane
	EB	Move LRT stop to near-side
Eglinton Ave and Bellamy Rd	NB	Include NB approach as existing
Eglinton Ave and Beachell St	NB	Retained NB approach
Eglinton Ave and Kingston Rd	EBR	Change to dedicated right-turn lane
	SBR	Change to dedicated right-turn lane
	NB	Reduce to 2 through lanes
Kingston Rd and Scarborough Golf Club Rd	EB/WB	Remove channelization
Kingston Rd and Westlake Rd	EBR	Change to dedicated right-turn lane
Kingston Rd and Galloway Rd	EB	Remove channelization
Kingston Rd and Poplar Rd	EBL	Maintained Dedicated left turn lane as existing
Kingston Rd and Lawrence Ave	EB/WB	Remove channelization
	NB	Move LRT stop to near-side
	SB	Move LRT stop to far-side
Kingston Rd north of Lawrence Ave	-	Change to 4-lane, add new stop south of Morningside Ave
Morningside Ave north of Kingston Rd	NB/SB	Change to 2-lane, LRT track becomes centre running
Ellesmere Road East of Morningside Ave	EB/WB	LRT track becomes centre running
Kingston Rd and Morningside Ave	NB	Change to one through lane plus one right lane
	SB	Change to one through lane plus one right lane
Morningside Ave between Kingston Rd and Ellesmere Rd	-	Update model to reflect 2-lane cross-section
Morningside Ave and Beath St	NB	LRT stop re-location to near-side (south of Lawrence Ave)
	SB	LRT stop re-location to far-side (south of Lawrence Ave)
Morningside Ave and Morningside Park Access	-	Update model to include signalized intersection
Ellesmere Rd between Morningside Ave and New Military Trail	-	Update model to centre-running LRT and relocate the stop at UTSC
New Military Trail	-	Update model to reflect design plan configurations which includes the addition of 2 pedestrian crosswalk and an additional UTSC parking access

The above are expected to impact the traffic operations at the intersections involved, which require testing and confirmation at the network level to assess the overall impacts.

Further to the conversation with City of Toronto in June 2023, it is noted that speed limits, signal timing policies for clearance timing, and various Vision Zero related measures have been applied throughout the EELRT modelling area, on both the corridor and on cross streets. Modelling of the changes to the network and updated policies will be undertaken during subsequent detail design stages.

5.1.3.1 Permanent Impacts and Associated Mitigation

5.1.3.1.1 Network-Wide Impacts

Table 5-3 and Table 5-4 summarize the changes in network level operational metrics between the previous June 2019 study and the current scenario for the AM and PM peak, respectively.

Table 5-3: Summary of Operations – AM Peak (2041)

Scenario/Simulation Period	AM Peak				
Scenario 2.4 (June 2019)	**Car**	**Truck**	**Bus**	**EELRT**	**Peds.**
Simulated Flow (veh)	69,548	1,315	408	15	14,988
Delay (s/km)	76	74	63	67	987
Total Travel Time (veh.h)	11,744	267	108	11	302
Total Travelled Distance (veh.km)	355,221	8,394	1,963	203	681
Mean Virtual Queue (veh)	2,888	130	4	0	18
Current Design	**Car**	**Truck**	**Bus**	**EELRT**	**Peds.**
Simulated Flow (veh)	70,746	1,623	407	15	16,783
Delay (s/km)	91	129	71	78	1,799
Total Travel Time (veh.h)	12,167	307	110	7	507
Total Travelled Distance (veh.km)	350,449	8,729	1,961	113	759
Mean Virtual Queue (veh)	4,608	221	6	0	259

The following observations are made based on the 2041 AM peak simulated flow, which represents the expected network throughput:

- **Cars:** A slight increase in flow from 69,500 to 70,700, which is partly attributed to the increased network size since the June 2019 study.
- **Trucks:** More significant increase from 1,300 to 1,600, which is primarily attributed to the increased network size and additional demands travelling on McCowan Road.
- **Buses:** Remain relatively the same at approximately 400.
- **LRT:** No change at 15 per hour during AM peak.
- **Pedestrians:** Minor increase from 15,000 to 15,100.

The following are general observations on other metrics during the AM peak.

- Generally, delays increased for all modes.
- Total Travel Time increased across all vehicle types except EELRT. Most notably, car travel time increased from 11,700 to 12,200 vehicle-hours.
- A slight increase in total distance travelled for all modes apart from cars and EELRT, particularly notable for cars (from 355,200 to 350,400 veh.km).
- The virtual queues, which means the unserved demands, significantly increased for cars from 2,900 to 4,600. Truck queues also increased marginally (from 130 to 221).

In summary, the new geometric updates resulted in higher flows, increased delays, and travel times for some vehicle types. The mean virtual queues increased for cars and trucks.

Table 5-4: Summary of Operations – 2041 PM Peak

Scenario/Simulation Period	PM Peak				
S2.4 (June 2019)	**Car**	**Truck**	**Bus**	**LRT**	**Peds.**
Simulated Flow (veh)	82,397	1,593	354	15	18,679
Delay (s/km)	104	94	76	66	896
Total Travel Time (veh.h)	14,770	327	101	9	348
Total Travelled Distance (veh.km)	410,791	10,211	1,737	178	834
Mean Virtual Queue (veh)	4,332	143	4	0	41
Current Design	**Car**	**Truck**	**Bus**	**LRT**	**Peds.**
Simulated Flow (veh)	82,861	1,760	351	15	20,752
Delay (s/km)	117	130	83	76	1,207
Total Travel Time (veh.h)	15,291	348	103	6	478
Total Travelled Distance (veh.km)	404,997	10,142	1,744	110	923
Mean Virtual Queue (veh)	6,073	208	7	0	172

The following observations are made based on the 2041 PM peak Simulated Flow, which represents the expected network throughput.

- **Cars:** An increase in flow from 82,400 to 82,900.
- **Trucks:** An increase from 1,600 to 1,800.
- **Buses:** A marginal decrease from 354 to 351.
- **LRT:** No change at 15 per hour during PM peak.
- **Pedestrians:** Increased from 18,700 to 20,800.

The following are general observations on other metrics during the PM peak.

- Delays increase for all modes. Car delays increased from 104 to 117 s/km and truck delays went up from 94 to 130 s/km.
  - s/km (seconds per km) is the average delay experienced by an individual.
- Total Travel Time increased for most vehicle types, including cars which went from 14,800 to 15,300 veh.h.
  - veh.h (vehicle-hour) is the sum of the total travel time by every individual in each mode.
- A slight decrease in the total traveled distance for cars and trucks (from 410,800 to 405,000 veh.km for cars).
- Virtual queues increased for cars (from 4,300 to 6,100), trucks, buses, and pedestrians. The EELRT and SELRT remain the same.

The updated model led to increased flows for all vehicle types in the PM Peak. Delays and total travel time generally decreased for motorized vehicles but increased slightly for pedestrians. Virtual queues increased marginally for cars. Overall, the design changes appear to have somewhat streamlined the flow for most vehicle types in the PM Peak period. To address traffic impacts, it is recommended to monitor traffic volumes and adjust signal timings as necessary before, during and after construction.

Due to the intersection geometry updates to accommodate the LRT, a majority of network delays are along the LRT route with hot spots triggered by dedicated LT phases or existing high traffic volumes. The simulated LOS for the network with the latest design refinements for the AM and PM scenario are visualized in the following figures.

Figure 5-5: 2041 Simulated Levels of Service – AM

Figure 5-6: 2041 Simulated Levels of Service – PM

The following operational constraints are noted at key locations where the design refinements were made. Note that operational constraints are not necessarily attributed to the design refinements, as poor operations were noted during previous design iterations as well.

Table 5-5: Summary of Design Changes – Issues and Constraints

Intersection/Segment	Movement	Issues and Constraints
Eglinton Ave and Midland Ave	SBR	Future conditions operate at and LOS F in both peaks
Eglinton Ave and Danforth Rd	EB/WB	Future conditions operate at and LOS F in both peaks
	NBL	
	NBR	
	SBR	
	WBL	
	EB	
Eglinton Ave and Kingston Rd	EBR	-
	SBR	Future conditions operate at and LOS F in both peaks
	NB	
Kingston Rd and Lawrence Ave	EB/WB	Future conditions operate at and LOS F in both peaks as protected turn phases are required due to at grade LRT
	NB	
	SB	
Ellesmere Road East of Morningside Ave	EB/WB	Centre running LRT requires protected LT phases. Future conditions operate at and LOS F in both peaks
New Military Trail	-	Increase in delay with the addition of pedestrian crossing. LOS E or F.

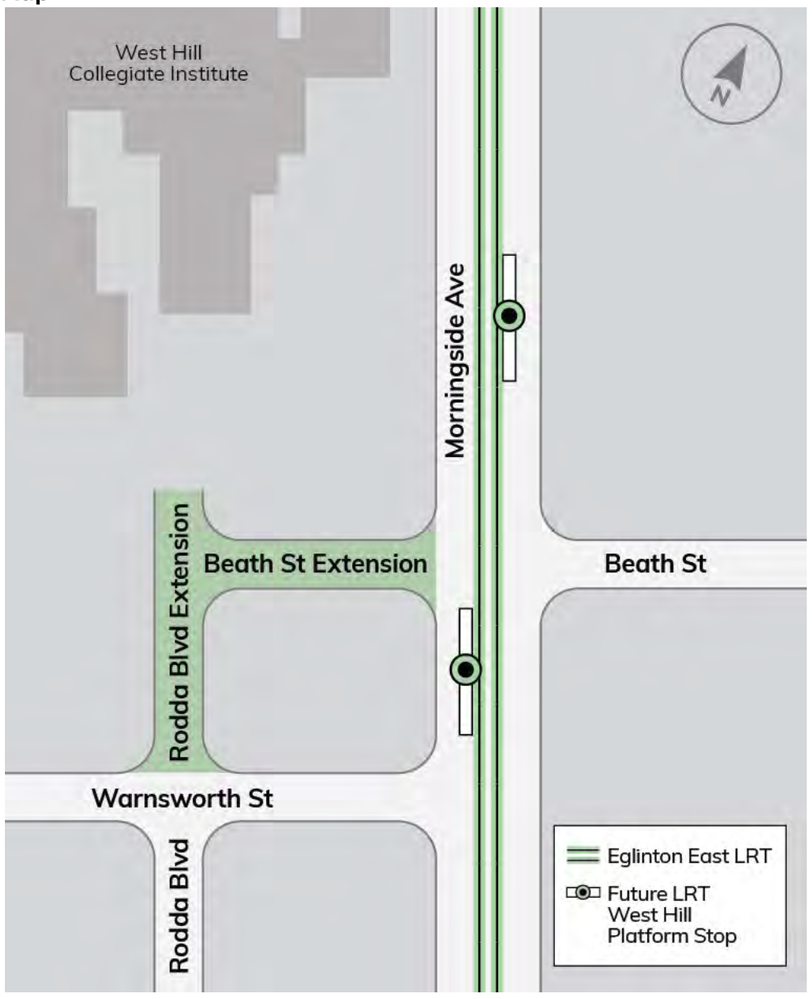
5.1.3.1.2 Localized Impacts

BEATH STREET

Another permanent impact to be noted due to the EELRT project is the extension of Beath Street, shown in Figure 5-7. This extension provides several benefits mitigating the impact of LRT operations at this location. Namely:

- The consolidation of the two separate, all-moves, unsignalized Warnsworth and Beath T-intersections on Morningside into one combined, 4-leg signalized intersection, providing all-moves access for vehicles, cyclists, and pedestrians for communities west and east of Morningside Avenue
- Provision of a signalized access for West Hill Collegiate Institute for vehicles, pedestrians, and cyclists
- Accommodation of LRT platforms at the new signalized Beath Street intersection with pedestrian access to communities on both sides of Morningside Avenue

Figure 5-7: Beath Street Extension and Realignment and Rodda Boulevard Extension Map



The section of Warnsworth Street between Rodda Boulevard and Morningside Avenue should be retained to provide access to existing homes on the north and south sides of the street. Removing vehicular access from Warnsworth Street to Morningside Avenue would require construction of a cul-de-sac which would require property acquisition from 324 Morningside Avenue (southwest corner of Morningside and Warnsworth) and 38 Warnsworth (northwest corner of Morningside and Warnsworth). To avoid property acquisition from these two residential properties, right-in, right-out access is recommended to be retained for Warnsworth Street at Morningside Avenue.

FALAISE DETOUR

Another permanent impact is local traffic infiltration. The Kingston-Morningside Focus Area Analysis concluded that NBL/SBL protected turns cannot be reasonably accommodated within the draft signal timings. In the design and implementation stage, detailed assessments and resulting operational safety considerations may lead full prohibition of those movements as opposed to allowing permissive movements.

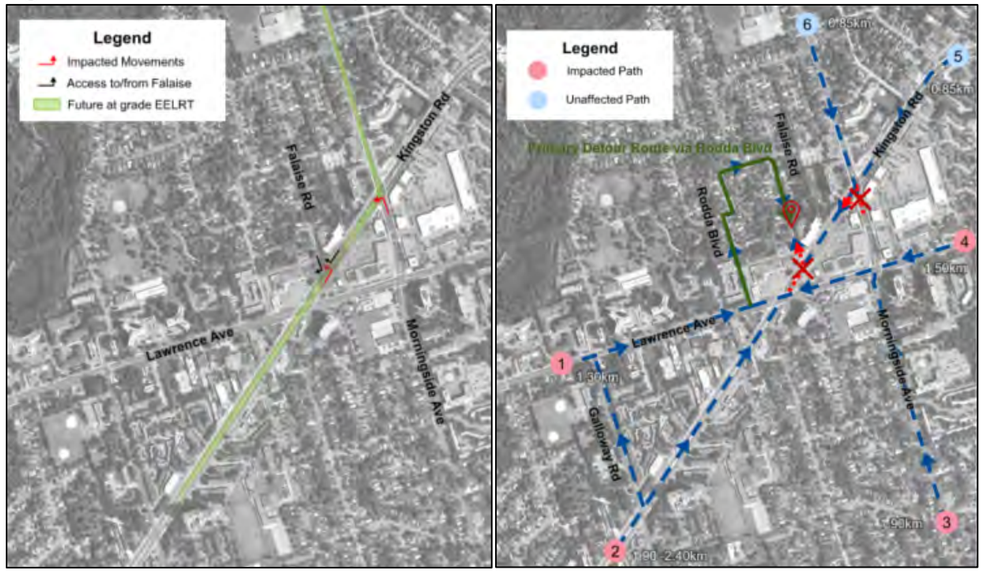
Consequently, local destinations on Falaise Road would face a situation where:

- Existing unsignalized EBL from Kingston Road EB to Falaise Road NB would be removed- and prohibited due to median EELRT tracks, and
- Existing protected-permissive NBL from Morningside Avenue NB to Kingston Road WB, and then WBR from Kingston Road WB to Falaise Road NB, would be removed due to intersection redesign and operations at Kingston Road at Morningside Avenue.

The detour analysis studied six (6) entry paths to Falaise Road and concluded that for the 4 of 6 entry points identified, Rodda Boulevard would be the primary detour path that would minimize the additional travel distance. Should this path be adopted accordingly, there would be an increased demand for EBL and WBR at the unsignalized intersection of Lawrence Avenue and Rodda Boulevard. Hence, it is recommended that the intersection operations be monitored for increased demand in the future and subsequent upgrade considerations.

Above analysis and findings are summarized below in Figure 6. The full step-by-step analysis is included in **Appendix M.**

Figure 5-8: Falaise Detour Analysis Summary



5.1.3.2 Temporary Impacts and Associated Mitigation

The key goal of the construction approach is to minimize traffic disruptions on critical roads like Eglinton Avenue, Kingston Road, Morningside Road, Ellesmere Road, Sheppard Avenue, and Neilson Road. These routes either serve as major arteries in the network or are integral to the RapidTO program, thus making them vital for both general traffic and local transit.

Staging plans, designed to cause the least hindrance, will be finalized during the detailed design stage. Although full road closures are not recommended, partial lane closures will be inevitable for conducting the construction in stages.

To accommodate AM and PM peak traffic flows, a minimum of two lanes will remain on current lane segments, most critically for the peak direction during AM and PM peaks. Outside of the peak periods, at least one lane will be open in each direction. For two lane segments, at least one lane per direction must be maintained, as alternating one-way traffic flow is unlikely to be permitted by the City. During construction, prioritizing transit vehicle flow will ensure that a strong ridership base is maintained. The existing RapidTO curbside bus lanes may need to be temporarily reconfigured to realign with temporary pavement marking. However, the approach to retaining RapidTO lanes during construction must be confirmed between the City and TTC during future phases of the project.

The key is to be flexible while ensuring safety and efficiency. When it comes to intersections, closures may be required for tasks like excavation, grading, utility relocation, and track slab construction. Such closures will be tightly coordinated with the City to mitigate traffic impacts. The exact times, duration, and configuration of closures will need to be specified during the development of the project agreement for construction.

As part of the construction requirements, a Traffic and Transit Management Plan (TTMP) will be developed in accordance with the City's latest standards. A TTMP should be data-driven, based on comprehensive traffic studies and modeling to understand the most significant pain points and potential bottlenecks. One mitigation measure is to stage and coordinate the EELRT construction activities alongside any other background construction projects planned by transportation, water, utility, and TTC, to minimize simultaneous impact on multiple key areas.

Additionally, temporary signal timing adjustments must be provided to accommodate changed traffic patterns, particularly at intersections impacted by lane reductions. Advanced notification systems, like dynamic message signs and social media updates, can provide real-time information to drivers, allowing them to make informed travel decisions. Lane marking and clear signage for detours will be crucial to guide drivers safely through or around construction zones.

Special provisions can also be made to ensure uninterrupted access for emergency vehicles. Overall, the focus should be on proactive management and real-time adjustments based on ongoing monitoring, enabling efficient handling of traffic operations during the construction period.

In addition to traffic management measures, an Emergency Response Plan must also be prepared by the contractor. This plan will lay out protocols for various emergency scenarios, from minor accidents within the construction zone to major incidents that could affect the broader network. By preparing for these eventualities in advance, the project aims to ensure quick and effective responses to emergencies, thereby minimizing additional disruption to the already constrained road network.

5.2 Infrastructure

5.2.1 Drainage and Stormwater Management Impacts

The Drainage and Stormwater Management Report can be found in **Appendix C.**

5.2.1.1 Hydraulic Structures Capacity Assessment

Preliminary assessments for the conveyance capacity of hydraulic structures spanning the regulated watercourses within the project limits have been completed to identify any existing potential capacity constraints within the existing drainage system. The capacity assessment for the hydraulic structures has been completed based upon the criteria provided in the Highway Drainage Design Standards (MTO, January 2008).

The design peak flows for the hydraulic structures spanning regulated watercourses were obtained from the currently approved hydraulic models provided by TRCA for use in this study. During detailed design, the design flows should be reviewed and verified using hydrologic modelling to confirm any changes to the land-use, channel geometry and associated hydrologic information that may affect the peak flows presented in this study.

The culvert capacities were assessed based on the 100-year and Regional storm events for freeboard and clearance, and the Regional storm assessment also considered depth of overtopping to confirm safe vehicle passage for an emergency access route. As per the MTO standards, the minimum design flow for the bridges on regulated watercourses is 100-year storm event.

As it currently stands, the Sheppard Avenue — Highland Creek Bridge near McCowan Road (Structure ID: 265) will be overtopped by 100-year and Regional Storm events. However, this bridge will require widening and / or replacement to accommodate the EELRT. Therefore, it is essential that future bridge improvements be designed with appropriate drainage capacities in accordance with regulatory requirements while considering fluvial geomorphology and associated aquatic habitats.

5.2.1.2 Proposed Drainage Conditions

For the minor drainage system, the overall drainage pattern is anticipated to remain consistent with existing conditions, under the proposed expansion to accommodate the project. To accommodate the proposed roadway widening, storm sewer upsizing and catchbasin relocations are anticipated. The proposed works may also warrant additional storm infrastructure to capture and convey flows.

The drainage within University of Toronto Scarborough Campus newly proposed roadway (i.e., New Military Trail) is to be provided through the proposed underground storm sewer system and an outlet. Those will be designed at the detailed design stage.

The major system of the proposed urban arterial road will be designed to convey the 100-year flow within the right-of-way. The maximum allowable flow spread for a two-lane New Military Trail roadway should provide 3.5 metres of open roadway. The storm sewer system for the ultimate roadway configuration is to be established at the detailed design stage for a 5-year storm event as per the City of Toronto Storm Drainage Design Requirements. Roadway drainage will be collected by a series of catchbasins and will be conveyed by storm sewers to the existing storm outlet locations.

The requirements to replace or extend hydraulic structures spanning regulated watercourses were determined based on the review of the proposed conditions (e.g. road widening) and the results of the existing hydraulic structures capacity assessment conducted in the previous section. The requirements for hydraulic structure extension or replacement are summarized in Table 5-6 for each of the scenarios evaluated.

Table 5-6: Proposed Scenario Existing Hydraulic Structures Assessment

Structure ID (City of Toronto)	Location	Proposed Recommendation
265	Sheppard Avenue — Highland Creek Bridge near McCowan Road	Replace
211	Sheppard Avenue — Highland Creek Bridge near Washburn Way	Extend
357	Morningside Avenue — Highland Creek Bridge	Extend

The hydraulic structures for the ultimate roadway configuration are to be designed at the detailed design stage, including review of the existing structures conditions, fluvial geomorphological considerations, and associated aquatic habitats.

5.2.1.3 Stormwater Management Criteria

The stormwater management plan for the project shall be developed to comply with the policies, regulations, and standards of Toronto and Region Conservation Authority (TRCA), Ministry of Environment, Conservation and Parks (MECP), and City of Toronto.

WATER QUALITY CONTROL REQUIREMENTS

Watercourses within the TRCA's jurisdiction are classified as requiring an "Enhanced" level of protection, which equates to 80% Total Suspended Solids (TSS) removal.

Water quality management measures within the study limits will be designed at the detailed stage to provide "Enhanced" water quality treatment for the increased pavement area due to the roadway widening.

WATER QUANTITY CONTROL REQUIREMENTS

Within the project limits, the stormwater runoff from EELRT corridor discharges either into the existing storm sewer systems or outlets at the watercourse crossings. For locations where the runoff discharges into an existing system, the minor system design storm peak flows must be controlled to the existing peak flows, for which the receiving system was designed.

TRCA has established quantity control targets for the watersheds under their jurisdiction. Details in this regard are summarized in Table 5-7.

Table 5-7: Summary of Water Quantity Control Criteria

Watershed	Water Quantity Control Criteria
Highland Creek	Control post development peak flows to pre-development levels for all storms up to and including the 100-year storm (i.e. 2-, 5-, 10-, 25-, 50- and 100-year storms).
Rouge River	Control post-development peak flows to pre-development levels for all storms up to and including the 100-year storm (i.e. 2, 5, 10-, 25-, 50-, and 100-year storms). Note: Further study is required to determine the appropriate level of control for lands draining to contributing tributaries of the above noted watercourses.

The TRCA criteria for water balance and erosion control requires retention of 5 mm of rainfall. This criterion is applicable to increased pavement area as a result of roadway widening/improvements.

5.2.2 Stormwater Management Mitigation

Stormwater management requirements and alternatives have been evaluated for proposed project. This assessment has been completed based upon the change in impervious coverage as determined from the capacity assessment. Where the drainage area has been identified as resulting in an increase in impervious coverage to the drainage outlet, it has been anticipated that this would correspondingly require stormwater management practices be implemented to mitigate the impacts of the additional impervious coverage, primarily with respect to quantity (i.e. flooding) impacts. The preliminary assessment of stormwater management constraints, documented in **Appendix C**, indicates that the proposed project includes areas which are highly constrained from a stormwater management perspective.

Various Best Management Practices (BMPs) alternatives are available to provide stormwater management for the additional impervious coverage resulting from the implementation of the EELRT. The BMPs alternatives for areas with impervious area increase are summarized in Table 5-8.

Table 5-8: Best Management Practices Available for Stormwater Management

Drainage Constraints	Water Quantity	Water Quality
High	• Online Storage Pipes with Increased Sewer Conveyance and Catchbasin Inlet Capacity • Underground Chambers with Increased Sewer Conveyance and Catchbasin Inlet Capacity	• OGS Units • Bioretention Cells • Infiltration Trenches • Vegetated Filter Strips
Medium	• Online Storage Pipes • Underground Chambers	
Low	• None Anticipated to Be Required	

These BMPs will be reviewed and assessed for their applicability during the detailed design stage. Other stormwater management alternatives (i.e. drainage area diversions) should also be investigated in future phases, to mitigate potential increases in peak flow to major and minor drainage systems representing the receivers from the right-of-way.

Due to the nature of the development area as a linear transportation corridor and the limited space within the roadway right-of-way, an available pervious area space will be assessed at the detailed design stage for the ultimate design. Low Impact Development Best Management Practices (LID BMPs) can then be incorporated at that stage to provide resilience for the municipal drainage system.

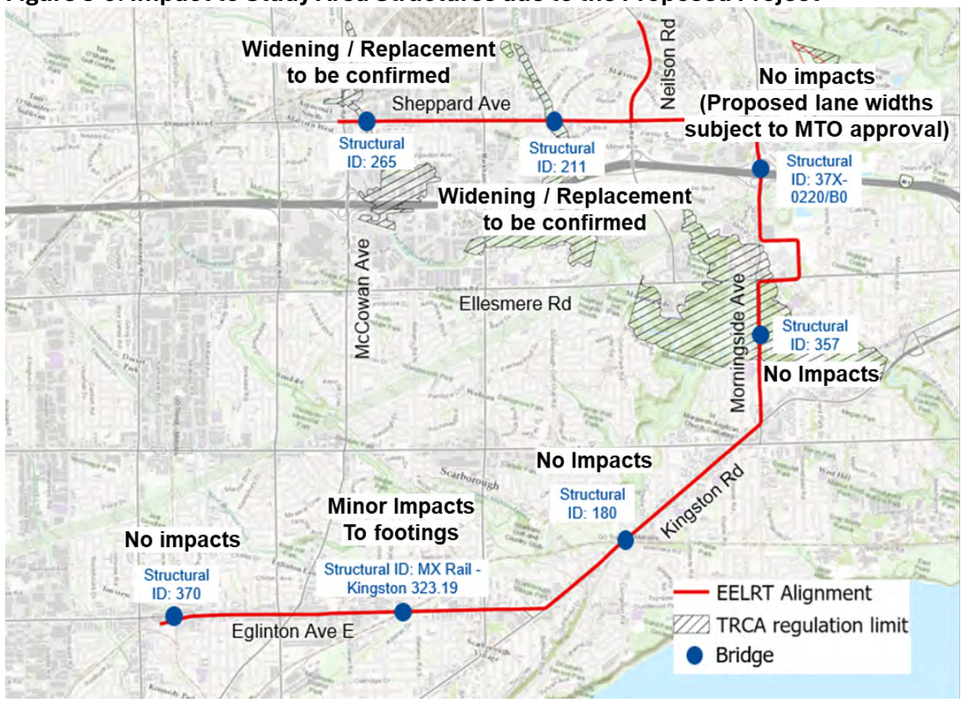
In terms of temporary impacts, the construction associated with the proposed structures and culvert works has the potential to alter water quality through on-site erosion of exposed materials and the subsequent impairment of downstream water quality with sediments and other contaminants. A detailed Erosion and Sediment Control Plan will be prepared in later design stages to develop site-specific erosion and sedimentation control measures to mitigate impacts to the drainage system from both a water quality and quantity perspective.

The proposed road improvements will result in additional impervious surface area. Stormwater management best practices, including catchbasin inserts, oil-grit separators, bioretention systems, exfiltration trenches, and online storage pipes, are proposed to be evaluated at the detailed design stage to provide stormwater quality treatment, water balance, erosion control, and quantity control for the increased runoff from the roadway right-of-way.

5.2.3 Bridges and Structures

Project impacts to study area bridges and structures are described in the Project Description Chapter 3.2.11 and are summarized in Figure 5-9 below.

Figure 5-9: Impact to Study Area Structures due to the Proposed Project



5.2.3.1 Permanent Impacts and Associated Mitigations

The proposed EELRT design has potential impacts to the SSE emergency exit buildings located at the intersections of Eglinton Avenue and Midland and Winter Avenues. Further coordination with Metrolinx will be undertaken in future phases of design to confirm impacts and identify necessary mitigations at these suspected conflict points.

The EELRT anticipates little or no permanent impacts to most bridge crossings along the study area, including Structures ID: 370, 323.19, 180, 357 and 37X-0220/B0. These existing structures can accommodate the proposed LRT and the new road configuration.

However, structures along Sheppard Avenue near McCowan Road (ID: 265) and Washburn Way / Lapsley Road (ID: 211) must be widened to facilitate the proposed project. This will be done while remaining within the existing available City right-of-way at these locations. The extent of this work, whether full replacement or rehabilitation and widening, has yet to be determined and will be confirmed in future phases of the study. Ultimately these decisions will inform the construction methodology and will influence the type of impact incurred and the mitigations required.

Engaging with stakeholders such as Metrolinx (Structure ID: MX Rail Kingston 323.19) and MTO (Structure ID: 37X-0220/B0) will also be required in efforts to mitigate any impacts to these existing structures, obtain approvals and streamline next steps for the design.

5.2.3.2 Temporary Impacts and Associated Mitigation

Where bridge works are proposed, construction impacts are anticipated. Near Sheppard Avenue and Washburn Way / Lapsley Road, adjacent to Burrows Hall Park, improvements to accommodate the LRT at the crossing (ID: 211) have the potential to temporarily impact nearby TRCA-owned lands during construction.

Temporary encroachment into the adjacent banks of the creek may be required and will be mitigated through the development of a construction staging and management plan. During the detailed design phase, plans will outline the extent of grading, label access routes and staging areas, and clearly display all disturbance areas, erosion, and sediment controls (ESCs), and communicate construction sequencing and phasing. There will be a need for a slope stability and erosion hazard assessment as well, to identify the risk and to develop appropriate measures to address the potential risk of the expanded bridge footprint. Any future access, stockpiling, staging, or construction work related to the project on TRCA lands will require further coordination with TRCA.

Beyond the functional design phase, infrastructure upgrades such as span sizes and structure dimensions will be refined and their impact on fluvial geomorphic processes, connections to natural corridors, and wildlife movement will be further investigated. Mitigation measures will need to address potential adverse impacts on the environment, local communities, and transportation systems, as appropriate, and will include considerations for:

- Vegetation, Habitat and Wildlife Protection and Restoration,
- Water Quality and Sediment Control Management,
- Noise and Air Quality Control,
- Traffic Management,
- Community Engagement,
- Stormwater Management,
- Emergency Preparedness, and
- Slope Stability and Erosion Hazard.

5.2.4 Utilities

5.2.4.1 Permanent Impacts and Associated Mitigation

Impacts on the existing surface and underground utility infrastructure are expected as a result of the construction of the LRT guideway, stations and stops and ancillary infrastructure. Impacts of the project on known, existing utilities are shown visually in the Utility Conflict Maps and Utility Conflict Matrix provided in **Appendix B**. Existing utilities are to be confirmed in future phases of design through the completion of subsurface utility investigations (SUE) to provide further information and accuracy on the type, size and location of all utilities.

Detailed utility relocation plans will be developed during detail design and follow all applicable standards. The project team will coordinate the proposed utilities relocation design with the City, TTC, Metrolinx, and potentially affected private utility owners. Potential utility conflicts shall be identified in consultation with each utility owner as part of detail design to develop applicable protection and/or relocation strategies prior to construction. Impacts to municipal servicing shall be consulted with the City of Toronto and required permits shall be obtained prior to construction.

5.2.4.2 Temporary Impacts and Mitigation

Potential impacts to surface and sub-surface utilities may include service disruptions to utility end-users / customers during construction. Impacts due to utility relocations include access restrictions, road closures, sidewalk closures, traffic detours and delays. Temporary utility impacts will ultimately depend on construction methodologies chosen.

Depending on the proposed location of the relocated utilities, impacts to the public can be limited and minimized dependent upon available space within the road allowance. To minimize potential disruption due to utility relocations, a construction staging plan will need to be developed during detail design. During future phases of design, utility conflicts will be reviewed and detailed utility relocation plans will be outlined. The solutions proposed in the design will follow all applicable standards.

5.3 Socio-Economic Environment

This section investigates the potential socio-economic and land use effects of the project within the study area as defined by an 800 m radius from the alignment. It presents recommendations for minimizing adverse impacts and establishing monitoring measures during construction and implementation.

5.3.1 Building and Property

5.3.1.1 Permanent Impacts and Associated Mitigation

By locating the majority of the EELRT project within municipal road allowances, the need for acquiring private property is reduced. However, land acquisitions are required to accommodate the LRT, associated infrastructure such as TPSSs and improvements to public space where the public right-of-way is limited. This includes property consolidations and expropriations of varying degrees for all direct and supporting LRT infrastructure.

As part of the functional design, a high-level space proofing assessment was performed for property requirements at the corners of each intersection to implement protected intersections where possible at the later design phase.

An assessment was conducted in conjunction with the City of Toronto using the Ontario Traffic Council (OTC) Protected Intersection Guide as reference and a simplified approach was developed to help guide the process. Daylight triangles dimensions were applied based on whether the intersection was a major or minor street crossing and whether the intersection was deemed to be a significant skewed crossing. These triangles are conservative in nature and are intended to reserve land at the corners for protected intersections without fully developing the detailed configuration specific to each individual intersection at the 10% functional design phase.

Ultimately, property acquisition will be necessary along the study area to obtain the parcels of land required to construct the system. According to the 10% functional design, approximately 380 properties will be impacted by the project. It should be noted that the actual property requirements can only be determined through completion of detailed design.

The City of Toronto will conduct all property acquisition for the project. In acquiring property, the City balances community needs with the rights of individual property owners, including tenants and business owners.

The City's objective is to ensure that the individual's rights are respected and protected, and to provide fair compensation within the framework of the Expropriations Act for any property interest 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. Only when negotiation has not produced an agreement and the property is required for construction to begin, will the City of Toronto initiate expropriation.

The property acquisition process and resulting compensation are intended to leave the affected owner "whole", thereby mitigating any negative impacts.

5.3.1.2 Temporary Impacts and Associated Mitigation

Most residential and business disruption impacts relate to the construction of the project and are temporary in nature. The impacts to homes, local businesses and recreational facilities can be primarily attributed to changes in vehicle and pedestrian movement patterns but may include the following:

- Reduced visibility of storefronts and signs,
- Reduced on-street parking,
- Less convenient access and disruption or closures to any off-street parking facilities, and
- Patron inconvenience due to temporary construction debris, noise, and dust.

Impacts to local residents and businesses due to general construction activities will be addressed indirectly through the mitigation efforts noted in other sections of this report (traffic and transit service, pedestrians and cyclists, noise, and dust, etc.). As mentioned previously, a number of mitigation measures will be developed prior to construction including, but not limited. to construction management and staging plans, traffic and transit management plans, temporary signal timing plans and emergency response plans. Construction work including utility relocation, excavation, and station building will be visible along the corridor as the project is implemented.

To ensure the project's success and to address concerns from impacted property and business owners, the project team will continue to learn from the successes and shortcomings of comparable transit projects, both locally and regionally. The project team is studying the Finch West LRT design and implementation closely and is also reviewing the Eglinton Crosstown LRT project comprehensively to identify further lessons learned that can be applied to the Eglinton East LRT project.

The City's Community Relations Team will work with and continuously inform communities, residents, business owners and institutions directly impacted by new construction. It is recommended that a Construction Liaison Committee be established to act as the community's advocate, develop relationships with the affected communities, receive and respond to questions and concerns, and anticipate community issues. The committee can also inform potentially affected property owners and businesses early in the process and provide appropriate follow through to minimize impacts on owners to the extent possible.

During the TRPAP, clear and accessible communication channels will be established. It is recommended that Frequently Asked Questions (FAQs) be developed to summarize readily available information regarding project impacts on the community, the study process, future consultation opportunities and proposed timelines. Should additional information be required, the public is encouraged to contact the City for answers to specific concerns.

In the next phases of design, properties that may be more susceptible to construction impacts can be identified and tailored mitigation plans developed for each. Prior to implementation, optimizing construction teams' schedules can be considered to minimize disruptions during peak hours or crucial times for property owners. For example, off-peak construction hours can help reduce inconvenience for residents and businesses.

The project team is committed to collaborating with the community throughout the project to design a system that meets the needs of those who would use it, while ensuring it is done in a way that supports the local community. Closer to construction, Community Benefits Agreements will be considered to prioritize supporting Scarborough communities, providing opportunities for economic development to the area.

During construction, the project team will coordinate with the community regularly and frequently by providing advanced notice and clear communication about the types and timeframes of impacts to bus service, traffic, and businesses.

5.3.1.3 Kennedy Station Area

Don Montgomery Community Recreation Centre (CRC) north parking lot (south of future EELRT terminal station) and Kennedy GO station will be impacted during construction and will be reconfigured in the ultimate condition, pending further design and coordination. Approximately 55 parking spaces will be eliminated due to the proposed LRT station footprint. In addition to completing a traffic impact study for the site, early and transparent communication with local residents and patrons of the CRC is essential to explain the parking changes, outline benefits of the LRT station and to address community concerns. Improvements to transit, the public realm, and cycling and pedestrian infrastructure will encourage active transportation as viable alternatives to driving to the CRC.

The project will avoid impacts to the City of Toronto Housing Now redevelopment vision for the site at 2444 Eglinton Avenue East, being located across the street as shown in Figure 5-10.

Figure 5-10: City of Toronto Housing Now redevelopment site at 2444 Eglinton Ave East

Source: City of Toronto Housing Now

5.3.2 Land Use, Demographics and Built-Form

All land uses will experience similar permanent impacts in the form of property takings to accommodate the LRT where there is limited right-of-way available as well as benefit from improved access to higher-order transit upon project implementation. In terms of temporary impacts, construction activities are expected to affect all land use types. It is strongly recommended that a suite of flexible and responsive community support initiatives be deployed, including engagement, local procurement opportunities, construction mitigation and opportunities for local employment through the project implementation.

Table 5-9 below presents a summary of impacts and associated mitigation and monitoring measures related to land use, demographics and built-form.

Table 5-9: Land Use, Demographics and Built-Form Impacts and Associated Mitigation and Monitoring Measures

Feature	Phase	Potential Impacts	Mitigation/Monitoring Measures
Land Use			
Mixed Use, Neighbourhoods & Apartment Neighbourhoods	**Construction**	• Emission, dust, noise, and vibration during construction • Potential road closures impacting access	• Refer to Chapter 5.6 (Emissions) for recommended mitigation measures related to noise and vibrations • Conduct a Dust Management Plan to identify ways to minimize dust and emission during construction • Explore alternative barrier-free pedestrian and active transportations routes to ensure continued access to the neighborhoods • Explore alternative vehicular routes during the time of construction to ensure seamless movement around the study area • Explore ways to consolidate entrances to ensure continued access to residences and businesses • Ensure safety during construction through clear wayfinding and signage in construction zones
	Operation	• LRT may attract demand for development and intensification	• Integrate EELRT impacts and implementation into ongoing planning studies (Avenue Study, EHON) to achieve city-building objectives and support strong neighbourhoods.
Parks and Open Spaces	**Construction**	• Potential road closures impacting access, regular park maintenance and watering • Potential damage to trees, grass, and vegetation during construction • Potential realignment of trails and routes • Potential impact to the ecosystem due to runoff from construction into natural areas	• Ensure access to parks by consolidating entrances and making at least one entrance open to public at any point in time • Necessitate barrier-free access to existing parks • Clear wayfinding to the parks amidst construction and clear signage indicating that the park is open • Establish Tree Protection Zones construction zones to ensure mature canopy is protected during the process • Ensure watering and maintenance access to trees and planting areas • Protect for alternative trail routes through Parks, Forestry and Recreation Study • Refer to Chapter 5.4 (Natural Environment) for details on natural environment mitigation measures
	Operation	• No adverse impacts anticipated during operations	• Mitigation and monitoring measures are not required during operation
Employment and Institutional Uses	**Construction**	• Emission, dust, noise, and vibration during construction	• Refer to Chapter 5.6 (Emissions) for recommended mitigation measures related to noise and vibrations • Conduct a Dust Management Plan to identify ways to minimize dust and emission during construction

Feature	Phase	Potential Impacts	Mitigation/Monitoring Measures
		• Potential road closures impacting access to institutional buildings, student residences, parking, employment, and loading / servicing • Access to parking spots may be restricted due to construction activity	• Explore alternative vehicular routes, especially for servicing and loading during the time of construction to ensure seamless movement around the study area • Ensure safety during construction through clear wayfinding and signage in construction zones
	Operation	• LRT may attract demand for development and intensification	• Integrate EELRT impacts and implementation into ongoing planning studies (Avenue Study, EHON) to achieve city-building objectives and support strong neighbourhoods
Demographics			
Population	**Construction**	• A prolonged period of construction may affect the everyday life and commute patterns for residents in the community	• Conduct a Traffic Impact Study to understand short and long-term impacts
	Operation	• The presence of the LRT will trigger changes in uses and increase density along the transit corridor raising demand for community services and facilities • Development activity triggered by the LRT will see a change in demographic profile, especially in Designated Avenues with Mixed Use designation like Eglinton Avenue where more residential units being added as part of future developments	• Conduct a Community Development Study to provide a framework for change and growth in the community and to advance initiatives to further enhance social cohesion, community safety, inclusive economic opportunities**,** and stronger neighborhoods • Explore strategies to protect local businesses and mitigate gentrification through a Community Development Study • Ensure demand for new schools, daycares, parks, recreation facilities and community amenities
Access to services (jobs, food and other basic necessities)	**Construction**	• Proximity to food and other necessities may be potentially impacted due to closing portions of main street during construction • Potential slowdown in business activity for existing commercial uses which may impact jobs	• Explore needs for social support and provision of reliable access to food and other basic necessities through a Community Development Study • Ensure barrier-free access to all buildings in the neighbourhood • Explore opportunities to protect small businesses along the corridor through a Community Development Study
	Operations	• No adverse impacts during operations	• Mitigation and monitoring measure are not required during operation
Neighbourhood Improvement Areas	**Construction**	• Neighborhood Improvement Areas (NIAs) within the study area such as Scarborough Village, West Hill, Morningside, Eglinton East and Golfdale- Cederbrae-Woburn will be further impacted during construction	• Integrate EELRT impacts and implementation into ongoing planning studies (Avenue Study, EHON) to achieve city-building objectives and support strong neighbourhoods
	Operation	• No adverse impacts anticipated during operations	• Mitigation and monitoring measures are not required during operation

Feature	Phase	Potential Impacts	Mitigation/Monitoring Measures
Built Form			
Public Realm	**Construction**	• Emission, dust, noise, and vibration during construction • Potential interruptions to sidewalks, existing active transportation infrastructure and public spaces impacting quality of life in the surrounding area • Potential removal of existing street trees in constrained locations	• Refer to Chapter 5.6 (Emissions) for recommended mitigation measures related to noise and vibrations • Develop a local Construction Management Plan to understand and mitigate construction impacts • Explore alternative pedestrian and cyclist routes during construction to ensure seamless movement for all • Establish Tree Protection Zones to ensure mature tree canopy is protected during construction • Develop a Tree Planting Plan to compensate for tree removals
	Operation	• No adverse impacts anticipated during operations • The project will increase the public realm attractiveness	• Mitigation and monitoring measure are not required during operation
New Development	**Construction**	• Potential interruptions to construction sites	• Maintain ongoing communication and coordination with developers of active sites to mitigate LRT construction impacts and eliminate potential conflicts • Plan construction activities to minimize interference with entrances, driveways, and parking areas • Develop and implement comprehensive traffic control plans to manage the flow of vehicles and pedestrians around construction zones. Clearly communicate temporary changes in traffic patterns to minimize disruptions • Explore opportunities for phased construction or schedule construction activities to minimize disruptions to ongoing developments
	Operation	• Increase in Transit Oriented Developments (TOD) near transit stations altering the existing built-form • The construction of LRT will make way for newer building typologies (denser and taller) that are different from the current urban fabric	• Conduct a Community Services and Facility Study to understand needs for new recreational and community uses

5.4 Natural Environment

The following section documents impacts, mitigation, and monitoring for the natural environment. The Natural Environment Report can be found in **Appendix E**.

5.4.1 Natural Heritage Impacts and Associated Mitigation

Table 5-10: Summary of Natural Heritage Anticipated Impacts, Mitigation and Monitoring Measures

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
Natural Environment			
Terrain and Soils	**Construction**	• The soils located along the Eglinton East LRT are susceptible to erosion and will be impacted during construction due to clearing, excavation and grading • Consequently, soil disturbance associated with drainage improvements, grading revisions, culvert extension, etc. may result in erosion of, and sedimentation to, sensitive receiving watercourses • Improper management of excess soil can also negatively affect ground or surface water quality and/or quantity in natural areas and agricultural lands	**Erosion and Sediment Control** • Standard erosion and sediment control measures will be followed during construction in accordance with Ontario Provincial Standard Specification (OPSS) 805 – Construction Specification for Temporary Erosion and Sediment Control Measures (2010) to minimize construction-related impacts on surface water quality and fish habitat • Site-specific erosion and sedimentation control measures to be implemented prior to construction will be identified during later design stages following best management practices recommended in the following documents: o Erosion and Sediment Control Guideline for Urban Construction (Greater Golden Horseshoe Area Conservation Authorities 2006) o Best Management Practices Manual for Fisheries (MTO 2017) o Environmental Guide for Erosion and Sediment Control during Construction of Highway Projects (MTO 2007) o Erosion and Sediment Control (ESC) Guideline of Urban Construction (TRCA 2019) • These guidance documents will be used to prepare a detailed Erosion and Sediment Control Plan that will implement a multi-barrier solution that includes: o Placing straw bale/rock flow checks at regular intervals in ditches down-gradient from areas of soil disturbance in rural sections o Protecting inlets to catch basins and maintenance holes in urban sections o Placing silt fence along stream margins in areas of soil disturbance o Managing stormwater during construction to prevent contact with exposed soils o Implementing erosion control products within exposed areas, such as erosion control blankets, coir logs, tackifier and mulch

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
			○ Implementing temporary stormwater treatment measures during construction including sediment bags, sediment basins/ponds, diversion swales, pumping/drawdown of sediment basins/ponds ○ Limiting the extent and duration that soils are exposed to the elements to the minimum area and time necessary to perform the work ○ Applying seed and mulch, tackifier and/or erosion control blanket in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization ○ Monitoring and maintenance of erosion and sedimentation control measures during construction to ensure their effectiveness ○ Frequent monitoring of watercourses for suspended solids during construction and long-term for any installed sewage works • Temporary erosion and sediment controls shall be inspected on a regular basis in accordance with the following documents: ○ Erosion and Sediment Control Inspection Guide (TRCA 2008) ○ Silt Smart: Erosion and Sediment Control Effectiveness Monitoring and Rapid ○ Response Protocol for Large Urban Development Sites (CVC, MNRF, MECP and ○ DFO 2012) ○ Construction Administration and Inspection Task Manual (MTO 2007) • As a minimum, erosion and sediment control measures shall be inspected daily during installation, prior to forecasted major storm events, during snowmelt and following significant storm events. Inspections for routine maintenance of erosion and sediment controls shall occur once per week unless maintenance/repairs are required upon inspection and after significant storm events • These environmental protection measures will greatly reduce the potential for soil erosion and impairment of surface water quality and fish habitat

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
			Excess Soil Management • It is critical to highlight the importance for the project constructor to implement a cradle-to-grave approach and comply with O. Reg. 406/19 and other applicable regulations related to the proper disposal of excess soils. Best practices include: o Implementing plans and procedures to ensure soil is properly tested and characterised, stockpiled on site, hauled (with licensed haulers) and disposed of at legitimate receiving sites (i.e., beneficial re-use sites and/or registered disposal sites) o Adopting a robust tracking system to ensure all soil leaving the site is being taken to the correct location (as described in a soil destination report) o Hauling of soil by vetted haulage companies. To ensure all soil is being hauled transparently, it is best to deal directly with the haulage company and not a third-party company o Compiling a contingency receiving site list in case receiving sites reach capacity and/or are no longer accepting soil o Ensuring the Soil Registry is kept up to date with receiving sites and soil movements
	Operation	• No adverse impacts anticipated during operations	• Mitigation and monitoring measures are not required during operation
Fish and Fish Habitat	**Construction**	**Main Branch Highland Creek** • The existing bridge located at this watercourse crossing can accommodate the proposed EELRT; therefore, no in-water work will be required, and no harmful alteration, disruption, or destruction (HADD) of fish habitat is anticipated **Markham Branch of Highland Creek** • To accommodate the LRT guideway, while maintaining 4 lanes and meeting the current City public realm standard, widening or replacement of this bridge is anticipated. Feasibility of widening and/or replacement will be analyzed during the next design phase. The potential for a HADD and any mitigation measures required will be determined at that time **Malvern Branch of Highland Creek** • To accommodate the LRT guideway, while maintaining 4 lanes and meeting the current City public realm standard, widening or replacement of this bridge is anticipated. Feasibility of widening and/or replacement will be analyzed during the next design	• The following mitigation measures will be employed to avoid/minimize impacts to the aquatic environment during construction: **Maintenance of Riparian Vegetation** • Prior to construction, trees / shrubs to be retained will be clearly identified in the field by the installation of tree/shrub protection barriers • In areas where riparian vegetation removal is necessary to accommodate construction, measures to protect the local fish communities shall include the following: no clearing of mature trees providing a bank stabilization function; no felling of trees into the watercourse; minimize the amount of debris produced from entering the watercourse; and only clear the vegetation required to complete the necessary works • Planting plans will be completed, that includes planting native trees, shrubs, and native seeding at each watercourse crossing, to replace and enhance the riparian communities **Soils, Erosion and Sediment Control, and Surface Water** • Placing flow checks at regular intervals in roadside ditches down-gradient from areas of soil disturbance to trap suspended sediments and reduce the erosive force of runoff • Placing silt fence along watercourses, ditches, wetlands, and forest/woodland edges in areas of soil disturbance

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
		phase. The potential for a HADD will be determined at that time **Tributary of Morningside Creek** • The existing culvert located at this watercourse crossing can accommodate the proposed EELRT; therefore, no in-water work will be required, and no HADD is anticipated at this location • The culvert located downstream of this crossing on the south side of the MSF site is recommended to be removed and an open channel constructed. Further discussions will be conducted with TRCA during later design phases to determine approval requirements. A Request for Review will be submitted to DFO to determine if a HADD will occur and what measures will be taken to compensate for the HADD, if warranted. No modifications to the watercourse located on the east side of the MSF are anticipated	• Limiting the extent and duration that soils are exposed to the elements to the minimum area and time necessary to perform the work • Managing stormwater during construction to prevent contact with exposed soils • Applying seed and mulch, tackifier and/or erosion control blanket in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization • Monitoring and maintenance of erosion and sedimentation control measures during construction to ensure their effectiveness • Frequent monitoring of watercourses for suspended solids during construction and long-term for any installed sewage works • Any dewatering will have discharge directed to a sediment containment system (sediment basin, sediment bag, etc.) prior to release to the watercourse **Contamination of Surface Water from Other Sources** • Storage, stockpiling and staging areas will be delineated prior to construction and inspected in accordance with the Erosion and Sediment Control Guideline for Urban Construction (GGHA 2006) • Construction material, excess material, construction debris, and empty containers will be stored at least 30 m distance from watercourses and watercourse banks to prevent their entry into watercourses • Equipment refueling, maintenance and washing activities will be conducted at a pre-determined site located at an adequate distance (minimum 30 m) from the watercourses and their banks located within the study area to prevent the entry of petroleum, oil or lubricants (POL) or other deleterious substances (including any debris, waste, rubble or concrete material) into watercourses within the study area, or their release to the environment. Any material which inadvertently enters the watercourses will be removed by the contractor in a manner satisfactory to the Contract Administrator • All spills that could potentially cause damage to the environment shall be reported to the Spills Action Centre of the MECP. In the event of a spill, containment and clean-up will be completed quickly and effectively. An NSSP (Spill Prevention and Response Contingency Plan) must be included in the contract package to ensure a Spill Prevention and Response Contingency Plan and the appropriate contingency materials to absorb or contain any petroleum products/spills that may be accidentally discharged should always be on site

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
			Changes to Water Quality and Quantity • Changes to water quality during construction will be mitigated through the isolation of the work areas, the treatment of effluent from dewatering (if applicable) prior to its release back into the receiving watercourse, and the deployment and maintenance of erosion and sediment controls (silt fencing, flow checks, etc.) which will prevent sediments from reaching the watercourse from exposed soils upslope. In addition, all exposed areas should be vegetated as quickly as possible once the work is completed **In-Water Works** • At warmwater watercourses (Markham Tributary, Malvern Tributary and Morningside Tributary), no in-water work (or work on watercourse banks) will be permitted from March 15 to June 30 to protect spawning warmwater fish, incubating eggs, and fry emergence • At coolwater watercourses (Highland Creek), no in-water work (or work on watercourse banks) will be permitted from September 15 to June 30 to protect spawning coolwater fish • Where cofferdams are to be employed, dewatering effluent will be treated prior to discharge • Cofferdams will be constructed using pea gravel bags, sheet piling or other appropriate material to isolate the work area: flow will be maintained at all stations • Only clean material free of particulate matter will be placed in the watercourse • Fish isolated by construction activities (if present) will be captured by a qualified fisheries specialist and safely released to the watercourse **Species-at-Risk** • No aquatic species at risk are found within the project limits
	Operation	• No adverse impacts anticipated during operations	• Mitigation and monitoring measures are not required during operation
Vegetation Communities	**Construction**	• Construction of the Eglinton East LRT has the potential to result in impacts to vegetation and vegetation communities. Effects on vegetation related to the construction of the LRT and associated facilities could include: o Displacement of and/or disturbance to vegetation and vegetation communities o Displacement of and/or disturbance to Rare, Threatened or Endangered Vegetation and Vegetation Communities	• The implementation of the following measures will help to monitor and mitigate potential impacts on vegetation and vegetation communities: o **Avoidance:** The EELRT has been designed to avoid terrestrial ecosystems to the extent possible. Minor refinements to the current alignment may occur during later design stages on a site-specific basis to minimize footprint area and avoid natural heritage features, where practical. Where avoidance cannot be achieved, restoration and enhancement measures will be identified to replace vegetation communities lost as a result of the LRT, following TRCA policies

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
		• Impacts to wetland communities within the study area will primarily be too shallow marsh communities largely dominated by European reed. It is expected that post-construction, new wetland areas will be created due to changes in drainage related to the construction of the Eglinton East LRT and its related components • Impacts to forest communities within the study area will primarily result in the new removal of the deciduous forest community within the maintenance and storage facility lands. Compensation and enhancement measure will be identified during later design stages in consultation with the City of Toronto and TRCA • Clearing of vegetation will be required to accommodate the proposed construction of the Eglinton East LRT. The proposed construction will result in the removal of approximately 10.46 ha of naturalized and human influenced areas. The largest area of impact will be to lands that have been anthropogenically influenced including cultural vegetation communities and a restoration area • The breakdown of the impacts is as follows: o Cultural – Dry-Moist Old Field Meadow (CUM1-1): 9.56 ha – Scotch Pine Coniferous Plantation (CUP3-3): 0.06 ha – Mineral Cultural Woodland (CUW1): 0.14 ha o Wetland – Shallow Marsh (MAS2): 0.57 ha o Human Influenced Lands – Restoration Area: 0.13 ha • A total of 9.89 ha of cultural vegetation communities and human influenced lands will be removed due to the proposed project. The largest impact will be to cultural meadow communities (CUM1-1) within the lands identified for the maintenance and storage facility. Overall, impacts resulting in the loss of vegetation within these cultural vegetation communities are considered minor. Cultural	o **Restoration and Enhancement:** Restoration and enhancement measures to mitigate the removal of wetland and forest communities will be determined through consultation with agencies and the municipality during a future design stage. Restoration and enhancement measures will be implemented in accordance with MNRF and TRCA policies. The TRCA Guideline for Determining Ecosystem Compensation (2023) identifies wetland offsetting programs as one of the most successful approaches to addressing wetland loss. Wetland offsetting often require the restoration of a larger wetland than the wetland impacted. • **Invasive Species Management:** Efforts to control non-native and invasive plant species that have become established, as well as prevent the establishment of new non-native and invasive plant species at a minimum should include the following: o Where there are dense patches of common buckthorn, swallow-wort or garlic mustard, the appropriate removal and control of these species by a qualified specialist should be undertaken o Minimize the exposure of bare soil, where bare soil must persist over a period of time these should be planted with a non-invasive annual cover crop for an interim period; and, o No non-native and invasive ornamentals plants should be used for landscaping (e.g., Norway maple, purple loosestrife, Japanese knotweed, Japanese honeysuckle, etc.) • **Planting Plans:** A detailed planting plan will be developed during a later design stage once areas identified for restoration have been determined in consultation with the respective agencies. It is recommended that the planting of forest and wetland habitat be undertaken with the appropriate native and non-invasive plant species which will be presented on site-specific plans to be developed by an experienced landscape architect • **Construction Best Management Practices:** At a minimum, the following mitigation measures will be implemented during construction: o Vegetation cover will be used to protect any exposed surfaces in accordance with OPSS 804 - Construction Specification for Seed and Cover o Topsoil from stockpiles to be in accordance with OPSS 802 o Old field seed mix and mulching or erosion control blanket (in accordance with NSSP-Erosion Control Blanket) will be placed in areas of soil disturbance to provide adequate slope protection and long-term slope stabilization

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
		vegetation communities typically persist in areas that are regularly disturbed, and as a result, contain a high proportion of invasive and non-native plant species that are tolerant of these conditions • In addition, a total of 0.57 ha wetland communities will be removed. The largest area of impact to vegetation communities will occur at the maintenance and storage facility on Sheppard Avenue. No impacts will occur to vegetation communities located within the Morningside Park ESA or the forest community within the maintenance/storage facility lands	o Tree protection to be in accordance with OPSS 801 - Construction Specification for the Protection of Trees o The Seed Mix Guideline (TRCA 2022) will be followed to support the selection of appropriate seed mixes suitable to the various adjacent habitats • To mitigate impacts during construction, Tree Protection Zones and a Parks, Forestry and Recreation Study are recommended to maintain existing planting zones as much as possible
	Operation	• No adverse impacts anticipated during operations. Disturbance activities often serve to promote the establishment and/or spread of certain plant species such as those disturbance tolerant species	• Mitigation and monitoring measures are not required during operation
Wildlife and Wildlife Habitat	**Construction**	• The project will be constructed primarily within the right-of-way of existing municipal roads. The existing right-of-way will be widened; however, the area of encroachment consists of previously modified/disturbed terrestrial wildlife habitat with low habitat structure and diversity and limited habitat capability. Consequently, the development of the LRT will have no significant effect on wildlife and wildlife habitat along the running way • Most of the wildlife habitat to be removed is located at the Maintenance and Storage Facility on Sheppard Avenue. Development at the MSF will result in the removal of CUM1-1, CUW1, MAS2 and FOD vegetation communities, although the majority of the FOD vegetation community is located on the valley slope and will likely not be heavily impacted by the MSF • Implementation of the project has the potential to result in impacts to wildlife and wildlife habitat. Effects related to the construction of the Eglinton East LRT and associated facilities include: o Displacement of wildlife and wildlife habitat o Barrier effects on wildlife passage o Wildlife/vehicle conflicts o Disturbance to wildlife from noise, light, and visual intrusion o Potential impacts to migratory birds	• Prior to construction, a wildlife sweep should be carried out at the MSF to drive wildlife away from the work zone. Wildlife that cannot be dispersed from the work zone should be captured and transported to nearby suitable habitats outside of the work zone • A Scientific Collectors Permit will be obtained from MNRF prior to wildlife salvage activities • A more detailed evaluation of bat habitat and the occupancy of their habitat will be completed as part of the permitting phase of the project in advance of construction. Should bat maternity roosts be identified, consultation with MECP should be carried out to confirm permitting requirements. Vegetation removals should not be carried out during the active period, which typically extends from April 1 to September 31 • Several bird species listed under the Migratory Birds Convention Act (MBCA) are located within the study area. While migratory insectivorous and non-game birds are protected year-round, migratory game birds are only protected from March 10 to September 1. To comply with the requirements of the MBCA, disturbance, clearing or disruption of vegetation where birds may be nesting should be completed outside the window of April 1 to August 15. In the event that these activities must be undertaken from April 1 to August 15, a nest survey will be conducted by a qualified avian biologist to identify and locate active nests of species covered by the MBCA

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
		○ Displacement of rare, threatened, or endangered wildlife or significant wildlife habitat • Wildlife surveys conducted in 2023 confirmed the presence of the following rare, threatened or endangered wildlife: ○ **Barn Swallow** Barn Swallow is regulated as 'Special Concern' under the ESA and under SARA. One Barn Swallow was observed during the 2023 field investigations exhibiting foraging behaviour. No active or historical nests were observed for this species; however, potential nesting structures are present within the study area. Since no active or historical nests were observed, the single Barn Swallow observation exhibited foraging behaviour and Barn Swallow are currently regulated as a 'Special Concern' species, no impacts to Barn Swallow are anticipated to occur and no permitting is expected ○ **Chimney Swift** Chimney Swift is regulated as 'Threatened' under the Ontario ESA and is afforded habitat protection and is also listed as 'Threatened' on Schedule 1 of the Canada SARA. Chimney Swift were observed flying overhead nearby residential and naturalized lands associated with BBS Station 4 during the morning of July 5, 2023. While the Chimney Swift observation was a flyover, with no evidence of nesting or obvious nesting structures, no impacts to Chimney Swift are anticipated to occur and no permitting is expected for this species • Bats are also anticipated to occur in the study area, although formal bat surveys were not carried out	

Feature Phase	Phase	Potential Impact	Mitigation/Monitoring Measure
	Operation	• No new barriers to wildlife passage are expected to occur because of the construction of the EELRT. Major watercourse crossings, which provide passage for wildlife, will be maintained, or new bridges/culverts will be installed • Given that wildlife found within the study area are acclimatized to the presence of road infrastructure, disturbance to wildlife from any increase in noise, light and visual intrusion potentially caused by the operation of the EELRT are not expected to have any significant adverse effects • Wildlife/vehicle conflicts appear to be very minor at present within the EELRT corridor as it follows existing roads. Watercourse crossings will be bridges/culverts, which should minimize wildlife/vehicle conflicts	• All new bridges/culverts should be reviewed during later design phases to ensure that as a minimum, existing openness ratios are maintained • Potential disturbance caused by light pollution from the EELRT median and stops can be mitigated by using reflectors to focus light beams onto the facilities and away from natural heritage features adjacent to the EELRT. Focused lighting should also be employed at the maintenance and storage facility to avoid light spillage into the adjacent Morningside Creek Forest/Milnes Forest located north of the facility
Designated Natural Areas	**Construction**	• No adverse impacts during construction as construction can be staged within the existing road pavement and available City right-of-way • Potential encroachment during construction into TRCA-owned lands near structures along Sheppard Avenue, to be determined in future phases based on ultimate bridge crossing design, footprint and recommended construction methodology	• Encroachment into the adjacent banks of the creek may be expected during construction and will be mitigated through the development of a construction staging and management plan • During the detailed design phase, plans will outline the extent of grading, label access routes and staging areas, and clearly display all disturbance areas, erosion and sediment controls (ESCs), and outline construction sequencing and phasing • There will be a need for a slope stability and erosion hazard assessment as well, to identify the risk and to develop appropriate measures to address the potential risk of the expanded bridge footprint • Coordination with TRCA throughout is recommended as the design at creek crossings advance
	Operations	• No impacts to designated natural areas are anticipated to accommodate the Eglinton East LRT as the EELRT will be constructed primarily within the right-of-way of existing municipal roads. For example, near Morningside Park and Highland Creek where most ESAs, PSWs and ANSIs are concentrated, the EELRT proposes no encroachment beyond the existing available City ROW • In locations where the existing ROW is proposed to be widened, the areas of encroachment do not consist of designated natural areas but generally of previously modified/disturbed environmental conditions	• As no adverse impacts are anticipated during operations, no mitigation and monitoring measures are required during operation

5.4.2 Contamination / Limited Phase 1 ESA

Preliminary environmental screening was conducted in the study area to review information and data on incidents that have the potential to pose an environmental risk and possibly contribute to environmental impacts related to soil and groundwater in the study area.

Based on the evaluation of the historical data and site reconnaissance, one (1) potentially contaminating activity (PCA) on the project site and ninety-four (94) PCAs within the study area (250 m buffer around the project site) were identified.

Sixty-five (65) of the ninety-four (94) PCAs identified in the study area were considered an environmental concern due to the nature of the activities and their proximity to the project area. For more details, please see Chapter 4.4.7 and **Appendix K**.

Based on the Limited Phase 1 ESA findings, a Phase 2 ESA should be undertaken to assess the soil and groundwater quality underlying the project site.

5.5 Cultural Environment

This section documents the impacts, mitigation, and monitoring associated with the Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) as well as Archaeological Resources in the Study Area. The Cultural Heritage Report can be found in **Appendix F.**

5.5.1 Built Heritage Resources and Cultural Heritage Landscapes

To assess the preliminary impacts of the proposed infrastructure improvements on identified BHRs and CHLs in the study area, identified resources were considered against a range of possible impacts as outlined by the MCM (2019). Impacts may be positive or negative, direct, or indirect, and may affect the property's potential cultural heritage value or interest. Additional factors such as the scale or severity of the impact, whether any changes are temporary or permanent, and if the alterations are reversible or irreversible, should be considered.

An initial review of federal, provincial, and municipal registers, inventories, and databases, background information and fieldwork revealed that there are two (2) known and five (5) potential built heritage resources (BHRs) as well as one (1) known and three (3) potential cultural heritage landscapes (CHLs) in the study area, as follows:

- BHR 1: 3739 Kingston Road,
- BHR 2: 3741 Kingston Road,
- BHR 3: 3750 Kingston Road,
- BHR 4: Guildwood Parkway and Kingston Road,
- BHR 5: 4234 Kingston Road,
- BHR 6: 156 Galloway Road,
- BHR 7: 344 Morningside Avenue,
- CHL 1: Morningside Avenue from Fairwood Crescent to Tefft Road,
- CHL 2: 130 Old Kingston Road,
- CHL 3: Highland Creek, and
- CHL 4: 130 Old Kingston Road.

CHLs, BHRs, anticipated impacts and proposed mitigations are summarized in Table 5-12.

The proposed project is anticipated to result in direct adverse impacts to three BHRs and one CHL, as follows:

- Impacts to 3750 Kingston Road (BHR 3) are anticipated to include: encroachment, the potential to impact views to and from the BHR, and the potential to impact its setting through the addition of the landscaped tree planter.
- Impacts to 156 Galloway Road (BHR 6) are anticipated to include: encroachment, reconfiguration of the existing sidewalk, and the construction of a cycle track.
- Impacts to 344 Morningside Avenue (BHR 7) are anticipated through removal of the structure on this property.
- Impacts to Morningside Avenue from Fairwood Crescent to Tefft Road (CHL1) are anticipated through removal of several structures within the streetscape. The properties proposed for removal are: 304 Morningside Avenue, 306 Morningside Avenue, 308 Morningside Avenue 310 Morningside Avenue, 314 Morningside Avenue, 316 Morningside Avenue, 318 Morningside Avenue, 320 Morningside Avenue, and 324 Morningside Avenue.

The proposed work is anticipated to result in potential vibration impacts to seven BHRs and two CHLs: 3739 Kingston Road (BHR 1), 3741 Kingston Road (BHR 2), 3750 Kingston Road (BHR 3), Guildwood Parkway and Kingston Road (BHR 4), 4234 Kingston Road (BHR 5), 156 Galloway Road (BHR 6), 344 Morningside Avenue (BHR 7), Morningside Avenue from Fairwood Crescent to Tefft Road (CHL 1), and University of Toronto Scarborough Campus; 1265 Military Trail, Toronto (CHL 4). No impacts are anticipated to two CHLs: 130 Old Kingston Road (CHL 2) and Highland Creek (CHL 3)

Proposed mitigations strategies to cultural heritage in the study area are provided below:

- Vibration impacts are anticipated for nine (9) heritage resources: BHR 1, 2, 3, 4, 5, 6, and 7, and CHL 1 and 4. A baseline vibration assessment should be undertaken during detailed design to ensure that identified properties are not adversely impacted during construction. A vibration monitoring plan should be prepared and implemented to minimize vibration impacts, or where potential vibration impacts cannot be avoided, the property should be included in a condition assessment of structures.

- No anticipated direct or indirect impacts were identified for two (2) heritage resources: CHL 2 and 3. No further heritage reporting is required for these resources at this time.

- Cultural Heritage Evaluation Reports (CHERs) are recommended to be completed during TRPAP for two (2) resources: BHR 7, and CHL 1; if impacts cannot be avoided. A CHER will determine if each individual property is a significant cultural heritage resource and recommend whether further assessment is required to ensure cultural heritage value is conserved. If Cultural Heritage Value or Interest (CHVI) is determined, a Heritage Impact Assessment (HIA) should be undertaken in detailed design.

- Heritage Impact Assessments (HIAs) are recommended to be completed as early as possible during detailed design for two (2) resources: BHR 3 and BHR 6. These resources are designated, in whole or in part, under Part IV of the Ontario Heritage Act and will experience impacts to their properties due to the project's undertaking. As such, HIAs are recommended to understand and identify the impacts to the cultural heritage attributes, and to recommend appropriate mitigative measures to reduce or remove the impact to the resources.

Should it be determined that there are no other technically feasible options than to encroach on CHL or BHR properties, a HIA will be undertaken by a qualified person as early as possible during detailed design, and developed in consultation with, and submitted for review to, the Ministry of Citizenship and Multiculturalism (MCM) and interested parties including the municipal heritage planner and/or municipal heritage committee and Indigenous Nations, as appropriate. A heritage permit may be required and further consultation with heritage staff at the municipality is recommended.

Should future alterations to the proposed design introduce potential new property impacts, these impacts are to be assessed by a qualified cultural heritage professional in an addendum and submitted for review.

5.5.1.1 Cultural Heritage Evaluation Report Findings

Cultural Heritage Evaluation Reports for BHR 7, and CHL 1 were developed to determine if each individual property is a significant cultural heritage resource and recommend whether further assessment is required to ensure cultural heritage value is conserved.

Based on the results of historical research, field review, consultation, comparative analysis, and application of the Ontario Regulation 9/06 Criteria, none of the properties along Morningside Avenue are of cultural heritage value or interest (CHVI).

Table 5-11: Cultural Evaluation Report Preliminary Findings

Feature ID	Address	Meets 9/06 Criteria
BHR 7	344 Morningside Avenue	Does Not Meet
CHL 1	304 Morningside Avenue	Does Not Meet
	306 Morningside Avenue	Does Not Meet
	308 Morningside Avenue	Does Not Meet
	310 Morningside Avenue	Does Not Meet
	314 Morningside Avenue	Does Not Meet
	316 Morningside Avenue	Does Not Meet
	318 Morningside Avenue	Does Not Meet
	320 Morningside Avenue	Does Not Meet
	324 Morningside Avenue	Does Not Meet

Given that no Cultural Heritage Value or Interest (CHVI) has been found, no Heritage Impact Assessments (HIA) are required in detailed design.

Table 5-12: Summary of Cultural Heritage Assessment, Impacts and Mitigation

ID	Location	Heritage Status / Designation	Direct Impacts	Indirect Impacts	Proposed Mitigation Strategies
BHR1	3739 Kingston Road	Potential BHR	No direct adverse impacts anticipated	Indirect impacts possible due to construction activities in proximity to BHR	• A baseline vibration assessment must be undertaken during detailed design
BHR2	3741 Kingston Road	Potential BHR	No direct adverse impacts anticipated		
BHR3	3750 Kingston Road	Known BHR, Designated under Part IV of the Ontario Heritage Act (Bylaw 18102)	Direct impacts to this property include: • Encroachment (~ 5.8 m) • Potential impact to views to and from the BHR • Potential impact to setting through the addition of the landscaped tree planter	Indirect impacts possible due to construction activities in proximity to BHR	• A Heritage Impact Assessment (HIA) must be undertaken during detailed design. A heritage permit may be required and further consultation with municipal heritage staff and Indigenous Nations is recommended. • A baseline vibration assessment must be undertaken during detailed design
BHR4	Guildwood Parkway and Kingston Road	Potential BHR *(identified in previous report, ASI 2009)*	No direct adverse impacts are anticipated as the pillars and associated potential heritage attributes will not be directly impacted	Indirect impacts possible due to construction activities in proximity to BHR	• A baseline vibration assessment must be undertaken during detailed design
BHR5	4234 Kingston Road	Potential BHR *(identified in previous report, ASI 2009)*	No direct adverse impacts anticipated	Indirect impacts possible due to construction activities in proximity to BHR	• A baseline vibration assessment must be undertaken during detailed design
BHR6	156 Galloway Road	Known BHR, Designated under Part IV of the Ontario Heritage Act (Bylaw 20972)	Direct impacts are anticipated through: • Encroachment (~ 2.3 m) • Reconfiguration of the existing sidewalk • The construction of a cycle track This will trigger the requirement for an HIA	Indirect impacts possible due to construction activities in proximity to BHR	• A Heritage Impact Assessment (HIA) must be undertaken during detailed design. A heritage permit may be required and further consultation with municipal heritage staff and Indigenous Nations is recommended. • A baseline vibration assessment must also be undertaken during detailed design
BHR7	344 Morningside Avenue	Potential BHR (identified in previous report, ASI 2009)	Direct impacts are anticipated through: • Removal of the structure on this property • Encroachment (~11.8 m)	Indirect impacts expected due to construction activities in proximity to BHR	• A CHER has been undertaken during the TRPAP and has determined that this property does not have cultural heritage value or interest.
CHL1	Morningside Avenue from Fairwood Crescent to Tefft Road	Potential CHL (identified in previous report, ASI 2009)	Direct impacts are anticipated through removal of several structures within the streetscape. The properties proposed for removal are: 304, 306, 308, 310, 314, 316, 318, 320 and 324 Morningside Avenue.	Indirect impacts possible due to construction activities in proximity to BHR	• A CHER has been undertaken during the TRPAP and has determined that these properties do not have cultural heritage value or interest. • A baseline vibration assessment must also be undertaken during detailed design
CHL2	130 Old Kingston Road	Known C.H.L. – Designated under Part IV of the Ontario Heritage Act (Bylaw 302-1998 and 744-2001)	No direct adverse impacts are anticipated to the known heritage attributes of the property.	No indirect impacts are anticipated due to construction activities as the structure on this property is set back more than 100 m from the proposed work	• As no heritage attributes are anticipated to be impacted, no mitigation is required.
CHL3	Highland Creek	Potential CHL (identified in previous report, ASI 2009)	No direct adverse impacts as proposed project will not result in encroachment onto this watercourse and the resulting visual conditions will be like existing.	No indirect impacts anticipated	• As no heritage attributes are anticipated to be impacted, no mitigation is required.
CHL4	130 Old Kingston Road	Potential CHL (identified in previous report, ASI 2009)	No direct adverse impacts are anticipated to the potential heritage attributes of the property	Indirect impacts possible due to construction activities in proximity to CHL	• A baseline vibration assessment must be undertaken during detailed design.

5.5.2 Archaeological Resources

The Stage 1 background research for the project footprint study area determined 18 previously registered archaeological sites are located within one km of the study area, two of which are within approximately 50 metres and do not exhibit further cultural heritage value or interest.

The property inspection determined that the following properties within the project footprint, beyond areas that have been previously assessed or are disturbed, exhibit archaeological potential and will require Stage 2 archaeological assessment:

- 3739 Kingston Road
- 3741 Kingston Road
- 38 Warnsworth Street
- 3295 Ellesmere Road
- 7600 Sheppard Avenue East
- 1085 Neilson Road
- 10 Tapscott Road

Figure 5-11: Sites Requiring Stage 2 Archaeological Assessment

Source: Google Streetview

The remainder of the study area may be considered clear of archaeological concern, on account of deep and extensive land disturbance, slopes exceeding 20 degrees, or being previously assessed.

The Stage 2 archaeological assessment, and any further stages of archaeological assessment recommended in the Stage 2 report, will be undertaken by an archaeologist licenced under the OHA as early as possible during the detailed design process and prior to any ground-disturbing activities.

Should previously undocumented archaeological resources be discovered during construction, the person discovering the archaeological resources shall cease alteration of the site immediately and engage a licensed consultant archaeologist to conduct an archaeological assessment, in compliance with Section 48(1) of the OHA. If the discovery includes human remains, the police or coroner shall also be notified.

Should the proposed work extend beyond the current study area, further archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.

5.6 Emissions

5.6.1 Air Quality

The project itself is not a source of air emissions as it is an electrified rail system and will displace emissions that would otherwise be generated by alternative forms of transport, such as private vehicles or buses. However, the existing traffic conditions on the roads surrounding the project are expected to be impacted and are the focus of this study. The assessment was conducted as per the general guidance provided by the Ministry of Environment, Conservation, and Parks (MECP).

Construction activities have the potential to create temporary, localized effects on air quality in the immediate vicinity of the proposed Project. Emissions from construction are primarily comprised of fugitive dust and combustion products from the movement and operation of construction equipment and vehicles. These emissions, in turn, may create a nuisance or disturbance effect for local residents and land users during the construction phase. Mitigation measures to reduce potential nuisance effects of dust and air emissions include the following:

- Regular maintenance of equipment used on site to minimize exhaust.
- Use of effective dust suppression techniques to minimize fugitive dust, such as on-site watering, as necessary.
- Reducing speed limits on unpaved areas for mobile equipment.
- Optimization of material transfer operations, including reducing distance for material transfers, if possible.

- Following a response protocol to record, keep on file and address formal complaints.
- Frequent monitoring of the surface conditions as well as continuous monitoring of impacts to sensitive receptors around the MSF construction area (i.e. public school, residential neighbourhood, assisted living facility). The project might benefit from automatic monitoring devices for particulate matter for these sensitive receptors, especially if construction will take place over a period.
- At the MSF construction site, leaving vegetated areas and natural shrubs/trees in areas not currently under construction would assist in reducing fugitive dust emissions.
- Prior to construction the Phase 1 Environmental Site Assessment should also be reviewed to identify potential areas of ground contamination along the construction route. In addition to the dust suppression techniques provided in this plan, any areas that have the potential to emit other contaminants as a part of the fugitive dust should be reviewed further and consideration should be given to additional onsite monitoring at sensitive receptors for any site-specific contaminants identified.

Vehicle emissions rates for the future no-build and future build scenarios were estimated using the US EPA Motor Vehicle Emissions Simulator (MOVES 4.0). MOVES is a tool used to estimate vehicle emissions resulting from the combustion of fuel, brake and tire wear, fuel evaporation, permeation, and refuelling leaks.

Overall, the results of the air quality assessment show that predicted concentrations of all indicator compounds are below the values of the future no-build scenario. The conclusions are as follows:

- An emissions inventory of vehicle traffic along the main line route has been completed, examining “future build” (with the EELRT in place) and “future no-build” (assuming the EELRT is not constructed) scenarios. The proposed EELRT system will result in a decrease in vehicle-related emissions along the route, which would result in improvements in local air quality.
- Specific air quality impacts from the Maintenance and Storage Facility and from new bus stations along the line were assessed. Air dispersion modelling was conducted. All provincial standards at the property line. Minor excesses of the annual Canadian Ambient Air Quality Standards (CAAQS) due to the fact the background concentrations already exceed the criteria. In these situations, contributions from the MSF and bus stations will be less than 2% of the total. The results show that the MSF and bus stations will have negligible effects on air quality in the area.
- The predicted maximum concentrations at sensitive receptors were conservatively combined with the 90th percentile of the background concentrations for the assessment. data for both the MSF and the worst-case transit vehicle station.
- A screening level assessment of greenhouse gases from the project (GHG). The proposed EELRT system will result in a decrease in vehicle related GHG emissions by 18%.
- Guidance has been provided for addressing fugitive dust emissions from construction. This should in included in a code of practice for future Contactors to reduce the potential for air quality impacts during the construction phase of the project.

The Air Quality Report can be found in **Appendix H**.

5.6.2 Noise and Vibration

The potential noise and vibration impact for the project has been evaluated using approved protocols and project-specific criteria. The focus of the noise and vibration assessment is the effects associated with the project on receptors where human activity is expected to occur. The potential noise and vibration sensitive land uses containing points of reception (PORs) were identified through an analysis in accordance with NPC-300. The noise and vibration from construction activities were also considered.

Construction noise and vibration impacts are temporary in nature, and largely unavoidable. Although for some periods and types of work, construction noise and vibration may be noticeable, with adequate controls, impacts can be minimized.

To minimize the potential for construction noise and vibration impacts, as the project design and construction plan proceeds, it is recommended that provisions be written into the contract documentation for the contractor, as outlined below:

- Construction should be limited to the time periods allowed by the City Noise By-law. If construction activities are required outside of these hours, the Contractor must seek permits / exemptions directly from the City in advance.
- All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- Screening level predictions of construction noise levels should be completed, particularly for areas where construction activity may occur for long durations, such as laydown yards, platforms, or traction power substations. Sound levels may be predicted using the methods outlined in the U.S. FHWA Construction Noise Handbook. Where sound levels at residences are predicted to exceed 75 dBA during the day or 70 dBA at night, then noise control measures should be developed to reduce noise levels as much as is practicable. Such measures could include:
    - Staging of operations,
    - Hoarding or other noise barriers, and
    - Use of alternate construction methods.
- The contract documents should contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to are in effect.
- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MOE NPC-115 guidelines.
- In the presence of persistent complaints and subject to the results of a field investigation, alternative noise control measured may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration should be given to the technical, administrative, and economic feasibility of the various alternatives.

- The contractor should submit as part of the permit applications the vibration control assessments and forms required under City of Toronto By-Law 514-2008 and follow any recommendations and requirements.
- While infrequent, noise stemming from emergency equipment and associated mitigation measures, should be investigated further in future phases.

The Noise and Vibration Report can be found in **Appendix I**.

5.6.2.1 Noise

The results show that changes in sound levels resulting from the proposed project are expected to be very minor for the receptors along Eglinton Avenue East, and Sheppard Avenue. In the areas surrounding Military Trail, the UTSC Campus, and Neilson Road, the EELRT's addition will create meaningful changes in sound level in excess of the criteria. An investigation of noise mitigation measures in this area has been completed. Mitigation in these areas is feasible and can include noise barriers, track treatment, and wheel treatment. Sound levels are driven by wheel squeal from the turns in the LRT track alignment. The assumed mitigation measures are:

- The use of "resilient wheels" on the LRT trains is a common mitigation for LRVs[6], which incorporate elastomer springs between the tire and wheel rim to provide compliance between these components. Examples of resilient wheels include the Bochum 54 and 84 wheels, and the SAB wheel. These are generally effective in reducing or eliminating wheel squeal at curves of radii greater than about 30 m (100 ft). As a conservatism, a reduction of 10 dB to wheel squeal noise has been assumed. The actual reduction may be higher.
- Noise barriers, in the form of noise walls, at some locations.

At the Maintenance and Storage Facility (MSF), the following mitigating measures demonstrated adherence to NPC-300 guideline limits when incorporated:

- Similar to operational noise, the use of "resilient wheels" on the LRT trains, which incorporate elastomer springs between the tire and wheel rim to provide compliance between these components. As a conservatism, a reduction of 10 dB to wheel squeal noise has been assumed. The actual reduction may be higher.
- Noise barriers, in the form of a 2.0 m high noise wall, located along the property line of the facility.

Additionally, to mitigate potential complaints and/or concerns from the nearby school (Alvin Curling) and assisted living facility (Extendicare Rouge Valley), a robust and compliant response procedure is recommended for implementation to ensure timely response of noise complaints and potential further corrective actions and/or mitigative measures.

[6] Refer to U.S. Federal Transit Administration / Transportation Research Board "TCRP Report 23" wheel Rail Noise Control Manual", 1997 (https://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_23.pdf)

5.6.2.2 Vibration

The MECP/TTC Protocol has been adopted for this project. The Protocol outlines ground-borne vibration limits, and states that vibration levels must not exceed 0.1 mm/s RMS (72 VdB re: 1µ.in/sec) for any residential point of reception within 15 metres of the LRT tracks. Vibration levels from LRT operations are expected to meet the criteria at all receptors, and vibration mitigation is not anticipated to be required. This should be confirmed as the project proceeds to detail design.

Vibration impacts from construction are not anticipated. Regardless, as the project proceeds and the construction plan are developed, the contractor should submit as part of the permit applications the required vibration control assessments and forms.

5.7 Source Water Protection

The Eglinton East LRT would be occurring within the Toronto Region Source Protection Area. Therefore, the CTC Source Protection Plan (2019) applies. The study area is located in the intake protection zones (IPZ) 2 and 3 for the F.J. Horgan Water System and the maximum vulnerability score is 4.5. Portions of the project also intersect with a vulnerable area known as an event-based area, where modeling has shown that spills from fuel oil pipeline breaks could impact the quality of water at the drinking water intakes.

Coordination with MECP indicated that, although the EELRT is located in surface water intake protection zones, transit projects and activities associated with normal operations of the Eglinton East LRT are not considered threats under the Clean Water Act.

While the normal operation phase of the project may not pose a significant threat to sources of drinking water, activities could pose a risk during the construction phase of the project. Particular attention should be paid if the relocation of any fuel oil pipelines is necessary during construction.

As identified in the CTC Source Protection Plan (2019), potential moderate and low threats associated with the Eglinton East LRT pertain to the construction and maintenance phases of the project and include:

- the establishment, operation, or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage (limited to stormwater runoff);
- the storage and application of road salt, and;
- the storage of snow.

A meeting with CTC on June 13, 2024 confirmed that only non-binding policies are applicable to the EELRT, due to low threat to drinking water supply.

Table 5-13 lists preliminary findings regarding applicable regulatory policies prescribed by the CTC Source Protection Plan (2019) and potential mitigation measures for each of the threats identified above.

Table 5-13: Source Water Protection Threats, Policies and Proposed Mitigation Measures

Threats	Policies	Proposed Mitigation Measures
The establishment, operation, or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage (limited to stormwater runoff)	No policies apply to the project area	Stormwater management measures within the project limits will be designed to provide enhanced water quality treatment, as a minimum, for the increased pavement area as a result of roadway widening/improvements. The recommended low impact development (LID) / best management practice options for stormwater management include: • Bioretention cells to provide quality control, which could be tree planters or landscaping with a trench filled with compacted soil underneath the roadway boulevard areas • Online storage pipes to provide quantity control such as oversized storage pipes with flow control devices upstream of the discharge location to provide peak flow control in combination with allowable surface ponding for major flows. Other potential BMP measures to support treatment are to be considered in detailed design: • Infiltration trenches • Vegetated Filter strips • Oil-grit separator units. These mitigation measures are further discussed in Section 5.2.2 and **Appendix C.**
Storage and application of road salt	**SAL-10** *Non legally binding* Where the application of road salt would be a moderate or low drinking water threat, the planning approval authority is encouraged to require a salt management plan, which includes a reduction in the future use of salt, as part of a complete application for development which includes new roads and parking lots in any of the following areas: Such plans should include, but not be limited to, mitigation measures regarding design of parking lots, roadways, and sidewalks to minimize the need for repeat application of road salt such as reducing ponding in parking areas, directing stormwater discharge outside of vulnerable areas where possible, and provisions to hire certified contractors. **SAL-13** *Non legally binding* Where the application, handling and storage of road salt is, or would be, a moderate or low drinking water threat, the municipality is requested to report the results of its sodium and chloride monitoring conducted under the Safe Drinking Water Act and any other monitoring programs annually to the Source Protection Authority. The Source Protection Authority shall assess the information for any increasing trends and advise the Source Protection Committee on the need for new source protection plan policies to be developed to prevent future drinking water Issues, in any of the following areas: WHPA-A (VS = 10) (existing, future); or WHPA-B (VS ≤ 10) (existing, future); or WHPA-C (existing, future); or WHPA-D (existing, future); or WHPA-E (VS ≥ 4.5 and <9) (existing, future) HVA (existing, future); or SGRA (VS ≥ 6) (existing, future)	
The storage of snow	No policies apply to the project area.	

5.8 Climate Change and Sustainability

Climate change refers to long-term shifts in temperatures and weather patterns through natural variability or as a result of anthropogenic activity. Since the Industrial Revolution, human activities have been the main driver of climate change. Climate change in the Greater Toronto Area is generally expected to bring increases in temperature, precipitation, and extreme weather events.

Scientific consensus has determined that greenhouse gas (GHG) emissions, from fossil fuel use and land use changes are trapping more heat in the atmosphere which disrupts the natural balance and leads to more local and regional events, such as heat waves, droughts, and severe storm events. To minimize these impacts and cope with climate change, a long-term GHG reduction goal has been developed for the Province of Ontario. Additionally, the City of Toronto TransformTO plan contains a Net Zero Strategy for community-wide GHG emissions to be net zero by 2040.

Climate change and its related extreme weather events concern many aspects of society and the economy. Two approaches for considering and addressing climate change in project planning are considered – mitigation and adaptation.

5.8.1 Climate Change Mitigation

Climate change mitigation refers to actions that prevent the effects of climate change from worsening. Some examples of mitigation include reducing the amount of GHG emissions released into the atmosphere, minimizing impacts on vegetation, and reducing energy consumption.

The EELRT operates on electricity, making it a low-carbon transportation mode. With the development of new public transit, this encourages modal shift from inefficient single occupant vehicles to more sustainable modes such as active transportation and public transit. The implementation of the LRT alongside significant improvements to active transportation facilities as part of the project are anticipated to aid in the reduction of GHG emissions by encouraging modal shift.

The EELRT also avoids disrupting natural spaces by running primarily within the established public right-of-way. This allows for carbon sequestered in mature vegetation to remain out of the atmosphere. Additionally, public realm improvements will provide space for new vegetation that will provide additional carbon sequestering potential.

Other mitigation measures to be reviewed in future phases of the project include:

- Integrating renewable energy generation into the project scope as a climate mitigation, such as using solar and battery systems instead of natural gas for power backup system at the MSF.
- Reducing the embodied carbon as part of construction, which is mainly attributed to concrete, to be achieved through assessment of alternative concrete manufacturing techniques.

5.8.2 Climate Change Adaptation

Climate change adaptation refers to actions that anticipate future climate related impacts and preventing them from impacting the society and the economy. Some examples of adaptation include stormwater management and using materials that can withstand extreme weather conditions.

The EELRT will increase shade within the public realm and aim to reduce heat retention and the urban heat island effect. These strategies will provide more comfortable conditions for pedestrians, cyclists, and transit riders while using the corridor which encourages its use. Stormwater management strategies will be implemented to reduce the impacts of flooding.

6 Consultation

This section documents all consultation and engagement activities throughout the project.

6.1 Consultation Overview

Public and stakeholder consultation is an integral and mandatory component of transit projects that are subject to O. Reg. 231/08, which requires meaningful consultation with individuals, groups, and organizations that have an interest in the project. Active consultation throughout a transit project allows a project team to:

- Inform and engage parties and individuals who may hold an interest in the transit project,
- Identify and inform the general public about the range of potential impacts of the transit project through environmental, technical, and socio-economic lenses and mitigation measures, and
- Respond to the questions and concerns of interested persons and agencies.

The Eglinton East LRT (EELRT) project team has been proactively engaging the public, stakeholders, regulatory agencies, and Indigenous Nations throughout the Pre-Planning and TRPAP phases of the project. The team has made use of a broad range of communications and engagement methods that include but are not limited to:

- Project website updates,
- A dedicated project email address and database,
- Notices, letters, and notifications,
- Social media posts (Facebook, X [previously known as Twitter], Instagram),
- TTC media channels (platform screens and PA announcements),
- Newsletters,
- Public and Stakeholder Meetings, and
- Online public surveys.

The public and stakeholder consultation activities carried out as part of this of the EELRT project can be categorized into two phases: Pre-Planning Consultation (Phase 1) and TRPAP Consultation (Phase 2). The consultation and engagement milestones completed in each of these phases are outlined in the subsequent sections.

6.1.1 Record of Consultation

Public and stakeholder consultation was initiated during the EELRT 10% design through the distribution of notifications to the public, stakeholders, and lndigenous Communities, and the initiation of the project website. The project team has maintained a record of all public and stakeholder consultation undertaken during the Transit and Rail Projects Assessment Process 120-day regulatory consultation phase.

Appendix L documents all project-related correspondence, meeting summaries, and survey results. All comments received from the public have been summarized, and the names and personal information of commenters has been omitted to protect participants' privacy under the Freedom of Information and Protection of Privacy Act.

6.1.2 Project Website

A project website, www.toronto.ca/eglintoneastlrt, was developed and regularly updated by the City of Toronto for the project throughout both phases of consultation. Key information that can be found on the project website includes:

- The project background, history, and study process.
- A map of the project area.
- Design features.
- Public consultation opportunities, event links, materials, and updates.
- Project contact information.

6.1.3 Consultation and Engagement Approach

The two phases of public and stakeholder engagement were centred around two project milestones: (1) the project Pre-Planning and (2) TRPAP consultation, documenting project impacts, mitigation, and monitoring. The project team built a public and stakeholder engagement plan into the project's broader work plans and schedules to incorporate meaningful consultation and engagement activities during project development.

Through this plan, the project team established the following goals for its public and stakeholder consultation program:

1. **Equitable Consultation**
   - Ensure inclusivity by accommodating various needs such as work schedules, travel limitations, childcare, language barriers, and internet access.
   - Explore measures with City staff to reflect varied socio-economic status along the corridor.
   - Address concerns like gentrification, land speculation, rent increases, and changes to neighborhood character.

2. **Open Communication**
   - Communicate the project's history, current status, and changes based on past consultations.
   - Explain the Transit and Rail Project Assessment Process (TRPAP) and outline what will be studied during this phase.
   - Communicate the outcomes of the June 2022 Council decision to decouple the Eglinton East LRT (EELRT) from Line 5 Eglinton
   - Communicate impacts to auto traffic, turning restrictions, and lane reductions with the addition of a center-running LRT as well as proposed changes to the public realm and opportunities for improvement.

- Communicate early plans to leverage transit investment for community benefits beyond construction and operation.
- Clearly define the differences in design between the 10% design and earlier plans.

3. Constant Collaboration

- Gather feedback on alternatives, preferred alignments, design sections, and technical considerations at key locations and throughout the design development.
- Collaborate on the service concept for the LRT and intersecting bus network.
- Outline coordination with other transit projects to help the public understand how EELRT fits into the City's and Province's transit vision.
- Identify site-specific barriers to enabling multimodality through engagement
- Collaborate with communities to suggest improvements as well as to mitigate property impacts.

The specific tools and tactics used to realize these goals differed in the two phases of consultation and are described in the subsequent sections of this document.

6.2 Pre-Planning Consultation (Phase 1)

The foundations for the EELRT project extend as far back as 2010 with the original Transit City plans. This section summarizes the consultation activities that were undertaken during the Pre-Planning period of the distinct service design which began in 2022, spanning the development of the EELRT functional 10% design. Pre-Planning engagement occurred through a set of Virtual Public Meetings in between May 15 and June 21, 2023. A full Public Consultation Report for this phase of public and stakeholder engagement is found in **Appendix L**.

6.2.1 Public Engagement

Leading up to and during the Pre-Planning consultation, the project team used several avenues of outreach to notify the public, stakeholders, and Indigenous Communities about opportunities to engage and provide comments on EELRT, including:

- Public Meeting Notice, published in four local newspapers, three of which were translated into non-English languages:
  - Metroland Scarborough Mirror on May 18, 2023.
  - Canadian Chinese Express (Simplified Chinese) on May 19, 2023.
  - Senthamarai (Tamil) on May 19, 2023.
  - Gujarat Abroad (Gujarati) on May 19, 2023.
- Stakeholder email, sent to 75 stakeholder organizations in and around the project area on May 3, 2023.
- Social media posts on the City of Toronto's official Twitter (now X), Instagram and Facebook accounts, as well as on the City of Toronto's GetInvolvedTO Twitter, from May 15 to June 14, 2023.
- TTC media channels, including:
  - TTC transit platform screens on all lines from May 15 to June 14, 2023.
  - TTC transit platform screens in Victoria Park, Warden, and Kennedy Stations from May 17 to June 2021.
  - PA Announcements in Kennedy, Victoria Park, and Warden Stations from May 17 to June 21, 2023.
  - TTC social media (Twitter, Instagram, and Facebook) from May 17 to June 21, 2023.
  - TTC webpage "Latest News" section from May 17, 2023 and June 8, 2023.
- Three virtual public meetings, as discussed further in Section 6.2.1.1.

6.2.1.1 Virtual Public Meetings

The EELRT project team hosted three virtual public meetings during the Pre-Planning consultation phase. The objective of these virtual public meetings was to share project updates and design progress with the public and seek feedback on proposed plans. Participants provided feedback and questions on the functional (10%) design of the project, including the route, stops, typical design, public realm improvements and technical details of specific Focus areas.

The three meetings were tailored toward different geographical audiences. Each meeting's presentation was largely the same but featured different Focus Areas:

- Meeting 1 (May 30, 2023; 51 participants) focused on Kennedy Station, Eglinton GO, Eglinton Avenue & Kingston Road and Guildwood GO.
- Meeting 2 (June 1, 2023; 44 participants) focused on Kingston Road, Lawrence Avenue and Morningside Avenue (KLM); Highland Creek Bridge; UTSC; and Hwy 401 overpass.
- Meeting 3 (June 7, 2023; 37 participants) focused on Conlins MSF, Neilson Road / Malvern Town Centre and Sheppard-McCowan Station.

6.2.1.2 Online Survey

A 19-question survey was posted to the project webpage and was live to the public for 6 weeks in May and June 2023. It covered various transit topics such as travel behaviour, transfer priorities, stop amenities, Complete Streets and more. The survey had a total of 687 respondents, with 525 (76%) fully completing all questions.

6.2.2 Stakeholder and Agency Engagement

The Pre-Planning Agency and internal technical coordination activities for the EELRT project consisted of a myriad of stakeholder engagement opportunities, including, but not limited to:

- 5 Technical Advisory Committee meetings (TAC).
- 1 Stakeholder Advisory Group meeting (SAG).
- 7 Public Realm Working Groups (PRWG).
- 2 intersection working groups (IWG).
- 2 meetings with MTO.
- 3 meetings with TRCA.
- 17 meetings with MX-SSE.
- 4 meetings with MX-DSBRT.
- 9 meetings with University of Toronto Scarborough Campus (UTSC).
- 1 meeting with the Toronto District School Board (TDSB).
- Development application coordination
- Over 60 biweekly core coordination meetings, comprised of TTC and City internal departments.
- 17 service/operation planning meetings with TTC.
- Additional ad-hoc technical coordination meetings.

In addition to engaging in frequent correspondence with technical stakeholders, the project team formed a Technical Advisory Committee (TAC). Key stakeholders were identified throughout the corridor and were invited to participate in the Pre-Planning consultation process via formal virtual stakeholder meetings.

The following internal City departments, governing bodies, external agencies, conservation authorities and private utility companies were included in the technical advisory meetings as part of the EELRT project:

- City of Toronto
  - Transit Expansion
  - Transportation Services
  - Engineering & Construction Services
  - Toronto Water
  - City Planning
  - Parks, Forestry & Recreation
  - Fire Services SEPP Command
  - Legal
  - Corporate Real Estate Management
  - Toronto Police Services
  - Toronto Paramedic Services -Planning & Emergency Management
  - Economic Development & Culture - Policy & Research
  - Toronto Public Health
  - Toronto Parking Authority
  - Toronto Pan-Am Sports Centre
  - CreateTO
  - Toronto Hydro
- TTC
- Metrolinx
  - SSE
  - RT operations
  - ECLRT
  - Sheppard (Line 4) Extension
  - DSBRT
  - TOC
  - Stations Program
- TRCA
- GO Transit
- Durham Region Transit
- Province of Ontario
  - Infrastructure Ontario (TOC)
  - Ministry of Transportation
  - Ministry of Indigenous Affairs
  - Ministry of Municipal Affairs and Housing
  - Ministry of Citizenship and Multiculturalism
  - Ministry Natural Resources and Forestry (MNRF)
  - Ministry of the Environment, Conservation and Parks (MECP)
  - Ministry of Energy, Northern Development and Mines
- Government of Canada
  - Canadian Transportation Agency
  - Impact Assessment Agency of Canada
  - Environment and Climate Change Canada
- Utility Companies
  - Bell Canada
  - Rogers Communications
  - Zayo Fibre Optics
  - Husky Energy / Cenovus
  - Hydro One
  - Enbridge Gas Distribution

The first Technical Advisory Committee (TAC) meeting was held on December 1, 2022. The purpose of this stage of TAC engagement was introductory in nature; introducing the project, summarizing the June 2022 Council Direction, identifying opportunities unlocked due to the distinct LRT service and outlining the scope, schedule, and key milestones. The committee was invited to review the materials and provide comments following the meeting.

TAC meeting #2 was divided into two parts, A and B, due to the length of the study corridor and was held on February 28, 2023 and March 6, 2023, respectively. The purpose of this

meeting was to follow up and respond to comments received at TAC#1, confirm assumptions, and outline key changes from 5% design to be incorporated in the emerging functional (10%) design. TAC #2A covered the discussion of the design from Kennedy Station to Morningside and West Hill, whereas TAC meeting #2B covered the northern portion of the study area, from Highland Creek to Sheppard-McCowan. The committee was invited to review the materials and provide comments following the meeting.

TAC meeting #3 was held on April 27, 2023. This meeting facilitated the response to feedback on the previous meeting, outlined the urban design strategy for mixed-use and suburban land use typologies along the study corridor, presented design considerations at SSE interfaces and shared opportunities, constraints and design alternatives at focus areas including Neilson, Highland Creek, Kingston / Lawrence / Morningside, and the Eglinton GO underpass. As always, the committee was invited to review the materials and provide comments following the meeting.

TAC meeting #4 was held on February 22, 2024. The meeting provided an update on completed milestones since the last meeting, including the Initial Business Case and Council's approval of the EELRT alignment in December 2023. The meeting also covered major changes to the 10% design since it was last shared with the committee and presented the key findings of the environmental impact assessment. The project team also shared an update on protections related to the SSE interface as well as next steps ahead of TRPAP launch.

A Stakeholder Advisory Group meeting was also held on May 15, 2023 via Webex Meetings. The meeting objective was to allow representatives of key stakeholder groups along the EELRT corridor to preview the public consultation material ahead of the virtual public meetings, held from May 30 to June 7, 2023. Attendees provided feedback and questions on the 10% design of the project, including the route, stops, typical design, public realm improvements and technical details of specific Focus Areas. The meeting was geared to capture additional stakeholders such as local Business and Neighbourhood Improvement Areas and transit interest advocacy groups. A total of 15 stakeholders participated in the SAG meeting.

As public realm improvements were a key focus for the LRT study, the City held several internal Public Realm Working Group and Intersection Working Group meetings to discuss desired cross-section and element widths, confirm general guidelines for intersection design and resolve specific design issues at complex intersections such as Eglinton-Danforth, Kingston-Lawrence-Morningside, and Eglinton-Kingston. The meetings also covered design strategies related to the public realm configuration, protected intersections, skewed intersections, and opportunities to mitigate residential impacts. The traffic modeling approach was discussed, and it was agreed that signal timing modifications would not be included at the 10% design phase, with future phases incorporating the latest signal operation policy.

The EELRT project crosses a significant portion of UTSC and, therefore, engaged the University on various occasions to present design principles, discuss alignment alternatives, confirm cross-section and public realm configurations, and investigate right-of-way impacts along Ellesmere Road, New Military Trail, and Morningside Avenue. As the future New Military Trail is planned to become the spine of the University's movement network, meetings also covered discussion on location of signalized intersections, pedestrian crossings, and LRT stop configuration.

The project team also held a meeting with TDSB to discuss the proposed 10% design at West Hill Collegiate Institute (CI) and the associated realignment and extension of Beath Street, relocation of the signalized intersection on Morningside Avenue and implementation of a T-intersection at Beath Street and Rodda Boulevard. Other access changes to the school were noted as well such as right turn only limitations for the existing driveway. The project team also outlined the project's local benefits resulting from improved access thanks to the LRT stop at Beath Street, new infrastructure improvements such as sidewalks and cycle tracks, and enhanced connection to the community south of the school. Property requirements were identified and next steps for TDSB feedback and TRPAP initiation were shared.

The EELRT project as a distinct service has had two major City reports to Executive Committee and City Council. Engagement with all interested government officials and agencies, including the TAC members, will continue as the project progresses.

Table 6-1 provides a summary of engagement with technical stakeholders undertaken prior to the TRPAP Notice of Commencement for the EELRT. Also, in advance of the TRPAP launch, the draft EPR and 10% design were circulated to agencies and stakeholders for review on March 8, 2024. The project team has documented comments and responses to feedback received in a comment-response tracker.

Additional detailed relevant correspondence, including meeting summaries (TAC, SAG), comments and responses from agencies such as Metrolinx (SSE, ECLRT and SSE), MCM, MECP, TRCA, MTO and IO are documented in **Appendix L.**

Table 6-1: Summary of Pre-Planning Engagement with Technical Stakeholders

Meeting Type	Meeting Date	Title	Summary
TAC	Thursday, December 1, 2022	TAC #1	The project team invited the Technical Advisory Committee to attend the first TAC meeting. Meeting minutes are provided in **Appendix L**.
TAC	Tuesday, February 28, 2023	TAC #2A	The project team invited the Technical Advisory Committee to attend the TAC meeting #2A. Meeting minutes are provided in **Appendix L**.
TAC	Monday, March 6, 2023	TAC #2B	The project team invited the Technical Advisory Committee to attend the TAC meeting #2B. Meeting minutes are provided in **Appendix L**.
TAC	Thursday, April 27, 2023	TAC #3	The project team invited the Technical Advisory Committee to attend the TAC meeting #3. Meeting minutes are provided in **Appendix L**.
Stakeholder Advisory Group	Monday, May 15, 2023	SAG #1	The project team invited the Stakeholder Advisory Group to review materials to be presented at the virtual public open house session held on May 30 through June 7, 2023. Meeting minutes are provided in **Appendix L.**
TAC	Thursday, February 22, 2024	TAC #4	The project team invited the Technical Advisory Committee to attend the TAC meeting #4. Meeting minutes are provided in **Appendix L**.
MTO	Wednesday, August 10, 2022	Hwy 401 - Morningside Avenue Underpass	The meeting was held to confirm LRT can be accommodated across the 401/Morningside underpass. The project team shared a conceptual revised layout for the interchange with a different centreline alignment for the road and LRT. The new IC layout urbanizes the interchange, removes free-flow ramps and turns them into right turns. The outcome of the meeting was the exchange of information: MTO to provide full set of original and rehab drawings and the project team to provide the finalized LRT concept including the plan, profile and modified General Arrangement drawing.
MTO	Thursday, March 23, 2023	MTO Morningside Bridge Coordination	The meeting was held to discuss the initial findings of the MTO bridge structural analysis and opportunities to modify the existing structure as part of the bridge rehab to increase the stiffness for the LRT. It was noted during the meeting that the flexural frequency presents an issue for the rider experience but does not adversely affect the pedestrians crossing the structure via the sidewalks. Based on the EELRT project schedule, the project team would not have the information required to incorporate into the MTO rehab design.
TRCA	Monday, May 15, 2023	TRCA Coordination Meeting #1	The project team met with TRCA to provide an update on the design within TRCA regulated lands and on the scope of work and future commitments. TRCA flagged that they have no record of Metrolinx culvert works done at the Conlins MSF and therefore their HEC-RAS model does not reflect any early works. TRCA also noted that, should there is encroachment into the embankment at Morningside -Highland Creek and Sheppard-Highland Creek bridges, the HEC-RAS model should be updated to confirm that there is no net fill in the TRCA regulated area.
TRCA	Friday, July 21, 2023	TRCA Coordination Meeting #2	The project team met with the TRCA to discuss the approach to stormwater management and drainage at TRCA regulated lands. TRCA agreed with the proposed approach that the natural flood hazard definition was not applicable, should existing stormwater infrastructure be present at the MSF site. A site investigation was recommended to confirm. The project team also confirmed the setback requirements from the open drainage feature for the MSF design. TRCA requested that a survey of the open watercourse through the MSF property be undertaken in future phases to refine the HEC-RAS hydraulic model and corresponding hazard definition, as well as a geotechnical investigation to understand long-term slope stability.
TRCA	Friday, September 1, 2023	TRCA Coordination Meeting #3	The project team reported back findings of the visual inspection of the MSF site: that a stormwater facility was found constructed and functioning. The project team proposed planning corridor parameters based on TRCA requirements. TRCA expressed no further concerns about the approach to the proposed watercourse management strategy for the MSF design.
MX-SSE	Monday, December 13, 2021	SSE Meeting	The purpose of this meeting was to resolve issues related to SSE and EELRT interface. Challenges discussed included box separation, bridge abutments, EEB conflict, and the constructability of an LRT tunnel and portal over the SSE tunnel. MX informed that the SRS Contract has moved into the RFQ stage, targeting February 2022 for RFP. Further coordination between Metrolinx, TTC, and the City was deemed necessary to address these challenges and determine the path forward.

Meeting Type	Meeting Date	Title	Summary
MX-SSE	Wednesday, January 19, 2022	SSE Workshop #2	The purpose of this meeting was to produce a formal position statement from Metrolinx on acceptable SSE design and procurement modifications and tolerances for potential approaches to protect for the EELRT. Conflicts discussed include the SSE and EELRT box separation, TBM tunnel conflict and emergency exit building conflict. Metrolinx expressed little willingness to accommodate any further changes to the SRS contract.
MX-SSE	Friday, February 4, 2022	SSE Workshop #3	The meeting covered various topics, including updates on Metrolinx comments on the Council-approved alignment, and exploration of alternative through-service options for the EELRT. Metrolinx provided insights on alignment restrictions and considerations, emphasizing the limitations on tiebacks and the need for certainty in EELRT alignment. The project team presented alternative options, with Option 5 (Station and portal east of Midland) being potentially the most viable, though all options presented property, public realm, and traffic impacts.
MX-SSE	Friday, February 25, 2022	SSE Workshop #4	The project team presented four options for the Sheppard-McCowan station, with plans for elevations and cross-sections to be prepared for review by the SSE team. For the Kennedy distinct service options, the project team presented surface and elevated concepts, with Metrolinx expressing the need to ensure no direct impact on SSE operations. Coordination with ECLRT and GO Transit teams was suggested, and minor adjustments to SSE vent shafts along the alignment were noted possible. Commercial evaluations and considerations, including lessons learned from ECWE, were recommended for assessing options. Next steps involved sharing the reference concept design and presentations, obtaining post-meeting comments from Metrolinx, and exchanging contact information with ECLRT and GO Transit teams.
MX-SSE	Friday, March 25, 2022	SSE Workshop #5	The project team presented Surface Option 6 concept to Metrolinx, who in turn was tasked with providing formal comment on the concept. Attendees discussed technical considerations and requested verifying the impacts of removing the existing secant pile wall (SOE) for SSE on operations and waterproofing, during EELRT construction. They also noted the importance of understanding changes to the SSE vent shaft, including bends and rotations. Further review was deemed needed to determine if a separate entrance is necessary for the proposed north-south pedestrian underpass. Operational aspects, such as providing space at the exit doorway from the SSE stairs for emergencies, and considering the impact on the SRT guideway, should be included in the evaluation of proposed EELRT options. Next steps included setting up a future meeting to discuss preliminary input to SSE SRS specifications for both interface areas between EELRT and SSE.
MX-SSE	Thursday, March 31, 2022	Kennedy Evaluation Continued	The meeting reiterated concerns about the constructability of elevated EELRT options at Kennedy, emphasizing the need for additional input from TTC regarding construction impacts, costs, and schedule risks. A call with TTC was recommended to discuss O&M approaches, constructability, and to share assumed service times. The discussion suggested that the options evaluation process to consider monetizing delays, reliability for customers, conflicts due to signal delays, operational resilience, and accounting for additional signals in Elevated vs. Surface options. The project team also shared lessons learned from the ION LRT project to inform the undertaking.
MX-SSE	Friday, April 22, 2022	SSE Workshop #6	This meeting was held as a follow up to Metrolinx comments on the emerging proposed design at Sheppard-McCowan. Meeting outcomes included SSE investigating a 6.4 m northerly shift of SSE headhouse, confirming CAD file coordinates, providing background on PPUDO requirements. The project team committed to evaluating south side widening and confirming required setbacks with City Planning.
MX-SSE	Thursday, August 11, 2022	SSE SRS Coordination Workshop #7	The purpose of this meeting was to confirm Metrolinx deadlines for City inputs, present the updated Kennedy Station Surface Option 6 and seek future ROW protections and agreement on utility relocation approach.
MX-SSE	Thursday, August 18, 2022	Kennedy Station Design Update	This meeting was held to present the Kennedy Station vent shaft updates, confirm programming requirements, share the Midland stop cross-section and the approach to the Midland and Kennedy traffic operations assessment.

Meeting Type	Meeting Date	Title	Summary
MX-SSE	Thursday, August 18, 2022	SSE SRS Coordination Workshop #8	The purpose of this meeting was to follow up on actions from the meeting on August 11, 2022, further understand the request from Metrolinx regarding deadlines for City inputs and discussing guiding principles at Sheppard-McCowan Station to protect for the overlapping requirements at this site (PPUDO, TOC, Bus requirements, ROW, headhouse shift).
MX-SSE	Tuesday, August 23, 2022	Kennedy Traffic Operations Analysis	The purpose of this meeting was to develop a feasible signal timing plan at Midland and at the Kennedy Loop, analyze the intersection delay to LRT service at these locations and determine if eastbound queues from Midland will block the LRT at the loop. The results of the analysis showed the signal timing plans are feasible for both intersections but 2041 operations at Midland are at capacity. Mitigation measures should be considered for further analysis such as LRT focused signal optimization and coordination.
MX-SSE	Friday, March 3, 2023	SSE/EELRT – Sheppard-McCowan Interface Technical Memo	This meeting was held as a follow-up to the SSE workshop #6, to walk through the proof-of-concept design of Sheppard - McCowan Station, which protects for a 45.5 m ultimate ROW with a 6.4 m headhouse shift. The meeting was also an opportunity to respond to the independent review completed by Metrolinx (Memorandum dated January 31, 2023).
MX-SSE	Friday, June 9, 2023	MX-SSE Interface meeting	This meeting was held by Metrolinx to provide an update on accommodations made at Sheppard-McCowan and showed the provision of the setback and ROW as requested by the City. The meeting also revealed clashes at Kennedy Station between the EELRT station box and the SSE box structure. Given proximity of the structures, future discussions were deemed required regarding the interface.
MX-SSE	Tuesday, June 27, 2023	SSE Constructability meeting #1 with TTC	The meeting aimed to evaluate the level of protection to be incorporated into the MX SSE contract to safeguard the EELRT. Two main approaches were discussed: Option 1, wherein MX preferred the City to assume the SSE is in operation while building the EELRT around it, and Option 2, where the City/TTC would request MX to include provisions for the EELRT in the actual design. The discussion centered around conflicts at Kennedy, particularly the SSE box curvature intersecting with the EELRT box, requiring structural considerations for future construction. A key outcome from the meeting was for the project team to develop design principles to be communicated to MX to future-proof the SSE design at Kennedy and McCowan.
MX-SSE	Tuesday, July 11, 2023	SSE Constructability meeting #2 with TTC	The meeting addressed the construction challenges at the Kennedy interface of the EELRT, where MX-SSE is building a cut and cover box without accounting for vertical load transfers from the EELRT box. The purpose of the meeting was to gather input from TTC to inform the City's request for protection in the MX-SSE SRS contract to accommodate EELRT. The project team presented three scenarios for building the EELRT, with the recommended option (Scenario 3) being for SSE to protect for EELRT, as it is the most economical and least impactful on SSE. TTC agreed with the conclusion that the LRT is not constructible without provisions in the SSE design for EELRT and supported Scenario 3.
MX-SSE	Friday, July 21, 2023	MX-SSE Interface protections meeting	The meeting focused on reviewing the constructability scenarios at Kennedy station and discussing options to protect for EELRT construction at the EELRT-SSE interfaces. Scenario 1, building SSE without any protections for EELRT, was not recommended due to potential rework and impacts on SSE operations. Scenario 2, pre-building the EELRT station box, was also not recommended, and MX expressed concerns about O&M implications. The recommended Scenario 3 involves SSE protecting for EELRT, with structural separation joints and common shoring walls. MX requested additional information to quantify impacts for Scenarios 1 and 3. The meeting covered concerns related to constructability and fatal flaws. Metrolinx requested the assessment of the straddle beam option, and details on the provision for structural connections between boxes. The discussion also touched on the Kennedy vent shaft design and modeling, as well as adjustments needed for the Sheppard-McCowan Station. Next steps included Metrolinx confirming the pursuit of Kennedy: Scenario 3 and ongoing coordination and intergovernmental agreement development.
MX-DSBRT	Wednesday, October 26, 2022	DSBRT Meeting	The meeting began with an update from MX-DSBRT, indicating their preliminary design progress and next steps for the project. Then, the EELRT project team provided an overview of the project, as well as City council direction for EELRT, emphasizing its distinct-service approach. The emerging EELRT 10% design at Ellesmere was presented, highlighting a conflict with a watermain in the south boulevard. The Ellesmere median option was discussed, with considerations for bus

Meeting Type	Meeting Date	Title	Summary
			movements and stop locations. DBRT noted their preference for the EELRT running on the south side, to better allow both projects to advance independently but expressed DSBRT interest in potentially sharing the LRT guideway. The discussion covered the timeline for evaluating EELRT alignment options for the UTSC area, headway assumptions, and approximations of boardings and alighting at Ellesmere. The meeting concluded with actions for comments and further discussions, with the City aiming to reach conclusions on alignment options before the end of the year.
MX-DSBRT	Tuesday, February 7, 2023	DSBRT Coordination	The project team presented an overview of the UTSC evaluation, emphasizing the emerging preferred route Option 2 (via center of Ellesmere and then north in the median of New Military Trail). Metrolinx provided updates on the DSBRT project, stating that the Preliminary Design Business Case (PDBC) is in progress and to be completed by 2024.
MX-DSBRT	Friday, June 9, 2023	DSBRT Shared Corridor Workshop #1	The project team shared the 10% design for EELRT with the Ellesmere median option and asked for MX comments on transit service allocation within the common Ellesmere segment. The preferred scheme was for DSBRT to operate on the curb side between Morningside and New Military Trail. The project team also sought comment from MX on the guiding principles which prioritize LRT over buses, as a higher-order form of transit. The discussion involved design details at Ellesmere/NMT and Ellesmere/Morningside, including pedestrian considerations and transfer coordination, with a follow-up workshop planned with MX-DSBRT to discuss BRT transitions.
MX-DSBRT	Thursday, August 31, 2023	DSBRT Workshop #2	The project team presented progress on the 10% design, focusing on the Ellesmere median option. During the meeting, the idea of DSBRT sharing the LRT guideway was vetoed. The meeting also showcased concepts for DSBRT transitions on the west and east. DSBRT suggested dedicated curbside bus lanes, but the City has not evaluated this yet, ruling out only shared LRT/BRT guideway. DSBRT expressed interest in review the traffic impact analysis, which will be part of the EELRT EPR circulation.

6.2.3 Indigenous Engagement

At the start of the Pre-Planning consultation phase, the project team notified the Ministry of the Environment, Conservation and Parks (MECP) of their intent to begin public consultation on the project and requested information about which Indigenous Communities were required to be consulted during this phase of the project. In an email on February 9, 2023, the MECP advised for the following Indigenous Communities to be consulted:

- Mississaugas of the Credit First Nation
- Williams Treaties First Nations
  - Mississaugas of Scugog Island First Nation
  - Hiawatha First Nation
  - Alderville First Nation
  - Curve Lake First Nation
  - Chippewas of Georgina Island First Nation
  - Chippewas of Rama First Nation
  - Beausoleil First Nation
- Huron-Wendat

Prior to the launch of the Transit and Rail Project Assessment Process (TRPAP), the project team reached out to Indigenous Communities on the following occasions:

- **Phase 1 Public Consultations Notification –** This communication, on May 17, 2023, informed First Nations about the EELRT project, upcoming Phase 1 public consultations for the functional, 10% design of the EELRT and extended the opportunity for First Nations to provide feedback or to request a meeting.
- **Stage 1 AA Report –** This communication shared a copy of the Stage 1 Archaeology Assessment Report as of January 25, 2024 in advance of the TRPAP and requested questions or concerns about the findings by February 16, 2024.
- **Draft Environmental Project Report and Stage 1 AA Report (Revised) –** This communication shared a presentation of an overview of the project in PDF format, a copy of the Environmental Project Report (EPR) to date, and a copy of the revised Stage 1 Archaeology Assessment Report as of April 24, 2024 which included additional archaeological assessment for traction power substation sites along the route of the EELRT. A list of EPR appendices was also shared which the First Nation was invited to request through secure file transfer owing to the size of the documents.

During the Pre-Planning consultation phase, the project team received:

- No response from the Beausoleil, Curve Lake and Huron-Wendat First Nations.
- A response to update contacts from the Mississaugas of Scugog Island First Nation.
- An acknowledgement and request for further updates as the project progresses into the next phases from the Chippewas of Rama First Nation and the Hiawatha First Nation.
- A request for a meeting by Mississaugas of the Credit First Nation, following the receipt of the Phase 1 Public Consultation communication. A virtual meeting was held on January 31, 2024 where the EELRT project team, consisting of staff from the City of Toronto, HDR (Project Consultant), and ASI (sub-consultant for the archaeology report), gave a presentation to provide MCFN with the project's background and history, an overview of the studies conducted as part of the draft Environmental Project Report (EPR), details about the upcoming Transit and Rail Project Assessment Period (TRPAP), and the project's immediate next steps. The outcome of the meeting was to engage the MCFN in future phases, particularly during the Stage 2 Archaeological Investigations.
- A request for filing and review fees from Alderville and Chippewas of Georgina Island First Nations.

A log of Pre-Planning communications with Indigenous groups, email correspondence as well as a full summary of the meetings detailed above are found in **Appendix L**.

6.3 Transit and Rail Project Assessment Process Consultation (Phase 2)

This section summarizes the consultation activities that were undertaken during the Transit and Rail Project Assessment Process (TRPAP) phase of the Eglinton East LRT project, often referred as Phase 2. The Phase 2 Consultation Report, found in **Appendix L**, provides additional details on the consultation methods, activities and key findings of the public outreach throughout the TRPAP.

6.3.1 TRPAP Notice of Commencement and Public Outreach

On May 15, 2024, the City of Toronto and TTC initiated the TRPAP process. The Notice of Commencement was distributed to study area residents and published online at the following link: Notice of Commencement: Transit and Rail Project Assessment Process (toronto.ca).

The notification was intended to notify members of the public in the vicinity of the project area as well as stakeholder agencies and Indigenous Communities of essential information regarding the project including project area, scope, and timelines, as well as to inform recipients of ways to participate in the upcoming public consultation events. This information was also posted on the updated webpage: Eglinton East Light Rail Transit – City of Toronto. The Notice of Commencement is also found in **Appendix L.**

The City of Toronto undertook a multi-pronged approach to informing the public of the TRPAP launch and of the public consultation drop-in events. A summary of the outreach is provided as follows:

Communications	Details
Notice of Commencement	• Mailed to 47,197 property owners within the 30 meters of the transit project along the corridor.
Postcards	• 1500 postcards distributed on May 21 at Kennedy Station. • 2000 postcards distributed on May 23 at Scarborough Town Centre Bus Terminal.
Newspaper Ads	• Published in the: o Toronto Sun on May 15, 2024. o The Caribbean Camera on May 16, 2024 – 35,000. o Canadian Chinese Express on May 17, 2024 (Simplified Chinese) – 18,000. o Gujarat Abroad (Gujarati) on May 17, 2024 – 15,000. o Ming Pao Daily News on May 17, 2024 – 28,000. o Senthamarai (Tamil) on May 17, 2024 – 12,300.
Road Signs	• 2 road signs placed at Toronto Pan Am Sports Centre and Neilson Road/Sheppard Avenue East for the month of June.
Social Media Ads	• Posted from May 24 to June 5, 2024 on the following City social media channels: o @CityofToronto and @GetInvolvedTO (X [formerly Twitter]) o @CityofTO (Instagram) o City of Toronto (Facebook). Sample post here. • Organic socials posted on City channels occasionally throughout May 24 and June 30, 2024. • Multicultural Online, PrimeDatalytics, Facebook; see **Appendix L.**
Project Team Mailing list	• An email notice and invitation to participate in the second round of public consultations was circulated to 309 registrants of the EELRT project mailing list on May 25, 2024.

TTC also employed several communication strategies to promote the EELRT TRPAP launch and the public consultation events, summarized as follows.

Communications	Details
Social Media Posts	• TTC reshared one tagged post via @TTChelps (X [formerly Twitter]) on May 15, 2024. • TTC Webpage “Latest News” Section, from May 15 to June 3, 2024. • Additional tagged posts were reshared on Instagram @TakeTheTTC and on Facebook on the Toronto Transit Commission page
Web	• TTC posted an update at the “Riding the TTC” section of its Home page to inform the public of the upcoming Open House • TTC made a post on the “Latest news” section of ttc.ca
Platform Video Screen (PVS)	• Landscape (1920 x 1080) PVS for Victoria Park, Warden and Kennedy Stations from May 15 to June 1, 2024
Station Announcements	• Announcements at Victoria Park, Warden, Kennedy, and Scarborough Centre Stations from May 15 to June 1, 2024.
Announcements on CityNews 24/7	• A short announcement was made by TTC staff on CityNews 24/7 on May 28, 29 and 30, 2024.
TTC Stakeholder Newsletter (May 2024)	• Monthly stakeholder newsletter, which was issued on May 22, 2024 and distributed to 1,850 people throughout the City including Councillors, staff, general public, and interested organizations.
Community BBQ	• Community BBQ by Local Councillor for Scarborough-Guildwood on June 17, 2024.

6.3.2 Public Engagement

6.3.2.1 Interest Groups

The project team held a community interest group meeting on May 22, 2024 following the launch of the TRPAP. The purpose of the meeting was to provide an opportunity for community groups and organizations to relay relevant information to their members during the consultation period and provide early feedback to the project team, identifying key questions, support, and concerns that may arise during public engagement.

The project team identified key groups and organizations throughout the route and invited them to participate in a virtual meeting, from 12:00 to 1:30 p.m. During the meeting, the project team shared a general overview of the project, updates to the functional (10%) design since the previous round of public consultation, information about the TRPAP, and findings from the draft EPR. The project team was represented by staff from the City’s Transit Expansion, Transportation Services, and Public Consultation Unit teams; TTC’s Transit Service team; and consultant HDR’s engineering and design team. A total of 10 participants attended the meeting, representing the following nine groups or organizations:

- Agincourt Village Community Association
- Centennial College Student Association Inc.
- CodeRedTO
- Scarborough Community Renewal Organization
- Sheppard East Village BIA
- TTCRiders
- UTSC Community Partnerships and Engagement
- UTSC Student Union Vice President
- Woburn Residents Association

Participating community interest group representatives shared general support for the project while raising several thoughts and concerns that would later be echoed by the public throughout consultation. Specifically, participants were interested in the overall travel time of EELRT and using transit signal priority (TSP) to ensure quicker, more reliable service; the inclusion of a stop at the entrance to Morningside Park; parking considerations at Sheppard-McCowan Station and Kennedy Station for Scarborough commuters; and the need for further coordination and refinement of the future Sheppard-McCowan station.

A full summary of the community interest group meeting can be found in **Appendix L**.

6.3.2.2 Public Open Houses

The project team hosted three in-person public consultation events to share information about the project, the final functional (10%) design, and the findings from the draft EPR. These events served as an opportunity for members of the public to ask questions and give feedback on the project's proposed design and identified impacts and mitigation measures.

The events were drop-in style, meaning the project team did not provide a formal presentation and attendees could arrive and depart at their convenience. Event information and number of attendees at each was as follows:

- **Event 1 [52 participants]:** Wednesday, May 29, 2024
  5:30 – 8:00 p.m.
  Scarborough Village Recreation Centre, 3600 Kingston Road
- **Event 2 [54 participants]:** Thursday, May 30, 2024
  5:30 – 8:00 p.m.
  Highland Hall Event Centre at the University of Toronto Scarborough, 1265 Military Trail
- **Event 3 [33 participants]:** Saturday, June 1, 2024
  11:00 a.m. – 2:00 p.m.
  Lester B. Pearson Collegiate Institute, 150 Tapscott Road

Upon arrival, attendees were asked to sign in prior to entering the event space but were free to explore the project materials at their own pace once inside. While the three events had different layouts due to room size, shape, and other constraints, the format and information of each was the same. The rooms were loosely broken up into different sections of information:

- Welcome and Introduction
- Project Background and Context
- Project Timeline and Details
- Functional (10%) Design
- EPR Findings
- Project Benefits and Public Realm Improvements
- Public Feedback
- Children's Activity

A number of representatives from the City of Toronto, TTC, and the consultant HDR staffed each event.

6.3.2.3 Pop-Up Events

Following the public consultation events, the City of Toronto hosted two additional pop-up events at high-traffic areas to reach an additional audience who may have been unaware of the previous events or unwilling to travel to them. Event information and number of engagements at each was as follows:

- **Pop-up event 1 [100 engagements]:** June 19, 2024
  8:00 am – 12:00 p.m.
  Malvern Town Centre Mall and TAIBU Community Health Centre, 31 Tapscott Road
- **Pop-up event 2 [75 engagements]:** June 28, 2024
  3:00 – 6:00 p.m.
  Scarborough Town Centre Mall, 300 Borough Drive

6.3.2.4 Online Survey

An online survey was posted to the EELRT project page of the City's website the day the Notice of Commencement was issued (May 15, 2024) and was available to the public for the next six weeks (until June 30, 2024). The survey received a total of 674 respondents, with 481 (71%) fully completing all questions while the start page received 2,100 views.

A majority of respondents reported that they live near the proposed EELRT route, while a half reported that they travel on/through and nearly half shop or dine near the route.

Nearly two-thirds of respondents indicated they currently drive throughout the project area, while nearly the same amount responded that they use the TTC.

Survey results can thus be viewed as reflective of both drivers and TTC passengers, with a sizeable group of respondents (26%) currently using both modes.

6.3.2.5 Public Feedback

Public feedback was received during interest group and public meetings, during pop-up events, from an online survey accessible through the project web page, via email, from telephone calls, and from mailed letters. Feedback received during TRPAP is relevant for, and will be considered during, future phases of project development and design. Key findings of the public consultation are summarized below.

Overall, the public expressed their support for the project. In many cases, support was in the form of comments pleading to expedite the project and questions inquiring on the status of funding and timelines to construction. General non-specific comments of opposition were much less common, as most people who opposed the project had specific reasons why.

In response to information on the project impacts and mitigation measures, the public was generally most concerned with:

- **Transit and traffic impacts** the project will have, both during construction and operation. Members of the public were worried that traveling through Scarborough will become even more challenging than it is today with the increased traffic and with potential changes to existing bus routes. Two areas generated the most public concern, including Neilson Road (due to the reduction from four to two lanes) and Kingston-Lawrence-Morningside (where turns were noted to be difficult to navigate due to congestion).
- **Impacts to the natural environment**, citing the need to preserve and protect Highland Creek, Morningside Park, and the habitats and ecosystems within them as much as possible.
- **Noise and vibration impacts**. There was skepticism that the project will be able to mitigate noise and vibration impacts during construction and operation, affecting quality of life for Scarborough residents.
- **Cultural heritage impacts**. Several participants were divided as to the importance of the cultural environment, with some preferring to prioritize much needed transit while others were more inclined to protect cultural resources that contribute to Scarborough's heritage.

Members of the public also provided feedback on the final functional (10%) design, with a particular focus on:

- **Connections and ease of transfer.** Many wanted to ensure that all of Scarborough transit systems worked as seamlessly and efficiently together as possible. There were suggestions to integrate EELRT with Line 5 at Kennedy and the proposed Line 4 Extension.
- **Changes in route design, stops, stations, and service plan**, along with other **miscellaneous design** suggestions. Participants had various ideas for how to improve the project's design, some requested additional LRT stops to serve certain destinations while others suggested eliminating stops to decrease travel times.
- **Separation of modes.** Some participants felt that the project should be redesigned with a grade separation in mind, as either an elevated or underground system.
- **Transit signal prioritization (TSP).** Several participants called for the implementation of TSP to increase the efficiency and reliability of the EELRT.
- **Bicycle and pedestrian accommodations**, as **well** as **added green space** along the project corridor. Participants reaffirmed their desire for improved active transportation and an enhanced public realm.

Members of the public had comments and feedback beyond the EPR and the 10% design, as follows:

- Many warned the City and TTC to **avoid the mistakes of Eglinton Crosstown** (Line 5) project by adhering to construction timelines, learning from other similar LRT projects, and minimizing socio-economic impacts on Scarborough residents and businesses.
- Some advocated for **zoning changes** and supported **transit-oriented development**.
- Concerns were raised about the **speed, frequency, and reliability of the EELRT**, with a desire for it to remain faster than existing bus service.
- Several emphasized the **need for safety for the public and workers** during construction.
- A small group was concerned about **project costs**, while others wanted to see a full business case comparing the cost/benefit analysis with other transit modes like BRT or subway.
- Participants requested **comprehensive communication and consultation strategies** to keep residents, businesses, and commuters informed throughout construction.

Public feedback received from the pop-up events mirrored what was heard in the survey and public open houses. A higher proportion of participants had more general questions about the project than those who attended the consultation events, likely due to a lack of familiarity with EELRT and an absence of comprehensive project information at the pop-ups.

Appendix L contains a complete summary of feedback received in the TRPAP consultation and provides records of correspondence with members of the public following the commencement of the 120-day EPR development period, along with follow-ups and responses to such comments.

6.3.3 Property Owner Engagement

As part of the broader public consultation efforts during the TRPAP, potentially impacted property owners were sent individual letters by registered mail or email in advance of the formal commencement of the TRPAP to notify them of an impact to their property based on the functional (10%) design of the EELRT.

The letter informed them about the EELRT project and its current status; an explanation of the potential impacts to the property; how property owners could learn more about the potential impacts to their property; and the typical City processes related to property to enable public infrastructure. The letter also contained some frequently asked questions to help address common questions related to property impacts. Accompanying the letter was an aerial image of the property with demarcations showing the impact to the property. A total of 310 property letters were issued.

The project team then held preliminary meetings with the owners and/or their authorized agents/ of properties that would be impacted by the project based on the functional (10%) design. The purpose of these separate meetings was to help address owner concerns related to their specific properties being impacted. In total, four events were held: one virtually, and three in-person on the same dates and at the same locations as the public consultation events. In addition, members of the project team met individually with property owners and/or their authorized agents who could not attend any of the four events/sessions.

- **Virtual Property Owner Meeting:** Wednesday, May 22, 2024
  6:00 – 7:00 p.m.
- **Property Owner Drop-In Session 1:** Wednesday, May 29, 2024
  4:00 – 8:00 p.m.
  Scarborough Village Recreation Centre, 3600 Kingston Road
- **Property Owner Drop-In Session 2:** Thursday, May 30, 2024
  4:00 – 8:00 p.m.
  Highland Hall Event Centre at the University of Toronto Scarborough, 1265 Military Trail
- **Property Owner Drop-In Session 3:** Saturday, June 1, 2024
  11:00 a.m. – 2:00 p.m.
  Lester B. Pearson Collegiate Institute, 150 Tapscott Road

In total, members of the project team met with 55 property owners and/or their authorized agents (44 in-person, 11 virtual) between May 22 and July 29. Property owners and/or their authorized agents who met with the project team included:

- 16 properties adjacent to Morningside Avenue (two of which were north of Ellesmere Road)
- Nine properties adjacent to Eglinton Avenue East
- Eight properties adjacent to Kingston Road
- Six properties adjacent to Sheppard Avenue East

The project also received emails from 18 property owners and had telephone calls with 14 property owners.

A high-level summary of the questions and feedback raised by property owners during these meetings, from most to least common, includes the following:

- **Real estate.** Many property owners inquired about fair compensation and valuation and appraisals for property acquisitions. They also inquired about what the process for property acquisition entails. Inquiries about compensation for business losses were also made.
- **Property impact.** Many property owners wanted to better understand the changes to their property and the City-owned right-of-way. Some inquired about the possibility of adjusting the design to avoid impacting parts of their property such as parking areas (driveways and parking lots) and to avoid relocating structures on their property. Some inquired about sight triangles.
- **Project timelines.** Many property owners inquired about expected timelines for design and property acquisition, as well as duration of construction. Some expressed frustration with the uncertainty of the project timelines and funding.
- **Access to property and/or road.** Some property owners raised concerns about changes to vehicular access to their property with the loss of left turns due to the LRT guideway.
- **Impact on business and/or property use.** Some property owners raised concerns about loss of business revenue or potential closure due to construction and upon completion of the project due to parking loss as a result of roadway widening or Traction Power Substations (TPSSs). Potential need for closure was raised by at least two businesses. Some referenced businesses affected by the Eglinton Crosstown LRT.
- **Miscellaneous.** Other concerns raised by property owners include the impact of the project design and future property acquisition on current development proposals or future development of the property, noise during construction and/or upon completion of the project, the impact of construction, and the desire to see the route changed.

6.3.4 Stakeholder and Agency Engagement

The bulk of engagement with stakeholders occurred in the Pre-Planning phase when discussions where required as part of design development. As the proponents, the City of Toronto and TTC have been thoroughly engaged in all aspects of the project, including but not limited to, the alignment, service planning, road design, traffic, active transportation, coordination with surrounding planning initiatives and real estate.

A revised draft EPR and 10% design were circulated with affected stakeholders and agencies on May 29, 2024 along with draft responses to their comments on the prior submission (March 8, 2024). This circulation aimed to close the loop on feedback provided by MCM, MECP, TRCA and MTO.

To discuss and resolve outstanding comments and concerns, follow-up meetings were held with the following affected stakeholders and review agencies:

- **UTSC:** May 15, 2024
  - This meeting was held to notify UTSC of the TRPAP launch and to present the updated 10% design. UTSC also provided an update on undertakings on their lands, namely along New Military Trail.
- **MECP:** June 3, 2024
  - This meeting was held to discuss the eligibility of the New Military Trail roadway to be included as part of the TRPAP. This was in response to comments received from MECP stating that a separate environmental assessment process for New Military Trail would be required. A follow-up meeting was scheduled for June 27, 2024, and contains the conclusion to this discussion.
- **MTO:** June 4, 2024
  - This meeting was held as a response to comments received from MTO on the EPR circulation, mainly to discuss the reconfiguration of on/off ramps at the Morningside-401 bridge. MTO expressed their openness to ramp urbanization, contingent on their approval of appropriate safety and traffic impact assessments, to be completed in future design phases. The project team provided MTO with previous submission materials and necessary documents as there have been changes in staffing and points of contact. Meeting minutes were circulated to attendees on June 17, 2024.
- **TRCA:** June 7, 2024
  - This meeting was held to discuss EPR comments received from the TRCA. Clarification was sought on outstanding comments related to stormwater management, erosion and geotechnical hazard assessments, and feature based water balance assessments. The project team prepared sample responses for discussion, TRCA accepted the proposed responses. Meeting minutes were circulated to attendees on June 25, 2024.
- **CTC Source Protection Agency:** June 13, 2024
  - This meeting was held to discuss existing source water protection features and applicable policies and mitigation measures. Through the discussion, CTC confirmed that no legally binding policies apply to the project area. As such, no further source protection action would be required.
- **MECP:** June 27, 2024
  - This meeting was held to follow-up on the requirement for a separate environmental assessment process for the New Military Trail roadway. MECP reiterated that the roadway could not be included as part of the TRPAP and suggested separating it from the LRT guideway and public realm. This led to the additional future commitment and updates to the project description. The project team also sought advice on the approach on consultation with Indigenous Nations that have requested review fees. MECP recommended developing a pre-assessment summary for Indigenous Nations to review, with focus on their items of interest. Meeting minutes were circulated to attendees on June 28, 2024.

Acknowledgement and replies to the draft comment-responses were then shared by:

- MCM on June 24, 2024. Comments have since been addressed.
- MECP on June 4, 11 and 14. Comments have since been addressed.
- TRCA on June 28, 2024. Key items to be addressed by the proponent include a request for application review fee and for the project proponent to submit a survey at the MSF on base topographic mapping to be provided as soon as it is reasonably possible given property access constraints.

Stakeholder and agency comments were generally addressed where possible, or acknowledged through future commitments, to be resolved in the next phases of design. Agency comments and responses, meeting summaries and relevant correspondence with agencies and affected stakeholders can be found in **Appendix L.**

6.3.5 Indigenous Engagement

As part of the TRPAP, a transit project team has a duty to consult with Indigenous Communities that may have an interest in or may potentially be affected by the project.

When the TRPAP for the EELRT formally commenced on May 15, 2024, a formal email was circulated to Indigenous Communities identified by the MECP as potentially having an interest in the EELRT project. The email included a copy of the Notice of Commencement; a link to the EPR and supporting studies, project web page information; ways to contact the EELRT project team by email and telephone; and an invitation to ask questions, request more information, provide input, and arrange a meeting. This email notification was sent to:

- Williams Treaties First Nations
  - Mississaugas of Scugog Island First Nation
  - Hiawatha First Nation
  - Alderville First Nation
  - Curve Lake First Nation
  - Chippewas of Georgina Island First Nation
  - Chippewas of Rama First Nation
  - Beausoleil First Nation
- Mississaugas of the Credit First Nation
- Huron-Wendat

A reminder about the closure of the public consultation was sent out by the City of Toronto on June 19, 2024 to all Indigenous Communities to encourage project feedback. During the TRPAP consultation phase, the project team received:

- No response from the Beausoleil, Curve Lake, Hiawatha, Chippewas of Rama and Mississaugas of the Credit. The Chippewas of Rama and Hiawatha First Nations had previously acknowledged the project and asked to be kept involved as the project

progresses. The Pre-Planning meeting in January 2024 with the Mississaugas of the Credit First Nations had resolved their concerns at this stage in the study.
- An acknowledgement from the Huron-Wendat First Nations, expressing no comments on the EELRT TRPAP with a request to be kept updated as the project advances.
- A request for filing and review fees from Alderville and Chippewas of Georgina Island First Nations.
- A request for a meeting with the Mississaugas of Scugog Island First Nation (MSIFN) after receiving the email about the formal launch of the TRPAP. A virtual meeting was held on June 18, 2024 with Don Richardson, (Minogi Corporation), Rob Lukacs (MSIFN) and Ameer Adris (MSIFN) where the EELRT Project Team gave a presentation about the project, provided information about timelines for the TRPAP, and had an opportunity to get input from MSIFN. Areas of interest for MSIFN included transit-oriented communities (TOC), capacity funding, an impact benefit agreement, and concerns about treaty rights.

With regards to the requests for filing and review fees as well as capacity funding, the City of Toronto does not have the necessary policies nor channels in place to exchange payment for review of project materials. Therefore, per guidance from the MECP, the City of Toronto has summarized the project's impacts and mitigations in a concise pre-assessment document, designed to target particular areas of interest for Indigenous Communities such as natural environment, built heritage, cultural and archaeological resources. The pre-assessment was circulated on August 2, 2024 with the intention to alleviate review efforts for Indigenous Communities in light of their limited resources and the City's inability to process payment for the requested fees. The pre-assessment is included in **Appendix L**.

Indigenous Communities engagement is expected to continue as the project advances into the next phases of design and into implementation.

6.3.6 TRPAP Notice of Completion

The project Notice of Completion was filed on September 10, 2024. Its circulation closely follows that of the Notice of Commencement and consists of broad outreach to members of the public, potentially impacted property owners, review agencies, other stakeholders, and Indigenous Communities, using similar methods.

To summarize, the following means are used to engage potential interested persons following the Notice of Completion:

- Posting in the following newspapers with local circulation:
  - Toronto Sun on September 10, 2024;
  - Canadian Chinese Express (Simplified Chinese) on September 13, 2024;
  - Ming Pao Daily News (Traditional Chinese) on September 13, 2024;
  - Senthamarai (Tamil) on September 13, 2024;
  - Gujarat Abroad (Gujarati) on September 13, 2024;
  - The Caribbean Camera on September 19, 2024;
- Physical mailout sent to all properties in or near the project area;
- Email to project mailing list, including members of the public who have expressed an interest in receiving project updates;
- Post updated project information, Notice of Completion, and EPR on the project website;
- Circulate the Project Notice of Completion, including information on the project and links to the EPR, via email to interest group representatives; and
- Circulate the Project Notice of Completion individually via email to all other stakeholders, review agencies, and Indigenous Communities who received the Notice of Commencement; and
- Letters to potentially impacted property owners.

A copy of the Notice of Completion is included in **Appendix L**.

6.4 Future Communications and Engagement

The EELRT project team is committed to continued consultation with stakeholders, residents, neighbourhood associations, interest groups, businesses, and others beyond the TRPAP and into the next phases of the project's design. As described in Chapter 8, the proponents will:

- Develop a Public and Stakeholder Consultation Plan for the next phase of the project's design, detailing the outreach and engagement methods, tools, and tactics throughout that phase of the project.
- Create and consult on a Community Benefits Agreement to increase opportunities for business and job creation in the communities along and surrounding the Eglinton East LRT corridor.
- Continue consultation with agencies -- particularly the Toronto and Region Conservation Authority (TRCA) and MECP -- as required to ensure compliance with the applicable environmental policies, guidelines and plans regarding acceptable mitigation/compensation protocols for natural heritage features, and to identify any additional required mitigation measures to ensure impacts to these areas are minimized to the extent possible.
- Continue to communicate with potentially impacted property owners about their rights during any property acquisition process, what that process entails and when it may begin.
- Consult with municipal heritage staff and other jurisdictions as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage conservation districts or conservation areas (parks). If there is encroachment on heritage property, a HIA will be required to be undertaken by a qualified person as early as possible during detailed design, and developed in consultation with, and submitted for review to, the MCM and interested parties including the municipal heritage planner and/or municipal heritage committee and Indigenous Nations, as appropriate. A heritage permit may be required and further consultation with heritage staff at the municipality is recommended.

- Continue engagement with Indigenous Communities during future phases of the project, specifically regarding any future studies and fieldwork related to natural heritage, cultural heritage, and archaeology.

If, in the future, substantial or fundamental changes are proposed to the Project Description provided in Chapter 3 of this EPR, consultation will be undertaken with MECP regarding the process to be followed under Section 15 of Ontario Regulation 231/08.

7 Permits, Approvals, and Legislative Requirements

In addition to meeting the requirements of Ontario Regulation 231/08: Transit and Rail Projects Assessment Process, several federal, provincial, and municipal permits, approvals, and authorizations will be required prior to implementation of the project. A preliminary list of the permits, approvals, and authorizations that are anticipated to be required is provided below. Prior to construction, during the detailed design phase, the proponent will continue consultation with relevant stakeholder agencies (i.e., Metrolinx, TRCA, MECP, MNRF, MCM, etc.) as necessary to review, confirm and secure all required permits, approvals, and authorizations for the implementation of the EELRT.

7.1 Federal

The following federal approvals may be required for the construction of the project.

7.1.1 Impact Assessment Act, 2019

On June 21, 2019, Bill C-69 (Act to Enact the Impact Assessment Act and the Canadian Energy Regulator Act, to Amend the Navigation Protection Act and to make Consequential Amendments to other Acts) received Royal Assent. On August 28 and 29, 2019, the Impact Assessment Act (IAA) came into effect, along with a new set of Regulations, establishing the legislative basis for the federal EA process. The new IAA replaces the previous Canadian Environmental Assessment Act (CEAA 2012) and is led by the Impact Assessment Agency of Canada.

Similar to the process under the CEAA 2012, federal impact assessments under the IAA are conducted for proposed physical activities that are "designated," in two ways:

- through the Physical Activities Regulations (commonly known as the Project List which prescribes the physical activities that constitute a "designated project"); and,
- by the federal Minister of the Environment and Climate Change if, in the Minister's opinion, the project may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or if public concern related to those effects warrants a designation.

A review of the Project List determined that implementation of the Eglinton East LRT does not constitute a "designated project" as described in the Physical Activities Regulations (Project List). As a result, based on this review, the activities associated with the EELRT are not subject to the IAA. Further review of IAA triggers should be undertaken during the detail design phase to confirm that the requirements of the IAA do not apply to the project.

7.2 Provincial

The following provincial permits and approvals may be required for the construction of the project:

- Secure Notice to Proceed with the EELRT project from the Minister as part of TRPAP.
- Obtain Environmental Compliance Approvals (ECA) for new/relocated sanitary sewers, new/relocated storm sewers and outfalls, stormwater quality controls, sewer use for discharge of dewatering effluent (in compliance with s. 53 of the Ontario Water Resources Act (OWRA) and relevant the Ministry of the Environment, Conservation and Parks guidelines), as appropriate. Should potable water lines be relocated, ECA will be sought from MECP prior to relocation.
- Develop an Excess Soil Management Strategy to implement a cradle-to-grave approach and comply with O. Reg. 406/19 and other applicable regulations.
- Contact the Ministry of Environment, Conservation and Parks (MECP) if species at risk are identified within the construction influence zone to determine appropriate treatment.
- Apply for either an Environmental Activity and Sector Registry (EASRs) or Permit to Take Water (PTTWs) in areas where groundwater levels are anticipated to be lowered to below elevations of proposed foundation footings. A PTTW should be sought from the Ministry of the Environment (MOE) under Ontario Regulation 387/04 if dewatering for guideway/structural/building foundations exceeds 50,000 litres per day but less than 400,000 L/day. However, it is not anticipated that a PTTW will be needed for dewatering or diverting flow from watercourses through mechanical pumping. Once the details on the proposed excavations are finalized during detail design, the need for an EASR or Permit to Take Water (PTTW) will be re-assessed using any additional hydrogeological data collected.
- Obtain letters from Ministry of Citizenship and Multiculturalism (MCM) indicating that all Archaeological Assessment reports have been entered into the Ontario Public Register of Archaeological Reports, including reports that recommend no further stages of archaeological assessment for each property.
- Further built heritage investigations will be conducted and the associated reports (CHERs and HIAs) will be submitted to MCM for review and comment, as required prior to any ground disturbance. CHERs and HIAs should be circulated to City of Toronto Heritage Planning, Indigenous Communities, and other interested parties.
- Secure TRCA permits during detailed design to comply with Section 28.1 of the Conservation Authorities Act.
- Acquire permit(s) or other form of permission(s) for all or part of the project components under the Endangered Species Act. Specialty studies and assessments may be required to fulfill this obligation. If trees or buildings are to be removed or manipulated, SAR bats are to be considered.
- Secure final approval from Enbridge Gas for their facilities in the corridor.
- Obtain relevant permits for encroachment onto MTO Right-of-Way (ROW) and ensure adherence to MTO standards and procedures. Follow the requisite land

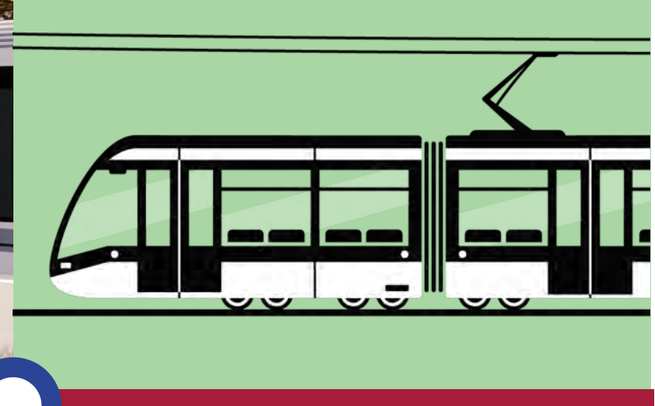
assessment/procurement requirements as identified by the Ministry Property Office, should MTO lands be identified for project needs.

7.3 Municipal

The following municipal approvals are required for the construction of this project:

- Approvals and permits from the Toronto Region Conservation Authority (as required)
- Drinking Water Works Permit Application (DWWP) for relocation, alteration and/or installation of watermains works (as required).
- Sewer Discharge Permits and Agreements when private water (water not purchased from the City) is discharged into the City's sewer system, including storm sewers, sanitary sewers, or combined sewers (as required). Watermain Isolation Application for watermain shut requests (as required).
- Construction Sequencing and By-Pass Flow Plan for sewer work in cases where Third Parties are proposing temporary sewer by-pass work on the City's trunk and local sewers for any period.
- Approvals from Toronto City Council as required (e.g., zoning amendments, permanent street closures or closures in excess of 365 days, etc.)
- Planning Act Approvals, including Site Plan Approval and any other related permits from the City, as required.
- Alterations to properties designated by bylaw pursuant to Part IV of the OHA.
- Building permits for construction activities, including demolition permits, prior to construction.
- Applications (as required) to Transportation Services potentially affecting roads/streets (e.g., street closures, cut permits, parking, etc.)
- Applications (as required) to Toronto Water associated with any potential water and/or sanitary main relocations and/or sewer uses (e.g., discharges or connections)
- Utility agreements related to utility crossings, hydro, gas and telecommunications connections applications and service agreements.
- Approvals for City and private tree removals (as required) in compliance with Tree Preservation By-laws.

An example of an LRV from Finch West LRT.



8 Commitments to Future Work

8.1 Summary of Future Commitments, Mitigation Measures and Monitoring Requirements

The following section provides a summary of the commitments outlined throughout this report and resulting from discussions with internal and external stakeholders. The commitments result from proposed mitigation measures to address potential impacts of the Eglinton East LRT, as well as the proponent's commitments to future consultation with the MECP, Indigenous Nations, regulatory agencies, applicable stakeholders, and property owners. This table will be the basis for an Environmental Mitigation and Monitoring Plan (EMMP), which will be developed to ensure that the commitments to mitigation are completed throughout the detail design, construction, and operation phases of the project, and that such mitigation is effective.

Table 8-1: Summary of Commitments for Future Work

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
Transportation			
Active Transportation	Preliminary Design, Detailed Design and Construction	• Apply the latest available City standards for protected intersection design during future phases of design. • Refinement of intersection corner rounding and sight triangle property protection requirements will be applied in conjunction with the application of protected intersection design standards and principles at the preliminary and detailed design phases of the project. • Prepare a Construction Management Plan that prioritizes safe and convenient access for pedestrians and cyclists during construction. Refer to the Ontario Traffic Manual (OTM) Book 7 Temporary Conditions. o Explore alternative barrier-free pedestrian and active transportations routes to ensure continued access to the neighbourhoods during construction. • Complete further assessment to potentially allow continuous separate sidewalk and cycling facilities along Sheppard Avenue (in conjunction with analysis of public feedback and the future evolving transportation network in Malvern). Consider providing clear separation between pedestrians and cyclists, incorporating proper signage, and ensuring accessibility for all. • Coordinate connections to broader cycling network during future design. • Review proximity of pedestrian crossings across Ellesmere Road at Military Trail and at New Military Trail. • Review frequency and signal timings for proposed pedestrian crossings along the New Military Trail alignment based on the latest implementation of the UTSC Master Plan / Secondary Plan. • Coordinate with the UTSC, as part of the future Class EA, streamlined assessment or studies that may be undertaken, as required by the Environmental Assessment Act to confirm the active transportation infrastructure along New Military Trail. • Explore the following mitigation measures to reduce the risk of cyclist oncoming collision or sideswiping the railing on the Morningside – Highland Creek bridge, due to the 3.0 m multi-use path (MUP): o Incorporate setback crossings at both park driveways north and south of the bridge. The setback crossing would mean that the MUP would bend out before the crossing and bend back after. These bends should help moderate bicycle speeds before they enter the bridge. o Consider warning or advisory speed signage to inform approaching cyclists of the constrained MUP widths. Do not include dismount signage. o Consider designing the outer railings such that they slope outward, increasing the effective width at handlebar height.	• City of Toronto • Metrolinx • UTSC

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		○ If structurally feasible, consider having short bump-outs where the MUPs widen (a design similar to a lookout) to provide space for someone to pull over and allow others to pass more comfortably. ○ Review opportunities to increase the MUP width beyond 3.0 m as the design advances. • Review with Metrolinx opportunities for streetscape enhancements for the future LRT-GO transfer at Guildwood GO Station, as the EELRT project does not specifically address improvements here. Explore whether a study should be conducted to evaluate extending the Highland Creek Trail from Livingstone Road to the GO station, under the Kingston Road bridge, to increase access and make it easier for pedestrians and cyclists to cross the Kingston Road. • Consider installing a buffer with flexible bollards along the top of the proposed curb, between the travel lanes and the MUP, on Morningside Avenue Highland Creek bridge with the LRT.	
Transit	Preliminary Design, Detailed Design, Construction, Operation	• Confirm details about LRV specifications in later stages of design. Retrieve manufacturer specifications to ensure considerations for coupling of vehicles and their ability to navigate track radii and gradients. Initiate discussions with manufacturers to accommodate design specifications. • Include transit signal priority capabilities and determine the extent, type and form in future design phases. • Conduct OpenTrack rail simulation to confirm LRT service concept requirements and energy consumption needs. • Details surrounding the future service plans (routes, origins/destinations, service span, frequency, etc.) are to be defined by the TTC based on further design of the LRT and how best to serve community needs. • Explore opportunities for full-sized bus shelters, where possible. Confirm LRT station and stop amenities and features in future phases of the design • Explore stop shelter design elements that protect against winter cold and wind such as providing heated shelters • Confirm TPSS recommendations and locations once load flow analysis is completed as well as mitigation measures for noise and vibration. • Verify and address the setback of stop bars at specific intersections where the LRT turns, to ensure the distance from the traffic signal to the stop bar does not exceed 55 m in the next phase of design. Move bus stops previously located at channels closer to the stop bar. • Ensure that the EELRT accommodates the future 4th GO track at Eglinton GO bridge, which is currently 3 tracks wide, should needs arise. • Investigate opportunities to improve safety and mitigate concerns regarding the proposed bus right-turn channel at the Eglinton-Kingston intersection. Key issues raised in regarding the proposed configuration are related to regular vehicles using the right turn channel reserved for bus operations, though this can be mitigated using red paint and signage to deter access. Alternatively, the existing Eglinton Avenue can be used for turning buses around, but this would shift buses further away from the Eglinton-Kingston LRT stop. Future proponents to consider opportunities to revisit and assess additional options beyond the proposed bus channel and potentially remove the right-turn channel (and pork chop island). • Review and potentially increase width of bus only left-turn lane at Malvern Bus Terminal from 3.0 m to 3.3 m, to be completed in conjunction with future TTC plans for the terminal. • Review the conservative design speed assumptions at Neilson Road and further explore opportunities to increase LRT operating speed without impacting additional properties. Design speeds will depend on selected LRV specifications.	• City of Toronto • Toronto Transit Commission (TTC) • GO Transit • Metrolinx

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Explore a future TTC bus route to better serve Morningside Park, subject to adherence to TTC Board approved service standards. • Explore potential connection points to Morningside Park along Ellesmere Road west of Morningside Avenue, if the existing natural environment and topography permits (under RNFP By-law and TRCA regulations), considering the major transit node at Ellesmere and Morningside Avenue proposed to be served by both LRT and BRT. • City and Metrolinx-SSE are in discussions to confirm a mutually agreeable scenario to ensuring constructability at SSE and EELRT station interfaces. EELRT will be designed to minimize impact on SSE structures during EELRT construction. City-EELRT and MX-SSE will continue coordinating throughout to ensure the overall reduction of impact for both projects and taxpayer cost benefit. o Provide requirements for SSE shoring to protect for future EELRT station construction and SSE operations. o Design and construct utility relocations to allow for a future EELRT utility exclusion zone at and in the vicinity of Kennedy Station. o Design and construct a knockout panel at Sheppard-McCowan Station to accommodate the efficient flow of passengers in the future between the EELRT and SSE • Refine design of the MSF to improve site efficiency based on yet to be determined service concept and operational requirements. Obtain Permission-to-Enter site from Metrolinx and conduct additional surveys and investigations related to the observed pipe system at the MSF site. Should concerns relating to the long-term availability and suitability of the 8304 Sheppard property for the MSF arise in the future, the proponent is to explore and confirm whether there may be an alternative or expanded available and suitable property to accommodate the EELRT MSF. • Complete a traffic operations analysis for Ellesmere Road from New Military Trail to Morningside Avenue using the 10% design and including buses operating in the curb lanes. • Collaborate with Metrolinx during DSBRT detailed design and explore cost-effective and efficient measures to improve bus operations through the shared segment along Ellesmere Road. Resume discussions regarding BRT transit priority improvements given shared project goals and support future undertakings of transit and traffic analysis, as needed. • Complete a full assessment of transit impacts around EELRT interchanges at Kennedy Station and Sheppard-McCowan Station once construction timelines of nearby projects (SSE, ECLRT, Line 4-Sheppard Extension) are better understood and the EELRT design has progressed beyond the early functional design stage. • Develop a Construction Management Plan during detailed design phase to reduce hindrance to transit riders. • Develop a Traffic and Transit Management Plan (TTMP) in accordance with the City's latest standards, as part of the construction requirements. • During construction and post-implementation, TTC to monitor observed ridership patterns and travel time impacts to adjust schedule and frequency to maintain acceptable performance.	
Road	Preliminary and Detailed Design	• At the functional 10% design stage, curb radii have been applied conservatively to protect for large vehicle turning and protecting for reasonable worst case property impact. Consider conducting context-sensitive analyses on curb radii for each intersection during later design stages. • Apply the latest available City standards for protected intersection design during future phases of design.	• City of Toronto

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• At the functional 10% design stage, daylight triangles have been applied conservatively to protect for corner property requirements. Refine daylight triangle design as needed in future phases of design to mitigate impact on active development applications and to suit the context-sensitive nature for each intersection. • Develop the public realm at the corners of intersection with updated information on the City plans for Complete Streets along the side streets. • Verify using AutoTURN analysis that buses can navigate the proposed corner radii and refine design, as appropriate. • Update the proposed design along Ellesmere Road to reflect changes with the Ellesmere Complete Street project. • Reconfigure the Eglinton Avenue Loop road to service Kennedy Station and future adjacent land uses. • Confirm need for TTC right-turn channel at Eglinton Avenue East and Kingston Road. • Coordinate with or undertake future Class EA, streamlined assessment or studies that may be undertaken, as required by the Environmental Assessment Act for the New Military Trail roadway.	
Traffic	Preliminary and Detailed Design	• Confirm and implement appropriate traffic signal policy and transit signal priority technology to complement and enable EELRT while balancing the needs of other ROW users. • Monitor traffic volumes and adjust signal timings as necessary before, during and after construction. • Undertake signal timing modifications to the EELRT traffic model, incorporating current signal operation policy (such as the Vision Zero Road Safety Plan) for the entire corridor, during subsequent design stages. • Conduct further assessment for the proposed pedestrian crossover (PXO/MPS) at Ellesmere Road near New Military Trail. • Incorporate DSBRT design and future operations in the modelling scenarios (even as a sensitivity analysis). • Consider the signalization of Mornelle Court and Ellesmere Road in the scenario that EELRT is constructed prior to DSBRT. • Confirm retention of RapidTO lanes during construction or to revert to mixed traffic. The assessment should examine person-hour savings (based on people moved through corridor rather than vehicles since buses carry more than single occupant vehicles) and the strategic considerations around maintaining ridership base with reliable service, climate goals, equity, etc. • Complete a microsimulation and PXO warrant process at Ellesmere/New Military Trail to determine whether proposed PXO is operationally feasible/effective. • Conduct a transportation and traffic safety assessment as part of detailed design, incorporating the signal operation policy and signal timing modifications in effect at the time of analysis. • Develop a Traffic and Transit Management Plan (TTMP) in accordance with the City's latest standards, as part of the construction requirements. • Emergency Response Plan must be prepared by the contractor. • To address concerns about traffic congestion along Neilson Road, explore extensions to existing truck restrictions as well as signal timing updates and alternate truck routes.	• City of Toronto • TTC

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
Public Realm	Preliminary and Detailed Design	• Develop a tree protection plan, tree inventory log and arborist report to ensure preservation of mature trees is prioritized. • Preserve in-situ healthy mature trees in the design when possible. This may require skewing the alignment of transit infrastructure towards the opposite side of the street. • Explore opportunities for sustainable landscape elements, adhering to Toronto Green Standards (TGS), Low Impact Design (LID) techniques, and Crime Prevention Through Environment Design principles, which can include: o Landscaping adjacent to tracks, platforms, centre medians, etc. where excess space allows, to foster traffic calming o Green/landscaping strip between sidewalk and property line. Typically, in Scarborough, 1 m is provided for greenery o Additional trees and landscaping – At intersections – Along Eglinton Avenue south side between Danforth and Oswego – Along Kingston Road north side from Sounders to Cromwell – Along Kingston Road north side east of Overture – Along Morningside Avenue between Tams and Military Trail o Landscaping in the triangular areas between the LRT guideway and the roadway at the following locations: – Sheppard Avenue at Water Tower Gate – Sheppard Avenue at Morningside Avenue – Sheppard Avenue at Neilson Road – Sheppard Avenue at Gateforth Drive – Sheppard Avenue at Malvern Street / Progress Avenue – Sheppard Avenue at Scunthorpe Road – Sheppard Avenue at Shorting Road – Neilson Road at Tapscott Road o Integration of green tracks o A wider, 8.5 m public realm where possible at certain locations o Benches and water fountains as part of the public realm strategy • Relocate existing above and below grade utilities to achieve public realm vision and design, as appropriate • Include all active development applications on future design drawings with front yard setbacks. • Provide mitigation measures to limit the visual impact of TPSS' and EEBs on the public realm. • Identify the scope of work on side streets. • Provide appropriate buffer between the sidewalk and the cycling facilities to promote pedestrian safety, where possible. • Locate the planting and furniture zone between the sidewalk and the cycling facilities.	• City of Toronto
Focus Areas			
Kennedy Station	Preliminary and	• Identify pedestrian and cycling connections to the station from the existing communities to the north and south, and between the LRT and GO station.	• City of Toronto • TTC

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
	Detailed Design	• Develop Kennedy Station area public realm plan and sections, include conceptual streetscape and landscape improvements, entrance locations, and transit plazas. Ensure that there will be no conflicts with the findings of the City of Toronto's Kennedy Public Realm Plan. • Identify mitigation measures for SSE infrastructure. • Continue to coordinate opportunities for a well-integrated Kennedy Station.	• Metrolinx
Sheppard East Station (Sheppard-McCowan)	Preliminary and Detailed Design	• Explore increased public realm dimension and increased setback of the SSE headhouse through alignment adjustment, additional widening, and lane reduction. • Identify potential locations for the westbound night bus stop at McCowan, given limited ROW in front of the SSE headhouse (nearside). • Validate the EBL capacity reduction into the Sheppard-McCowan bus terminal entrance.	• City of Toronto • TTC • Metrolinx
Infrastructure			
Drainage and Stormwater Management	Preliminary, Detailed Design And Construction	• Include TRCA regulation and Floodplain limits on all applicable drawings in the detailed design phase. • Undertake a survey (on base topographical mapping) of the MSF site at the soonest possible opportunity subject to a permission to enter agreement with the property owner. • Establish a storm sewer system for a 5-year storm event as per City of Toronto Storm Drainage Design Requirements for ultimate roadway configuration. • Review and verify the design flows using hydrologic modelling during detailed design. • Update survey data for existing and proposed drainage conditions and integrate fluvial geomorphology recommendations into the design to prevent flooding impacts. • Perform a hydraulic analysis of any new crossings or modifications to existing crossings using TRCA's HEC-RAS model and updated survey data and proposed conditions. Advance the design of proposed hydraulic structures for the ultimate roadway configuration. Ensure there are no off-site impacts to drainage at the three watercourse crossings if there is a change in crossing size and / or road width. • Confirm requirements for anticipated storm sewer upsizing and catch basin relocations due to proposed roadway widening. • Ensure the stormwater management design follows the City of Toronto's Wet Weather Flow Management Guidelines, particularly that the flow to the minor system be restricted to the capacity of the pipes. • During detailed design, ensure the stormwater management report includes the following sections: • a) Water balance (Monthly, using Thornthwaite spreadsheet method) • b) TRCA Wetland Water Balance Risk Tool • c) Water quality, including TSS removal and disinfection, if any. • d) Water Quantity, including flood flow management and erosion control. • e) Erosion and sediment control during construction. • f) Discharge criteria to municipal infrastructure, in accordance with the City's "Design Criteria for Sewers & Watermains". • g) Sewer connections. • Provide TRCA with the following project details to facilitate permitting: • Existing conditions details (as is condition) including profiles and cross sections. • Details regarding removals and decommissioning of existing infrastructure as required.	• Toronto Region Conservation Authority (TRCA) • Toronto Water

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Design detail for new sections/local improvements (cross- and longitudinal sections). • Method(s) for managing creek flows during construction. • Watercourse protection. • Stockpile and construction staging areas, access routes. • Erosion and sediment control measures during and post construction. • Site restoration and enhancement opportunities. • Provide documentation of the following plans/drawings to facilitate TRCA's review of the impacts within regulated area: • TRCA Regulation Limits • Regional Storm Flood Plain lines • Physical extent of existing natural features (vegetation, wetlands, surface water features, contour lines, etc.) • Construction limits (east, west, north, south) • Proponent's property boundaries • TRCA property limits • Municipal Roads, trails, bridges, staircases, and tunnels • Investigate opportunities to incorporate green infrastructure into the design in future design phases. These low impact development measures such as permeable pavements and rain gardens can help manage water and reduce the urban heat island effect, among other social and ecological benefits. • Review various best management practices and assess their applicability during the detailed design stage, following TRCA policies and standards. • Confirm the following TRCA stormwater management criteria are applicable for the proposed works area and project right-of-way during detailed design: • **Quantity:** control peak flows for the 2-year, 5-year, 10-year, 25-year, 50-year and 100-year design storms to existing conditions. • **Quality:** 80% total suspended solids removal; and • **Erosion Control:** 5 mm on-site retention above the initial abstraction • For the Conlins MSF, the limits for flood plain, drip line, and top of bank (TOB) / long term stable TOB will be determined in the 30% design. A 10 m development setback from the greatest inland hazard should then be applied to the site. Hazard limits and setbacks should be established for the top and eastern edges, and possibly the southern section based on existing conditions updates and modelling, depending on where the TOB and flood plain land. This should all be identified in a high-level figure at the 30% design stage as this will impact facility design. • Perform loading analysis on the 2250 mm storm sewer below the Sheppard-McCowan station box, mitigate any impacts, and address concerns about accessibility for maintenance • Design the drainage system for the new proposed roadway (i.e., New Military Trail) during future phases of the project. • Design wet utilities in accordance with the current and applicable standards and guidelines from the City.	

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• During construction, follow the maximum allowable vibration level requirements outlined in GN117SS, for piling and shoring work near trunk and local sewers, and transmission and distribution watermains.	
Bridges and Structures	Preliminary and Detailed Design, Construction and Operation	• Analyze the feasibility of widening and/or replacement of the Sheppard Avenue — Highland Creek Bridge near Washburn Way (Structure ID: 211) and Sheppard Avenue — Highland Creek Bridge near McCowan Road (Structure ID: 265) during the next design phase. • Update the HEC-RAS model, if there is encroachment into the embankment at bridge locations • Complete an incremental cut and fill analysis to confirm that there is no net fill in TRCA regulated areas • Consult with Metrolinx (Structure ID: MX Rail Kingston 323.19) and MTO (Structure ID: 37X-0220/B0) to obtain approvals. • Conduct hydraulic analysis following Natural Hazards Policies or the Technical Guide, River and Stream Systems; Flooding Hazard Limit (2002) to ensure that all following flood hazard objectives are met: o Follow the TRCA's Crossing Guideline for Valley and Stream Corridors (2015) when setting stream crossing objectives for watercourses under TRCA jurisdiction during the detail design phase. o Coordinate with TRCA to consider the proposed works related to flood control around bridges during detailed design. Assess hydraulic conditions using TRCA's 2D hydraulic model during detailed design to further refine the design and the proposed grading plan, to ensure there is no net fill volume within the floodplain and not any offsite or on-site impact to the water surface elevation and velocities of the 2-year, 5-year, 10-year, 25-year, 50-year, 100-year, and the TRCA's Regulatory design storm floodplains. • Coordinate with and obtain approval from MTO regarding the ultimate design of the MTO 401-Morningside bridge and its roadway during preliminary design (30%). o Obtain relevant permits for encroachment onto MTO Right-of-Way (ROW) and ensure adherence to MTO standards and procedures. o Adhere to Depth of Cover regulations. o Submit environmental, traffic, traffic management plans, and drainage impacts to the MTO for review. o Coordinate with MTO during future phases of the EELRT design regarding approvals for environmental work (Phase II ESA, planting plans, vibration) and geotechnical work (soil stockpiling, boreholes). o Coordinate with MTO for other planned and ongoing projects in the area. o Explore opportunities for a wider Morningside-401 bridge deck to support enhanced public realm. o Follow Access Management Guidelines for site access, per the Highway Corridor Management Manual Chapter 4. o Conduct Synchro traffic analysis to advance ramp urbanization. Confirm existing and future (10-year) volumes will operate through the ramp terminal intersections without adversely impacting ramp operations. Confirm level of service is maintained after urbanization and for the 10-year time frame. Evaluate of options with and without urbanization. o Coordinate and obtain approvals for the proposed ramps reconfiguration from MTO. o Investigate in future phases increasing lane widths from 3.0m to 3.3m across the bridge by using buffer widths adjacent to the LRT guideway. • Determine risk of erosion hazard for the crossings through slope stability assessments. • Define maintenance requirements and responsibilities during next phases of design as the proposed EELRT will complicate spring/summer/winter maintenance activities on the 401-Morningside bridge. Draw on recent agreements on Finch West LRT.	• City of Toronto • Toronto Region Conservation Authority (TRCA) • Metrolinx • MTO

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Coordinate with Metrolinx and confirm impacts and any necessary mitigations to emergency exit buildings (EEBs) at Eglinton Avenue and Winter and Midland Avenues. • Advance design of bridge/structure upgrades including span sizes, impact on fluvial geomorphic processes, connections to natural corridors, and the incorporation of eco-passages.	
Retaining Walls	Preliminary and Detailed Design	• Confirm the type and dimensions of retaining wall to be used along Ellesmere Road. It is anticipated the deep foundation caisson are required. Up to 1.5 m thick wall have been assumed for 10% design to not limit choices. Verify that the type of retaining wall selected does not hinder maintenance access to the transmission watermain underneath, south of Ellesmere Road. • Revisit design of retaining walls to reduce the heights and explore design options to minimize their impact. • This phase of the project explored that Mechanically Stabilized Earth (MSE) walls are a potential alternative to re-grading the valley embankment for Morningside road widening. In future phases, the proponent should conduct structural analysis of MSE walls to confirm their applicability for re-grading the Morningside-Highland Creek valley embankment. • Explore a wider than 300 mm toe wall where toe walls are required to accommodate City standard toe wall per City Standard Drawing T-601.01-2. • Minimize retaining walls. Where they are necessary, provide mitigation measures such as terracing, landscaping, and upgraded exterior materials.	• City of Toronto
Utilities	Preliminary and Detailed Design Construction	• Develop a utility relocation strategy and detailed utility relocation plans, following all applicable standards in future phases of design. Review and confirm utility impacts and recommendations based on the design of the EELRT at the time. • Undertake subsurface utility investigations and develop detailed utility relocation plans in future design phases. • Identify potential utility conflicts in consultation with the City, TTC, Metrolinx, and affected private utility owners, to develop applicable protection and/or relocation strategies prior to construction. Required permits shall be obtained from the City prior to construction. • The existing utilities which are in conflicts should be removed not abandoned and abandoned utilities should be removed and disposed of off-site considering the space constraints. • Verify zone of influence of the Ellesmere Road 2100 mm transmission main to ensure no adverse impacts are expected from the retaining wall proposed by the project. • Identify any deviations from standard utility clearances explicitly and discuss with City staff for approval. Submit appropriate and separate Municipal Consent Requirements (MCRs) documentation to secure City acceptance. Standard clearances must comply with MCR-Appendix O. Any exemptions require review and approval by Toronto Water.	• City of Toronto • Private Utility Companies
Socio-Economic Environment			
Property	Preliminary Design, Detailed Design and Construction	• Undertake an Official Plan Amendment to protect for the EELRT right-of-way. • Undertake Zoning By-law Amendments, if necessary, to allow for the EELRT and its facilities. • Coordinate and confirm details regarding the interim condition of the north parking lot at Don Montgomery Community Recreation Centre (DM CRC), post SSE construction. This coordination should encompass site restoration responsibilities for SSE and provide information on available parking between SSE and EELRT.	• City of Toronto

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Coordinate and communicate with CreateTO, the City's Housing Secretariat and the City's Corporate Real Estate Management (CREM) division regarding any impacts to City-owned properties to ensure the City's interests, including current and future plans for those lands, are considered and protected. • Explore opportunities to reduce impacts to the DM CRC during EELRT construction and operations as it is expected that reduced parking will adversely affect community centre programming. Consider providing continued parking access for specialized facilities such as arenas and relocating non-ice programming to other facilities. Rely on Parks, Forestry and Recreations available data to identify impacts of any relocations on existing users. • Continue to communicate with potentially impacted property owners about their rights during any property acquisition process, what that process entails and when it may begin. • Continue to investigate opportunities to minimize impacts to properties where possible • Provide civic numbers on future design drawings. • Include all active development applications with front yard setbacks on future design drawings. • Outline the extent of grading, label access routes and staging areas, and clearly display all disturbance areas during detailed design.	
Land Use	Preliminary and Detailed Design	• Conduct a Construction Management Plan to identify ways to minimize dust and emission during construction. • Conduct a Community Development Study to understand how to protect small businesses during and after construction and mitigate impacts of gentrification. • Conduct a Parks, Forestry and Recreation Study and establish Tree Protection Zones during construction. • Conduct a local Construction Management Plan. • Conduct a Tree Planting Plan. • Develop an OPA to protect for ROW width requirements along the corridor. • Deploy responsive community support initiatives, including engagement, local procurement opportunities and construction mitigation. Consider the creation of a Community Benefits Agreement to increase opportunities for business and job creation in the communities along and surrounding the EELRT corridor. • Continue outreach and discussions with the community as part of future phases prior to and during construction.	• City of Toronto
Natural Environment			
Terrain and Soils	Preliminary and Detailed Design, Construction	• Prepare a detailed Erosion and Sediment Control Plan to identify and implement site-specific sedimentation control measures prior and during construction. • Develop a detailed Excess Soil Management Plan to manage excess soil in accordance with the O. Reg. 406/19: On-Site and Excess Soil Management (2019) and other applicable regulations. • Plans and procedures should be implemented to ensure soil is properly tested and characterized, stockpiled on site, hauled (with licensed haulers) and disposed of at legitimate receiving sites (i.e., beneficial re-use sites and/or registered disposal sites) • The project should have a robust tracking system to ensure all soil leaving the site is being taken to the correct location (as described in a soil destination report).	• City of Toronto • MECP • MTO • Indigenous Communities

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Hauling of soil should be performed by vetted haulage companies. To ensure all soil is being hauled transparently, it is best to deal directly with the haulage company and not a third-party company. • Contingency receiving site list should be compiled in case receiving sites reach capacity and/or are no longer accepting soil. • Ensure the Soil Registry is kept up to date with receiving sites and soil movement. • Ensure no soil stockpiling to be undertaken on MTO ROW or within the 14 m setback.	
Fish and Fish Habitat	Preliminary, Detailed Design and Construction	• Conduct a self-assessment in accordance with DFO procedures to determine the potential for "HADD" once culvert and bridge designs have been advanced. Further correspondence with DFO shall take place to discuss species at risk and Fisheries Act requirements. • Protect riparian vegetation, follow Erosion and Sediment Control Plan, avoid contamination of surface water through construction activities, monitor changes to water quality and quantity and follow best practices for in-water works (as described in Chapter 5.4.1).	• City of Toronto • Fisheries and Oceans Canada (DFO) • TRCA
Vegetation and Vegetation Communities	Preliminary and Detailed Design	• Prepare the following environmental management plans: Restoration and Enhancement Plans; Erosion and Sediment Control Plan; and Environmental Inspection and Monitoring Plan. Continue consultation with agencies as required to ensure compliance with the applicable environmental policies, guidelines and plans regarding acceptable mitigation/compensation protocols for natural heritage features, and to identify any additional required mitigation measures to ensure impacts to these areas are minimized to the extent possible. • Minimize impact to trees by conducting a Tree Inventory and Arborist Report as well as developing a Tree Planting Plan	• TRCA • Ministry of the Environment, Conservation and Parks (MECP)
Wildlife and Wildlife Habitat	Preliminary and Detailed Design, Construction	• Conduct a wildlife sweep at the MSF prior to construction to drive wildlife away from the work zone. Wildlife that cannot be dispersed from the work zone should be captured and transported to nearby suitable habitats outside of the work zone. • Obtain a Scientific Collectors Permit from MNRF prior to wildlife salvage activities. • Complete a more detailed evaluation of bat habitat and the occupancy of their habitat as part of the permitting phase of the project in advance of construction. Should bat maternity roosts be identified, consultation with MECP should be conducted to confirm permitting requirements. Vegetation removals should not be conducted during the active period, typically extending from April 1 to September 31. • Several bird species listed under the Migratory Birds Convention Act (MBCA) are located within the study area. While migratory insectivorous and non-game birds are protected year-round, migratory game birds are only protected from March 10 to September 1. To comply with the requirements of the MBCA, disturbance, clearing or disruption of vegetation where birds may be nesting should be completed outside the window of April 1 to August 15. In the event that these activities must be undertaken from April 1 to August 15, a nest survey will be conducted by a qualified avian biologist to identify and locate active nests of species covered by the MBCA. • Obtain TRCA permits at the detailed design stage under Section 28.1 of the Conservation Authorities Act (Ontario Regulation 166/06). Further correspondence shall take place with TRCA to determine application requirements for permits under the regulation and to stake the boundaries of wetlands located in proximity of the Eglinton East LRT. • Review all new bridges/culverts design during later design phases to ensure that as a minimum, existing openness ratios are maintained.	• Environment and Climate Change Canada • MECP • Ministry of Natural Resources and Forestry (MNRF) • TRCA
Species at Risk (SAR)	Preliminary and Detailed Design	• Undertake further correspondence with MECP to discuss species at risk that have been identified or have the potential to be located in the vicinity of the study area, and any requirements under the Ontario ESA. • Undertake further field investigations during the appropriate seasons using MNRF protocols. Surveying for species at risk should be conducted to confirm their presence or absence, and thus, the appropriate steps for protection and permitting.	• MECP • MNRF
Designated Natural Areas (ANSI & ESA)	Detailed Design	• Identify restoration, enhancement, and compensation measures during later design stages in consultation with MNRF and TRCA.	• City of Toronto

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• During construction, great care and monitoring of sediment run-off and impacts to connecting storm system to be taken to ensure no impacts to nearby creeks.	• MNRF • TRCA
Geotechnical Conditions	Detailed Design	• Undertake additional subsurface investigations consisting of the drilling of boreholes to provide geotechnical design parameters, identify areas that require special design considerations, and provide sufficient information for costing and construction purposes. • Use test pits in some areas and collect bulk samples for laboratory testing purposes to assess issues associated with the stability of open cut excavations, presence of seepage and/or static groundwater, and the presence of cobbles and/or boulders. • Conduct further geotechnical and stability studies and implement design recommendations in support of the proposed works including earthworks, grading, and site alterations. • Submit borehole investigations and geotechnical reports to MTO.	• MNRF • TRCA • MTO
Contamination	Detailed Design	• The project proponent will need to make the necessary environmental site assessments to ensure that any new land conveyances and easements pertaining to Toronto Water infrastructure are free from contamination, and if contamination exist, the lands shall be appropriately remedied by the proponent. • The Contaminated Site Assessment report of the new land conveyances and easements shall undergo the City's environmental peer review process and shall be cleared by the City's peer reviewer. • Based on the Limited Phase 1 ESA findings, a Phase 2 ESA should be undertaken to assess the soil and groundwater quality underlying the project site.	• Toronto Water • City of Toronto Engineering & Construction Services
Fluvial Geomorphology	Detailed Design	• Complete a fluvial geomorphology assessment during detailed design • Provide TRCA with fluvial geomorphology studies for any new crossings or modifications to existing crossings to ensure that the alternatives consider the technical implications and design costs of appropriately designing the crossings using the meander belt width or the 100-year erosion rate of the watercourse along with the crossing orientation and location in line with fluvial geomorphology principles. This will ensure that the proposed infrastructure is protected from watercourse erosion hazards (applicable only to natural channels, not concrete lined ones).	• TRCA
Cultural Environment			
Built Heritage Resources and Cultural Heritage Landscapes	TRPAP, Preliminary and Detailed Design, Construction	• Consult with municipal heritage staff and other jurisdictions as appropriate to determine if proposed infrastructure will be subject to specific policies within heritage conservation districts or conservation areas (parks). Consult with municipal heritage staff and the Ministry of Citizenship and Multiculturalism (MCM) as early as possible during the next phase of design to complete additional cultural heritage studies • Plan and undertake construction activities and staging to avoid unintended negative impacts to identified BHRs and CHLs. Avoidance measures may include, but are not limited to: erecting temporary fencing, establishing buffer zones, issuing instructions to construction crews to avoid identified BHRs and CHLs, etc. • Undertake resource-specific Heritage Impact Assessments (HIAs) (by a qualified person) as early as possible during detailed design as direct impacts are proposed for 3750 Kingston Road (BHR 3) and 156 Galloway Road (BHR 6). HIAs will be developed in consultation with, and submitted for review to, municipal heritage staff, the municipal heritage committee, the MCM and Indigenous Nations, as appropriate.	• City of Toronto • Ministry of Citizenship and Multiculturalism (MCM) • Indigenous Communities

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		A heritage permit may be required and further consultation with heritage staff at the municipality is recommended. The HIA should be completed following the City of Toronto's Terms of Reference for Heritage Impact Assessment (City of Toronto, 2023). Permission under Section 33 of the OHA may be required depending on the impacts, which will be confirmed through the HIA. • Indirect impacts to identified BHRs within 50 metres of the proposed limits of impact are possible due to construction activities which may result in limited and temporary adverse vibration impacts to five known and potential BHRs. To ensure that identified BHRs are not adversely impacted during construction, a baseline vibration assessment should be undertaken during detailed design. Should this advance assessment conclude that the any structures will be subject to vibrations, 1) a vibration monitoring plan should be prepared and implemented as part of the detailed design phase of the project to lessen vibration impacts related to construction; and where potential adverse vibration impacts cannot be avoided (2) a qualified engineer should include this property in the condition assessment of structures within the vibration zone of influence for this project. Further, the Contractor must make a commitment to repair any damages caused by vibrations. • Should future work require an expansion of the study area then a qualified heritage consultant should be contacted in order to confirm the impacts of the proposed work on potential heritage resources. • Continue engagement with Indigenous Communities during future phases of the project, specifically regarding any future studies and fieldwork related to natural heritage, cultural heritage and archaeology.	
Archaeological Resources	Preliminary and Detailed Design	• Conduct Stage 2 archaeological assessment on parts of the study area exhibiting archaeological potential (3739 Kingston Road, 3741 Kingston Road, 38 Warnsworth Street, 3295 Ellesmere Road, 3295 Ellesmere Road, 7600 Sheppard Avenue East, 1085 Neilson Road, and 10 Tapscott Road), prior to any proposed construction activities on these lands. • For properties requiring Stage 2 Archaeological Assessment, testing is to consist of test pit survey at 5 m intervals. • 3750 Kingston Road is a Designated heritage property circa 1867 and retains archaeological potential surrounding the existing structure underneath the paved parking lot. According to the S & G Section 2.1.7, Standard 3, this area will require Stage 2 mechanical trenching at a maximum of 10 metre intervals prior to any development, catered to the project impacts. • Conduct testing using a backhoe equipped with a smooth bucket to sample any deeply buried soil horizons and sample any subsurface features that may be present. Additional hand exposure/excavation of significant archaeological features or deposits may be required as part of this process. • Should the Stage 2 Archaeological Assessment result in a recommendation for further assessment, all required remaining stages at the time of TRPAP completion will be completed as early as possible in the detailed design process and before any ground disturbing activities. • Should previously undocumented archaeological resources be discovered during construction, the person discovering the archaeological resources shall cease alteration of the site immediately and engage a licensed consultant archaeologist to conduct an archaeological assessment, in compliance with Section 48(1) of the OHA. If the discovery includes human remains, the police or coroner shall also be notified. • Should the proposed work extend beyond the current study area, further archaeological assessment should be conducted to determine the archaeological potential of the surrounding lands.	• Ministry of Citizenship and Multiculturalism (MCM) • Indigenous Communities

Environmental Component	Project Phase	Future Commitment	Agencies and Groups to be Consulted (as required)
		• Continue engagement with Indigenous Nations during future phases of the project, specifically regarding any future studies and fieldwork related to natural heritage, cultural heritage and archaeology.	
Emissions			
Air Quality	Detailed Design Construction	• In future design phases, use a meteorological dataset from the nearest meteorological station(s) for the most recent five years for future assessments as noted in the Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects (MTO, May 2020). • Create a code of practice for future contractors with guidance for addressing fugitive dust emissions from construction to reduce the potential for air quality impacts during the construction phase of the project. • Prior to construction the Phase 1 Environmental Site Assessment should also be reviewed to identify potential areas of ground contamination along the construction route. In addition to the dust suppression techniques, any areas that have the potential to emit other contaminants as a part of the fugitive dust should be reviewed further and consideration should be given to additional onsite monitoring at sensitive receptors for any site-specific contaminants identified. • At the MSF construction area, monitoring of impacts to sensitive receptors (i.e., public school, residential neighbourhood, Extendicare facility) should be continuous. Consider automatic monitoring devices for PM for these sensitive receptors, especially if construction will take place over a period.	• Ministry of the Environment, Conservation and Parks (MECP)
Noise	Detailed Design Operation	• Evaluate noise from Traction Power Sub-stations (TPSS) and identify feasible mitigation measures that can be used to ensure compliance. • Review noise mitigation measures to ensure applicable criteria is met for the final design with an Acoustical Consultant. Further explore the ability of resilient wheels to mitigate noise and achieve compliance. Confirm the type of wheels, their suitability for the speeds and frequency of use and any measures required to maintain them. • An acoustic audit should be performed when all mitigative measures are implemented to confirm dB reduction and compliance with NPC-300 limits. • While infrequent, noise stemming from emergency equipment and associated mitigation measures, should be investigated further in future phases. • Implement robust complaint response procedures to enable timely response of noise complaints and ensure potential further corrective actions and/or mitigative measures are investigated and implemented.	• MECP
Vibration	Detailed Design Operation	• Review vibration mitigation measures to ensure applicable criteria is met for the final design with an Acoustical Consultant. • Any construction activity causing vibration must be reviewed by MTO prior to the activity taking place as part of the pre-construction consultation, inspection, and monitoring program. • Vibrations must be monitored during construction to the satisfaction of MTO.	• MECP • MTO